



TABLE Explainer

What is ecomodernism?



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TABLE Explainer series



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Note that we also had exchanges with another reviewer whose comments were very useful, but who felt unable to endorse the final piece, and wishes to remain anonymous.

Note also that reviewing and advising do not constitute an endorsement, and the named reviewers should not be understood to agree with everything in the piece. Final editorial decisions, including any remaining inaccuracies and errors, are the sole responsibility of TABLE.

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Cover

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1. Introduction

Ecomodernism is an environmental philosophy rooted in the belief that technological progress can allow humans to flourish while minimising our impacts on the environment. Ecomodernists define human flourishing as both “democracy, tolerance, and pluralism” and material wellbeing in the form of access to “modern living standards” for all.¹ According to ecomodernist philosophy, an essential approach to achieving both prosperity and protecting nature is to free up land for conservation by intensifying the production of food and other resources using technology. Governments, the private sector, and civil society should work together to achieve this goal.

Ecomodernism as a movement encompasses a diversity of views. However, here we focus on the well-known [Ecomodernist Manifesto](#) of 2015, which is perhaps the most coherent exposition of the ecomodernist philosophy. This form of ecomodernism is most visible in the United States but is also influential in other countries, including the Netherlands² and the United Kingdom.³

We first describe the values, goals, and practical solutions promoted by the Manifesto and what they would mean for land use and the food system. We then explore the history of the ideas that underlie ecomodernism, including academic concepts from social science, and their relation to different forms of environmentalism. Finally, we discuss the main critiques of the values and evidence underpinning ecomodernism.

A note on scope, sources and the review process

The aim of this piece was to produce an overview of what ecomodernism is and what the main contestations are around the concept from both proponents and critics of the idea. It is beyond the scope of this piece to conduct a detailed assessment of the scientific validity of the many claims made by different stakeholders. More salient, for this piece, are the arguments that people construct about the concepts. We have therefore cited a number of sources in addition to academic journal articles, including reports and blog posts, because this is where people are talking specifically about ecomodernism.

Through TABLE’s peer review process, we had hoped to produce a description of the disagreements that “both sides” can agree accurately reflects the state of the debate. **We have failed to do this.** Some reviewers felt that the piece was strongly biased against ecomodernism, while other felt it was strongly biased in favour of it. Some felt that some of the criticisms and counterarguments to be scientifically invalid or “strawman” arguments and that they should not even be included in the piece lest, by describing them, we lend them validity. Our general approach has been to keep these descriptions of the arguments in the piece, because regardless of their validity or otherwise, they represent strong influences in the live and contentious debate around ecomodernism.

Although the review process has not resulted in agreement among the reviewers, it has however been extremely helpful in bringing several points of fundamental disagreement to the surface – these will be discussed further below. Note that one reviewer felt unable to endorse the final piece and wishes to remain anonymous.

We would like to stress that (a) we are very grateful to all our reviewers for their comments and suggestions, which have strengthened the piece, and (b) their being named as a reviewer does not imply that they agree with everything in this piece.

Box 1. How this explainer was produced

2. Ecomodernism according to the Manifesto

The term ecomodernism has been used at least as far back as 1993⁴, but has gained prominence since the 2015 publication of the [Ecomodernist Manifesto](#) by a group of 19 “scholars, scientists, campaigners, and citizens”. The authors include Ted Nordhaus and Michael Shellenberger, co-founders of [The Breakthrough Institute](#), a Californian think tank that advocates for technological solutions to environmental challenges.

The Manifesto summarises ecomodernism:

“In this, we affirm one long-standing environmental ideal, that humanity must shrink its impacts on the environment to make more room for nature, while we reject another, that human societies must harmoni[s]e with nature to avoid economic and ecological collapse.”

Figure 1 gives a simplified overview of ecomodernism’s values, goals, and solutions. The next two sections expand on each of these as described by the Manifesto; critiques of ecomodernism will be discussed in later sections.

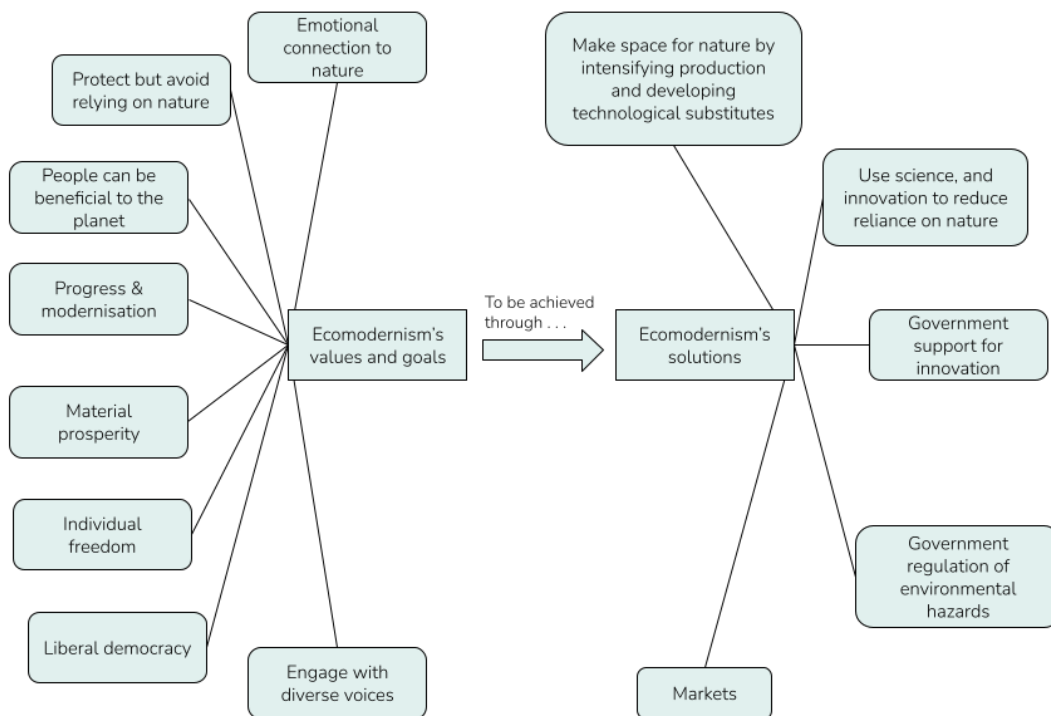


Figure 1: An overview of ecomodernism’s values and goals as well as its proposed solutions for meeting these goals. Graphic produced by TABLE.

2.1 Ecomodernism's values and goals

Ecomodernism in the form described by the Manifesto places high importance on **ending material poverty** through economic and social development, and giving all people access to “modern living standards”. It claims that people currently living in poverty rightly prioritise improving their quality of life over tackling environmental challenges⁵.

It also prioritises **progress and modernisation**, understanding them to mean “vastly improved material well-being, public health, resource productivity, economic integration, shared infrastructure, and personal freedom”.

Freedom for all individuals is important. The Manifesto refers to “liberating” people from hard agricultural labour so that they can pursue other endeavours (including arts and culture) and calls for women to be freed from “traditional gender roles” and to have control over their fertility.

People can have a good relationship with the planet; modern human society is not necessarily harmful⁶. The Manifesto states that “knowledge and technology, applied with wisdom, might allow for a good, or even great, **Anthropocene**.”

This relationship with nature is two-fold. Humans should generally **reduce their demands for natural resources**, including land use for agriculture and settlements, by increasing land use efficiency and settlement density as opposed to living rural lifestyles⁷. At the same time, there is value in having **emotional or spiritual connections to both wild and cultural landscapes**^{8,9}.

Society should be based on the principles of **democratic governance, tolerance, and pluralism** – both for their own sake, and as essential tools to navigate environmental challenges¹⁰. Although the Manifesto proposes specific technological solutions (see the next section), it recognises that they will not suit all social, economic, cultural, and political contexts. To avoid imposing top-down solutions, it is therefore important to **engage with diverse voices**¹¹.

2.2 Ecomodernism's proposed solutions

To reach ecomodernism’s goals, the Manifesto sets out a general approach of **making space for nature by intensifying production** – that is, for yields per unit of resource use (including land and labour) to be increased – as well as by developing **substitute technologies**, such as nuclear energy in place of wood for fuel¹². **Science and innovation** should therefore be used with the aim of reducing human reliance on goods and services from ecosystems¹³.

Ecomodernists therefore **reject societal dependence on forms of production that they see as inefficient** in their use of either land or labour. For example, the Manifesto raises concerns about the large area of land used by climate solutions such as biofuels, and argues that pre-industrial societies had greater environmental impacts per capita than we have today – hence their subsistence strategies are not suited to sustaining today’s much larger populations¹⁴. It also sees labour-intensive agriculture as an impediment to modernisation (specifically urbanisation), and labour-efficient agriculture as freeing people to pursue other endeavours¹⁵.

The Manifesto argues that “[t]echnological progress is not inevitable” if left to the market alone. Although it **does not support central planning of the economy by the state**¹⁶ and believes that markets have an important role to play, **governments should actively support innovation** by collaborating with businesses and civil society, as well as **regulate environmental hazards**.



Image: A researcher examines cell culture vessels, Mosa Meat R&D Team, Mosa Meat Press Kit



Image: Drone precision agriculture, Herney, Pixabay, Pixabay Licence

3. An ecomodernist food system

Ecomodernism applies to the whole economy, but is particularly relevant to food because farming occupies so much of the Earth's surface: one third of ice-free land is permanent grazing or cropland, with more being intermittently used for seasonal grazing¹⁷.

Ecomodernists advocate for agriculture to be intensified by drawing on scientific developments and technological substitutes to increase outputs of food per unit area of land. The goal is to [spare land](#) to support nature conservation – but note that ecomodernists understand “wild nature” to include many landscapes that have long been inhabited and influenced by people. The Manifesto co-authors note that specific approaches to conservation are likely to vary depending on the preferences of local communities, in some cases encompassing a land-sharing model where agriculture and wild nature co-exist on the same land.

The Manifesto mentions few specific agricultural technologies other than (presumably intensive forms of) [aquaculture](#). However, specific recommendations are set out in various publications from The Breakthrough Institute¹⁸. The report [Nature Unbound](#), written by three Manifesto co-authors, gives examples of both substitution and intensification to help move the food system up a “technology ladder” away from the harvesting of wild biomass, towards controlled production of biomass, and ultimately towards fully synthetic options. Note, however, that ecomodernists do not aim to completely shift to any one mode of production, but rather aim to shift only to the extent required to conserve nature while sustaining societies¹⁹. Ecomodernists advocate for a food system that:

- Shifts away from unsustainable forms of harvesting of wild fish in favour of sustainable forms of **aquaculture** – specifically forms that minimise side effects such as eutrophication and the destruction of coastal habitats such as mangroves. Examples include closed indoor tanks that recirculate their water, and fish farms placed in deep offshore waters. Both options rely on low-carbon energy, for pumps, filters, or long boat trips to offshore farms^{20,21}.
- Favours **rearing livestock** over unregulated hunting of wild animals for meat (the latter a practice still common in many countries) to reduce harm to biodiversity (particularly because some wildlife can be slow to reproduce, so even low levels of harvesting can be damaging)²².
- **Intensifies meat and dairy production** to meet rising demand on existing pasture to spare further land from conversion, and possibly even free up land for nature conservation²³. Nature Unbound cites a study that finds conventional beef feedlot systems in the United States produce considerably lower environmental impacts across several categories when compared to grass-fed beef systems²⁴.

