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## Whose Technology? Contribution to GTI Forum [Technology and the Future](#)

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There is no concept as urgently in need of rethinking as technology. It is a category that obscures the modes of social organization with which it is intertwined. If asked to define it, most of us would answer that it is human ingenuity applied to nature. If that were the whole story, there would indeed be an unbroken continuity between Paleolithic stone axes and space shuttles, as mainstream narratives of human history often suggest. However, the Industrial Revolution was a more profound discontinuity than historians of technology generally acknowledge. In the late eighteenth century, British capitalists developed technologies that depended not only on ingenuity applied to nature, but also on global market prices of embodied labor and other biophysical resources. From this point on, most technological innovations have been contingent on asymmetric flows of resources in the colonial and neo-colonial world-system—that is, ecologically unequal exchange. Such asymmetric physical flows are the result of global differences in the prices of labor, land, materials, energy, and other resources, but to this day remain invisible to mainstream economics. In not acknowledging the reliance of modern technologies on such flows, we tend to think that their only social implications are in terms of downstream consequences, while ignoring that the very existence of those technologies is a manifestation of an abysmally unequal world order.

Most of the modern technologies mentioned in this discussion so far are available only to a privileged fraction of the world's population, yet they are referred to as something that “we” can choose to adopt or reject. This illustrates that the category of “technology” in the modern worldview refers to a phenomenon that is ambiguously located at the interface of natural and social science. Physicists and engineers are not asked to consider the extent to which an

advanced technology is an inherently distributed phenomenon, while economists and social scientists are not expected to understand the physical principles that it is designed to exploit. In other words, accounts of technology are perceived as having nothing to do with society, while understanding the economy requires no knowledge of nature. This binary divide between the material and the social reproduces the illusion that technology is merely a matter of revealing and harnessing the forces of nature, oblivious of the fact that the physical artifacts and infrastructures designed to do so are products of capital accumulation and unequal exchange. Technology thus seems to remain securely out of reach of critical social theory. Even Marxists are prone to conceptually sequester the “productive forces” from the “relations of production.” Given what we now know about material flows and ecologically unequal exchange, the rising productivity of British workers that Marx celebrated in the nineteenth century was largely achieved at the expense of workers and ecosystems in the peripheries of the British Empire.

Attempts by constructionists to transcend the divide between the material and the social have demonstrated how technological design is a product of social context, but they have not acknowledged that even the physical substance of technologies is socially assembled. The posthumanist “neo-materialists,” too, continue to ignore the materiality of world trade. At a time when the dilemmas of the Anthropocene are prompting us to revise our understanding of the interface between the natural and the social, it may be easier for us to grasp that even our technologies—foundational to our modern narrative of progress—are socio-natural hybrids. They are not just revelations of nature but social strategies for appropriating human labor time and natural space from other parts of the world-system.

Why is this rethinking of technology so crucial? Because technology is pervasively perceived as our savior. Technological solutions are understood as, in principle, available to everyone, once they can pay for them, and what is economically feasible—that is, purchasing power—is conceptually sequestered from what is technically feasible. This is the illusion that we must now transcend. If the ecomodernist dreams to which so many of us take refuge really were feasible for the eight billion people on the planet, we should expect them to start materializing. Yet they remain forever “around the corner,” even in the wealthier countries of the world. To the extent that technology does suggest solutions to our problems, we must concede that the category “our” only denotes

a minority of those eight billion, which means that such solutions are an illusion from the start. The global social conditions for technological transitions are systematically obscured. Photovoltaic solar power, for instance, is an option in Europe as long as the panels are built by low-wage Asian labor using minerals mined where environmental legislation is less rigorous. Another example is the recurring rhetoric on a “circular economy.” Given the wage differences, recycling will inevitably be more expensive for Europeans than importing fresh resources extracted in the periphery. There is a systematic socio-metabolic logic that displaces work and environmental loads to the Global South. Yet this is rarely a problem for either economists or engineers.

Technologies are ultimately generated by the way economic exchange is organized. Solutions to our global dilemmas must begin by reimagining how money is designed!<sup>1</sup> The central challenge for humankind is to master the artifacts that she herself has created, but that have become her masters. This certainly applies to technological artifacts, but even more fundamentally to the artifact of all-purpose money, which, in generating a globalized market, makes modern technologies possible. To achieve the Great Transition that we are hoping for, we need to consciously redesign the artifacts that in turn design us. The convivial technologies that we must aim for should make it possible for humans to sustainably draw on the resources provided by a globally average ecological footprint, rather than take abysmal global inequalities for granted. For most Europeans and North Americans, this clearly means degrowth.

## Endnotes

1. Alf Hornborg, *Nature, Society, and Justice in the Anthropocene: Unraveling the Money-Energy-Technology Complex* (Cambridge: Cambridge University Press, 2019).

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## About the Author



Alf Hornborg is an anthropologist and Professor of Human Ecology at Lund University. His research focuses on theorizing the cultural and political dimensions of human-environmental relations in different societies in space and time. His books include *The Power of the Machine*; *Global Ecology and Unequal Exchange*; *Global Magic*; and *Nature, Society, and Justice in the Anthropocene*. He has also co-edited several collections at the intersection of anthropology, environmental history, political ecology, and ecological economics, including *Rethinking Environmental History*, *The World System and the Earth System*, and *Ecology and Power*. He holds a PhD in cultural anthropology from the University of Uppsala.

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