Nuclear Energy Agency

NEA/NE(2020)9

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3 April 2020

NUCLEAR ENERGY AGENCY
STEERING COMMITTEE FOR NUCLEAR ENERGY

PROPOSAL FOR A GLOBAL FORUM ON NUCLEAR EDUCATION, SCIENCE, TECHNOLOGY AND POLICY

(Note by the Secretariat)

This document proposes the establishment of a Global Forum on Nuclear Education, Science, Technology and Policy (hereinafter, "Global Forum"). There are currently 14 Global Fora operating within the OECD; the proposed Global Forum would be the first launched by the OECD Nuclear Energy Agency (NEA).

This document is submitted for approval under the written procedure.

If no written comments are received by the Secretariat by ***Friday, 15 May 2020*** *close of business, the Steering Committee for Nuclear Energy will be considered as having (i) noted document* NEA/NE(2020)9 *and (ii) approved the proposal to launch the proposed Global Forum on Nuclear Education, Science, Technology and Policy presented in document* NEA/NE(2020)9 *and its mission statement set forth in Appendix to document* NEA/NE(2020)9.

Following approval by the Steering Committee, the OECD External Relations Committee will be will be notified by written procedure. In the absence of any intervention, the creation of the Global Forum will be confirmed.

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JT03460374

PROPOSAL FOR THE ESTABLISHMENT OF THE GLOBAL FORUM ON NUCLEAR EDUCATION, SCIENCE, TECHNOLOGY AND POLICY

Background

1. There is a growing recognition in many countries that nuclear science and technology may have an increasing role in supporting the development of low-carbon energy systems to provide electricity, heat, and clean water; providing new and better ways to diagnose and treat a wide range of diseases; and in the advancement of science. It is also recognised that new capabilities, new pathways, and new ideas will be needed to overcome the challenges that nuclear technologies face today. Even in countries that are not currently using or pursuing nuclear energy as part of their energy futures, there is an acknowledged need to assure that capabilities, skills and expertise in various aspects of nuclear science and technology will be available when needed to enable the member countries of the OECD Nuclear Energy Agency (NEA) to respond to future priorities.

2. Central to the maintenance of these capabilities are the many institutions across NEA member countries that provide the science and technology education and training needed to develop the experts of the future. However, the NEA framework has engaged this vital segment of our societies only sporadically and these institutions lack a global platform for sharing experiences and co-operating to meet common goals.

3. In order to explore how best to meet these needs, the NEA organised two exploratory meetings inviting representatives from 16 academic institutions from NEA member countries with leading programmes of research and education in nuclear science and technology.[1] The two exploratory meetings were held in July 2019 and January 2020.

4. The first exploratory meeting was convened within the context of continuing global attention to the need for decarbonising the energy sector as well as the future of energy supply and use in the coming decades. The aim of the first exploratory meeting was to explore the possible role of academic institutions in generating novel solutions to challenging issues confronting the nuclear sector, particularly with regard to the development of human capital, and their potential to offer recommendations and insights to fellow researchers and educators worldwide, policymakers, and the nuclear sector at large.

5. Over the course of the first meeting, representatives from invited universities were briefed on the NEA structure, strategic priorities and key areas of work. The majority of the meeting was then devoted to a discussion and identification of areas that ought to be strategic priorities for the future of nuclear education, technology development, and policy.

[1] These are University of New South Wales (Australia); KU Leuven (Belgium); McMaster University (Canada); Technical University of Munich (Germany); Politecnico di Milano (Italy); University of Tokyo (Japan); Korea Advanced Institute of Science and Technology (Korea); National Research Nuclear University (Russian Federation); KTH Royal Institute of Technology (Sweden); University of Cambridge and University of Manchester (United Kingdom); and Carnegie Mellon University, Purdue University, Massachusetts Institute of Technology, Texas A&M University and University of Wisconsin (United States).

6. Through their discussions, representatives of 16 academic institutions from NEA member countries identified four strategic priority areas. These are (1) achieving gender balance in nuclear technology and academic workforces, (2) defining the future of nuclear engineering education, (3) rethinking the relationship between nuclear energy and society, and (4) identifying ways of revitalising innovation in the nuclear sector to improve the future competitiveness of nuclear energy. The university representatives highlighted the importance of each of these areas and the interaction each area has with the others. They further advised that each of these four areas require not only sustained attention but also swift action by policymakers, educators and researchers worldwide.