- Replaces draft animals (still used in many countries) with **tractors**, to reduce the land area used to feed these animals²⁵.
- Uses **synthetic fertiliser in addition to organic fertilisers**. Ecomodernists make the argument that using only organic fertilisers (such as crop residues, manure, compost, human waste, and legumes grown to fix nitrogen) may require twice as much land to produce a given amount of food, compared to using synthetic fertilisers²⁶. Ecomodernists seek to reduce nitrogen pollution from all forms of fertiliser, for example by using precision farming equipment to apply only as much fertiliser as is required²⁷.
- Reduces harm to non-target species through **selective pest control**, such as monitoring tools, precise application of pesticides, and genetically modified plants that deter insects²⁸.
- Is supported by **government investment** in innovations such as **cell-cultured meat** and **plant-based alternatives** to meat^{29,30}.

Ecomodernists place relatively little emphasis on reducing impacts through dietary change, although they do note the current disparity in consumption between richer and poorer nations. Instead, the discussion is about how to meet the predicted rise in demand (e.g. for meat) as sustainably as possible. Saying that, The Breakthrough Institute sees the trend of Americans eating pork or chicken in place of beef as environmentally beneficial, although politically difficult to scale up³¹.

4. The historical context of ecomodernism

The cluster of ideas associated with ecomodernism can also be found to various degrees in earlier schools of thought that, similarly, tend to view the continued development of technology as essential for protecting nature and for providing sustainable material prosperity.

One example is **Ecological Modernisation Theory (EMT)**, developed in Europe during the 1980s and 1990s within the academic field of environmental social science. EMT calls for the process of modernisation to be “ecologised” using tools such as Life Cycle Assessment, environmental reporting and auditing, eco-labelling, certification schemes and environmental standards to integrate the cost of **externalities** into the economy^{32,33}.

Ecomodernism and EMT share several elements, to the extent that American ecomodernism has been described as “reinventing the wheel” of European 1980s EMT thinking³⁴. Both schools of thought:

- Do not see “modernity” (which they define broadly, with reference to material wellbeing, public health, and so on) as inherently problematic, and for example do not argue for agrarian societies or for a halt to urbanisation^{35,36}
- Allow a central role for technological innovation as a route to addressing environmental and social problems
- Distance themselves from theories such as degrowth that emphasise a reduction in material production and consumption, and
- Support a role for both state and market actors.

Ecomodernism is arguably more normative than EMT: it promotes a specific vision, reflecting its think tank origins. EMT is normative only in the sense that it believes environmental concerns should be integrated into the economy; it does not engage in activism in the same way that think tanks often do.

Ecomodernism also builds on **post-environmentalism**, outlined by Manifesto co-authors Shellenberger and Nordhaus in their 2004 essay *The Death of Environmentalism*³⁷. Post-environmentalism proposes that, to gain widespread

support, environmentalists must anchor their policies to core values held by the public, rather than focus on “narrow” technical issues such as vehicle mileage standards.

Other environmental movements of the 2000s that also view technology favourably include: **bright green environmentalism**, which distances itself from the perceived misanthropy and frugality of what it calls “dark green environmentalism” and would instead direct innovation towards providing abundant, sustainable goods and service³⁸; and **technogaianism**, which claims that the environment can only be restored using technologies such as geoengineering and biotechnology for treating hazardous waste³⁹. Despite some alignment between these schools of thought and ecomodernism, ecomodernists do not appear to directly refer to either frequently.

Critiques of ecomodernism – discussed in more detail below – come from several directions. Many critiques emerge from philosophies focused on scaling down human activity – encompassing population, material affluence, and use of damaging technologies⁴⁰ – in a planned and equitable way, to fit within environmental limits. Notably, the **degrowth** movement argues the need for a planned reduction of material production and consumption in richer countries.

5. Contestations surrounding ecomodernism

Ecomodernism has provoked significant debate⁴¹, with critical reactions clustering around both its evidence base and its values (see Figure 2). There is in practice some overlap between the two clusters, since values influence how evidence is selected and used.

With many of the critiques that we describe here, there is a gap between how the critics define ecomodernism, and how ecomodernists themselves define the concept. Ecomodernists may therefore see many of these critiques as “straw man” arguments, while critics may similarly feel that their arguments are misrepresented by ecomodernism’s counterarguments. We have attempted to even-handedly represent the views of both critics and ecomodernists and, where possible, tease out the differences in how each party perceives ecomodernism.

It should also be noted that individual ecomodernists may hold different views on the exact goals and solutions of ecomodernism. We have attempted to reflect some of the diversity within ecomodernism here.

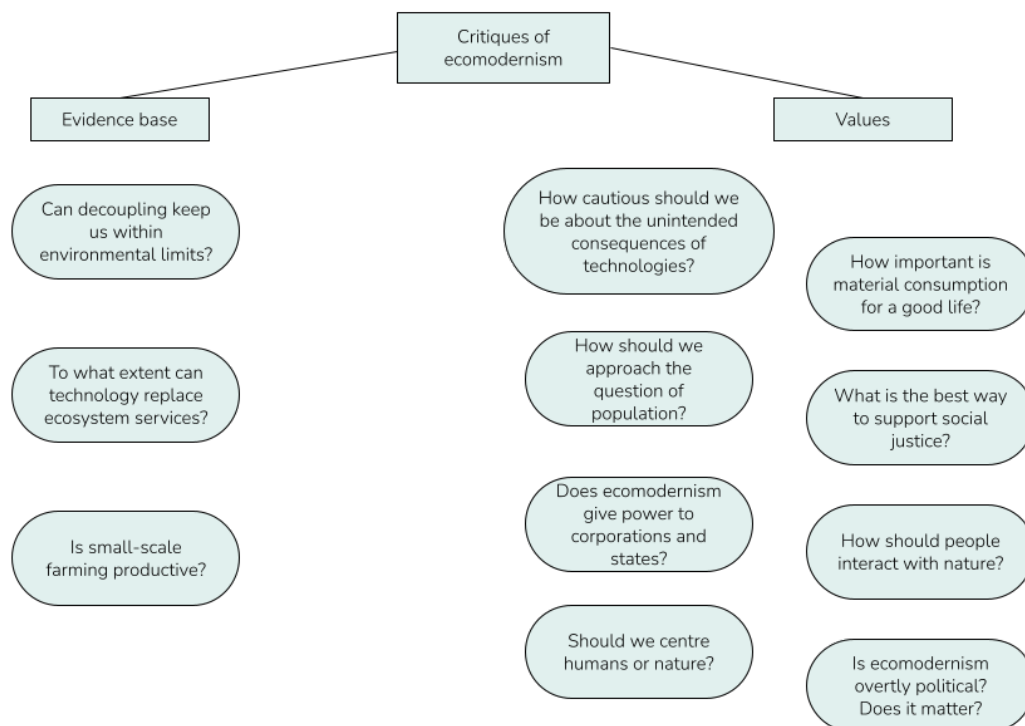


Figure 2: Contestations around ecomodernism, divided very roughly into those linked to evidence and to values. Graphic produced by TABLE.

5.1 Contestations around ecomodernism's evidence base

Can decoupling keep us within environmental limits?

Is ecomodernism's intention of providing material prosperity and protecting nature at the same time feasible? Critiques – particularly from the degrowth movement – tend to focus on whether ecomodernism would result in sufficient **decoupling** of economic activity to stay within environmental limits. We can break this down into several sub-questions.

First, what is meant by environmental limits?

The 2009 **planetary boundaries** framework quantifies nine environmental limits, including climate change and biodiversity loss, which it argues must not be breached^{42,43}. Similarly, the 1972 report *The Limits to Growth* warned that overshooting the planet's **carrying capacity** – its ability to provide resources and assimilate wastes – could lead to social and ecological collapse⁴⁴. A connected idea is **tipping points**: thresholds at which a small “push” (such as additional greenhouse gas emissions) can lead to a runaway feedback loop, resulting in the sudden shift of a local ecosystem or the entire planet to a new state (say, a much hotter climate) that is irreversible on human timescales. Furthermore, one tipping point could trigger others in a cascade⁴⁵.

While ecomodernists acknowledge the grave impacts of environmental damage⁴⁶, some emphasise that some scientists criticise the idea of hard limits in relation to both environmental harm and resource availability.

Regarding resource availability, ecomodernists have suggested there is enough energy available from solar, wind,

nuclear and other resources, and technologies to power the production of substitutes for scarce natural resources. As a result, they feel that the theoretical upper limits to resource availability are too high to be a meaningful constraint on material consumption⁴⁷, and that notions of a fixed carrying capacity are faulty because of our capacity to engineer greater yields⁴⁸. The argument that energy availability can circumvent resource availability limits, however, does not explicitly address the materials for which few or no technically adequate substitutes are available, such as some micronutrients in agriculture – the issue being that the factors that limit material productivity might change as output levels grow⁴⁹.

Some ecomodernists argue that planetary boundaries are not a valid concept. What this means in more detail is that – according to Nordhaus, Shellenberger and Blomqvist in a 2012 report – six of the supposed planetary boundaries are not linked to global-level tipping points, and hence any “boundary” set in relation to them is an arbitrary expression of the preferred state of the system⁵⁰. They conclude that environmental impacts in these “non-threshold” categories are better managed at the regional (rather than global) level, and in terms of trade-offs rather than absolute boundaries. The report does, however, say that there are global tipping points in some categories, including climate change, where feedback effects have likely already begun to operate.

Second, **is absolute decoupling of economic activity from environmental impacts possible?** Note that relative decoupling means total impacts or resource use rise despite increased efficiency, while absolute decoupling means total impacts decrease⁵¹. Note also that while material consumption and economic growth are not the same thing, ecomodernists tend to speak favourably about economic growth⁵² and the Manifesto talks about decoupling in relation to economic growth; meanwhile, studies on decoupling tend to refer to economic growth rather than to material consumption.

Some critics argue, based on historical trends and modelling, that growth will worsen impacts and that ecomodernism is too optimistic – particularly if efficiency encourages rebounds in consumption as described by the Jevons Paradox^{53,54,55,56}.

