



IAEA

International Atomic Energy Agency

Atoms for Peace and Development

International Conference on Small Modular Reactors and their Applications

IAEA Headquarters

Vienna, Austria

21–25 October 2024

Organized by the

International Atomic Energy Agency (IAEA)

Announcement and Call for Papers

A. Background

Global demand for energy is increasing as countries strive to develop their economies and sustain their societies in a context of climate change. The International Atomic Energy Agency (IAEA) projections estimate that electricity consumption will almost double by 2050. However, over 60% of global electricity generation comes from unabated fossil fuels, the largest contributor to climate change. In order to address the challenge of powering their socioeconomic development and ensuring energy supply security while protecting the planet, a growing number of countries are expanding or looking to nuclear power as a low carbon yet reliable energy source.

Nuclear power is the second-largest source of low carbon electricity today, following hydropower, and accounts for about 25% of the world's clean electricity. Thirty-one countries operate more than 400 nuclear power reactors, and about 30 others are interested in introducing nuclear into their energy mix. While currently operating reactors continue to be at the forefront of electricity decarbonization in many countries, nuclear innovation is bringing forth new technologies and designs such as small modular reactors (SMRs), which may offer a viable option for achieving clean and abundant energy accessible to more countries.

SMRs have a power capacity of up to 300 MW(e)—about one third of the generating capacity of a traditional nuclear power reactor. Their components may be mass manufactured in factories and then transported and installed on sites, which may make them more affordable and faster to build. SMRs may also be sited in remote locations and in areas lacking sufficient transmission lines and grid capacity. Finally, SMRs are being considered for both electric and non-electric applications and are suitable for flexible operation, providing stability to electrical grids in integrated energy systems that combine nuclear, variable renewables, and energy storage to provide resilient and clean energy supply to different users in the form of heat, electricity, and hydrogen.

Significant advances have been made in recent years in SMR design and technology development, and there are over 80 SMR designs at different stages of development globally. These types of reactors may use innovative safety technologies including a substantial use of passive and inherent safety features, different types of fuels and coolants, and different approaches to practically all aspects of a reactor lifecycle, such as construction, commissioning, operation, decommissioning, radioactive waste and spent fuel management, and transportation. SMR designers are also considering new approaches to security and safeguards by design. Similar to traditional nuclear power plants, SMR vendors and operators will be required to demonstrate that novel aspects of SMRs comply with safety requirements. The first SMR units are already in operation in China and Russia, while other countries are preparing for their commissioning. Some of them are undergoing pre-licensing or licensing reviews, while others completed these steps and have entered or are expected to enter commercial operation in this decade. A larger deployment of different types of SMRs, including microreactors, is expected in 2030 and beyond.

The IAEA supports the efforts of Member States in the development and safe and secure deployment of SMRs. To accelerate those efforts, the IAEA established the IAEA Platform on SMRs and their Applications (SMR Platform) and the Nuclear Harmonization and Standardization Initiative (NHSI). The SMR Platform is a focal point for the IAEA's activities in this field and provides coordinated support and expertise from across the entire Agency. At the same time, NHSI brings together policy makers, regulators, designers, vendors, and operators to enhance the harmonization of regulatory approaches and the wider standardization of industrial approaches to ensure the safe and secure deployment of SMRs. The IAEA has also conducted a thorough review of the Agency's Safety Standards for applicability to SMRs and non-water-cooled reactors.

To take stock of various global activities related to SMRs, as well as discuss emerging challenges and opportunities, the IAEA is organizing the first International Conference on Small Modular Reactors and their Applications in Vienna, Austria, from 21 to 25 October 2024.

B. Purpose and Objectives

The purpose of this conference is to provide an international forum to take stock of the progress and discuss the opportunities, challenges and enabling conditions for the accelerated development and safe and secure deployment of SMRs among all possible stakeholders for SMRs.

The primary objectives are to:

- Present and discuss the up-to-date design and technology of SMRs and microreactors and their associated fuel cycle approaches;
- Address the safety, security, and safeguards approaches specific to SMRs;
- Discuss legislative and regulatory frameworks and existing practices in regulation of SMR design, development, and deployment.
- Consider ways to facilitate the near-term deployment of SMRs, including financing and contracting approaches;
- Discuss the status of national nuclear energy programmes in the Member States by highlighting technical and non-technical expectations and end-user requirements to SMRs design; and
- Share information on recent Member State and IAEA initiatives relating to SMR development and deployment, including NHSI, and foster international collaboration among all stakeholders.

