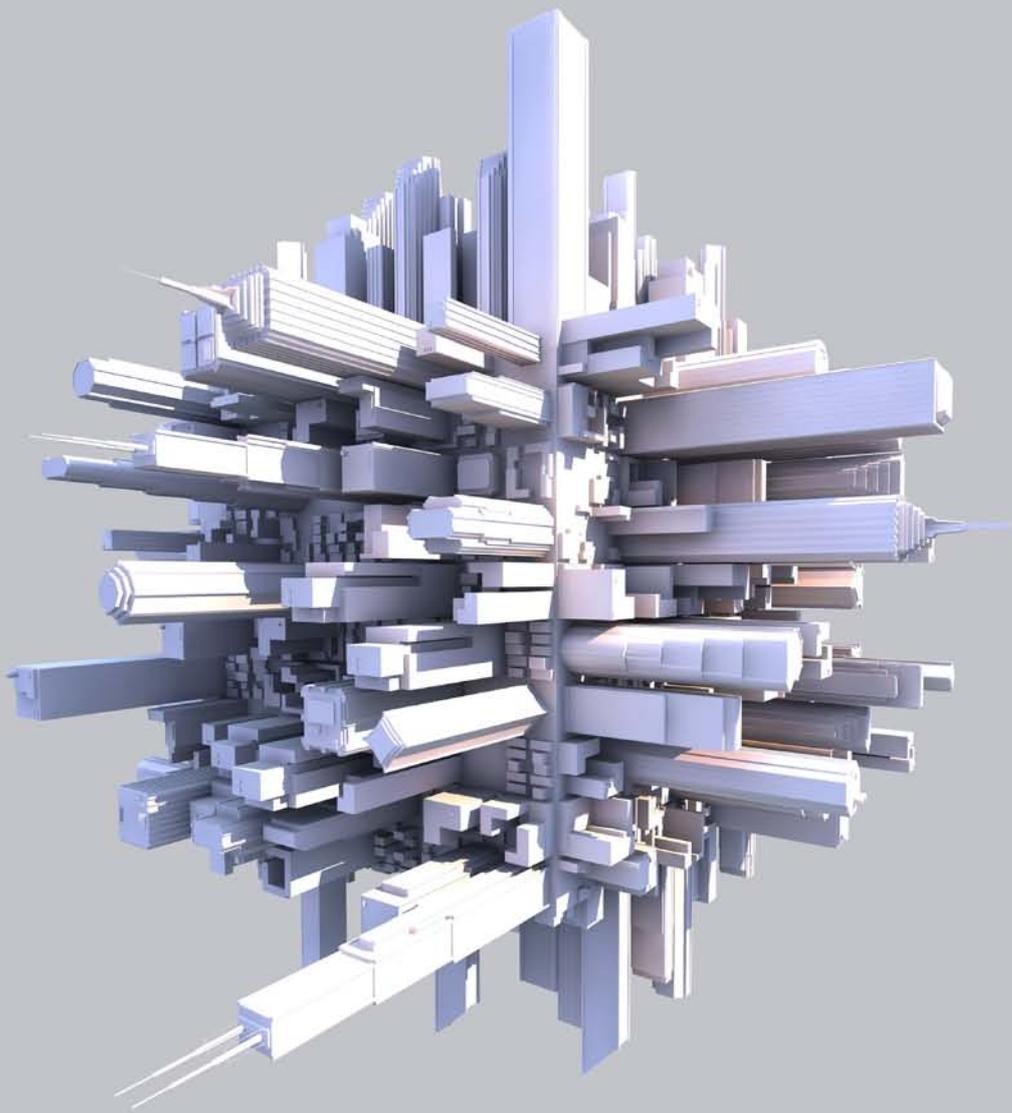




THE CLIMATE NOOSE

BUSINESS, NET ZERO AND THE IPCC'S ANTICAPITALISM

Rupert Darwall



The Climate Noose: Business, Net Zero and the IPCC's Anticapitalism

Rupert Darwall

Report 40, The Global Warming Policy Foundation

ISBN 978-1-9160700-7-3

© Copyright 2020, The Global Warming Policy Foundation

'We must stop Tuvalu from sinking and the world from sinking with Tuvalu.'

UN Secretary-General António Guterres, 17 May 2019²

'The IPCC's 1.5-degree special report cites the French Marxist Thomas Piketty's book *Capital in the 21st Century*, but does not survey the many criticisms of the book.'

Rupert Darwall

'A senior UN environmental official says entire nations could be wiped off the face of the Earth by rising sea levels if the global warming trend is not reversed by the year 2000.'

AP News, 30 June 1989¹

'Shutting down the whole economy is the only way of limiting global warming to 2°C.'

Yvo de Boer, former head of the UNFCCC⁵⁶



Contents

Dedication	iii
About the author	iii
Two-minute read	iv
The West versus the rest	iv
Summary	vi
1. The new battleground in the climate wars	1
2. The role of business	5
3. The non-disappearing coral atolls	10
4. Ideology and the IPCC Special Report	15
5. Repackaging the carbon budget	16
6. Holes in IPCC climate science	18
7. The IPCC's anti-growth bias	20
8. A policy prescription failing every conceivable cost-benefit test	22
9. Conclusion: The coronavirus pandemic and the 1.5 degree limit	27
Notes	31
About the Global Warming Policy Foundation	36

Dedication

To the memory of David Henderson (1927–2018)

This paper is, in a sense, a tribute to Professor David Henderson. His interest in, and trenchant critiques of, 'corporate social responsibility' – what today goes under the banner of ESG – was what led him to global warming. On one of the last occasions I saw David, he reminded me of *The Role of Business in the Modern World* (2004). I remembered those words when writing this report and took the copy he gave me from my bookshelf. There I found his case contra CSR expressed with crystal-line clarity. I hope he would approve of my use of it here.