On the other hand, The Breakthrough Institute reports that 32 countries (including the United States and several European countries) have achieved absolute decoupling between their overall economic growth and climate impact (both for territorial and consumption emissions)⁵⁷. Absolute decoupling has been reported in a limited number of other cases including global sulphur dioxide pollution⁵⁸, global greenhouse gas emissions from farming⁵⁹, and water extraction in the United States⁶⁰.

There is more evidence to show relative decoupling in some areas: for example, farmland area and wood consumption have declined on a per capita basis over the past few decades (both at the global level), while the totals have increased over the same time period and then appear to be plateauing recently. In other areas, such as water use, total use continues to trend upwards despite plateauing per capita use⁶¹.

Ecomodernists interpret the trends in relative decoupling hopefully, arguing that they could lead to absolute decoupling this century⁶². Ecomodernists also tend to see economic growth itself as a driver of decoupling: the Manifesto claims that societies can become more resource-efficient as they grow richer and Nordhaus argues that demand for many goods and services saturates as countries grow wealthier^{63,64}.

Critics dispute some ecomodernist claims about resource efficiency.

For instance, one response to the ecomodernist Manifesto argues that the largest cities use a greater share of the world’s electricity and gasoline and produce a greater share of waste than the share of the world’s population that they are home to⁶⁵. (The data source cited by that response also shows that, compared to their share of population, megacities use the same share of total energy, and a lower share of water⁶⁶.)

While the Manifesto notes that net reforestation is happening in some parts of the world, respondents point out that at the global level, net deforestation continues⁶⁷ including in biodiversity hotspot regions.

Several empirical studies question the premise that agricultural intensification leads to a decrease in the area of land used. For example, one finds that simultaneous increases in yield and decreases in the area of land cultivated for ten major crops were unusual, both nationally and globally, between 1970 and 2005, and are more likely to occur in countries that have both rising grain imports and conservation set-aside programmes⁶⁸. Another found that yield increases caused no reduction in per capita cropland use in developed countries, and only weak reductions in per capita cropland use in developing countries⁶⁹. A third distinguishes between different types of intensification: while intensification driven by market demand (say, a shift to crop types with a higher market value) often leads to land expansion and deforestation, intensification driven by technology (i.e. when a technological development permits increased yields for the same level of inputs) tends to lead to land-sparing at the global level. It reports that natural resource governance is needed in addition to technological intensification if deforestation is to be halted – note that, as described above, ecomodernists recommend both governance and technology solutions⁷⁰.

Third, would ecomodernism's solutions offer sufficiently rapid and large absolute decoupling to avert environmental tipping points? Critics raising this question tend to assume that the planetary boundaries framework is valid. As discussed above there is debate over whether all proposed boundaries actually contain global-level tipping points. Both degrowthers and ecomodernists, however, acknowledge (as noted above) the existence of tipping points in the global climate system.

In The Breakthrough Institute's decoupling study, the decline in consumption-based emissions over a period of 14 years up to 2019 ranges from 1% (Norway) to 52% (Ireland)⁷¹. Research suggests that no country yet meets all minimum thresholds for the wellbeing of its citizens while staying within its "fair share" of resource use according to the (disputed) planetary boundaries framework⁷² and that technological improvement must happen many times faster than is currently the case if we are decarbonise the economy rapidly enough to avoid dangerous climate change⁷³. A 2020 review paper concludes that absolute decoupling between economic activity and greenhouse gas emissions is occurring in some countries (driven by environmental policies), but not to the extent required to meet stringent climate targets⁷⁴. Critics including degrowthers fear that ecomodernism is not radical enough to cut impacts quickly, since it abstains from criticising economic growth and argues that people generally seek to follow the consumption patterns of currently richer nations^{75,76,77,78,79}.

Is small-scale farming productive?

The Manifesto claims that small-scale farming is less productive, but critics say the evidence shows **smaller farms, on average, have higher yields per hectare than larger farms**, partly because of high levels of manual labour^{80,81}. Ecomodernists take the view that the relevant comparison is not between different sizes of farms within poorer nations, but between the relatively low yields⁸² of any size of farm in poorer countries and the several-fold higher yields of farms in richer countries (where farms tend to be large and intensified). Furthermore, they argue that centring the food system on smallholder labour could trap large rural populations in poverty⁸³.

To what extent can technology replace ecosystems services?

As discussed previously, ecomodernists advocate for a general shift away from depending on ecosystems and wild biomass, towards technological substitutes. This should not be interpreted to mean that ecomodernists wish to completely decouple the economy from nature. Indeed, while some critics note that **not all ecosystem services can easily be augmented or replaced with technology**, ecomodernists also acknowledge this point. For example, while nutrient cycling can be replaced to some extent with synthetic fertilisers, air pollutants can be removed by filters instead of trees, and desalination and water treatment can be used to supplement the natural water cycle, examples of ecosystems services that are harder to replace altogether include photosynthesis and decomposition⁸⁴.

It is worth noting that the term "ecosystems services" is itself contested, for example on the grounds that it may

be ineffective in gaining public support for conservation, promotes the commodification or exploitation of nature, and is anthropocentric^{85,86}. Ecomodernism only aligns to a small extent with market-based views of nature. The report *Nature Unbound* argues that placing a market value on ecosystems services, as a standalone measure, could help make conservation economically feasible in some limited circumstances and on limited areas of land. It argues that achieving conservation will in most cases require additional measures, such as cooperation of NGOs and policymakers to plan land use, and the active promotion of technologies to achieve higher yields⁸⁷.

5.2 Contestations around ecomodernism's values

How cautious should we be about the unintended consequences of technologies?

Critics argue that ecomodernism might underestimate the impacts of **side effects and unintended consequences** of technology, such as nuclear waste, reliance on global supply chains vulnerable to disruption, or the escape of genetically modified organisms or their genes^{88,89,90}. These side effects are often difficult to predict for novel technologies, especially if there are rebound effects on consumption patterns⁹¹.

The critiques cited above (all published in 2015) appear to have based their assessment primarily on the Manifesto, which does acknowledge some of the impacts of modern technologies, particularly fossil fuels, on ecosystems and the climate. However, the Manifesto gives a very limited treatment of potential hazards arising from monoculture farming, biotechnology, microplastic pollution and overfishing, to give just a few examples. Many later publications from The Breakthrough Institute do address some of these issues in detail⁹². It is therefore not (or no longer) accurate to say that ecomodernists ignore the potential side effects of technologies.

Some environmentalists favour using the **precautionary principle** regarding novel technologies, which recommends treading carefully when the impacts of a technology are not yet clear⁹³. In response, ecomodernists have promoted two other concepts. First, the **proactionary principle**, which is the idea that failure to use available technologies can be more dangerous than shying away from their possible negative impacts⁹⁴. Second, **intended consequences** – an idea that emphasises the risks of inaction and favours inclusive decision-making to identify and mitigate the risks of interventions⁹⁵.

How important is material consumption for a good life?

Ecomodernists tend to believe that material prosperity (including access to energy) is a key contributor to quality of life^{96,97}. In particular, they favour lifting the poorest people out of material poverty even when that increases their environmental impacts^{98,99}; and some also stress the centrality of social equity in designing conservation programmes¹⁰⁰. As discussed in the decoupling section above, ecomodernism is uncritical of economic growth, but thinks growth is unlikely to continue at high rates in richer countries. It puts little emphasis on constraining consumption patterns in either richer or poorer countries (in contrast to strands of environmentalism that focus on changing individual consumption patterns, for example by focusing on personal carbon footprints¹⁰¹), aiming instead to shift societal systems towards more efficient and less environmentally harmful strategies for meeting societal demands.

Many environmentalists who do not align with ecomodernism also agree with helping people escape material poverty. An early example is the 1987 Brundtland Report, which emphasises that human society risks breaching environmental limits at the same time as stressing the need for “sustainable development” to eliminate material poverty¹⁰².

Many critics feel ecomodernism simplistically equates modernity and wellbeing with material consumption as well as

urbanisation, productivity, and economic growth^{103,104}. The underlying tension here is about the relative emphasis that people place on the many factors contributing to a “good” life.

Degrowth advocates believe that the current paradigm of economic growth does not satisfy the most important human needs. Instead, they aspire to an alternative vision of progress, which is less founded on material consumption and whose elements include a sharing economy, shorter working hours, meaningful pursuits and community interactions¹⁰⁵. Elements of degrowth thinking have been drawn from earlier schools of thought including the simple living movement (which has roots in Christianity and certain Eastern religious traditions)¹⁰⁶ and anti-materialist elements of the hippie movement of the 1960s and 1970s¹⁰⁷.

Some critics feel that ecomodernism pays too little attention to ways of living well that involving consuming less than current patterns in richer countries, once basic material needs such as healthcare have been met¹⁰⁸. Others feel that ecomodernism is “condescending” towards poorer and less industrialised societies, downplays religion, spirituality, and Indigenous cultures, and sees agricultural labour as a burden from which people need to be liberated¹⁰⁹.

Furthermore, the Manifesto and ecomodernist writings more broadly say little about the potential downsides of high material consumption (quite apart from environmental impacts)¹¹⁰, such as the negative effects on mental health of excessive consumerism or ubiquitous advertising. Critics also feel that ecomodernism pays too little attention to the downsides of social inequality within richer countries – for example, to the argument that health and social problems in rich countries are more strongly influenced by income inequality than by average income¹¹¹ – and misses the opportunity to alleviate poverty through redistribution of resources¹¹².

Part of the difference in perception of ecomodernism here between its critics and proponents is whether ecomodernism is prescriptive or enabling. Critics think ecomodernism pushes one way of life – modern, urban, and based on higher material consumption – as the best and ignores ways of life that do not depend on industrial modernity. Defenders of ecomodernism instead think it merely seeks to give people greater choice in how they live, work, and consume¹¹³.

How should we approach the question of population?

There are many different interpretations of the significance of human population. Some environmentalists stress the social benefits of slowing or reversing human population growth, such as better access to housing for young people, higher wages, and the empowerment of women^{114,115,116}. Others criticise certain strands of overpopulation discourse (notably 18th and 19th century Malthusianism¹¹⁷ and the 1968 book *The Population Bomb*¹¹⁸) as racist and misanthropic for giving more importance to managing birth rates in poorer countries than to reducing material consumption in richer countries¹¹⁹.

Similarly to many environmentalists, ecomodernists tend to take the view that the process of escaping material poverty is a driver of lower birth rates. Hence, ecomodernism does not perceive a trade-off between poverty reduction and slowing population growth, but rather sees them as synergistic¹²⁰. Ecomodernists predict, based on demographic trends, that our numbers are likely to peak this century, stressing that human reproduction rates are now below replacement level in most of the world.

What is the best way to support social justice?

Part of the reason for ecomodernism’s emphasis on material wellbeing is that ecomodernists believe material prosperity for all is an essential component of social justice¹²¹. Some ecomodernists also argue that it is more important and effective to provide equitable access to wealth and infrastructure than to focus on the causes of unequal exposure to adversity^{122,123}. For example, some suggest that environmental policies can provide better health outcomes in marginalised communities when those policies are universal, not specifically aimed at people oppressed

by (say) race or class¹²⁴.

