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The Strategic Plan of the Nuclear Energy Agency

2005-2009

Summary

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NUCLEAR ENERGY AGENCY
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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NUCLEAR ENERGY AGENCY

The OECD Nuclear Energy Agency (NEA) was established on 1st February 1958 under the name of the OEEC European Nuclear Energy Agency. It received its present designation on 20th April 1972, when Japan became its first non-European full member. NEA membership today consists of 28 OECD member countries: Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Mexico, the Netherlands, Norway, Portugal, the Republic of Korea, the Slovak Republic, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The Commission of the European Communities also takes part in the work of the Agency.

The mission of the NEA is:

- to assist its member countries in maintaining and further developing, through international co-operation, the scientific, technological and legal bases required for a safe, environmentally friendly and economical use of nuclear energy for peaceful purposes, as well as
- to provide authoritative assessments and to forge common understandings on key issues as input to government decisions on nuclear energy policy and to broader OECD policy analyses in areas such as energy and sustainable development.

Specific areas of competence of the NEA include safety and regulation of nuclear activities, radioactive waste management, radiological protection, nuclear science, economic and technical analyses of the nuclear fuel cycle, nuclear law and liability, and public information. The NEA Data Bank provides nuclear data and computer program services for participating countries.

In these and related tasks, the NEA works in close collaboration with the International Atomic Energy Agency in Vienna, with which it has a Co-operation Agreement, as well as with other international organisations in the nuclear field.

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I. Introduction and contextual changes

The first Strategic Plan of the Nuclear Energy Agency (NEA) was adopted in 1999. It has generally been considered relevant, exhaustive and a useful tool. To assist member countries in meeting the foreseeable future energy, environmental and societal challenges of the next five years, the NEA has developed a revised Strategic Plan covering the period 2005-2009. The important changes that have occurred in the energy and nuclear landscapes, as well as in the OECD framework, are the basis for this revision insofar as they influence the NEA's role and activities.

Energy use continues to grow inexorably and fossil fuels continue to dominate the energy mix. Although the earth's energy resources are adequate to meet demand in the medium term, serious concerns remain regarding security of supply, investment in energy infrastructure and the threat of environmental damage caused by energy production.

Concerns about climate change are growing. In 2030, CO₂ emissions are expected to be 70% higher than today, with new emissions that will shift from industrialised countries to the developing world. To help meet the short-term and long-term objectives of the energy policies that they have decided in a sustainable development perspective, OECD member countries will continue to favour energy savings as well as renewables and less CO₂-producing energy sources. In addition, many of them consider nuclear power as a realistic option for their energy mix.

Despite regular increases in electricity demand, the **contribution of nuclear power to electricity production in OECD countries remains stable at approximately 24%**. The number of nuclear power plant retirements has been less significant than expected since the life of many operating plants has been extended. The impact of these plant retirements on electricity generation has also been counterbalanced by better availability factors and the power uprating of some plants. The cost of electricity generated by existing nuclear power plants is still very competitive with conventional plants, including gas plants. Most countries using nuclear energy consider that it provides significant environmental benefits, in particular in limiting CO₂ emissions and helping to fulfil commitments under the Kyoto Protocol.

A number of countries have shown new or renewed interest in nuclear energy and have taken decisions to prepare its future development. The construction of a new nuclear power plant has been decided in Finland and a number of countries have decided to co-operate to prepare a new generation of nuclear energy systems including power plants and the associated fuel cycle facilities. This co-operation is part of the long-term planning for replacing plants to be retired in future.

While some OECD countries stopped their moratorium on nuclear power over the last few years, others decided to phase out nuclear power due to national concerns about consequences of a severe accident and radioactive waste disposal. **To sustain or increase its role as a significant non-fossil source of electricity, nuclear power must meet several challenges.** The safety record of nuclear power plants is good in OECD countries, but maintaining high standards of safety and enhancing the quality and effectiveness of nuclear regulation are crucial in a context of increasing market liberalisation, and continuous efforts are needed. A large number of nuclear power plants are presently approaching the end of their initially estimated lifetimes and require license extension or decommissioning. The competitiveness of new nuclear plants has not been demonstrated everywhere in today's market conditions and the reduction of their capital cost is a real challenge. Recent progress towards the opening of the Yucca Mountain disposal site in the United States and the Olkiluoto disposal facilities in Finland, and the characterisation of two sites in Sweden are important to validate the current approaches to the disposal of high-level radioactive waste and spent fuel, but more must be done in this area to improve public and political confidence that such waste can be safely managed. The continuous reduction of government funding for research is not new, but in the long term loss of expertise, facilities and data may cause serious damage to the scientific and technical infrastructures, may limit the transfer of knowledge to new people and may deter young scientists from working in the nuclear field. The absence of construction of new plants over a long period affects industrial capabilities, skills and competencies. Satisfactory answers to these issues are a precondition to keeping nuclear energy as a credible option for the future.

