Enhancing Collaboration on Innovations to Support Sustainable Nuclear Energy Systems

(Task 2 ‘Innovations’, Activity 2.1 - Overview)

Alexey GRIGORIEV & Alexey KAZENNOV

9th INPRO Dialogue Forum
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INPRO (in cooperation with Member States, International Organizations and Initiatives, and other IAEA organizational units) is performing Activity 2.1:

Disseminate good practices in enhancing collaboration in innovations to support sustainable nuclear energy systems

General approach to undertaking this activity was endorsed by the INPRO Steering Committee at its meeting in May 2013
Effective collaboration in the area of developing innovative and globally sustainable Nuclear Energy Systems (NES) offers many advantages and recognized as essential. Further enhancing such collaboration employing the best world-wide practices may help Member States:

- Foster collaboration on sustainable NES, innovations and related R&D;
- contribute to sharing experience in R&D associated with NES;
- Increase visibility of technology updates and innovation trends;
- Increase the awareness of decision-makers on the sustainability of existing and future NES;
- Preserve knowledge on R&D, technical and institutional innovations, and transfer this knowledge to the new generations of researches, developers and managers involved in the development and deployment of sustainable NES;
- Increase effectiveness of education and training needed for the development and deployment of sustainable NES; and,
- Nurture new generations of developers and users of innovative sustainable NES.
Objectives

Main Goal:

- **Disseminate** to IAEA Member States *world-wide good practices* in establishing effective mechanisms for collaboration in R&D and innovations in support of development and deployment of sustainable nuclear energy systems.

- **and Analyse options** for further support to Member States in pursuing innovations.
What We Can Potentially Get From That?

- Those who have already established collaboration mechanisms:
  - Benchmarking
  - Sharing experience, bringing lessons learned and good practices
  - Improving

- Those who are establishing or planning to establish a collaboration mechanism:
  - Taking into account experience of others

- Countries embarking on nuclear power:
  - Opportunities to make maximum use from various collaborations
  - Capacity building

- All stakeholders:
  - Consider how to make maximum use from collaborative work
  - Increase visibility of R&D, innovations and technology updates
  - Preserve knowledge
  - Attract attention of decision-makers and managers to critical issues
  - Significantly increase chances to achieve the sustainable nuclear energy systems
Outputs Expected From The Entire Activity

✓ A Nuclear Energy series **publication** with the provisional title:

*Enhancing Collaboration on Innovations to Support Sustainable Nuclear Energy Systems*

✓ **Experience shared** through Technical Meeting, Dialogue Forum and Consultants’ Meetings

**Duration:** 2013 – 2015
Scope

We will do our best to provide examples and practices of establishing various collaboration mechanisms including:

- International and national research centres
- Collaborative projects
- Networks
- Centres of excellence (Centres of Competence)
- Communities of practice
- Scientific / technical parks
Good practices and lessons learned will be summarized. Various aspects of collaboration practices planned to be analyzed, including:

- Purpose, objectives, areas and methods of collaboration
- Participants and their roles
- Legal framework, institutional basis and associated agreements
- Financing mechanism
- Intellectual property aspects
- Timeframe and main milestones
- Hosting country and/or organization (as/if applicable)
- Management, organization and staff
- Research facilities (as applicable)
- IT support
- Constraints, barriers encountered, and measures to overcome
- Results achieved or planned
- Lessons learned and useful experience
Main Activities

Already performed (as of October 2014):

✓ First Consultants’ Meeting: 5 to 8 November 2013
✓ Survey to solicit case-studies – initiated, many received, ongoing
✓ Technical Meeting: 8 to 11 April 2014
✓ Consultants’ meetings: 2014 (preparing for Dialogue Forum, Intellectual Property management in innovations, review a draft of the new publication)

Being performed (November 2014 – July 2015):

Consultants’ Meeting 5-8 November 2013 - a remarkable example of collaboration among professionals:

- **11 external highly qualified consultants** possessing both invaluable technical and managerial competence (Belgium / Former JRC DDG, China / CIAE, France / CEA, SNETP, ENEN, India / NPCIL, Republic of Korea / KAERI, Poland / Coordinator for Nuclear Energy, Russia / ROSATOM and Project Center ITER, USA / INL)

- **11 IAEA representatives**: (INPRO, Department of Nuclear Safety and Security, Research Reactor Section / NE, Department of Nuclear Sciences and Applications, Waste Technology Section / NE, Nuclear Knowledge Management Section / NE)

