

# Ecomodernism, Green Growth and the Imperial Arrangement

*Jason Hickel* | ORCID: 0000-0002-7490-9757

Institute for Environmental Science and Technology (ICTA-UAB),  
Autonomous University of Barcelona, Barcelona, Spain; ICREA, Barcelona,  
Spain; Department of Political Science and Public Law, Autonomous  
University of Barcelona, Barcelona, Spain; International Inequalities  
Institute, London School of Economics and Political Science, London,  
United Kingdom

Corresponding author

*jason.hickel@uab.cat*

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Ecomodernism is, in its dominant articulation, a capitalist position. It is meant to appeal to those who wish to maintain the current structure of the economy while making it compatible with ecology (Kallis and Bliss 2019). Toward this end, it proceeds from the premise—either explicit or tacit, inasmuch as no alternative arrangement is advanced—that production and distribution should remain owned and controlled by capital, and therefore driven by the imperatives of profit maximization, growth and accumulation.

As world-system scholars have demonstrated, one of the key features of capitalism is that it requires an imperial arrangement (Wallerstein 2004; Patnaik and Patnaik 2021). Capital accumulation needs an ever-increasing flow of labour and resources as inputs to production, which must be obtained at the cheapest possible price. This process entails very severe social and ecological contradictions, and cannot be sustained for long within a bounded economy. Capital accumulation in the core therefore requires a periphery from which it can obtain a steady supply of cheap inputs, and suppress rebellions with as much force as necessary, in order to maintain profits.

This core-periphery dynamic has shaped the world economy for the past 500 years. During the colonial period, core states intervened to shift

production in the periphery away from sovereign development to supply exports to the core on unfavourable terms. In the “post-colonial” era, they have sought to organize peripheral production in subordinate positions within global commodity chains dominated by core firms, while intervening—using structural adjustment programmes, sanctions and even outright invasion—to prevent Southern states from using strategies of nationalization, industrial policy and planning to achieve sovereign industrialization. Through these mechanisms, the periphery is in large part denied control over its own productive capacities, denied control of its own output, and kept in conditions of dependency and underdevelopment (Kadri 2014).

Scholars including Samri Amin, Arghiri Emmanuel, Ruy Mauro Marini and Immanuel Wallerstein argued that the high levels of consumption and accumulation in the core rely on a large net-appropriation from the periphery through unequal exchange in international trade (Wallerstein 1983; Amin 1978; Emmanuel et al. 1972; Marini 2022). We can see this for instance in the case of materials. On average, the core countries use about 28 tons of materials per capita per year, which is roughly four times over the safe threshold that industrial ecologists have proposed. Nearly half of this material is net-appropriated from the periphery (for the US the ratio is lower, for European countries the ratio is much higher) (Hickel et al. 2022). Something similar is true for the core’s consumption of embodied labour: the core states consume nearly twice as much labour as they contribute to production (Hickel et al. 2024).

This means that continued growth in the core compromises development in the periphery. Real resources and productive capacities that could be used for human development are instead diverted toward accumulation elsewhere. And while the benefits of global production are disproportionately enjoyed in the core, the ecological damages are offshored to, and suffered in, the periphery.

Ecomodernism has no answer to this problem—it does not even attempt to address it. The imperialist dynamics that prop up the core economies are, like capitalism itself, taken for granted in ecomodernist visions. This is generally true of left-wing ecomodernist visions too, which imagine that socialism could extend core-style consumption (eg, SUVs and cruise ships for all) to the entire world, without considering the world-system dynamics that underpin the core economies.

The solution is to support ongoing struggles for national liberation and self-determination in the periphery. Governments in the South need the freedom to implement socialist and developmentalist strategies to reclaim control over national productive capacities, and organize production around human needs

and national development (Amin 1987; Cabral 1966). But of course such an insurgency would in turn pose very serious challenges to capitalism in the core, as it would cut off the flow of cheap labour and resources on which these economies depend. Indeed, it is precisely to prevent such an insurgency that the core states invest so heavily in military power, which they regularly deploy to invade and attempt to destroy sovereign-seeking movements or states in the South: Vietnam, North Korea, Iraq, Libya, Palestine, etc. Ecomodernists give little indication that they wish to break from this dynamic.

