



IAEA

International Atomic Energy Agency

Atoms for Peace

**INPRO Dialogue Forum on
Legal and Institutional Issues in the
Global Deployment of Small Modular Reactors**

(13th INPRO Dialogue Forum)

**IAEA Headquarters
Vienna, Austria**

18–21 October 2016

Ref. No.: I4-TM-52258

Information Sheet

A. Background

There is a sustained global interest in small and medium sized or modular reactors, which are expected to play an important role in globally sustainable energy development as part of an optimal energy mix. Such reactors have the potential to enhance energy availability and security of supply in both countries expanding their nuclear energy programmes and those embarking on a nuclear energy programme for

the first time. In particular, certain small modular reactors (SMRs), which seek to incorporate economies of mass serial production of transportable units, may pose new issues that require resolution. The International Atomic Energy Agency (IAEA) has several dedicated projects and activities supporting the development and deployment of SMRs in Member States. Over the years, the IAEA has produced a number of major publications and has convened a series of international forums addressing a variety of SMR issues.

At its 59th regular session in September 2015, the IAEA General Conference acknowledged the IAEA Secretariat's efforts on SMRs and called upon the Secretariat to continue to promote effective international exchange of information on the options regarding SMR designs that are available internationally for deployment and on topics such as technology roadmaps for SMR development and deployment, infrastructure requirements for countries embarking on new nuclear power programmes, operational performance, maintainability, safety and security, waste management, constructability, economics, proliferation resistance, and safeguards by design, by organizing Technical Meetings and workshops, as appropriate, and to produce relevant status and technical reports. Following this call, a decision was made to devote the 13th INPRO Dialogue Forum to the theme of "Legal and Institutional Issues in the Global Deployment of Small Modular Reactors".

The International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO) was launched in the year 2000, on the basis of IAEA General Conference resolution GC(44)/RES/21. The objective of INPRO is to help ensure that nuclear energy is available to contribute to meeting the energy needs of the twenty-first century in a sustainable manner. To achieve this, INPRO brings together nuclear technology holders and users to consider jointly international and national actions that would result in required innovations in nuclear reactors, fuel cycles or institutional approaches. More details about INPRO are available at: www.iaea.org/INPRO.

The INPRO Dialogue Forum series offers a platform for technology holders, technology users and other stakeholders to share information, perspectives and knowledge on issues related to sustainable nuclear energy development. Information on the already convened Dialogue Forums is available at: <http://www.iaea.org/INPRO/DFs/index.html>.

The INPRO Dialogue Forum on Legal and Institutional Issues in the Global Deployment of Small Modular Reactors will be held from 18 to 21 October 2016 at the IAEA's Headquarters in Vienna, Austria, and is expected to attract about 80 participants. The Dialogue Forum is being organized within the framework of INPRO Task 4 ("Dialogue and Outreach").

The Forum is being organized by the INPRO Section in cooperation with the Nuclear Power Technology Development Section of the Division of Nuclear Power in the Department of Nuclear Energy, as well as with the Regulatory Activities Section of the Division of Nuclear Installation Safety in the Department of Nuclear Safety and Security. Furthermore, certain topical areas are being coordinated with other Sections within the Department of Nuclear Energy and the Department of Nuclear Safety and Security, and with the Division of Concepts and Planning in the Department of Safeguards. This Dialogue Forum will include keynote speeches, lectures and presentations by the invited participants and discussions among participants representing interested Member States.

B. Objectives

The overall objective of the Dialogue Forum is to identify and elaborate upon legal and institutional issues that are key to facilitating the global deployment of non-transportable and transportable SMRs.

The specific objectives of the Dialogue Forum are to:

- Showcase SMR progress towards advanced design stages and deployment;
- Deliberate on SMR economics (including economic models for such reactors), SMR deployment strategies, and SMR markets;
- Present the licensing status of, licensing approaches for, and licensing experience gained with advanced SMRs;
- Analyse drivers for SMR deployment and to identify and examine any impediments, including a discussion on how to overcome these;
- Consider the legal and regulatory issues involved in the deployment of SMRs, including transportable SMRs;
- Present safety, siting and emergency planning issues for SMRs and deliberate on the associated regulatory issues and approaches;
- Examine key infrastructure issues for SMR deployment in countries embarking upon a nuclear energy programme; and
- Discuss specific safeguards and security issues for SMRs, including transportable SMRs.

C. Expected Outputs

The major outcome of the Dialogue Forum will be the identification and analysis of the legal and institutional issues that are key to the global deployment of SMRs.

