

Hybrid Event:

Technical Meeting of the INPRO Collaborative Project Analysis Support for Enhanced Nuclear Energy Sustainability Pilot Study (ASENES) "Potential of Innovative Nuclear Installations to Support Multi-Recycling of Fuel in a Nuclear Energy System"

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

4-8 December 2023

Ref. No.: EVT2205379

Information Sheet

Introduction

The INPRO section developed a service package, "Analysis Support for Enhanced Nuclear Energy Sustainability" (ASENES), with the main purpose of facilitating capacity building, in strengthening the competence and skills of national experts, for evaluation of alternative nuclear energy evolution scenarios, and formulation of strategic plans for development and deployment of sustainable nuclear energy.

Responding to recommendations from the 30th INPRO Steering Committee Meeting, October 2021, INPRO launched a new collaborative project, "Analysis Support for Enhanced Nuclear Energy Sustainability Pilot Study on Potential of Innovative Nuclear Installations to Support Multi-recycling of Fuel in a Nuclear Energy System" (STEP FORWARD). The objective of this project is to apply the ASENES service package and other INPRO tools of relevance to the evaluation of nuclear energy systems and scenarios involving an initially small number of innovative nuclear energy installations

with multi-recycling of fuel in a complete nuclear energy system, that include operating and evolutionary reactors with thermal neutron spectrum. A specific objective is to understand conditions that enable moving to a larger deployment of innovative technologies in countries or international centres that provide nuclear fuel cycle services. The conditions include lead and lag times, timely availability of services, absence of peaking capacities, and additional infrastructure, particularly for collaborative scenarios (nuclear trade) between spent fuel recycling providers and fuel recipients.

This is the fourth meeting of STEP FORWARD, which is an INPRO activity under Task 1 "Global Scenarios" and Task 2 "Innovations".

Objectives

The following are the objectives of this technical meeting.

- 1. Present case studies including results, review reports, and agree upon any proposals for additional case studies.
- 2. Discuss and identify preliminary conclusions and common findings, then develop a path forward for the completing the final project report.
- 3. Update the scope and schedule of work for the period until the next project meeting in 2024.
- 4. Identify possible presentations of STEP FORWARD case studies for upcoming International Conferences in 2024.
- 5. Prepare the draft technical meeting report.

Target Audience

This technical meeting will pursue broad participation from INPRO members within the following groups.

- Experts participating in the STEP FORWARD Collaborative Project and familiar with INPRO ASENES service and tools, including their application in national studies;
- Technical experts and managers working in national research laboratories and ministries, responsible for development and implementation of national programmes of innovative technology development for nuclear energy, strategic energy planning and international cooperation (nuclear trade).
- Newcomer countries are targeted participants, especially countries planning to become an important part of the regional and global nuclear energy systems in the 21st century.

Working Language(s)

The working language of the meeting will be English. Participants must submit all communications papers and presentations in English.

Expected Outputs

The following are expected outputs of this technical meeting on the collaborative project STEP FORWARD.

- Draft of case studies from project participants for the final report.
- Discussion and documentation of conclusions and common findings of the case studies and a path forward for completing the project report.
- Updated scope and schedule of work covering the time until the next meeting in 2024.
- List of possible presentations of STEP FORWARD case studies at upcoming 2024 International Conferences.
- Meeting report.

Structure

The meeting will include presentations from IAEA Secretariat and project participants and observers. Project participants will present case studies, including findings and results. Project observers should make presentations on their general observations and preliminary findings. After presentation of case studies and general observations, attendees will discuss the preliminary findings and results to identify common findings and conclusions for inclusion in the final report. Participants and observers will work on the draft meeting report. Additionally, participants and observers will contribute draft case studies and preliminary findings and conclusions for the final report.

Working 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, drafting of the meeting report, and to content for the final project report. Additionally, there will be email communications between the Secretariat and all project participants and observers.