However, beyond supporting democracy, pluralism, and the general principle of respecting local preferences, the Manifesto says little about how to resolve long-standing structural power imbalances such as systemic racism and sexism, economic class, or geopolitical relations. Critics say ecomodernism overemphasises the role of modernisation – as opposed to active struggles for social justice – in liberating women from traditional social roles and ethnic minorities from oppression¹²⁵, and argue that social inequality within a country does not fall as wealth grows¹²⁶.

Another critique is that the Manifesto’s conception of “stages of development from underdeveloped subsistence economies to fully developed capitalist service economies” may not be possible, or desirable for all countries to follow, since the wealth of richer countries depends (critics argue) on exploiting poorer countries and people, for example through slavery and colonial violence^{127,128,129,130}.

Ecomodernist ideas about social justice appear to be in the process of developing. See for example The Breakthrough Institute’s 2021 [special journal issue on Ecomodern Justice](#). These ideas include: that climate policies in California have placed a disproportionate cost burden on the poorest communities of colour¹³¹; that the Green Revolution helped India break its dependence on Western grain imports¹³²; and that Bangladesh has achieved rapidly improved living standards and self-determination as a country in part through investing in the productivity of its agricultural sector¹³³.

Does ecomodernism give power to corporations and states?

Concerns have been voiced in relation to the power dynamics – involving both corporations and states – that may accompany some solutions preferred by ecomodernists^{134,135}.

Some critics think that the large-scale, intensive technologies favoured by ecomodernism suit powerful, wealthy corporations that have the resources to implement these solutions, and are simply a continuation of existing trends towards intensification, thus favouring the beneficiaries of the status quo. Ecomodernism has therefore been critiqued as entrenching unjust or exploitative power structures, for example by protecting the existing economic interests of private industry¹³⁶, deepening wealth inequalities¹³⁷, undermining or doing nothing to enhance land rights for indigenous peoples, small scale farmers or the general population (on account of its association with land-sparing)¹³⁸, or doing too little to rebalance the influence that profit-driven corporations and lobbyists have over environmental policies and consumption patterns¹³⁹.

The Manifesto argues that modernisation is not synonymous with capitalism and corporate power, on the basis that modernisation is a broader process including social, cultural, economic, political, and technological development¹⁴⁰. Furthermore, some ecomodernists argue that the most effective way to conserve biodiversity is to empower Indigenous and local communities¹⁴¹.

From another perspective, free market thinkers might be equally concerned about the power dynamics or market distortions caused by the top-down government interventions that are also favoured by ecomodernism, for example subsidies and environmental regulations¹⁴². It is not surprising that ecomodernism might attract criticism from both left- and right-wing thinkers, since it does not fall neatly at either end of the traditional political spectrum and instead contains elements of both camps¹⁴³. Given ecomodernism’s stated preference for locally and nationally determined technological solutions, as opposed to top-down choices, criticisms tied to specific policies or technologies may not reflect the full diversity of views held by ecomodernists.

How should people interact with nature?

Ecomodernism's proposed relationship between people and nature has been critiqued in several ways.

One critic says that ecomodernism relies on "outdated notions of nature as passive, pristine and only able to prosper apart from us"¹⁴⁴. If true, this could be problematic because the trope of "pristine nature" has historically been used by state and colonial powers to justify violence, such as the ejection of Indigenous people from what was incorrectly seen as wild, unused land by settlers in the United States¹⁴⁵.

However, many ecomodernists would strongly reject the accusation that they rely on the notion of pristine nature, and indeed some stress that conservation can succeed in the context of many different human cultures¹⁴⁶. The Manifesto and some separate publications by its authors note that most landscapes have been influenced by humans for millennia, and that there is no clear "pre-human" baseline to which landscapes can be returned^{147,148}. Ecomodernists assert that using some land intensively to spare other large swathes of land for conservation or restoration of nature does not require a belief in pristine landscapes.

Another critique is that ecomodernism presents a "polarised" vision of clearly separated areas of "nature versus non-nature" – a perception that seems to be based on ecomodernism's aim of making more room for nature conservation¹⁴⁹.

The Manifesto does praise the potential of urbanisation and intensification for making more room for non-human species. However, it recognises that not all communities will choose a land-sparing model, and ecomodernists favour varying degrees of human interaction with areas of "nature". For example, Emma Marris favours the "interwoven decoupling" model, in which there are extensive conservation areas, but in which all people also have access to a variety of green spaces for purposes ranging from urban vegetable gardening to traditional food gathering to rock climbing¹⁵⁰. Erle Ellis argues that the traditional uses of lands and waters by local and indigenous communities are generally crucial to the success of wildlife conservation measures¹⁵¹.

There is some debate as to whether and why people in industrial societies might value nature. Ecomodernists argue that people tend to care more about conserving wild nature when they no longer depend directly on it for their physical wellbeing¹⁵². Other thinkers, including some ecomodernists, argue that in fact it is poorer communities who are dependent on nature who are at the forefront of defending ecosystems against actions by corporations or states¹⁵³.

In a contrasting ecomodernist view, Ruth DeFries says "there's no intrinsic value to nature for most people and that's okay"¹⁵⁴. Indeed, ecomodernists depart from environmental movements that assign intrinsic value to rural living or nature itself¹⁵⁵, and would prefer to move away from some traditional, Indigenous, or subsistence practices in the cases they are carried out at unsustainable levels, such as environmentally harmful levels of firewood or bush meat harvesting¹⁵⁶.

Should we centre humans or nature?

Ecomodernism primarily takes an **anthropocentric** approach – that is, it centres human wellbeing, while seeing human thriving as connected with conserving ecosystems and species (as do some other strands of environmentalism). Some critics think ecomodernism sees humans as the ones who should decide what happens to nature¹⁵⁷.

Schools of thought that differ from ecomodernism's human-centric framing include **deep ecology**, which believes that all living beings have inherent value regardless of their utility to us, and **sentientism**, which assigns moral worth to beings (including humans, animals and artificial intelligence) depending on their capacity to experience "suffering and flourishing". These movements may see ecomodernism as lacking through not giving non-human individuals, species, or ecosystems moral status. Deep ecology critiques technofixes as too narrow in scope and condemns "industrial

culture” for treating nature only as a convenient, profitable resource¹⁵⁸.

Arguably, ecomodernism and non-anthropocentric movements such as deep ecology place similar levels of importance on making space for non-human life to flourish, but they do so for different reasons.

Is ecomodernism overtly political? Does it matter?

Finally, there is a cluster of concerns around the political motivation of ecomodernism. Nordhaus and Shellenberger have experience in communications, opinion research, and politics (Shellenberger ran as a Democratic candidate for governor of California in 2018). Critics suggest they may have used this expertise to carefully construct an environmental narrative with values that appeal across political divides, for example to gain the support of people concerned with jobs, security, and economic growth¹⁵⁹. The concern is that such a narrative may avoid less politically acceptable – but, in the eyes of critics, necessary – environmental measures, such as lifestyle change.

Some critics say that ecomodernism is covered widely and positively by the media, which they attribute to its partial alignment with the media’s preferred political and economic narratives (such as progressivist thought and capitalist market systems)^{160,161,162}. Indeed, if ecomodernism was indeed conceived with political popularity in mind, it would make sense that it is well-received by some media outlets. However, some ecomodernists feel that the media instead prefers environmental crisis narratives instead of those that align with ecomodernism’s preferred solutions. Our reviewers were divided on the point of whether ecomodernist narratives receive favourable media coverage.

The counterargument to concerns about political motivation is that framing messages to align with the target audience’s pre-existing beliefs or values is a pragmatic and widely researched approach for increasing the effectiveness of environmental interventions, as opposed to a harmful approach¹⁶³. Emphasising alignment with widely held values may be necessary if environmental conservation is to become politically successful in democratic countries. Indeed, one co-author states that the Manifesto was aimed at people who are dissatisfied with both the perceived negativity of traditional left-wing green politics and the lack of serious attention given to environmental issues by some right-wing free-market thinkers¹⁶⁴.

6. Conclusion

Ecomodernism aims to provide material prosperity for everyone while minimising harm to the biosphere. It sees technological progress as an important method of partially decoupling humanity’s material requirements from nature by intensifying production of goods such as food.

In seeking solutions that serve both people and the planet, ecomodernism has drawn criticism from those who: think technology does not offer sufficiently rapid decoupling between economic growth and environmental impacts; argue we should be cautious about the unintended side effects of novel technologies; feel it does not fully acknowledge the significant tensions that can exist between material consumption, social justice, and ecology; fear that it does not sufficiently address questions of power and therefore underestimate the extent to which corporate and state power dynamics can hinder environmental action; question its ideas about what makes for a good life; or are wary of its preference for urbanisation and land-sparing.

Environmentalists and social justice advocates may find themselves torn between ecomodernism’s advocacy of economic development to reduce poverty and the idea of seeking ways of living well that shrink human activities and our material consumption to minimise harm to the biosphere. Where can a pragmatic balance be found, particularly as we approach potential tipping points in the climate system? Will policies to support transitions to new technologies and further development of those technologies be quick enough, or do we need – additionally or instead – policies that incentivise drastic short-term changes to lifestyles in richer countries? Is thinking in terms of trade-offs between prosperity and environmental impacts the best approach, or are prosperity and sustainability

synergistic?

Technologies such as meat substitutes and solar panels are advancing rapidly, and even some critics of ecomodernism have embraced the game-changing potential of new technologies. For example, environmental writer George Monbiot, who has spoken out against ecomodernism's understanding of modernity, believes "farmfree" fermentation of protein using microbes could free up vast swathes of land for rewilding and carbon sequestration – an approach in line with ecomodernism's tendency to prefer land-sparing, although at least one ecomodernist thinks that energy requirements make this scenario impractical in the short term^{165,166}.

Significant questions remain as to how ecomodernist approaches would play out in practice over the long-term. For example, what happens when ecomodernism encounters local preferences that go against its default assumption of land-sparing, for example in areas where extensive farming has significant social, economic, cultural, spiritual, or emotional benefits for people? And what role would belief systems other than "Western" science, for example Indigenous frameworks for ecological management, play in shaping an ecomodernist food system?