7. In a letter to the Director-General of the Nuclear Energy Agency, the university representatives noted that the NEA exploratory meeting marked the first time that universities had been given the opportunity to speak collectively on the important issues of nuclear education, science, technology and policy. They offered their strongest possible support for a framework for sustained co-operation and for enabling a long-term dialogue among academic institutions, policymakers and key stakeholders in the nuclear energy sector and civil society. It was also hoped that a formal mechanism would allow the identification of best practices, joint activities and multilateral programmes of investigation.

8. At the second exploratory meeting held in January 2020, the university representatives presented, discussed and further developed white papers on each of the four strategic areas noted above. It is proposed that these four strategic areas constitute the focus of the proposed Global Forum on Nuclear Education, Science, Technology and Policy.

Rationale for the proposed Global Forum

9. The work of the NEA would benefit significantly from increased engagement with academic institutions, and universities from NEA member countries would benefit from a framework for global co-operation and engagement.

10. Based on the two exploratory meetings held thus far with representatives of leading academic institutions from NEA member countries, the proposed Global Forum could greatly leverage the impact of ongoing NEA initiatives related to innovation, human capital development, and engagement with stakeholders to the benefit of both academic institutions and the NEA member countries themselves.

11. Institutions of higher learning are acknowledged as centres and incubators of forward looking, long-term creative and rigorous thinking. Many universities, particularly those that are homes to programmes of research and education in nuclear science and engineering, have taken a deep interest in the policy aspects of nuclear technologies and their futures. This interest has been demonstrated by the execution of long-term research with a policy focus as well as the training of undergraduate and graduate students who specialise in the policy aspects of nuclear technologies.

12. Today there is limited co-ordination among academic institutions nationally and, except for bilateral and regional contacts,[2] almost no co-ordination at the international level. Further, no formal channels exist for bringing the views and opinions of academic

[2] Some examples of national collaboration are the American Nuclear Engineering Department Heads Organization (NEDHO) and the Italian *Intra-University Consortium for Nuclear Technology Research (CIRTEN). The* European Nuclear Education Network (ENEN) is an example of a regional collaboration initiative.

institutions into the policymaking processes and for establishing an ongoing dialogue among academic institutions, policymakers and key stakeholders in the nuclear sector. The establishment of the Global Forum would provide such a platform.

13. The Steering Committee for Nuclear Energy (the "Steering Committee") has encouraged the Secretariat to engage in activities related to the enhancement of human capital.[3] The lack of direct contact between the NEA and academic institutions has resulted in limited information available to the NEA to address key issues in human capital development.

14. The creation of the Nuclear Education, Skills and Technology Framework (NEST), a joint undertaking established under Article 5 of the NEA Statute that came into force in 2019, represented a first step in filling this strategic gap. NEST aims, through programmes of research and fellowships, to transmit both codified and tacit knowledge to the next generation of nuclear science and technology professionals.

15. In addition to NEST, a mechanism for bringing the views and advice of academics concerning nuclear education, science, technology and policy to policymakers is needed.

16. The proposed Global Forum would provide a mechanism with which to formalise such a sustained co-operation with academic institutions, policymakers and key stakeholders in the nuclear energy sector and civil society worldwide. Its creation, and through its sustained collaboration with leading academic institutions, would provide universities in NEA member countries with a platform for co-operation while strengthening the work the NEA is already performing in priority areas.

17. The four areas of strategic focus for the future of nuclear education, science, technology and policy identified by the academic representatives is strongly consistent with priorities of the NEA:

- The areas "Achieving Gender Balance in Nuclear Technology and Academic Workforces" and "Defining the Future of Nuclear Engineering Education" are vital aspects of the work the NEA is pursuing in the area of improving human capital for the future and these areas provide mutual benefit to NEA efforts such as NEST, exploring gender balance, and mentoring workshops. These areas also respond to the need to advance the nuclear engineering discipline, which many suggest has become too insular and resistant to adopting innovations made in other disciplines and sectors of industry.
- The discussions related to the focus area "Rethinking the Relationship Between Nuclear Energy and Society" has already provided broad insights that magnify the understandings that are emerging from the 2019 NEA Workshop on Nuclear Energy and Social Sciences. This area is also directly related to the areas explored by the NEA Stakeholder Involvement workshops.
- The final strategic area identified by the representatives of academic institutions is "Revitalising Innovation in the Nuclear Sector to Improve the Future Competitiveness of Nuclear Energy", which is an excellent addition to the activities the NEA is pursuing related to innovation, including several aspects of the ongoing work of the Committee for Technical and Economic Studies on Nuclear Energy Development and the Fuel Cycle, such as Nuclear Innovation 2050

[3] See the Summary of Decisions Taken at the 137th Session of the Steering Committee for Nuclear Energy NEA/SUM/DEC(2018)2.

and the fora on innovation the NEA holds with global partners such as, the Electric Power Research Institute (EPRI), Korea Atomic Energy Research Institute (KAERI), International Atomic Energy Agency (IAEA), and the United Kingdom's National Nuclear Laboratory (UK NNL).

