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

TERMS OF REFERENCE

Collaborative Project

Assessing Sustainability for Transitioning Fossil Fuel Plants to Nuclear Energy Systems

(INPRO F2N)

An interdisciplinary project supported by the INPRO members with IAEA Interdepartmental cooperation

DATE: 22 MAY 2026

1 SUMMARY

To expand access to energy, strengthen economies, support energy resilience, and reduce air pollution, several countries have expressed interest in exploring nuclear power as a way to diversify their energy mix. These efforts include replacing fossil-fuelled generating plants, including coal-, gas-, and oil-fired power plants, depending on national circumstances, with nuclear and/or renewable technologies. Both currently operating and embarking IAEA Member States (MSs) are increasingly considering or planning the construction of nuclear power plants (NPPs) at, or near, the sites of fossil-fired power plants—commonly referred to as "repurposing"—to transition to stable electricity and heat production from nuclear power.

To support MSs in strategic planning and in assessing the sustainability of nuclear energy systems (NESs) for these transitions, the INPRO collaborative project on Assessing Sustainability for Transitioning Fossil Fuel Plants to Nuclear Energy Systems (INPRO F2N) is endorsed by the INPRO Steering Committee (SC) under Task 3, Sustainability Assessment and Strategies, in the INPRO Subprogramme Plan 2026–2027. The project will use INPRO methods and tools, along with other IAEA and national tools, to support capacity building and knowledge sharing for fossil-to-nuclear (F2N) transition analysis and assessment. MSs will benefit from an improved understanding of key aspects, considerations, and scenarios for selecting effective strategic approaches and policies for sustainable F2N transitions, supporting informed decision-making.

For this project *repurposing* means developing new nuclear power (along with associated energy infrastructure) at, or near the site of an existing fossil-fired power plant.

2 RATIONALE

To promote energy access, economic development, energy resilience, and reduction of air pollution, many countries are exploring nuclear power as a replacement for fossil-fuelled generation due to the benefits that may be realized from repurposing existing power generation assets.

This project uses INPRO methods and tools, as well as other IAEA and national tools, to support MSs in:

- strategic planning
- capacity building
- sustainability assessments

Applying the IAEA and INPRO, along with other relevant methods and tools, to F2N transitions can help countries identify viable strategies, understand trade-offs, and integrate nuclear energy effectively into their long-term energy transition strategy.

3 OVERALL OBJECTIVE

The Project aims to assist Member States in conducting analyses and sustainability assessments consistent with national priorities, to inform the feasibility (technical, economic, and infrastructure) and strategic planning of a transition from fossil-fuelled energy generation

technologies to nuclear energy systems, using IAEA/INPRO and other relevant methods and tools, and through capacity building to support fossil-to-nuclear transition pathways planning.

4 SCOPE OF WORK

The scope of work includes the following activities:

1. Performance studies and/or qualitative assessments within the scope of analyses and assessments of feasibility and forward-looking, long-term national, regional scenarios, roadmaps and strategies for an F2N transition using IAEA/INPRO and other relevant methods and tools.
2. Analysis, exchange of experiences, and generalization of the study's results leading to conclusions regarding strategic planning of fossil to nuclear transition using IAEA/INPRO and other relevant methods and tools.
3. Preparation of an IAEA Publication presenting, summarizing, and generalizing results of the studies on using IAEA/INPRO and other relevant methods and tools in the analyses and assessments of sustainable transition from fossil to nuclear.
4. Capacity building workshops and training as well as exchange of lessons learned related to strategic planning of fossil to nuclear transition using IAEA/INPRO and other relevant methods and tools.

The activities of this collaborative project will be coordinated with the IAEA ongoing technical work related to the nature of the collaborative project (avoiding duplication and ensuring one-house approach) performed by Planning and Economic Studies Section (PESS), Nuclear Power Technology Development Section (NPTDS) and others as appropriate.

5 EXPECTED PROJECT OUTCOMES

The expected outcomes of the project are:

— Improved Member State understanding and capacity to analyze and assess F2N transition options using INPRO and other relevant tools and methods.
— Practical resources (e.g., study templates, example scenarios, and consolidated lessons learned) that can be applied in national and regional energy planning.

6 DELIVERABLES

The project shall produce the following deliverables:

— Agreed study framework and workplan (including roles, responsibilities, and reporting schedule).
— Indicative study templates (e.g., assumptions, scenarios, indicators, and reporting format) to support reasonably consistent contributions across participating MSs.
— Draft study results and consolidated findings for review at Working Group/Technical Meetings (including an annotated TECDOC outline when applicable).
— Final IAEA publication (TECDOC) documenting the results of studies on using IAEA/INPRO and other relevant methods and tools in the analysis and assessment of a just and sustainable transition from fossil-fuelled energy generation technologies to

nuclear technologies, including those based on advanced and innovative nuclear reactors including small modular reactors (SMRs).

7 RESOURCES

Each participating Member State or organization shall be responsible for financing its own contributions to the collaborative project, including costs associated with personnel assigned to project activities.

