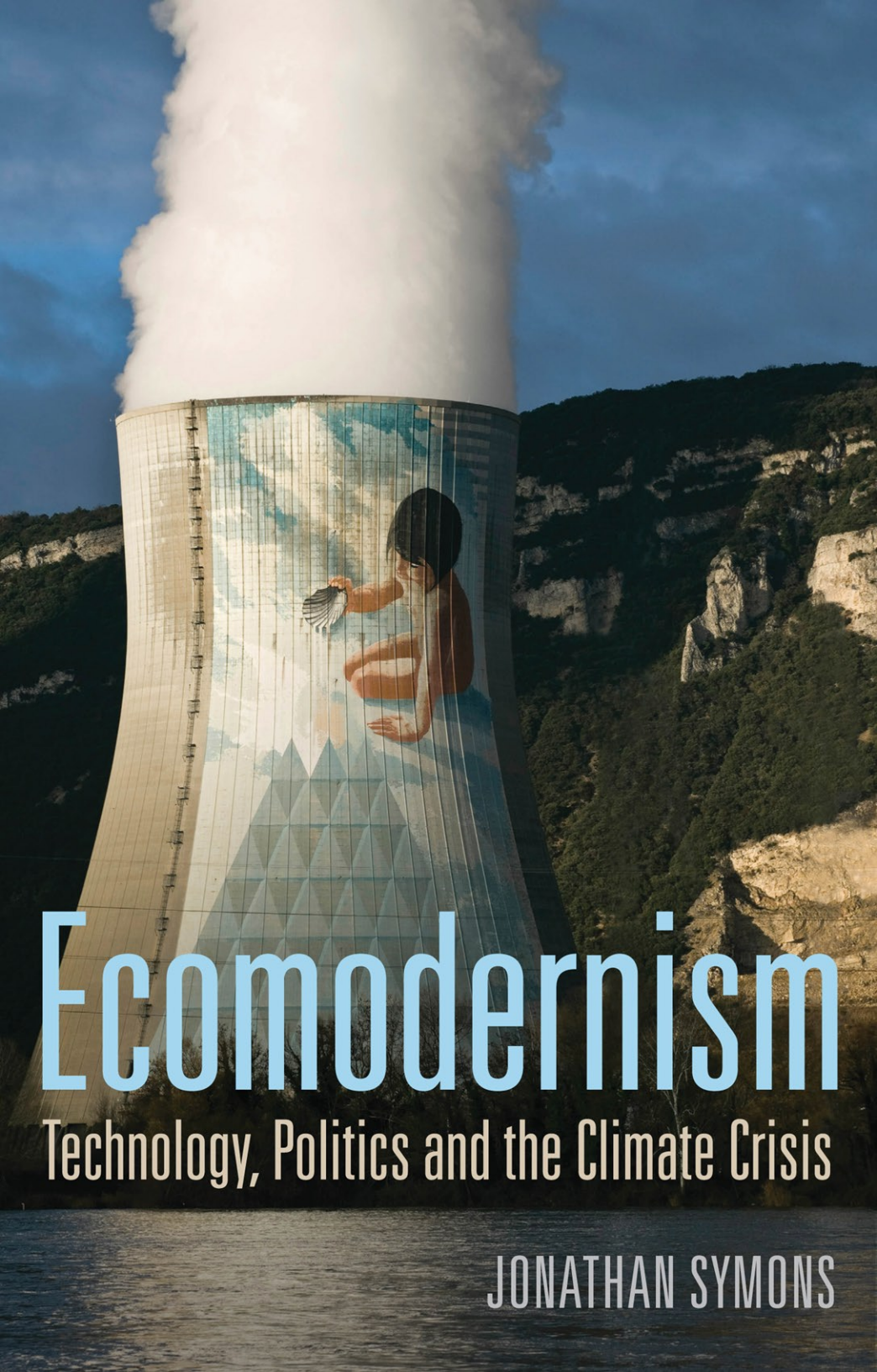
Ecomodernism
Technology, Politics and the Climate Crisis
JONATHAN SYMONS

