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Decarbonisation on a Finite Planet

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SYNOPSIS

Decarbonisation is not happening in a vacuum but on a planet already replete with ecological challenges. The material-intensive requirement of low-carbon technologies means more mining, and the currently inadequate recycling capacity means more waste. Existing pressures point to an urgent need to reduce consumption to avert climate and ecological crises.

COMMENTARY

DECARBONISATION THROUGH the deployment of low-carbon technologies such as electric vehicles, solar and wind power has become the most dominant strategy in combating climate change. It is a central component of reaching net-zero or carbon neutrality. While much focus is given on its potential role to reduce emissions and create jobs, the context within which decarbonisation is taking place receives much less attention.

Recognising existing realities is important because high emissions are not the only environmental crisis confronting humanity. Rather, the Earth has long been suffering from resource over-extraction and biodiversity decline which, together with the use of fossil fuels, are deteriorating the planet's health even further. Thus, unless continuing expansion of low-carbon technologies takes into account existing environmental and social challenges carefully, decarbonisation may unintentionally run the risk of exacerbating problems instead of solving them meaningfully.

The Context

Drivers of environmental degradation abound, but consumption demand plays a key role. Consumption is responsible for emissions. Between 1990 and 2008, a group of developed countries listed in the Annex B of the 1997 Kyoto Protocol registered a

three percent drop in territorial emissions. However, emissions embedded in imported goods from developing countries reversed the negative number and rendered the Annex B countries contributing to 11 percent of global emission growth instead.

In fact, every year since the 1970s, the world's consumption has been exacting toll on Mother Earth's resources more than what it can regenerate, resulting in what is referred to as 'overshoot'. It practically means resource depletion and carbon accumulation in the atmosphere. Our consumption today sees an overshoot equivalent of 1.6 Earths, with advanced economies, and by extension the richer segments of society, disproportionately consuming more.

The state of resource over-extraction due to high consumption is consistent with 2.3 million km2 of forest being deforested globally between 2000 and 2012 with only about 35 percent being reforested. It is also reflected in global material footprint that continued to increase from 73.2 billion metric tonnes to 85.9 billion metric tonnes between 2010 and 2017 despite efforts to increase resource efficiency and reduce material use through, for example, circular economy in some societies.

Various sustainability certification mechanisms are in place. Net forest loss rate has slowed down in the last decade. Conservation and management initiatives are showing progress. Although these are positive developments, the overall impact remains limited as nature continues to spiral into a dangerous decline.

Worsening land degradation has reached critical levels in many parts of the world affecting at least 3.2 billion people. Similarly, current extinction rates are unprecedented and accelerating, with about 1,000,000 animal and plant species now being threatened.

Indeed, the fact that none of the 2020 Aichi Biodiversity Targets, which were adopted during the 10th meeting of the Conference of the Parties to the Convention on Biological Diversity in Nagoya, Japan, in 2010, will be fully met this year strongly indicates that humanity is failing Mother Earth.

Low-Carbon Energy Transition

Low-carbon technologies require many more critical minerals compared to their fossil fuel-based counterparts. An electric car requires five times more minerals compared to a conventional car, and an onshore wind plant needs eight times as much compared to a gas-fired plant of the same capacity. The development of electric storage batteries may even result in a 1,000 per cent increase in demands for aluminium, cobalt, iron, lead, lithium, manganese and nickel.

Such material-intensive requirement means intensifying mining activities, which are known to be environmentally destructive and socially problematic. Nickel mining has turned parts of Indonesia's Sulawesi sea red with nearby fishing community being affected.

Lithium extraction has caused environmental degradation and affected drinking water supplies for local communities in Chile's Andes Mountain region. Cobalt mining in the

Democratic Republic of the Congo, the single largest cobalt producer in the world, has seen alleged cases of environmental destruction and human rights abuse.

A parallel issue is waste generation. The manufacturing and deployment rates of low-carbon products are currently outpacing recycling capacity. Not only recycling technologies for lithium-ion batteries are still being figured out, solar panel and wind blade wastes are projected to amount to respectively 78 million tonnes and 43 million tonnes by 2050.

In a world that is still grappling with plastic waste conundrum, which is now increasingly witnessing mounting electronic waste, these additional millions of tonnes of waste from low-carbon products will certainly add extra pressures on the natural environment.

The revival of once controversial carbon capture and storage (CCS) technology also presents another uneasy scenario. In view of the likelihood of tropical forest soils and permafrost discharging enormous amount of trapped carbon into the atmosphere should the world's temperature increase further, the prospect of disturbing the land ecosystems by digging deep into the Earth in a bid to find a permanent storage for CCS' sequestered carbon is unsettling despite technical claim of its safety.

Holistic Approach Needed: Renewable Energy Not Enough

Reducing fossil fuel use is important, but simply replacing it with renewable energy sources may not necessarily save the planet. A more holistic approach may point to the need to reduce consumption in absolute terms towards restoring a balance with nature while reducing emissions at the same time. A transformation of the current global economic system to a steady-state economy may be a way to achieve such a vision.

A steady-state economy is defined as "an economy with constant population and constant stock of capital, maintained by a low rate of throughput that is within the regenerative and assimilative capacities of the ecosystem".

In practice, the steady-state economy concept proposes wealthy countries to reduce consumption absolutely by slowing down economic growth and focusing instead on improving population's well-being through less material use, so that poorer countries can have the resources and ecological space they need to grow; all towards functioning within environmental limits.

This transformation will certainly require a rethinking of how the measurement of societal progress and the different aspects of human security such as food, economic, and health, are to be reconfigured to remain compatible within the Earth's limits. Strong cooperation from members of the public and the business sector is key. Effective multilateral cooperation is essential but the ongoing COVID-19 pandemic clearly demonstrates that it is not within easy reach.

Standing somewhat less prominently in the 2018 IPCC report on Global Warming of 1.5°C is the following observation: "1.5°C pathways that include low energy demand, low material consumption, and low GHG-intensive food consumption have the most

pronounced synergies and the lowest number of trade-offs with respect to sustainable development and the SDGs."

For the sake of the future of the planet and humanity, giving consumption reduction a stronger emphasis and a systemic treatment probably cannot wait any longer.

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