Absent appropriation through unequal exchange, consumption in the core would decline by up to 50% (Hickel et al. 2024). To maintain consumption at existing levels, as ecomodernists want to do, the core economies would have to increase national labour time and domestic material extraction by a factor of two—assuming equal productivity. The alternative, as proposed by eco-socialists, is to prioritize production of, and ensure universal access to, socially necessary goods and services while reducing unnecessary production. For ecomodernists—who insist on perpetual growth as a fundamental principle—this is unacceptable.

The extent to which ecomodernists presuppose the imperial arrangement is perhaps clearest in the “green growth” scenarios that they point to as plausible pathways toward global climate mitigation. Here I use the term green growth to describe scenarios where GDP per capita continues to increase in the core for the rest of the century, while emissions decline fast enough to achieve the Paris Agreement objectives of limiting global warming to 1.5C or “well below” 2C. These scenarios, developed by modellers and included in the periodic reviews published by the IPCC, are regularly invoked by ecomodernists as evidence to support their views.

However, in recent years these scenarios have come under intensive scrutiny within the scientific community.

To begin with, a hallmark of the green growth scenarios is that they tend to maintain the current, very high, levels of energy use in the core economies. The core economies currently use on average about 150 GJ per capita per year, including energy embodied in imported goods (and minus the energy embodied in exported goods). This is roughly three times higher than the global average. It is worth noting, furthermore, that “decent living standards” (DLS) could be delivered for all with about 20 GJ per capita per year, if that was the objective of production (Hickel and Sullivan 2024).

This high energy use creates major problems. To the extent that it is provided by fossil fuels it is driving climate breakdown on a global scale. Indeed, this is why the global North is responsible for some 90% of global emissions in excess of the planetary boundary (Hickel 2020). Furthermore,

the high energy use makes sufficiently rapid decarbonization very difficult to achieve (that is, decarbonization consistent with fair shares of Paris-compliant carbon budgets), even with optimistic assumptions about the speed of renewable energy deployment. To resolve this issue, green growth scenarios resort to several deeply problematic assumptions.

First, recognizing the tension between high energy use in the core and the achievement of the Paris agreement targets, these scenarios resolve the problem by *constraining* energy use, and therefore development, in the periphery—in some cases to levels that are below what is required for even basic needs (Hickel and Slamersak 2022). This approach, which assumes and perpetuates the existing inequalities that structure the imperialist world-system, is obviously immoral and unjust.

Second, green growth scenarios tend to assume large-scale deployment of negative emissions technology in the future, mostly in the form of bioenergy with carbon capture and storage (BECCS). BECCS entails establishing massive plantations for biofuel crops, which would pull carbon out of the atmosphere before being burned in power stations where emissions would be captured and stored underground. The assumption here is that we can overshoot the Paris Agreement limits now, because we will be able to pull carbon back out of the atmosphere at some point in the future. Scientists have raised substantial questions about this approach; it is existentially risky because, if for any reason this scheme cannot be scaled in the future, we would be locked into a high-temperature trajectory (Larkin et al. 2018; Van Vuuren et al. 2017). Furthermore, BECCS would require vast tracts of land for biofuel monoculture, up to three times the size of India, exacerbating deforestation, soil depletion, water depletion, biodiversity loss, and other ecosystem damages, while constraining food availability (Creutzig et al. 2021). In other words, this approach seeks to resolve the climate problem by transmuting it into other ecological (and social) problems (Hickel et al. 2021). Alternative carbon removal strategies such as direct air carbon capture and storage (DACCS) may avoid some of these problems, but could use up to 50% of the world's current electricity generation to achieve the carbon removal rates assumed in existing scenarios, making it more difficult to decarbonize global energy supply (Realmonde et al. 2019).

Crucially, the land necessary for large-scale BECCS in these scenarios is appropriated from the global South (Hickel and Slamersak 2022). In other words, land that should be used for Southern production, development and food provisioning would be diverted instead to maintain high energy use in the core. Here too, it is clear that the imperialist structure of the world economy is reproduced, and indeed even sharpened, in these scenarios.

