Radiation technology for development: How the IAEA helps

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Radiation, when used wisely and with the right safety precautions, can work wonders for our lives and the environment, making our world a safer, healthier and more secure place to live. If you look around, you will see ways radiation has touched your life too — from the energy shining from the sun to the hygienic food on your plate. Here at the IAEA, we work with countries around the world to help spread the peaceful use of radiation technology for the benefit of all.

There are many different tools and approaches a country can use to meet its development goals and challenges, and for many countries radiation technology is increasingly becoming part of the solution. Indeed, it is recognized as one of the most environmentally friendly and cost-effective options. Its many applications make it well suited for the diverse work required for achieving the United Nations Sustainable Development Goals (SDGs) and their comprehensive set of targets, which range from health and the environment to industry and infrastructure.

(Photo: N. Jawerth/IAEA)

Radiation can be used to break down living cells to treat diseases like cancer, fight harmful pathogens in food and sterilize surgical tools and medical supplies. Radiation can enable us to destroy pollutants in water, in the air and in the ground before they contaminate the environment. Other waste materials, such as bagasse — the fibrous matter from the sugar industry — or the shells of seafood such as prawns, can be tackled by using radiation technology to convert them into biodegradable and more eco-friendly materials, such as food packaging or high-quality nutrients used for farming. Radiation can also be used to join up and link molecules to make stronger, more sustainable cables and wires and create high performance materials and coatings that we use in our homes and cars and in industries worldwide.

We can even use radiation to help us 'see' the 'invisible' interiors of buildings and machinery to ensure they are still structurally sound and safe, especially after natural disasters. Every time you go to the airport you see an example of radiation technology in action, as officers scan people and baggage to ensure security. These are just a few examples highlighting how diverse the use of radiation technology can be.

To tap into the potential of radiation technology and science, countries require highly skilled professionals and the right equipment. Through IAEA support, many countries are able to get the necessary training and education courses, expert guidance and equipment they need to adopt this technology. Hundreds of scientists from institutes and organizations in both developed and developing countries also work together through IAEA coordinated research projects that advance scientific research.

These projects often result in significant practical applications, many of which are then also included in the work done through the IAEA's technical cooperation programme to transfer nuclear technology to where it is needed. This comprehensive support is

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important for many countries, particularly for low and middle income countries that face resource constraints.

A platform for research, innovation and progress

The many uses of radiation technology stem from decades of research and development in radiation science, but as with any area of science, this work is not done in isolation. Collaboration is a vital way for countries to exchange ideas and make the most of this technology. Through IAEA meetings, events and conferences, such as the International Conference on Applications of Radiation Science and Technology (ICARST), being held from 24 to 28 April 2017, scientists, experts and industry specialists are able to connect with one another and learn from each other's experiences. These connections are a key ingredient to making advances in the field, identifying best practices and finding new and innovative ways to apply these powerful tools.

It is in part through strong partnerships between academia and industry that research in radiation science and technology can move out beyond the walls of laboratories and into factories and businesses worldwide. The IAEA helps to facilitate strategic and public–private partnerships through national, regional and global initiatives. When scientists and experts team up with industry specialists, technology can be scaled up and, in many cases, commercialized. The result is that the benefits of radiation technology now reach people everywhere through the products used on a daily basis.

Use safely and securely

While radiation technology can help open many doors to a better future, these doors can only open when this technology is used safely and securely. Building a system of safety and security goes hand in hand with adopting radiation technology. Many countries work with IAEA support to build a system of regulations and policies that reflect internationally agreed safety and security standards. They also draw on the IAEA's support to establish appropriate quality regulations and get the necessary training and certification for personnel. In the hands of well-trained professionals working in a safe and secure manner, radiation technologies have tremendous potential to help in improving the lives of people and boosting the industrialization and development of countries worldwide.