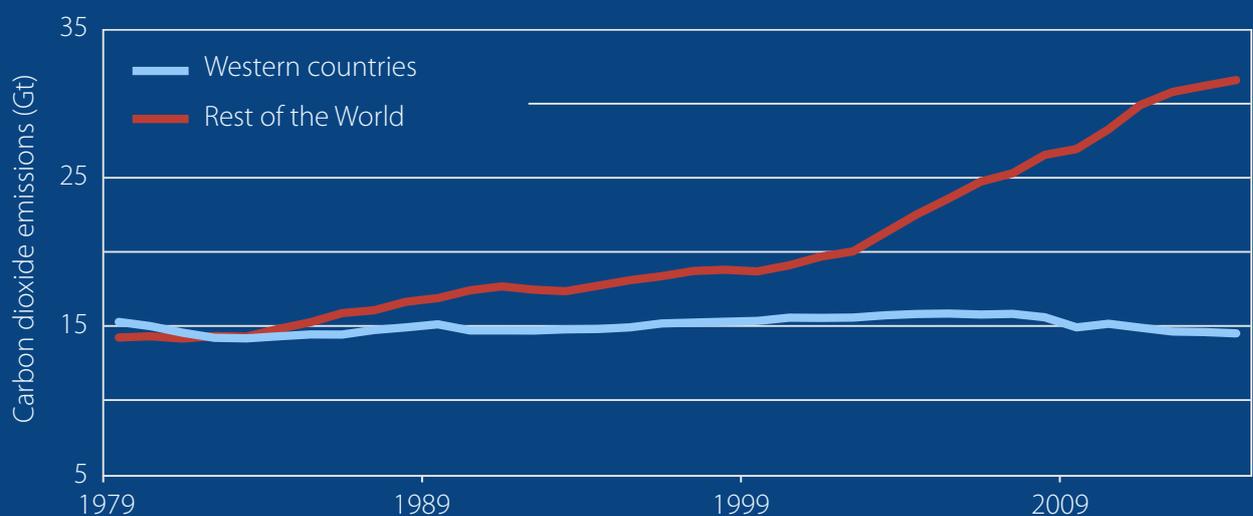
About the author

Rupert Darwall is a fellow of the Real Clear Foundation. After reading economics and history at Cambridge University, he worked in the City of London as an investment analyst and in corporate finance before becoming a special adviser to the then Chancellor of the Exchequer, Norman Lamont. He has written extensively for publications on both sides of the Atlantic, and is the author of the widely-praised *The Age of Global Warming: A history* (2013) and *Green Tyranny: Exposing the totalitarian roots of the climate industrial complex* (2017). He has written reports on UK energy policy for Reform (*How to Run a Country: Energy policy and the return of the state*, November 2014) and the Centre for Policy Studies (*Central Planning with Market Features: How renewable subsidies destroyed the UK electricity market*, March 2015) as well as an analysis for the Centre for Policy Studies on reforming tax credits (*A Better Way to Help the Low Paid: US lessons for the UK tax credit system*, 2006) and on energy and industrial policy for Civitas (*Going Through the Motions: The industrial strategy green paper*). This is his third paper for GWPF, the first being *The Anti-Development Bank* (2017) and the second *The Climate Change Act at Ten* (2018).

Two-minute read

- **Why 1.5°C?** The stated aim of the 1992 UN Framework Convention on Climate Change is to avoid dangerous anthropogenic interference in the climate system. This was defined by European governments as limiting the rise of global temperature to no more than 2°C above pre-industrial levels, a definition subsequently written into the UN climate texts. In the run-up to the 2009 Copenhagen climate conference, small island states claimed the 2°C limit risked their homes sinking under the waves. As a result of their lobbying, the 2015 Paris Agreement speaks of 'pursuing efforts' to limit the temperature rise to 1.5°C above pre-industrial levels.
- **What was the scientific backing for the claim that 1.5°C was needed to save small islands from drowning?** 1.5°C to save small islands is a brilliant soundbite that turns out to be 100% wrong. Nearly two centuries ago, Charles Darwin wrote that coral atolls are formed by the slow subsidence of the seabed. Even though green activists, from the UN Secretary-General down, falsely claim otherwise, modern research finds Darwin was right and that many apparently threatened atolls have increased their land area.
- **Why now?** The Paris Agreement talked of reaching net zero sometime in the second half of the current century. In 2018, three years after the Paris climate conference, the IPCC published its 1.5°C special report. The IPCC declared that net zero must be reached by around 2050 and that emissions must fall 40% by 2030. The 2030 timeline unleashed the current wave of intensified climate alarm, with talk of '12 years to save the planet', as if a rise in global temperature of around 0.5°C from current levels presages planetary catastrophe.
- **On what basis did the IPCC mandate net zero by 2050?** In its Fifth Assessment Report, published four years earlier, the IPCC declared a 1.5°C carbon budget that was about to be used up. It therefore had to repackage the 1.5°C budget to avoid the new, lower temperature limit being dead on arrival. The process of revising the carbon budget demonstrates it is more of a smoke and mirrors exercise than hard science, with ample scope for subjective judgment and choices.

The West versus the Rest



Carbon dioxide emissions from energy and cement manufacture

- **Why did the IPCC decide to create a climate emergency?** The IPCC says net zero provides the opportunity for 'intentional societal transformation'. Indeed, the IPCC does not hide its belief that capitalism and economic growth threaten the future of the planet.
- **What does the IPCC want to replace capitalism with?** Reaching net zero in 2050 requires top-down coercive central planning on a global scale, encompassing energy, manufacturing, construction, transportation, agriculture and land use.
- **How much will it cost?** The IPCC tries to sweep cost under the carpet, saying cost data on 1.5°C are scarce. The few numbers it provides imply the policy costs of net zero by 2050 are up to 61 times estimated climate benefits, showing that 1.5°C is an arbitrary target requiring massive policy overkill at huge cost to human welfare.
- **What is the likely impact on the world's poor?** The IPCC concedes that draconian emissions reductions mean higher food and energy prices, the latter delaying the transition to clean cooking, and therefore keeping in place one of the main causes of preventable deaths in developing countries.
- **Is there any chance of reaching net zero in 2050?** Irrespective of what Europe and the US do, there's not a chance. In less than a decade and a half, the *increase* in developing nations' carbon dioxide emissions outstripped the combined *total* of US and EU emissions.
- **Why should companies target net zero when the world's governments are going to miss it by a country mile?** Unilateral net zero will make companies, their shareholders, employees, customers and local communities poorer. There is no economic, social or ethical justification for self-improvement, as it benefits no-one but green rent-seekers and the West's competitors. Capitalism depends on corporations innovating and competing. Investors and boards that force companies to become tools of public policy undermine the motive power of capitalism, the only economic system that generates long-term economic growth. In doing so, they are digging a grave for the West and ceding economic leadership to the rising powers of the East.

The Coronavirus and the 1.5-degree limit

Shutting down the whole global economy is the only way of achieving a two-degree goal, the former UN climate chief Yvo de Boer said in in the run-up to the 2015 Paris Agreement.⁵⁶ We can now see what a global shutdown looks like. Unlike any economic bounce back from Covid-19 lockdown, decarbonisation permits no let up; it goes on year after year, decade after decade. In a rational world, governments will prioritise economic growth over decarbonisation. Yet adoption of the 1.5°C target was based on a PR soundbite, not reason or analysis. Two factors, however, doom 1.5 degrees and net zero. The first is the growth of non-Western emissions, as shown on the graph on the previous page:

- From 1979, it took the Rest of the World 33 years to increase carbon dioxide emissions by 63%, a compound average growth rate of 1.6% per year.
- There is a marked inflection point in 2002, after which it took only 12 years for the Rest of the World's emissions to rise by 77% – a compound average growth rate of 4.9% per year – to a level three times higher than the West's.

The second is the return of geopolitics. In its handling of the pandemic, China – the world's largest emitter of greenhouse gases – has proven itself a bad-faith actor. Great-power rivalry has no place for a multilateral process that undermines participants' economies and their national security. At some point, the penny will drop.