Participation and Registration

In order to be designated by an IAEA Member State or invited organization, participants are requested to submit their application via the InTouch+ platform (<u>https://intouchplus.iaea.org</u>) 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 **8 September 2023**, 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 **3 November 2023**.

For additional information on how to apply for an event, please refer to the <u>InTouch+ Help</u> page. Any other issues or queries related to InTouch+ can be sent to <u>InTouchPlus.Contact-Point@iaea.org</u>.

Selected participants will be informed in due course on the procedures to be followed with regard to 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.

Presentations and Papers (Draft Case Studies)

Project participants of the meeting are requested to deliver presentations highlighting the progress on the STEP FORWARD case studies, including preliminary conclusions and findings. Participants should submit draft report of their case studies for inclusion in the final report.

Project observers should make presentations on their general observations of the project.

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 **3 November 2023**.

The application for financial support should be made, together with the submission of the application, by **3 November 2023**.

Venue

The event will be held at the Vienna International Centre (VIC), Building M, Room BR-A, where the IAEA's Headquarters are located. Participants must make their own travel and accommodation arrangements.

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 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.

The meeting will also be conducted in online mode (Cisco Webex) for virtual participants.

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.

IAEA Contacts

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

Enclosure: Attachment 1 – Terms of Reference for STEP FORWARD



Participation Form

Technical Meeting of the INPRO Collaborative Project Analysis Support for Enhanced Nuclear Energy Sustainability Pilot Study (ASENES) "Potential of Innovative Nuclear Installations to Support Multi-Recycling of Fuel in a Nuclear Energy System"

IAEA Headquarters Vienna, Austria and virtual participation via Cisco Webex 4-8 December 2023

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: <u>Official.Mail@iaea.org</u> or by fax to: +43 1 26007 (no hard copies needed). Please also send a copy by email to the Scientific Secretaries <u>A.Bychkov@iaea.org</u> and <u>J.M.C.Johari@iaea.org</u> and to the Administrative Secretary <u>L.Tagani.@iaea.org</u>.

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: 3 November 2023

Family name(s): (same as in	n passport)	First name(s): (same	e as in passport)	Mr/Ms
Institution:				
Full address:				
Tel. (Fax):				
Email:				
Nationality:	Representing follo invited organizatio	owing Member State/r on:	oon-Member State/e	entity or
If/as applicable:				
Do you intend to submit a paper? Yes No				
Would you prefer to present your paper as a poster? Yes No				
I plan to attend virtually: Yes No				

Participants are hereby informed that the personal data they submit will be processed in line with the <u>Agency's Personal Data and Privacy Policy</u> 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.



Grant Application Form

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Deadline for receipt by IAEA through official channels: 3 November 2023

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:			
I plan to attend virtually:	Yes No	Yes No		

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 wo from	rked 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



Attachment 1

International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO) NENP/INPRO Section

TERMS OF REFERENCE

INPRO Collaborative Project

Analysis Support for Enhanced Nuclear Energy Sustainability Pilot Study on Potential of Innovative Nuclear Installations to Support Multi-recycling of Fuel in a Nuclear Energy System (STEP FORWARD)

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1. SUMMARY

The IAEA's International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO) supports Member States in their long-term strategic planning for deploying sustainable nuclear energy. To assist interested Member States in formulating national strategies for enhancing nuclear energy sustainability, Task 1 "Global scenarios" of INPRO has developed a service package called "Analysis Support for Enhanced Nuclear Energy Sustainability" (ASENES). The main purpose of this service is to facilitate capacity building in Member States to strengthen the competence and skills of national experts for evaluation of alternative nuclear energy evolution scenarios and collaborative arrangements and for the formulation of strategic plans towards development and deployment of sustainable nuclear energy.