Nature and goals of the proposed Global Forum

18. The Global Forum would be launched under the conditions set out in the "Revised Framework for the OECD Global Forums" endorsed by the Council [C(2008)208/FINAL]. Under this framework, the proposed Global Forum on Nuclear Education, Science, Technology and Policy would not be an NEA official body such as a standing technical committee or working party and would not take decisions. The proposed Global Forum would be a vehicle used by the NEA to engage a broad community of stakeholders with a focus on nuclear science, technology, and policy education.

19. In accord with OECD practice, the proposed Global Forum would allow for the participation of experts from academic institutions from all NEA member countries and from outside the nuclear sector as well. It is proposed that the Global Forum operate under the auspices of the Steering Committee. In order to steer the discussion and activities of the Global Forum, it is proposed that a selected advisory group of representatives of academic institutions from NEA member countries develop the proposed activities of the Global Forum and conduct analyses pursuant to the goals identified at the Global Forum. This advisory group would be limited to a maximum of 20 university representatives on a rotation basis.

Goals of the proposed Global Forum

20. The proposed Global Forum would serve as a mechanism for ongoing direct engagement with academic institutions, which are responsible for educating the next generation of nuclear science and technology experts.

21. The Global Forum would also bring the long-term creative thinking of academic institutions to address the policy challenges that nuclear energy faces today as inputs to NEA processes.

22. Additionally, the Global Forum would provide academic institutions around the world with a framework for sustained interaction and co-operation.

23. It is proposed that the Global Forum would facilitate an exchange of experiences and views, highlight good practices, and identify opportunities for joint activities and programmes of investigation towards:

- achieving gender balance in nuclear technology and academic workforces;
- defining the future of nuclear engineering education;
- rethinking the relationship between nuclear energy and society; and
- identifying ways of revitalising innovation in the nuclear sector to improve the future competitiveness of nuclear energy.

24. Additional themes could be considered by the Steering Committee in consultation with the advisory group described below.

25. The Global Forum would focus on areas related to the mission of the NEA and avoid any duplication with other intergovernmental organisations or fora.

26. By facilitating collaboration and the exchange of information amongst stakeholders, the Global Forum would help identify synergies with other organisations − both intergovernmental, nongovernmental and academic − and further enhance the visibility of the NEA and its work, thus helping to avoid duplication of NEA activities by others.

27. The goals of the Global Forum are set out in the draft mission statement that is an Appendix to the present document.

Process for launching, reviewing and operating the Global Forum

Launch and review processes

28. The Global Forum would be launched upon the approval of the proposal by the Steering Committee. The External Relations Committee (ERC) would be informed of the decision of the Steering Committee to launch the Global Forum. Any ERC delegate would be given 15 days to request that the matter be included in the ERC's agenda.

Governance

29. The Global Forum would be under the direct responsibility of the Steering Committee, which would be informed on a regular basis of its activities, to be included in the NEA Programme of Work and Budgets and the Steering Committee's Global Relations Strategy. Outside of these regular reviews, the Steering Committee would be able to decide at any point in time to review and assess, and, as appropriate, discontinue the Global Forum. The Steering Committee as well as the NEA standing technical committees would benefit from the activities of the Global Forum.

30. Additionally, an advisory group would be established. This advisory group would be made up of representatives of academic institutions that have leading programmes of research and education in nuclear science and technology. University representatives who participated in the two exploratory meetings described above would be invited to participate in the advisory group to ensure continuity with the discussions that have already taken place.

