

Capacity Building and Nuclear Knowledge Maintenance for Sustainable Energy Development

Objective

To enhance the capacity of Member States to perform their own analyses of electricity and energy system development, energy investment planning and energy–environment policy formulation and their economic implications. To sustain and effectively manage nuclear knowledge and information resources for the peaceful uses of nuclear science and technology. To support Member States interested in including nuclear energy in their national energy mixes by providing nuclear information.

Energy Modelling, Databanks and Capacity Building

The Agency's projections of global nuclear power capacity are published annually. In the 2013 projections, the low case and the high case show an increase of 17% and 94%, respectively, by 2030. The strongest projected growth is expected in regions that already have operating nuclear power plants, led by countries in Asia, including China and the Republic of Korea. Eastern Europe, including the Russian Federation, as well as the Middle East and South Asia, including India and Pakistan, also show strong growth potential. However, for the third consecutive time since the accident at the Fukushima Daiichi nuclear power plant in 2011, projected growth is lower than in the previous year. Reasons include the decision of some countries to postpone introducing, or to phase out, nuclear power, the low price of natural gas and the increasing capacities of subsidized renewable energy.

During 2013, about 600 energy analysts and planners from 72 countries were trained in the use of the Agency's analytical tools for conducting national and regional studies on future energy strategies and the role of nuclear power. Conventional face to face training was complemented by web based e-learning courses. New versions of the tools were developed and distributed to interested Member States and are currently being used in research and planning institutions in 128 countries. These tools have also been acquired by 20 international and regional organizations for use in energy projects in developing countries.

Energy–Economy–Environment (3E) Analysis

In preparation for the 19th session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP19), held in November in Warsaw, the Agency published an updated

and considerably extended edition of the report *Climate Change and Nuclear Power*. Summarizing the latest data and information, the report demonstrates the importance of nuclear energy in reducing emissions of carbon dioxide from the electricity sector. It looks at the impact of restricting the use of nuclear energy as part of an international or domestic climate change mitigation portfolio on the cost and the environmental effectiveness of climate protection measures. In addition, the Agency continued its contributions to the United Nations High-Level Committee on Programmes (HLCP) Working Group on Climate Change. This included a side event at COP19, at which the Agency reported on its work on climate change mitigation. At COP19, the Agency also maintained an information centre to explain the linkages between nuclear power and climate change mitigation, sustainable energy development and other related issues.

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In 2013, the Agency continued its collaboration with the Intergovernmental Panel on Climate Change (IPCC) by submitting its inputs to the final drafts of the Fifth Assessment Report (AR5), completing a four year contribution to the work of Working Groups II and III. The report is subject to government review and approval at the IPCC Plenary Sessions in 2014.

The Agency provided support to Member States in enhancing their understanding of the financing of nuclear power projects. A consultants meeting on financial risk management involved participants from ten countries, and the first Technical Meeting of a CRP on Financing Nuclear Investments attracted participants from 12 countries. Issues regarding optimal financial risk allocation in financing nuclear power plants were presented at various meetings, including the OECD Workshop on the Role of Electricity Price Stability and Long-Term Financing for Nuclear New Build held in Paris in September, and during an expert mission to Phan Rang Tháp Chàm City, Viet Nam, in September.

The Agency initiated work on developing a set of analytical tools for assessing the social and economic impacts of nuclear energy programmes, including key economic implications of building and operating nuclear power plants. In December, the Agency organized a major international workshop in Cyberjaya, Malaysia, on the macroeconomic impacts of a nuclear power programme in South East Asia. The 35 senior level participants identified lessons learned from recent national experience with quantitative tools and developed strategies to further improve quantitative analysis in South East Asia through assessment of regional impacts.

Nuclear Knowledge Management

Three knowledge management assist visits were conducted in 2013. A mission to the Malaysian Nuclear Agency ('Nuclear Malaysia', part of the Ministry of Science, Technology and Innovation (MOSTI)) to help develop its knowledge management programme and system, focusing on process oriented knowledge management, took place in Kuala Lumpur in January. In February, a mission to assess the new curricula of the nuclear engineering department of Chulalongkorn University in Bangkok, Thailand, was undertaken. A follow-up knowledge management assist visit to the Nuclear Power Production and Development Company (NPPD) of the Islamic Republic of Iran, conducted in December in Tehran, made a number of recommendations for a roadmap for the implementation of a nuclear knowledge management system.

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In addition to the annual Joint ICTP–IAEA Nuclear Energy Management School (NEMS), held at the Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy, NEMSS were conducted in Japan and the USA. In March, an NEMS was held at Texas A&M University (Fig. 1), the first such meeting held in the USA, and in May, an NEMS was held in Tokyo and Tokai, Japan, with the University of Tokyo. A total of 90 participants graduated from these courses. In addition, the annual ICTP–IAEA Nuclear Knowledge Management School (NKMS) took place in September in Trieste. The NEMS and NKMS provide young professionals from the nuclear sector with specific knowledge on nuclear energy matters and specialized training in implementing knowledge management programmes in nuclear organizations.

The Agency continued to support the activities of and collaboration among regional nuclear education networks, including the AFRA Network for Education

in Nuclear Science and Technology (AFRA-NEST), the Asian Network for Education in Nuclear Technology (ANENT), the European Nuclear Education Network (ENEN) and the Latin American Network for Education in Nuclear Technology (LANENT). Fifty delegates from 24 African Member States gathered in Arusha, United Republic of Tanzania, in August for the first General Assembly of AFRA-NEST. Attendees included delegates of universities, research institutes and laboratories, and national atomic energy commissions, along with representatives of ANENT, ENEN, the United Kingdom's Nuclear Technology Education Consortium (NTEC) and the Agency.



FIG. 1. Participants in the Nuclear Energy Management School held at Texas A&M University.

Collecting and Disseminating Nuclear Information

Operated in collaboration with 128 Member States and 24 international organizations, the International Nuclear Information System (INIS) is the Agency's largest document database. It comprises over 3.6 million records and more than 481 000 full texts not readily available through commercial channels. The INIS Collection Search offers a single point of access to the Agency's INIS and NUCLEUS databases and the Library catalogue. In 2013, an average of 46 500 INIS searches and 2600 downloads were performed each month. Assistance and on the job training were provided to a number of national INIS centres, improving all aspects of their INIS operational capabilities. The joint *INIS/ETDE Thesaurus* was expanded and now also covers Japanese.¹

The 'NE News' app for iPad, iPhone and Android was launched in 2013, allowing users to access newsletters, brochures and social media channels through a single portal (Fig. 2).

¹ The joint *INIS/ETDE Thesaurus*, prepared jointly with the IEA Energy Technology Data Exchange (ETDE), is available for free in Arabic, Chinese, English, French, German, Japanese, Russian and Spanish at www.iaea.org/inis.

The IAEA Library continued to ensure that information resources and services remain current, cost effective and easily accessible. The number of electronic journals available through the Library increased from 16 000 in 2012 to over 20 000 in 2013. More than 14 300 people visited the Library in 2013, and loans rose from 25 241 to more than 30 000. Responding to customer requests for tailored packaging of nuclear

information products and services, personalized user profiles increased from 1018 to 1145; and 69 234 information packages were delivered in 2013, compared with 58 987 in 2012.

Fulfilling the Agency's mandate of fostering information exchange, membership in the International Nuclear Library Network, coordinated by the IAEA Library, grew from 42 partners in 2012 to 49 in 2013.



FIG. 2. The 'NE News' app, a single portal for information about the Agency's nuclear energy related activities, was launched in 2013.