It is expected that this conference will help catalyse current activities in Member States and enhance prospects of safe and secure SMR deployment that will offer options for achieving clean energy transition and energy supply security in both embarking and expanding countries.

C. Themes and Topics

The IAEA welcomes high-quality contributions in accordance with the following topical groups:

Topic 1. SMR Design, Technology and Fuel Cycle

This topical group will focus on research and development of SMR designs from major technology lines: water-cooled reactors, gas-cooled reactors, molten-salt reactors, liquid metal-cooled reactors, and microreactors for both electricity generation and non-electric applications. Advanced fuel designs and anticipated challenges of the nuclear fuel cycle including High Assay Low Enriched Uranium (HALEU) and high burnup fuels will be addressed. Discussion will also cover engineering, codes and standards, supply chain, operation and maintenance and decommissioning of SMRs, waste generation and management, including transport of SMR spent fuel and waste.

Topic 2. Legislative and Regulatory Frameworks

This topical group will focus on legislative and regulatory aspects related to SMRs. Consideration will be given to the applicability and suitability of the existing international legally binding instruments in the areas of nuclear safety, security, safeguards, and civil liability for nuclear damage; the potential impact of SMRs on national nuclear laws, as well as on regulatory roles and functions; and other relevant areas of law, such as environmental law, law of the sea and maritime law. Consideration will also be given to regulatory approaches, including inter alia the licensing steps depending on deployment scenarios, the application of relevant safety standards and nuclear security guidance, as well as cooperation among regulators.

Topic 3. Safety, Security and Safeguards

This topical group will focus on the safety, security, and safeguards aspects of SMR development and deployment. This will include safety demonstration for SMRs, challenges and opportunities related to safety by design, such as design simplification, integration, modularity and new SMR deployment models. In addition, emergency preparedness and response for new SMR deployment models will be discussed. The topical group will cover physical protection considerations and computer security aspects of novel technologies applied to SMRs, in addition to security by design. In addition, safeguards by design will be discussed, to explore technical solutions to cope with specificities of safeguards implementation for SMRs. Lastly, challenges related to safety, security, and safeguards interfaces will be addressed in the context of the novelties in SMR technologies.

Topic 4. Considerations to Facilitate Deployment of SMRs

This topical group will focus on how nuclear infrastructure development can create an enabling environment to facilitate deployments of SMRs. These include energy planning to meet energy demand and climate goals, integration of SMRs in energy systems with large shares of renewables, nuclear infrastructure including capacity building, stakeholder engagement, financing, cost and economic appraisals, contracting approaches, revenue models for demonstrating business case and viable deployment and business models, e.g., interactions amongst vendors, utilities, end users and other stakeholders. This area will also include international cooperation for harmonization and standardization.

D. Structure

The conference will have plenary and panel discussions, in addition to topical sessions. Plenary and panel sessions are aimed at addressing cross-cutting aspects related to development, deployment, and oversight of SMRs. Topical sessions will include oral and poster presentations, which will be held in accordance with topical groups identified in the Chapter C “Themes and Topics”.

Exhibitions and side events will be held as well during the conference to present latest developments in various areas on SMRs.

E. Expected Outcomes

The conference is expected to benefit relevant organizations and stakeholders in the IAEA Member States and the international community, considering that the discussion and information exchange will help to:

- enhance knowledge of the current status and near-term trends in developing SMR technologies including technological readiness, related safety, security and safeguards aspects and approaches to licensing;
- share awareness of the benefits and possible ways to address challenges of developing and deploying SMRs in the energy mix;
- increase understanding of the viable deployment and business models facilitating the contribution of SMRs to Net Zero and other uses;
- strengthen international cooperation and harmonization and standardization in the area of SMRs.

F. Target Audience

Participation in the conference is solicited from potential users and operators, regulatory bodies, relevant industries and technology holders, government officials, technical support organizations, representatives of international organizations, and technical and legal experts working in all areas of SMRs and nuclear power programmes. The conference is also intended for non-governmental organizations and academic institutions. The IAEA highly encourages the participation of women, early career professionals, and individuals from developing countries.

