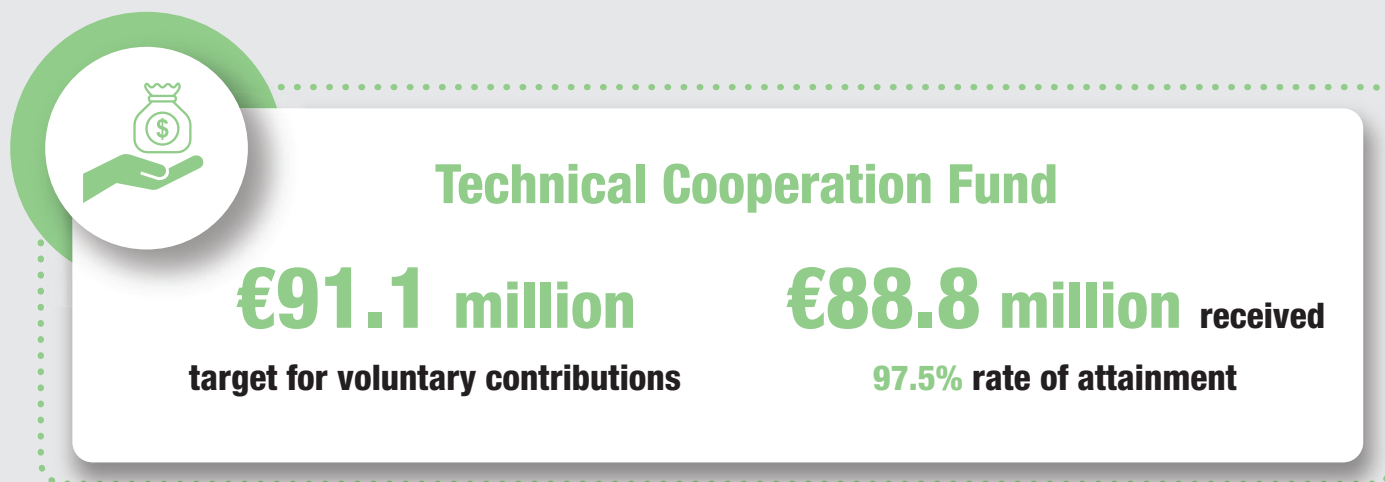


# Management of Technical Cooperation for Development



# 2022



**159**

**regional and interregional  
training courses**



**135**

**projects closed in 2022**

**530**

**projects in closure at the end of 2022**



**1436**

**fellows and  
scientific visitors**

**3072**

**training course  
participants**



**1881**

**purchase  
orders issued**



**value of purchase orders issued**

**€66.5 million**

# Management of Technical Cooperation for Development

## Objective

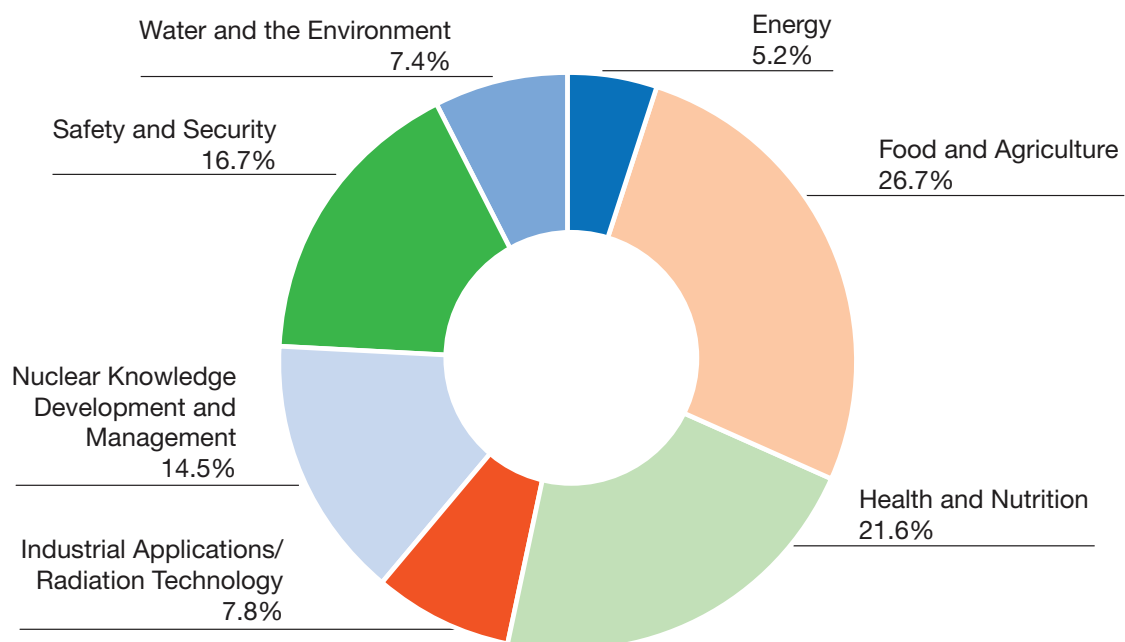
To manage, develop and implement a needs-based, responsive technical cooperation programme in an effective and efficient manner, and thus to strengthen the technical capacities of Member States in the peaceful application and safe use of nuclear technologies for sustainable development.

## The Technical Cooperation Programme

### Programme delivery

The technical cooperation (TC) programme is the Agency's major vehicle for transferring nuclear technology and building capacity in nuclear applications in Member States. It supports national efforts to achieve development priorities, including the targets underpinning the Sustainable Development Goals (SDGs), and encourages cooperation between Member States and with partners.

