

Recommendations to the IAEA & Chairs' Summary

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The 25th INPRO Dialogue Forum on Nuclear Energy
Development in Embarking Countries

Main Objectives

- ❑ To discuss long-term strategies for sustainable nuclear energy deployment.
- ❑ To highlight nuclear energy's environmental benefits and low carbon emissions.
- ❑ To analyse approaches to public communication on nuclear energy's role in meeting energy needs and combating climate change.
- ❑ To identify the specific requirements of newcomer countries to support sustainable nuclear energy development.
- ❑ To develop recommendations for the IAEA Secretariat and Member States to support nuclear energy programs in newcomer countries

Participation and Structure

- ❑ **Over 80** participants from **28** Member States and 1 International Organization
- ❑ **4** Plenary Sessions, **4**MSs sessions, and Breakout session
- ❑ Technical visit to **Olkaria** Geothermal Power Plant
- ❑ **5** Days

Highlights from Opening session

- ❑ Growing global interest and need to expand nuclear energy capacity, especially from newcomer countries.
- ❑ IAEA projections indicate global nuclear capacity could grow 2.6 times by 2050 compared to 2024 levels.
- ❑ INPRO now has 47 member states, with Sudan and Nigeria joining this year.
- ❑ The forum aims to foster partnerships, highlight key issues, and encourage innovative solutions.
- ❑ INPRO methodology supports Member States in strategic planning and evaluating national nuclear energy strategies.
- ❑ Hosting the forum in Kenya provided a regional opportunity to chart a path forward for a clean and sustainable nuclear energy future.

Highlights from the Plenary 1- Opportunities and Challenges on Nuclear Energy in Embarking Countries

- ❑ Zambia, Libya, Nigeria and Croatia shared their Nuclear Power Programme (NPProg) status, challenges, and strategic priorities.
- ❑ Program drivers include enhancing energy security and reducing GHG emissions from the energy sector.
- ❑ Croatia's 50/50 ownership of the Krško NPP with Slovenia is a unique collaboration, extending to radioactive waste and spent fuel management.
- ❑ Opportunities for newcomers include job creation, energy diversification, industrialization, and scientific innovation.
- ❑ Common challenges include regulatory & legal gaps, human resource constraints, financing, and public perception.

Highlights from the Plenary 2: Strategic Planning and Stakeholder Engagement (1)

- ❑ A robust National Position, supported by holistic energy assessments, is critical for new nuclear programs.
- ❑ IAEA offers energy planning tools and capacity building for energy system assessments, with many MS using INPRO methodologies.
- ❑ The Cost-to-GDP economic evaluation approach provides a more comprehensive viability analysis than Levelized Cost of Energy (LCOE).
- ❑ Lesotho used INPRO tools (KIND-ET) for evidence-based decision-making.
- ❑ Public awareness, transparency, and stakeholder involvement are essential for sustainable implementation of NPP.
- ❑ Policymakers should integrate energy planning with outreach, education, and regional cooperation

Highlights from the Plenary 3: Capacity Building

- ❑ Developing a skilled workforce is a key challenge for embarking countries.
- ❑ Regional cooperation (e.g., AFRA-NEST) and educational networks are vital for Human Resource Development (HRD).
- ❑ INPRO provides a comprehensive framework of education, knowledge management, and analytical tools.
- ❑ Establishing robust legal, regulatory, and technical frameworks for the 3S is vital for trust, compliance, and international cooperation.
- ❑ IAEA tools are accessible via the IAEA Learning Management System.
- ❑ Continuous capacity building is crucial in this knowledge-intensive sector and builds stakeholder trust.
- ❑ Local training at universities through nuclear-related degrees and strengthening regional/national networks enhances knowledge transfer and mobility.

Highlights from Member States session-1

- ❑ Sustainable capacity building requires local training facilities, including research reactors (RR).
- ❑ University of Nairobi and AFCONE are collaborating on safeguards capacity building, with a nuclear curriculum nearing approval.
- ❑ The African Young Generation in Nuclear (AYGN) plays a critical role in capacity building, outreach, and policy engagement.
- ❑ Indonesia uses reactor simulators for public understanding, stakeholder engagement, and workforce training, aiding the transition from coal.
- ❑ Kenya has used INPRO methodology to assess multi-recycling options for nuclear fuel sustainability.

