INPRO Dialogue Forum on Cooperative Approaches to the Back End of the Nuclear Fuel Cycle: Drivers and Legal, Institutional and Financial Impediments.

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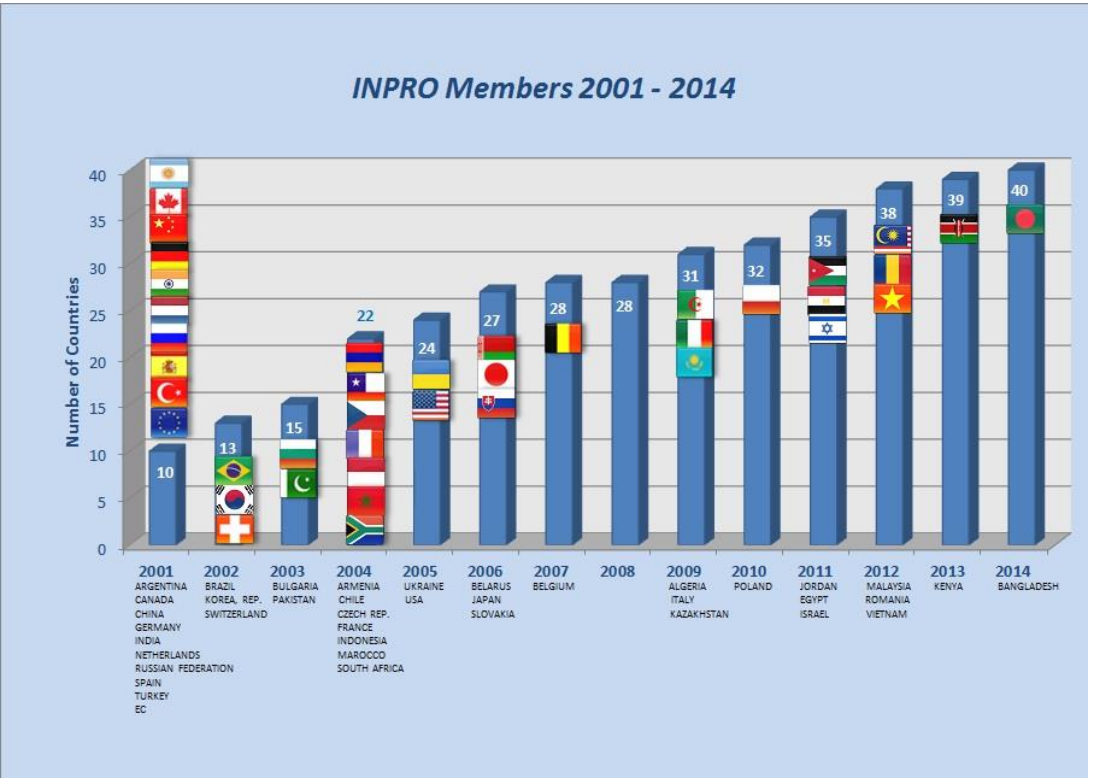
International Conference on the Management of Spent Fuel from Nuclear Power Reactors: An Integrated Approach to the Back End of the Fuel Cycle