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Abbreviations

ACT UP	AIDS Coalition to Unleash Power
AIDS	Acquired Immune Deficiency Syndrome
AZT	first HIV drug
BI	Breakthrough Institute
BP	British Petroleum
BSE	Bovine spongiform encephalopathy
CCP	Chinese Communist Party
CCS	Carbon capture and storage
CCU	Carbon capture and utilization
CDM	Clean Development Mechanism
CRISPR	Clustered Regularly Interspaced Short Palindromic Repeats (genome editing)
DNA	Deoxyribonucleic acid (molecule)
EU	European Union
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GHG	Greenhouse gas
GJC	Geoengineering Justice Coalition (a fictional entity used for illustrative purposes)
GM	Genetically modified
GMO	Genetically modified organism
G77	Group of 77

HIV	Human Immunodeficiency Virus Infection
ICAO	International Civil Aviation Organization
ICISS	International Commission on Intervention and State Sovereignty
IEA	International Energy Agency
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
MI	Mission Innovation
MNC	Multi-National Corporation
NIEO	New International Economic Order
OECD	Organization for Economic Co-operation and Development
OPEC	Organization of the Petroleum Exporting Countries
PV	Photovoltaic (solar)
RtoP	Responsibility to Protect principle
R&D	Research and Development
RD&D	Research, Development and Deployment
SRM	Solar Radiation Management
TCP	Technology Collaboration Programmes
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
US	United States of America

Introduction

Restraint or Innovation?

In 1982 when press secretary Larry Speakes was first asked for President Reagan's response to the AIDS epidemic, he replied, 'I don't have it. Do you?' This contempt set the tone for years, during which, as tens of thousands of Americans died, the word 'AIDS' never passed the President's lips. Faced with an unprecedented epidemic, Reagan chose to ignore, moralize and exclude rather than to enlist science or include affected communities in public-health responses. Emphasizing the immorality of drugs and homosexuality, officials urged educators to 'teach restraint as a virtue'. Reagan's first budgets actually cut medical research alongside renewable energy research programmes.

The Republican Party of the 1980s, committed both to 'supply-side economics' and the ascendant 'moral majority', was perhaps especially ill equipped to respond to an illness whose first victims included homosexuals, injecting drug users and sex-workers. Some religious conservatives described HIV as God's work and redoubled their efforts to sanction homosexuality and drug use. America was not exceptional. Sweden passed compulsory quarantine laws, Chinese

Communist Party officials denied that the epidemic had reached their shores, and many thousands of South Africans died unnecessarily because President Mbeki promoted traditional herbal cures and challenged the connection between HIV and AIDS. Each of these countries has since made giant strides towards inclusive and effective public health programmes. However, in the face of ideologues promoting simplistic solutions, it was at first unclear how affected communities should respond. Even some in the gay community chose to question whether HIV was really the cause of AIDS, to moralize against promiscuity, or to ask if the CIA had covertly spread the disease. Only slowly did activists formulate a response that was tailored to the challenge: inventing and promoting safe-sex and safe-injecting practices; demanding access to state-funded medical research; enhancing public services; and producing and distributing generic drugs in the developing world.

It was not until 1987 that Congress began to earmark funds for the work that ultimately produced effective antiretroviral treatments for HIV (Danforth 1991). Although state-funded innovation was necessary to counter the epidemic, so too were social reforms. In the first instance, activist groups like ACT UP fought repressive attitudes and discriminatory laws, reshaped clinical drug trials and demanded increased medical research-funding (France 2016). Later, people in the developing world accessed life-saving treatment, but only after a global, civil society campaign successfully demanded that intellectual property regulations allow low-cost manufacture of generic drugs. More inclusive public health programmes, in which George W. Bush's President's Emergency Plan for AIDS Relief played a big part, eventually brought further progress. Although the HIV epidemic is far from over and some political divisions remain, new infection and treatment rates have improved dramatically during the twenty-first century.

Why begin a book about ecomodernism, technology and climate change by recalling historical debates over AIDS? Most practically, the analogy underscores the value of

innovation. State-funded, democratically controlled innovation has yet to gain the prominence it deserves within climate activism. By contrast, HIV activists fought not only for a dramatic increase in spending on HIV research, but to open drug-trial registers, eliminate the use of placebo medications for control groups, and make medical services accessible to all (France 2016, p. 253). In retrospect, it may seem obvious that medical innovation should have been a central political demand. Yet the gay community was beset by vigilante attacks, media neglect, and discriminatory healthcare providers. AIDS activists might easily have focused on these adversaries and ignored the slow and complex processes of medical research. Yet, as historian David France describes in *How to Survive a Plague*, on the same day in 1987 that pharmaceutical company Burroughs Wellcome obtained FDA approval for the first HIV treatment, the company also announced that the drug, AZT, would cost $10,000 per year – far above many insurance plans' coverage caps. ACT UP's fury at this exploitative pricing prompted activists to seek to reform medical innovation. Among other things, this book is something of a call to arms for a similar climate response – and a rejection of the idea that innovation should be viewed as somehow belonging outside of politics.

