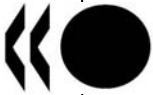


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**NUCLEAR ENERGY AGENCY
COMMITTEE FOR TECHNICAL AND ECONOMIC STUDIES ON NUCLEAR ENERGY
DEVELOPMENT AND FUEL CYCLE**

**NEA/NDC(2008)19
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First Meeting of the Ad Hoc Expert Group on Financing of Nuclear Power Plants

SUMMARY REPORT

28-29 January 2008, NEA Headquarters, Issy-les-Moulineaux, France

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COMMITTEE FOR TECHNICAL AND ECONOMIC STUDIES
ON NUCLEAR ENERGY DEVELOPMENT AND THE FUEL CYCLE (NDC)

**AD-HOC EXPERT GROUP ON FINANCING OF NUCLEAR POWER PLANTS
SUMMARY REPORT OF THE FIRST MEETING
28-29 January 2008, NEA Headquarters**

Item 1. Welcome and introductory remarks

1. The meeting was opened by Mr. Stan Gordelier (NEA), who welcomed the participants. He briefly described the roles of the OECD and the NEA, and the Nuclear Development Division in particular. He pointed out the important role of experts from the member states in the work of the NEA. The success of projects such as this one depended very much on the contributions made by such experts. He also mentioned the background to the project, and the reasons why the Nuclear Development Committee had decided to include it in its programme of work. There was clearly renewed interest in nuclear power, but so far only a few new plants had actually been ordered. There appeared to be a reluctance to invest in new nuclear plants, so the aim was to investigate the reasons for this and to examine what governments might do to overcome it.

Item 2. Introduction of participants

2. The participants were asked to briefly introduce themselves to the group. The list of participants is given in Attachment 1.

Item 3. Nomination of the Chair

3. Mr. Gordelier explained that the group needed to have a Chair or Co-chairs drawn from its membership, and asked that participants consider whether they could take on this role. This could be discussed informally during the morning before a decision was made. After some discussion during the break, Mr. Martin Taylor (NEA) reported that Mr. Paul M. Murphy (United States) had expressed his willingness to chair the group. This was welcomed by all participants, and Mr. Murphy was confirmed as Chair.

Item 4. Adoption of the agenda

4. The proposed agenda in document NEA/NDC(2008)6 was accepted by the participants.

Item 5. Presentation on the background and scope of the project

5. Mr. Taylor introduced the background paper he had prepared setting out the motivations for the study, the background against which it was being carried out, and the objectives which the NDC had set for the group. It included a proposal for the contents and structure of the group's report, and the suggestion that a series of case studies examining the financing of current and potential nuclear projects should be annexed to the report. These were discussed in more detail later in the meeting.

6. It was clear, he noted, that very substantial investment in new generating capacity would be needed in many OECD and non-OECD countries in the coming decade, and also that there was renewed interest in nuclear. However, financing appeared to be a problem in many cases, particularly in countries with competitive electricity markets. The viability of nuclear projects was very sensitive to the cost of capital, which depended on the financial risks perceived by potential investors. The group would need to

review the obstacles to successful financing of nuclear plants and assess the measures that governments might consider to remove or alleviate these. The report should also discuss the methods and sources of financing, and the lessons which could be drawn from recent experience.

7. There was considerable discussion of the issues involved in financing of nuclear plants and the particular aims of this NEA project. The supply chains and expertise needed for nuclear construction had been run down over the last 20 years or so, Mr. Murphy observed, and reviving them would take time. Banks looking at nuclear financing would be concerned that this might result in delays and cost overruns. Mr. Iginio Chellini (Italy) noted that reducing carbon emissions and increasing security of supply were important motivations for countries to move away from fossil fuels, and that renewable energies were being directly subsidised. However, other incentives may be needed to encourage investment in new nuclear plants. Mr. Hans-Holger Rogner (IAEA) noted that nuclear did not necessarily have a security of supply advantage, especially in developing countries. However, this was one of the aims of the GNEP programme, Ms. Maureen Clapper (United States) pointed out, so in the longer term this could change.

Item 6. Discussion of relevant existing report and findings

8. The NEA had published, in co-operation with the International Energy Agency, a series of reports entitled Projected Costs of Generating Electricity, the most recent update being in 2005. This compared the projected costs of nuclear with other generating options, and included breakdowns of the cost structure for each option. This could provide some useful background to the present study. Mr. Gordelier also drew participants' attention to a recent article in "NEA News" which discussed the implications of taxation policy for the overall economics of nuclear projects, which may be an issue which the group should consider. Mr. Bertrand Roques (France) said that the French government would shortly be publishing a revised version of its electricity costs study, which would cover Flamanville 3.