Results:

- Experiences, good practices and challenges in collaboration
- Needs to enhance collaboration discussed
- A generalized outline of a new publication reviewed
- Survey for acquiring case-studies and targeted organizations
- Recommendations (among others – potential need in criteria for evaluation of effectiveness of collaboration mechanisms)
Survey to Acquire Examples

- Data Collection Form to solicit case-studies was developed, containing 21 sections.
- The most important and valuable information expected – lessons learned, good practices, experience, constraints, barriers encountered, measures to overcome, and how effectiveness of collaboration is evaluated.
About 40 examples were considered, and approximately 25 were identified as candidates for case-studies. We hope to receive approx. 15-17 good responses.

15 responses to the survey already received including Generation IV International Forum (GIF), ITER Project, JINR (Dubna, RF), Eastern European Research Reactor Initiative (EERRI), European Nuclear Education Network Association (ENEN), FALCON (Fostering ALfred CONstruction), International Network of Nuclear Reaction Data Centres (NRDC), Association “Consortium of Abutting Universities of Rosatom”, Sustainable Nuclear Energy Technology Platform (SNETP), European Sustainable Nuclear Industrial Initiative (ESNII), Nuclear Cogeneration Industrial Initiative (NC2I), Networks on Waste Technology (IAEA), Nuclear Academic Industry Liaison – NAILS (UK), Advanced Test Reactor (ATR) National Scientific User Facility (NSUF) partnership program and memoranda of understandings and Cooperative Research and Development Agreements (CRADAs) (USA) and Technical Working Group on Fast Reactors (IAEA).

Many thanks to those who have already responded to the survey!
A new report provisionally entitled

**Enhancing Collaboration on Innovations to Support Sustainable Nuclear Energy Systems**
A Tool for Self-Evaluation of Collaboration Mechanisms

- Potential need in **Objectives and Criteria for evaluating effectiveness of collaboration mechanisms** serving in support of the development and deployment of innovative sustainable nuclear energy systems was discussed at the Consultants’ Meeting in November 2013.

- The idea is simple – Are development and improvement possible and realistic without evaluation and self-assessment?

- Purpose:
  - To pay attention to important aspects of establishing collaboration mechanisms
  - To evaluate the status
  - To identify the gaps and fields for improvement, and plan solutions
Technical Meeting April 2014

- Technical Meeting on Effective Collaboration in the Development of Innovations to Support Sustainable Nuclear Energy Systems
- IAEA Headquarters, Vienna, Austria, 8–11 April 2014
- 48 participants including 32 participants from 21 Member States, and 16 participants from various IAEA organizational units
- Experience and good practices related to the establishment of effective collaboration mechanisms in support of innovations and R&D were discussed:
  - Measures to design collaboration mechanisms
  - Future needs for collaboration on the development of innovative solutions regarding infrastructure
  - Practical aspects and issues of collaboration on innovations between technology holders and technology users
  - Role of governmental coordination for achieving success in collaboration on innovations

Future publication *Enhancing Collaboration in Innovations to Support Sustainable Nuclear Energy Systems* was discussed in the three working groups during a break-out session; and valuable inputs were obtained.
Consultants Meeting June 2014

✓ **Consultants’ Meeting** 11-13 June 2014 to prepare for the 9th INPRO Dialogue Forum and to discuss Intellectual Property Management Aspects

✓ 20 participants - 10 international experts from 6 Member States and 2 international organizations; and 10 IAEA staff from 4 organizational units

- 10 external highly qualified consultants from Germany, Indonesia, Poland, Russian Federation, UK, CERN, ITER Organization and WIPO
- Extensive preparation for the meeting was performed to accomplish a big scope of the meeting and to conduct discussions in a very structured and effective way

Results:

- Dialogue Forum overall programme was discussed and further developed
- Experience, challenges and solutions regarding IP management in the context of collaboration on innovations were presented and discussed
- Particular subjects related to IP to be addressed at the Dialogue Forum, key presentations, main presenters, content of break-out sessions and moderators were identified
- Inputs to the report *Enhancing Collaboration in Innovations to Support Sustainable Nuclear Energy Systems* regarding IP within collaboration on innovations obtained
INPRO 9th Dialogue Forum

- **Title:** International Collaboration on Innovations to Support Globally Sustainable Nuclear Energy Systems

- **Dates:** 18 - 21 November 2014

- **Venue:** Vienna, Austria, VIC, Room M3

- **Key-Note Speeches + Q/A sessions + Break-out sessions + National presentations + Discussions**

