

Summary on Session 2: Approaches to roadmapping and issues for Roadmap development

INPRO Dialogue Forum 11

IAEA HQ, Vienna



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International Atomic Energy Agency

Report on Session 2

Approaches to roadmapping and issues for Roadmap development



At session 2 of the Dialog Forum 11 four presentations were given and discussed:

- Options for nuclear energy sustainability
(presented by Mr Vladimir Kuznetsov, scientific secretary)
- The Roadmap template and examples of its application
(presented by Mr Vladimir Usanov, Russia)
- Advance analytical tools for roadmap development
(prepared by Mr Andrey Andrianov, IAEA consultant/ presented by Ms Galina Fesenko)
- Global P&T and ADS roadmap
(Mr Gert Van Den Eynde)

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Presentation: “Options for nuclear energy sustainability”



The draft document on the options for NE sustainability was distributed for review to all participants of INPRO Dialogue Forum 11 and feedback was taken into account

It is noted in the introduction of the document that INPRO Task 1 had defined generic options for enhanced nuclear energy sustainability in two directions:

- ❖ Enhancing Sustainability via Advanced Reactors and Fuel Cycles
- ❖ Collaborative Enhancements

The technology options which can be considered for enhancing nuclear energy sustainability were specified. Brief characterization of each option: Status, (Targeted) Benefits, Arising issues was given

Options for collaborative enhancements were also described.

Some issues to be examined further were formulated in the presentation.

The presentation summarizes some issues which ROADMAP project participants met with under development of a first draft of the ROADMAPS Template for a technology holder and displays some findings of the work

The proposed draft Template:

- includes information on boundary conditions of the NES deployment;
- describes possible formats for national strategic plans visualization;
- provides probable options for nuclear technology innovation and for enhancing international cooperative activities;
- demonstrates need for further development and agreement on analytical tools.

The following findings were noted:

- strategic plan depends on view of SNF as resource or as waste;
- ‘radical’ R&D to be implemented within governmental programs
‘evolutionary’ industry programs;

- cooperation with a vendor facilitates front and back end strategies for newcomer countries and in some options cuts infrastructure to minimum thus reducing investments and enhancing NES proliferation resistance;
- for a technology holder/vendor, cooperation provides possibility to expand business, reduce product & service costs due to scale effect, etc.
- an important added value of the Template draft is an attempt to take into account not only domestic plans but also plans for collaboration with partners and its impact on the sustainability enhancing
- preliminary results of the Template tools application show that nuclear technology innovations and international collaboration are important leverages for enhancing NES sustainability

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Presentation: “Advance analytical tools for roadmap development” IAEA

The presentation provides overview of references, advanced tools for nuclear related roadmaps and some features of roadmapping towards sustainable NES.

The tools are categorized as Visualization tools, Analytical tools and Software for supporting roadmapping. Examples of analytical tools and of the most popular options for roadmap visualizations are provided.

The presentation highlights the following features of roadmapping:

- a structured approach for developing the model of a globally sustainable NES;
- indicating where savings in time, efforts and resources could be achieved by countries through international collaboration;
- long-term perspective and dynamic nature of the model.

For ROADMAPS it's reasonable to adapt well-founded and effective analytical tools by providing implementation of best-practices and developed patterns, templates, and frameworks illustrating NES-oriented roadmapping.

Adaptation of quantitative software tools and elaborated models provides added value to the studies related to roadmapping for NES sustainability.

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Presentation: “Global P&T and ADS roadmap”



- The main messages of the presentation are:
- a) P&T can be a valuable part of the closed fuel cycle;
- b) 4 building blocks (LWR fuel recycling, transmutation fuel fabrication, industrial transmuter, transmutation fuel reprocessing) have to be designed/developed/proto-typed;
- c) before you can really evaluate scenarios/options/... You need experience feedback from these prototypes on TRL, cost, efficiency;
- d) MYRRHA will be a prototype for the 3rd building block: an ADS type transmuter. It will demonstrate technology (accelerator, coupling, LBE cooled system), provide irradiation conditions relevant for fission and fusion;
- e) In order to support MYRRHA licensing and to build expertise, we constructed VENUS_F, a zero power lead-based critical facility delivering reactor physics data for validation of nuclear data and codes;

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Presentation: “Global P&T and ADS roadmap”



- f) don't underestimate the time and manpower necessary to deal with licensing: either discussions with an existing licensing body or establishing a new licensing body in case of a new-comer country. As I said it bluntly: if you have all the money in the world, you can buy a PWR and have it installed tomorrow.
- But even with all the money in the world, one cannot infinitely speed-up the knowledge and expertise generation required for safe operation in operators, engineers, licensers, etc.

THANK YOU!



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