The Carbon Emission Challenge

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There are really only two data points that matter when it comes to tackling humankind's existential challenge: 51 billion and zero. The first is the number of tonnes of greenhouse gases that are typically added to the atmosphere every year. The second is the number we need to arrive at to avoid catastrophe.

While acknowledging that the challenge is daunting, and how we make things, grow things, move around, keep cool and stay warm will all need to fundamentally change, wholesale transformation is possible while maintaining lifestyles in high income countries and continuing to lift billions out of poverty.

There is a growing impetus around the concept of the "green premium". Carbon remains cheaper as a source of energy because its negative impacts – or "externalities" – aren't priced in. Governments subsidise fossil fuels because they are reliable and proven. The green premium is the additional cost of using a green alternative. In some instances – such as producing electricity using wind turbines or solar energy – it can be zero, depending on the country. In other sectors, such as concrete, fertiliser or steel production, it's enough to deter the use of clean alternatives. While wealthy countries might be able to pay a premium for these zero carbon options, that isn't currently possible for some fast-growing nations in Asia, Africa and South America. The green premium needs to be so low as to make sense to switch.

A number of different technological breakthroughs, large-scale investment in infrastructure, patient capital funding, government policy and individual action can have an impact, and provide a roadmap to getting to zero carbon emissions by our chosen date.

Zero is important: just reducing the carbon we're putting into the atmosphere simply extends the extremely limited amount of time humankind has until we hit planetary boundaries. Currently, the concentration of carbon dioxide in Earth's atmosphere is around 414.68 parts per million (ppm) – there is consensus that, once the level reaches 450ppm it will raise the global temperature above 2 degrees Celsius, triggering extreme weather events and irreversible, catastrophic change.

Short-term emission reductions from the likes of electric cars and using solar and wind for electricity generation is less than 30% of the problem. Electric cars and solar and wind power are relatively easy solutions but, if we want to really tackle climate change, all of us need to address the hard things too. We need to address how we make things like construction materials, plastics and clothing which account for 31% of emissions. Electricity consumption accounts for 27% of greenhouse gases. We need to work out how we plug in less. Growing things like plants and animals for human consumption is responsible for 18% of emissions. How do we consume differently or less? Flying planes, sailing cargo ships and driving trucks makes up 16% of emissions. How do we travel and transport stuff more sustainably? Finally, heating ourselves and our buildings up in winter, cooling them down in summer and refrigerating what we consume accounts for 6% of greenhouse gas emissions. How can we become less reliant on our temperature controllers?

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