IAEA Input to HLPF 2023

The International Atomic Energy Agency (IAEA), in line with its 'Atoms for Peace and Development' motto, supports countries in their efforts to reach the 17 Sustainable Development Goals (SDGs) set out in the United Nations (UN) 2030 Agenda for Sustainable Development. Many countries use nuclear science and technology to contribute to and meet their development objectives in areas including energy, human health, food production, water management and environmental protection. The use of these techniques contributes directly or indirectly to almost all SDGs..

In relation to the SDGs under HLPF review in 2023, the following examples demonstrate the work of the IAEA in support of SDGs 6, 7, 9 and 17.

Progress, experience, lessons learned, challenges and impacts of the COVID-19 pandemic

- SDG 6, Water and Sanitation
  Capacity development in support of SDG6 has been strengthened with a view to support south-south and triangular cooperation mechanisms to better ensure sustainability of efforts. With this is mind, several training courses on isotope hydrology were successfully organised bringing together experts and academia (*PhD Students from Sahel Characterising & Understanding Water | IAEA*). This has, in turn, led to the initiation of laboratory network proposal aimed to build analytical capacity in Member States (a *Global Water Isotope Network Laboratories (GloWIN Laboratories)* is expected to be launched at the forthcoming UN Water Conference 2023). The IAEA activities in this area provide Member States with the key data required to enhance water management capacity at national, regional and international level and could provide guidance on the development of regulations and policy frameworks.

- SDG 7, Clean Energy
  The experience during the COVID-19 pandemic and recovery demonstrated the resilience of nuclear power in ensuring access to reliable, clean and affordable energy. Nuclear energy's resilience contributed to substantial reductions in the carbon intensity of electricity generation seen early in the pandemic and complemented increased shares of intermittent renewable energy generation, providing lessons for the low carbon transition. (*COVID-19 and Low Carbon Electricity: Lessons for the Future | IAEA; Amid Global Crises, Nuclear Power Provides Energy Security with Increased Electricity Generation in 2021 | IAEA*). However, the pandemic has exacerbated challenges related to financing the clean energy transition and SDG 7, with many national government responses continuing support for fossil fuel investment. In contrast, leading independent studies (e.g. IEA WEO) indicate that realizing a sustainable recovery that puts the world on track to reach SDGs and long term climate goals requires substantially ramping up investment in nuclear energy. (*Nuclear Energy for a Net Zero World; Climate Change and Nuclear Power 2022*)

- SDG 9, Industry, Innovation and Infrastructure
  During the COVID-19 pandemic, a high demand for sterilisation methods for Personal Protective Equipment (PPE) was raised by Member States. A task force was coordinated by the IAEA to develop the scientific evidence to use radiation technology in the re-sterilisation of PPE, particularly filter mask, due to the shortage generated. A technical document and a Webinar to deliver the information were performed as a quick response (*http://www-*

naweb.iaea.org/napc/iachem/working_materials/Technical%20Report%20(Mask%20Reprocessing.pdf)

Key areas where transformative actions for accelerated progress have been successful

- SDG 6, Water and Sanitation
  Interconnecting the work on several SDGs has proven particularly successful specifically in underlining the importance of the impact of climate change on water resources. To this end, the increased capacity to monitor and better manage their water resources reached with IAEA's support using isotope techniques in Africa, Island States, Central America, Europe are particularly noteworthy. In addition, the IAEA has been assisting Member States in ensuring access to water in the face of glacier retreat, which has resulted in new activities aimed to strengthen the evaluation of the impact of water quality for water resource management (*Card4Africa; COP27: Protecting water sources in the Central American Dry Corridor; Tracking Freshwater in Malta | IAEA; Glacier Retreat in Response to Climate Change: Using Novel Scientific Tools to Assess Impacts*; *IAEA COP27 Event Highlights How Nuclear Science Helps Island States Tackle Climate Change Impact on Water Resources*).

- SDG 9, Industry, Innovation and Infrastructure
  The IAEA provides support to Member States in building capacities for the application of Non-Destructive Testing (NDT) technology, which is used to evaluate the integrity and properties of industrial, cultural and commercial materials. Non-destructive testing is also an important tool for the evaluation of civil structures and buildings, especially following natural disasters, such as earthquakes. Such assistance was provided by the IAEA to Lebanon following the port explosion in Beirut (*IAEA Supports Lebanon in Assessing Integrity of Buildings Impacted in Last Year's Beirut Blast | IAEA*) and in natural disaster management in Latin America and the Caribbean (*Latin America, Caribbean Achieves Capability in Using Nuclear Techniques to Respond to Natural Disasters | IAEA*) and has brought to the global attention the importance of the development of high quality standards and of the harmonisation of methodologies in the use of NDT (*ISO - ISO 23159:2020 - Non-destructive testing — Gamma ray scanning method on process columns*)