Responding to recommendations from Member States expressed at the 29th INPRO Steering Committee meeting in October 2020, the INPRO Secretariat has decided to launch a new INPRO collaborative project titled "ASENES Pilot Study on Potential of Innovative Nuclear Installations to Support Multi-recycling of Fuel in a Nuclear Energy System" (STEP FORWARD). The overall objective of the STEP FORWARD collaborative project is to apply the ASENES package and other methods and tools developed in Member States or elsewhere to the evaluation of the nuclear energy systems and scenarios involving initially small numbers of innovative nuclear energy installations to enable multi-recycling of fuel in a complete nuclear energy system including also the operating and evolutionary reactors, with the goal to achieve a meaningful reduction of spent nuclear fuel inventory and expansion of fissile resources.

The project is expected to produce an IAEA TECDOC Series publication with documented results of national and, potentially, joint (e.g., including 2 countries or, when possible, multi-national) studies on evaluation of the nuclear energy systems and nuclear energy evolution scenarios involving initially small numbers of innovative nuclear energy installations to enable multi-recycling of fuel in a complete nuclear energy system involving also the operating and evolutionary reactors with thermal neutron spectrum. The report could also provide conclusions on the conditions that need to be met to enable moving to a larger deployment of such innovative installations in technology holder countries or in international centres providing nuclear fuel cycle services.

The target audience are senior technical experts and managers working in national research laboratories and ministries, responsible for formulating and implementing national programmes of innovative technology development for nuclear energy, strategic energy planning and international cooperation (nuclear trade).

The collaborative project STEP FORWARD is being implemented as an activity under Task 1 "Global Scenarios" and Task 2 "Innovations" in Project 1000151 of the IAEA Programme & Budget 2021-2022.

2. RATIONALE

The ASENES service consists of the four main modules:

(1) Nuclear energy system evolution scenario modelling and analysis, including the MESSAGE-NES tool to provide better understanding of the key issues and find plausible solutions for enhanced nuclear energy sustainability.

(2) Economic evaluation of alternative nuclear energy systems, including the NEST tool;

(3) Comparative evaluation of nuclear energy system or scenario options based on problem structuring and the state-of-the art judgement aggregation/uncertainty analysis methods to support the multi-

criteria selection of a preferred nuclear energy or scenario option through a substantive dialogue with decision makers, supported by the KIND-ET tool.

(4) Road mapping for enhanced nuclear energy sustainability to present the status, prospects, benefits and risks associated with a variety of options for the national nuclear energy system configuration and evolution scenario, inter alia, helping to indicate opportunities for saving time, effort and resources for improving sustainability of a national nuclear energy system through collaboration and nuclear trade with other countries, supported by the ROADMAPS-ET tool.

An important component of this service is the support package which includes training materials such as IAEA INPRO publications, eLearning training course, self-education modules on the IAEA Learning Management System platform, quizzes for self-assessments, etc.

This ASENES service is available to all Member States who have determined that nuclear energy is a suitable option for meeting their future energy needs and intend to embark on or expand the already implemented, nuclear energy programme. The service is also available for technology holders to evaluate future market potential for their nuclear energy technologies or to identify priority areas for innovations and R&D in nuclear energy technologies.

Apart from being provided to interested Member States upon their requests, the ASENES service could be a vehicle for implementation of the various new INPRO collaborative projects such as those where deployment scenarios need to be developed and analyzed for sustainability, and where different energy systems need to be compared. One of such collaborative projects is STEP FORWARD.

In STEP FORWARD, the scope of innovative nuclear energy installations to be considered is open to include a variety of options, such as fast reactors with any type of coolant, molten salt reactors, accelerator driven subcritical systems, thermal spectrum reactors with modified cores supporting fuel multi-recycling or even fission-fusion hybrids. The types of fuel to be considered are also not restricted and may include uranium, mixed uranium-plutonium, ²³³U-Th fuels or combinations thereof in a variety of solid or liquid forms. Within studies on multi-recycling, transmutation of radioactive waste and excess plutonium disposition could also be topics for consideration.