As discussed in Box 1, we asked reviewers from both ecomodernist and critical perspectives to comment on this piece. We found several issues where the opinions of some reviewers were in opposition to each other, to the extent that it was difficult even to describe the disagreements in a manner acceptable to all parties. Some of the key areas of tension were:

- **Whether the planetary boundaries concept is scientifically valid.** One reviewer was of the opinion that it is problematic even to mention the idea of environmental limits or planetary boundaries as a critique of ecomodernism, for fear of giving those critiques more credibility; another assumed that most people agree on the idea that we should avoid critical thresholds of environmental damage.
- **The relationship between ecomodernist narratives and the media.** One reviewer viewed ecomodernism as essentially a form of "business as usual" and therefore in line with mainstream media narratives and framings, while another felt very strongly that ecomodernism is unpopular with the media.
- **Whether the ecomodernist movement acts in good faith.** One reviewer felt that ecomodernism is a tactic to protect the beneficiaries of the economic status quo, while another felt that this perception is a slur (to ecomodernism) so unjust that it is better not to mention it.
- **Whether agricultural labour is a burden from which people should be liberated.** Some reviewers agreed with this criticism of ecomodernism, on the grounds that ecomodernists promote an urbanised lifestyle as the best or most desirable way of living. Others took it for granted that agricultural labour is burdensome, and were surprised that "liberation" from agricultural labour could be seen as a negative or inaccurate framing by critics of ecomodernism.

It is outside the scope of this piece to settle the science on whether there are indeed planetary boundaries or to assess media bias towards or against ecomodernism. What instead we have tried to do is identify some key underlying tensions that fuel the divide between ecomodernism and strongly differing movements such as degrowth. The review process has, however, also shown some points of consensus:

- Despite disagreement about planetary boundaries, reviewers from both ecomodernist and critical perspectives agree that **tipping points exist in the climate system.**
- One "degrowth" reviewer agreed with the ecomodernist point that **non-threshold boundaries should be managed locally**, not globally, and wished that the degrowth movement would acknowledge this point more strongly.
- Multiple reviewers agreed with the importance of drawing a distinction between the ecomodernist perception of itself as **enabling** greater freedom in lifestyle choices, versus the degrowth perception that ecomodernism **prescribes** certain lifestyles.

- Multiple reviewers also stressed that ecomodernism is an overarching term that encompasses a **diversity of viewpoints**; and that the same is also true of critical movements, such as degrowth.

This piece has been far from comprehensive. To summarise the key features of ecomodernism and the contestations that surround it, we have inevitably simplified both the range of views that exist under the umbrella of ecomodernism and the views of critics. The concept of ecomodernism is linked to many highly polarised debates about how we should live well and respond to sustainability challenges, with disagreements reflecting contradictory worldviews as well as differing interpretations of what the very word “ecomodernism” means. Our aspiration is that the piece has offered some insight into why the idea of ecomodernism is so contentious. We hope it will serve to feed further dialogue on ecomodernism and the overarching principles linked to it.

Glossary

Anthropocene

The Anthropocene is the proposed (and, so far, unofficial) name for a new and current geological epoch distinguished by humanity's significant impacts on the planet's physical, chemical and biological systems, including climate and ecosystems. The exact start date and definition of the Anthropocene remain debated.

Carrying capacity

Carrying capacity, in ecology, refers to the maximum population of a species that can be sustained by a particular environment. The concept can also be applied to people, for example in attempts to calculate how many humans the earth can sustain indefinitely.

Degrowth

Degrowth is a movement that argues we need to reduce material production and consumption in richer countries in a planned and equitable way. The movement criticises the capitalist focus on ongoing economic growth and argues that we need to organise society in a way that prioritises social and ecological wellbeing.

Externalities

Externalities are side-effects of activities or economic transactions that affect people who did not take part in the activity or transaction. Externalities can be negative (for example second-hand smoke from cigarettes can make other people ill) or positive (for example vaccines can protect those who do not receive them, by reducing the spread of disease). Externalities are not usually reflected in the price of an economic transaction, because the costs are usually borne by third parties.

Tipping points

A tipping point, in ecological or geological terms, is a threshold at which a small "push" (such as additional greenhouse gas emissions) can lead to a runaway feedback loop, resulting in the sudden shift of a local ecosystem or the entire planet to a new state (say, a much hotter climate). These shifts may follow a pattern known as hysteresis, where it is much harder to reverse the shift than it is to cause it. For example, an ice sheet that melts rapidly due to climate change might take a long time to regrow even if climate change were to be reversed. Hence, tipping points could potentially result in environmental changes that are irreversible on human timescales.

Endnotes

- 1 [An Ecomodernist Manifesto](#) (2015).
- 2 See for example the 2015 TEDx talk [It is time for Ecomodernism](#) by Dutch science journalist Hidde Boersma. Boersma has also co-authored the 2020 Dutch book on ecomodernism [Meer: Hoe overvloed de wereld juist duurzamer en welvarender maakt](#) (translation: More: How abundance makes the world actually more sustainable and prosperous) together with Dutch journalist and philosopher Ralf Bodelier and Belgian philosopher Maarten Boudry.
- 3 Lynas (2015), [The Guardian](#), [Ecomodernism launch was a screw-up of impressive proportions](#).
- 4 Maarten Hajer uses the term ecomodernist to refer to the ecological modernisation movement's approach to the issue of acid rain in Britain, in the chapter [Discourse Coalitions and the Institutionalization of Practice: The Case of Acid Rain in Great Britain](#) in the 1993 book [The Argumentative Turn in Policy Analysis and Planning](#). See also [Ulhøi and Welford \(2000\)](#), [Exploring Corporate Eco-modernism: Challenging Corporate Rhetoric and Scientific Discourses](#), who cite [Welford \(1997\)](#), [Hijacking Environmentalism: Corporate Responses to Sustainable Development](#) as using the term eco-modernist to refer to the idea that industry should use environmental management tools to become more environmentally responsible.
- 5 The Manifesto [says](#) "Climate change and other global ecological challenges are not the most important immediate concerns for the majority of the world's people. Nor should they be."
- 6 The Manifesto [begins](#): "To say that the Earth is a human planet becomes truer every day. Humans are made from the Earth, and the Earth is remade by human hands. Many earth scientists express this by stating that the Earth has entered a new geological epoch: the Anthropocene, the Age of Humans... A good Anthropocene demands that humans use their growing social, economic, and technological powers to make life better for people, stabilize the climate, and protect the natural world." See also [Holthaus \(2015\)](#), [Manifesto Calls for an End to "People Are Bad" Environmentalism](#) and [Nature editorial \(2015\)](#), [Decoupled ideals](#).
- 7 The Manifesto acknowledges that not everyone wants to live the lifestyle they propose, saying "Even if a fully synthetic world were possible, many of us might still choose to continue to live more coupled with nature than human sustenance and technologies require."
- 8 The Manifesto does recognise that many landscapes cannot be regarded as truly wild, having been influenced by people for millennia.
- 9 The Manifesto [says](#): "There must still be a conservation politics and a wilderness movement to demand more wild nature for aesthetic and spiritual reasons. Along with decoupling humankind's material needs from nature, establishing an enduring commitment to preserve wilderness, biodiversity, and a mosaic of beautiful landscapes will require a deeper emotional connection to them."
- 10 The Manifesto [says](#): "We value the liberal principles of democracy, tolerance, and pluralism in themselves, even as we affirm them as keys to achieving a great Anthropocene."
- 11 In line with this reasoning, the Manifesto website [publishes](#) both complimentary and critical responses.
- 12 The Manifesto [says](#): "In some cases, the objective is the development of technological substitutes. Reducing deforestation and indoor air pollution requires the substitution of wood and charcoal with modern energy... Urbanization, agricultural intensification, nuclear power, aquaculture, and desalination are all processes with a demonstrated potential to reduce human demands on the environment..."
- 13 The Manifesto [says](#): "...modern technologies, by using natural ecosystem flows and services more efficiently, offer a real chance of reducing the totality of human impacts on the biosphere", "Humans should seek to liberate the environment from the economy" and "Nature unused is nature spared."
- 14 The Manifesto [says](#): "The processes of decoupling described above challenge the idea that early human societies lived more

lightly on the land than do modern societies. Insofar as past societies had less impact upon the environment, it was because those societies supported vastly smaller populations. In fact, early human populations with much less advanced technologies had far larger individual land footprints than societies have today. ...The technologies that humankind's ancestors used to meet their needs supported much lower living standards with much higher per-capita impacts on the environment."

- 15 The Manifesto [says](#): "As human lives have been liberated from hard agricultural labor, enormous human resources have been freed up for other endeavors. Cities, as people know them today, could not exist without radical changes in farming. In contrast, modernization is not possible in a subsistence agrarian economy."
- 16 The Manifesto rejects "the planning fallacy of the 1950s". The term "[planning fallacy](#)" refers to underestimating the time it will take to complete a future task, but given the context in which it is used, it seems unlikely that this is the intended meaning. On Twitter, Ted Nordhaus [confirms](#) that the Manifesto was referring to "[S]oviet-style central planning (production quotas and like)" and furthers extends the concept to "the notion that the world, or even nations, can meaningfully make commitments to zero emissions or 100% clean energy over multiple decades... As if future policy makers can ever be bound by the commitments of their predecessors or we have enough foresight about technology, society, or the economy to know how we will achieve those commitments with enough certainty to be binding or reliable."
- 17 For more details, see the section "How much land is farmed?" of the TABLE explainer [What is feed-food competition?](#)
- 18 See for example the 2018 series [The Future of Food](#).
- 19 Blomqvist, Nordhaus and Shellenberger (2015), The Breakthrough Institute, [Nature Unbound: Decoupling for Conservation](#), page 36. "In many societies, different modes of agricultural production exist simultaneously. Moreover, the transitions are often not absolute, or complete, and do not need to be in order to save or spare nature."
- 20 [Nature Unbound](#), page 44. "The end goal is not complete decoupling of fish production from the oceans. When harvested at biologically sustainable levels, wild fish stocks can remain in good conservation status while providing food for humans without the land footprint or pollution associated with other protein sources... In coming decades, most additional demand for fish needs to be met from aquaculture in order to ensure healthy populations of wild fish."
- 21 Swain (2017), [Plenty of Fish on the Farm](#), The Breakthrough Institute.
- 22 [Nature Unbound](#), pages 39-40 and 65.
- 23 Blaustein-Rejto et al. (2019), [Achieving Peak Pasture](#).
- 24 [Nature Unbound](#), page 40. The study cited is Capper (2012), [Is the Grass Always Greener? Comparing the Environmental Impact of Conventional, Natural and Grass-Fed Beef Production Systems](#).
- 25 [Nature Unbound](#), page 49.
- 26 [Nature Unbound](#), page 47. "The substitution of synthetic fertilizer for organic fertilizer may be the largest single contribution to lowering humanity's land footprint."
- 27 Blaustein-Rejto et al. (2018), [To Cut Nitrogen Pollution, Move Past the Synthetic–Organic Debate](#).
- 28 Blomqvist (2017), [Food Production and Wildlife on Farmland](#).
- 29 Smith and Shah (2021), [The Government Needs an Innovation Policy for Alternative Meats](#).
- 30 Smith et al. (2021), [The Case for Public Investment in Alternative Proteins](#).
- 31 Smith and Blaustein-Rejto (2019), [We Need to Talk About Ranching](#) and Blomqvist (2019), [Eat Meat. Not Too Much. Mostly Monogastrics](#).
- 32 Mol, Sonnenfeld and Spaargaren (eds.)(2020), [The Ecological Modernisation Reader: Environmental Reform in Theory and](#)

Practice, Chapter 1.

