Contribution of the International Atomic Energy Agency, through its Marine Environment Laboratories, to the Secretary-General's background note for the preparatory meeting of the 2025 United Nations Conference to Support the Implementation of Sustainable Development Goal 14

I. Introduction

The International Atomic Energy Agency has contributed to advancing and supporting the implementation of SDG14 targets, through its Marine Environment Laboratories, since 2022 and within its mandate.

II. Status and Trends

1. Status and trends including key milestones.

***Target 14.1*: By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution**

Plastic pollution: Plastics continue to be the most prevalent debris item recorded, accounting for an estimated 60 to 80 per cent of all marine litter. Since 1980, plastic pollution in oceans has increased tenfold. In total, an estimated 8 million tons of mismanaged plastic waste enter the ocean annually. At such a pace, it is likely that the goal of a significant reduction in marine pollution by the year 2025 will not be achieved without transformative action.

In addition to banning single-use plastics, it is important to address plastic pollution more comprehensively through the consideration of global approaches aimed at harmonizing standards and practices, as well as catalysing significant innovation across the entire plastics supply chain.

To address some of these challenges, the IAEA launched its Nuclear Technology for Controlling Plastic Pollution (NUTEC Plastics) initiative in early 2022 to enhance the capacity of national and regional laboratories to track and monitor marine microplastics via capacity building and provision of equipment, as well as to harmonize procedures and sampling kits to facilitate standardized data collection for marine microplastic monitoring programmes. The IAEA is currently developing a global network of laboratories in Member States to monitor marine microplastic pollution, with the IAEA Marine Environment Laboratories serving as Reference Laboratory to continuously develop and validate technologies for follow up action. As of March 2023, 81 countries are equipped with harmonized protocols for marine microplastics sampling and analysis, giving them the capability to report on the indicator SDG14.1.1b (Level 3; Abundance of microplastics in marine waters, sediments and organisms). One large Interregional, 4

Regional and 22 National projects are undergoing implemention to further strengthen Member States' capacities in microplastics monitoring.

It is estimated that over 140,000 synthetic chemicals are manufactured globally, with new man-made chemicals constantly being developed. Frequency of usage and the high production volumes of these chemicals that can harm marine ecosystems and human health are projected to triple by 2050. A handful of these chemicals, often referred to as "priority substances", are regulated and monitored in the marine environment by Member States. However, only a small fraction of toxic effects observed in the aquatic environment can be attributed to the presence of these known substances. Through its R&D programmes, the IAEA Marine Environment Laboratories have developed new analytical methods to detect contaminants of emerging concern, such as plastic additives and PFAS (dubbed "forever chemicals"), to study their distribution, fate and toxicity in various marine compartments.

Mercury pollution: 12 Caribbean countries are now able to report historical trends over the last century of Hg in coastal areas of sites of interest, using nuclear techniques. This information strengthens the Minamata Convention on Mercury.

Marine radionuclides: The IAEA conducts this review IAEA's Marine Environment Laboratories conduct regular interlaboratory comparisons for source and environmental monitoring and reviews against the IAEA Safety Standards, which constitute harmonized high levels of safety worldwide and, as such, a global reference for protecting people and the environment.

Coastal zone Eutrophication: IAEA will implement a CRP on harmonizing methods for determining the index of eutrophication in coastal zones (indicator SDG141.1.a). Pilot studies were conducted to use remote sensing to quantify the eutrophication index. MEX, ARG and URY presented results in the in-situ validation.

***Target 14.2:* By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans**

Blue Carbon: The protection and restoration of coastal ecosystems, such as mangroves, salt marshes and seagrass meadows (coastal "blue carbon" ecosystems) represent a nature-based solution with multiple co-benefits; increasing carbon uptake and storage, coastal protection against erosion and storm surges, fish breeding areas, protection of biodiversity, counteracting eutrophication and locally combating ocean acidification. Since 2022, IAEA has provided training to 34 Member States in assessing the capacity of coastal vegetated ecosystems to sequester carbon through provision of and training in necessary equipment, hands-on workshops on setting up Blue Carbon projects,

preparation of training materials and conducting carbon burial assessments.

***Target 14.3*: Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels**

Roughly one quarter of all anthropogenic carbon dioxide emissions are absorbed by the ocean. In the ocean, dissolved carbon dioxide causes changes in ocean chemistry, including an increase in ocean acidity. As a result of these emissions, the ocean is currently 30% more acidic compared to pre-industrial times, and it is projected to become 150% more acidic by 2100. Ocean acidification negatively impacts much of the biological life in the sea, leading to degradation of entire ecosystems and marine food chains. Numerous calcifying organisms, including phytoplankton serving as essential primary producers and economically crucial species targeted by fisheries and aquaculture, are gravely affected, with repercussions for end-beneficiaries of marine resources and services ranging from food security and quality to coastal protection and vital economic activities. This is particularly alarming for vulnerable coastal communities and Small Island Developing States which require an elevated degree of monitoring and targeted investment in mitigation and adaptation methods to build resilience.

