

Chapter 24

IAEA's Technical Cooperation Programme—Nuclear Technology Contributing to Development



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The IAEA is the world's centre for cooperation in the nuclear field, with a mandate "to accelerate and enlarge the contribution of atomic energy for peace, health and prosperity throughout the world." The IAEA's technical cooperation programme has supported development for 60 years. It supports the peaceful application of nuclear science and technology in fields that include human health, food and agriculture, water and environment, sustainable energy, radiation technology and safety and security. The programme provides development assistance and cooperation to IAEA Member States through national, regional and interregional projects, with the goal of supporting socioeconomic impact and contributing to the achievement of the major sustainable development priorities of each country. The programme builds human and institutional capacity, and also supports the procurement of essential equipment. The IAEA is not the lead UN agency in agriculture, health or environment, so the TC programme works with FAO, WHO and UNEP and a range of other partners in implementing projects in these and other development fields. Nuclear science and technology can provide concrete development solutions; data to support the development of policy; and data to assess the efficacy of interventions, or progress towards development objectives.

The IAEA is the world's centre of cooperation in the nuclear field. It was set up as the world's 'Atoms for Peace' organization in 1957 as an autonomous international organization with a special relationship with the United Nations System. This relationship is regulated by a special arrangement with the UN.

The IAEA's mission is guided by the interests and needs of Member States, strategic plans and the vision embodied in the IAEA Statute. Three main areas of

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work underpin the IAEA's mission: Safety and Security, Science and Technology, and Safeguards and Verification.¹

The Agency works with its Member States and multiple partners worldwide to promote the safe, secure and peaceful application of nuclear science and technology. The Agency's mandate for technical cooperation is found in Article II of the IAEA Statute: "to accelerate and enlarge the contribution of atomic energy for peace, health and prosperity throughout the world."²

The IAEA's technical cooperation (TC) programme is the main vehicle through which the IAEA carries out this mandate—some 70% of the Agency's capacity building activities are delivered through the TC programme. It does this by facilitating access to the peaceful uses of atomic energy; the transfer of nuclear technology; the application and utilization of atomic energy for peaceful purposes in Member States; and the promotion of cooperation between Member States for that purpose. Member States must undertake to use the technology for peaceful use only, in a safe and secure manner. Member States drive the programme, and share responsibility for it. Technical assistance shall be allocated primarily to meet the needs of developing countries. Each Member State of the Agency or group of Member States shall be eligible for technical assistance.³

Technical cooperation activities are guided by the *Guiding Principles and General Operating Rules to Govern the Provision of Technical Assistance by the IAEA*, adopted by the Board of Governors in February 1979 in document INFCIRC/267.⁴ INFCIRC/267 governs the provision of all Agency technical assistance. The decisions of the IAEA Board of Governors and the annual General Conference resolution: '*Strengthening of the Agency's technical cooperation activities*,'⁵ provide guidance for the operation of the programme and its management, and ensure that the programme responds to the current and emerging needs and concerns of Member States. Revised Supplementary Agreements govern the provision of technical assistance by the Agency, and must be concluded by Member States participating in the TC programme.

The main objective of the 2002 Technical Cooperation Strategy is "to increasingly promote tangible socio-economic impact by contributing directly in a cost-effective manner to the achievement of the major sustainable development priorities of each country".

There are many stakeholders in the TC programme, and all share responsibility to ensure its success. The programme is the result of the combined efforts of the Member States, the IAEA Secretariat and a range of key strategic partners. All

¹<https://www.iaea.org/about/about-iaea>.

²<https://www.iaea.org/sites/default/files/statute.pdf>.

³INFCIRC267 <https://www.iaea.org/sites/default/files/publications/documents/infcircs/1979/infcirc267.pdf>.

⁴<https://www.iaea.org/sites/default/files/publications/documents/infcircs/1979/infcirc267.pdf>.

⁵GC(61)/RES/10 https://www.iaea.org/About/Policy/GC/GC61/GC61Resolutions/English/gc61res-10_en.pdf.

Member States are eligible to participate in the TC programme, which is jointly developed through a consultative process. All Member States benefit from the TC programme, whether directly through projects or indirectly through activities for the global good; whether by receiving direct support or by being the source of equipment and experts. In parallel, all Member States share the responsibility for the programme by providing political, financial or implementation support.

The TC programme is managed by the Department of Technical Cooperation, and supported by the technical Departments, who are responsible for the technical integrity of the programme.