Summary

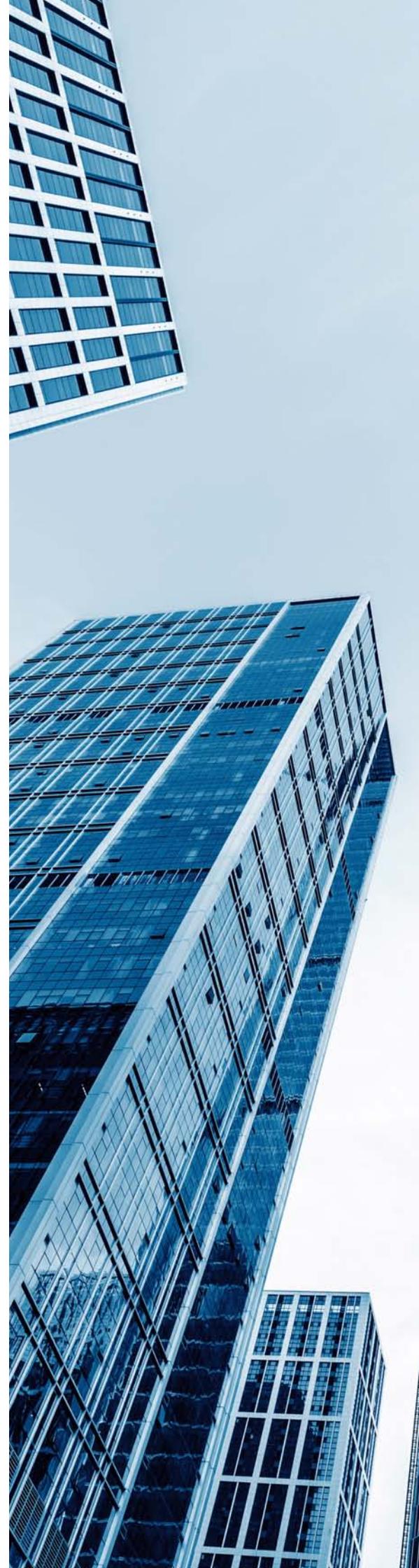
Business is now on the frontline of the climate wars as never before. Corporations are being told their business strategies must align with the goals of the Paris Agreement. The financial sector is being weaponised to make good that threat. This paper sets these developments in the context of the near certainty that governments, who are the actual parties to the Paris Agreement, have no intention of eliminating net greenhouse gas emissions by mid-century, which the Intergovernmental Panel on Climate Change (IPCC) says is needed to prevent global temperatures rising by more than 1.5°C above pre-industrial levels (Section 1).

Underlying the call that business should go beyond law and regulation to decarbonise is the view that the role of business is to do good; in effect, to be like charities that happen to make a profit. This is a profound misunderstanding of how capitalism works. Individual businesses do not set out to raise living standards; it is the ceaseless effect of competition and the imperative to innovate that have transformed mankind's material condition. Tying corporations in stakeholder fetters and climate shaming them to act against their shareholders' interest threatens to drain the life force out of capitalism. As Joseph Schumpeter argued in the 1940s, the biggest threat to capitalism comes from within capitalism itself (Section 2).

Lowering the target from 2°C to 1.5°C drove the timetable to meet the net zero target. It came about as a result of a sustained campaign by small island states pushing the narrative that their countries were likely to disappear under the waves. Like the iconic polar bear threatened with extinction, this turns out to be false and have no scientific basis at all (Section 3).

The 1.5°C target was included in the Paris Agreement as an aspiration, rather than a hard target. The IPCC was then tasked with providing a scientific and economic justification for it. The IPCC has always been a political body and was conceived as such, but its 1.5°C special report breaks new ground in being overtly ideological, as evidenced by its opinion that the net zero target provides the opportunity for 'intentional societal transformation' (Section 4).

The IPCC had set a 1.5°C carbon budget in its Fifth Assessment Report four years earlier. However, it was about to run out; without a revision to the budget, the 1.5°C target would have been missed virtually the moment it was set, which would have been embarrassing for all concerned. So the IPCC's first order of business was to devise a new carbon budget and push out the





net zero deadline. The way in which the IPCC was able to repackage the 1.5°C budget – the maximum amount of carbon dioxide that can be emitted to stay below 1.5°C – illustrates the amount of discretion it has and the degree of artifice lurking behind ostensibly objective science.

Although it could only muster *medium confidence* on the size of the remaining 1.5°C budget, the IPCC was able to assert *high confidence* that emissions must reach net zero by around 2050 and decline by about 45% from 2010 levels by 2030. It was the 2030 timeline that unleashed the current wave of heightened climate alarm, provoking Congresswoman Alexandria Ocasio-Cortez to talk of the world ending in twelve years (Section 5).³

The IPCC's treatment of climate science in the special report is full of holes and is far from being a model of scientific objectivity. In keeping with its political mandate, the IPCC avoids any discussion of climate-model tuning strategies being designed to produce politically acceptable results (Section 6).

As an ideological document, IPCC focuses exclusively on the negative consequences of capitalism and economic growth and ignores its benefits: rising standard of living, quality of life and extended longevity. In similar vein, its assessment of the 1.5°C pathway amounts to saying climate impacts are lower than on a 2°C pathway, something a child could have told them. Because the IPCC avoids evaluating the extra costs of the 1.5°C pathway, as a guide to policy, its gloss on 1.5°C is worthless. Comparison with social cost of carbon estimates produced by the Obama White House imply that the costs of the 1.5°C pathway are one to two orders of magnitude greater than the estimated climate benefits from those emissions reductions; that is to say, it represents massive policy overkill and inflicts unwarranted costs on the world economy, especially on the poorest (Section 7).

To cap it all, the IPCC wants to replace free-market capitalism with central planning on a global scale to bring about top-down transformations of the energy, industrial, transportation, construction, land use and agricultural sectors. The IPCC grudgingly concedes that this is likely to mean higher food prices, hitting the poorest hardest. It also expects higher energy costs to delay the move to clean cooking, meaning more indoor pollution and therefore lost lives. When seen in this light, it becomes clear that advocates of 1.5°C and net zero are behaving like fanatics, with little or no regard for the welfare of the poor and the wider interests of humanity (Section 8).





1. The new battleground in the climate wars

Corporations are being made an offer they can't refuse: align your business strategy with the Paris Agreement's 1.5-degree temperature target or else. According to the We Mean Business (WMB) climate coalition, 550 companies have committed to reducing their greenhouse gas emissions in line with the goal of the Paris Agreement to limit the future rise in global temperature to 1.5°C above pre-industrial levels.⁴ If companies don't take steps to becoming Paris-compliant, their access to finance might be curtailed. 'Sustainability is no longer a matter of taking care of the environment to please millennials. It's now a cost of capital issue,' says Peter Bakker, president and CEO of the World Business Council for Sustainable Development.⁵

In September 2019, Mike Bloomberg's Climate Finance Leadership Initiative produced a report for the UN Secretary-General on mobilising capital to meet the Paris target. 'The world requires a significant shift in investments that make financial flows consistent with pathways toward low greenhouse gas emissions,' wrote Bloomberg and his seven co-signatories – including the CEOs of Goldman Sachs and HSBC, the world's third largest bank outside China – collectively responsible for \$4.5 trillion in assets under management.⁶ Capital is not only to be switched to investments deemed socially acceptable; it is to be denied to those deemed unacceptable. A month later, Moody's changed the outlook for Exxon Mobil from stable to negative, citing the threat of 'potential carbon dioxide regulations' as a factor.⁷

Higher energy costs are not popular. Given the chance, voters in the United States reject carbon taxes; in 2018, carbon tax proposals were voted down in Arizona, Colorado and, for a second time, in Washington State. Circumventing voters and the ballot box, climate activists seek to politicise businesses and turn them into tools to achieve public policy ends. 'All businesses – especially those that to date have been silent on the threat of climate change – need to step-up their ambition and actions,' the WMB climate coalition says.⁸ In other words, companies are to be bullied and climate-shamed into taking action they judge contrary to their interests.