Activities

31. The proposed Global Forum would include the following activities:

a) **Biennial symposium**: The Global Forum symposium would be organised as a high-visibility event to bring together policymakers from NEA member countries and selected non-members, international organisations and other stakeholders in the nuclear energy sector, mainly representatives of academic institutions having programmes of research and education in nuclear science technology, young professionals as well as representatives of civil society as appropriate. To ensure

international co-operation, inclusivity and representation of regional as well as intellectual diversity, the Global Forum meeting would include opportunities for remote participation and live video-streaming. Discussions during the exploratory meetings seem to indicate support for a biennial symposium, but the final approach would be confirmed in consultation with the Steering Committee.

b) **Research and joint activities**: The Global Forum could help the development of a programme of research, joint activities and the identification of best practices in order to (a) achieve gender balance, (b) define the future of nuclear science and technology education, (c) reimagine the relationship between nuclear energy and society and d) identify ways of revitalising innovation in the nuclear sector to improve the future competitiveness of nuclear energy technologies. Several of the universities that participated in the two exploratory meetings already have programmes of research and action in these areas. The Global Forum would serve as a first-of-a-kind mechanism to leverage and link these ongoing research initiatives, thus creating opportunities for collaborations on novel research questions that are closely linked to problems from the world, as well as embark on novel activities in service of the objectives listed above. The Global Forum would further serve as an opportunity to showcase the outputs of these new programmes of research and joint activities.

c) **Publications:** Outcomes of multilateral programmes of research as well as joint activities could be communicated via papers and reports presented at the Global Forum symposium. Selected papers could be published in special issues of appropriate journals, in collaboration with the NEA. Where appropriate, these publications could be used to draft Policy Briefs to inform the Steering Committee and the NEA standing technical committees, as appropriate. Additionally, outcomes of the Global Forum symposium would also be described in a summary report.

d) **Side events:** To sustain the momentum of the Global Forum symposium side events and webinars would be organised as appropriate in collaboration with strategic partners. For example, side events, as appropriate, could be hosted in rotation by academic institutions or by NEA member countries.

Participation

32. OECD Global Forums have been designed as a flexible mechanism to address issues that defy solutions in individual countries or regions. Global Forum events foster inclusivity and are open to a broad range of stakeholders. Participation in the Global Forum symposium would be open, though not limited to, the following:

- **Governmental representatives**: in particular, delegates in NEA bodies, the IEA or other OECD bodies as well as permanent Delegations would be invited to attend the Global Forum symposium. Representatives of selected non-NEA members could also be invited.
- **Academic institutions**: experts from academic institutions having programmes of research and education in nuclear science and technology would be invited to attend the Global Forum symposium**.**

- **Other stakeholders** such as experts from research institutions, private sector foundations, think tanks, media and specialised journals could also be invited to attend the Global Forum symposium.

Funding

33. The activities of the proposed Global Forum, including the biennial Global Forum symposium and analytical and other co-operative activities, would be funded by voluntary contributions from a mix of public as well as private resources, including foundations and national research and funding agencies.

34. Funding for Secretariat support would also be provided by voluntary contributions supplemented by assessed contributions during the initial phases, i.e. 2020-2021, and provided entirely by voluntary contributions as the work of the Global Forum moves forward.

Actions by the Steering Committee

35. The Steering Committee is invited ***to note*** document NEA/NE(2020)9 and ***to approve*** the proposal to launch the proposed Global Forum on Nuclear Education, Science, Technology and Policy presented in document NEA/NE(2020)9 and its mission statement set forth in Appendix to document NEA/NE(2020)9.

Following approval by the Steering Committee, the OECD External Relations Committee will be notified by written procedure. In the absence of any intervention, the creation of the Global Forum will be confirmed.

Appendix

Draft Mission Statement of the Global Forum on Nuclear Education, Science, Technology and Policy

The Global Forum on Nuclear Education, Science, Technology and Policy will serve as an inclusive network of experts in the nuclear energy sector from various horizons in particular from academia to enable the generation and flow of ideas, thus helping confront, with creative problem-solving measures, some of the most significant challenges the nuclear energy sector faces today.

The Global Forum will aim to:

- Position the OECD Nuclear Energy Agency (NEA) as the premier forum for international co-operation and dialogue on nuclear education, science, technology and policy.
- Conduct a biennial symposium to serve as a venue, for experts from academic institutions, representatives of NEA member countries, as well as other stakeholders to exchange good practices and identify emerging issues and creative solutions related to the strategic areas listed above.
- Identify good practices, facilitate shared activities and co-ordinate joint programmes of investigation to advance nuclear science and technology education and policy in member countries of the NEA.

To that effect, the Global Forum will be supported by an advisory group composed of university representatives who will help develop the proposed activities of the Global Forum and conduct analyses pursuant to the goals identified at the Global Forum.