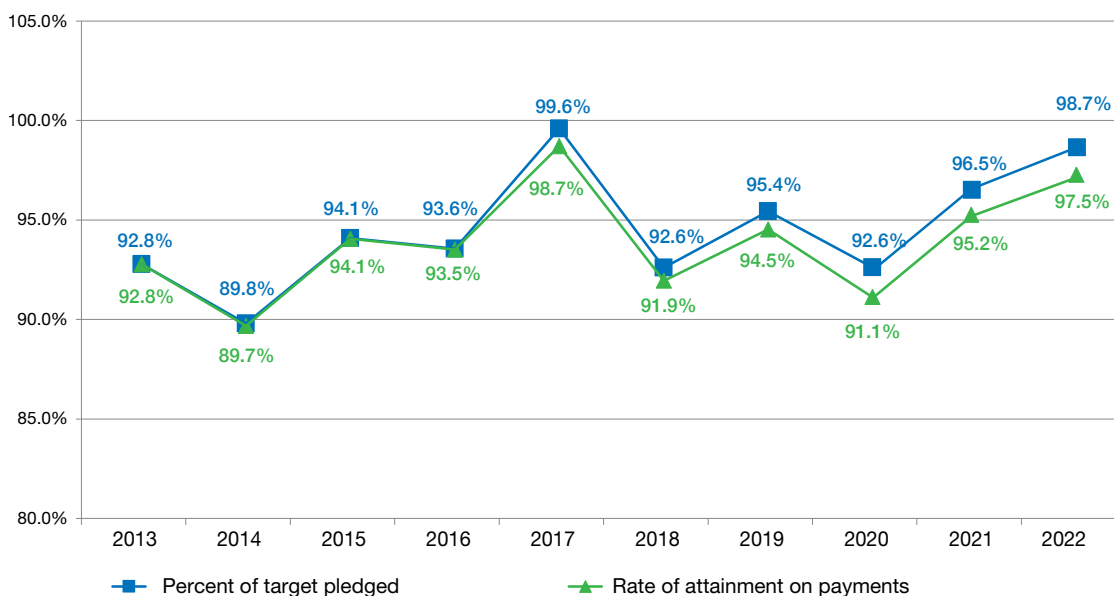
The main areas of Agency technical cooperation in 2022 were food and agriculture, health and nutrition, and safety and security.



Technical cooperation programme disbursements (actuals) by technical field for 2022. (Percentages do not add up to 100% owing to rounding.)

## Financial highlights

Payments to the 2022 Technical Cooperation Fund (TCF) totalled €93.7 million (including assessed programme cost arrears, national participation costs and miscellaneous income). The rate of attainment on payments at the end of 2022 reached 97.5%. The TCF implementation rate was 84.4%.



*Trends in the rate of attainment, 2013–2022.*

## Country Programme Frameworks and Revised Supplementary Agreements

Nineteen Country Programme Frameworks (CPFs) were signed in 2022, with the total number reaching 112 by the end of the year.

### 19 CPFs were signed in 2022

Belarus	Estonia	Mongolia	Qatar
Botswana	Fiji	Montenegro	Rwanda
Côte d'Ivoire	Guatemala	Nepal	Saint Lucia
Dominican Republic	Jordan	Papua New Guinea	Viet Nam
	Malaysia	Philippines	Zimbabwe

The number of Revised Supplementary Agreements Concerning the Provision of Technical Assistance by the International Atomic Energy Agency stood at 143 at the end of 2022.

## Rays of Hope

In February, on the margins of the African Union Summit, Director General Rafael Mariano Grossi and President Macky Sall of Senegal launched the Rays of Hope initiative, which aims to support Member State efforts to increase access to radiation medicine services. The IAEA Director General also issued a joint statement with the Director-General of the World Health Organization (WHO), noting that cancer treatment remained inaccessible in many parts of the world and reiterating the commitment of the Agency and WHO to scale up their collaboration with the goal of closing cancer care inequity gaps and accelerating progress towards the achievement of the 2030 Agenda.

Following the launch of Rays of Hope, the Agency established an integrated approach to ensure proper coordination across the Agency. Integrated missions of PACT (imPACT) Review assessments and National Cancer Control Plans (NCCPs) were among the many factors considered when defining priority needs in radiation medicine under Rays of Hope. Resource mobilization efforts continued, with the Agency forging new partnerships with traditional and non-traditional donors to support Member States in addressing gaps in cancer diagnosis and treatment under Rays of Hope.

Support under Rays of Hope has been initiated in seven African countries (Benin, Chad, the Democratic Republic of the Congo, Kenya, Malawi, the Niger and Senegal), and training and equipment needs assessments have been completed for most of these. Benin is building a new hospital that will include radiotherapy services. Chad plans to launch its NCCP in early 2023 and is making preparations for its first cancer therapy centre in N'Djamena. Malawi will complete its bunker in 2023 in preparation for the receipt of a radiotherapy machine and Kenya is planning to expand radiotherapy access. Senegal has recently completed its NCCP, which outlines its goal to scale up cancer care outside Dakar, increasing access in particular in the town of Diamniadio. Nineteen additional countries in the region are completing an assessment of their needs, which include the training of medical professionals and the procurement of diagnostic imaging and radiotherapy equipment.

In Asia and the Pacific, several Member States have also expressed interest in participating in Rays of Hope, including as anchor centres. Resource mobilization in the region is being explored, including extrabudgetary contributions, government cost-sharing and public–private partnerships.

In November, the Board of Governors approved an off-cycle TC project to strengthen radiation therapy and medical imaging in Ukraine. The project aims to strengthen existing services in order to meet increasing demand, in particular at some medical institutions that have become key locations for cancer patients coming from different regions of the country. It will contribute to the effective delivery of cancer diagnosis, management and treatment by providing equipment and strengthening human resource capabilities. The project is being implemented and delivered through existing Agency mechanisms, under the Rays of Hope initiative (with a focus on prioritizing high-impact, cost-effective and sustainable interventions to help meet national needs and commitments) and in partnership, when relevant and necessary, with WHO and other stakeholders.



*The Director General briefs the Group of 77 and China (Vienna Chapter) on topics including Rays of Hope, NUTEC Plastics and ZODIAC during a meeting at the Agency Headquarters in Vienna, 21 April 2022.*

In Latin America and the Caribbean, memoranda of understanding (MOUs) relating to Rays of Hope were signed with Argentina and Cuba in 2022. The former states that the Agency and Argentina will collaborate towards the establishment of an Agency Rays of Hope anchor centre and the latter focuses on coordination, collaboration and control in the Caribbean region.

Uruguay received a state-of-the-art digital mammography unit with tomosynthesis for accurate and detailed breast imaging in 2022. Under Rays of Hope and through the TC project 'Improving Capabilities in Three-Dimensional Mammography (Tomosynthesis)', the Pereira Rossell Hospital received equipment, training and expert advice for acceptance testing. The institution has also established a quality control programme for the improvement of services.

## ZODIAC

Implementation of the Zoonotic Disease Integrated Action (ZODIAC) project is supported through the TC programme under an interregional project entitled 'Supporting National and Regional Capacity in Integrated Action for Control of Zoonotic Diseases', which supports national and regional capacity building in ZODIAC national laboratories (ZNLs). Several virtual interregional training courses and workshops were held in 2022, reaching more than 1000 participants. Topics included generic methods for validating standard operating procedures; the use of the Agency's genetic sequencing services; and current developments relating to whole-genome sequencing platforms. A recorded course on the use of the iVETNet platform was accompanied by two live virtual Q&A sessions in June. The ZODIAC Portal was launched in 2022, providing access to educational and training videos and recordings of ZODIAC briefings.