The Department of Nuclear Sciences and Applications supports the application of non-power technologies. These technologies make a significant contribution to the achievement of the Sustainable Development Goals in human health, food and agriculture, radioisotope production and radiation technology, water resource management and the marine and terrestrial environment.⁶

The Department of Nuclear Energy focuses on sustainable nuclear energy development by supporting existing and new nuclear programmes around the world.⁷ Embarking in nuclear power is a sovereign decision of a Member State. The Agency does not interfere with any decision of Member States on nuclear power. But, if a country decides to go for a nuclear programme, the IAEA will provide assistance to make sure it is safe and secure.

The Department of Nuclear Safety and Security ensures the safe and secure use of nuclear technologies, developing common safety standards for use around the world and promoting the implementation of these standards. Improving safety comes at all stages of the peaceful use of nuclear applications: from the initial planning to waste management and disposal. This also applies to nuclear installation and to radiation, transportation and waste. Work also includes preparation for radiological incidents and emergencies, at the national, regional and international level. While safety refers to avoidance of and protection from accidents, Security refers to avoidance of and protection from malice—things like sabotage, theft and attacks.⁸

The Office of Legal Affairs (OLA) reports directly to the Director General. In addition to providing legal services internally, OLA assists interested Member States establish legislative and regulatory frameworks to address all the legal aspects of safety, security, safeguards and civil liability for nuclear damage. OLA has also developed reference material such as the *Handbook on Nuclear Law, Volumes I and II*, to help Member States to draft their nuclear legislation and to bring such legislation in line with international legal instruments and standards. To face the increasing interest and to meet the demand OLA supports training in the

⁶<https://www.iaea.org/about/organizational-structure/department-of-nuclear-sciences-and-applications>.

⁷<https://www.iaea.org/about/organizational-structure/department-of-nuclear-energy>.

⁸<https://www.iaea.org/about/organizational-structure/department-of-nuclear-safety-and-security>.

field of nuclear law, specifically for drafting legislation, through the Nuclear Law Institute.⁹

The Department of Safeguards applies safeguards in line with the Agency's Statute. It carries out the IAEA's duties and responsibilities as the world's nuclear inspectorate, supporting global efforts to stop the spread of nuclear weapons.¹⁰ The Department of Safeguards is responsible for reviewing all TC projects to ensure that support provided through TC is not used in such a way as to further any military purpose (INFCIRC/267).

The TC programme provides capacity building, supporting a whole range of training mechanisms to build Member State capacities in the safe, secure and peaceful application of nuclear technologies. The programme also supports procurement, helping Member States to specify their needs, and supporting purchases of equipment—for example, machines, equipment for laboratories, radioactive sources for medical use.

The TC programme supports the application of science and technology in the areas of human health, food and agriculture, water and environment, sustainable energy, radiation technology and safety and security. It helps countries to increase their scientific and technical capacities and capabilities in these areas to enhance their socioeconomic development.

For example, in the field of human health, the programme helps Member States enhance prevention, treatment and control of diseases. In the area of food and agriculture, technical cooperation activities assist States to increase productivity and quality. Regarding water and the environment, IAEA support helps States to manage water and other natural resources.

In human health, the Agency aims at improving the diagnosis and treatment of diseases, such as cancer, cardiovascular diseases, as well as in improving monitoring of nutrition programmes.

In food and agriculture, the Agency works in partnership with FAO to expand the use of nuclear technologies to improve livestock production, insect pest control, crop improvement, soil management and food safety.

In the area of radioisotope production and radiation technology, the Agency provides knowledge and expertise for science and industry.

In water resource management the Agency focuses on expanding the use of isotopic techniques by Member States. Through these techniques, the Agency helps Member States better understand their water resources, leading to greater availability and sustainability of water for drinking water supplies, as well as for industrial, energy and agricultural demands.

In environmental protection, the Agency focuses on expanding the use of nuclear techniques to gain a better understanding of the environment and to act efficiently to reduce negative impacts.

⁹<https://www.iaea.org/services/legislative-assistance>.

¹⁰<https://www.iaea.org/about/organizational-structure/department-of-safeguards>.

The Agency also helps build nuclear science competencies in Member States, and provides information on atomic, molecular and nuclear data. Such data are used in everything nuclear—from safeguards to reactors to medicine. The Department of Nuclear Energy, in collaboration with the Departments of Nuclear Sciences and Applications, and Nuclear Safety and Security, also works on the technological aspects of research reactors.

For Member States interested in nuclear power, the Agency works on all major aspects of the nuclear fuel cycle, cradle-to-grave: from uranium exploration and production, to responsible handling of the waste. Regarding nuclear power plants, the Agency provides support to Member States when they explore or start nuclear power programmes, and while they operate them (in areas like lifetime management, upgrading instrumentation and control, and strengthening knowledge management). At the end of the cycle, support is also provided in the areas of waste management, decommissioning, environmental remediation and final disposal. This also includes the technological aspect of managing and disposing of nuclear waste from non-power applications, like radioactive sources used in medical procedures in hospitals.