Governments will continue to rely on a competitive free market to provide sufficient energy supplies at acceptable cost. But several of the key challenges mentioned above will not be met by the market alone. Ensuring that national energy and nuclear policies meet sustainable development principles is clearly the responsibility of governments. Among these principles, good functioning of and fair access to the market, environmental protection and long-term security of supply will remain priorities for governments. Informing and involving the public is another key responsibility for governments.

Governments must also establish regulations and monitor their implementation where and when necessary, in particular in areas involving core responsibilities, such as nuclear safety, radiation protection, radioactive waste disposal, non-proliferation and national security. They have to ensure, to the greatest extent possible, that these regulations reflect the best modern practices, comply with the state of the art and are consistent across all energy technologies. Government support of research and development will continue to play a key role in the pursuit of technological progress and will contribute to halt the worrisome decrease of human and technical infrastructure in member countries.

In addressing these issues, governments can benefit from authoritative international assessment and common understandings. More generally, governments need a consistent and balanced OECD view of all future energy sources, including nuclear energy, within the broader energy, socio-economic and environmental contexts. Governments can also benefit from international co-operation to help them maintain nuclear expertise and sound scientific and technical infrastructure.

The **Strategic Plan of the NEA** is aimed at helping it to meet the evolving needs of its member country governments in the nuclear energy field, including applications of ionizing radiation. Following the introduction, the second chapter presents the NEA mission statement and general objectives; the third chapter describes the Agency's basic areas of work or "strategic arenas"; the fourth chapter considers interactions with various organisations and groups outside the NEA, including within the OECD family; and the fifth chapter addresses issues regarding the Agency's efficiency. The basis of authority for the NEA and its activities is presented in the Plan's appendix.

This document summarises the main lines of the NEA Strategic Plan for the period 2005-2009, the full text of which is available at www.nea.fr.

II. Mission of the Nuclear Energy Agency and strategic arenas of work

Mission statement:

To assist its member countries in maintaining and further developing, through international co-operation, the scientific, technological and legal bases required for a safe, environmentally friendly and economical use of nuclear energy for peaceful purposes. To provide authoritative assessments and to forge common understandings on key issues as input to government decisions on nuclear energy policy and to broader OECD policy analyses in areas such as energy and sustainable development.

To fulfil its mission, the NEA:

- will be a **forum for sharing information and experience** among member countries;
- will **promote international co-operation** in the nuclear field;
- will help member countries to **pool and maintain their technical expertise and human infrastructure**, and support their nuclear activities;
- will provide member countries with **nuclear policy analyses**.

The following areas of work, considered as “strategic arenas” insofar as they represent the key areas in which the NEA must fulfil its Mission, will continue to provide the basis for NEA activities: nuclear safety and regulation; radioactive waste management; radiation protection and public health; nuclear science; economics, resources and technology; legal affairs; Data Bank services; and information and communication. There are other areas of the Agency’s work which are cross-sectorial by nature such as decommissioning, scientific and technical infrastructure, the impact of market liberalisation or next-generation reactors. These areas are addressed in the Plan in each relevant strategic arena, and receive special attention to ensure that they are satisfactorily dealt with and that the relevant activities are well co-ordinated within the Agency.

In selecting the strategic arenas, particular attention has been paid to the work of other international organisations and to the potential added value of the NEA, taking into account its strengths and its specificities, such as its membership, methods of work and structure, past experience and achievements.

Nuclear safety and regulation

The goal: to assist member countries in ensuring high standards of safety in the use of nuclear energy, by supporting the development of effective and efficient regulation and oversight of nuclear installations, and by helping to maintain and advance the scientific and technological knowledge base.

Maintaining and improving high standards of nuclear safety in accordance with the current state of science and technology, and enhancing the quality and effectiveness of nuclear regulation are two interrelated objectives for member countries. The NEA will assist them in maintaining and further developing the scientific, technical and regulatory knowledge base required to assess the safety of design, construction, operation and decommissioning of nuclear reactors and other civilian nuclear installations. International co-operation plays an essential role in this field to maintain safety performance and further improve it where possible, and to address existing and future safety and regulatory issues on the basis of best knowledge and methodology available.