A second reason to compare climate change with HIV is because, amid the challenges of resurgent nationalism, international inequality and climate-denial, this story offers hope. It reminds us that communities have faced intractable, 'wicked' problems before, and have eventually found their way to an inclusive and scientifically engaged response. However, it was only by treating AIDS as a medical illness, rather than as a judgement on the society it struck, that a coherent response became possible (Sontag 1989). It is remarkable how many of the flawed cultural logics that thwarted early HIV responses persist within climate discourse. For example, while few now propose abstinence education as a useful response to HIV, Reagan's pro-celibacy mantra 'teach restraint as a virtue' has been repurposed by

people who promote virtuous individual behaviour change as a coherent climate response. Denial, which is so often the twin of abstinence, has also blighted both debates.

Third, HIV and climate change have both challenged pre-existing paradigms. Just as HIV activism needed to move beyond gay liberation, a politics capable of addressing climate change may look very different from twentieth-century environmentalism, whose foundational beliefs were formed before the climate crisis was well understood. For example, opposition to hydroelectricity and nuclear power – which even today are the two largest sources of zero-carbon electricity and the only technologies that have allowed any country to decarbonize their electricity grid (Finland's remarkable geothermal resources make it the only exception) – was central to the emergence of modern Green movements. A climate-focused politics might take a very different view on these mature, low-carbon technologies. Green taboos against 'intervention in nature' are also challenged by advances in genetic technology. For example, milk brewed from genetically modified yeast, low-methane GM rice crops, or genetically engineered algae-derived biofuels might potentially achieve significant cuts in greenhouse gas (GHG) emissions (Shuba and Kifle 2018). As climate change gathers pace, those strands of twentieth-century Green ideology that oppose all such interventions may provide an imperfect guide to effective responses.

Whereas perceptions of elite greed and corruption galvanized AIDS activists to politicize innovation, in climate politics the reverse has happened. Allegations of elite corruption have fuelled a fruitless culture war over the reality of climate change. On one side, 'climate change deniers' allege a vast conspiracy in which grant-hungry scientists are working with the United Nations to promote socialist world government. Many conservatives find the whole warming hypothesis inherently suspicious. The discovery that capitalist–consumerist modernity is destroying the biosphere seems to have too convenient a fit with left-wing agendas (Uscinski et al. 2017; for an example of

conspiratorial thinking see Inholfe 2012). Thus, early efforts by fossil-fuel lobbyists to seed doubt over climate science have bloomed into a genuine movement of denial (Hamilton 2013). Although denial of climate science is intellectually groundless – the evidence is increasingly there to be seen and experienced – conservative nationalists are right about one thing. Many climate activists really do think an effective climate response will require a move towards much deeper forms of international cooperation and assistance. This book is an example – I argue that social services and emergency assistance must be guaranteed universally if the most vulnerable people are to be protected from climate harms. My call for a rethinking of international obligations, although radical, mirrors that of many climate justice activists. If the lifestyles of ordinary first-world people are indirectly and accidentally impoverishing people in far-away places, then political institutions should ideally reflect the new ways in which our fates are connected.

On the progressive side of politics people overwhelmingly accept the reality of climate change, yet many are preoccupied with a different conspiracy. Consider Naomi Klein's analysis of the root cause of climate change:

> We are stuck because the actions that would give us the best chance of averting catastrophe – and would benefit the vast majority – are extremely threatening to an elite minority that has a stranglehold over our economy, our political process, and most of our major media outlets. (2015, p. 18)

Klein is right that carbon-intensive industries (which include energy, industrial, agricultural and transport sectors), like cigarette companies before them, really have set out to oppose regulatory responses and to muddy the public's understanding of the science. However, her argument takes a conspiratorial form: it alleges that an elite minority is secretly plotting to harm the wider community. Fixation with conspiratorial dynamics can distort analysis even when the basic outline of a conspiratorial belief is accurate. For

example, some people have become so obsessed with the US's significant moral failings that they overlook the flaws of the despotic regimes that oppose it – one has to assume that contemporary left-wing apologists for Assad's Syrian regime are caught in this dynamic (Hasan 2018).