Climate shaming is being given a huge boost by the greening of Wall Street. The G20 has a task force on climate-related financial disclosures, chaired by Mike Bloomberg. Under the guise of fulfilling their mandate for financial stability, financial regulators and central bankers have formed a so-called 'Network for Greening the Financial System'. Although it doesn't include the Fed or other federal regulators, one member of the Commodities Futures Trading Commission has said the risks posed to financial markets by climate change are on a similar scale to the sub-prime crisis.⁹ Christine Lagarde, president of the European Central Bank (ECB), wants climate change to be part of the ECB's strategic mission. According to François Villeroy de Galhau, governor of the Banque de France, by increasing energy prices and lowering economic

growth, global warming could cause a ‘stagflationary shock.’¹⁰ De Galhau missed out a word; what he describes are the likely economic consequences of global warming *policies* rather than the direct effects of warming itself. The more you have, the worse the economic consequences.

All this raises the question of the demarcation between the rightful domains of democratic politics and business. ‘We’re not going to be the ones to decide society’s response. That is for elected officials, not us,’ Fed Chairman Jerome Powell told the Joint Economic Committee of Congress in November 2019.¹¹ There are 189 parties to the Paris Agreement. All are states, or, in the case of the European Union, a union of member states. None are businesses. And the Paris Agreement requires no ordinary outcome, but a top-to-bottom economic and societal transformation. Limiting global warming to 1.5°C requires ‘rapid and far-reaching transitions in energy, land, urban and infrastructure...and industrial systems,’ the IPCC says. ‘There is no documented historic precedent for their scale.’¹²

To state this is to acknowledge the unreality of what is being proposed. To bring it about requires a system of global governance with coercive powers over the allocation of global resources and the ability to dictate lifestyles. With the conceivable exception of EU member states that have already done so, sovereign nations will not willingly cede the necessary authority to a supranational body. In fact, the Paris Agreement gained the acceptance of the major emerging economies precisely because its architecture is designed around *nationally* determined contributions, not top-down targets.

Emission failure

A Martian visiting planet Earth and told about the UN Framework Convention on Climate Change would assume that the aim of the agreement was to boost carbon dioxide emissions. As shown in Table 1, far from slowing down, during the 22 years since the UN-FCCC was signed in 1992, annual emissions rose in absolute and relative terms, the growth rate actually accelerating: from an increase of 50% in the 22 years before the climate pact to 62% over the subsequent 22 years.

Table 1: Global CO2 emissions from fossil-fuel burning and cement manufacture.

Source: Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory (March 2017) https://cdiac.ess-dive.lbl.gov/ftp/ndp030/global.1751_2014.ems

	Annual emissions	22-year change	
	Mt	Mt	%
1970	14,862	—	—
1992	22,288	+7,426	+50.0
2014	36,138	+13,850	+62.1



This is not an accident. The one consistent theme running through nearly three decades of UN climate talks is the refusal of developing nations to be bound by treaty to anything that might appear to oblige them to cut their greenhouse gas emissions. The UNFCCC divides the world into advanced nations (Annex I parties) and the rest. At the COP1 Berlin climate conference in 1995, the parties adopted the Berlin Mandate, which states that the process will not introduce any new commitments for non-Annex I parties. The Berlin Mandate led to the ineffective Kyoto Protocol, which excluded the fastest-growing emitters. The 2009 Copenhagen climate conference (COP15) attempted to remedy this fundamental defect. Article 2 of the draft Copenhagen accord spoke of the requirement for 'deep cuts' in global emissions with a view to halving global emissions by 2050.¹³ The Copenhagen treaty was quashed by China, India, Brazil and South Africa.

As originally drafted, the Paris Agreement had a provision for targets and timetables for emissions cuts. Article 3 was drafted with a collective long-term goal of peaking global emissions, aiming to achieve zero global emissions by 2060–80.¹⁴ The target didn't make the final cut. All numbers and formulae that had been in square brackets in the draft were removed from the final text. Despite a weakened commitment – and much less onerous than climate activists believe (see Box 1) – collectively the parties

Box 1: Relevant provisions of the Paris Agreement

The Paris Agreement has been misinterpreted as limiting the rise in global temperature to no more than 1.5°C above pre-industrial levels and requiring net zero greenhouse gas emissions by 2050. This is a serious misrepresentation of what the agreement states.

Article 2 defines the agreement's objective as:

Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and *pursuing efforts* to limit the temperature increase to 1.5°C above pre-industrial levels. (Emphasis added; Article 2 .1. (a))

Article 4 outlines an emissions trajectory to achieve 'the long-term temperature' goal set out in Article 2.

Parties aim to reach global peaking of greenhouse gas emissions as soon as possible, recognizing that peaking will take longer for developing country Parties and to undertake rapid reductions thereafter in accordance with best available science, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the *second half of this century* (Emphasis added; Article 4.1.)

Article 4 goes on to differentiate the respective responsibilities of developed and developing Parties:

Developed country Parties should continue taking the lead by undertaking economy-wide absolute emission reduction targets. Developing country Parties should continue enhancing their mitigation efforts, and are encouraged to move over time towards economy-wide emission reduction or limitation targets in the light of different national circumstances (Article 4.4).

The Agreement's recitals provide context on how its provisions should be interpreted. There is one that warns against adopting over-zealous climate policies that lead to self-harm:

Recognizing that Parties may be affected not only by climate change, but also by the impacts of the measures taken in response to it (p. 1).

