

# Nuclear Development and the Fuel Cycle

## Nuclear Development Committee (NDC)

*Set against the backdrop of renewed government interest in ensuring long-term security of energy supply and alleviating the risk of global climate change, the NDC has been focusing its activities on the technical, economic and policy issues of relevance for assessing the nuclear option as a sustainable supply source, taking into account environmental and social goals as well as economic efficiency objectives.*

### Nuclear policy issues

NDC activities in the field of sustainable development were pursued with emphasis this year on climate change issues. The Agency participated in the organisation of the OECD Forum Round Table on Nuclear Energy and Sustainable Development. A report was published on *Nuclear Energy and the Kyoto Protocol*, providing key facts and highlighting the challenges and opportunities for the future of nuclear energy in the context of implementing the Kyoto Protocol and beyond. It served as a basis for NEA informal presentations and discussions in side events organised in connection with the World Summit on Sustainable Development, held in Johannesburg, South Africa, in August, and in parallel with the Eighth Conference of the Parties to the UN Framework Convention on Climate Change (COP8), held in New Delhi, India, at the end of October.

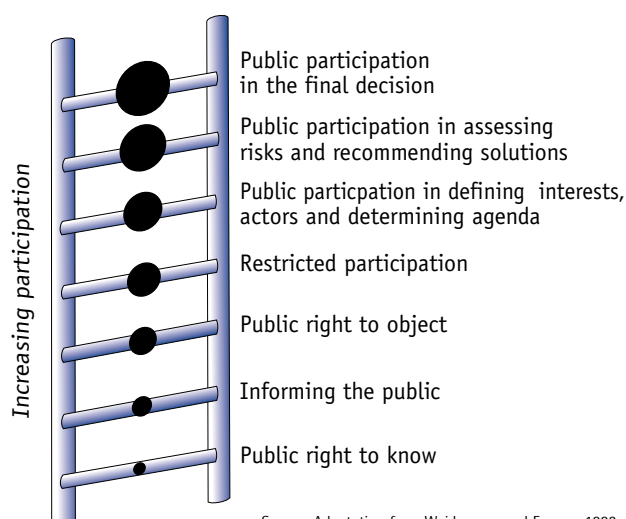
A report on *Society and Nuclear Energy: Towards a Better Understanding*, prepared under NDC auspices, was published. The publication is essentially a desk study compiling and analysing literature and research work on risk perception and communication, and public participation in decision making on nuclear energy projects. It provides a robust basis for further work on the societal aspects of nuclear energy that will be undertaken by the NDC in 2003. For more detailed information about NDC work in the area of civil society and nuclear energy, see page 32.

The NEA participated in the International Energy Agency (IEA) energy policy reviews of Germany, Hungary and Switzerland, countries where nuclear energy is a significant component of the supply mix. Nuclear policy issues were particularly important in Germany where an accelerated shut-down of nuclear power plants has been decided by the Government and the Parliament.

### Economics

The proceedings of the joint IEA/NEA workshop on "Externalities and Energy Policy: The Life Cycle Analysis Approach" were published early in 2002. The publication includes all the papers presented at the workshop as well as a summary of the round table discussion and an executive summary that pulls together the conclusions and findings of the workshop. Building upon the outcome of the workshop and

### The public participation ladder



Source: Adaptation from Weidemann and Femers, 1993

other work carried out previously at the NEA, the Secretariat is preparing a short report on external costs of nuclear energy for policy makers and analysts. Once reviewed and endorsed by the NDC, the report will be published as a free booklet for wide distribution.

### Technology

The Seventh Information Exchange Meeting on "Actinide and Fission Product Partitioning and Transmutation" (P&T), which for the first time was organised jointly with the NEA Nuclear Science Committee, was held in Jeju, Korea on 14-16 October 2002. It brought together a large number of experts in the field and provided opportunities for very fruitful discussions between scientists and P&T experts. The proceedings from the meeting will be published in 2003. The Eighth Information Exchange Meeting will be held in Las Vegas, Nevada in 2004.

The comparative study on accelerator-driven systems and fast reactors in advanced fuel cycles aiming at partitioning and transmutation of minor actinides was completed and published. The experts

concluded that multiple recycling based on very efficient technologies could achieve drastic reductions in radiotoxicity of nuclear waste, up to 100-fold, but that a considerable amount of R&D was needed to reach this objective. Furthermore, the report stresses that the full potential of a transmutation system could be exploited only if it was utilised for a period equal to or exceeding a century.

Further work concerning the back-end of the fuel cycle will be undertaken in 2003 and will focus on the impact of advanced fuel cycles, including P&T, on the required physical characteristics and costs of repositories for high-level waste disposal.