The specific outputs of the Dialogue Forum are expected to include:

- Identified drivers and impediments for global deployment of SMRs, including proposals on how to overcome the impediments;
- Proposals for development/elaboration of national/international legal and regulatory framework to support SMR deployment, with a focus on the needs of countries that have recently embarked on a nuclear energy programme;
- Improved understanding of possible roles of the technology users and the technology holders in SMR deployment, operation and decommissioning; and
- Identified safety, security and safeguards issues to be resolved prior to global deployment of SMRs, including integrating safety, security and safeguards into design, operations, and life cycle management, together with proposals on possible ways to resolve these issues.

D. Expected Participation

The Dialogue Forum is open to around 80 participants from the following Member States:

Algeria, Argentina, Armenia, Australia, Austria, Bangladesh, Belarus, Belgium, Brazil, Bulgaria, Canada, Chile, China, Croatia, Czech Republic, Egypt, Estonia, Finland, France, Germany, Ghana, Hungary, India, Indonesia, Israel, Italy, Japan, Jordan, Kazakhstan, Kenya, Republic of Korea, Latvia, Lithuania, Malaysia, Mexico, Netherlands, Nigeria, Pakistan, Philippines, Poland, Romania, Russian Federation, Saudi Arabia, Serbia, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Thailand, Tunisia, Turkey, Ukraine, United Arab Emirates, United Kingdom, United States of America, Bolivarian Republic of Venezuela, and Viet Nam,

as well as from the following organizations:

the European Atomic Forum (FORATOM), the European Commission (EC), the Generation IV International Forum (GIF), the International Framework for Nuclear Energy Cooperation (IFNEC), the Multinational Design Evaluation Programme (MDEP), the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development (OECD/NEA), the Western European Nuclear Regulators Association (WENRA), the World Association of Nuclear Operators (WANO), and the World Nuclear Association (WNA).

All persons wishing to participate in the Dialogue Forum are required to complete the attached Participation Form (Form A). Designations by a formal letter with the completed Participation Form attached should be submitted to the IAEA through the established official channels (e.g. Ministry of Foreign Affairs or National Atomic Energy Authority; or by an organization invited to participate), indicating as a reference number: **I4-TM-52258**. Designations should be submitted for the attention of the Scientific Secretary of the Dialogue Forum, Mr Kyungwon Rho (please see contact details in Section II below). The full names and complete contact details (including postal address, telephone/fax numbers, and email address) of designated participants should be provided. The designations with the completed Participation Forms attached should reach the IAEA not later than **26 August 2016**. They should be sent to the Scientific Secretary of the Dialogue Forum by email to: K.Rho@iaea.org, with a copy to: L.Tagani@iaea.org. When completing the Participation Form please indicate whether you are planning to give a presentation, state the topic(s) that would be addressed in your presentation, and provide a brief explanation (about five to seven lines) of the content of the proposed presentation. The Scientific Secretary may contact participants to discuss the content of their presentations. Also, in accordance with the IAEA's policy, all presentations and other files should be uploaded on a computer used at a meeting room in advance. Therefore, the presentations and any other supplementary files should be sent to the Scientific Secretary by email not later than **30 September 2016** (Microsoft PowerPoint files are preferable, although PDF format may be also used). When submitting the files electronically, please note that the size of a message should not exceed 5 MB.

The Dialogue Forum is, in principle, open to all officially designated persons. The IAEA, however, reserves the right to limit participation should this become necessary due to limitations imposed by the available seating capacity. It is therefore recommended that interested persons take the necessary steps to obtain their official designation as early as possible.

E. Scope, Format and Topics

The Dialogue Forum will (tentatively) include the following plenary sessions:

- *Session 1. Opening Session*

This session will include opening speeches by the IAEA Deputy Director General, Head of the Department of Nuclear Energy, the Directors of relevant IAEA Divisions and other IAEA Secretariat staff involved in the preparation of the Dialogue Forum. The Secretariat will highlight the agenda and procedures of the Dialogue Forum. All participants of the Dialogue Forum will review the agenda. The Dialogue Forum's chairman and the rapporteurs will be selected during this session.

- *Session 2. SMR Progress towards Advanced Design Stages and Deployment*

This session will include presentations from selected SMR vendors and the IAEA Secretariat highlighting the state-of-the-art in the development and deployment of advanced SMRs.

- *Session 3. Drivers and Impediments for SMR Deployment*

This session will highlight the motivations for Member States to deploy SMRs and the impediments that are being faced along the way. It may cover all subject areas of INPRO (economics, safety, environment, waste management, proliferation resistance, nuclear infrastructure, etc.) and will include both presentations from the invited keynote speakers and by the participants. The discussions at this session will also address possible ways to overcome the impediments identified.