A virtual interregional workshop on mpox (monkeypox) and Lassa fever infections in animal reservoirs and the risks for public health transmission was held in June and addressed by the IAEA Director General and high-level representatives from the Food and Agriculture Organization of the United Nations (FAO) and WHO. Meeting participants agreed that a system for screening the virus in domestic and wildlife environments was urgently needed, and also discussed how to utilize available diagnostic tools such as reverse transcription–polymerase chain reaction (RT–PCR), one of the most widely used nuclear-derived laboratory methods for detecting various pathogens. Together with the Agency, FAO, WHO and international experts, more than 250 participants from ZNLs agreed to strengthen cooperation and to define research topics to understand the epidemiological role of animal carriers and reservoirs. Using nuclear science and technology, the Agency will work together with ZNLs in Africa, Asia, Europe and Latin America to fine-tune the diagnostic algorithms for the two diseases. These actions will contribute to improved understanding of how these viruses circulate in animals, how they survive in the environment and how they spread from species to species.

A ZODIAC progress meeting for ZODIAC national coordinators and ZNL representatives was conducted for the Africa and Europe regions in January, and for the Asia and the Pacific region in February. Serology and molecular diagnostic equipment was procured for 30 ZNLs (12 from Africa, 5 from Asia and the Pacific, 7 from Europe and Central Asia and 6 from Latin America and the Caribbean) and whole-genome sequencing platforms were procured for 9 ZNLs (3 from Africa, 2 from Asia and the Pacific, 2 from Europe and Central Asia and 2 from Latin America and the Caribbean). In addition, three fellowship training courses on whole-genome sequencing were completed by fellows from Indonesia, Senegal and Tunisia. A first in-person training course on the generic verification of standard operating procedures for serology and molecular diagnostics in ZNLs was implemented in September at the Institut Pasteur de Dakar, Senegal, where 23 participants from 19 French-speaking African Member States received training.

## NUTEC Plastics

The Nuclear Technology for Controlling Plastic Pollution (NUTEC Plastics) initiative focuses on addressing plastic pollution through recycling using radiation technology and through marine monitoring using isotopic tracing techniques. In Africa, actions under a regional project entitled ‘Reutilizing and Recycling Polymeric Waste Through Radiation Modification for the Production of Industrial Goods (AFRA)’ aim to accelerate the transition to a circular plastic economy using nuclear science and technology. Sixteen African Member States are participating in the project. Interactions with the World Economic Forum’s Global Plastic Action Partnership regional working group for Africa have identified areas of synergy under NUTEC Plastics.

Ten countries in Asia and the Pacific are participating in the regional project ‘Reutilizing and Recycling Polymeric Waste through Radiation Modification for the Production of Industrial Goods’. Indonesia, Malaysia, the Philippines and Thailand, which, of the ten countries, have the most advanced national plastic recycling programmes, made significant progress in technology development in 2022. Two national stakeholder meetings were held to engage government and potential industrial partners, and the Agency facilitated the participation of the Philippines’ research team in the Asian Development Bank Innovation Fair, where the team showcased progress in developing plastic recycling.

In Latin America and the Caribbean, a regional project entitled ‘Promoting Radiation Technology in Natural and Synthetic Polymers for the Development of New Products, with Emphasis on Waste Recovery (ARCAL CLXXIX)’ aims to demonstrate the feasibility of using radiation technology to convert different types of polymeric waste into value-added products. In November, laboratory staff from Argentina, Chile, Costa Rica, Panama, Peru and the Bolivarian Republic of Venezuela participated in a regional training course in Brazil on scaling up the application of radiation technology from the laboratory scale to the pilot and industrial scale, with an emphasis on waste recovery.

Specialists from the Regional Network of Marine-Coastal Stressors in Latin America and the Caribbean (REMARCO) finalized four harmonized microplastics sampling protocols for coastal areas. This achievement aligns with NUTEC Plastics and will contribute to ensuring harmonized approaches for microplastics monitoring programmes being implemented in the region.

The Agency signed two separate MOUs with Argentina and Cuba, setting out a framework for scientific cooperation under NUTEC Plastics on the control of plastic pollution in Antarctica and the Caribbean. Activities include the organization of expert missions and educational and training activities to build capacity for the collection and analysis of data on the nature and distribution of microplastics.

## Regional Cooperative Agreements and Regional Programming

### Africa

In 2022, 19 new regional TC projects were launched under the umbrella of the African Regional Co-operative Agreement for Research, Development and Training Related to Nuclear Science and Technology (AFRA). Seventy-six courses delivered training to more than 2200 participants, while almost 90 meetings brought together more than 1550 attendees. Seven new regional AFRA project designs are being prepared for approval for the 2024–2025 TC cycle, with three focusing on integrated approaches to radiation medicine, food and agriculture, and radiation safety.

The 33rd AFRA Technical Working Group Meeting was held in Kigali, Rwanda, in July. The 33rd Meeting of AFRA Representatives took place in hybrid format in Vienna, Austria, during the 66th regular session of the General Conference. At the meeting, delegates endorsed the AFRA Annual Report for 2021 and recognized five new AFRA Regional Designated Centres. At the AFRA High-level Policy Meeting in Cairo, Egypt, in December, delegates adopted a new plan of action and a political declaration setting the strategic direction for AFRA’s governance, programme and resource mobilization efforts.

## Asia and the Pacific



The Director General at the launch of RCA programme socioeconomic impact assessment reports.

A ministerial declaration to mark the 50th anniversary of the Regional Co-operative Agreement for Research, Development and Training Related to Nuclear Science and Technology for Asia and the Pacific (RCA) was issued at a special RCA ministerial-level meeting on the margins of the 66th regular session of the General Conference. The anniversary was also marked by an exhibition and the launch of two new socioeconomic assessment reports conducted by the RCA, with the support of the Agency, on radiotherapy and non-destructive testing projects carried out under the RCA programme. The Agency joined the RCA Regional Office (RCARO) to celebrate the 20th anniversary of the office's establishment at an international symposium sponsored by the Ministry of Science and ICT and other relevant institutes in the Republic of Korea and entitled 'Cooperative Leadership in Nuclear Science and Technology and Sustainable Development in the Asia-Pacific Region: Future Vision of the RCARO'.