Radioactive waste management

The goal: to assist member countries in the area of management of radioactive waste and materials, focusing on the development of strategies for the safe, sustainable and broadly acceptable management of all types of radioactive waste, in particular long-lived waste, and spent fuel.

Radioactive waste and materials exist in countries with and without nuclear power programmes as a result of past and present activities, and need to be managed in a manner that is responsible to present and future generations. Significant progress has been achieved and considerable experience is available in NEA member countries on waste and materials processing, conditioning, storage, transportation and disposal. Special efforts are being expended in the area of long-term management of radioactive waste with a view to continue to integrate technical advances and societal demands in decision making as well as to refine regulatory and policy frameworks. International co-operation amongst implementers, regulators, policy makers and R&D specialists is essential to fostering a broader understanding of the issues at hand and formulating more widely accepted solutions.

Radiation protection and public health

The goal: to assist member countries in the regulation and implementation of the system of radiological protection by identifying and addressing conceptual,

scientific, policy, regulatory, operational and societal issues in a timely and prospective fashion, and clarifying their implications.

In order to beneficially utilise and cope with radiation and radioactive material, NEA member countries proactively engage in the radiological protection of the public, workers and the environment. New scientific and social challenges continue to arise in this area, notably concerning the radiological protection of non-human species, and the application of modern risk-governance approaches to radiological-risk decision making. In response, the international system of radiological protection, international standards, and national policies and regulations are also evolving. It is in the interest of all NEA member countries to share and build on past experience, and to address emerging issues and their practical implications, focusing on the development of policy-relevant regulatory, scientific, technical and practical aspects of radiological protection.

Nuclear science

The goal: to help member countries identify, collate, develop and disseminate basic scientific and technical knowledge required to ensure safe, reliable and economic operation of current nuclear systems and to develop next-generation technologies.

Research capability and technical expertise in basic disciplines such as nuclear and radiation physics, thermal hydraulics, neutronics, fuel chemistry and material science are needed to maintain a high level of performance and safety, and to develop nuclear programmes. Present and future nuclear technologies will greatly benefit from improved knowledge in these areas. Fostering active maintenance and development of this knowledge in an international framework and enhancing the dissemination of the scientific results are vital to the performance of nuclear activities.

Economics, resources and technology

The goal: to provide authoritative, reliable information on nuclear technologies, economics, strategies and resources to governments for use in policy analyses and decision making, including on the future role of nuclear energy in a sustainable development perspective and within the broad context of national and international energy policies.

Energy, particularly electricity, is a vital public commodity needed to support modern life. It is an accepted responsibility of OECD governments to ensure that it is provided economically, securely and with minimal environmental impact. Nuclear energy meets the needs of a significant share of the electricity

consumption of OECD countries and has the potential to become more important in the future. There are many synergies between the nuclear energy issues of individual countries and the sector has considerable international implications. The added value of the NEA will result from the engagement of a broad scope of expertise in studies which will lead to robust findings and conclusions that support sound national policy making.

Legal affairs

The goal: to help create sound national and international legal regimes required for the peaceful uses of nuclear energy, including international trade in nuclear materials and equipment, to address issues of liability and compensation for nuclear damage, and to serve as a centre for nuclear law information and education.

Achieving confidence in the peaceful exploitation of nuclear energy requires the existence of comprehensive and effective legal regimes whose goals are to protect the public and the natural environment from the risks inherent in those activities. Those regimes include regulation at a national level, co-operation at bilateral and multilateral levels and harmonisation of national policies and legislation through adherence to international conventions. They need to be strong enough to set and enforce limits, and flexible enough to keep pace with technological advances and changing public concerns.

Data Bank services

The goal: to be the international centre of reference for its member countries with respect to basic nuclear tools, such as computer codes and nuclear data, used for the analysis and prediction of phenomena in the nuclear field; and to provide a direct service to its users by developing, improving and validating these tools and making them available as requested.

Computer codes and basic nuclear data are fundamental tools to analyse and predict phenomena in the nuclear field. It is essential that these codes and data be internationally validated and disseminated in order to become common tools for actors in the nuclear area.

The Data Bank is formally a part of the NEA but has its own membership and a separate budget. The relationship between the Data Bank and the general NEA Secretariat is based on the principle of mutual benefit. The Data Bank benefits from, and contributes to, the general infrastructure of the NEA Secretariat and provides various parts of the NEA with its expertise in databases.

Information and communication

The goal: to provide member governments and other major stakeholders with information resulting from NEA activities and to enhance awareness and understanding of the scientific, technical and economic aspects of nuclear activities as well as awareness of the NEA itself.