I worry that preoccupation with the immorality of fossil fuel industries might similarly distort our understanding of climate mitigation. To be sure, extractive industries have worked hard to delay climate action, but we should also recognize that GHG emissions are the unintended consequence of the technologies that well-meaning people depend upon in their everyday lives. The frame we adopt – whether of 'elite corruption' or 'unintended consequence' – will influence our political responses. In believing that renewable energy is already superior and that fossil fuels are kept alive only by the political power of incumbent industries, many climate activists conclude that political mobilization is all that's needed. They propose that we must divest and resist, blockading mines, pipelines and power plants, one campaign after another, until we break the power of the fossil fuel industries. Valuable as these campaigns may be, I argue that climate activism should also think in more strategic, global terms. I worry that if the underlying demand for fossil fuels remains, these blockades may resemble efforts to deflate a mattress without opening the valve. Roll on one part of the mattress, and pressure escapes elsewhere. Force one coal mine to close and, if the demand for fossil fuels persists, production will simply expand at another.

A more effective way of undermining extractive industries would be to use the institutional power of the state to develop radically better technologies. When new technologies are profoundly more attractive than established alternatives, incumbents either lose their power or embrace change. Kodak's swift decline following the rise of digital photography, and DuPont's development of substitutes for ozone-layer destroying chlorofluorocarbons in the late 1980s are examples. Protection of the ozone layer under the Montreal Protocol (negotiated during the less-than-Green Reagan

Administration) is probably the single most successful example of global environmental action. It was achieved in part because DuPont, seeing an opportunity for technological advantage, became an advocate for international regulation (Haas 1992).

When zero-carbon technologies become cheaper and more dependable than fossil fuel alternatives, similar transformations will become possible. Wind, solar power and electric cars have all made dramatic and sustained gains in the last decade. Yet, they have not attained the kind of advantage that rapidly reshapes markets. Shortly before I completed this book, British Petroleum (BP 2018) released its annual summary of world energy statistics for 2017. Solar and wind enjoyed a record year in 2017, but their success was insufficient to halt the steady increase of oil and gas production. Global coal consumption also increased in 2017, with a net increase in energy generated that was just a little greater than that achieved by solar (coal had declined slightly in previous years). Even in countries like Germany and Denmark where renewable industries have gained the upper hand politically and won aggressive government support, GHG emissions have remained far above levels that would be consistent with averting dangerous climate change.

Recognizing the difficulty of decarbonization, the Intergovernmental Panel on Climate Change (IPCC) has argued that the development of 'new technologies is crucial for the ability to realistically implement stringent carbon policies' (Somanathan et al. 2014, p. 1178). Bizarrely, some climate activists disagree. They insist that we already 'have the technical tools we need to get off fossil fuels' and propose that all that is needed is a collective struggle against the privileged 'extractivist' elites (Klein 2015, p. 16). The possibility that low-carbon innovation might be a desirable goal of collective struggle, or that new technologies might help reconcile the twin challenges of eliminating GHG emissions and advancing the welfare of what will most probably soon be ten billion people, is rarely considered. Calls for collective struggle against an oppressive elite are attractive because

they fit climate change into a paradigm that is familiar from many previous social justice campaigns. Addressing climate change, however, is not like a civil rights movement – it calls into question the technological constitution as well as the political and cultural organization of human society. Just as ACT UP activists responded to HIV by politicizing the process of medical research, so too should climate activism seek to transform zero-carbon innovation.