Item 7. Presentations by participants on their experience and perspectives

9. Ms. Irina Borysova (WNA) made a presentation on the work which the World Nuclear Association was doing in the area of financing nuclear plants. A working group established by the WNA was preparing a report entitled "Structuring Nuclear Projects for Success", which would identify the main risks involved in nuclear financing and how these could be controlled. It would also examine project structuring and allocation of risks, as well as the role of governments. She presented the main preliminary findings from the report, which was still being drafted but was expected to be finalised in the next few months. Copies of the presentation were made available to the group, including a table setting out the risks which had been identified.

10. A presentation on the financing of potential new nuclear plants in the United States was made by Mr. Murphy. The Energy Policy Act of 2005 contained several measures designed to facilitate financing, providing government support for at least the first few new plants. This was intended to get over the problem that commercial banks were reluctant to lend for nuclear projects without some governmental support, until it had been demonstrated that the risks involved were manageable. There had also been important reforms to the licensing process, which should reduce risks associated with delays in the regulatory process. His presentation was made available to the participants.

11. Mr. Javier Garcia Lon (European Commission) made a presentation on Euratom loans for nuclear projects. Since 1977 such loans had been available for projects in member states, with a limit of 20% of the total cost. Several loans had been made in the past but none was still outstanding. A 1994 decision extended the scope of the scheme to certain non-member countries in Eastern Europe and the former Soviet Union, for plants in operation or under construction and where safety and efficiency improvements would result. Loans had been made to projects in Bulgaria, Romania and Ukraine. The

overall limit for the cumulative amount of loans which could be made presently stood at EUR 4 billion; of this, just over EUR 3.4 billion had been used, leaving almost EUR 600 million available. Any increase in this limit would need to be agreed among EU member countries. Copies of his presentation were also made available to the participants.

12. A presentation was made by Mr. Chellini on the activities of his company, ENEL, in nuclear projects in France, Slovakia and other countries. In Slovakia, ENEL was involved with the operation of four units and with a plan for completion of another two, while in France it had a 12.5% share of the Flamanville 3 project. The company was also considering involvement in financing nuclear plants in Bulgaria and Romania. In general, the experience was that during construction banks required a guarantee in the form of the balance sheets of the companies involved. Project financing had been explored, but had not proved possible so far. The main difficulties for financing were during construction, when risks had traditionally been covered by utilities. The difficulties in obtaining insurance cover were also a factor; often the risks were not insurable.

13. Mr. Murphy also made a short presentation on the activities of his company, Bechtel, and on the work of the IAEA relevant to the financing of nuclear plants. He noted that the global capacity to build nuclear plants was much less now than it had been in the past, due to lack of orders. There were fewer competitors in the market, less expertise was available, and there were also fewer certified component suppliers. More companies could enter the market, but were waiting to see if demand was really going to increase; it would thus take time for capacity to increase significantly.

Item 8. Discussion of the outline of the group's report and the key issues

14. The group considered further the proposed contents and structure for its report which Mr. Taylor had prepared as part of the background paper. Given the NEA's role in providing advice to its member governments, one of the major issues to be addressed by the group's report would be the role of governments in setting a legal and policy framework conducive to the financing of nuclear projects. There was considerable discussion of what the role of governments could be. Mr. Francois Nguyen (IEA) noted that governments needed to ensure the availability of economic energy supplies, and thus needed to consider the overall economic impact of energy supply options.

15. It was agreed that, following the introduction, the report should contain a section on historical perspectives and experience. There were clearly lessons to be learned from the rapid expansion of nuclear power in the past. The degree of direct government involvement may be an important difference in some countries, where electricity markets had been opened to competition, Mr. Murphy noted. Mr. Nicholas Ott (France) pointed out that rapid expansion in the past had followed a period of slower development. Mr. Rogner agreed that the industry was not starting from scratch this time round, and that the world had a much greater economic capacity now than in the 1970s and 1980s. The problem of financing new nuclear plants would thus be a relatively short-term one, he felt. Mr. Jurgen Fryges (Belgium) said that one difference may be that, while high oil prices had been the driver for earlier nuclear expansion, now the need to reduce CO₂ emissions was also an important factor. It was also noted that security of supply concerns were playing a role.

16. The report would then include a section on the major challenges to financing new nuclear power plants, it was agreed, which would address each risk involved in financing, which parties were involved, how it could be mitigated, and the role of governments. This was likely to be one of the largest sections of the report. Mr. Takeshi Sakamoto (Japan) thought that, to the extent possible, the report should compare the risks of nuclear investment with that of other energy and infrastructure investments.

