



# IAEA

Atoms for Peace and Development

الوكالة الدولية للطاقة الذرية

国际原子能机构

International Atomic Energy Agency

Agence Internationale de l'énergie atomique

Международное агентство по атомной энергии

Organismo Internacional de Energía Atómica

Vienna International Centre, PO Box 100, 1400 Vienna, Austria

Phone: (+43 1) 2600 • Fax: (+43 1) 26007

Email: [Official.Mail@iaea.org](mailto:Official.Mail@iaea.org) • Internet: <http://www.iaea.org>

In reply please refer to: EVT1803515

Dial directly to extension: (+43 1) 2600-22818

The Secretariat of the International Atomic Energy Agency (IAEA) presents its compliments to the IAEA's Member States and has the honour to draw their attention to the **INPRO Dialogue Forum on Opportunities and Challenges in Small Modular Reactors** (hereinafter referred to as "event") to be held, within the framework of the International Project on Innovation Nuclear Reactors and Fuel Cycles (INPRO), in Ulsan, Republic of Korea, from **2 to 5 July 2019**.

The purpose of the event is to provide an opportunity for Member States to exchange information on topics for immediate interest related to sustainable development of nuclear energy systems, including related cooperation between countries and their technology developers, suppliers and customers.

The attached Information Sheet provides further details of the event.

The event will be held in English.

Member States are invited to designate one participant for this event. Member States are strongly encouraged to identify suitable women participants.

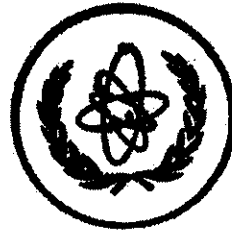
The IAEA is generally not in a position to bear the travel and other costs of participants in the event. The IAEA has, however, limited funds at its disposal to help meet the cost of attendance of certain participants. Upon specific request, such assistance may be offered to normally one participant per country, provided that, in the IAEA's view, the participant will make an important contribution to the event. The application for financial support should be made at the time of designating the participant(s) using the attached Grant Application Form (Form C).

It should be noted that compensation is not payable by the IAEA for any damage to or loss of personal property. The IAEA also does not provide health insurance coverage for participants in IAEA events. Arrangements for private insurance coverage on an individual basis should therefore be made. The IAEA will, however, provide insurance coverage for accidents and illnesses that clearly result from any work performed for the IAEA.

Designations should be submitted to the IAEA through the competent national authority (Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority) not later than **30 April 2019** using the attached Participation Form (Form A). Completed and authorized Participation Forms should be sent either by email to: [Official.Mail@iaea.org](mailto:Official.Mail@iaea.org) or by fax to: +43 1 26007 (no hard copies needed). Copies should be sent by email to the Scientific Secretaries of the event, Mr Bongsoo Kim, Mr Maxim Gladyshev and Mr Frederik Reitsma of the Division of Nuclear Power, Department of Nuclear Energy (Emails: [B.Kim@iaea.org](mailto:B.Kim@iaea.org), [M.Gladyshev@iaea.org](mailto:M.Gladyshev@iaea.org) and [E.Reitsma@iaea.org](mailto:E.Reitsma@iaea.org)) and to the Administrative Secretary, Ms Karron Robinson-Onorati (Email: [K.Robinson-Onorati@iaea.org](mailto:K.Robinson-Onorati@iaea.org))

The Scientific Secretaries of the event will liaise with the participants directly concerning further arrangements, including travel details, as appropriate, once the official designations have been received.

The Secretariat of the International Atomic Energy Agency avails itself of this opportunity to assure the IAEA's Member States of its highest consideration.



2019-03-21

Enclosures: Information Sheet

Participation Form (Form A)

Form for Submission of a Presentation (Form B)

Grant Application Form (Form C)



**INPRO**  
International Project on  
Innovative Nuclear Reactors  
and Fuel Cycles

## **INPRO Dialogue Forum on Opportunities and Challenges in Small Modular Reactors**

Hosted by the  
Government of the Republic of Korea

through the  
Ulsan National Institute of Science and Technology

**Lotte Hotel Ulsan**  
**Ulsan Republic of Korea**

**2–5 July 2019**

Ref. No.: EVT1803515

### **Information Sheet**

#### **A. Introduction**

The International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO) was established through a General Conference resolution in 2000 (GC(44)/RES/21, 2000) to support efforts leading to the long term sustainability of nuclear energy so that it can help meet the rapidly growing energy needs of Member States in the 21st century. To achieve this outcome, INPRO supports Member States in their long-term planning for deploying sustainable nuclear energy. It provides direct support related to advanced and innovative nuclear energy system scenario modelling, analysis, and sustainability assessment using the INPRO Methodology and through facilitating dialogue, cooperation and collaboration among Member States in their respective roles as nuclear energy technology developers, suppliers and customers.