The States Parties to the Co-operative Agreement for Arab States in Asia for Research, Development and Training related to Nuclear Science and Technology (ARASIA) marked the 20th anniversary of the agreement at a ceremony on the margins of the 66th regular session of the General Conference. The publication *Breaking Through to Progress: A Collection of Success Stories from ARASIA in Collaboration with IAEA Technical Cooperation in Asia and the Pacific* was launched by Director General Grossi in the presence of ambassadors and representatives from ten ARASIA States Parties and the ARASIA Chair. ARASIA also published a booklet which provides detailed information on the region's secondary standards dosimetry laboratories (SSDLs), and on the services offered by ARASIA Regional Resource Centres.





Students participating in the 2021 Nuclear Science and Technology Education Competition visit the International Centre for Synchrotron Light for Experimental Science and Applications in the Middle East, in Jordan. (Photograph courtesy of I. Lim/Philippines)

## Europe

Thirty-three Member States in the Europe region endorsed the *Regional Profile for Europe and Central Asia for 2022–2027* at a meeting of National Liaison Officers (NLOs) on the margins of the 66th regular session of the General Conference. The document sets out regional priorities in four thematic areas — nuclear and radiation safety, nuclear energy, human health, and isotope and radiation technologies — and will act as a reference for Member States and the Secretariat in the formulation of regional TC projects.

The *Strategic Framework for the Technical Cooperation Programme in the Europe Region 2019–2025* guides the implementation of TC activities in close collaboration with Member States and is aligned with the priorities identified in the Regional Profile and CPFs. Considerable effort was focused on capacity building in 2022, with 500 human resource activities implemented during the year. Four hundred and twenty-one equipment procurement requisitions were processed.

At the biennial meeting of NLOs from the Europe region, held in Istanbul, Türkiye, in May, regional proposals for the 2024–2025 TC cycle were prioritized, and 79 national and 13 regional TC projects were moved to the design phase.

A publication entitled *Energy Planning Support to Europe and Central Asia: Case Studies* was issued by project counterparts, highlighting actions implemented by six countries in Europe and Central Asia to achieve low-carbon energy targets in line with the Paris Agreement on climate change. In October, 14 countries met in Cyprus to exchange good practices in the development of integrated energy and climate plans.



*Collection of Aedes mosquito larvae in the public drainage system, Cyprus.*

### **Latin America and the Caribbean**

The 23rd Meeting of the Regional Co-operation Agreement for the Promotion of Nuclear Science and Technology in Latin America and the Caribbean (ARCAL) Technical Coordination Board (OCTA) took place in Vienna, Austria, in May and was attended by 16 national ARCAL representatives and representatives from Spain. Meeting participants reviewed the implementation of ARCAL's outreach and communication strategy to promote nuclear applications, as well as partnership strategies. Needs for project monitoring and evaluation planning were discussed, and ARCAL project proposals were selected for submission for the 2024–2025 TC cycle. Guidelines for the implementation of the Regional Strategic Profile 'Agenda ARCAL 2030' were finalized, defining baselines, indicators and goals to be achieved during the period 2022–2029.



*Senior representatives of CARICOM technical institutions meet the Director General to discuss ongoing collaboration facilitated through the TC programme.*

Eighteen NLOs, National Liaison Assistants and senior representatives of Caribbean Community (CARICOM) technical institutions and Agency Member States from CARICOM attended the first in-person meeting of the Regional Steering Committee of the Regional Strategic Framework (RSF) for Technical Cooperation with IAEA-CARICOM Member States: 2020–2026 in Vienna, Austria, in November. The meeting was held to assess progress achieved under the RSF and to propose actions to improve its implementation, including aligning regional projects proposed for the 2024–2025 TC cycle in order to achieve RSF outputs.

## Programme of Action for Cancer Therapy (PACT)

Four imPACT Reviews to assess cancer control capacities and needs were conducted in 2022 in Colombia, the Lao People's Democratic Republic, the Syrian Arab Republic and Uzbekistan. A series of national cancer control programme (NCCP) webinars was organized jointly with WHO and the International Agency for Research on Cancer (IARC), providing a forum for dialogue with Member States to share lessons learned on NCCP development and implementation.

The Agency participated in several high-level events, including World Health Assembly and WHO Regional Committee meetings, and supported the participation of ten Member State counterparts in the World Cancer Congress to enable experience sharing. The Agency also led the IAEA-IARC-WHO annual consultation in Geneva and collaborated with the Union for International Cancer Control (UICC) and City Cancer Challenge to strengthen partnership.

An article entitled 'Evolution of the joint IAEA, IARC and WHO cancer control assessments (imPACT Reviews)' was published in *The Lancet Oncology* to coincide with the publication of the *Methodology for Integrated Missions of the Programme of Action for Cancer Therapy (imPACT Reviews)* (IAEA Services Series No. 46).

In cooperation with the International Cancer Control Partnership (ICCP), countries receiving imPACT Reviews and support for the development of national cancer control programmes and that could benefit from ICCP advisory support in implementing cancer plans were identified.



An imPACT Review to assess cancer control capacities and needs was conducted in Colombia in 2022. (Photograph courtesy of Colombia's Instituto Nacional de Cancerología)

## Strengthening the Quality of the Technical Cooperation Programme

The TC Project Report Processing System (TC-Reports) was updated to facilitate progress tracking and link yearly progress with final achievements.

The Agency strengthened its results based approach to ensure sustainable and cost-effective benefits. Performance indicators were refined to measure programme performance and results based monitoring was strengthened.

## Outreach and Communication

New outreach material on the TC programme issued in 2022 included *The IAEA Technical Cooperation Programme: Selected Highlights 2021*, a special report for COP27 entitled *Nuclear Technologies and Climate Adaptation in Africa* and a video on cancer prepared in partnership with the British Broadcasting Corporation. To reduce printing costs and paper usage, materials were increasingly shared electronically, including through QR indexes at events. Social media continued to offer a cost-effective channel for outreach on the programme, and both the @IAEATC and @iaeapact Twitter accounts grew significantly.

### Technical Cooperation outreach in 2022

<b>124</b>	Agency web articles on technical cooperation
<b>7907</b>	@IAEATC Twitter followers (growth of 12% from 2021) and <b>453</b> tweets posted
<b>2502</b>	@iaeapact Twitter followers (growth of 23% from 2021) and <b>185</b> tweets posted
<b>4594</b>	LinkedIn followers and <b>72</b> posts

Six TC side events were organized during the 66th regular session of the General Conference. They were entitled 'Revealing Secrets Using Nuclear Techniques', 'Diagnostic Radiology Medical Physicists: Who Are We?', '20th Anniversary of ARASIA', 'Plans for PCMF Upgrade', 'Enhancing Capacities of Member States in Africa to Achieve Food Security Through the Peaceful Use of Nuclear Techniques', and 'Improving National Frameworks for Radiation Protection in Medical Exposure in Europe and Central Asia'. Two exhibitions on technical cooperation were organized, at the General Conference and at the Global South–South Development Expo.