The rationale behind the proposed studies is as follows. The number of innovative nuclear installations is likely to be limited at early stages of their commercial deployment since they will need time to acquire proofs of reliable operation and economic competitiveness before being deployed at a larger, e.g., global scale. However, as shown by some studies, in particular, those performed within successfully completed INPRO SYNERGIES collaborative project (IAEA Nuclear Energy Series No. NF-T-4.9 [5]), even with a relatively small number of such installations one might be able to achieve a notable reduction of spent nuclear fuel inventory and expansion of fissile resources through multi-recycling fuel in all reactors present in a nuclear energy system.

Scenarios with the initial introduction of a limited number of innovative nuclear energy installations offer large flexibility with respect to their further evolution and better match the developments observed in technology holder countries worldwide. Indeed, such scenarios appear to bear minimal risks related to potential delays in transition to large scale deployment of the innovative nuclear energy installations in technology holder countries and at the same time may offer tangible benefits to both technology holders and technology users, through nuclear trade in the fuel cycle front-end and backend. Regarding further evolution of the innovative nuclear installations, such scenarios allow a movement to their larger deployment in technology holder countries or in international centres providing nuclear fuel cycle services, if their reliability, competitiveness and other important features prove to be feasible.

It is anticipated that within STEP FORWARD the INPRO member countries will perform the studies using the INPRO developed scenario and nuclear energy system related tools (MESSAGE-NES, KIND-ET, ROADMAPS-ET, NEST) augmented or superseded by their own analysis tools. INPRO will conduct consultants' and technical meetings to allow reporting on progress and findings among studies.

3. OVERALL OBJECTIVE

The overall objective of the STEP FORWARD collaborative project is to apply the ASENES package and national or other tools of relevance to evaluation of the nuclear energy systems and scenarios involving initially small number of innovative nuclear energy installations to enable multi-recycling of fuel in a complete nuclear energy system including also the operating and evolutionary reactors with thermal neutron spectrum.

4. SPECIFIC OBJECTIVES

The specific objectives of STEP FORWARD are:

(1) To apply national or other neutronic and depletion calculation tools to analyze and compare different approaches to deployment and operation of innovative nuclear energy installations to achieve a meaningful reduction of spent nuclear fuel inventory and expansion of fissile resources through multi-recycling of fuel in a complete nuclear energy system.

(2) To apply ASENES and/or national or other tools of relevance to model, analyze, compare and present different nuclear energy system and nuclear energy evolution scenario options corresponding to the findings of the specific objective 1.

(3) To derive practicable conclusions, based on the outputs derived in the specific objectives 1 and 2, for the potential of particular innovative nuclear energy installations to contribute to a notable reduction of spent nuclear fuel inventory and expansion of fissile resources, through multi-recycling of fuel in a complete nuclear energy system.

(4) To derive practicable conclusions on conditions that need to be met to enable moving to a larger deployment of innovative installations in technology holder countries or in international centres providing nuclear fuel cycle services¹.

(5) To provide feedback on the usefulness of ASENES for its further development, amendment and improvement.

5. SCOPE OF WORK

¹ If several small national systems are joined, this will have more "space" to study the impact of innovative nuclear energy systems. Several small systems could be analyzed together, or a combination of some small systems with a large system could be considered, etc. The options for analysis here could be "add-on scenario", cooperative approaches, etc.

However, such a "joint" part of the study may also have its drawbacks and specific problems. Analyzing a larger "joint" nuclear energy system is not as simple as the analysis of a single system. Joint systems have their own multinational, legal, transport related, and other issues. For example, in a large national system the material flows could be regular, i.e., one shipment per every so and so time. In multinational scenarios one would need to take into account delayed shipments, intermediate storages, maybe even international storages, as well as many other aspects.