Source: UNFCCC, Paris Agreement (December 2015) https://unfccc.int/files/meetings/paris_nov_2015/application/pdf/paris_agreement_english_.pdf.

to the Paris Agreement lack the desire or will to meet the agreement's objective of holding the rise in global temperature to 'well below' 2°C above pre-industrial levels. In November 2019, the Obama administration's climate negotiator and one of the agreement's architects, declared that:

...the Paris Agreement is going to rise and fall on the level of political will in constituent countries of the agreement...The fact is that there is a lack of political will in virtually every country, compared to what there needs to be.¹⁵

2. The role of business

Why should business step into the breach to do what governments won't or can't? The enemies of capitalism blame business for the world's ills: inequality, stagnant income growth, poverty in poor countries, environmental degradation and, of course, global warming. Accepting this critique, the reformers of capitalism counter that the ills capitalism caused, business can cure. Corporations can set themselves a wider social purpose; they can make themselves accountable to their stakeholders and the wider community; they can pledge to engage in sustainable business practices and require their supply chains to do likewise and lobby governments to force other companies to do all those things that they claim is in their interests. It is a critique implicitly conceded by the 181 CEOs of American corporations who put their signatures to the Business Roundtable statement of corporate purpose, demoting profit and their accountability to shareholders.¹⁶

All this misses the reason why capitalism has transformed societies for the better. Businessmen, entrepreneurs and investors didn't set out to make the world a better place, but that is the aggregate result of their individual efforts. The point is beautifully made by Harvard Business School professor Clayton Christensen and his co-authors in *The Prosperity Paradox*.

By investing in market-creating innovations, investors and entrepreneurs inadvertently engage in nation-building...Once these new markets are created, the economy becomes more resilient, as it generates more income to fund schools, roads, hospitals, and even better governance.¹⁷

Contrast Christensen's insight with the dismal and incoherent message of the UN Secretary-General António Guterres banging the drum for fossil fuel divestment and the climate crisis:

People around the world are taking to the streets to protest against rising living costs. A narrow focus on growth, regardless of its true cost and consequences, is leading to climate catastrophe.¹⁸

Climate policies make energy more expensive, retard development and make poor people poorer. The major emerging economies are going to carbonise before they decarbonise. The growth of global carbon dioxide emissions since 1992 is a conse-

quence of more people being lifted out of poverty than the world has ever seen. It is why the emissions reductions required by the Paris Agreement are an exercise in make-believe.

If collectively the governments who are parties to the Paris Agreement are not going to eliminate net greenhouse gas emissions by mid-century, why should business corporations? External pressure for them to align their business strategy with net zero is evidence that it's against the interests of their shareholders – otherwise there would be no need to climate-shame them. But then neither is it in their stakeholders' interests. Carbon dioxide acts as a greenhouse gas on a global scale. Cutting carbon dioxide emissions in one part of the globe makes no difference to the local atmosphere and the local weather where emissions are cut: there is no benefit to employees, whose wages are likely to be lower (or there may be fewer of them) or to customers, who will pay more for the same or whose range of consumer choice becomes more restricted, or, indeed, to local communities.

Corporate greenwashing

It is the case that the Paris Agreement invites corporate hypocrisy. The financial sector, for example, is almost totally immune from energy costs. Take Goldman Sachs. Its direct energy costs are a fraction of its office occupancy costs of \$809m in FY2018, which in turn amounted to just 2.2% of FY2018 \$36.6bn net revenue.¹⁹ Better still, the finance sector can more than hedge its miniscule exposure to rising energy costs by profiting from them. 'At the end of 2018, we reached \$80 billion in our goal to finance or invest \$150 billion in clean energy by 2025', Goldman CEO David Solomon boasts in its 2018 annual report.²⁰

There is a great deal of self-interest in the greening of Wall Street and the City of London. It helps absolve bankers from their culpability in the 2008 global financial crisis and diverts attention from what UCLA economist Axel Leijonhufvud says are the privileges bankers enjoy, which skew income distribution towards them.²¹ And there's hypocrisy too. In a market economy, what matters is consumption emissions, not production emissions. The producer does not decide the purpose of his production, Ludwig von Mises wrote in *Socialism*: 'Those for whom he works decide it – the consumers. They, not the producer, determine the goal of economic activity.'²²

A growing number of companies boast about going 100% renewable energy. Apple and over 200 others, including Bloomberg, Facebook, Google, Nike, and Starbucks, have committed to go 100% renewable. In the real world, as distinct from the world of corporate PR, no business can depend solely on weather-dependent, intermittent wind and solar electricity. Contrary to its claims, neither does Apple. Rather than 100%, an overwhelming percentage of Apple's energy comes from coal and almost none from wind and solar. Claims of 100% renewable energy rely on an entirely legal accounting fraud that says, in effect, renewable electricity can be stored; corporations such as Apple buy sufficient

renewable energy certificates equal to the electricity they have consumed and pretend that this means they have consumed only electricity from renewables. In reality, they have taken power from whatever generators were connected to the grid at the moment they took it.

The business purpose error

There's a deeper issue than corporations making phoney claims about how they're saving the planet. Demands that corporations should go beyond the letter and spirit of applicable law and regulation when it's not in their interest to do so raise the question of the role of the business corporation in the modern world: What are corporations for? According to the Davos Manifesto 2020 of the World Economic Forum:

A company serves society at large through its activities, supports the communities in which it works, and pays its fair share of taxes...It consciously protects our biosphere and champions a circular, shared and regenerative economy...

A company is more than an economic unit generating wealth. It fulfils human and societal aspirations as part of the broader social system. Performance must be measured not only on return to shareholders, but also on how it achieves its environmental, social and governance objectives.²³

Writing on how to reform capitalism, Martin Wolf, the *Financial Times'* chief economic commentator, quoted approvingly the British Academy's *Principles for Purposeful Business*: 'the purpose of business is to solve the problems of people and planet profitably, and not profit from causing problems', Wolf adding, 'That is self-evident'.²⁴ Is it? This views businesses as performing a similar function for society as charities. Their role is to do good – but make money doing so. Just as charities have a charitable purpose, so businesses should have a social purpose. In a tripartite arrangement, governments, businesses and NGOs work together to solve the problems facing society. For matters of global concern and planetary management, their primary governmental partner is the UN.

The desire to harness business to this goal is understandable because of the success of business – more accurately, businesses operating within a capitalist economic system – in transforming humanity's material existence. Nonetheless, it is mistaken. In their critique of the Business Roundtable's demotion of shareholders and their replacement by a raft of stakeholders, George Shultz, Michael Boskin, John Cogan and John Taylor,* describe the elevation of multiple stakeholders and the downgrading of shareholder value as wrongheaded and misguided. The Business Roundtable's statement, they write,

* Respectively Secretary of State under President Reagan, Chairman of the President's Council of Economic Advisers under President George HW Bush, Senior Fellow at the Hoover Institution and professor of economics at Stanford University.



lends credence to an incorrect view of the way American businesses operate in today's economy; it fundamentally misunderstands the role that business plays in a free market economy; and it fails to consider the practical, real world, adverse consequences of demoting shareholders' interests...US Corporations have played a central role in improving standards of living in the US and around the globe.²⁵

The economist David Henderson also addressed this issue in his 2004 pamphlet *The Role of Business in the Modern World*.

There is good reason to think that profit-oriented 'capitalist' business enterprises, operating within the framework of competitive market economies, have played, and are continuing to play, a large part in making such achievements possible. *From an economy-wide perspective, as distinct from that of the individual firm, this is the primary role of business.*²⁶

The role of government

Henderson goes on to delineate the respective domains of business and government. The effective performance of business requires a framework of laws, institutions and political stability in which a market economy can function.