## Cooperation with the United Nations System

Throughout 2022 the Agency continued to strengthen its collaboration with the UN system at every level, with a view to building stronger synergies and ensuring that nuclear and nuclear-derived science, technology and innovation were considered part of the solution to global crises including food insecurity, climate change and energy scarcity.

Agency assistance to Member States in support of the 2030 Agenda for Sustainable Development and the attainment of the SDGs was highlighted at high-level events including the fifth session of the United Nations Environment Assembly, the UN High-level Political Forum on Sustainable Development, the UN Multi-stakeholder Forum on Science, Technology and Innovation for the Sustainable Development Goals, the G-20 Research and Innovation Initiative Gathering and the associated ministerial meeting. The Agency also participated in the UN Global South–South Development Expo and in meetings of the Interdepartmental Task Force on African Affairs organized



*Deputy Director General Hua Liu addresses delegates at the Seminar on Technical Cooperation for Permanent Missions held in Geneva in 2022.*

by the UN Office of the Special Adviser on Africa. Participation in such events facilitated the Agency's engagements with international financial institutions, the private sector and philanthropic foundations — all essential to resource mobilization, and in particular to actions focused on the Agency's flagship initiatives NUTEC Plastics, Rays of Hope and ZODIAC.

The Agency signed a cooperation agreement with the World Meteorological Organization in January to jointly support the implementation of an interregional project to build capacity in using stable isotopic techniques to attribute the source of greenhouse gases in the atmosphere.

The Agency, IARC and WHO met following the 2022 World Cancer Congress for the annual strategic consultation on cancer control to facilitate planning for efficient and effective collaboration between the three agencies.

As part of its cooperation with organizations in the UN system, the Agency signed an agreement with the Abdus Salam International Centre for Theoretical Physics and the University of Trieste to support a master's programme geared towards human capacity building in the area of medical physics.

## **Partnership Agreements, Practical Arrangements and Memoranda of Understanding**

Significant engagement with donors, including Member States, financial institutions and the private sector, continued throughout 2022 in support of Rays of Hope and the other major initiatives. The Agency signed two MOUs with Argentina, one of which focuses on cooperation in the implementation of Rays of Hope through, inter alia, collaboration towards the establishment of an IAEA Rays of Hope anchor centre. The second MOU sets out a framework for scientific cooperation to support the control of plastic pollution in Antarctica under NUTEC Plastics. A further two MOUs were signed with Cuba, also covering Rays of Hope and cooperation to support the control of plastic pollution in the Caribbean under NUTEC Plastics.

In June, the Agency signed an MOU with Morocco, establishing a framework for cooperation in fighting cancer and zoonotic diseases. Subsequently, in December, the Agency signed Practical Arrangements with Mohammed VI Polytechnic University in Morocco to promote collaboration in education, training, research and development on the peaceful uses of nuclear technology.

In September, Foreign Minister of Argentina Santiago Cafiero and Director General Grossi signed an action plan with the Community of Latin American and Caribbean States to establish collaboration in the peaceful application of nuclear science and technology. The action plan also

aims to strengthen regional infrastructure and support the development of national capacities that will contribute to the achievement of the SDGs.

In December, the Agency signed Practical Arrangements with three Chinese institutions — the Beijing Research Institute of Uranium Geology, the East China University of Technology and the Beijing Research Institute of Chemical Engineering and Metallurgy — to advance cooperation in the exploration and exploitation of uranium resources.

In January 2022, a new interregional project was initiated to improve Member State knowledge and build capacity for the eventual deployment of small modular reactors. The project has attracted the interest of donors and resources have been mobilized from five countries.

### **Activities and actions under existing agreements**

Cooperation between the Agency and the Asian Development Bank (ADB) was expanded under the Cooperation Framework Agreement to cover Rays of Hope, NUTEC Plastics, ZODIAC and agriculture. The Agency participated in the Second ADB Innovation Fair, where it demonstrated how nuclear technology could be applied to manage plastic waste through the NUTEC Plastics initiative.

In February, Practical Arrangements between the Agency and the African Union for cooperation in the safe, secure and peaceful use of nuclear technologies for sustainable development in Africa were renewed. In September, Practical Arrangements between the Agency and the African Commission on Nuclear Energy were renewed to support Agency Member States in Africa in the peaceful use of nuclear science and technology for development, and nuclear safety, security and safeguards.

Cooperation was expanded under existing Practical Arrangements with Cambodia and Viet Nam, and the Lao People's Democratic Republic and Viet Nam, in the areas of non-destructive testing, nuclear medicine and mutation breeding, and the Practical Arrangements were extended for a further five years. Four capacity-building activities were conducted with the support of Viet Nam.

Programmatic partnerships were advanced within the framework of existing Practical Arrangements with City Cancer Challenge and the UICC, including through consultations on engaging civil society stakeholders in order to promote participatory imPACT Reviews and national cancer control planning work in countries including Colombia and Kenya.

In collaboration with the Pan American Health Organization and WHO, the Agency implemented the Optimization of Protection in Paediatric Interventional Radiology in Latin America and the Caribbean (OPRIPALC) programme with the goal of promoting a safety culture in paediatric radiology and strategies for its optimization, including the determination and use of appropriate reference levels.

### **Legislative Assistance**

The Agency continued to provide legislative assistance to Member States through workshops, missions and meetings to raise awareness, advise and train on developing and revising national legislation and adhering to and implementing relevant international legal instruments.

Seven Member States (Burkina Faso, Central African Republic, Jordan, Kuwait, Libya, Nigeria and Somalia) received country-specific bilateral legislative assistance through written comments and advice on drafting national nuclear legislation.

Eighteen legislative assistance activities were conducted, including ten meetings with decision makers, policymakers and senior officials (Benin, Burkina Faso, Comoros, Croatia, Egypt, El Salvador, Kenya, Kuwait, Saudi Arabia and Senegal) to raise awareness about the various elements of comprehensive national nuclear legislation and/or the importance of adhering to relevant international legal instruments and to discuss specific issues, and eight national workshops on nuclear law (Benin, Egypt, Kenya, Kuwait, Nigeria, Saudi Arabia and Senegal) to increase stakeholders' understanding of international legal instruments and the various elements of comprehensive national nuclear legislation and to address specific topics of interest for each Member State.