- 33 Mol and Sonnenfeld (2000), [Ecological modernisation around the world: An introduction](#).
- 34 Bussink (2016), [Het ecomodernisme is al 30 jaar oud](#), quoting Dutch sociologist and EMT theorist Gert Spaargaren, who has previously worked as part of the TABLE team.
- 35 The Manifesto sees modernisation as “the long-term evolution of social, economic, political, and technological arrangements in human societies toward vastly improved material well-being, public health, resource productivity, economic integration, shared infrastructure, and personal freedom.” It believes that things have been getting better for people in recent centuries.
- 36 Dutch ecomodernist Hidde Boersma explicitly [rejects](#) the notion that – in response to the concerns raised by The Population Bomb and The Limits to Growth – humans must live in harmony with nature. EMT thinkers have said “To make this ‘structural anchoring’ of environmental concerns in the market possible, it was necessary to leave behind prior tendencies within organised environmentalism that favoured vitriolic critiques of capitalism and industrialism and focused on making a fundamental break with modernity”. EMT rejects a “romantic yearning to revert to an agrarian past premised on ‘small-is-beautiful’ ideals”, arguing that a pragmatic approach is needed to engage economic actors in the sustainability debate – see [The Ecological Modernisation Reader - Introduction](#).
- 37 Shellenberger and Nordhaus (2004), [The Death of Environmentalism](#). See also Kallis and Bliss (2019), [Post-environmentalism: origins and evolution of a strange idea](#).
- 38 Robertson (2013), [A Brighter Shade of Green: Rebooting Environmentalism for the 21st Century](#).
- 39 Environment and Ecology (no date), [Technogaianism](#).
- 40 Impacts are related to each of these factors through the I=PAT equation (impact = population x affluence x technology), which was first published in 1971 by John Holdren and Paul Ehrlich in response to work by Barry Commoner. For a history of the equation’s development, see Holdren (1993), [A brief history of "IPAT"](#). For an overview of the different forms the equation has taken over the decades, see Chertow (2001), [The IPAT Equation and Its Variants](#).
- 41 For a selection, see the extensive collection of [third-party responses](#) listed on the Manifesto’s own website.
- 42 Rockström et al. (2009), [A safe operating space for humanity](#).
- 43 Steffen et al. (2015), [Planetary boundaries: Guiding human development on a changing planet](#). The four boundaries that have already been passed are loss of biosphere integrity, climate change, land-system change and human interference in biogeochemical cycles (nitrogen and phosphorus).
- 44 Meadows et al. (1972), [The Limits to Growth](#). See also [Limits to Growth: The 30-Year Update](#) (2004).
- 45 Steffen et al. (2018), [Trajectories of the Earth System in the Anthropocene](#).
- 46 The Manifesto [says](#): “There remain, however, serious long-term environmental threats to human well-being, such as anthropogenic climate change, stratospheric ozone depletion, and ocean acidification. While these risks are difficult to quantify, the evidence is clear today that they could cause significant risk of catastrophic impacts on societies and ecosystems. Even gradual, non-catastrophic outcomes associated with these threats are likely to result in significant human and economic costs as well as rising ecological losses.”
- 47 The Manifesto [says](#): “To the degree to which there are fixed physical boundaries to human consumption, they are so theoretical as to be functionally irrelevant. The amount of solar radiation that hits the Earth, for instance, is ultimately finite but represents no meaningful constraint upon human endeavors. Human civilization can flourish for centuries and millennia on energy delivered from a closed uranium or thorium fuel cycle, or from hydrogen-deuterium fusion. With proper management, humans are at no risk of lacking sufficient agricultural land for food. Given plentiful land and unlimited energy, substitutes for other material inputs to human well-being can easily be found if those inputs become scarce or expensive.”

- 48 Nordhaus (2018), [The Earth's carrying capacity for human life is not fixed](#).
- 49 Table S1 of Graedel et al. (2013), [On the materials basis of modern society](#), shows that numerous metals have no adequate substitute for at least one of their primary uses (note that there are not necessarily shortages of all the metals included in the list, at least at the present time). Food-related examples are boron, magnesium and selenium, used as micronutrients in agriculture. For rarity of selenium, see Haug et al. (2007), [How to use the world's scarce selenium resources efficiently to increase the selenium concentration in food](#). Another example (not a metal) is phosphorus: there is controversy over whether or not there will be phosphorus fertiliser shortages over the next few decades. See the introduction of Alewell (2020), [Global phosphorus shortage will be aggravated by soil erosion](#), for an overview.
- 50 Nordhaus, Shellenberger and Blomqvist (2012), [The Planetary Boundaries Hypothesis: A review of the evidence](#).
- 51 There appear to be different definitions of absolute decoupling: some say that absolute decoupling means impacts fall regardless of the growth rate of economic activity (p5 of UNEP (2011), [Decoupling Natural Resource Use and Environmental Impacts from Economic Growth](#)), while others say absolute decoupling means impacts fall while economic activity rises (see section 2 of the Ecomodernist [Manifesto](#), Eurostat and Hausfather (2021), [Absolute Decoupling of Economic Growth and Emissions in 32 Countries](#), for example).
- 52 See for example DeFries et al. (2019), [The missing economic risks in assessments of climate change impacts](#), “[The impacts of climate change] would also undermine economic growth and development, exacerbate poverty and destabilise communities”; tweets from Shellenberger include [this](#) (positive trends in reforestation are “All thanks to economic growth”) and [this](#) (“...why aren't you advocating for higher economic growth in poor nations so they have the money to build the waste-management systems required to prevent plastic from escaping into the environment?”).
- 53 Kallis and Bliss argue in [Post-environmentalism: origins and evolution of a strange idea](#) that the Manifesto is built on the assumption that technological advancement and economic growth are actually possible without increasing environmental harm - an assumption that, they say, might or might not be correct.
- 54 Caradonna et al. (2015), [A Degrowth Response to an Ecomodernist Manifesto](#). This group of degrowth scholars argues that the idea of decoupling growth from impacts is a “myth”, since while some countries have achieved relative decoupling, none have yet achieved absolute decoupling.
- 55 Wernick (2015), [A New Environmental Politics](#).
- 56 Smaje (2015), [Dark Thoughts on Ecomodernism](#).
- 57 Hausfather (2021), [Absolute Decoupling of Economic Growth and Emissions in 32 Countries](#).
- 58 [Nature Unbound](#), page 32.
- 59 Bennetzen et al. (2015), [Decoupling of greenhouse gas emissions from global agricultural production: 1970–2050](#). “We show that agricultural production and GHGs have been steadily decoupled over recent decades. Emissions peaked in 1991 at ~12 Pg CO₂-eq. yr⁻¹ and have not exceeded this since. Since 1970 GHG emissions per unit product have declined by 39% and 44% for crop- and livestock-production, respectively.”
- 60 Blomqvist (2018), [Decoupling or Degrowth? Why "Peak Stuff" May Not Be As Dire As You've Heard](#).
- 61 [Nature Unbound](#), pages 24-33.
- 62 Blomqvist (2016), [Towards Peak Impact](#).
- 63 2018, [Perspectives on climate change: Economic growth - The Architectural League of New York](#). “As we get wealthier, demand for many goods and services saturates... Growth will be asymptotic, meaning that it may never stop entirely, but growth rates will likely get ever lower.”
- 64 This framing can be understood as a contrast to conventional notions of peak resource use, such as peak oil, peak soil or

peak water extraction from aquifers, which see “peak resource” as a supply-side constraint, (e.g. as discussed in [Limits To Growth](#) and [The End of Oil](#)). The ecomodernist argument is that, as countries grow richer, money will go towards service and knowledge sectors instead and that greater efficiency will cause a peak on the demand side.

65 Bessoudo (2015), [Megacities: Environmental Friend or Foe?](#)

66 Kennedy et al. (2015), [Energy and material flows of megacities.](#)

67 Caradonna et al. (2015), [A Degrowth Response to an Ecomodernist Manifesto \(summary and full document\)](#). Source of data for claims about deforestation: United Nations, [The Millennium Development Goals Report 2014](#), which states “There were around 13 million hectares of forest lost worldwide each year between 2000 and 2010, either through devastation by natural causes or because the land was converted to other land uses. Urbanization and the expansion of large-scale commercial agriculture were the main causes of deforestation at the global level.”

68 Rudel et al. (2009), [Agricultural intensification and changes in cultivated areas, 1970–2005](#). “Despite the slow rate of increase in cultivated land, there are few historically observable instances in which yield increases appear to have brought about declines in cultivated land.”

69 Ewers et al. (2009), [Do increases in agricultural yield spare land for nature?](#)

70 Byerlee et al. (2014), [Does intensification slow crop land expansion or encourage deforestation?](#)

71 Hausfather (2021), [Absolute Decoupling of Economic Growth and Emissions in 32 Countries.](#)

72 O’Neill et al. (2018), [A Good Life For All Within Planetary Boundaries](#). See also the [TABLE summary](#) of this research.

73 Isenhour (2016), [Unearthing human progress? Ecomodernism and contrasting definitions of technological progress in the Anthropocene](#) cites Jackson (2009), [Prosperity without Growth](#): “...to avoid dangerous climate change, technological improvement would have to increase 10 times faster than the current rate and the carbon intensity of the economy would require a 21-fold improvement at the global level.”

74 Haberl et al. (2020), [A systematic review of the evidence on decoupling of GDP, resource use and GHG emissions, part II: synthesizing the insights.](#)

75 Kallis and Bliss (2019), [Post-environmentalism: origins and evolution of a strange idea.](#)

76 Isenhour (2016), [Unearthing human progress? Ecomodernism and contrasting definitions of technological progress in the Anthropocene](#). “...ecomodernist perspectives... are linked to affluent and powerful postindustrial urban viewpoints that delegitimize more aggressive and just proposals for both climate mitigation and human progress.”

77 Degrowth Web Portal (no date), [What is degrowth?](#) The degrowth movement became prominent after the first international degrowth conference in 2008.

78 Monbiot (2015), [Meet the ecomodernists: ignorant of history and paradoxically old-fashioned](#). “If, as the manifesto anticipates, all the world’s people follow this presumed curve – their consumption rising until it matches ours, before it peaks and falls – the load imposed on the planet’s living systems before the expected transition occurs is likely to be horrendous.”

79 Latour (2015), [Fifty Shades of Green.](#)

80 Monbiot (2015), [Meet the ecomodernists: ignorant of history and paradoxically old-fashioned](#). “The ecomodernists talk of “unproductive, small-scale farming” and claim that “urbanisation and agricultural intensification go hand in hand.” In other words, they appear to believe that smallholders, working the land in large numbers, produce lower yields than large farms. ... hundreds of papers in the academic literature demonstrate the opposite: that there is an inverse relationship between the size of farms and the crops they produce. The smaller they are, on average, the greater the yield per hectare.”

