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INTRODUCTION

In May 2025, I gave the Battcock Lecture in Oxford.[1] My title was 'Climate Realism: time for a re-set' and my lecture infuriated lots of what might be called 'the climate change community'. The climate community can be defined as a very loose coalition of academics, politicians, activists and media commentators who share a number of concepts and basic assumptions, and see the evidence, new hypotheses and policies shaped through this lens. Because they see the world this way, apparent refutations and conflicting evidence get reinterpreted in ways that leave the basic framing intact.

It's a classic intellectual paradigm[2] with an added campaigning activism to stop the disaster they, perhaps rightly, see coming. Like all paradigms, this one comes in different shades, and the wider climate community which coalesces around this paradigm is inevitably a loose and often quarrelsome network, and a progressive one, convinced it is on the right side of history. Most, but certainly not all, are on the political left.

Some describe it as a religion, but it is not. Paradigms have considerable virtues, and this one has far more content. The theory of the greenhouse effect is grounded in core science. If the greenhouse gases (GHGs) in the atmosphere increase in concentration, then the climate warms. This is nineteenth-century science.[3] Different GHGs have different effects, but all go in the direction of global warming. Carbon dioxide (CO_2), as a core GHG, and as a proxy for the others,[4] has been increasing in concentration in the atmosphere, and looks like continuing to do so, and the temperature has

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risen, as it has in the geological past, when the concentration of carbon has gone up.

This is the scientific bedrock of the climate change paradigm. It is the claims that are added to this, and the policies, advocacy and activists that go with them, that make the climate change community more close-knit, more political and more closed to criticism and challenges. This is why my lecture and this book will prove challenging to them.

First up is the assumption that climate change is *the* problem of our age, to which all others are subsidiary. Second is the claim that existing technologies can solve the problem. Third, there is the claim that renewables are cheap and getting cheaper and are the route to cheap energy, and that fossil-fuel prices are going to be high and volatile, and hence getting out of fossil fuels is a good thing, independent of the carbon emissions. Staying with fossil fuels is claimed to be the route to economic decline: only the nations that embrace renewables have a competitive future. These claims are knitted together around the concept of 'the transition'.

A community defines itself not only on what it agrees about but also who are its enemies. This leads to a common vocabulary. The 'enemy' are climate 'deniers' and climate 'sceptics'. The root cause of our difficulties lies with the evil fossil-fuel companies and their directors and shareholders. We need to 'disinvest' and deal with these climate 'criminals'. Companies that do not adhere to strict net zero targets, compatible with the Paris Agreement 2015,[5] the outcome of COP21, are 'bad'. The task is to 'unlock' and 'unleash' 'green finance', which will produce 'green growth' and 'greater prosperity'.

Like any community, the climate change community has its heroes and its villains. The 'good guys' are leaders like Barack Obama, John Kerry and Joe Biden, academics like Nick Stern, and climate negotiators like Christiana Figueres and Pete Betts. The bad guys include George Bush Jr and Donald Trump, and all the far-right leaders that emerged in

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Europe. It is almost entirely a Western league of the good and the bad. Vladimir Putin and Xi Jinping rarely get a mention, except to fawn over the cheap (subsidised) Chinese solar panels and electric vehicles (EVs), and ignore China's grip on the minerals and the rare earths and the pollution that goes with their mining and refining, and especially turn a blind eye to Chinese coal-burning – over half the world's total coal-burn and nearly 60 per cent of its electricity generation.[6] Autocrats like Xi Jinping in China are going to save the planet, whilst democratically elected Western leaders will take us on the road to hell. Hence, democracy is itself suspect: many climate activists want to impose their policies on the rest of us.

The antics of the 'activists' are often tacitly supported by the wider climate community, including scientists and academics. Greta Thunberg is treated as a kind of secular saint. The likes of Just Stop Oil pursue the very dangerous utopian idea that we could 'just stop oil', with little or no regard to what would happen if we did.