The dissemination of authoritative information and rigorous analyses to policy makers and other interested circles is key to enlightened and broadly shared decision making in the nuclear energy field. Improving the visibility of the NEA and its ability to convey the results of its work to member countries contributes to this endeavour.

III. Interactions and efficiency

An interactive NEA will allow the Agency to benefit from outside input and experience, and to enhance the value of its work. Greater NEA participation in broader studies and strengthened co-operation with other international organisations would help complement the activities of each other, create synergies and provide full value for the money of member countries. Member country help is important to ensure consistency and complementarity of the activities of the relevant international organisations when approving their respective programmes of work.

To bring NEA expertise and the results of its work into the broader energy, socio-economic and environmental OECD context and to help provide member countries with a consistent and balanced OECD view on energy issues, the Agency will **interact with the OECD as a whole**, especially by participating in the horizontal work of the Organisation in such areas as sustainable development and market liberalisation, and will pursue co-operation with the **International Energy Agency (IEA)** on the basis of respective independence and clearly defined areas of competence, which are conditions for the objectivity of analyses carried out by the two agencies.

To ensure complementarity and increase synergy with the **International Atomic Energy Agency (IAEA)** and with other international bodies as well as to optimise resources, capitalise on NEA expertise and disseminate the results of NEA work to a wider audience, the Agency will enhance co-operation and undertake additional efforts to minimise overlap and avoid duplication with the IAEA as well as enhance interaction with the European Commission and other groups such as the G8 Nuclear Safety and Security Working Group, as appropriate.

NEA interaction with **industry** will be based upon the recognition that the NEA is an intergovernmental organisation whose member countries determine its programme and the appropriate degree of industrial involvement with the Agency. However, the liberalisation of electricity markets and the privatisation of production capacities are giving a major role to the industry. To benefit further from industry contributions, the Agency will establish useful interaction with key organisations and groups representing the nuclear industry in member countries and increase exchanges with industry that could be beneficial to NEA activities.

Keeping the Agency's membership relatively small and homogeneous according to agreed criteria, and establishing forms of **co-operation with non-members**, especially Russia and China, which help them and provide added value to the Agency's programme, consistent with financial, political and practical realities and OECD policy on outreach, are the means to achieve the goal of establishing effective relationships with non-member countries whose participation

in the NEA programme can be mutually beneficial, while limiting further membership to countries that can make a significant contribution to the Agency.

Efficient **working methods** aim at establishing the best Programme of Work to meet the needs of member countries and at delivering quality work on time and cost-effectively. They should preserve NEA flexibility and responsiveness, which are traditional NEA strengths. Special attention has been paid in the 2005-2009 Strategic Plan to the management of cross-cutting issues and to the monitoring and evaluation of the Strategic Plan.

The **Steering Committee's role** is to ensure that the purpose of the Agency and its assigned tasks are carried out in conformity with the provisions of the NEA Statute and the decisions of the OECD Council, and to ensure the Agency's responsiveness to member countries' needs. It provides the NEA with political guidance to extend the NEA's focus beyond specialist areas and to allow it to play a more policy-oriented role. To this end, the Steering Committee will increase its role in the preparation of the Programme of Work and assess and monitor its implementation as well as the implementation of the Strategic Plan, pursue a policy-oriented role for the NEA and establish closer ties with the NEA standing technical committees while enhancing the efficiency of its working procedures.

Composed of member country experts, the **standing technical committees** constitute a unique feature and important strength of the NEA, providing flexibility for adapting to new issues and helping to achieve consensus rapidly. They will, under the guidance of the Steering Committee, foster international co-operation in the NEA strategic arenas with a view to developing common approaches and consensus, optimise co-ordination among themselves and treat cross-cutting issues efficiently, monitor the implementation of the Strategic Plan in their respective areas of work while reviewing their working methods regularly and adjusting them as necessary to enhance their efficiency.

The Agency will ensure an appropriate selection of activities and the transparency of its Programme of Work. In a context of zero-growth or decreasing budgets, the NEA will promote continuous improvement in **Secretariat efficiency** by streamlining administrative procedures, benefiting from the use of modern technologies and ensuring that its structure is appropriate.

Fulfilment of the objectives fixed by the Strategic Plan presupposes a stable and predictable level of financial resources as well as well-qualified staff, who are essential in ensuring that the Agency's work is of high quality. To this end, the Agency will consolidate the funding of its core programme, seek additional sources of funding and attract the best staff, while maintaining efficient operational management of resources.