81 Ricciardi et al. (2021), [Higher yields and more biodiversity on smaller farms.](#)

- 82 As measured by the “[yield gap](#)”, i.e. the difference between the actual output of a given piece of farmland and the maximum output that could be achieved in that location, climate and soil by using different agricultural practices and technologies. Yield gaps are generally high in sub-Saharan Africa, with outputs often just one-tenth of what they could be. Ken Giller discusses this topic on the TABLE Feed podcast: [Ep1: Ken Giller on the Food Security Conundrum](#).
- 83 Nordhaus, Shellenberger and Blomqvist (2015), [George Monbiot is wrong to suggest small farms are best for humans and nature](#).
- 84 An example of a critic making this point is Mace (2015), [We can only save nature by using it – Responding to Ecomodernism](#). “A [recent review](#) concluded that as you move back into the environment, starting with the goods that people use directly (energy, food, clean water), to the regulating services (climate regulation, flood control) and then to the underpinning ecological and evolutionary processes (nutrient cycling, primary production, decomposition), it becomes progressively harder for technology to augment them and progressively more often impossible to replace them.” [Nature Unbound](#), p69, cites the [same study](#) but emphasises those ecosystems services that can be augmented or replaced by technology. It says “Photosynthesis appears to be the only regulating ecosystem service that cannot yet be artificially replaced.”
- 85 Bekessy et al. (2018), [Ask not what nature can do for you: A critique of ecosystem services as a communication strategy](#).
- 86 Schröter et al. (2014), [Ecosystem Services as a Contested Concept: a Synthesis of Critique and Counter-Arguments](#).
- 87 See pages 64-71 of [Nature Unbound](#), for example “For the strategy of conservation through regulating ecosystem services to work, the material value of the regulating service must be detectable and amenable to at least a rough estimation. Otherwise, no rational economic actor would be willing to pay for the purported benefits of regulating ecosystem services.” And “In sum, while the value of regulating ecosystem services can probably make conservation the highest use of land in some cases, the amount of land that can be saved this way is probably constrained by the self-limiting nature of highly efficient regulating ecosystem services”.
- 88 McGahey (2015), [Ecomodernism: A Call for More Technology to Address Climate Change](#). “So they want more intensified, productive agriculture and aquaculture, along with nuclear power, desalinization, and other technologies. I think the manifesto is very hopeful to naive about our ability to manage some of these specific technologies (especially nuclear waste).”
- 89 Mace (2015), [We can only save nature by using it – Responding to Ecomodernism](#). “...it is rare for any new technology to be simply and straightforwardly a good thing. In almost all cases, there are unintended consequences or side-effects, and there are winners and losers, often dramatically distinguished.”
- 90 Caradonna et al. (2015), [A Degrowth Response to an Ecomodernist Manifesto](#). “...nuclear power provides less than 6 percent of the world’s energy needs while creating long-term storage nightmares and present-day environmental hazards.”
- 91 Grunwald (2018), [Diverging pathways to overcoming the environmental crisis: A critique of eco-modernism from a technology assessment perspective](#). “Statements on the environmental impact of technical options, technology consequences or innovation potentials involve considerable uncertainties that cannot be eliminated... even if technological progress is focused on the ideals of environmental compatibility, it is very likely that unintended side effects also have to be reckoned with.”
- 92 See for example [How Not to Deregulate GMOs](#) (2020), [Food's Overlooked Air Pollution Footprint](#) (2020), [The Environmental Case for Synthetic Fertilizer](#) (2019), [To Cut Nitrogen Pollution, Move Past the Synthetic–Organic Debate](#) (2018), [Marine Biodiversity is the New Frontier of Conservation](#) (2014, before the publication of the Manifesto) and [Grasping at Straws](#) (2018). See pages 55-57 of [Nature Unbound](#) (September 2015, several months after the publication of the Manifesto) for discussion of the effects of intensification on soil erosion, water use and pollution from fertilisers.
- 93 Epstein (updated 2019), Encyclopedia Britannica, [Precautionary principle](#). The principle originated in 1970s German environmental law.
- 94 The Breakthrough Institute (2014), [The Rise of the Up-Wingers Part One](#).

- 95 Phelan et al. (2021), [Intended consequences statement](#).
- 96 Caine et al. (2014). [Our High-Energy Planet](#). “The relationship between access to modern energy services and quality of life is well established.”
- 97 Pritzker (2014), [The Case for Energy Abundance](#).
- 98 Nordhaus (2021), [Ted Nordhaus on how green activists mislead and hold back progress](#): “An activist movement that took its concerns about climate justice seriously would acknowledge that the environmental impacts happen at the intersection of a warming climate and poverty—and it would support, rather than oppose, continuing access to fossil fuels for the poorest people in the world, since they’re too expensive to replace for the moment and they make poor countries more resilient to the impact of climate change.”
- 99 Breakthrough Staff (2015), [Can Ecomodernism Contribute to the "Rise of the Rest"? Poor Countries Need Modern Energy for Development](#).
- 100 Ellis (2017), [Nature for the People](#). “A truly equitable, effective, and sustainable global conservation system will need to be more than a global land deal or a global property portfolio in the hands of a few powerful institutions.”
- 101 Critics of the concept of “carbon footprints” argue that it was popularised by the fossil fuel industry to intentionally shift blame away from corporations and towards individual consumers. See for example Kaufman (no date), [The carbon footprint sham](#).
- 102 [Our Common Future: Report of the World Commission on Environment and Development](#) (1987).
- 103 Kallis and Bliss (2019), [Post-environmentalism: origins and evolution of a strange idea](#).
- 104 Monbiot (2015), [Meet the ecomodernists: ignorant of history and paradoxically old-fashioned](#). “There is no attempt in the manifesto to interrogate the concept of modernisation, to determine what it means and what it doesn’t, to examine its problems as well as the benefits it delivers.” “...there appears to be a crude and unexplored assumption that people working in the formal, urban economy are modern, while those on the outside are not.”
- 105 Alexander (2014), [Life in a 'degrowth' economy, and why you might actually enjoy it](#).
- 106 For example, Mahatma Gandhi was quoted in Schumacher (1973), [Small is Beautiful](#), as saying “Earth provides enough for to satisfy every man’s need, but not for every man’s greed”. The accuracy of this quote is disputed. See also Elgin (1981), [Voluntary Simplicity](#), a book that advocates for an “outwardly simple, inwardly rich” lifestyle.
- 107 Encyclopedia Britannica (updated 2020), [Hippie](#).
- 108 Smith (2015), [The Ecomodernist Myth](#). “...one wonders what motivates the ecomodernists to jump to support the western lifestyle when, for example, they could look at the state of Kerala in India which obtains the same development indicators as many so-called developed states, without the same high-income, high-consumption lifestyle.”
- 109 Caradonna et al. (2015), [A Degrowth Response to an Ecomodernist Manifesto](#).
- 110 Nordhaus and Shellenberger have criticised “ecological elites” who want degrowth at the global scale while themselves frequently travelling and buying expensive electronics – but note that the target of their criticism is not the consumption itself, only the perceived hypocrisy. See Nordhaus and Shellenberger (2011), [Evolve](#).
- 111 See [The Spirit Level](#) (accessed 20 August 2021). A PowerPoint of slides showing the relationship between income inequality and various indicators of wellbeing for a selection of rich countries.
- 112 Smaje (2015), [Dark Thoughts on Ecomodernism](#).
- 113 Roy and Foreman (2021), [Ecomodern Justice: Introducing Issue 14 of the Breakthrough Journal](#). “An ecomodern

alternative will focus on the broadly shared benefits of technology, the value of self-determination, and the necessity of infrastructure, industrial policy, and democratic institutions... It will not romanticize poverty and antiquarian systems of production. And it will support poor countries, Indigenous communities, and people of color to pursue industrial modernity on their own terms, rather than asking the rich and powerful or the developed world for either permission or charity.”

- 114 Population Matters (no date, accessed 18 August 2021), [Poverty & development](#).
- 115 Götmark et al. (2018), [Aging Human Populations: Good for Us, Good for the Earth](#).
- 116 Sachs (2004), [The Case for Slowing Population Growth](#).
- 117 Malthusianism is the idea that population growth results in demand for food outstripping supply. MacRae (updated 2020), Encyclopedia Britannica, [Thomas Malthus](#).
- 118 Ehrlich and Ehrlich (1968), *The Population Bomb*, Sierra Club/Ballantine Books (note that although Paul and Anne Ehrlich co-authored the book, the publishers insisted on crediting the book to a single author; hence the book is usually credited to Paul Ehrlich alone). Read Chapter 1 [here](#). Numerous critics (recent examples include [Bush Bollay \(2020\)](#), [Schee and Nair \(2021\)](#) and [Zubrin \(2012\)](#)) have argued that the book is racist, a charge that the Ehrlichs reject while acknowledging that there are racist elements within the population planning movement ([Ehrlich and Ehrlich, 2009](#)).
- 119 See for example Wilkinson (2020), [Humanity isn't a disease - but ecofascism is](#), Friends of the Earth (2020), [Population, consumption and human rights: our position](#), and Alberro (2020), [Why we should be wary of blaming 'overpopulation' for the climate crisis](#).
- 120 Whitaker and Dattani (2021), [Interview: Ted Nordhaus on ecomodernism](#). “The big driver in the decline of population growth is just actually economic growth, which is something that degrowthers will never recognize.”
- 121 Moore (2020), [Nuclear Energy is Climate Justice](#), “There can be no prosperity in a region wracked by extreme energy poverty. And putting restrictions on the energy choices of the people who need it the most is deeply unethical. Climate policy that ignores the injustice of an energy-poor Africa has no legitimacy.” From Nordhaus and Brush (2019), [Whole Earth Equity](#): “Modern societies are more unequal than subsistence economies. But everybody, rich and poor, is also wealthier.”
- 122 Nordhaus and Brush (2019), [Whole Earth Equity](#). “...[I]nvocations of justice often direct our gaze away from the central inequities that ought to concern us... [T]he most immediate, direct, and effective way to address those disparities is to help poor people... to no longer be poor... the contemporary Left has no pro-active development or economic agenda beyond incoherent demands for bottom-up decentralization and enfranchisement.” See also “...the demand for “politics” is actually a demand for a sweeping, millenarian politics, one that flattens the world into a universal conflict, where class, race, gender, ethnicity, and ecology are fused into a single construct, with the forces of egalitarian righteousness and liberation arrayed in Manichean struggle against a corporate, neo-colonial, white supremacist, extractivist elite.”
- 123 Roy and Foreman (2021), [Ecomodern Justice](#).
- 124 Foreman (2013), [On Justice Movements](#).
- 125 Collard et al. (2016), [The Moderns' Amnesia in Two Registers](#). “The ecomodernists are quick to thank modernization (twice) for liberating “women from traditional gender roles” and “chattel status.” We are grateful every day that we are not someone's property, but we do not thank modernity for this. Instead, we are thankful for the incredibly hard battles fought by women (and their allies) to be recognized as persons rather than property. ...capitalism, modernity's partner in crime ... has involved a deepening of patriarchal control over women's bodies and reproductive labours...”
- 126 Kallis and Bliss (2019), [Post-environmentalism: origins and evolution of a strange idea](#).
- 127 Kallis and Bliss (2019), [Post-environmentalism: origins and evolution of a strange idea](#), criticise a belief in “stages of development from underdeveloped subsistence economies to fully developed capitalist service economies”, arguing that “rich nations developed at the direct expense of poor ones, leaving them underdeveloped”.