These factions all coalesce around two related ideas: that the United Nations (UN) COPs are a good way of solving the problem and that net zero carbon territorial production targets are the way to do this. Lots of climate activists can be found attending the COPs, part of around 50,000–90,000 attending, a communion of the believers, and most of them fly to these destinations.

There are many good people in this community, much very good research is done, and lots and lots of useful policy proposals are dreamt up. Climate modelling has made extraordinary advances. I know and admire many in the community.

Yet there is always a problem with 'groupthink'. Language gets debased, genuinely sceptical criticism is suppressed or shouted down, and the tendency is to talk to themselves rather than the rest of the world. The scientific process of trying to refute existing theories is not just put aside but often actively scorned.

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Sadly, this is becoming all too obvious. Whilst the climate community gets ever more convinced of its righteousness, the politics is slipping away from them. The electorates in Europe and the US are not voting for the sorts of policies advocated by these activists. Quite the contrary: the far right across Europe shares an anti-net zero perspective, often second only to the focus on immigration. Trump has been elected twice in the US on a pro-fossil-fuel agenda. They all see net zero as a progressive left-wing idea, and lump it together with other agendas, like diversity, equality and inclusion (DE&I). Meanwhile, the key places where emissions are going up, and where the sequestration of the natural world is being devastated, take little or no notice. India is boosting its coal-burning to support its economic growth at over 6 per cent GDP per annum. Indonesia is burning lots of coal and doing great damage with its nickel mining, and China is building more coal power stations on its way to its future energy mix: coal, nuclear and renewables. In Sub-Saharan Africa, mining for cobalt, coltan and copper minerals adds to the expansion of oil and gas resources, and coal mining. The Congo, Amazon and Mekong are all suffering great damage in the name of extracting minerals for batteries, and hence for EVs. Lithium, copper, nickel and cobalt are all being extracted in the name of net zero.

'Zero emissions', 'carbon-free energy' and other fantasies do not exist in the reality of their great resource requirements and their mining and refining, nor in the materials for all the solar panels, wind turbines and batteries. Clean energy does not exist; there are just degrees of 'dirty energy'.

There are two other realities that the climate community needs to face up to. There is no slowdown in the increase in the carbon concentration in the atmosphere, the only number that really matters. By December 2025, it had reached 426 ppm, and it has been increasing at around 2 ppm every

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year since 1990. In 2024, it was over 3 ppm.[7] This is net of emissions and sequestration, and both are heading in the wrong direction. The temperature is rising: having in practice already tested 1.5 °C warming, busting through the Paris Agreement.

There is also no transition. In energy, there never has been a transition. Fossil fuels are still over 80 per cent of world energy supply,[8] and that is 80 per cent of a much bigger number, as GDP has expanded since 1990. The rest is large hydro, nuclear and conventional biomass, none of which has been built solely for climate reasons, but rather for energy supply, and wind and solar make up the rest.

There was no transition from wood to coal, from coal to oil, or from oil to gas. Every new technology helped to meet the *extra* demand for energy, whilst the existing technologies carried on expanding too. Each new technology has served to increase the demand for energy. More supply has created more demand. Digitalisation, AI, data centres and quantum computing are the new energy-intensive demands of our age. The idea that we are on a transition *from* fossil fuels *to* renewables and that this can be achieved by 2050 remains a fantasy, unless something truly remarkable happens. Even then, even nuclear fusion would take several decades to be built at a scale to meet the ever-increasing total energy demand.

For those in the paradigm, contrary evidence on the effectiveness of the policies they promote gets re-interpreted to make it fit the paradigm's basic assumptions. There are side explanations to reconcile the way the world is with that of the paradigm. Take the fact that the UK has emerged with the highest industrial energy prices in the industrial world. You might expect that this would at least prompt a questioning of why this is the case, and lead to the inconvenient conclusion that perhaps ever-lower costs of energy are not compatible with the 'transition' to wind and solar? Perhaps wind and solar are not cheap after all?