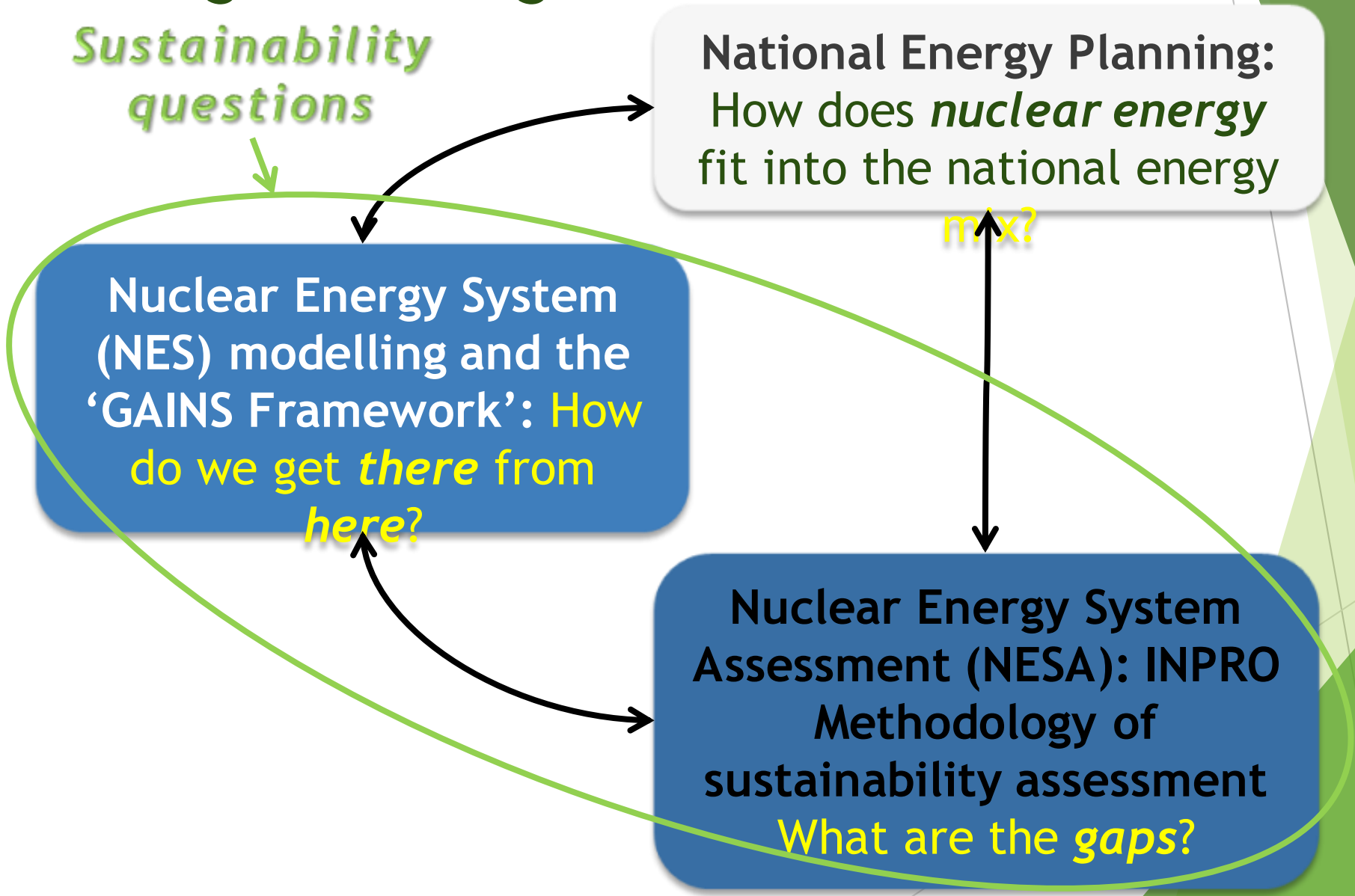
Vienna, Austria, 15–19 June 2015

IAEA INPRO project

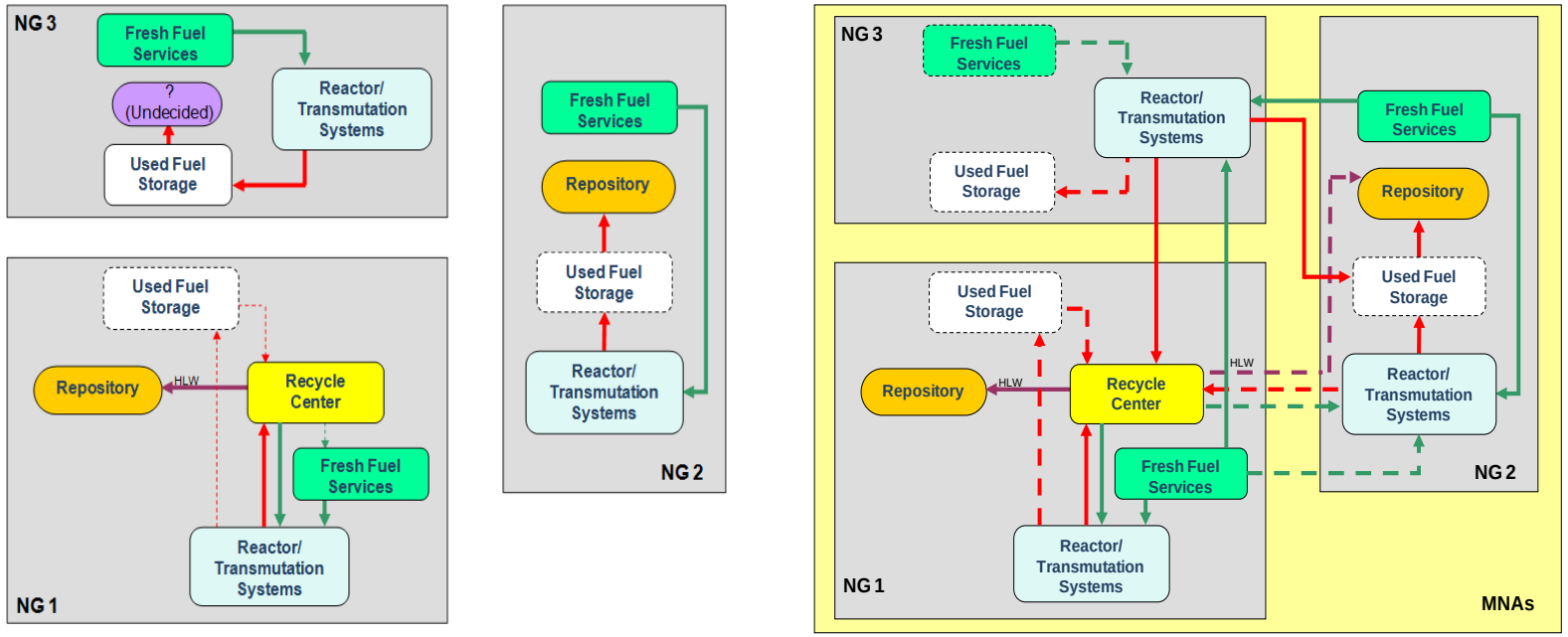
- The International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO) was launched in 2000 based on resolution of the IAEA General Conference.
- INPRO's objective is to help ensure that nuclear energy is available in the 21st century in a sustainable manner.
- INPRO seeks to bring together all interested Member States, including technology holders and users, to consider actions to achieve desired innovations.