The scope of work includes:

- (1) Definition of cases for the study and review of the ASENES and national tools with the subsequent identification of the most appropriate tools for use in the studies.
- (2) Analysis of physics of innovative nuclear installations and existing and advanced nuclear reactors present or considered to be present in a nuclear energy system aimed at identification of plausible options for multiple recycling of discharged fuel in the considered nuclear energy system.
- (3) For identified plausible options, use of dynamic scenario modelling and material flow analysis in order to identify a practicable nuclear fuel cycle scheme for coordinated operation of innovative nuclear installations and existing and considered advanced reactors with multirecycle of fuel (using MESSAGE-NES or/and national tools of relevance).
- (4) Comparative economic evaluation of the selected multi-recycling options under different fuel market conditions (using NEST, MESSAGE or/and national tools of relevance).
- (5) Comparative economic (and whole life cycle carbon emissions) evaluation of nuclear with different recycling options and renewables with energy storage.
- (6) Comparative evaluation and ranking of the selected multi-recycling NES options/scenarios on a selected set of key indicators representing many or all INPRO assessment areas, *inter alia* versus business-as-usual scenarios, using MCDA and relevant sensitivity/uncertainty analysis (with KIND-ET or/and other tools of relevance).
- (7) Development of roadmaps for the most promising scenarios selected within the multi-criteria analysis (using ROADMAPS-ET or/and national tools of relevance).
- (8) Analysis of the results obtained to derive practicable conclusions on:
 - Potential of initially small numbers of innovative nuclear installation to contribute to a notable reduction of spent nuclear fuel inventory and expansion of fissile resources, through multi-recycling of plutonium in a complete nuclear energy system.
- (9) Identification of conditions that need to be met to enable moving to a larger deployment of innovative installations in technology holder countries or in international centres providing nuclear fuel cycle services.²
- (10) Analysis of the experience in ASENES tools application within STEP FORWARD, development of recommendations for further development, improvement or amendment of ASENES.
- (11) Preparation of the STEP FORWARD project report.

6. EXPECTED OUTPUTS

The outputs of the STEP FORWARD collaborative project will be:

(1) Documented results of national and, potentially, joint studies (e.g., involving 2 countries or, if possible, multi-national studies, potentially involving other international organizations) on

² Apart from technology advancement, human capacity building, supply chain construction and infrastructure deployment, when it comes to international cooperation, challenges on regulation framework, long-term policy stability, financing schemes, as well as incentives for service suppliers would also be important issues to address. Since more emerging nuclear countries would be interested in the concept of international centers or multilateral cooperation, it would be worth in-depth discussion.

evaluation of the nuclear energy systems and nuclear energy evolution scenarios involving initially small numbers of innovative nuclear energy installations to enable multi-recycling of fuel in a complete nuclear energy system with the option of consideration of the deployment of evolutionary reactors with the goal of minimizing spent fuel inventory and maximizing the available fissile resource base.

- (2) Conclusions on plausible and most promising scenarios and the conditions that need to be met to enable moving to a larger deployment of such innovative installations in technology holder countries or in international centres providing nuclear fuel cycle services.
- (3) Recommendations on further development, improvement or amendment of the ASENES service package, including the ASENES tools.

7. EXPECTED OUTCOME

It is anticipated that the STEP FORWARD collaborative project will contribute to improved understanding of the potential of innovative nuclear installations to support multi-recycling of fuel in a nuclear energy system, in particular, at the early stages of their commercial deployment, when their number will be limited since they will need time to acquire proofs of reliable operation and economic competitiveness before being deployed at a larger, e.g., global scale.

Regarding further evolution of the innovative nuclear installations, knowledge of the conditions that need to be met to enable moving to a larger deployment of such innovative installations in technology holder countries or in international centres providing nuclear fuel cycle services will assist Member States in formulating and implementing long term nuclear energy strategies and international cooperation (nuclear trade).

8. DELIVERABLES

The IAEA TECDOC Series publication will present and summarize the results and findings of the STEP FORWARD collaborative project. The target audience are senior technical experts and managers working in national research laboratories and ministries, responsible for formulating and implementing national programmes of innovative technology development for nuclear energy, strategic energy planning and international cooperation (nuclear trade).

9. RESOURCES

Each participating country is expected to meet its own expenses on manpower deployed for this purpose. Travel and participation support from the Agency will be limited to representatives of countries eligible for the IAEA support under a Technical Cooperation programme.