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But no, those in the paradigm double down on the 'cheap' argument. It is not, they say, because renewables are expensive, but rather because gas prices are always going to be 'high and volatile'. They conflate a spike (like those caused by the Ukrainian invasion and the attacks on Iran) with trends. And, anyway, even if wind and solar are more expensive now, just around the corner their costs are going to crater, whilst the price of gas will keep going up. Those in the paradigm appeal to the 'S-curve',[9] which purports to give convincing evidence that the price of solar, in particular, is going to fall so that – as was once claimed for nuclear – it will be too cheap to measure. Even if the holy grail of cheaper energy gets repeatedly postponed, faith in its inevitability remains.[10]

To make the cheap energy argument stick, those in the paradigm need to pick a measure of costs that gives them the answer they want to get to. They point to the fact that the *marginal* costs of wind and solar are both close to zero. Indeed, these energy sources do not have marginal costs at all, whereas gas and coal (and oil) do. The wind and the sunshine are free. Yet a moment's reflection should signal that it is not the marginal cost of a solar panel or a wind turbine that determines the system cost.

In the UK, it already takes twice as much capacity to deliver the same energy when the technology comes in small units, is geographically diffuse, has low energy densities, and, critically, is *intermittent*. Intermittency requires batteries and storage, which gas does not, and being decentralised and small scale, it needs a lot more transmission and distribution infrastructure. The result is very different from relying on an S-curve in respect of solar panels and the marginal cost argument. Even the S-curve is questionable – it is an extrapolation of past cost changes to technologies that the paradigm takes as the answers to climate change. There is little explanation of why fossil-fuel prices might not fall a lot, not just because of technology but

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also because there are vast reserves which are at costs well below the current prices.

The climate community once believed in peak oil – that there are limited oil, gas and coal resources and we are in imminent danger of running out. As the supplies dwindled away, the prices would inevitably rise. It was nonsense, though a large number of otherwise sensible people did in fact advance this hypothesis. The amount of oil, gas and coal that we know about is the amount that it has been worth finding out about. It turns out that there is more than enough to fry the planet many times over, and new fossil-fuel technologies just keep coming: modern fracking and seabed platforms, to name just a couple. Worse, climate change may actually make even more resources accessible, notably the abundant resources of the Arctic, as the ice melts.

The default reaction to any criticism or countervailing view for a paradigm is to re-interpret the claims so that they are compatible with the paradigm.[11] Throughout this book, we will meet repeated examples: in criticisms of net zero territorial carbon production targets; criticisms of the COP processes and outcomes; criticisms of the pollution caused by mining for renewables and refining; criticisms of costs; criticisms about security; and criticisms about the impacts on economic growth.

As these criticisms are examined, I will no doubt condemn myself to the full force of the climate change community, for I am committing the ultimate heresy. My claims are that current policies are not working, that the main policy-related assumptions of the carbon paradigm are wrong, and that the policies advocated will not solve climate change.

The heresy is to suggest that what the carbon community is advocating will not solve the problem. Indeed, some of the policies put forward may actually make matters worse. And in doing so, the political hostility that has grown up will not be assuaged. Repeated claims that renewables can mostly meet energy demands and that they will be cheaper

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and that bills will consequentially fall towards the marginal or levelised costs of wind and solar make for good speeches and encourage 'progressives' in politics. They get the activists going. But as voters find out that they are not true, their reaction is perfectly predictable and understandable. That is why the net zero consensus, such as it was, has broken down, and not just led by the far right, but now increasingly by the political mainstream.[12]

All, however, is not lost. Having first demolished some of the main foundations and assumptions of the existing paradigm, the ground is cleared to put something better in its place. The starting point is to revisit the core problem – climate change and its causes – rather than take all this for granted. It requires a focus on the 'global' bit and the primary causes of the rises in emissions and the falling sequestration. It requires an understanding that it is not just the US and Europe that are causing climate change and always having in mind the simple fact that it does not matter where a tonne of carbon is emitted or sequestrated. Because it is a global problem, it will be solved (or not) in places like India, China, Indonesia, Brazil and Nigeria. Claiming 'world leadership', as UK and EU politicians do, only works if India, China, Indonesia, Brazil and Nigeria are listening. Why should they bow down to our claimed superior leadership, especially if it brings the highest prices for electricity and deindustrialisation?