Nuclear Energy System (NES) Strategic Planning: 3 linked Parts

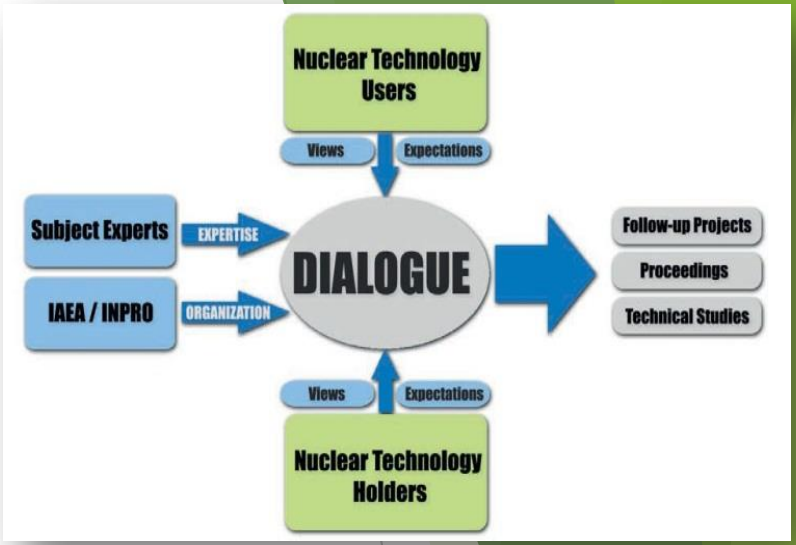


INPRO example: GAINS Project
Possible Story Lines of Long-term Nuclear Energy Evolution



- **Heterogeneous non-synergistic world** based on self-reliance and national/regional systems with limited cooperation
- **Heterogeneous synergistic world** with rapid changes toward regional and global solutions and fully open cooperation
- **The real world** is a mixture of these 'bounding storylines' – the extent of cooperation will have impacts on sustainable development

INPRO and Closed Fuel Cycle



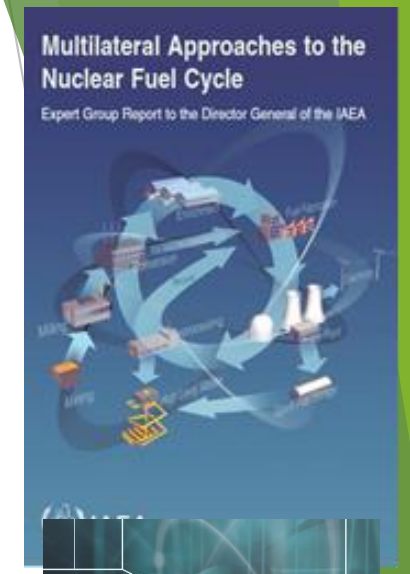
- The utilization of innovative fuels and fuel cycles can contribute directly to the development of sustainable nuclear energy systems (NESs), for technical reasons as well as in terms of enhancing public acceptance.
- Innovations in the back end of nuclear fuel cycle have the potential to make a significant contribution to the growth of nuclear power.
- The sustainability of NESs at the regional and at global levels requires cooperation in the fuel cycle, particularly for issues involving the back end, including the end-point for high-level waste.
- The INPRO Steering Committee decided to organize the "Dialogue Forum on Cooperative Approaches to the Back End of the Nuclear Fuel Cycle: Drivers and Legal, Institutional and Financial Impediments".
- INPRO 10th Dialogue Forum was held in Vienna from May 26th to 29th. 48 participants from 25 Member States and International organizations, 20 officials from various Departments and Offices of the IAEA took part in the meeting.