G. Call for Papers

Contributions on the topics listed in Section C are welcome as oral or poster presentations. All submissions, apart from invited papers, must present original work, which has not been published elsewhere.

G.1. Submission of Abstracts

Abstracts (approximately 150 to 200 words on one A4 page, may contain any charts, graphs, figures and references) should give enough information on the content of the proposed paper to enable the Programme Committee to evaluate it. Anyone wishing to present at the conference must submit an abstract in electronic format using the conference's file submission system ([IAEA-INDICO](#)), which is accessible from the conference web page (see Section Q). The abstract can be submitted through this system from **15 December 2023** until **29 February 2024**. Specifications for the layout will be available on IAEA-INDICO. The system for electronic submission of abstracts, IAEA-INDICO, is the sole mechanism for submission of contributed abstracts. Authors are encouraged to submit abstracts as early as possible. The IAEA will not accept submissions via email.

In addition, authors must register online using the InTouch+ platform (see Section H). The online registration together with the auto-generated Participation Form (Form A) and Form for Submission of a Paper (Form B) must reach the IAEA no later than **29 February 2024**.

IMPORTANT: The Programme Committee will consider uploaded abstracts only if these two forms have been received by the IAEA through the established official channels (see Section H).

G.2. Acceptance of Abstracts

The Secretariat reserves the right to exclude abstracts that do not comply with its technical or scientific quality standards and that do not apply to one of the topics listed in Section C.

Authors will be informed by **29 March 2024** as to whether their submission has been accepted, either orally or as a poster, for presentation at the conference. Accepted abstracts will also be reproduced in an unedited electronic compilation of Abstracts which will be made available to all registered participants of the conference.

G.3 Submission of Full Papers

Authors of accepted abstracts will be requested to submit a full paper in Word format, of about **5 to 7** pages in length. A compilation of full papers (in electronic format) will be made available to participants at registration.

Full papers must also be submitted through the [IAEA-INDICO](#) file submission system in Word format. Submitting the paper in the indicated electronic format is mandatory. Specifications for the layout and electronic format of the contributed papers and for the preparation of posters will be made available on IAEA-INDICO.

The IAEA reserves the right to exclude papers that do not comply with its quality standards and those that do not apply to one of the topics outlined in Section C above and those that do not meet the expectations based on the information in the abstract.

The deadline for electronic submission of the full papers as Word files is **31 May 2024**. The IAEA will not accept papers submitted after the deadline.

The IAEA will notify authors of its completed review process of the full papers by **31 July 2024**. The deadline for revised papers to be submitted through IAEA-INDICO is **6 September 2024**.

IMPORTANT: The system for electronic submission of papers, IAEA-INDICO, is the sole mechanism for submission of contributed papers. Authors are encouraged to submit papers as early as possible. The IAEA will not accept submissions via email.

G.4 Proceedings

Following the conference, the IAEA will publish a summary report. The proceedings will be made available to read online.

H. Participation and Registration

All persons wishing to participate in the event must be designated by an IAEA Member State or should be a member of an organization that has been invited to attend.

Registration through the InTouch+ platform:

1. Access the InTouch+ platform (<https://intouchplus.iaea.org>):

- Persons with an existing NUCLEUS account can [sign in here](#) with their username and password;
- Persons without an existing NUCLEUS account can [register here](#).

2. Once signed in, prospective participants can use the InTouch+ platform to:

- Complete or update their personal details under ‘Basic Profile’ (if no financial support is requested) or under ‘Complete Profile’ (if financial support is requested) and upload the relevant supporting documents;
- Search for the relevant event (**EVT2300044**) under the ‘My Eligible Events’ tab;
- Select the Member State or invited organization they want to represent from the drop-down menu entitled ‘Designating authority’ (if an invited organization is not listed, please contact Conference.Contact-Point@iaea.org);

- If applicable, indicate whether a paper is being submitted and complete the relevant information;
- If applicable, indicate whether financial support is requested and complete the relevant information (this is not applicable to participants from invited organizations);
- Based on the data input, the InTouch+ platform will automatically generate Participation Form (Form A), Form for Submission of a Paper (Form B) and/or Grant Application Form (Form C);
- Submit their application.