The idea that state-backed technological innovation is a necessary precondition for both human and ecological flourishing is commonly associated with a strand of environmentalism that has come to be called *ecomodernism*. This philosophy has been most publicly articulated by the environmental think-tank, the Breakthrough Institute, which was established in Oakland, California, in 2003. The term *ecomodernism*, however, has only been in common use since 2013 (see Kloor 2012; Asafu-Adjaye et al. 2015). Ecomodernism's argument for innovation is not the familiar demand that governments must simply support deployment of renewable energy, nor is it a celebration of capitalist creative destruction (Schumpeter 2010). Rather, it is a call for state investment in mission-oriented research to accelerate the development and deployment of an array of breakthrough low-emissions technologies that can transform industry, transport and agriculture as well as electricity generation. Ecomodernists welcome the emerging twenty-first-century trend towards convergence of global living standards (Milanovic 2011), and wish to hasten progress towards universal human flourishing. They argue, however, that their vision of 'universal human development' on an 'ecologically vibrant planet' also necessitates a second core principle, that of *intensification*. The idea here is that a global modernity will only spare space for nature if most people live in high-density cities, utilize high-density energy sources and draw on all available technologies to minimize the footprint and maximize the efficiency of agricultural production.

The difficult reality is that today's technologies necessitate a close link between GHG emissions and human development (Bazilian 2015). This creates tough choices. Which should be the higher priority: expanding third-world energy access or reducing emissions? A community's resilience to climate harms is closely linked to the state of its hard infrastructure. If poorer countries are to adapt to climate harms by constructing robust housing, hospitals, sewage systems, road and rail, they will need emissions-intensive steel, concrete and oil. Should the rich world use its power to influence development choices? Naomi Klein's beguiling account of collective struggle against elite extractivists pretends that there is no tension between human flourishing and ecological protection and elides the question of which technologies a population of eight billion people will use to supply food, shelter, health care and travel in a post-capitalist future. Addressing these challenges really will require collective struggle. Third-world communities are already rising up and demanding better standards of living and more equal energy access. As they do so, their allies in the rich world should be mobilizing to increase public investment in low-carbon innovation so that these expectations can be satisfied without compounding climate harms. Attempting to block the third world's rise would be both monstrous, given the deprivation in which the majority of the world's population still live, and stupid, because they will demand their time in the sun regardless.

Back in 2006, Harvard psychology professor Daniel Gilbert (2006) wrote an opinion piece provocatively titled 'If Only Gay Sex Caused Global Warming'. Gilbert argued that humans are social animals whose minds are specialized for thinking about people and their intentions, and that we are particularly exercised by threats that prompt disgust, or moral outrage. Conversely, if a story lacks scheming villains, we tend to ignore it. I think this explains why both reactionaries and progressives tell conspiratorial stories. Both the conservatives' fiction of fraudulent scientists bent

on 'one-world' government and the progressives' (more plausible) fables of rapacious, extractivist elites serve the same function. We humans are enraged by the thought of immoral, privileged cliques. Without these villains, a slow-burn problem like climate change becomes about as interesting as retirement-planning. So perhaps I shouldn't be too critical of Naomi Klein. Propagandists who spin morally compelling stories expand public interest in climate change. Although their arguments are flawed, the partisan outrage they inspire may be a necessary stage in societal reckoning with a complex challenge. If we hope, however, to take effective climate action, then we also need narratives that connect to the main feature of the problem: that the technologies that enable modern lives also inadvertently imperil the planet.

Social psychology also tells us that people are generally much more likely to acknowledge the existence of a threat if they believe that others have caused it. Consider the 2015 Paris Agreement's aspirational target of limiting warming to 1.5°C. This goal was always a fantasy whose adoption suggests a collective desire to avoid difficult truths. Even if all emissions ceased today, warming might eventually exceed 1.5°C (Hansen et al. 2008). The more ambitious 2°C target now also looks practically unfeasible. Full implementation of the Paris Agreement pledges would bridge only about twenty-two percent of the gap between our current emissions trajectory and a pathway consistent with limiting this century's warming to 2°C (UNFCCC 2015b, p. 44). At the time of writing, no major developed economy is on track to meet even these feeble pledges (Victor et al. 2017). If we must acknowledge that temperature rises in the vicinity of 3°C by 2100 are now likely (with more warming in the twenty-second century), it feels better to blame this on a nefarious elite than to accept our collective failure. The reality is more unsettling. When I fly from Sydney to Melbourne to visit family at Christmas, when a rice farmer seeds a methane-emitting paddy, or when builders pour the concrete foundations and erect the steel girders

of a new hospital, we intend no harm. Yet, climate change arises as an unintended side-effect of each of these well-meaning actions.