Sorting out the causes leads to the next bit. Net zero targets, as constituted by the UN COPs and the national determined contributions (NDCs) and unilaterally by the EU and especially the UK, are the wrong targets. The target should be net zero carbon *consumption*, not net zero carbon production. Focusing on territorial emissions is not just insufficient but can be actually perverse. Remember, it does not matter where the emissions take place. Steel produced in China instead of in the UK or Germany still has emissions, and if it is imported rather than made at home,

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total emissions are probably higher. Deindustrialisation is not a strategy to address climate change; it does not lead to economic growth and prosperity, but it is very effective in reducing territorial carbon emissions.

As ever, the climate community has a ready-made answer. Net zero carbon territorial emission targets will work if everyone has them and everyone achieves them. Welcome to utopia, not the world we live in. Lots and lots of countries do indeed sign up to NDCs, but signing up is not the same as achieving them. Recall that fossil fuels are still over 80 per cent of total global energy supplies, and the demand for oil, gas and coal is still going up. Peaking of these fossil fuels, if it ever happens, is not a great achievement – it would still leave us with extraordinarily high fossil-fuel emissions. Peaking is still disastrous. If everyone was set the more appropriate carbon consumption target, the goal would also be achieved, but the distribution of burdens would be very different.

Getting the causes sorted out properly and setting a net zero carbon consumption target instead of a net zero carbon territorial production target would change the game. It would also turn the lens onto the carbon footprint of the renewables. Remember all that mining. Remember all the environmental damage being caused. Think of all the energy needed for the refining, and the associated pollution. Take a look at the aerial pictures of the damage to the rainforests from nickel mining in Indonesia. Look at the cobalt mines (and copper mines, which cobalt is associated with) in the Democratic Republic of Congo (DRC). Look at the great environmental horror that is the Bayan Obo mine in Inner Mongolia, and the mines in Yunnan Province in China.[13] Look at the coal mining and burning to make the Chinese solar panels (80 per cent of the world's supply[14]). Look at the disposal of the batteries.

It is hard to escape the conclusion that not only is the paradigm not presenting a very good picture of what is going on, and not providing a credible set of policies, but that working

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within this paradigm is not a very productive way forward. For those in the climate community who have reached the same conclusion as I have – that we are not cracking the problem and that we are well on the way to 2 °C and probably 3 °C warming this century – one answer is to double down on technology. If we cannot control the emissions, why not bury them? Why not do carbon capture and storage (CCS) and why not do direct air capture and storage (DACS)? Let's manipulate the atmosphere itself to geoengineer carbon concentrations in the atmosphere with a 4 rather than a 5 in front of it, extracting enough carbon and burying it so that we don't reach 500 ppm?

Contemplating geoengineering is a recognition that current policies are not working. The 30 COPs have not dented the rising ppm in the atmosphere and are unlikely to do so. At least it is a start on rethinking the paradigm. But here too it gets dangerous. The search for get-out-of-jail cards leads to some very worrying territories. Injecting sulfur and other chemicals into the upper atmosphere and using solar reflectors could be done unilaterally, and have obvious military purposes. Others get more extreme. SpaceX wants to go to Mars and found a colony there. Whilst there are many who might welcome Elon Musk's departure from this planet, it is an incredibly expensive way of achieving very little for us here on this planet.

There are lots and lots of ideas out there as to how technology might augment the dash for wind and solar. Some might work. It might turn out that solar is too cheap to measure. It might turn out that solar and batteries can be made 'clean'. But it probably won't be soon enough. Which brings us back to an alternative way of looking at the problem and a different, but sometimes overlapping, environmental paradigm. Perhaps the problem is us and our consumption? Perhaps we are living beyond our environmental means? Whilst we can go on advancing our knowledge and ideas and making new discoveries – and hence have a genuine

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