- **Technology users, technology holders and other organizations involved in the development and deployment of sustainable nuclear energy systems and nuclear power programmes, as well as in R&D and innovations in the nuclear field**
Dialogue Forum Objectives

- To discuss lessons learned, and to share experience and good practices in selected areas related to the establishment of effective collaboration mechanisms in support of innovations and R&D

- To discuss constraints and barriers encountered and ways of overcoming these, in relation to the establishment and performance of collaboration mechanisms

- To discuss options to enhance collaboration in support of development and deployment of innovative NESs and associated innovative technologies and institutional arrangements

- To collect additional data for a new IAEA publication provisionally entitled *Enhancing Collaboration in Innovations to Support Sustainable Nuclear Energy Systems*
### Four Main Topics of the Dialogue Forum

1. **Driving forces of collaboration on innovations**

2. **Intellectual property management** within the context of collaboration on innovations

3. **Collaboration between technology users, technology holders and other organizations on the infrastructure** and institutional arrangements necessary for the development and deployment of sustainable NESs

4. **How to increase the trust between partners** involved in collaboration on innovations to support the development of sustainable NESs
29 potential topics for the related INPRO meetings were initially discussed and prioritized at the Consultants’ Meeting 5-8 November 2013 involving 11 external highly qualified consultants and IAEA staff. Based on that, four topics were selected for the Dialogue Forum.

Participants of the Technical Meeting 8-11 April 2014 and other selected experts have provided their advices on particular subjects recommended to be addressed under four main topics of the Dialogue Forum.
During the Consultants’ Meeting 8-11 June 2014 (10 external and 10 internal participants), a Dialogue Forum overall programme was discussed. In particular, the part related to Intellectual Property management (content, focus, key speakers, break-out sessions) elaborated in detail.

More than 30 presenters identified and approached.

Terms of Reference (TOR) prepared.
Dialogue Forum Participants

- This meeting is open to approx. 100 participants from:
  - 84 Member States: Albania, Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Bangladesh, Belarus, Belgium, Brazil, Bulgaria, Cameroon, Canada, Chile, China, Croatia, Cuba, Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Ghana, Greece, Hungary, India, Indonesia, Israel, Italy, Japan, Jordan, Kazakhstan, Kenya, Republic of Korea, Kuwait, Kyrgyzstan, Latvia, Lithuania, Malaysia, Mexico, Mongolia, Montenegro, Morocco, Namibia, Netherlands, Nigeria, Norway, Oman, Pakistan, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Russian Federation, Saudi Arabia, Serbia, Singapore, Slovakia, Slovenia, South Africa, Spain, Sudan, Sweden, Switzerland, Tajikistan, Thailand, the former Yugoslav Republic of Macedonia, Tunisia, Turkey, Ukraine, United Arab Emirates, United Kingdom, United States of America, Uzbekistan, the Bolivarian Republic of Venezuela, Viet Nam, Zambia, Zimbabwe
  - 17 intergovernmental and international organizations: FORATOM, European Commission, CERN, ENEN Association, European Commission’s Joint Research Centre (JRC), Generation IV International Forum (GIF), IFNEC, International Science and Technology Center (ISTC), ITER Organization, SNETP, OECD’s Multinational Design Evaluation Programme (MDEP), OECD/NEA, the Western European Nuclear Regulators Association (WENRA), WANO, World Institute for Nuclear Security (WINS), World Intellectual Property Organization (WIPO), WNA

- All major stakeholders in the development and deployment of sustainable NESs
- Representatives of governmental agencies, ministries and corporations, nuclear energy programme implementing organizations, owner and operating organizations, regulatory bodies, R&D and technical support organizations (TSOs), academia, educational and training organizations, and private sector

- IAEA departments and offices: Nuclear Energy, Nuclear Safety and Security, and Office of Legal Affairs
Dialogue Forum Overall Agenda

- **Plenary sessions:**
  - 2.5 days
  - 31 presentations planned

- **2 x 4 break-out sessions** (19 and 20 November 2014)
  - ½ day each; in four different rooms
  - Presentations, discussions, statement preparation
  - 16 presentations planned
Our Important Role

Overcoming barriers to performance is how groups become teams!
شكراً لحسن اهتمامكم

謝謝

Thank you for your attention

Merci de votre attention

Спасибо за внимание

Gracias por tu atención

A.Grigoriev@iaea.org  &  A.Kazennov@iaea.org