The Digital-Green Nexus is a Win-Win for the Planet and the Economy

This year's UN Climate Change Conference (COP28) in Dubai will conclude the global stocktake exercise, assessing global progress on mitigating climate change. As it will show, most countries have formulated national plans for reducing emissions, often combining existing technologies with those that are expected to develop during the current window to limit global temperature rise to 2°C. These plans are often too optimistic.

While many policymakers believe in a hockey stick-model of climate change mitigation in which they can await innovative technologies and cost reductions—and thus only achieve the bulk of reductions at the end of this decade—there is a real risk that mitigation actions will follow a flatline curve instead. There are also enormous technological uncertainties, and investments are mainly incremental improvements in existing technologies or in new green technologies which have been "immature" for decades. With only six years left to go until the end of the Paris Agreement's timeline of 2030, where should countries direct their efforts of technological innovation in support of reaching climate targets and major long-term transformation?

A "Twin Transition?"

The notion of the "twin transition" brings the information revolution into play, acting as the enabler as well as the reinforcer of the green transformation. Most green technologies have limits in terms of the technological multiplier effect of investments in technological innovation; they are extremely diverse in terms of their science and technology groundings, and there are few synergies between them. Improvements in wind energy technology do not have knock-on effects leading to improvements in, say, solar, low-carbon steel or green aviation. Conversely, digital technologies are internally dynamic and mutually reinforcing in terms of technological change, and they have an enormous green potential. Thus, the idea of

THE MANUFACTURERS OF DIGITAL EQUIPMENT WERE BORN IN TIMES OF CHEAP OIL AND RESOURCE ABUNDANCE, AND MOST HAVE CONTINUED WITH ENERGY- AND MATERIALS-INTENSIVE MODELS OF MASS PRODUCTION.

the twin transition is both misguided and right. It is misguided because there is no two-way interaction: green technologies do not lead to any dynamic improvements in the digital economy. Yet it is right because digital technologies—while often overlooked in climate mitigation discourse—are in fact the main source of much green technological change.

For example, blockchain technology can be used by companies to increase traceability of inputs, ensuring sustainable sourcing and increasing opportunities for enhanced recycling. The Internet of Things (IoT) could reduce overall demand for power; big-data analysis could identify ways to reduce materials and resource waste; artificial intelligence could help to increase the efficiency of wind turbines and optimize electricity grids to make them smarter, more interactive, and greener. The list goes on.

One of the most notable features of Information and Communication Technology (ICT) that is only beginning to be taken full advantage of now is its intangible nature, and hence its capacity to turn products into services. We are now consuming books in digital and audio formats, reducing paper manufacturing, keeping more trees as carbon sinks, and thanks to the pandemic, much of our work can now be done online—lessening the need to commute and travel by plane.

Addressing the Digital Revolution's Climate Unfriendliness

However, the digital revolution has not taken the best direction. It continued with the energy- and materials-intensive model of mass production and the "planned obsolescence" strategy of annual models for replacement and no maintenance. Regulation for basic standards, interoperability and refurbishment are needed. Equally, for electrical appliances, laws to make importers responsible for the full life-cycle and prohibiting the use of municipal garbage systems, would lead to a rental and maintenance business model, with clear preference for long-term durability, with digital passports for each product and web-based software for diagnosis and 3-D printing of parts. Millions of maintenance jobs would ensue to serve consumers, as well as for end-of-life disassembly and recycling. In addition, long-life appliances would facilitate global access to the consumption ladder and create a digitally assisted way of massive job creation in both the Global North and the Global South.

Overcoming age-old habits of production and consumption is a fight against inertia, and it is also risky for investors. Unless governments change the playing field in such a way that it becomes more profitable to invest in the new, greener technologies than in the old ones—and incentivizes consumers to shift to the new ways—it will not happen. Regulations must also clearly indicate the preferred direction of innovation and investment within the range of the new technological potential.

But, given that the profitability of green transition projects implies unknown risks, it will crucially depend on government policy in their favour. Each technological revolution has required an adequate socio-institutional framework to give it direction, and giving a clear green direction to the digital revolution is now crucial. Both innovation and investment must be reoriented away from the traditional profit models of mass production and toward transformative green innovation. Digital innovation can usher in these green changes, but only if governments provide clear incentives and signposting through policy, regulation, taxation, and major societal-level projects and missions.

When policy and decision makers convene at COP28, they should use the opportunity to advance the mitigation discourse and begin putting in place systematic frameworks for harnessing the power of digital technology capable of combating climate change. They should unite to drive innovation and investment convergence and make global public goods profitable. It is time to redirect the digital revolution toward the benefit of the planet and the people.

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