Dialogue Forum and INPRO’s Role in Sustainable Nuclear Energy System Development

INPRO Dialogue Forum on “Legal and Institutional Issues in the Global Deployment of Small Modular Reactors”

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Jon Rowan Phillips
INPRO Section
What is INPRO?

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

• INPRO began in 2001 based on a GC Resolution
• INPRO is membership based
• INPRO’s Plans (Tasks and Activities) and priorities are endorsed by the INPRO Steering Committee (SC) – Committee Members are nominated by Member States
• INPRO’s primary topical focus is sustainability and sustainable development of nuclear energy systems (NES) in a crosscutting approach
INPRO Overall Topical Focus: *Sustainability and Sustainable Development of Nuclear Energy System*

### Sustainability questions

National Energy Planning:
How does nuclear energy fit into the national energy mix?

Nuclear Energy System (NES) modelling and the ‘GAINS Framework’:
How do we get *there* from *here*?

Nuclear Energy System Assessment (NESA):
**INPRO Methodology** of sustainability assessment
What are the *gaps*?
What is INPRO’s definition of sustainability and sustainable development of NES?

- **INPRO Methodology** is a holistic (multidimensional) sustainability assessment metric derived from the “UN Brundtland Commission Report” (Our Common Future, 1987) on sustainable development.

- Brundtland’s summary concept of sustainable development:
  - “Development that meets the needs of the present without compromising the ability of future generations to meet their own needs”

- In Part II, Energy Chapter, Section 3: “Nuclear Energy: Unsolved Problems”: Seven key sustainable development issues for NES are discussed:
  - Proliferation
  - Economics (costs)
  - Health and environment risks (includes resource sufficiency)
  - Nuclear accidents risks
  - Radioactive waste disposal
  - **Sufficiency of national and international institutions**
  - Public acceptability
Purpose of INPRO projects on “Innovations”?

Taken from INPRO Subprogramme Plan 2016-17:

“Investigate innovative nuclear energy technologies and institutional arrangements that support development of sustainable nuclear energy in IAEA Member States in the current century.”
Purpose of INPRO Dialogue Forum?

Taken from INPRO Subprogramme Plan 2016-17:

“To provide an international venue for Member States’ guidance, for policy coordination and coordination with other international organizations and initiatives, bringing together technology holders and users to exchange ideas and information on long-range nuclear energy system strategies, global nuclear energy scenarios, and related technical and institutional innovations.”
How are SMR institutional issues relevant to sustainable development of global NES?

• If economies of mass production can be effectively applied to small factory assembled nuclear reactors, it could open a significant new global market space for nuclear generation.

• Smaller unit size is better fit to purpose in small grid countries.

• Smaller unit size opens more diverse opportunities for non-electric applications.

• Expanded and more diverse market opportunities makes nuclear power more “flexible” and more broadly “adaptable” – higher market adaptability often conveys greater sustainability.

• There are many legal and institutional issues that differ between traditional site built reactors and shippable SMR – some will be topics in this forum.

• Technology holders/developers of SMR and potential technology users are participants in this forum.

• This forum is cross-cutting: there are regulatory (safety and security), safeguards, nuclear law, and energy planning participants, etc.
Thank you!