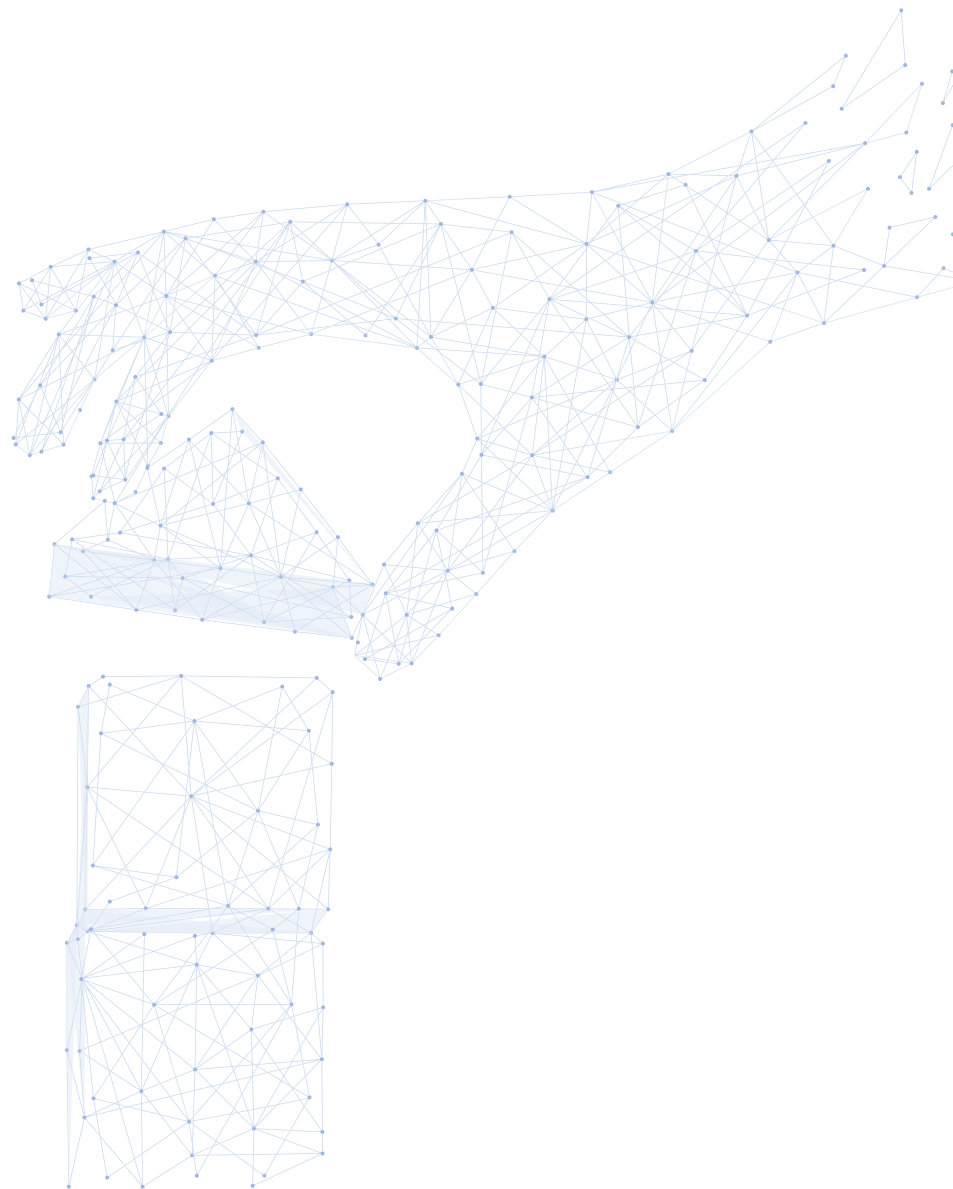
Three regional and subregional workshops were held for Member States in Asia and the Pacific (Viet Nam, August 2022), Latin America (Argentina, September 2022) and the Middle East (United Arab Emirates, December 2022).

The Agency organized the tenth session of the Nuclear Law Institute in Vienna, Austria, from 10 to 21 October 2022. This event enabled 57 participants from 54 Member States to acquire a solid understanding of all aspects of nuclear law, with a particular focus on legislative drafting. In addition, the Agency held five webinars on topical issues in nuclear law as part of the nuclear law webinar series launched in 2021.

The Agency held its First International Conference on Nuclear Law: The Global Debate in Vienna in April 2022, bringing together 1124 participants from 127 Member States and 31 organizations.

## Treaty Event

The annual Treaty Event took place during the 66th regular session of the General Conference, providing Member States with an additional opportunity to deposit their instruments of ratification, acceptance, or approval of, or of accession to, the multilateral treaties deposited with the Director General. The event focused on multilateral treaties relating to nuclear safety and security and to civil liability for nuclear damage.