'Dangerous climate change' is now such a familiar phrase that we generally pay it little attention. In the near-term, many climate harms will be hard to distinguish from the everyday atrocities created by global inequality. People who lack access to high-quality shelter and health care are always the most vulnerable to extreme weather events, crop failures, infectious disease and floods. Already there are incremental shifts in these harms that reflect the worsening climate. In time, impacts will become obvious to richer communities too – especially as cities such as Venice and Miami battle rising seas. Even as the impacts worsen, however, the underlying process of climate change is unlikely to become a key focus. People will always be preoccupied with immediate concerns like employment, education, health care and costs of living. When we confront unseasonal wildfires, droughts and flooding cities, political focus is likely to turn to emergency measures and local resilience rather than to reducing global emissions. If the very worst climate scenarios eventuate, in which melting permafrost in Canada, Russia and Greenland release trapped methane and trigger runaway warming, we will be concerned only with survival.

And so we arrive at a tragic dilemma. On the one hand, warming has the potential to imperil the entire human enterprise (most other species are already suffering at our hands). On the other hand, climate change seems likely to remain a secondary political concern. Current policies suggest the Anthropocene will see planetary conditions quite unlike those under which our species evolved. The 'Anthropocene' is a controversial term that refers to a geological epoch in which human activities have become a dominant force shaping our planetary environment. Debate surrounds whether the Anthropocene is a helpful concept, and when the proposed epoch commenced. When atmospheric chemist Paul Crutzen and limnologist Eugene Stoermer (2000)

proposed the term, they suggested it should be dated from the Industrial Revolution, owing to the increased use of fossil fuels that began at this time. Today, there can be little debate that human activities are inadvertently reshaping the planet's biomes and climate. Our challenge is to place our ecological impacts under democratic control.

Outline of the Argument

In searching for a politics that might effectively respond to climate change, this book advances three arguments. First, I outline the case for states to take on the mission of driving low-carbon innovation. Historically, innovation has been only a peripheral concern of social theory. Today, democratizing and accelerating the pace of technological change is an essential element of any effective response to Anthropocene challenges. Ultimately, low-carbon technologies need to become so attractive that they are widely deployed even under governments that repudiate Green values. While policy instruments like carbon prices are valuable, they are politically fragile. As the election of the Trump Administration has made clear, wider political currents will not always advance climate change mitigation. How, then, to achieve this accelerated technological progress? I argue that the state is the only actor with the capacity and social mandate to take on such a role, and that climate activists should make a demand for innovation central to their work.

This first argument is by no means innovative. The necessity of low-carbon innovation has been recognized by the IPCC (Somanathan et al. 2014, p. 1178), and by a wide variety of scholars (e.g. Garnaut 2008; Prins and Rayner 2007; Victor 2011; Brook et al. 2016) and public intellectuals (Asafu-Adjaye 2015; Gates 2015). Nevertheless, many Green activists are hostile towards technologically oriented environmental arguments, such as those advanced by ecomodernists. Therefore the book's second theme

addresses ecomodernism's political character and prospects. I argue that ecomodernism is best understood as a *social democratic* response to global ecological challenges. Social democracy is an ideology that advocates state regulation and intervention in a capitalist economy in order to promote equality, human development and other shared public interests. Ecomodernists, like most social democrats, are materialists in the sense that their concern for human welfare includes a focus on material comfort. Today, this materialism has been rejected by many Greens and consequently, ecomodernists' advocacy of traditional progressive values can seem conservative. The book's third argument emerges from an effort to extend ecomodernism by critiquing it against its own social-democratic and humanist values. Chapters 5 and 6 argue that if 'universal human flourishing' is to be possible during an era of mounting climate harms, then ecomodernism's social agenda will need to be broadened into a vision of 'global social democracy'. Universal provision of social services and global democratic control over earth systems governance will be needed.

The book thus has a dual purpose. First, it seeks to rethink whether social democratic principles can support global human flourishing in the Anthropocene. Second, it critically examines the connections between ecomodernism, social democracy and other strands of progressive thought. Specifically, I advance these goals by (1) outlining key drivers and threats associated with the climate crisis; (2) situating ecomodernism politically and connecting ecomodernist thinking with contemporary debates over social democracy, development and democratizing global governance; and (3) identifying emergent practices of ecomodernism and sources of momentum towards an ecomodernist future. While I am broadly sympathetic to ecomodernism, this book aspires to produce a critical reframing of ecomodernist ideas that connects them more explicitly with social democratic thought. My aim is to develop ideas that might help guide progressive climate policy and activism.