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Roundtable Highlights Nuclear Solutions to Address Plastic Pollution in North, Central, South America and the Caribbean

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(https://www.iaea.org/sites/default/files/styles/original_image_size/public/056102001140x640.jpg?itok=CdzSBZW5)

IAEA Director General Rafael Mariano Grossi addresses the NUTEC Plastic roundtable discussion for the Americas. (Photo: D. Calma/IAEA)

Plastic pollution is an issue that transcends national boundaries, as one of today's most pressing global environmental challenges directly threatening sustainable development. Around the world, one million plastic drinking bottles are purchased every minute, and 5 trillion single-use plastic bags are thrown away each year. Approximately 70 per cent of all plastics produced to date is now waste and only 9 per cent of this has been recycled. Projections indicate that by 2025 the ocean will contain one tonne of plastic for every three tonnes of fish, and by 2050, there may be more plastic in the ocean than fish, by volume.

"We are all, as a human society, affected by this problem of plastic pollution. This issue is now reaching alarming levels, and this means, within the international community and the involved actors, we need to tackle this in a different way – we need a proportionate response to the issue," said IAEA Director General Rafael Mariano Grossi, during a virtual roundtable yesterday with ministers, heads of institutions, high-level decision makers and partners in North, Central and South America and the Caribbean. The meeting focused on identifying innovative solutions and partnerships to confront plastic pollution. "The IAEA aims to rise to the challenge of these issues, and we recognize and look for others to work with us," he said.

Participants discussed the challenges faced due to growing plastic pollution, focusing on key policy and socio-economic issues, as well as on regulatory frameworks and initiatives for strengthening partnerships to facilitate global action. As in other parts of the world, landfills are often brimming with plastic waste in the Americas and pose an environmental threat to ecosystems, such as rivers, groundwater and the ocean. Incineration of plastic waste may also release toxic gases.

At the meeting, IAEA experts presented NUClear TEChnology for Controlling Plastic Pollution (</services/key-programmes/nutec-plastics>) (NUTEC Plastics), which aims to assist countries in integrating nuclear techniques in their efforts to address challenges of plastic pollution. NUTEC Plastics highlights the available nuclear technologies for recycling plastic waste using radiation technology, and marine

monitoring of microplastics using isotopic tracing techniques, and aims to facilitate scientifically supported decision making on plastic mitigation and disposal measures and policies.

"Actions against plastic pollution at whatever level will only work if the full range of available technological solutions is used – including nuclear technologies that complement conventional approaches," said Najat Mokhtar, IAEA Deputy Director General and Head of the Department of Nuclear Sciences and Applications. "The challenge is simply too big to miss out on innovative technologies that could add real value to ongoing efforts and initiatives. This is precisely why the IAEA has developed NUTEC Plastics. Nuclear technologies and techniques offer advantages that are not always well known, but they can be an accelerator and enhancer of results."

NUTEC Plastics offers support to countries on two fronts: using isotopic tracer techniques for monitoring and assessing marine microplastics and their impact, and radiation technology for innovations in the plastic life cycle, including recycling.

"Radiation technology can improve plastic recycling, and isotopic tracing techniques help monitor and analyse the behaviour and fate of microplastics in the seas and oceans," said Hua Liu, IAEA Deputy Director General and Head of the Department of Technical Cooperation, who provided closing remarks. "Through NUTEC Plastics, the IAEA will contribute to the global response to plastic pollution, and to a sustainable solution."

The roundtable brought together over 400 participants from 36 countries. The UN Secretary General's Special Envoy for the Ocean, Peter Thomson, gave an address at the meeting, and high-level officials from Argentina, Brazil, Chile, Colombia, Costa Rica, Cuba, Mexico and the United States of America presented ongoing national and regional efforts.

At the event, the United States of America announced it will provide US \$1 million to NUTEC Plastics, as part of its longstanding partnership with the IAEA to address global challenges. "We are strengthening that partnership to NUTEC Plastics to combat climate change and to promote sustainable development," said Frank Rose,

Principal Deputy Administrator of the National Nuclear Security Administration (NNSA) of the US Department of Energy. While the NNSA is primarily focused on nuclear security and non-proliferation, it is supporting projects that support the use of electron beam technology to advance plastic recycling, he said. "There is an emerging nexus between our core missions and combatting climate change. By working together to unlock the full potential of advanced nuclear technology, we are moving closer to meeting our goals of a healthier planet and helping nations achieve their sustainable development goals."