10. ORGANIZATION OF WORK AND PARTICIPANTS

10.1. Organization of work

The work within the STEP FORWARD project will benefit from the experience of the GAINS, SYNERGIES, KIND, ROADMAPS and CENESO collaborative projects [1-8]. The following features of work will be encouraged:

- Enhanced link to decision makers who could use the results of the project studies in support of decision making.
- STEP FORWARD will pursue in-house cooperation as needed or desired, potentially including NFCM, SG, PESS, etc.

10.2. Participants

The targeted participants are technical experts working in national research laboratories, responsible for formulating and implementing national programmes of innovative technology development for nuclear and fission-fusion energy. The targeted participants are also senior technical experts and managers working in ministries, responsible for formulating long term nuclear energy strategies and international cooperation (nuclear trade) programmes, from both technology holder and technology user countries.

10.3. Role and responsibility of each participant

Each participant will perform the activities assigned in the Terms of Reference (ToR) and those identified during the project implementation in order to achieve the overall objective, the specific objectives and the outcome of the STEP FORWARD project.

10.4. Representatives of participants

Each participant will communicate in writing to the INPRO Secretariat the nomination of its responsible personnel to perform the activities assigned in these Terms of Reference (ToR), including professional affiliation and contact information (institutional affiliation, organization, position, post address, telephone/s, fax and email). It is recommended to identify an alternative representative for cases in which the first person responsible is not available. The alternate will share copies of the most relevant information distributed among the participants unless otherwise requested. It is recommended to keep the nominated representatives unchanged during the duration of the project. If changes do take place, it will be communicated to the INPRO responsible officers as soon as decided.

IAEA/INPRO will provide support to the participants through the Scientific Secretary of the collaborative project (Mr Alexander BYCHKOV), by facilitating task definition, coordination, meetings and timely access to all STEP FORWARD documents and software with necessary training and consultancy provided upon request.

10.5. Communication

The flow of information should be done by e-correspondence. Several technical and consultants' meetings are considered necessary for reaching the objectives of the STEP FORWARD collaborative project (see Table 1 in Section 11 of the ToR).

11. MILESTONES AND DURATION

The milestones and duration for the STEP FORWARD project are summarized in Table 1.

Table 1. Milestones and duration of the STEP	FORWARD co	llaborative project (2022-2025)
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Activity	Status	Output	Estimated Cost (kC)
2022 – Preparatory consultancy	Implemented on 15-18 February 2022	Terms of Reference (ToR), Preliminary Scope of Work (SoW)	0
2022 – Technical meeting	Implemented on 29 November – 02 December 2022	Reviewed and updated ToR and SoW, path forward	25
2023 - Consultancy meeting and	CM on 11-14	Scope and outline of the final project	0
technical meeting	September 2023 TM planned for 4-8 December 2023	report Additional results, path forward	25
2024 – Consultancy meeting and technical meeting	Considered	First draft of the project report, review of the first draft	40
2024-2025 – Preparation and review of the final draft for	Considered	Final draft of the TECDOC reviewed and submitted to publication process	25

publication as an IA	EA
TECDOC technical	meeting

REFERENCES

[1] INTERNATIONAL ATOMIC ENERGY AGENCY, Planning enhanced nuclear energy sustainability: An INPRO service to Member States, Analysis Support for Enhanced Nuclear Energy Sustainability (ASENES)", IAEA Nuclear Energy Series No. NG-T-3.19, IAEA, Vienna (2021), https://www.iaea.org/publications/13628/planning-enhanced-nuclear-energy-sustainability.

[2] INTERNATIONAL ATOMIC ENERGY AGENCY, Framework for assessing dynamic nuclear energy systems for sustainability, Final report of the INPRO collaborative project GAINS, IAEA Nuclear Energy Series No. NP-T-1.14, IAEA, Vienna (2013), <u>http://www-pub.iaea.org/MTCD/Publications/PDF/Publ598_web.pdf</u>.

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