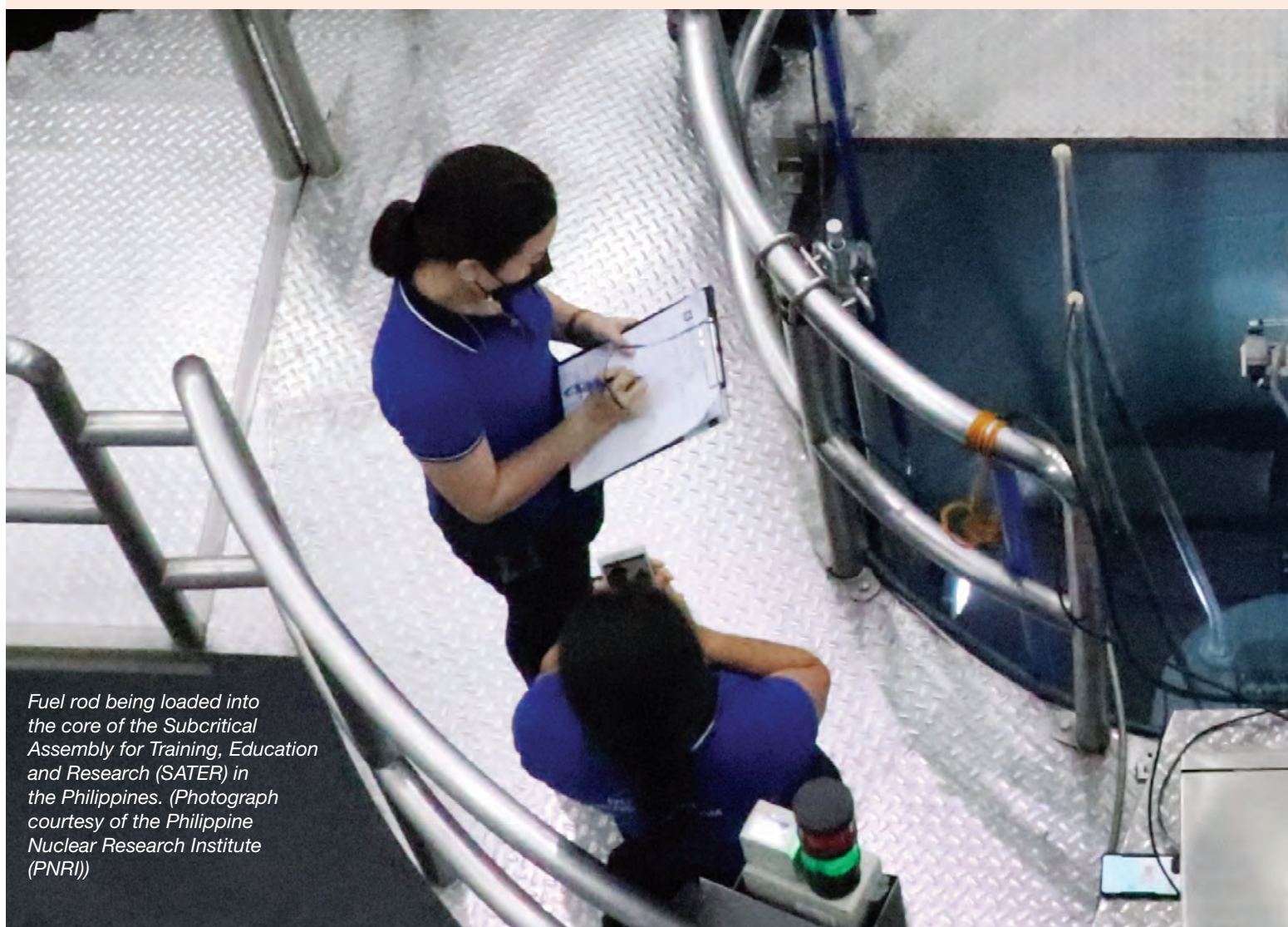


## Nuclear Facility in Philippines Revived After 34 Years

From 1963 to 1988, the Philippines operated a research reactor that offered a wide range of possibilities for research and training in nuclear science as well as isotope production. In 1988, however, the facility was shut down owing to several technical issues and its refurbishment was put on hold.

In recent years, a new research reactor — the Subcritical Assembly for Training, Education and Research (SATER) — was constructed inside the same reactor building. In June 2022, under a technical cooperation project with the Agency, Philippine experts reached a key milestone in bringing SATER into operation as 44 fuel rods from the original research reactor were loaded into SATER's core. With the loading of the 44 fuel rods, the reactor entered the commissioning phase in preparation for routine operation. It is expected that, by 2023, all the commissioning tests will be completed and the reactor will be fully operational, serving as a safe and versatile tool for education and research.

The Philippine Nuclear Research Institute (PNRI), a Government agency responsible for research and development in the nuclear field, has received robust support from the Agency in this endeavour. Under the first related technical cooperation project, launched in 2016, the Agency helped the PNRI: build reactor design capacity by helping personnel attend scientific visits, fellowships and technical workshops; enhance neutron dosimetry by procuring state-of-the-art equipment; and develop national regulations related to research reactors via multiple expert missions.



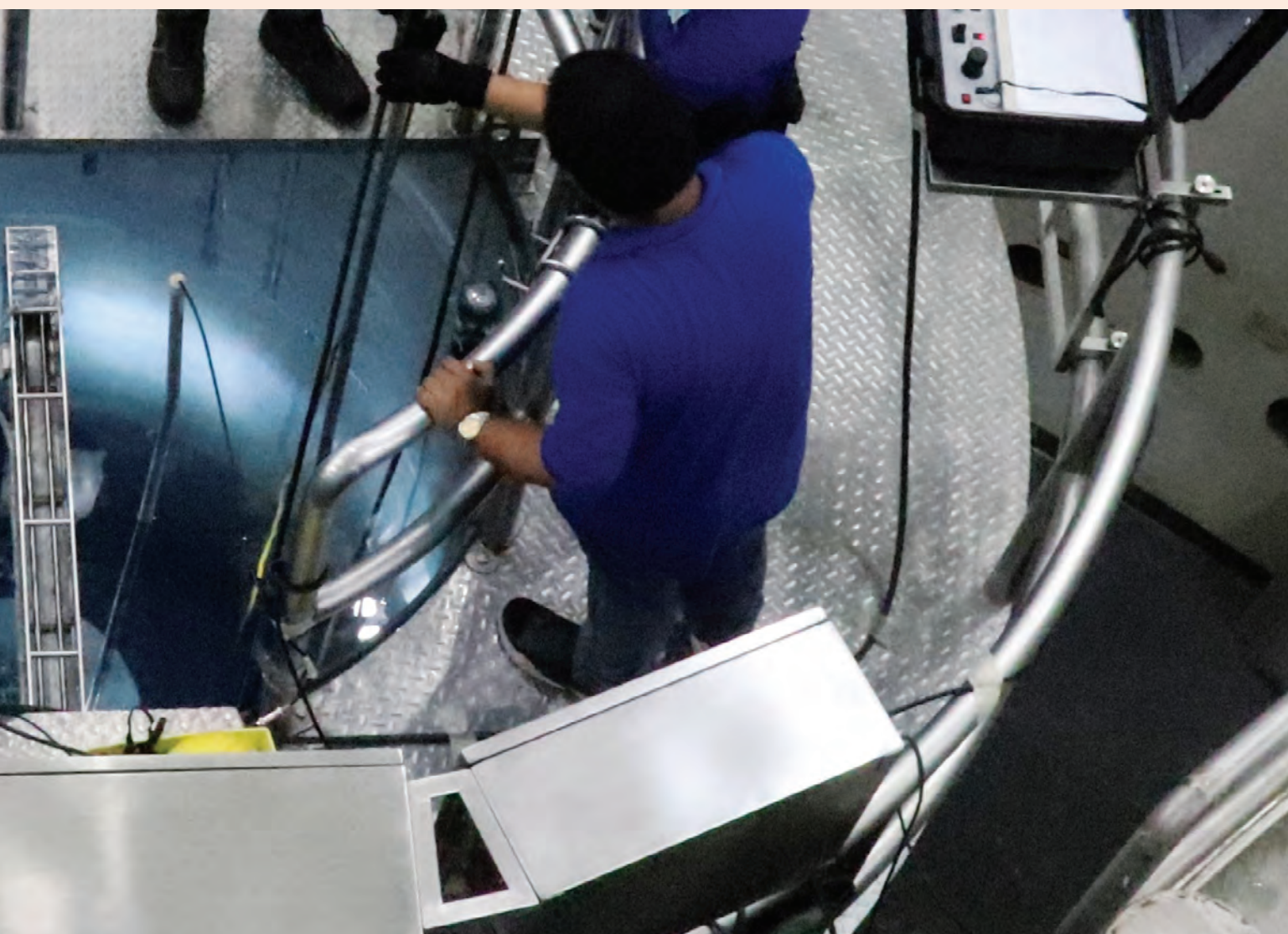
*Fuel rod being loaded into the core of the Subcritical Assembly for Training, Education and Research (SATER) in the Philippines. (Photograph courtesy of the Philippine Nuclear Research Institute (PNRI))*