- *Session 4. SMR Economics (Including Economic Models for SMRs), SMR Deployment Strategies and SMR Markets*

Competitive economics is a key to SMR success in targeted applications. This session will include lectures and presentations from the IAEA Secretariat and the invited participants highlighting the state-of-the-art in SMR economic modelling. Specifically, many SMRs tend to replace the economy of scale of a facility with the economy of scale of production of serial factory assembled modules, which makes the strategy of transition from the first-of-a-kind expensive single module to the production and deployment of large numbers of modules crucially important. Both the invited speakers and the participants will be requested to present their views on how such a transition could be effectively accomplished. The discussions at the session will also highlight which legal and institutional developments could support faster achievement and demonstration of SMR competitive economics.

- *Session 5. Safety, Siting and Emergency Planning Issues for SMRs*

Many advanced SMR designs involve novel safety features that could not only enhance safety but also help simplify the design and reduce costs. Many SMR designs target closer location to the customer, be it a small population centre or an industrial facility. For this purpose methodologies are being developed and justifications provided of a smaller source term allowing a smaller emergency planning zone radius. The question is whether current national regulations and international safety standards are sufficient to assess such features adequately, and which modifications/amendments to them may be

needed to facilitate this. This session will bring together SMR developers, national regulators and potential customers in Member States to bring out the state-of-the-art on the matter, as well as insights on future developments needed.

- *Session 6. Specific Safeguards and Security Issues for SMRs*

Some SMR designs target remote and difficult to access or sparsely populated areas; some include the feature of plant transportability, whilst others are designed to operate within multi-module plants of flexible overall capacity. In all such cases, new concerns and considerations may apply regarding safeguards and security measures by design and in implementation during construction and operational plant phases. This session will include presentations from the IAEA Secretariat and invited keynote speakers, followed by a discussion to bring out the scope of the arising issues and outline possible pathways to their resolution.

- *Session 7. Infrastructure Issues for SMR Deployment in Countries Embarking upon a Nuclear Power Programme*

Before constructing its first nuclear power plant, a newcomer country is expected to create a national infrastructure for nuclear power. The specific objective of this session is to identify whether and in which ways it is possible to reduce the overall infrastructure effort for a newcomer country through application of SMRs and which types of SMRs/forms of agreements and contracts could facilitate this. This session will include presentations and discussions on the matter, including those on possible roles of the technology users and the technology holders in SMR deployment, operation and decommissioning.

- *Session 8. Licensing Status, Licensing Approaches and Licensing Experience of Advanced SMRs*

At the time of this Dialogue Forum, several advanced SMR projects are in the construction stage or will already have completed design certification. Others would be progressing towards final design stages with pre-licensing considerations already started. This session will include lectures and presentations from the IAEA Secretariat and invited keynote speakers highlighting the state-of-the-art in SMR licensing and presenting the already available success stories, including those for transportable, as well as conventionally deployed, SMRs. The focus will be on how established or amended licensing processes address the issues identified in Sessions 5–7 of the Dialogue Forum. The discussions at this session will address issues that require further actions to be resolved, as well as suggestions on how this might be accomplished.

- *Session 9. Closing session*

This session will include presentations by the rapporteurs and the Dialogue Forum's chairman summarizing the major findings and conclusions of the Dialogue Forum, as well as by the IAEA Deputy Director General, Head of the Department of Nuclear Energy, the Directors of relevant IAEA Divisions and other IAEA Secretariat staff involved in the organization of the Dialogue Forum.

The sessions will consist of lectures by IAEA staff, invited experts and representatives from Member States and international organizations, and will include discussions on the topics listed above. The rapporteurs will prepare summaries of each session to be delivered at the closing session of the Dialogue Forum. Based on the outputs of the Dialogue Forum, the IAEA Secretariat will prepare an extended report which, after review by all of the participants, will be posted on the Dialogue Forum's web page.

F. Working Language

The working language of the Dialogue Forum will be English with no interpretation provided. All communications, abstracts and papers must be submitted in this language.

G. Venue

The Dialogue Forum will commence at 9.30 a.m. on Tuesday, 18 October 2016, in Room C4, Building C, of the Vienna International Centre (VIC). Participants are requested to arrive at Checkpoint 1/Gate 1 of the VIC one hour before the start of the Dialogue Forum on the first day, in order to allow sufficient time for issuing of grounds passes, which are necessary for official visitors to the VIC.

H. Visas

Participants who need a visa for entering Austria should submit the necessary application to the nearest diplomatic or consular representative of Austria as early as possible.

I. Organization

Official correspondence with regard to the technical aspects of the Dialogue Forum should be addressed to the Scientific Secretaries:

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