The threats posed by ocean acidification are compounded by the impact of multiple stressors and can be exacerbated by the effects of increased seawater temperature, organic and inorganic pollution, deoxygenation, overfishing and other harmful factors directly generated or influenced by anthropogenic activities.

Despite efforts from the international community to report to SDG 14.3.1 since 2022, **significant gaps remain in local knowledge of ocean acidification conditions.** Continued and increased investments are necessary for the assessment of local ocean acidification conditions in understudied areas, to determine the capacity of important species to adapt to project ocean acidification conditions, and to develop adaptation plans at local levels. Furthermore, Member States require additional efforts and support to build monitoring and research capacities to produce robust evidence that could underpin relevant, informed decision and policy making.

Significant decreases in anthropogenic carbon emissions are required to prevent further acidification of the ocean. However, reversing the current upward ocean acidification trend is unlikely with current technologies, and thus adaptation efforts are paramount.

For more than a decade, **the IAEA Ocean Acidification International Coordination Centre (OA-ICC) has been facilitating and promoting global efforts to tackle ocean acidification** through targeted action in the areas of science, capacity building and communication. By enhancing local, regional and global monitoring and research capacities, training early-career scientists from around the world and supporting regional partnerships and networks, the OA-ICC has been steadily building Member States' resilience in the face of the growing concerns posed by ocean acidification to life in the ocean and its impact on humanity's wellbeing. In addition, in 2023, 7 LAC countries

(ARG, COL, CUB, MEX, PER, ARG and URY first reported on SDG14.3 as a result of IAEA regional cooperation projects, supported by the REMARCO network. Now the data generated by these countries are part of a global database.

III. Leveraging interlinkages between SDG 14 and other SDGs towards ocean action: Challenges and opportunities:

IV. Mobilizing all actors to accelerating ocean action:

1. Investing in SDG 14

The IAEA through its Marine Environment Laboratories provides a broad range of data quality assurance services to ensure that marine pollution data reported by Member States under SDG14 is accurate and robust. To this end, it has gained accreditation for the production of Reference Materials to assist laboratories worldwide with the quality assurance of data pertaining to radioactive marine pollutants. It organizes annual worldwide proficiency tests and interlaboratory comparison exercises to continue assisting Member States laboratories demonstrate their performance and continuously improve data quality. The IAEA coordinates the ALMERA network, a cooperative global effort of over 200 analytical laboratories in 90 countries to provide reliable and timely analysis of radionuclides in environmental samples in routine and emergency situations. Through its Marine Information System (MARIS), the IAEA Marine Environment Laboratories provide open, online access to the results of measurements of radioactivity in the marine environment conducted since 1957. Over 800,000 data are easily accessible to scientists, public and decision makers, and additional metadata and information pages are ensuring traceability and transparency. Data in MARIS documents the space-time patterns of marine radioactivity, providing information on baselines important in case of contamination events and on post-contamination evolution of marine ecosystems.

2. Strengthening Partnerships (including Voluntary Commitments)

The Ocean Decade 2021-2030 fosters a global commitment effort of previously unseen proportions in terms of partnerships and collaboration to advance science and knowledge to reach SDG14. The IAEA is a partner of this initiative and its commitment was reinforced since 2022.

3. Mobilizing All actors

Global collaborations are particularly important in the context of the ocean, seas and marine resources, as a result of global connectivity.

The IAEA, through its Marine Environment Laboratories, has been actively involved in the UN Environmental Management Group (EMG) coordination mechanism and in the UN-Oceans platform, both being successful coordination tools.

Through the EMG, IAEA recently contributed to the preparation of the UN system Common Approach towards a pollution-free planet. This Common Approach aims to help the UN align its efforts and mobilize the entirety of its relevant expertise and mandates to accelerate the sustainable, inclusive and just transition towards a pollution-free economy, building on existing efforts undertaken by various UN and related entities.

The IAEA, within its mandate, supports young scientists through dedicated fellowship programmes. and ensures gender balance in its programme implementation. To leave no one behind, specific attention is given by the IAEA to SIDs as they are particularly vulnerable to climate related ocean changes and marine pollution.

V. Possible themes for the Ocean Action Panels

The IAEA would like to propose the following themes for the Ocean Action panels:

1. Combatting marine pollution, including plastics (SDG Target 14.1)

2. Adaptation to and local mitigation of ocean acidification (SDG Target 14.3)

3. Conserving and restoring marine and coastal ecosystems as multi-purpose nature-based solution (including Blue Carbon) (SDG Target 14.2)

4. Increasing scientific knowledge, and developing research capacity and transfer of marine technology for sustainable use of the ocean

VI. Way Ahead/Next Steps