The second project, which began in 2020 and is ongoing, focuses on reactor engineering, operation and use, as well as the development of a reactor training programme for local specialists. To assist the Philippine regulatory authorities and operating staff with the commissioning of SATER, the Agency has been providing recommendations on licensing and setting up the facility. It has also helped organize various on-site missions by international experts and has assisted the PNRI in strategic planning, which is essential to ensuring SATER's long-term, sustainable use.

"The activation of SATER is a milestone for the Philippines, as the facility will provide significant support in re-establishing nuclear capabilities in the country", said Alvie Asuncion-Astronomo, Associate Scientist in the Department of Science and Technology and former Head of the PNRI's Nuclear Reactor Operations Section.

Subcritical assemblies such as SATER are not only valuable instruments for advancing scientific research but are also used for a variety of practical applications, including in industry, medicine and agriculture. Unlike nuclear power reactors, which are large and are used to generate electricity, research reactors are relatively small and simple, enabling the simulation of various operating conditions. SATER will be used for reactor physics experiments and as a demonstration facility for neutron irradiation and neutron activation analysis. It will be used to train reactor operators, nuclear facility maintenance personnel, radiation protection specialists, regulators, students and researchers.



## Protecting Malta's Cultural Heritage: The Role of Nuclear Technology

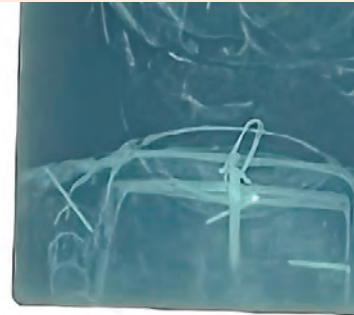
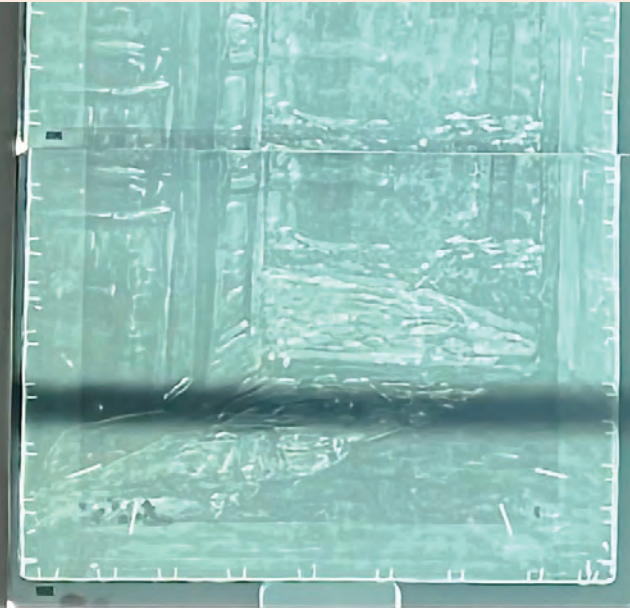
Malta has a rich heritage that includes Neolithic temples, medieval forts and other relics dating back some 8000 years. To protect the country's priceless cultural legacy and preserve it for future generations, Maltese scientists are taking advantage of modern nuclear techniques with the help of the Agency.

Thanks to its long and colourful history, with the first known inhabitants settling on the island as far back as 5900 B.C., Malta boasts a number of UNESCO World Heritage Sites, making it a popular tourist destination. Each year Malta is visited by around 2 million people, who contribute up to 15% of the country's GDP.

"We wouldn't have a thriving tourism industry in Malta if it were not for our extensive and multifaceted cultural heritage", said Joyce Dimech, Permanent Secretary at Malta's Ministry for the National Heritage, the Arts and Local Government. "So we are really engaged and committed to preserving this heritage for posterity", she continued.

At Heritage Malta, the country's cultural preservation agency, experts have been working to characterize materials and artefacts that make up the country's heritage. With the support of the Agency's technical cooperation programme, Maltese experts acquired the necessary equipment and training to use the X-ray diffraction (XRD) nuclear technique, enabling them to study and analyse pottery, pigments, mortars and other millennia-old materials without touching or risking damage to them.

*Heritage Malta is responsible for the conservation and preservation of all artefacts of cultural value in the country. Increasingly, Heritage Malta has turned to radiation technologies, both to analyse artefacts, artworks and ancient relics and to preserve them for future generations.*



The XRD method is a powerful analytical technique that provides researchers with detailed information about the chemical composition of historical objects, as well as their age and, in some cases, their origin. The process is microinvasive, requiring no more than a few specks of the sample. It provides data on the condition of the items, helping experts develop and apply the requisite conservation strategies, and helps identify the original materials comprising the artefacts and the methods used to produce them, offering further insights into how to preserve items before they are lost forever. Such information helps ensure access to artefacts of national and global historic value for future generations.

“We have more than 1 million objects and sites of cultural value in our portfolio, and with the XRD system now delivered, commissioned and already in operation it is helping to solve puzzles and relieve our workload”, said Matthew Grima, Manager of Heritage Malta’s Diagnostic Science Laboratories.

Thanks to the training and XRD equipment provided by the Agency, in 2022 Maltese experts were sufficiently well equipped to share their knowledge and experience beyond the island’s shores, organizing their own training course in Valletta for participants from eight countries in Europe and Central Asia and representing different cultural heritage disciplines.