The main responsibility for creating the necessary framework, which goes beyond norms and rules of conduct for enterprises, rests with governments rather than business. Further, it is for government to decide how far, and in what ways, to enlarge or restrict by law the market opportunities and competitive pressures that bear on both businesses and people in general. In doing so, they have to take account of other issues, and other aims of policy, than that of improving the performance of enterprises as a means to furthering economic progress.²⁷

Shultz and his co-authors are similarly critical of businesses taking on public policy roles that belong in the realm of democratically accountable governments. When corporate executives spend corporate funds, they are actually spending their owners' money.

Taking other people's money without their consent and using it to achieve social purposes is properly viewed as a governmental function...A policy of corporate social responsibility, on the other hand, gives corporate executives, or corporate 'stakeholders', the authority to choose which social goals to achieve and how much of other people's money to allocate to them. This policy circumvents the safeguards provided by the governmental system of checks and balances and effectively places the power to tax in the hands of unelected persons.²⁸

The threat to capitalism

Having defined the rightful role of government, Henderson goes on to explain why companies having a business purpose to grow the economy and make the world a better place is, at best, superfluous:

The primary role of business, thus defined, is not one that individual enterprises consciously set out to play: it is not 'internalised', nor could it be. Within it, businesses are cast as agents of market-led change, but this is not because they have chosen to act as such. In any case, internalisation would serve little purpose, since the effective performance of the role does not depend on it...The advances that capitalism has brought did not arise from the resolve of business leaders to make them possible, but from the operation of competitive market economies.

The primary role of business, then, is defined here without reference to either the objectives of enterprises or the motives of those who own, manage and direct them: and *its effective performance does not depend on a conscious attempt by business leaders to make the world a better place.*²⁹

Henderson cites William Baumol's *The Free-Market Innovation Machine* and the defensive motivation of the modern corporation to innovate, and therefore propel economic growth and rising living standards. In Baumol's words, his book's central contention is that:

what differentiates the prototype capitalist economy most sharply from all other economic systems is free-market pressures that force firms into a continuing process of innovation, *because it becomes a matter of life and death for many of them.*³⁰

Innovation accounts for much of capitalism's extraordinary track record and, in key parts of the economy, the primary weapon of competition is innovation, not price. As a result, firms cannot afford to leave innovation to chance. Rather, managements are forced by market pressures to support innovative activity systematically and substantially, and success of any one business firm forces rivals to step up their own efforts. The result is a ferocious arms race among the firms in the most rapidly evolving sectors of the economy, with innovation as the primary weapon.³¹

In their critique of the Business Roundtable's stakeholder doctrine, Shultz and his co-authors warn of the impact on share values and capital flows from sacrificing the primacy of shareholder value. 'The price will be paid by the entire society as economic growth slows and living standards stagnate.'³² Instead of serving as the agent of a single principal, the company's shareholders, corporate executives would simultaneously be agents of multiple stakeholders.

The lack of accountability, the potential for endless legal wrangling and litigation will slow down companies' decisionmaking and lengthen their response times. Ultimately, the dynamism of US companies, which has been so crucial to rising standards of living, will diminish.³³

To these two concerns, a third can be added. Baumol wrote of fear driving innovation; that failure to innovate threatens the firm's survival. Now a new fear stalks the inhabitants of the C-suite, a matter of career life or death – the fear of finding themselves on the wrong side of the Climate Mob. In the past, that mob was composed chiefly of shaggy protestors from groups like Greenpeace

and Friends of the Earth. Now their ranks are swollen by pinstriped climate activists wielding real power: the likes of Mike Bloomberg and his climate-related disclosure task force, and former Bank of England Governor Mark Carney (now UN Special Envoy for Climate Action and Finance and Boris Johnson's chief climate adviser).

Bending the corporate knee at the climate altar comes at a cost to business performance. Corporate affairs executives tell chief executives what they must do to position their corporation as climate friendly. Plans are commissioned to decarbonise supply chains. Promising initiatives are killed for fear of antagonising the climate clerisy. Innovation is chilled. The corporation slows down and starts behaving like a government bureaucracy.

The authors of the IPCC 1.5°C special report are open about viewing climate change as presenting the opportunity for 'intentional societal transformation'.³⁴ They view capitalism and its unprecedented transformation of human welfare as the enemy of the planet. By arguing for draconian emissions cuts that inflict far greater costs than estimates of any corresponding climate benefits, advocates of net zero evince scant regard for the welfare of the poor and the interests of humanity.

The attempt to abolish carbon dioxide emissions requires abolition of the system that gave rise to them. 'Capitalism pays the people that strive to bring it down', Joseph Schumpeter, the greatest economist of capitalism, observed in the 1940s.³⁵ They won't succeed, but for the efforts of soft anti-capitalists within the capitalist system. To climate-shame corporations without the sanction of law or regulation and bind them in stakeholder fetters, will extinguish the dynamism that justifies capitalism. The moral case for capitalism rests on its prodigious ability to raise living standards and transform the material conditions of mankind for the better. Remove its capacity to do that and we will have quietly entered a post-capitalist era. As we shall see, that is what 1.5 degrees and net zero are all about.

3. The non-disappearing coral atolls

'We are losing the battle', President Macron declared at the One Planet Summit in December 2017 to mark the second anniversary of the Paris Agreement. 'Behind me are the heads of state and governments. In 50, 60, 100 years, there are five, ten, fifteen who won't be there anymore.'³⁶ It was the conference's only moment of drama. In the playbook of climate alarmism, the coral atolls of the Pacific and Indian Oceans are the human equivalent of the polar bear; on the front line of global warming and threatened with imminent extinction. Do the facts bear out the climate soundbites?

Disappearing summer Arctic ice threatens polar bears with habitat loss, so the climate trope goes. Despite being put on the IUCN Red List of threatened species in 2011, summer sea ice decline has meant a healthier prey base. From a low of 10,000 or fewer in the 1960s, polar bear populations are thriving and could easily exceed 40,000.³⁷ Contrary to the climate narrative, polar bears



have shown themselves to be a highly adaptable species and are a conservation success story.

