13TH SYMPOSIUM ON ICT, ENVIRONMENT AND CLIMATE CHANGE

The role of frontier technologies in combating climate change and achieving a circular economy

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"Call for Action on the Use of Frontier Technologies in Combating Climate Change and Achieving a Circular Economy"
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Introduction

The 13th Symposium on ICT, Environment and Climate Change, which was held on 13 May 2019 in Geneva, Switzerland has acknowledged the transformative potential of frontier technologies. Artificial Intelligence (AI), the Internet of Things (IoTs), Big Data analytics, 5G, digital twins, distributed ledger technologies, additive manufacturing, robotics, edge computing, and augmented and virtual realities, among others, can help to lower carbon emissions, boost climate resilience, support the transition to a circular economy and raise awareness on climate issues. Thus, frontier technologies represent a significant opportunity for stakeholders to reach the goals of the 2030 Agenda for Sustainable Development and realize the visions and goals of the New Urban Agenda, the Paris Agreement on Climate Change and the Sendai Framework for Disaster Risk Reduction.

In particular, the Symposium has confirmed that frontier technologies can contribute to the achievement of the following United Nations' Sustainable Development Goals (SDGs): SDG 2, "Zero Hunger"; SDG 3, "Good Health and Well-being"; SDG 6 ,"Clean Water and Sanitation"; SDG 7, "Affordable and Clean Energy"; SDG 8, "Decent Work and Economic Growth"; SDG 9, "Industry, Innovation, and Infrastructure"; SDG 11, "Sustainable Cities and Communities"; SDG 12, "Responsible Consumption and Production" and SDG 13, "Take urgent action to

combat climate change and its impacts". This also takes into account the commitment of the Agenda to leave no one behind.

However, the proliferation of disruptive innovation carries its own set of challenges. There is a real risk that those who have no access to ICT could be left behind as traditional or informal labour forces could be replaced by new technologies. The risk of deepening social and economic inequalities is particularly high among women and other marginalized population groups in the Global South. Data acquisition and processing may generate algorithms that reinforce existing biases and stereotypes. The lack of adequate ICT infrastructure in developing countries is also preventing them from using frontier technologies to accelerate their national actions to identify, mitigate, adapt and, where possible, reverse the effects of climate change, while improving their policies to support a circular model for sustainable development. Furthermore, there is a lack of integration policies supporting the digital technology sector to accelerate effective climate and circular actions in both developed and developing countries. Frontier technologies themselves are also generating emissions that cannot be overlooked.

Therefore, frontier technologies should be developed in a strategic, inclusive and meaningful manner. Proper steps must be taken to address the challenges associated with the deployment of frontier technologies.

To that end, we the participants of the 13th Symposium on ICT, Environment and Climate Change recommend the following actions:

1. **Promote the use of AI and other frontier technologies to accelerate climate and circular economy actions**: Frontier solutions utilize data to spot patterns and analyze energy and material consumption profiles. The results allow industries and businesses to optimize energy and operational efficiency, thereby significantly improving environmental sustainability in supply chain management. Big Data and predictive analytics provide stakeholders vital information on the socio-economic and spatial dynamics of their surroundings. This allows for the integration of climate-vulnerability assessments in spatial planning and urban design, thus maximizing emission-reduction potential in cities. Real-time information also boosts climate resilience by enhancing climate monitoring and risk mapping capacity particularly in the agricultural sector. In addition, frontier technologies play a significant role in improving the life cycle assessment for ICT products and turning insights into actionable plans that would inform businesses to implement relevant eco-design guidelines in their products.

2. **Establish a comprehensive framework to ensure positive technological disruption:** Create a comprehensive framework that defines the objectives and boundaries of frontier technologies and aligns disruptive innovations to common goals and visions that are shared by the international community, in particular the SDGs, the Paris Agreement on Climate Change and the New Urban Agenda. It will provide a baseline understanding of a decarbonized society for industries and businesses as well as for governments at all levels, thus improving accountability and transparency while ensuring the application of frontier technologies is sustainable, inclusive and ethical, and that the benefits of these technologies are realized for all relevant stakeholders. In this process, an assessment of existing structures

in different contexts, and awareness for cultural structures and rules that matter for the use of technologies should be undertaken and the do-no-harm principle should be adhered to. Wherever possible, participatory and democratic processes in the development, testing and use of such frontier technologies should be applied;

3. **Encourage multi-stakeholder partnerships and international cooperation to facilitate sustainable and inclusive growth**: Strengthening cooperation among industries, businesses, governments, the academia, non-governmental and international organizations and other stakeholders is required in order to mobilize and share knowledge, resources, and expertise on the latest innovations. Technology and forums that support the engagement of youth, women and marginalized communities in decision making should also be promoted. International platforms that gather the views and expertise of all relevant stakeholders represent an important channel for fostering best practices and strengthening multi-stakeholder partnerships and cooperation. They allow the contributions of marginalized groups to sustainable development to be reflected at the international level, thus encouraging equitable progress for all.

4. **Implement international standards to harmonize the deployment of next-generation ICT infrastructure and evaluate the environmental impacts of frontier technologies**: International standards such as ITU-T Recommendations and other international frameworks and guidelines such as the UN Global Compact's Ten Principles contain important guidelines and tools that support governments at all levels in enabling and/or harmonizing the deployment of frontier technologies. They also assist industries and businesses in defining the environmental requirements of ICT infrastructure and evaluating the environmental impacts of these technologies. Developed with insights and expertise from leading industries and businesses, international standards are key in fostering and sharing best practices in the application of frontier technologies.

5. **Raise awareness on the role of frontier technologies in combating climate change and achieving a circular economy**: Industries, businesses and the public sector should be made aware of the potential of frontier technologies in lowering carbon emissions, boosting climate resilience as well as in reducing waste generation. Once they become aware of the benefits of reducing their social, economic and environmental footprint, and the opportunities presented by frontier technologies to enable transformational adaptation to climate change, they are more likely to embrace the digital transformation. Therefore, awareness raising campaigns must be organized more frequently at both the national and international levels.

6. **Reduce the negative impact of ICT-related e-waste to contribute to tackling climate change and moving to a circular economy:** The environmental impacts of frontier technologies-related e-waste must be assessed and properly tackled in an inclusive and efficient manner. Encouraging best practices and eco-design principles and taking advantage of frontier technologies could help to mitigate tons of GHGs per year, as well as, improve public health, working conditions and the environment.

7. **Direct frontier technologies to reduce societal greenhouse gas emissions in line with scientific trajectories and to foster a circular economy**: Industries and businesses should

use their power to lower their own and societal emissions and support the circular economy. This requires coherent policies that discourage polluting practices while scaling business models and solutions that are inclusive and eco-friendly. Frontier technologies should be leveraged to increase learning at all levels and spread successful policies.

Additional information on the 13th Symposium on ICT, Environment and Climate Change can be found at: https://www.itu.int/en/ITU-T/climatechange/symposia/201905/Pages/default.aspx