Once submitted through the InTouch+ platform, the application together with the auto-generated form(s) will be transmitted automatically to the required authority for approval. If approved, the application together with the form(s) will automatically be sent to the IAEA through the online platform.

NOTE: Should prospective participants wish to submit a paper or request financial support, the application needs to be submitted by the specified deadlines (see section O).

For additional information on how to apply for an event, please refer to the [InTouch+ Help](#) page. Any other issues or queries related to InTouch+ can be sent to InTouchPlus.Contact-Point@iaea.org.

If it is not possible to submit the application through the InTouch+ platform, prospective participants are requested to contact the IAEA's Conference Services Section via email: Conference.Contact-Point@iaea.org.

Participants are hereby informed that the personal data they submit will be processed in line with the [Agency's Personal Data and Privacy Policy](#) and is collected solely for the purpose(s) of reviewing and assessing the application and to complete logistical arrangements where required. Further information can be found in the [Data Processing Notice](#) concerning IAEA InTouch+ platform.

I. 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 conference. The IAEA has, however, limited funds at its disposal to help cover 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 conference.

If participants wish to apply for a grant, they should submit applications to the IAEA using the InTouch+ platform through their competent national authority (see Section H). Participants should ensure that applications for grants are:

1. Submitted by **29 February 2024**;
2. Accompanied by Grant Application Form (Form C); and
3. Accompanied by Participation Form (Form A).

Applications that do not comply with the above conditions cannot be considered.

Approved grants will be issued in the form of a lump sum payment that usually covers **only part of the cost of attendance**.

J. Distribution of Documents

A preliminary and final programme will be made available on the conference web page (see Section Q) prior to the start of the conference. The electronic compilation of abstracts will be accessible free of charge to participants registered for the conference.

K. Exhibitions

A limited amount of space will be available for commercial vendors' displays/exhibits during the conference. Interested parties should contact the Scientific Secretariat by email SMR2024@iaea.org by **31 May 2024**.

L. Working Language

The working language of the conference will be English. All communications must be sent to the IAEA in English.

M. Venue and Accommodation

The conference will be held at the Vienna International Centre (VIC), where the IAEA's Headquarters are located. Participants are advised to arrive at Checkpoint 1/Gate 1 of the VIC one hour before the start of the event on the first day in order to allow for timely registration. Participants will need to present an official photo identification document in order to be admitted to the VIC premises.

Participants must make their own travel and accommodation arrangements. Hotels offering a reduced rate for participants are listed on <https://www.iaea.org/events>. Please note that the IAEA is not in a position to assist participants with hotel bookings, nor can the IAEA assume responsibility for paying fees for cancellations, re-bookings and no-shows.

N. Visas

Participants who require a visa to enter Austria should submit the necessary application to the nearest diplomatic or consular representative of Austria as early as three months but not later than four weeks before they travel to Austria. Since Austria is a Schengen State, persons requiring a visa will have to apply for a Schengen visa. In States where Austria has no diplomatic mission, visas can be obtained from the consular authority of a Schengen Partner State representing Austria in the country in question.

For more information, please see the Austria Visa Information document available on <https://www.iaea.org/events>.

O. Key Deadlines and Dates

Submission of abstracts through IAEA-INDICO	29 February 2024
Submission of Form B (together with Form A) through the InTouch+ platform	29 February 2024
Submission of Form C (together with Form A) through the InTouch+ platform	29 February 2024
Notification of acceptance of abstracts for oral or poster presentation	29 March 2024
Electronic submission of full papers through IAEA-INDICO	31 May 2024
Notification of review of full papers	31 July 2024
Deadline for submission of revised full papers submitted through IAEA-INDICO	6 September 2024
Submission of Form A only (no paper submission, no grant request) through the InTouch+ platform	16 October 2024

P. Conference Secretariat

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Subsequent correspondence on scientific matters should be sent to the Scientific Secretaries and correspondence on administrative matters to the IAEA's Conference Services Section.

Q. Conference Web Page

Please visit the IAEA conference [web page](#) regularly for new information regarding this conference.