Some green growth scenarios take a different approach. They implement a reduction of energy use in the core, but assume this can be achieved while GDP continues to increase. In these scenarios, the dilemma is resolved through technological efficiency improvements. The main problem here is that the assumed rates of GDP/energy decoupling are not supported in the empirical literature—they are well outside even the most heroic documented achievements. High levels of GDP/energy decoupling are difficult to achieve because, as we know from empirical studies, in a growth-oriented capitalist economy, gains from efficiency improvements tend to be leveraged to *expand* processes of production and consumption, which tends to erode absolute reductions in energy or material use (Berner et al. 2022; Haberl et al. 2020; Ward et al. 2016).

It is important to emphasize that efficiency improvements and technological change are critically important to climate mitigation, and can enable us to make major gains. In fact we need more investment in this direction—investments that capital is currently not making in sufficient quantities because the necessary innovations (insulation, efficient appliances, heat pumps, public transit, and so on) are not profitable enough compared to conventional investments. The problem here is not whether technological change can be beneficial in this way, the problem is the structure of the economic system. In a post-capitalist economy, where innovation is not limited by profitability and where perpetual expansion is not the objective, efficiency improvements could in fact deliver very substantial reductions in energy use (Hickel 2023).

Finally, even with all of these problems aside, for high-income economies to achieve and maintain a decarbonized economy without any changes to the current structure of provisioning would require extraordinary levels of new material extraction. High energy use means high quantities of renewable technology and infrastructure (solar arrays, wind farms, batteries, etc) must be developed. And maintaining the existing size of the private car fleet will require one-for-one replacement by EVs. This makes it a massive and industrial undertaking, and most of the necessary materials will be obtained from the global South through supply chains that are already in many cases socially and ecologically destructive. The core states are certain to intervene, including through military power if needed, to maintain these inputs at a cheap price and to prevent Southern actions that could challenge this arrangement.

These scenarios—and the ecomodernist visions that rely on them—are not acceptable. They assume imperialist arrangements, they play loose with empirical science, and they gamble with our future, all in order to maintain high and ever-increasing aggregate output in the core which is not even needed.

What is more, this approach is clearly not working. Recent research shows that of all the high-income countries that achieved absolute decoupling of GDP from emissions in the last decade, none of them are on track to decarbonize in line with their fair-shares of Paris-compliant carbon budgets (Vogel and Hickel 2023). Indeed, at current rates they will take on average more than 200 years to reduce their emissions by 95%. Much faster mitigation is needed.

Ecosocialist visions take a fundamentally different approach. Instead of relying on speculative negative emissions technologies, they start with the objective of reducing energy use in the core in order to enable much faster mitigation. Some of this can be achieved with efficiency improvements (and in an ecosocialist scenario, finance can be directed toward accelerating necessary innovation and progress on this objective), but it also requires scaling down less-necessary forms of production and consumption (eg, private cars, fossil fuels, mansions, fast fashion, weapons, industrial beef, etc) in order to reduce energy use (and material use) directly. This is known as “demand-side”, “sufficiency-oriented” or “post-growth” mitigation in the climate literature (Kallis et al. 2025). Several recent studies modelling futures for the UK and EU show that, by using this strategy, countries can reduce their energy use by over 50%, without any loss to well-being, and thus feasibly decarbonize fast enough to achieve the Paris targets (e.g., Barrett et al. 2022).

There are now several modelling teams that are exploring post-growth climate mitigation scenarios. In addition to reducing less-necessary production in the core, these scenarios aim to achieve a full convergence of energy and material use between the core and periphery, to levels that are compatible with ecological objectives and sufficient for high levels of human development. In other words, these scenarios imply the abolition of the imperial arrangement. They also aim to achieve a more equitable distribution of resources within nations, consistent with empirical evidence on what people consider to be “fair”, such that no one falls below the consumption floor required for DLS (Millward-Hopkins et al. 2025).

Imperialism aside, ecomodernist approaches face more fundamental problems when it comes to viability. Capitalist ecomodernist visions require a very rapid and large-scale buildout of zero-carbon energy infrastructure. But, under capitalism, investment and production is organized around whatever is most profitable to capital, rather than what is most necessary for achieving social and ecological goals. This creates a problem for the energy transition, because while renewables are increasingly cheap, fossil fuels are three times more profitable, in large part because they are more conducive to monopoly power (Christophers 2025). So, capital continues to flow to fossil fuels and we

get inadequate investments in clean energy. In recent months, several major financial firms have abandoned their low-carbon investments because they are not profitable enough. In other words, ecomodernism's commitment to capitalism ultimately works against its ecological objectives. This may help explain why ecomodernists tend to promote nuclear power, because an energy grid dominated by capital-intensive forms of energy production with high barriers to entry is more likely to be profitable.