  Nuclear techniques, based on advanced oxidation/reduction processes such as electron beam and gamma radiation, have emerged as alternative solutions to eliminate pollutants in wastewater. (*China Opens Asia's First Facility to Treat Medical Wastewater Using Electron Beam Technology | IAEA; Started with IAEA Support, China's Electron Beam Industry Opens World's Largest Wastewater Treatment Facility | IAEA*). Nuclear techniques can also contribute to mitigate plastic pollution. IAEA is supporting its Member States through the NUTEC Plastics Initiative, by integrating the radiation technology into the recycling process for obtaining value-added products. (*Recycling of Polymer Waste for Structural and Non-Structural Materials by using Ionizing Radiation | IAEA; Strengthening the Use of Biomass for Synthesis of Bioplastics and Other Compounds, Using Radiation Technology*)

Examples of specific actions taken to recover from the COVID-19 pandemic that also accelerate progress towards multiple SDG targets

- SDG 7, Clean Energy
  To support recovery and accelerate progress towards SDG 7 (and interlinked SDGs) in its Member States, IAEA launched in 2022 its Energy Compact, Supporting Member States in their Clean Energy Transition, which consists of capacity building assistance, particularly for developing

regions, through training, technical assistance and information exchange in energy systems analysis and planning, as well as support to those Member States considering the nuclear power option, in the development of the infrastructure to ensure a safe, secure, and sustainable nuclear power programme. (*Accelerating the Clean Energy Transition: IAEA's UN Energy Compact Unveiled | IAEA*). This responded in part to renewed interest among MSs in nuclear power as a key enabler of clean energy transitions (both directly by delivering affordable, reliable and modern energy, and indirectly by providing the reliable clean power backbone for increasing the share of renewables to meet Target 7.2) and boosting employment and economic development, while contributing to supply security and resilience (thereby supporting multiple SDGs relying on clean energy). This is reflected in the upward revision of IAEA's long-term projections for nuclear energy. (*Energy, Electricity and Nuclear Power Estimates for the period up to 2050 (RDS-1 series), 2022 edition*). As an illustration, an increasing number of countries in Africa see nuclear power as central to social and economic development, as part of their recovery from the pandemic and realization of the SDGs. The IAEA is currently working closely with 13 African countries through its Milestones Approach to support their efforts to capitalize on nuclear energy to drive the post-pandemic recovery. These countries recognize the potential of nuclear power to enable systemic transformative development, by providing reliable, low-carbon baseload electricity, that can thereby support economic development and industrialization and the achievement of multiple interlinked SDGs (e.g. 1, 3, 4, 6, 8, 9, 10, 13).

- SDG 9, Industry, Innovation and Infrastructure
  There were several efforts in the different regions as response to the needs of industry at a time of significant regional industrial growth. The IAEA has helped establish and expand the local non-destructive testing (NDT) service industry. Trainings have been conducted qualifying trainees that have subsequently established their own NDT service businesses. Successful stories to this end are evident in particular in the Asia-Pacific Region (*IAEA and RCA Representatives Launch Two Publications, Highlighting the Impact of Cooperation in Health and Industry | IAEA and Publication | 50th anniversary*)

- SDG17, Partnerships for Goals
  As governments implement their national development strategies and plans, many turn to the IAEA and its partners to help them use nuclear science and technology to meet their objectives. Longstanding IAEA partnerships, such as with the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO), the United Nations Educational, Scientific and Cultural Organization (UNESCO) allow international organizations to contribute their skills and resources to support development worldwide.

Assessment of the situation in the mid-point of the implementation of the 2030 Agenda and the SDGs

- SDG 7, Clean Energy
  To realize SDG 7 and interconnected goals, substantial increased investment in the clean energy transition is critical; current levels remain inadequate. This requires a coherent set of policy, regulatory, infrastructure and other measures to guide markets and investors, foster cooperation and manage risks. Investment in nuclear energy, in particular, can support a just transition by driving an inclusive, resilient and secure recovery, and fostering innovation, to fully realize the SDGs. (*Nuclear Energy for a Net Zero World; Climate Change and Nuclear Power 2022*)

Key messages for consideration ref. the September 2023 SDG Summit

Science and technology help to understand and overcome many challenges, whether it's a deadly pandemic or the existential threat of climate change. However, science and technology are

unequally instituted across the world, with those who need them most, having the least access. Among the sciences, ***nuclear science*** is unique in the scale and breadth of its application: scientists have unlocked the power of the atom to deliver reliable low-carbon energy, to fight diseases, to study scarce water resources, to develop hardier crops and to monitor pollution in the oceans and on earth.

Science, technology and innovation should unite by virtue of its capacity to provide objective data for decision making and to be transformational when combined together. ***Nuclear technologies*** can play a part in tackling the world's global crisis and in supporting countries towards the achievement of the SDGs.

Additional Reference Material:

- Nuclear Energy for a Net Zero World brochure
- Climate Change and Nuclear Power 2022 report, released at the IAEA General Conference during a side event on Africa, and distributed at COP27 on the Atoms4Climate Pavilion.
- Energy, Electricity and Nuclear Power Estimates for the period up to 2050 (RDS-1 series), 2022 edition
- COVID-19 and Low Carbon Electricity: Lessons for the Future | IAEA
- Amid Global Crises, Nuclear Power Provides Energy Security with Increased Electricity Generation in 2021 | IAEA
- Accelerating the Clean Energy Transition: IAEA's UN Energy Compact Unveiled | IAEA