The key findings and conclusions from the "Three Agency Study" on innovative nuclear energy systems were published mid-year in a summary report entitled *Innovative Nuclear Reactor Development: Opportunities for International Co-operation*. The report includes recommendations for enhanced collaborative R&D on advanced reactors within international frameworks.

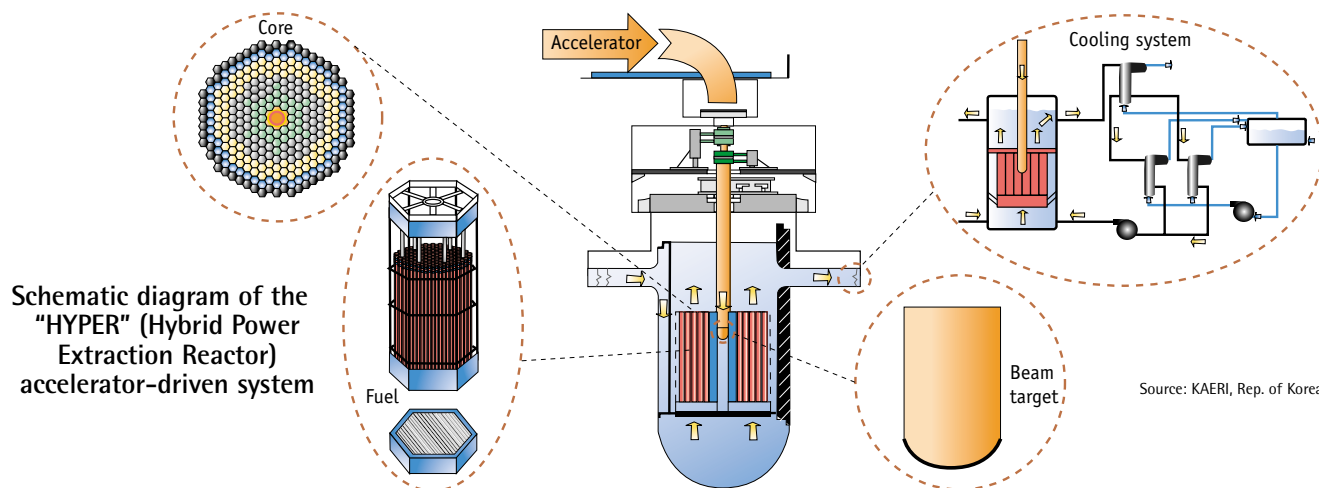
The Agency continued supporting the activities of the Generation IV International Forum (GIF), initiated by the US Department of Energy and carried out by ten countries (including three non-NEA member countries). The selection of six Generation IV concepts and the completion of the GIF Roadmap by the end of 2002 constituted key milestones in the project. The Technology Roadmap recommended concept-specific and cross-cutting R&D programmes that are expected to be pursued jointly by GIF countries in 2003 and beyond. A small programme on cross-cutting economic issues will start early in 2003 with the support of the NEA.

- Issues related to nuclear energy and sustainable development were addressed in several high-level meetings, including the OECD Forum 2002, the World Summit on Sustainable Development and the Eighth Conference of the Parties to the UN Framework Convention on Climate Change (COP8). The Agency contributed to the debate drawing from findings of its study on *Nuclear Energy and the Kyoto Protocol* as well as earlier works.

- A report on society and nuclear energy was published addressing risk perception and communication, and public participation in decision making on nuclear energy projects.

- A comparative study on accelerator-driven systems and fast reactors in advanced nuclear fuel cycles was completed and published in 2002. It provides an overview of opportunities and challenges associated with partitioning and transmutation (P&T) of minor actinides.

- The Agency continued to participate in the activities of the Generation IV International Forum (GIF) and provided assistance to GIF countries during the preparation of the technology roadmap, issued at the end of 2002.



### Data and resource assessment

In the field of resource assessment, the 19<sup>th</sup> edition was published of the Joint NEA/IAEA report on *Uranium: Resources, Production and Demand*, familiarly known as the "Red Book". Efforts are under way to improve the methods for gathering data, notably by allowing the use of the internet. Trials of the system are planned for 2003 and if successful, this concept would be extended to *Nuclear Energy Data* (the "Brown Book").

The 2002 edition of *Nuclear Energy Data* offers additional data and graphical representation of key statistics on nuclear energy in OECD countries. It provides a comprehensive international overview

of nuclear electricity capacity, generation and fuel cycle activities. The 2002 edition includes additional textual information provided by member country governments on nuclear energy programmes and policies.



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