The green transition ultimately cannot be left in the hands of capital. It will require substantial public finance, public works, industrial policy and planning in order to build out necessary renewable energy capacity, as well as to undertake other low-profit or zero-profit activities such as expanding public transit, insulating buildings, and regenerating ecosystems. Furthermore, increasing these activities cannot be done while national productive capacities are already maxed out by capitalist production. It will necessarily require scaling down less-necessary production, to liberate labour, engineers, resources etc to be remobilized for this purpose. Here too, this is not something that can be achieved within capitalism. Capital will not voluntarily scale down profitable forms of production. In other words, on all fronts, the transition will require reclaiming control over production from capital and aligning it with democratically ratified objectives.

## References

- Amin, S. 1978. "Unequal Development: An Essay on the Social Formations of Peripheral Capitalism." *Science and Society* 42 (2).
- Amin, S. 1987. "A Note on the Concept of Delinking." *Review (Fernand Braudel Center)* 10 (3): 435–44.
- Barrett, J., S. Pye, S. Betts-Davies, O. Broad, J. Price, N. Eyre, et al. 2022. "Energy Demand Reduction Options for Meeting National Zero-Emission Targets in the United Kingdom." *Nature Energy* 7 (8): 726–35. <https://doi.org/10.1038/s41560-022-01057-y>.
- Berner, A., S. Bruns, A. Moneta, and D. I. Stern. 2022. "Do Energy Efficiency Improvements Reduce Energy Use? Empirical Evidence on the Economy-wide Rebound Effect in Europe and the United States." *Energy Economics* 110: 105939. <https://doi.org/10.1016/j.eneco.2022.105939>.
- Cabral, A. 1966. *The Weapon of Theory. Address Delivered to the First Tricontinental Conference of the Peoples of Asia, Africa and Latin America*. Havana, Cuba.
- Christophers, B. 2025. *The Price is Wrong: Why Capitalism won't save the Planet*. London: Verso Books.

- Creutzig, F., K. H. Erb, H. Haberl, C. Hof, C. Hunsberger, and S. Roe. 2021. "Considering Sustainability Thresholds for BECCS in IPCC and Biodiversity Assessments." *GCB Bioenergy* 13 (4): 510–5. <https://doi.org/10.1111/gcbb.12798>.
- Emmanuel, A., C. Bettelheim, and B. Pearce. 1972. *Unequal Exchange: A Study of the Imperialism of Trade*, Vol. 11. New York: Monthly Review Press.
- Haberl, H., D. Wiedenhofer, D. Virág, G. Kalt, B. Plank, P. Brockway, et al. 2020. "A Systematic Review of the Evidence on Decoupling of GDP, Resource Use and GHG Emissions, Part II: Synthesizing the Insights." *Environmental Research Letters* 15 (6): 065003. <https://doi.org/10.1088/1748-9326/ab842a>.
- Hickel, J. 2020. "Quantifying National Responsibility for Climate Breakdown: An Equality-based Attribution Approach for Carbon Dioxide Emissions in Excess of the Planetary Boundary." *The Lancet Planetary Health* 4 (9): e399–e404. [https://doi.org/10.1016/s2542-5196\(20\)30196-0](https://doi.org/10.1016/s2542-5196(20)30196-0).
- Hickel, J. 2023. "On Technology and Degrowth." *Monthly Review* 75 (3): 44–50. [https://doi.org/10.14452/mr-075-03-2023-07\\_3](https://doi.org/10.14452/mr-075-03-2023-07_3).
- Hickel, J., P. Brockway, G. Kallis, L. Keyßer, M. Lenzen, A. Slamersak, et al. 2021. "Urgent Need for Post-growth Climate Mitigation Scenarios." *Nature Energy* 6 (8): 766–8. <https://doi.org/10.1038/s41560-021-00884-9>.
- Hickel, J., C. Dorninger, H. Wieland, and I. Suwandi. 2022. "Imperialist Appropriation in the World Economy: Drain from the Global South Through Unequal Exchange, 1990–2015." *Global Environmental Change* 73. <https://doi.org/10.1016/j.gloenvcha.2022.102467>.
- Hickel, J., M. Hanbury Lemos, and F. Barbour. 2024. "Unequal Exchange of Labour in the World Economy." *Nature Communications* 15 (1): 6298. <https://doi.org/10.1038/s41467-024-49687-y>.
- Hickel, J., and A. Slamersak. 2022. "Existing Climate Mitigation Scenarios Perpetuate Colonial Inequalities." *The Lancet Planetary Health* 6 (7): e628–e631. [https://doi.org/10.1016/s2542-5196\(22\)00092-4](https://doi.org/10.1016/s2542-5196(22)00092-4).
- Hickel, J., and D. Sullivan. 2024. "How Much Growth is Required to Achieve Good Lives for All? Insights from Needs-based Analysis." *World Development Perspectives* 35: 100612. <https://doi.org/10.1016/j.wdp.2024.100612>.
- Kadri, A. 2014. *Arab Development Denied: Dynamics of Accumulation by Wars of Encroachment*. London: Anthem Press.
- Kallis, G., and S. Bliss. 2019. "Post-Environmentalism: Origins and Evolution of a Strange Idea." *Journal of Political Ecology* 26 (1): 466–85. <https://doi.org/10.2458/v26i1.23238>.
- Kallis, G., J. Hickel, D. W. O'Neill, T. Jackson, P. A. Victor, K. Raworth, et al. 2025. "Post-Growth: The Science of Wellbeing Within Planetary Boundaries." *The Lancet Planetary Health* 9 (1): e62–e78. [https://doi.org/10.1016/s2542-5196\(24\)00310-3](https://doi.org/10.1016/s2542-5196(24)00310-3).



