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# Capacity Building and Nuclear Knowledge for Sustainable Energy Development

## Objective

*To support Member States in strengthening their capacities to formulate robust energy strategies, plans and programmes, and to improve the understanding of nuclear technology's contribution to achieving the SDGs, with an emphasis on mitigating climate change. To support Member States in strengthening their capacities to establish, manage and use their nuclear knowledge base by disseminating knowledge management methodologies, guidance and tools; providing relevant training and service; and fostering international networking. To acquire, preserve and provide Member States with access to information in the area of nuclear science and technology to facilitate sustainable information sharing among Member States.*

## Energy Modelling, Databanks and Capacity Building

The Agency issued the 40th edition of *Energy, Electricity and Nuclear Power Estimates for the Period up to 2050* (Reference Data Series No. 1), which provides detailed global trends in nuclear power by region.

The Energy Scenarios Simulation Tool (ESST), the Model for Analysis of Energy Demand (MAED) and the Wien Automatic System Planning Package (WASP) tools were upgraded and improved. The updated tools were made available to Member States for assessing energy system development and for planning and expanding power generating systems over a long period, and to provide a systematic framework for analysis of trends in energy needs.

The Agency hosted 18 training events on energy planning, where energy and climate specialists in Africa, Asia, Europe and Latin America and the Caribbean received support in the evaluation of their energy needs using the MAED and ESST tools. Energy planning is essential in informing decision making for sustainable energy development and the clean energy transition.

## Energy–Economy–Environment (3E) Analysis

The new report *Climate Change and Nuclear Power 2020* provides an overview of the current and future contributions of nuclear energy to climate change mitigation, in particular with respect to the objective of limiting global warming to 1.5°C above pre-industrial levels, in line with the 2015 Paris Agreement.

Another new Agency publication, *Integrated Assessment of Climate, Land, Energy and Water*, presents the findings of the coordinated research project on this topic, which addressed the development and application of an analytical framework for energy planning that enables the integrated assessment of climate, land (including food), energy and water.

The Agency published the proceedings of the International Conference on Climate Change and the Role of Nuclear Power, held in 2019.

A new coordinated research project entitled ‘Economic Appraisal of Small Modular Reactor Projects: Methodologies and Applications’ will focus on technoeconomic assessment approaches for small modular reactors, including microreactors, and address methodologies for planning and cost analysis, project structuring, financial valuation, business case demonstration and economic appraisal.

By signing a Memorandum of Understanding, the Agency and the International Energy Agency agreed to strengthen cooperation on activities involving nuclear power and the clean energy transition needed to achieve global climate goals by mid-century.

At the UN-Energy Principals meeting, Director General Grossi highlighted the role of nuclear energy in the clean energy transition and fight against climate change as well as the Agency’s potential contributions to the High-level Dialogue on Energy 2021, an initiative launched by the United Nations Secretary-General.

The Director General chaired a meeting of the Vienna Energy Club, which brings together 11 Vienna based international organizations in an informal platform for discussions on energy. The Director General also participated in a side event of the 11th Clean Energy Ministerial, entitled ‘Flexibility in Clean Energy Systems: The Enabling Roles of Nuclear Energy’. At these meetings, the Director General emphasized the need for all available sources of clean energy, including nuclear, in the decarbonization of the energy sector.

## Nuclear Knowledge Management

A four year coordinated research project entitled ‘Sustainable Education in Nuclear Science and Technology’ was concluded. The project supported national authorities in the adoption of innovative information technology (IT) practices, developed new IT tools and enabled further collaboration on nuclear science and technology education in participating countries.

Three universities received International Nuclear Management Academy (INMA) endorsement certificates: North-West University and University of the Witwatersrand in South Africa, and the Budapest University of Technology and Economics in Hungary. The certificates indicate that the master’s programmes at these universities provide training in the set of competencies identified by the Agency as necessary for master’s graduates to become competent managers in the nuclear sector.

The Agency provided a forum at the Annual Meeting of the INMA for 25 universities from 15 Member States to exchange information on their existing or planned nuclear technology management master’s programmes.

The new publication *International Nuclear Management Academy Master’s Programmes in Nuclear Technology Management* (IAEA Nuclear Energy Series No. NG-T-6.12) provides information for master’s programmes that focus on the management and leadership required by the nuclear sector and describes the requirements for an INMA nuclear technology management programme (Fig. 1).

