

Global trend for the policies toward carbon-neutral world

Humanity is facing formidable challenges from wars and hunger to pandemic and ever-increasing pressure on the Earth systems including climate change. Earth is the only planet we know that can sustain life we know; it “is a fine place and worth fighting for” as Ernest Hemingway once said.

The United Nations 2030 Agenda with its 17 Sustainable Development Goals (SDGs) and the Paris Climate Agreement back in 2015 there appeared resolve to achieve aspirational and ambitious vision of a safe and just future for all within planetary boundaries – a world free from hunger, injustice, and poverty, leading to universal education, health, and employment with inclusive economic development, based on transparency, dignity and equity. Many ambitious national and international policies were introduced to nudge the world toward a safe and just future for all. An example is the European Green Deal.

However, a decade has passed since the adoption of the SDGs and the Paris Climate Agreement. A lot has been achieved but not nearly enough given the Herculean task ahead and formidable immediate challenges and crises. An important example is climate change. To achieve the Paris Agreement, greenhouse gas emissions need to be halved every decade and approach net zero by the middle of the century, in less than three decades, while the global emissions are still increasing at an unprecedented rate. In fact, 2024 has been the hottest year with global mean temperature exceeding 1.5oC, the lower stabilization level of the Paris Agreement and with high certainty also the higher stabilization level of 2oC will be exceeded.

We argue that a safe and just future for all can be achieved through disruptive and inclusive change about people, societies and about values and behaviors. This will require “doing more with less” – efficiency and sufficiency of providing more services with less resources and impacts on the Earth system - a new integrated, systemic, and holistic pathways to achieve the grand transformation.

Digital Revolution along with the other disruptive transformations, despite many inherent dangers, hold the promise of helping achieve safe and just future. The potential is here for the integration of digital and other innovations into new systems and human activities. The ongoing advances encompass artificial intelligence (AI), connectivity, digitization of information, additive manufacturing (3D printing),

virtual reality, Internet of things (IoT), machine learning, block chain, robotics, quantum computing and synthetic biology. A good example of the power of digitalization is the disruptive nature of information and communication technologies (ICT) such as mobile phones and their gigantic potential effect in enabling fundamentally new human activities while reducing specific energy and materials requirements as well as greenhouse-gas emissions compared with the analogue devices they replace.

Humanity may be moving toward new civilizational thresholds. Super-intelligent machines like the convergence of quantum computing and AI might even develop a “life” of their own, with the capacity both to harm and benefit human agents. The digital transformation calls for a comprehensive “social steering”, a set of regulatory standards and normative frameworks, physical infrastructure, and digital systems, to capture the benefits of the digital revolution while avoiding the many potential downsides. An essential priority should be to develop science, technology, and innovation roadmaps to better understand the potential benefits and dangers of digitalization and how to leverage the digital revolution toward sustainable development for all. The principles of digital transformation for sustainable development have yet to be written as humanity embarks on the fundamental transformation. If the potential opportunities are seized, the transformational change would benefit people and the planet.