The IAEA may provide limited financial support for specific activities under the collaborative project, such as assistance for travel and participation in meetings, as well as support for the preparation and dissemination of publications. In general, the IAEA is not in a position to cover travel or related expenses for all participants; however, limited funds may be available to facilitate the participation of selected individuals, subject to established criteria and availability of resources.

In addition to financial contributions, in-kind support and dedicated work by INPRO will constitute an integral part of the project. The collaborative project will also seek to leverage existing resources and ongoing activities within relevant IAEA organizational units, including PESS, NPTDS, and others, to ensure efficient use of expertise and infrastructure.

As an indicative commitment, participating organizations are encouraged to assign at least one technical focal point able to contribute to coordination calls/meetings and to provide periodic inputs and reviews between meetings.

8 ORGANIZATION OF WORK AND PARTICIPANTS

8.1 Organization of Work

- INPRO will coordinate the collaborative project activities to ensure alignment with ongoing and planned INPRO work;
- Activities will include coordination meetings, offline work, and virtual or hybrid workshops;
- Documentation and records will be systematically managed.

8.2 Participants

Recommended profile for nominated representatives includes expertise in energy system planning and modelling, nuclear programme planning and infrastructure development, power plant siting and repurposing, techno-economic assessment, and/or sustainability assessment methods.

More specifically, INPRO will pursue inviting:

- The participants involved in studying and planning of fossil to nuclear transition using various methods, models, and tools, to bring in their expertise, national standpoints and views of relevance to the objectives of the project.
- The participants familiar with the IAEA and INPRO methods and tools, along with other relevant tools, will utilize them in the analyses and assessments.

— Experts from other IAEA units, including experts in the related fields of fossil to nuclear repurposing planning as appropriate.

Broader participation of technology user countries (including the newcomer countries) is also targeted, as such countries are expected to become an important part of the regional and global NESs in the 21st century, potentially including SMRs and innovative reactor technologies.

To become a collaborative project participant, MSs or experts from MSs and International Organizations and independent experts should communicate in writing to the INPRO Secretariat for their nomination, including full contact information, and INPRO will process accordingly. Each collaborative project participant is encouraged to designate an alternative representative(s) to maintain workflow efficiency and continuity.

8.3 Role and responsibility of each participant

Each participant shall be responsible for implementing the activities assigned to them in accordance with the work plan developed and endorsed by all collaborative project participants.

Participants are expected to:

— **Ensure timely and effective execution** of their respective tasks as outlined in the agreed work plan;
— **Provide regular progress updates** to the IAEA Project Coordinator and other participants, in accordance with the reporting schedule established for the project;
— **Maintain transparency and accountability** in the use of resources and in the delivery of outputs;
— **Collaborate and coordinate** with other participants to avoid duplication of effort and to ensure consistency and complementarity of activities;
— **Participate in project meetings and consultations**, as required, to review progress, address challenges, and agree on adjustments to the work plan;
— **Contribute to documentation and dissemination** of project results, including technical reports, publications, and presentations, as appropriate.

The Project Coordinator shall facilitate communication among participants, consolidate progress reports, and support alignment with the overall objectives and timeline of the collaborative project. The Project Coordinator will also coordinate the development of the work plan and manage review cycles for draft outputs (including the TECDOC) in consultation with participating experts and relevant IAEA organizational units.

Governance and decision-making: Key project documents (e.g., the work plan, study templates, and major draft outputs) will be developed collaboratively and endorsed by participating MS representatives. Where consensus cannot be reached, the Project Coordinator will document the differing views and propose a way forward for agreement at the next meeting or through written consultation. Clearance and issuance of the final TECDOC will follow applicable IAEA publication processes.

9 MILESTONES AND DURATION

A summary of the milestones and duration for this INPRO CP are in Table below.

No.	Activity	Duration	Due Date	Output	Status
1	Kick-off Technical Meeting on Using the INPRO Methodology to Assess Sustainability for Transitioning Fossil Fuel Plants to Nuclear Energy Systems	13-17 October 2025	17 October 2025	Draft Terms of Reference (ToR)	Done
2	CM: Finalizing ToR	13-15 May 2026	15 May 2026	Final Terms of Reference (ToR)	Done
3	TM to develop studies on sustainability assessment for F2N transition	Q4 2026	Q4 2026	Agreed study framework and work plan; study templates; proposed studies	Planned
4	Mid-term Review	Q2-Q3 2027	Q3 2027	Primary results and findings	TBD
5	CM: Review studies on sustainability assessment for F2N transition	Q4 2027	Q4 2027	Draft study results and consolidated findings for review (TECDOC outline, annotated, as applicable)	TBD
6	TM: Review draft TECDOC	Q2 2028	Q2 2028	Reviewed TECDOC draft	TBD
7	CM: Finalize draft publication	Q4 2028	Q4 2028	Final draft for IAEA publication (TECDOC)	TBD

These milestones and the associated schedule may be adjusted during the collaborative project based on discussions and input from project participants at Technical Meetings, Working Group Meetings, and, as appropriate, INPRO Steering Committee.