17. The report should then go on to address the methods and sources of finance, it was agreed. Mr. Martin Reinholdsson (Sweden) thought that some background on the capital structure of nuclear projects compared with other energy projects should be included. Mr. Murphy noted that there was greater scope for innovation in equity financing, although Mr. Fryges pointed out that equity was generally more expensive than debt financing. Mr. Rogner noted that the financing methods themselves were well-known; he felt that the scope for innovation was in risk allocation. Mr. Murphy mentioned that re-financing might be possible, notably after construction was completed and the risks were lower. Mr. Sakamoto noted, however, that re-financing could also present risks because it introduced uncertainty. It was also discussed that this section would need to address the role of the World Bank and other multilateral lending institutions. Both Mr. Murphy and Mr. Rogner noted that the involvement of such institutions would help projects to gain finance from commercial sources.

18. The next section of the report should address the role of governments, particularly in setting the policy and legal framework, it was agreed. Mr. Murphy noted that, especially in developing countries, the overall business climate would be an important factor; the existence of a broad political consensus on nuclear power was also very important. Ms. Borysova said that it would be important for governments to establish suitable legal frameworks for nuclear liability and insurance. The group agreed that this was an important issue, and one where government involvement was clearly necessary. Mr. Sakamoto felt it was important to point out that some risks were best taken by governments; risks were best taken by the party most able to control them, and sometimes this was governments. Mr. Murphy thought that a clear distinction would need to be made between shorter term government measures to get over the initial reluctance to finance new nuclear plants, and measures on, for example, regulation and licensing, which were part of the required background framework for successful financing.

19. With a few amendments, the proposed contents and structure of the report were accepted by the group for the preparation of a first draft of the report. The revised version is included as Attachment 2. However, it was noted that as the draft progressed further changes may become necessary.

20. The suggestion to prepare case studies on financing of nuclear plants was discussed; it was agreed by the group that a series of such studies should be prepared to provide important background material, and should be appended to the report. As well as looking at plants under construction and recently completed, these would examine projects at the planning stage, and also the general situation in countries where nuclear power was being seriously considered but no firm sites had yet been decided. Mr. Taylor had prepared an initial list of possible case studies as an annex to the background paper; members of the group suggested some additional countries which could be included. Mr. Taylor would prepare a more detailed outline of what the case studies should cover and an expanded list so that work could start before the next meeting. Several members of the group suggested that they could assist with one or more of the studies.

Item 9. Schedule for completion of the work, and date of next meeting

21. Mr. Taylor outlined the expected schedule for the further meetings of the group, and the eventual publication of its report. The aim was to complete the report by the end of the year. It was envisaged that a further two meetings of the group would be held, the first in May with a second in late September or early October. By the time of the next meeting, Mr. Taylor would prepare a first draft of the report, drawing on the discussions and presentations at the present meeting. At least some of the case studies should also be ready by that stage.

22. After some discussion, it was agreed that the next meeting would be held on Tuesday and Wednesday 20th and 21st May 2008, again at the NEA offices. Mr. Murphy thanked the participants for their contributions to the discussions, before closing the meeting.

Attachment 1

**COMMITTEE FOR TECHNICAL AND ECONOMIC STUDIES
ON NUCLEAR ENERGY DEVELOPMENT AND THE FUEL CYCLE (NDC)**

**First Meeting of the Ad Hoc Expert Group on Financing of Nuclear Power Plants
28-29 January 2008, NEA, Room B**

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Attachment 2

CONTENTS AND STRUCTURE OF THE REPORT

Executive Summary

1. Introduction

2. Historical Perspectives and Experience

The current situation with respect to financing NPPs has been influenced by the chequered history of NPP investments, so some historical background should be included.

3. The Major Challenges to Financing New Nuclear Power Plants

This is likely to be the largest section of the report, with a detailed discussion of each of the major risks identified. In the main this will look at the position in OECD countries, but a section could look at the particular circumstances which apply in developing countries.

4. Methods and Sources of Finance for New NPPs

It should not be the aim to prepare a detailed guide to financing, but to look at the main types and sources of financing available, from both the public and private sectors, and their applicability to NPP projects.

5. The Role of Governments in Setting the Policy and Legal Framework

Where governments wish to encourage private sector involvement in financing NPPs, they will need to set suitable frameworks for the management of the financial risks involved. The study should aim to identify the basic requirements for such frameworks.

6. Conclusions and Recommendations

These should in general be aimed at the NEA's member governments which see a future role for nuclear power in their national energy supply.