Highlights from the Plenary 4: Exploring the Potential of SMR

- ❑ SMRs are a viable option for countries with small grids (e.g., Estonia, Jordan, etc) due to scalability and lower grid impact.
- ❑ Countries like Estonia, Ghana, Kenya, Thailand, and Jordan pursue SMRs to complement renewables, reduce fossil fuel reliance, and achieve carbon neutrality.
- ❑ Low public awareness requires focused communication and stakeholder engagement strategies.
- ❑ Strengthening institutional and human resource capacity is essential for program readiness.
- ❑ Jordan is exploring coupling SMRs with water desalination and developing tailored regulatory frameworks.
- ❑ International collaboration is critical for capacity building and infrastructure development.
- ❑ Estonia's potential owner-operator is privately owned, established before government commitment.

Highlights from Member States session-2

Europe

- ❑ Türkiye's growing energy demand and import dependency drive its nuclear expansion, exemplified by the Akkuyu NPP under a Build-Own-Operate model.
- ❑ Türkiye aims to maximize local content and develop a domestic supply chain.
- ❑ Russia's Rosatom offers integrated development packages, including technology, infrastructure, regulation, and education.
- ❑ Poland's nuclear program, driven by energy security and climate goals, plans for 6–9 GW of capacity using large PWRs (AP1000). High public acceptance is attributed to proactive education and transparency

Highlights from Member States session- 3 Asia.

- ❑ Malaysia, Mongolia, and the Philippines are pursuing nuclear energy as key for energy security, reducing fossil fuels, and meeting climate goals (e.g., Malaysia's net-zero by 2050 target).
- ❑ NPProg. status vary: Malaysia's revived program; Mongolia in Phase 1; Philippines planning new builds and considers mothballed NPP rehabilitation.
- ❑ SMRs are highlighted for scalability, safety, and lower costs (Malaysia, Philippines).
- ❑ Public perception and stakeholder engagement are critical challenges; efforts focus on building awareness and trust.
- ❑ Funding and economic viability are challenges (Mongolia, Malaysia), with Private sector led nuclear power plant ownership(Philippines).
- ❑ Human capital development is a national priority, with Mongolia identifying it as a specific challenge.

Highlights from Member States session-4

Africa, America

- ❑ Brazil, with a largely renewable grid, views nuclear as a stable, low-carbon baseload, providing socioeconomic benefits and guided by strong public policy.
- ❑ In Kenya, higher education institutions are key to building national capacity in nuclear science and technology, developing relevant programs.
- ❑ Utilizing regional networks like AFRA is crucial for strengthening curricula and knowledge exchange.
- ❑ Academia is identified as a key institution for developing the requisite workforce for the Nuclear Power Programme.

Recommendations to IAEA

Enhance Strategic Coordination and Regional Collaboration

- ❑ Develop a comprehensive regional cooperation framework to facilitate resource and knowledge sharing.
- ❑ Build alliances with key regional political and economic blocs to elevate nuclear energy on their agendas.
- ❑ Foster collaborative partnerships specifically focused on the development and deployment of Small Modular Reactors (SMRs).

Recommendations to IAEA

Strengthen and Modernize Capacity Building

- ❑ Develop a robust "Nuclear Competency Framework" to standardize and guide skills development.
- ❑ Implement a "Train the Trainers" program to create a sustainable multiplier effect for expertise.
- ❑ Create and deploy tools to systematically monitor and evaluate the success of all capacity-building programs.
- ❑ Strengthen the use of the IAEA Learning Management System (LMS) and expand its course offerings and accessibility.

Recommendations to IAEA

Improve Knowledge Sharing and Communication

- ❑ Establish a dedicated platform for nuclear energy advocates to connect and share best practices.
- ❑ Popularize the use of the IAEA's Communicators Toolbox and build member state capacity to track and analyze public acceptance.
- ❑ Expand the IAEA's online learning platform and organize regular, structured forums for member state exchange.
- ❑ Organize technical tours to nuclear facilities for policymakers and other key influencers to build firsthand understanding.

Recommendations to IAEA

Provide Practical Guidance on Deployment

- ❑ Prioritize the development of clear guidance on near-term deployable reactor designs and innovative financing models.
- ❑ Review and adapt the "Milestone Approach" to introduce greater flexibility for a wider range of national contexts.

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