On 17 October 2009, President Nasheed of the Maldives held the world's first underwater cabinet meeting. 'We are trying to send our message to let the world know what is happening and what will happen to the Maldives if climate change isn't checked', he told reporters after re-surfacing.³⁸ It was a PR stunt ahead of the December 2009 UN Copenhagen climate conference. 'The reality is that temperature rises above 1.5°C will destroy this island nation from all sides: rising sea levels will swamp the tiny atolls, warmer water will kill its beautiful coral reefs, and an acidic ocean will literally dissolve the islands one by one', Mark Lynas, an environmental activist and adviser to Nasheed, wrote from the conference itself.³⁹

Lobbying for 1.5°C

A two-degree tipping point is first mentioned in the report commissioned for the 1972 UN Stockholm conference on the environment. 'Here we encounter the other facet of our planetary life: the fragility of the balances through which the natural world we know survives', Barbara Ward and René Dubos wrote.⁴⁰

It may take only a very small percentage of change in the planet's balance of energy to modify average temperatures by 2°C. Downwards, this is another ice age, upwards a return to an ice-free age. In either case, the effects are global and catastrophic.⁴¹

The two-degree 'guard rail' became a fixed part of the environmental furniture until the 2010 Cancún climate conference, the first after the disastrous Copenhagen conference. Following the pattern of UN climate conferences – after a fiasco, there is pressure to keep the show on the road with avowals of heightened ambition – the parties agreed at Cancún to commit to a maximum temperature rise of 2°C above pre-industrial levels and to consider lowering it to 1.5°C in the near future.⁴² Note, despite the lack of scientific justification, how the baseline is defined as the temperatures prevailing before industrialisation, even though the early twentieth century warming between 1910 and 1945 occurred before anthropogenic emissions exerted a major influence.⁴³ Rather than any genuine scientific basis, the pre-industrial baseline reflects the foundational tenet of environmentalist ideology: that the Industrial Revolution constitutes the original sin of modern civilisation.

In the run up to the December 2015 Paris climate conference, the Maldives and the 44-member Alliance of Small Island States (AOSIS) kept the pressure up for the 2-degree 'guard rail' to be lowered to 1.5 degrees. At the end of November, their call was taken up by the Climate Vulnerable Forum. 'It is essential that this target is strengthened towards a below 1.5°C goal', the forum declared.⁴⁴ In its opening statement at the conference itself, the Maldives, on behalf of the AOSIS, spoke up for the 1.5 degree limit, warning of sea-level rises that 'continue to assault our small states'.⁴⁵ With NGOs chanting '1.5 to stay alive', the lower limit quickly attracted

the support of over 100 countries. At one point, Todd Stern, the American climate negotiator, was spotted in a '1.5 to stay alive' march, which was wending its way around the pavilions of the conference centre. By then, it was a done deal.

Darwin's coral atoll hypothesis

The sinking low-lying coral atolls thesis that drove adoption of the 1.5°C degree target might seem superficially plausible. It's what Emmanuel Macron appeared to believe when he spoke of island nations literally disappearing. But science has refuted this claim, even as far back as the 1830s, when the 25-year old Charles Darwin, on the final year of his voyage on *HMS Beagle*, observed a coral atoll being pounded by waves 'which even exceed in violence those of our temperate regions, and which never cease to rage'.

Yet these low, insignificant coral islets stand and are victorious: for here another power, as antagonist to the former, takes part in the contest. The organic forces separate the atoms of carbonate of lime one by one from the foaming breakers, and unite them into a symmetrical structure. Let the hurricane rear up its thousand huge fragments; yet what will this tell against the accumulated labour of myriads of architects at work night and day, month after month.⁴⁶

It led him to hypothesise that coral atolls are formed by subsidence of the ocean bed; that is to say, rising sea levels: 'Let us imagine an island merely fringed by reefs extending to a short distance from the shore'.

Now let this island subside by a series of movements of extreme slowness, the coral at each interval growing up to the surface. Without the aid of sections it is not very easy to follow out the result, but a little reflection will show that a reef encircling the shore at a greater or less distance, according to the amount of subsidence, would be produced. If we suppose the sinking to continue, the encircled island must, by the submergence of the central land but upward growth of the ring of coral, be converted into a lagoon island.⁴⁷

Recent scientific research confirms Darwin's hypothesis. Six years after the submerged Maldivian cabinet meeting, Lynas was tweeting a 2015 study about Funafuti Atoll, in the tropical Pacific Ocean, which had experienced some of the highest rates of sea-level rise over the past 60 years. 'Despite the magnitude of this rise, no islands have been lost, the majority have enlarged, and there has been a 7.3% increase in net island area over the past century', the study found.⁴⁸ I tweeted Lynas, saying these findings would not have surprised Darwin, to which he responded: 'Darwin was right – and oddly hurricanes may be a good thing in piling up debris inside islands.'⁴⁹

A 2018 study on the Maldives by researchers from Northumbria University found that the atoll was formed when sea levels were up to 0.5 metres higher than today. Large, high-energy waves caused by storms off the coast of South Africa 'broke coral

rubble off the reef and transported it onto reef platforms creating the foundations for the reef islands.⁵⁰

What about Tuvalu, which the UN Secretary-General says the world must save from sinking beneath the waves? A University of Auckland study using aerial photographs and satellite imagery found that between 1971 and 2014, the tiny island had grown by 2.9%, even though sea levels rose at twice the global average.⁵¹ Perhaps, conceivably, coral atolls might even be beneficiaries of global warming and sea-level rise.

Macron versus the IPCC

Climate scientist Judith Curry notes that, for the last three decades, the climate policy cart has been way out in front of the scientific horse. 'There has been tremendous political pressure on scientists to present findings that would support [the] treaties, which has resulted in a drive to manufacture a scientific consensus on the dangers of manmade climate change', Curry says.⁵² Yet even the IPCC in its 2018 1.5°C special report gave short shrift to the disappearing islands thesis. 'Observations, models and other evidence indicate that unconstrained Pacific atolls have kept pace with [sea-level rise], with little reduction in size or net gain in land', the IPCC said, planing down politically inconvenient evidence that some atolls have actually grown.⁵³

The small-island sob story takes a further knock from global temperature trends. From around 1980, ocean surface temperatures have risen much more slowly than over land. In the words of the IPCC, 'most land regions are experiencing greater warming than the global average while most ocean regions are warming at a slower rate'.⁵⁴

The impulse for 1.5 degrees had come from the prospect of global warming submerging small island nations. 'As people living on the frontiers and in the epicentres of climate risk and vulnerability', AOSIS said at the conclusion of the 2019 Madrid climate conference, 'we know precisely what ambitious action looks like and how it must be supported. We live with climate impacts daily'.⁵⁵ This is as ridiculous as listing polar bears as a threatened species. Small island states are not on the forefront of climate change; their claim is without scientific foundation and a scare manufactured for the credulous and gullible.

Speaking two years before the Paris climate conference, Yvo de Boer, the former executive secretary of the UN climate convention, warned of the futility of the two-degree target. 'The only way that a 2015 agreement can achieve a two-degree goal is to shut down the whole global economy', de Boer told Bloomberg News.⁵⁶ Swallowing the small-island fable hook, line and sinker, the international community then doubled down by committing itself to pursuing efforts to limit the increase in global temperature to 1.5°C above pre-industrial levels.

Even so, the letter of the deal done in Paris is different from the maximalist interpretation subsequently given to the Paris Agreement to the point of serious misrepresentation (see Box 1,

p. 4). Whereas the Paris Agreement spoke of reaching net zero in the second half of the current century, it was the IPCC, three years later, which brought the timetable back to 2050, unleashing the current wave of intense climate alarm.