Finally, the TC programme ensures that Member States can use nuclear technology safely and securely, by helping countries to strengthen their regulatory safety infrastructure and address their legal nuclear related issues (Fig. 24.1).

S168	IAEA Member States		
146	Countries and territories receiving technical cooperation support in 2016	3114	Participants in regional and interregional training
37	LDCs participating in the TC programme	3777	Expert and lecturer assignments
80%	Of all Member States are non-nuclear power states.	1701	Fellowships and scientific visits
~ 650	new projects each biennium	193	Regional or interregional training courses
914	Active projects at end 2016		

TC projects are delivered at different scales, depending on need. Country Programme Frameworks (CPF) are used to identify and prioritise Member State needs. A CPF is not mandatory but is a useful document, as it provides a frame of reference for technical cooperation between a Member State and the IAEA, defining mutually agreed priority development needs and interests that can be supported through TC activities.

National projects involve one single country and focus on supporting national development priorities where the use of nuclear techniques or technologies is essential for the achievement of national objectives or represent the solution to a problem in a cost-effective, safe and secure manner. Examples include national projects to address foot and mouth disease in Mongolia, to support the use of the sterile insect technique to eradicate the cactus moth in Mexico, and to help Kenya to identify its energy needs.

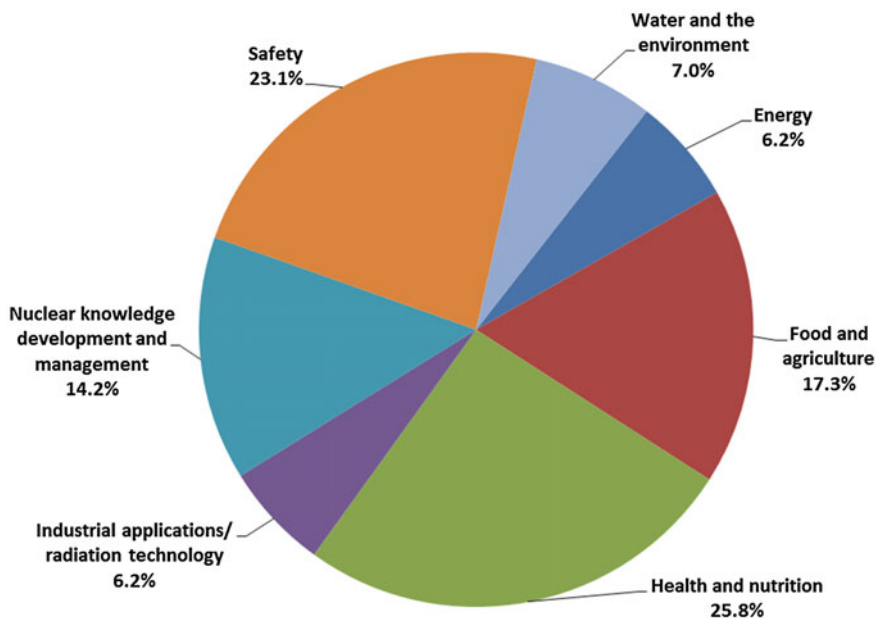


Fig. 24.1. Actuals by technical field for 2016

Regional projects take into account national development objectives but are developed according to regional development priorities established by regional cooperative agreements, strategies and frameworks. They promote Technical Cooperation among Developing Countries, and mainly target human resource development. Regional projects create links between regional institutions, and aim to share information/expertise and experience. For example, regional projects have supported aquifer mapping in the Sahel region, and the establishment and strengthening of radiation safety infrastructure in Latin America.

Interregional projects deliver support across national and regional boundaries, and address the needs of several Member States in different regions. Interregional projects are categorized as trans-regional, global, capacity building or as joint activities with an international entity. Small in number, interregional projects mainly target human resource development. For example, in the Mediterranean region, an interregional project has built capacity in ‘cradle to grave’ management of sealed radioactive sources, with the financial support of the European Union.

The Agency’s technical cooperation activities are supported by the Technical Cooperation Fund (TCF). This is funded by Member State contributions, based on shares established using UN assessment rates. The target for the TC Fund is set by the Board of Governors and finalized in a General Conference resolution.

National Participation Costs also flow into the TCF. These are an expression of Member State commitment to national projects, and are equal to 5% of the national

programme value. At least half a project's NPCs must be paid before project implementation can begin.

The TC programme also benefits from generous extrabudgetary contributions from Member States and other international organizations, including extrabudgetary funding provided through the Peaceful Uses Initiative.