The roundtable is the second in a series of roundtables on NUTEC Plastics organized by the IAEA, the first having been held in May 2021 with experts and high-level officials from the Asia and the Pacific region ([/newscenter/news/nutec-plastics-using-nuclear-technologies-to-address-plastic-pollution](#)). The next virtual NUTEC Plastics roundtable will be for the Africa region and will take place on 2 September 2021.

Monitoring marine microplastics



Plastics and other petroleum products, including disposable face masks, increasingly find their way through riverways and into oceans, releasing chemical pollutants and microplastics into the marine environment. (Photo: F. Emert/Flickr)

Among the most challenging plastic pollutants to manage are microplastics—plastic particles smaller than five millimetres in diameter — that end up in the ocean and are often taken up by marine organisms and transferred to humans through the consumption of seafood, as proven by research by the IAEA's Monaco-based Marine Environment Laboratories. These tiny particles often reach the oceans via surface runoff and originate from the continuous weathering and disintegration of larger plastic debris, including pellets used in industrial manufacturing, additives in cleaning and personal care products, and synthetic clothing.

Since 2016, experts from 18 countries in Latin America and the Caribbean have been working together as a network to address regional challenges and vulnerabilities of the marine and coastal environments, including marine pollution, ocean acidification, harmful algal blooms and microplastics. The network, known as the REMARCO (<https://remarco.org/>), was established with the support of the IAEA and the Regional Cooperation Agreement for the Promotion of Nuclear Science and Technology in Latin America and the Caribbean (ARCAL ([/about/partnerships/regional/cooperative-agreements/regional-cooperation-agreement-for-the-promotion-of-nuclear-science-and-technology-in-latin-america-and-the-caribbean-arc](https://remarco.org/)al))). In the last five years, more than 300 scientists and technicians participating in REMARCO have been trained on the use of nuclear-derived techniques to measure marine pollution, ocean acidification, harmful algal blooms and microplastics through the IAEA's technical cooperation programme.

Betina Lomovasky, a member of REMARCO and Senior Researcher at the Institute of Marine and Coastal Research in Argentina, was one of several high-level experts sharing challenges and ongoing national and regional efforts at the roundtable. She explained that the network provides scientific information and addresses the use of isotopic and nuclear techniques in order to contribute toward sustainable management of the coastal and marine environment. "REMARCO and NUTEC Plastic can result in a partnership in the study of microplastics," she said.

REMARCO technicians and scientists have so far collected almost 30 000 samples of water and marine organisms and have published numerous scientific papers on various threats to the ocean, including a recent study on the Gulf of California and the northern Pacific. The study, published in the Marine Pollution Bulletin (<https://www.sciencedirect.com/science/article/abs/pii/S0025326X2100672X>), explored the concentrations of microplastics over time in beach sediments, surface waters and among sediment trap samples in and around Mazatlán, a popular tourist destination in Mexico's Sinaloa state. It determined that microplastic fluxes were significantly higher during the region's rainy season, as opposed to the dry season, and it found no substantial difference between the abundance of microplastics along rural and urban beaches.

For decades, the IAEA has supported countries to monitor and analyse marine microplastic pollution with nuclear technologies and nuclear-derived techniques to track the abundance and distribution of microplastics. Created in 1961, the Agency's Monaco-based Marine Environment Laboratories provides research, development and training, while its technical cooperation programme is involved in the sampling, monitoring and assessment of microplastics.

Related Resources

-  NUTEC Plastics (<https://www.iaea.org/services/key-programmes/nutec-plastics>)
-  Flyer: NUTEC Plastics - A nuclear solution to plastic pollution (<https://www.iaea.org/sites/default/files/21/05/nutec-plastics.pdf>)
-  Brochure: NUClear TEChnology for Controlling Plastic Pollution (<https://www.iaea.org/sites/default/files/21/05/nuclear-technology-for-controlling-plastic-pollution.pdf>)
-  Targeting Microplastics with Nuclear Techniques (<https://www.iaea.org/newscenter/multimedia/videos/targeting-microplastics-with-nuclear-techniques>)
-  REMARCO (<https://remarco.org/>)
-  Regional Cooperation Agreement for the Promotion of Nuclear Science and Technology in Latin America and the Caribbean (ARCAL) (<https://www.iaea.org/about/partnerships/regional/cooperative-agreements/regional-cooperation-agreement-for-the-promotion-of-nuclear-science-and-technology-in-latin-america-and-the-caribbean-arc>)
-  Photo Gallery: NUTEC Plastic Roundtable for the Americas, 26 August 2021 (https://www.flickr.com/photos/iaea_imagebank/albums/72157719787085215)

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