# Efficient Industry, Cleaner Environment
## Making a Difference with Nuclear Technology

IAEA
International Atomic Energy Agency

*A range of safe, tested nuclear techniques can be used to measure pollution levels, identify and measure material properties, sterilize and disinfect, and change chemical, physical and biological properties. Radiation can be used for both the analysis and processing of a range of materials.*

*In environmental monitoring, nuclear techniques improve our understanding of sources and sinks of pollutants, their transport pathways and their ultimate fate.*

An increasing population, enhanced industrialization and need for higher agricultural production are leading to contamination of water bodies, especially in developing countries.

Twenty per cent of all water consumption is used for industry. With chronic shortages of water in arid and semi-arid regions of the world, developing Member States lack the water necessary to support local industry.

In the face of climate change, there is an urgent need to develop and use technologies that minimize the cost and environmental impact of industrial harbour management practices.

With rising global energy demands, it is vital to develop technologies that reduce or minimize pollution associated with fossil fuel consumption.

Cultural heritage artefacts are prone to damage from environment if not properly preserved, leading to loss of economic competitiveness in tourism, which, for example, in Europe is a €340 billion a year industry.

Electron beam or gamma irradiation can treat pollutants in water, thereby allowing wastewater to be reused for irrigation, industry and cleaning purposes.

Through electron beam treatment of flue gases from power plants, more than 70% of nitrogen oxides and 90% of sulphur dioxide can be removed and converted into valuable fertilizer in a one step process.

Ionizing beams can enhance the physical and chemical properties of industrial materials and reduce undesired contaminants.

Converting thermal metal coating facilities to electron-beam technology could lead to a 95% reduction in power usage.

Nuclear techniques can be used to characterize and distinguish fraudulent artefacts from real ones and assist archaeologists in the appropriate categorization of historical objects.

Radiation processing technology can help to protect and preserve cultural heritage artefacts.

Radiotracers and nucleonic control systems can help to optimize industrial processes, solve production problems, improve product quality, save energy and reduce pollution.

Nuclear technology can be used to address a wide range of development problems, such as environmental degradation, air and water pollution and soil contamination.

*The IAEA develops and transfers nuclear technology to Member States through coordinated research activities, the sharing of good practices and technical cooperation projects that support sustainable socioeconomic development. For more information, please visit www.iaea.org, www.facebook.com/iaeaorg or follow @iaeaorg on Twitter.*

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