Four tasks are reflected in the INPRO Subprogramme Plan for 2018–2019, as endorsed by the INPRO Steering Committee: Task 1: Global Scenarios; Task 2: Innovations; Task 3: Sustainability Assessment and Strategies; and Task 4: Dialogue and Outreach.

There are increasing interests in the development and deployment of small modular reactors (SMRs) as a cleaner alternative to fossil fuels and reducing greenhouse gas emissions. SMRs are newer generation reactors designed to generate electric power up to 300 MW, whose components and systems can be shop fabricated and then transported as modules to the sites for installation. Modular reactors allow for less on-site construction, increased containment efficiency, and heightened nuclear materials security. SMRs

have been proposed as a less expensive alternative to conventional nuclear reactors. SMRs could fulfil the need of flexible power generation for a wide range of users and applications, including replacing aging fossil power plants, providing cogeneration for countries with smaller electricity grids as well as regions with less developed infrastructure and for energy systems that combine nuclear and alternative sources, including renewables.

Significant advances have been made in recent years on SMRs. Currently there are more than 50 SMR designs at various stages of development for different applications, with commercial operations expected to begin in the coming years.

Though significant advancements have been made in various SMR technologies in recent years, some technical issues still attract attention in the industry. These include for example control room staffing and human factor engineering for multi-module SMR plants, defining the source term for multimodule SMR plants with regards to determining the emergency planning zone, developing new codes and standards, and load-following operability aspects. Some potential advantages of SMRs like the elimination of public evacuation during an accident or a single operator for multiple modules are under discussion with regulators. Furthermore, although SMRs have lower upfront capital cost per unit, their generating cost of electricity will probably be substantially higher than that for large reactors. Their costs will be weighed against alternatives and competitiveness will need to be pursued through economics of scale. The deployment of SMRs will involve the development of a resilient supply chain, human resources and a robust regulatory framework.

The INPRO Steering Committee, at its 27th meeting in October 2018, endorsed the organization of an INPRO Dialogue Forum on Opportunities and Challenges in SMRs to be held in Korea, Republic of in 2019.

The meeting will mainly consist of two parts: A Dialogue Forum and technical tours to local nuclear industries and nuclear power plants. The Dialogue Forum includes keynote speeches by the invited speakers, presentations by the participants from Member States, and discussions among participants representing interested Member States and international organizations.

## **B. Objectives**

The INPRO Dialogue Forum offers a platform for technology holders, technology users and other stakeholders from all IAEA interested Member States and facilitates discussion so that technology holders can better understand the needs and concerns of technology users, and users can better understand the possibilities and limitations of technology holders associated with the development and deployment of innovative nuclear energy systems.

The Dialogue Forum will focus not only on technology, but also institutional aspects, such as market, resources, effects of regulation and public acceptance issues.

The objectives of this 17th INPRO Dialogue Forum are as follows:

- To discuss and share information and knowledge on current status and potential SMRs and its role in the energy market (also beyond electricity generation) with a broad set of participant perspectives including technology developers and potential suppliers and customers;
- To promote an open dialogue on the national, regional and global opportunities while highlighting key challenges in development and deployment of SMRs (including investment and financial models);
- To explore the different perspectives of participants regarding these opportunities and challenges through structured breakout group dialogue sessions;

## C. Expected Outputs

The expected outputs of the 17th INPRO Dialogue Forum are as follows:

- To summarize in the meeting report, the national, regional and global opportunities and challenges in on-going SMR development including: existing and planned investment and financing, licensing status, demonstration plans, and related R&D on key challenges;
- To update, through dialogue, the Agency's and the Member States' broader understanding of future energy market prospects of SMRs and associated innovative nuclear energy systems and coupling with the larger energy system;
- To draw up recommendations for the IAEA Secretariat regarding any additional activities that the Agency might engage to support Member States in their development of SMRs and their specific applications.