Governments may also chose to fund activities in their own countries—funding for activities where the donor is the recipient is commonly referred to as Government Cost Sharing. In-kind contributions to the programme are also possible.

While the TC programme is successful in building capacity in nuclear science and technology in IAEA Member States, the programme does face some constraints.

Limited financial resources are always a consideration, which is why extrabudgetary support and Government Cost Sharing are important. At the same time, IAEA Member State numbers are increasing, and with this growth come increased requests for technical cooperation support. The Agency strives to ensure that TC projects will be sustainable, and work to build self-reliance in project counterparts.

Another challenge is of course achieving recognition of the IAEA as a partner in development. The IAEA is often regarded as a technical agency, primarily concerned with Safeguards and Safety issues. The expanded IAEA slogan, 'Atoms for Peace and Development', adopted in recent years, reflects the importance of the Agency's technical cooperation work.

The IAEA is committed to strengthening engagement with Member States and partners to ensure the effective, sustainable impact of the TC programme. The Agency will continue to seek ways and means to render resources for TCF sufficient, assured and predictable, including working with the private sector and non-traditional donors. Outreach efforts will continue, with the goal of strengthening public awareness of the TC programme and its work.

The IAEA is proud of its capacity to respond quickly to emergencies such as disease outbreaks or natural disasters like earthquakes. For example, the Agency was able to provide immediate emergency assistance in response to the Zika virus outbreak in 2016. This ability to respond quickly is an important strength of the technical cooperation programme: while emergencies are by their nature unpredictable, the programme planning process always takes them into consideration. Other recent emergency support provided through the technical cooperation programme has included assistance to Ecuador and Nepal in the aftermath of earthquakes, and to countries in Africa in response to the outbreak of Ebola virus disease.

The IAEA is also committed to helping Member States achieve important development objectives such as the Sustainable Development Goals (SDGs), and to ensure continuing programmatic flexibility to respond to emerging needs. Agenda 2030, and in particular Sustainable Development Goal 17, recognizes the role of science, technology and innovation as essential enablers for development. Goal 17 places a priority on partnerships as a critical means of implementation. Achieving

the Sustainable Development Goals will require collaboration and cannot be achieved in isolation.

TC programme activities are not disconnected from the global development community. Although the IAEA is a specialised technical agency, it contributes to the global development agenda. The TC programme has helped Member States address the Millennium Development Goals (MDGs), and is well placed to contribute to Member State efforts to achieve the Sustainable Development Goals. The Agency has identified nine Goals that it supports directly through technical cooperation programming, providing valuable but highly specific support to larger development goals in health, nutrition, agriculture, water, the environment and climate change.

Because the IAEA is not the lead UN agency in agriculture, health or environment, the TC programme works with FAO, WHO and UNEP in implementing projects in these fields. IAEA cooperation with the FAO is formalized and long established, and cooperation with WHO is also of long standing, particularly in the area of cancer.

In looking to the future, it is worth remembering that the IAEA's technical cooperation programme can help Member States apply nuclear technology to address many of the development challenges identified in the SDGs. Nuclear science and technology can provide concrete development solutions; data to support the development of policy; and data to assess the efficacy of interventions, or progress towards development objectives.

In May 2016, the IAEA organised the first ever International Conference on the Technical Cooperation Programme. This event provided an opportunity to take stock of what has been achieved through the technical cooperation programme and to demonstrate how it can best contribute to the attainment of the SDGs in Member States. The conference brought together over 1200 people from 160 countries and 27 organizations.

Delegates at the Conference noted that achieving the Sustainable Development Goals requires multi-actor collaboration, and cannot be addressed in isolation. The TC programme has established mutually beneficial strategic, technical and financial partnerships with UN sister organizations, including the Food and Agriculture Organization of the United Nations (through the FAO/IAEA Joint Division) and the World Health Organization, and has cooperated with other UN organizations such as UNEP and UNIDO, and other regional and international organizations, development banks and other financial institutions.

Delegates agreed that such long-standing cooperation should be encouraged and reinforced so that, together with its partners, the Agency can build on common strengths and effectively utilise resources for an optimal delivery of their services to Member States. Fostering partnerships that promote integrated approaches to development will support a more effective TC programme, and will also ensure coordination and complementarity of activities. This will enable an efficient and cohesive response to current and upcoming development challenges in Member States. In addition, promoting triangular, South-North and South-South cooperation will promote sustainability, and contribute to effective technical cooperation.

The TC programme has facilitated increased access to nuclear science and technology, supported knowledge sharing, built and reinforced scientific networks, and strengthened Member States' capacities to base their policies and decisions on scientific evidence in a broad range of important areas. It offers key capacity to Member States and partners in the Sustainable Development Goals era, and is ready to build on its six decades of experience as a technical agency.

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