



IAEA

International Atomic Energy Agency
Atoms for Peace and Development

Technical Meeting on the Validation and Utilisation of INPRO's FRAMES Model

**IAEA Headquarters
Vienna, Austria**
and virtual participation via Cisco Webex

9-13 December 2024

Ref. No.: EVT2304047

Information Sheet

Introduction

This is the first technical meeting (TM) for IAEA's International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO) Section **FR**amework for **MO**delling **E**nergy **S**ystems (FRAMES) collaborative project. The INPRO Section led the development of the FRAMES tool, with support from the IAEA's Planning and Economic Studies Section (PESS) and Nuclear Power Technology Development Section (NPTDS).

The FRAMES tool supports quantitative and comparative analyses and assessments of sustainable energy mixes, particularly involving the optimal grid integration of intermittent renewables and nuclear technologies. The FRAMES's analytical approach supports Member States (MSs) efforts in optimizing nuclear and renewable energy to meet net zero carbon emission goals. Recently, INPRO expanded FRAMES with additional features beyond electrical to include non-electric applications.

INPRO launched the FRAMES collaborative project in March 2024, based on INPRO Members' endorsement at the 32nd INPRO Steering Committee Meeting (October 2023). This FRAMES project supports members in analysing and planning sustainable nuclear energy system by optimizing energy system costs. The project comprises coordinated model development, and tool utilisation and benchmarking.

This TM is an extension of the work accomplished at the May 2023 Consultancy Meeting (CM) to Review the Needs for Validation and Benchmarking FRAMES Code (EVT2205706); and follows the two CMs to draft the collaborative project Terms of Reference (EVT2306243, March 2024 and EVT2302574, October 2024).

Objectives

The purpose of the event is to:

- Present the International Project on Innovative Nuclear Reactors and Fuel Cycles' (INPRO) FRAMES model to Member States for feedback on its scope and fidelity;
- Explore applicable aspects of FRAMES in INPRO studies and investigations; and
- Establish INPRO collaborative efforts to utilize the model for the evaluation of system costs in nuclear energy systems for capacity expansion.

The following are the specific key objectives of the meeting.

- Review and update the Terms of Reference (ToR), which includes project scope, objectives, and schedule;
- Obtain MS feedback on the INPRO's FRAMES model and tool; and
- Present and discuss the results of FRAMES tool/model validation and beta testing findings and observations.

Target Audience

The meeting participants are FRAMES collaborative project participants and experts from INPRO member and observer countries, particularly covering the following areas:

1. Energy system modelling, either developing tools or using similar tools in strategic energy planning and decision making;
2. Energy generation technology characteristics and their application in the electrical grid and overall energy system; and
3. Verification, validation and beta-testing activities.

Working Language(s)

The working language of the meeting is English.

Expected Outputs

The following are expected outputs of this technical meeting on the FRAMES collaborative project:

- Recommend further scope of applicability and intended use of FRAMES, including elaborations on confidence and fidelity of (i.e. verification and validation) FRAMES' performance, usability and suitability in their national and regional nuclear energy systems capacity expansion scenarios and considered energy policy options;
- Updated ToR and schedule of work until the next technical meeting of FRAMES in Q3 2025; and
- Meeting report.

Structure

The meeting will include presentations from IAEA Secretariat and FRAMES Collaborative Project participants and observers, as well as other participating INPRO MS experts who intend to use FRAMES tool, as follows:

- IAEA Secretariat will present the status of FRAMES model and tools and its applications that has been performed by the IAEA Secretariat;
- FRAMES Collaborative Project participants, including those who performed verification and validation activities, will present case studies, including findings and results. Project observers should make presentations on their general observations and preliminary findings/suggestions; and
- Other attendees will present and discuss their country specific cases or the development and use of their models/tools, including their experience on benefits and deficits of currently used models/tool in comparison to FRAMES to identify common areas for further FRAMES' development, validation, and utilization.

Meeting sessions will be in- person, with support for virtual participation via Cisco Webex. All participants of the meeting are encouraged to make presentations, contribute to brainstorming for final products for the use of FRAMES tool and drafting of the meeting report. Additionally, there will be email communications between the Secretariat and all participants and observers.

Topics

All participants are expected to contribute to one or more of the following topics.

- *Model development:* Identification of areas for further modelling development, such as those for inclusion of specific aspects of system vectors (e.g., electricity, heat, energy carriers), that would be needed to explore and to provide input to energy system planning with the inclusion of nuclear and related decision-making processes on energy generation expansion policies;
- *Model Validation:* Determination of common scenarios for validation of FRAMES, including those that would be cross validated by utilizing other tools similar to FRAMES (i.e., those that are

based on UC/ED approach and that use system cost as the metric to compare different generation capacity expansion); and

- *Model Utilization:* Development of specific national or regional generation capacity expansion and transition scenarios that have been (or are to be) analysed/assessed to quantitatively compare (based on system cost) the competitiveness of various generation technology options. (Also, the identification of the need for IAEA and/or INPRO products that would support model utilization, such as model description or user manual documentation, training material for the implementation by the Member State users).

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.

In order to be designated by an IAEA Member State or invited organization, participants are requested to submit their application via the InTouch+ platform (<https://intouchplus.iaea.org>) to the competent national authority (Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority) or organization for onward transmission to the IAEA by **11 October 2024**, following the registration procedure in InTouch+:

1. Access the InTouch+ platform (<https://intouchplus.iaea.org>):
 - Persons with an existing NUCLEUS account can sign in to the platform 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 ‘Complete Profile’ and upload the relevant supporting documents;
 - Search for the relevant event 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 InTouchPlus.Contact-Point@iaea.org);
 - 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 the Participation Form (Form A) and/or the 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 applicable form(s), will automatically be sent to the IAEA through the online platform.

NOTE: The application for financial support should be made, together with the submission of the application, by **11 October 2024**.

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.

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

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. The IAEA may also use the contact details of Applicants to inform them of the IAEA's scientific and technical publications, or the latest employment opportunities and current open vacancies at the IAEA. These secondary purposes are consistent with the IAEA's mandate. Further information can be found in the [Data Processing Notice](#) concerning IAEA InTouch+ platform.

Papers and Presentations

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

Participants who wish to give presentations are requested to submit an abstract of their work. The abstract will be reviewed as part of the selection process for presentations. The abstract should be in A4 page format, should extend to no more than two (2) pages (including figures and tables) and should not exceed 250 words. It should be sent electronically to Mr Armond Aghajani, the Scientific Secretary of the event (see contact details below), not later than **6 November 2024**. Authors will be notified of the acceptance of their proposed presentations by **18 November 2024**.

Expenditures and Grants

No registration fee is charged to participants.

The IAEA is generally not able 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, together with the submission of the application, by **11 October 2024**.

Venue

The event will be held at the Vienna International Centre (VIC), where the IAEA's Headquarters are located. Participants must make their own travel and accommodation arrangements. There will also be a Webex link for those attending virtually.

General information on the VIC and other practical details, such as a list of hotels offering a reduced rate for IAEA participants, are listed on the following IAEA web page: www.iaea.org/events.

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 to allow for timely registration. Participants will need to present an official photo identification document to be admitted to the VIC premises.

Visas

Participants who require a visa to enter Austria should submit the necessary application to the nearest diplomatic or consular representative of Austria at least 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.

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Subsequent correspondence on scientific matters should be sent to the Scientific Secretary/Secretaries and correspondence on other matters related to the event to the Administrative Secretary.

Event Web Page

Please visit the following IAEA web page regularly for new information regarding this event:

www.iaea.org/events/EVT2304047