## D. Expected Participation

The INPRO Dialogue Forum is open to participants from the IAEA Member States, especially those from the following INPRO Members:

Algeria, Argentina, Armenia, Bangladesh, Belarus, Belgium, Brazil, Bulgaria, Canada, Chile, China, Czech Republic, Egypt, France, Germany, India, Indonesia, Israel, Italy, Japan, Jordan, Kazakhstan, Kenya, Korea, Republic of, Malaysia, Mexico, Morocco, Netherlands, Pakistan, Poland, Romania, Russian Federation, Slovakia, South Africa, Spain, Switzerland, Thailand, Turkey, Ukraine, the United States of America and Viet Nam,

observers and the interested Member States:

Albania, Australia, Austria, Bolivia, Cambodia, Croatia, Cuba, Ecuador, Estonia, Ethiopia, Finland, Ghana, Georgia, Hungary, Iran, Jamaica, Latvia, Libya, Lithuania, Mongolia, Namibia, Nigeria, Norway, Oman, Paraguay, Peru, Philippines, Saudi Arabia, Senegal, Serbia, Singapore, Slovenia, Sri Lanka, Sweden, Sudan, Tunisia, United Arab Emirates, United Kingdom of Great Britain and Northern Ireland, Uruguay,

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 Sustainable Nuclear Energy Technology Platform (SNETP), the Western European Nuclear Regulators Association (WENRA), the World Association of Nuclear Operators (WANO), and the World Nuclear Association (WNA).

## E. Participation and Registration

All persons wishing to participate in the event must be designated by an IAEA Member State or should be members of organizations that have been invited to attend.

To be designated by an IAEA Member State, participants are requested to send the Participation Form (Form A) to their competent national authority (e.g. Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority) for onward transmission to the IAEA by **30 April 2019**. They should be sent to the Scientific Secretaries of the Dialogue Forum by email to: [B.Kim@iaea.org](mailto:B.Kim@iaea.org) with a copy to: [K.Robinson-Onorati@iaea.org](mailto:K.Robinson-Onorati@iaea.org). Participants who are members of

an organization invited to attend are requested to send the Participation Form (Form A) through their organization to the IAEA by above deadline.

Selected participants will be informed in due course on the procedures to be followed regarding administrative and financial matters.

Please note that the IAEA is in a transition phase to manage the entire registration process for all regular programme events electronically through the new InTouch+ (<https://intouchplus.iaea.org>) facility, which is the improved and expanded successor to the InTouch platform that has been used in recent years for the IAEA's technical cooperation events. Through InTouch+, prospective participants will be able to apply for events and submit all required documents online. National authorities will be able to use InTouch+ to review and approve these applications. Interested parties that would like to use this new facility should write to: [InTouchPlus.Contact-Point@iaea.org](mailto:InTouchPlus.Contact-Point@iaea.org).

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.

## F. Papers and Presentations

The IAEA encourages participants to give presentations on the work of their respective institutions that falls under the topics.

When completing the Participation Form please indicate whether you are planning to give a presentation and participate in an optional technical tour. Participants who intend to give presentations are requested to submit the **Form for Submission of a Presentation (Form B)** together with the **Participation Form (Form A)**. 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 **31 May 2019** (Microsoft PowerPoint files are preferable, although PDF format may also be used). When submitting the files electronically, please note that the size of a message should not exceed 5 MB.

## G. Working Language

The working language of the Dialogue Forum will be English with limited interpretation into Korean. All communications, abstracts and papers must be submitted in English.

## H. Expenditures and Grants

No registration fee is charged to participants.

The IAEA is generally not in a position to bear the travel and other costs of participants in the event. The IAEA has, however, limited funds at its disposal to help meet the cost of attendance of certain participants. Upon specific request, such assistance may be offered to normally one participant per country, provided that, in the IAEA's view, the participant will make an important contribution to the event.

The application for financial support should be made using the **Grant Application Form (Form C)** which has to be stamped, signed and submitted by the competent national authority to the IAEA together with the **Participation Form (Form A)** by **30 April 2019**.