- 128 Caradonna et al. (2015), [A Degrowth Response to an Ecomodernist Manifesto](#) suggest that ecomodernism has a narrow conception of “modernity” and “development” that rests on “the belief that industrialis[ed] modernity has been an undivided blessing”. The degrowth movement, in contrast, emphasises the “hugely destructive development path of European and Neo-European societies”.
- 129 Smaje (2015), [Dark Thoughts on Ecomodernism](#).
- 130 Collard et al. (2016), [The Moderns' Amnesia in Two Registers](#). “Modernity, which includes liberal ideas of universal justice, is built on displaced and dead bodies. Slavery, for example, is essential to the history of modern capitalism, to the emergence of mass consumption enjoyed by the privileged few. However, the manifesto dismisses this history while masking the unequal distribution of modernity's benefits.”
- 131 Hernandez (2021), [Green Jim Crow](#).
- 132 Bandyopadhyay (2021), [Growing Democracy](#).
- 133 Roy (2021), [Basket Case to Beacon: How Bangladesh Transformed Itself into a Modern and Resilient Society](#).
- 134 Robbins and Moore (2015), [Love your symptoms: A sympathetic diagnosis of the Ecomodernist Manifesto](#).
- 135 Smaje (2015), [Ecomodernism: a Response to my Critics](#).
- 136 See Smaje (2015), [Dark Thoughts on Ecomodernism](#) and Smaje (2015), [Ecomodernism: a Response to my Critics](#).
- 137 Smaje (2015), [Dark Thoughts on Ecomodernism](#). “A word you won’t find in the EM is inequality. There are glancing references to poverty, poor people and poor nations. But in the ecomodernist vision poverty is equated with a lack of modernisation. There is no sense that processes of modernisation cause any poverty.”
- 138 Monbiot (2015), [Meet the ecomodernists: ignorant of history and paradoxically old-fashioned](#). “In many other parts of the developing world, rural depopulation has resulted not in a smooth transition to the formal urban economy, but in a highly precarious existence on the economic margins, and a reliance on the informal economy, much of which remains connected to family businesses in the countryside. What the [eco]modernists describe as “relieving agricultural workers of a lifetime of hard physical labour” is experienced by millions as underemployment and desperate insecurity. For all its talk of “the liberal principles of democracy, tolerance, and pluralism”, the ecomodernist agenda resonates with a long history of such proposals, from the enclosures in England and the Highland clearances in Scotland, the colonial seizures of land in Kenya and Rhodesia, the Soviet disposessions and the villagisation in Ethiopia to the current theft of farmland in poor nations by sovereign wealth funds and the rich world’s financiers.”
- 139 Hamilton (2015), [The Technofix Is In](#). “...in the manifesto, which tells a story of how we got here and where we should go, there is no mention of the forces, national and international, that have given us rising carbon dioxide concentrations, acidifying oceans and all the rest. We look in vain to find reference to the proven power of corporations and lobbyists to stop environmental laws, or to the total victory of money politics in the United States, now entrenched after Citizens United. Exxon and organized denialism do not appear even between the lines.”
- 140 [An Ecomodernist Manifesto](#) (2015).
- 141 Ellis et al. (2021), [People have shaped most of terrestrial nature for at least 12,000 years](#).
- 142 For example, Shellenberger comments in a [podcast interview](#) (accessed 18 August 2021) with James Delingpole: “I want economic growth, absolutely... how you achieve that... sometimes involves some role of government that I think conservatives have been too quick to dismiss”. In [Ecomodernism: The Future Of Environmentalism? An Interview With Mark Lynas](#), Manifesto co-author Lynas says “I don’t think necessarily that these problems will resolve through the power of the free market, as the right wing is sort of obsessed with. In some ways government intervention is essential to address social problems and to foster technological innovation.”

- 143 The [left-right political spectrum](#) is inevitably a simplification of the many different political views that people can hold; alternatives include the [political compass](#), which maps political beliefs onto two axes: economic (left to right) and social (libertarian to authoritarian). Some of ecomodernism's goals arguably align with those of the political left: actively working to end poverty for all; a strong role for government in supporting technological innovation; the belief that markets alone will not guarantee the decoupling of economic activity from environmental impacts. Other goals are more often associated with right-wing politics: the rejection of central planning of the economy; a critical role for the private sector and markets; the focus on material prosperity as an important constituent of "progress".
- 144 Pearce (2015), [The big green divide](#).
- 145 See section "The Pristine Myth – Erasing Indigenous people (1400s-1830s)" on page 25 of [White wilderness: race, capitalism, and alternative knowledges of natural space](#) (Corliss, 2019).
- 146 Ellis (2017), [Nature for the People](#). "Contemporary industrial societies are not the first to value and conserve wild places and wildlife. From the traditional tapu areas of Polynesia (the source of the word "taboo") to the sacred groves of India, the Maasai's eschewal of game hunting in East Africa to the royal hunting grounds of Europe — through to the millions of acres of public lands designated by Teddy Roosevelt — countless forms of conservation have cropped up for millennia, emerging from the cultural priorities of the societies that created them. It is likely that most, if not all societies, from the days of hunter-gatherers to the present, have practiced some form of conservation, and that some of these efforts helped to sustain biodiversity for generations."
- 147 The [Manifesto](#) says "What we are here calling nature, or even wild nature, encompasses landscapes, seascapes, biomes and ecosystems that have, in more cases than not, been regularly altered by human influences over centuries and millennia. Conservation science, and the concepts of biodiversity, complexity, and indigeneity are useful, but alone cannot determine which landscapes to preserve, or how."
- 148 Ellis et al. (2021), [People have shaped most of terrestrial nature for at least 12,000 years](#).
- 149 Mace (2015), [We can only save nature by using it – Responding to Ecomodernism](#): "On the framing of conservation, the ecomodernists present a polarised view of nature versus non-nature. They distinguish areas of the world that are given over to agriculture, or otherwise dominated by people, from areas of the world that still contain 'nature'. Their pie chart shows just over half the world as nature, where nature is symbolised entirely by large, rare mammals, such as the great apes and the great whales. This framing sets people outside nature, and presents nature almost as a caricature, represented by some of the world's most endangered species. But nature is everywhere, and people are part of nature."
- 150 Marris (2017), [Can We Love Nature and Let It Go?](#)
- 151 Ellis (2019), [Sharing the land between nature and people](#).
- 152 Nordhaus and Brush (2019), [Whole Earth Equity](#).
- 153 Martinez-Alier (2014), [The environmentalism of the poor](#). "The thesis of the "environmentalism of the poor" does not assert that as a rule poor people feel, think and behave as environmentalists. This is not so. The thesis is that in the many resource extraction and waste disposal conflicts in history and today, the poor are often on the side of the preservation of nature against business firms and the state. This behaviour is consistent with their interests and with their values."
- 154 Breakthrough Staff (2015), [Price Nature or Make Nature Priceless?](#)
- 155 Some strands of environmentalism reject industrialisation on ideological grounds. For example, the simple living movement draws on the American Transcendentalists of the mid-19th century, who believed that living simply and in close contact with nature is spiritually beneficial (For example, Ralph Waldo Emerson and Henry David Thoreau Elgin. (1981), [Voluntary Simplicity](#).) Transcendentalism developed from the European Romantic movement of the 18th and 19th centuries, which revered wild nature and rejected urbanisation. See Pepper (1984), [The Roots of Modern Environmentalism](#). For example, the "dark Satanic Mills" described by Romantic poet William Blake are often [understood](#) to be a reference to England's

changing landscape during the Industrial Revolution.

- 156 Lewis (2014), [The Education of an Ecomodernist](#). Historian Martin Lewis is identified by Nordhaus and Shellenberger as one of their inspirations.
- 157 Latour (2015), [Fifty Shades of Green](#). “An Ecomodernist Manifesto is written entirely as if humans were still alone on stage, the only being who out of its own free will is in charge of apportioning space, land, money and value to the old Mother Nature.”
- 158 See Naess (1973), [The shallow and the deep, long-range ecology movement. A summary](#), Drengson (no date, accessed 27 July 2021), [Some Thought \[sic\] on the Deep Ecology Movement](#), and the eight principles of deep ecology proposed by Arne Naess and George Sessions in 1984, accessible at [The Deep Ecology Platform](#).
- 159 Kallis and Bliss (2019), [Post-environmentalism: origins and evolution of a strange idea](#).
- 160 Monbiot (2015), [Meet the ecomodernists: ignorant of history and paradoxically old-fashioned](#). “The media loves them, not least because some of what they say chimes with dominant political and economic narratives. So you will doubtless be hearing a lot about them.”
- 161 Kallis and Bliss (2019), [Post-environmentalism: origins and evolution of a strange idea](#). “Post-environmentalism's power is not in its tiny body of self-identifying adherents or in its capacity to mobilize people, but in the fact that it appeals to those in power, as evident from its wide coverage by prominent media.”
- 162 Isenhour (2016), [Unearthing human progress? Ecomodernism and contrasting definitions of technological progress in the Anthropocene](#). “The “Ecomodernist Manifesto” is, in part, so dominant because it builds on a long history of Western progressivist thought and is highly consistent with the capitalist market system and neoliberal economic governance.”
- 163 See for example Vainio et al. (2018), [How effective are messages and their characteristics in changing behavioural intentions to substitute plant-based foods for red meat? The mediating role of prior beliefs](#), Brough et al. (2016), [Is Eco-Friendly Unmanly? The Green-Feminine Stereotype and Its Effect on Sustainable Consumption](#) and de Boer and Aiking (2017), [Pursuing a Low Meat Diet to Improve Both Health and Sustainability: How Can We Use the Frames that Shape Our Meals?](#)
- 164 Lynas (2015), [The Guardian](#), [Ecomodernism launch was a screw-up of impressive proportions](#).
- 165 Monbiot (2020), [Lab-grown food will soon destroy farming – and save the planet](#).
- 166 Blomqvist (2020), [What Microorganisms Can Teach Us about Decoupling and Limits to Growth](#).