- Larkin, A., J. Kuriakose, M. Sharmina, and K. Anderson. 2018. "What if Negative Emission Technologies Fail at Scale? Implications of the Paris Agreement for Big Emitting Nations." *Climate Policy* 18 (6): 690–714. <https://doi.org/10.1080/14693062.2017.1346498>.
- Marini, R. M. 2022. *The Dialectics of Dependency*. New York: NYU Press.
- Millward-Hopkins, J., J. Hickel, and S. Nag. 2025. "Is Growth in Consumption Occurring Where it is Most Needed?" *The Lancet Planetary Health* 9 (6): e503–10.
- Patnaik, U., and P. Patnaik. 2021. *Capital and Imperialism: Theory, History, and the Present*. New York: Monthly Review Press.
- Realmonte, G., L. Drouet, A. Gambhir, J. Glynn, A. Hawkes, A. C. Köberle, et al. 2019. "An Inter-model Assessment of the Role of Direct Air Capture in Deep Mitigation Pathways." *Nature Communications* 10 (1): 3277. <https://doi.org/10.1038/s41467-019-10842-5>.
- Van Vuuren, D. P., A. F. Hof, M. A. Van Sluisveld, and K. Riahi. 2017. "Open Discussion of Negative Emissions is Urgently Needed." *Nature Energy* 2 (12): 902–4. <https://doi.org/10.1038/s41560-017-0055-2>.
- Vogel, J., and J. Hickel. 2023. "Is Green Growth Happening? An Empirical Analysis of Achieved Versus Paris-compliant CO<sub>2</sub>–GDP Decoupling in high-income Countries." *The Lancet Planetary Health* 7 (9): e759–e769. [https://doi.org/10.1016/s2542-5196\(23\)00174-2](https://doi.org/10.1016/s2542-5196(23)00174-2).
- Wallerstein, I. 1983. *Historical Capitalism*. London: Verso Books.
- Wallerstein, I. 2004. "World-Systems Analysis: An Introduction." In *World-Systems Analysis*. Durham: Duke University Press.
- Ward, J. D., P. C. Sutton, A. D. Werner, R. Costanza, S. H. Mohr, and C. T. Simmons. 2016. "Is Decoupling GDP Growth from Environmental Impact Possible?" *PLoS One* 11 (10): e0164733. <https://doi.org/10.1371/journal.pone.0164733>.