## I. Venue

The Dialogue Forum will commence at 9.30 a.m. on Tuesday, 2 July 2019, Lotte Hotel Ulsan, Ulsan City, Korea, Republic of (282, Samsan-ro, Nam-gu, Ulsan City, 44719 Korea, Republic of/ Tel: +82 52 960-1000 / [www.lottehotel.com/ulsan-hotel/en.html](http://www.lottehotel.com/ulsan-hotel/en.html)).

## J. Visas

Participants who need a visa for entering Korea, Republic of should submit the necessary application to the nearest diplomatic or consular representative of Korea, Republic of as early as possible, along with the invitation letter from the Agency.

## K. Organization

This Dialogue Forum will be organized by the IAEA in collaboration with the Government of the Korea, Republic through the Ministry of Science and ICT and Ulsan National Institute of Science and Technology (UNIST).

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

**Mr Bongsoo Kim**  
Scientific Secretary  
INPRO Section  
Division of Nuclear Power  
Department of Nuclear Energy  
International Atomic Energy Agency  
Tel.: +43 1 2600 22818  
Fax : +43 1 26007  
Email: [B.Kim@iaea.org](mailto:B.Kim@iaea.org)

Postal address:  
Vienna International Centre  
PO Box 100  
1400 VIENNA, AUSTRIA

**Mr. Frederik Reitsma**  
Co-Scientific Secretary  
Nuclear Power Technology Development Section  
Division of Nuclear Power  
Department of Nuclear Energy  
International Atomic Energy Agency  
Tel. : +43 1 2600 22565  
Email: [F.Reitsma@iaea.org](mailto:F.Reitsma@iaea.org)

**Mr Maxim Gladyshev**  
Co-Scientific Secretary  
INPRO Section  
Division of Nuclear Power  
Department of Nuclear Energy  
International Atomic Energy Agency  
Tel. : +43 1 2600 22809  
Email: [M.Gladyshev@iaea.org](mailto:M.Gladyshev@iaea.org)

**Mr Ji Hyun Kim**  
Local Meeting Director  
School of Mechanical, Aerospace and  
Nuclear Engineering  
50 UNIST-gil, Eonyang-eup, Ulju-gun, Ulsan 44919  
UNIST  
Tel.: +82 52 217 2913  
Email: [kimjh@unist.ac.kr](mailto:kimjh@unist.ac.kr)

Official correspondence regarding administrative issues should be addressed to the Administrative Secretary:

**Ms Karron Robinson-Onorati**

INPRO Section

Division of Nuclear Power

Department of Nuclear Energy

International Atomic Energy Agency

Vienna International Centre

PO Box 100

1400 VIENNA

AUSTRIA

Tel.: +43 1 2600 22885

Fax: +43 1 26007

Email: [K.Robinson-Onorati@iaea.org](mailto:K.Robinson-Onorati@iaea.org)



# Participation Form

## INPRO Dialogue Forum on Opportunities and Challenges in Small Modular Reactors

Ulsan, Republic of Korea

2–5 July 2019

To be completed by the participant and sent to the competent national authority (e.g. Ministry of Foreign Affairs, Permanent Mission to the IAEA, or National Atomic Energy Authority) of his/her country for subsequent transmission to the International Atomic Energy Agency (IAEA) either by email to: [Official.Mail@iaea.org](mailto:Official.Mail@iaea.org) or by fax to: +43 1 26007 (no hard copies needed). Please also send a copy by email to the Scientific Secretary [B.Kim@iaea.org](mailto:B.Kim@iaea.org) and to the Administrative Secretary [K.Robinson-Onorati@iaea.org](mailto:K.Robinson-Onorati@iaea.org).

Please attach a passport copy or other document of identification (ID).

Participants who are members of an invited organization can submit this form to their organization for subsequent transmission to the IAEA.

