
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 Sustainable Development Goals, 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 41st 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. For the first time since the Fukushima Daiichi nuclear accident a decade ago, the high case projections were revised upwards to reflect the potential growth of nuclear power capacity for electricity generation during the coming decades.

The Agency assisted countries in Latin America and the Caribbean as well as in Europe and Central Asia in energy planning for addressing sustainable development needs and climate change mitigation. Particularly, the Agency hosted 26 training events where energy and climate specialists received support in the evaluation of their energy needs and identified ways to satisfy those needs using the Agency's energy assessment tools.

The Agency and the International Renewable Energy Agency were selected as modelling partners for the development of the African Continental Power Systems Master Plan and provided capacity building services and technical support in project implementation for the initiative, led by the African Union Development Agency aiming to establish a long term continent-wide planning process.

Energy–Economy–Environment (3E) Analysis

The Technical Working Group on Nuclear Power in Low-Carbon Energy Systems was launched and held its first meeting resulting in a set of recommendations to the Agency on future activities.

The publication *Financing Nuclear Power Plants* (IAEA-TECDOC-1964) provides details of the experience of Member States recently involved in financing nuclear projects and presents the outcomes of a coordinated research project (CRP) on the same topic. The Agency also published *Assessing National Economic Effects of Nuclear Programmes* (IAEA-TECDOC-1962), which provides a description of the Extended Input Output Model

for Sustainable Power Generation, developed by the Agency, and presents its potential applications. The publication is based on outcomes of a CRP on assessing the national economic effects of nuclear programmes.

As part of the Nuclear Economics Workshop Series organized in cooperation with the United States of America, the Agency conducted a Workshop on the Economics of Emerging Reactor Concepts focusing on cost structures, cost drivers and strategies to reduce the costs of new designs, building on technological innovations and lessons learned from large reactors and other megaprojects. The workshop addressed the role emerging reactor concepts can play in evolving power grids with high shares of variable renewables, as well as policies and strategies that set out what needs to be done to develop an enabling environment for nuclear and other low carbon power generation technologies.

Participants in the Technical Meeting on the Role of Nuclear Energy in Energy Systems with Increased Shares of Variable Renewable Energy Sources discussed long term energy strategies of several Member States and analysed the potential role of nuclear power in future decarbonized energy systems. The event underlined the benefits of the complementarity of nuclear and renewable sources and recommended the need to develop energy modelling methodologies to better represent the complex interactions between generation technologies in low carbon energy systems.

Nuclear Knowledge Management

Two universities received International Nuclear Management Academy (INMA) review missions to assess their progress in developing the INMA programmes, namely Sofia University 'St. Kliment Ohridski' in Bulgaria and the University of West Bohemia in the Czech Republic. The Agency's formal endorsement of the INMA programmes delivered by universities recognizes the quality of the leadership and managerial development content of the programmes delivered. The INMA programme is designed to promote and support leadership and management development for nuclear engineering and nuclear technology graduates, helping them to become competent managers in the nuclear sector.

The Nuclear Knowledge Management Digital Hub went live in 2021 on the IAEA CONNECT platform. The digital platform offers easy access for Member States to the latest information on nuclear knowledge management guidance and services to support Member States with operating nuclear facilities and those considering or developing new nuclear programmes.

The new publication *Mapping Organizational Competencies in Nuclear Organizations* (IAEA Nuclear Energy Series No. NG-T-6.14) provides an overview of the range of competencies required to support the development of nuclear organizations. Another new publication, *Exploring Semantic Technologies and Their Application to Nuclear Knowledge Management* (IAEA Nuclear Energy Series No. NG-T-6.15), describes the major digital processes and mapping techniques used to support knowledge management developments in Member States.

Collection and Dissemination of Nuclear Information

The Agency established the Preprint Repository, providing users with Agency publications in advance of their final editing and approval, making them available to the public much sooner than they otherwise would be.

The Agency completed a 17-year project to digitize 18.6 million pages of nuclear information on microfiche. The resulting 350 000 PDF files were made available in the International Nuclear Information System (INIS).

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