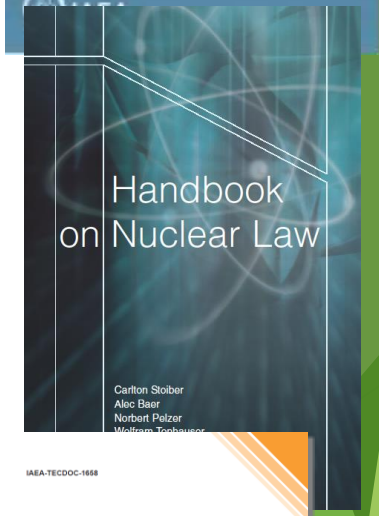
The objectives of the Dialogue Forum 10th

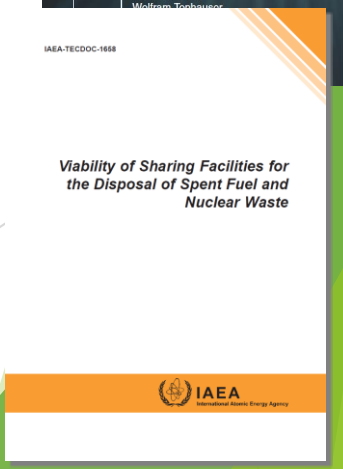
- To better understand the value of cooperation in the back end of the nuclear fuel cycle and the implications of such cooperation for the management of spent nuclear fuel;
- To analyze drivers for cooperation, as well as to identify and analyze impediments, including a discussion on ways of overcoming some of the impediments identified;
- To discuss in more detail the impediments which may arise due to the diversity of national legislative frameworks, public perception/acceptance and views on the urgency (or lack thereof) of implementing end points for SNF or High Level Waste;
- To point out potential technological developments that may impact on the pros and cons of SNF management through cooperation.

Sessions of Dialogue Forum #10

- *<u>Session 1:</u> Need for cooperation in the Back-End of the Nuclear Fuel Cycle*
- *<u>Session 2:</u> International conventions and national laws/regulations for SNF-transfer of responsibilities, trans-boundary transport*
- *<u>Session 3:</u> Drivers and Impediments for cooperation in area of Nuclear Fuel Cycle Back End*
- *<u>Session 4:</u> Time frames and public acceptance*
- *<u>Session 5</u>: Impacts of development of advanced reactors and fuel cycles to SNF management*







Some conclusions

- Global nuclear capacity is expected to increase significantly by 2030 which means that availability of the deep geological repository capacity will remain a scarce resource. Optimizing the use of scarce resources is critical for the sustainability of nuclear power. Options for management of spent nuclear fuel are sustainable if they cover all the steps of spent fuel management until final disposal, in accordance with an acceptable, practical plan that prove to be feasible with an acceptable impact level and include a realistic and balanced financing plan.
- Direct disposal and recycling are not competitive solutions. The geological disposal is an unavoidable step in nuclear waste management. SNF management can be based on recycling and on combination of recycling and direct disposal, as per decision of particular country. Multilateral cooperation will foster choosing path forward on nuclear fuel cycle back end.
- Discussions following each presentation and the panel discussion demonstrated the high level of interest in the topic. This type of dialogue is important in promoting multilateral cooperation on the back end. Progress in addressing the issues associated with the back end will depend on opportunities that promote discussion, such as this Dialogue Forum.

The Dialogue Forum provided for

- Understanding the value of cooperation in the back end of the nuclear fuel cycle and the implications of such cooperation for SNF management.
- Identification of drivers and impediments for cooperation on the back end of the nuclear fuel cycle, including proposed solutions to overcome some of the impediments identified.
- Identification of potential technological developments that may impact on the pros and cons of SNF management through cooperation.
- Clarification of high Member States' interest in participating in a future study on cooperative approaches to the back end of the nuclear fuel cycle, and development of recommendations to the IAEA on possible future activities in this area.

The following are recommendations of Dialogue Forum:

- Continue the efforts started by the Dialog Forum and modeling synergies in back end of nuclear fuel cycle including legal/institutional aspects.
- Detail studies on institutional, economic and legal drivers and impediments should be based on systematic INPRO methodology.

INPRO Dialogue Forum

on Cooperative Approaches to the Back End of the Nuclear Fuel Cycle

https://www.iaea.org/INPRO/10th_Dialogue_Forum/index.html