The publication *Application of Plant Information Models to Manage Design Knowledge through the Nuclear Power Plant Life Cycle* (IAEA-TECDOC-1919) provides an overview of plant information models, emphasizing the importance of their application in the management of design knowledge throughout the nuclear power plant life cycle.

A Technical Meeting to Develop Guidance on a Methodology for Defining Key Performance Indicators for Knowledge Management in Nuclear Organizations was conducted virtually. Participants exchanged lessons learned from establishing and using key performance indicators and provided comments on the related draft IAEA Technical Document.

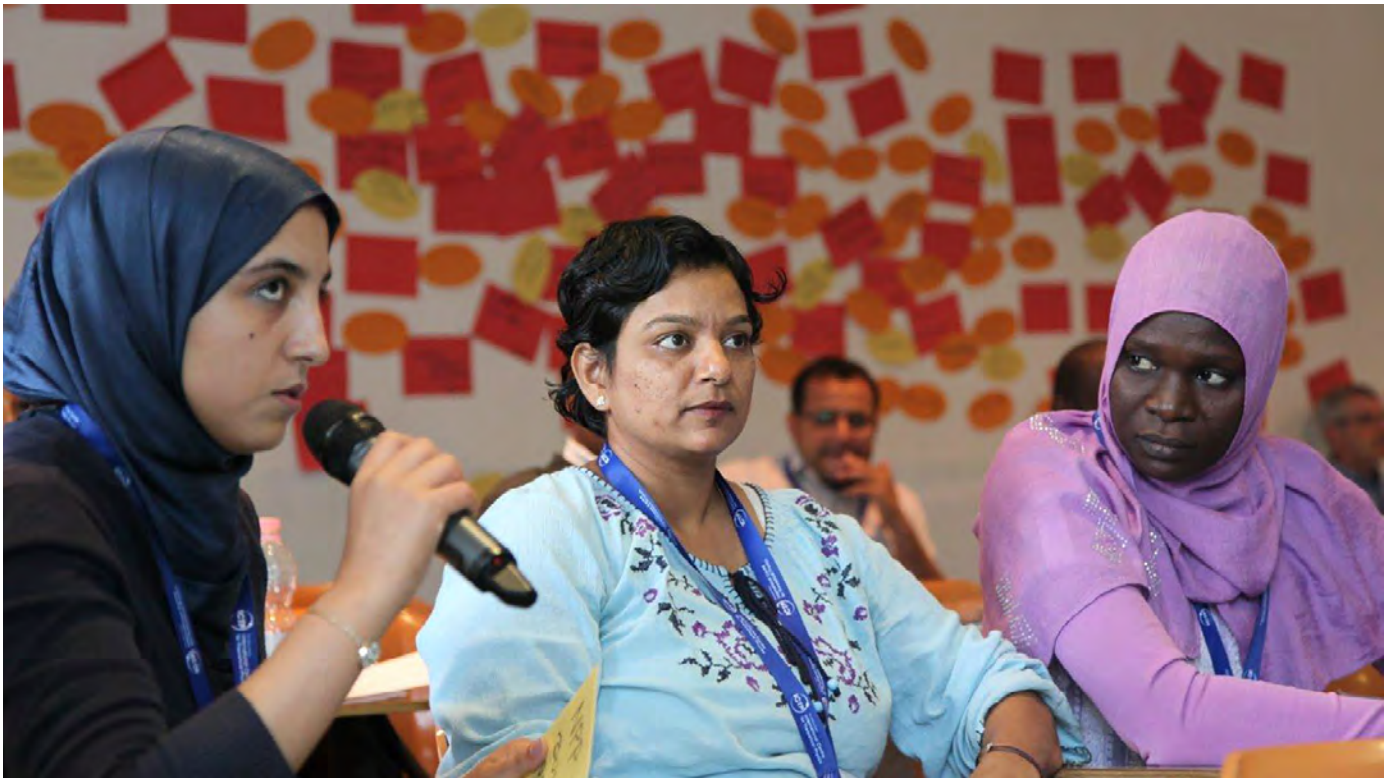


FIG. 1. Participants in a Nuclear Knowledge Management School in Trieste, Italy (file photograph).

At a Training Workshop on the Methodology for the IAEA Knowledge Management Maturity Assessment Tool, participants learned how to use the tool to help identify strengths and areas for development in an organization's overall knowledge management framework.

### **Collection and Dissemination of Nuclear Information**

The International Nuclear Information System (INIS) began a series of webinars entitled 'Strengthening National Nuclear Information Centres'. Three such webinars were held in cooperation with INIS Liaison Officers in 11 African States, attracting a total of 91 participants.