**Deadline for receipt by IAEA through official channels: 30 April 2019**

Family name(s): (same as in passport)		First name(s): (same as in passport)	Mr/Ms
Institution:			
Full address:			
Tel. (Fax):			
Email:			
Nationality:	Representing following Member State/non-Member State/entity or invited organization:		
If/as applicable: Do you intend to give a presentation? Yes <input type="checkbox"/> No <input type="checkbox"/> Title of the presentation: Do you intend to participate in optional technical tour on 5th July? Yes <input type="checkbox"/> No <input type="checkbox"/>			

# Form for Submission of a Presentation

## INPRO Dialogue Forum on Opportunities and Challenges in Small Modular Reactors

Ulsan, Republic of Korea

2–5 July 2019

To be completed by the participant and sent to the competent national authority (e.g. Ministry of Foreign Affairs, Permanent Mission to the IAEA, or National Atomic Energy Authority) of his/her country for subsequent transmission to the International Atomic Energy Agency (IAEA) either by email to: [Official.Mail@iaea.org](mailto:Official.Mail@iaea.org) or by fax to: +43 1 26007 (no hard copies needed). Please also send a copy by email to the Scientific Secretary [B.Kim@iaea.org](mailto:B.Kim@iaea.org) and to the Administrative Secretary [K.Robinson-Onorati@iaea.org](mailto:K.Robinson-Onorati@iaea.org).

**Deadline for receipt by IAEA through official channels: 31 May 2019**

Title of the presentation:		
Family name(s) and first name(s) of all author(s) (same as in passport(s):	Scientific establishment(s) in which the work has been carried out	City/Country
1.		
2.		
3.		
Family name(s) and first name(s) of author presenting the paper (same as in passport):		Mr/Ms:
Email:		
Abstract (700 characters max):		
Keywords (please use keywords (terms) from the IAEA International Nuclear Information System (INIS) <a href="https://inis.iaea.org/search/thesaurus.aspx">https://inis.iaea.org/search/thesaurus.aspx</a> separated by semicolon):		

I hereby agree to assign to the International Atomic Energy Agency (IAEA):

- ☐ the copyright; or
- ☐ the non-exclusive, worldwide, free-of-charge licence (this option is only for those authors whose parent institution does not allow them to transfer the copyright for work carried out in that institution) granting the IAEA world rights for the use of the aforementioned material in this and any future editions of the publication, in all languages, and in all formats available now, or to be developed in the future (digital formats, hard copy etc.).

**Please note:** If granting the licence mentioned above, please supply any copyright acknowledgement text required.

Furthermore, I herewith declare:

- ☐ that the material submitted to the IAEA is original, except for such excerpts from copyrighted works as may be included with the permission of the copyright holders thereof, has been written by the stated authors, has not been published before, and is not under consideration for publication by another entity;
- ☐ that any permissions and rights to publish required for third-party content, including but not limited to figures and tables, have been obtained, that all published material is correctly referenced; and
- ☐ that the material submitted to the IAEA does not contain any libellous or other unlawful statements and does not contain any materials that violate any personal or proprietary rights of any person or entity.

**Date:**

**Signature of main author:**

# Grant Application Form

## INPRO Dialogue Forum on Opportunities and Challenges in Small Modular Reactors

Ulsan, Republic of Korea

2–5 July 2019

To be completed by the applicant and sent to the competent national authority (e.g. Ministry of Foreign Affairs, Permanent Mission to the IAEA, or National Atomic Energy Authority) of his/her country for subsequent transmission to the International Atomic Energy Agency (IAEA) either by email to: [Official.Mail@iaea.org](mailto:Official.Mail@iaea.org) or by fax to: +43 1 26007 (no hard copies needed). Please also send a copy by email to the Scientific Secretary [B.Kim@iaea.org](mailto:B.Kim@iaea.org) and to the Administrative Secretary [K.Robinson-Onorati@iaea.org](mailto:K.Robinson-Onorati@iaea.org).

**Deadline for receipt by IAEA through official channels: 30 April 2019**

Family name(s): (same as in passport)	First name(s): (same as in passport)	Mr/Ms:
Mailing address:	Tel.:	
	Fax:	
	Email:	
Date of birth (yy/mm/dd):	Nationality:	

### 1. Education (post-secondary):

Name and place of institution	Field of study	Diploma or Degree	Years attended from to	

### 2. Recent employment record (starting with your present post):

Name and place of employer/ organization	Title of your position	Type of work	Years worked from to	

### 3. Description of work performed over the last three years:

### 4. Institute's/Member State's programme in field of event:

Date: Signature of applicant: \_\_\_\_\_

Date: Name, signature and stamp of Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority \_\_\_\_\_