4. Ideology and the IPCC Special Report

As part of the decision to adopt the 1.5-degree target, the Paris climate conference asked the IPCC to provide a scientific justification for what had already been decided. The IPCC has always been inherently political and aware of the PR implications of its climate messaging. Indeed, the IPCC was conceived with precisely that purpose in mind by Bert Bolin, the Swedish meteorologist who served as its first chair. A highly political scientist and an adviser to two Swedish prime ministers, Bolin was frustrated that scientific reports on climate change 'did not yet stir public opinion'.⁵⁷ What was needed, Bolin argued, was:

an organ that provided an international meeting place for *scientists and politicians* to take responsibility for assessing the available knowledge concerning global climate change and its possible socio-economic implications.⁵⁸

In 1995, political control over the IPCC's climate messaging led to the scandal of the Second Assessment Report. The report broke new ground with its claim in the Summary for Policy Makers that the balance of evidence suggested a 'discernible human influence on global climate'.⁵⁹ However, the body of the report stated that no study had shown clear evidence that changes in the climate could be attributed to increases in greenhouse gases. The Clinton Administration was on the cusp of a major policy shift in favour of supporting a treaty with mandatory emissions cuts. As the IPCC-supporting scientist Stephen Schneider later wrote, the timing of the Second Assessment Report was 'fraught with political significance'.⁶⁰ The offending sentence would have made the politics even more fraught. 'It is essential...that chapter authors be prevailed upon to modify their text in an appropriate manner', an official at the State Department told the IPCC.⁶¹ So out it came. Scientific integrity has limits.

Published in 2018, the IPCC's 1.5-degree special report, goes much further than any of its previous publications in making science the servant of ideology. To the journalist and Hoover Institution fellow Josef Joffe, the report appears 'the very model of scientific enquiry'. But Joffe's attention was drawn to the Summary for Policy Makers:

It is preceded by a motto taken from the beloved French children's book author Antoine de St. Exupéry that gives the game away: the report is about salvation but written in the language of science. The quote reads: 'As for the future, the task is not to foresee, but to enable it'.⁶²

Evidence of ideological bias is scattered through the report like fly ash. The IPCC cites the French Marxist Thomas Piketty's book

Capital in the 21st Century,⁶³ which argued that wealth inequalities are heading back to levels not seen since before the First World War, but does not survey the many criticisms of the book, including an investigation by the *FT*'s Chris Giles who found that the data underpinning Piketty's analysis contain a series of errors that skew his findings.⁶⁴

In any case, what has Piketty and inequality got to do with climate science? Environmentalism is an ideology, just as Marxism is, and exists in a similar relationship to its scientific base as communism did to the economics of *Das Kapital*. Science and ideology become so deeply entwined that in practice it is difficult to separate the two, the scientist and the environmentalist being one and the same person. It shouldn't, therefore, be a surprise that the IPCC's practice of climate science is far from being a model of methodological integrity and scientific objectivity.

5. Repackaging the carbon budget

In fulfilling its customary role of giving a scientific imprimatur to prior political decisions, the IPCC had a problem with 1.5 degrees. The post-2010 1.5°C carbon budget in the 2014 Fifth Assessment Report would be used up half way through 2019. For climate alarmists, it would mean the end of the world had already happened.⁶⁵ Like some end-of-the-world cult after the clock had passed midnight, it would be more than a little embarrassing. The IPCC's first order of business, then, was to upwardly revise the available carbon budget from that in the Fifth Assessment Report four years earlier to prevent the 1.5-degree limit being dead on arrival.

As luck would have it, the IPCC managed to increase the remaining 2°C budget by 60% (from approximately 1,000 GtCO₂ to 1,600 GtCO₂) and more than double the 1.5°C budget (from approximately 400 GtCO₂ to 860 GtCO₂).⁶⁶ A start had been made in a September 2017 paper co-authored by climatologist Myles Allen and a lead author of the IPCC 1.5 degrees special report. As climate sceptics had been pointing out, Allen found that the world had warmed more slowly than forecast by climate models, noting that a discrepancy in warming between models and observations had opened up since 2000.⁶⁷ 'We haven't seen the rapid acceleration in warming after 2000 that we see in the models', Professor Allen told *The Times*. Too many of the models 'were on the hot side', meaning they forecast too much warming.⁶⁸

The Fifth Assessment Report's 1.5°C carbon budget suggested headroom of less than seven years' current emissions, the paper said. That had led Professor Michael Grubb, another of the paper's authors, to say at the Paris climate conference that 'actually delivering 1.5°C is simply incompatible with democracy'.⁶⁹ Following the reanalysis, Professor Grubb changed his tune, saying that the changes to deliver the required emissions cuts would merely be

'very difficult.'⁷⁰ As the paper noted, sustained falls in emissions of 4–6% a year had historically occurred for short periods, for example globally during the 1930s Great Depression and the Second World War, and regionally at the time of the collapse of the Soviet Union. None of these events constitutes an especially reassuring precedent.

In his forensic analysis of the IPCC 1.5 special report, climate scientist Nic Lewis notes that a very large part of the increase is due simply from switching the baseline of past temperatures. The Fifth Assessment Report had used globally-complete near-surface air temperature over land and ocean. The special report uses a blend of near-surface temperature over land and sea-surface temperature over ocean. 'This seems remarkable,' Lewis comments, as the special report then inconsistently projects near-surface air temperature (not sea-surface temperature) over the ocean, as well as over land, for future warming.⁷¹

The IPCC also projects lower future warming than it had done four years earlier, despite using the same climate sensitivity assumptions (formally, the Transient Climate Response to Cumulative Emissions or TCRE). Lewis believes this can be explained by the IPCC using simulation runs for the Fifth Assessment Report from a subset of Earth System Models (ESMs) 'biased towards ESMs with a significantly higher TCRE than average,' a possibility the IPCC chose not to discuss.

What's the betting the IPCC's latest carbon budgets will also turn out to be unrealistically low?, Lewis asks. The IPCC has left itself plenty of wiggle room. Lewis notes that one of the most sophisticated observationally-constrained TCRE studies cited in the Fifth Assessment Report implies a low TCRE value.⁷² One would assume that natural scientists prefer results derived from nature, but not the IPCC. The range adopted by the IPCC in the 1.5 special report has a 22% higher central value and a 25% higher upper bound than the observationally-constrained range from this study.

For this higher range, as it had done in the Fifth Assessment Report, the IPCC uses the 67th percentile of its preferred TCRE range. Excluding the effects of non-CO₂ warming, using the 67th percentile implies double the chance of undershooting 1.5°C compared to over-shooting it. Making it an evens chance, as common sense suggests, would allow the IPCC to add a substantial increment to the remaining carbon budget.

The special report is laced with language to give the IPCC plenty of room to re-inflate the remaining carbon budget should that become necessary. It can further revise the historic temperature baseline. 'Future research and ongoing observations over the next years will provide a better indication as to how the 2006–2015

† Professor Grubb also told *The Times* that the fresh assessment was good news for island states such as Tuvalu, which could be inundated if average temperatures rose by more than 1.5°C, demonstrating that climate experts are also dupes of the sinking island fable.

base period compares with long-term trends and might affect the budget estimates', the IPCC says.⁷³ As a specific temperature limit is approached, 'relative uncertainties become larger'.⁷⁴

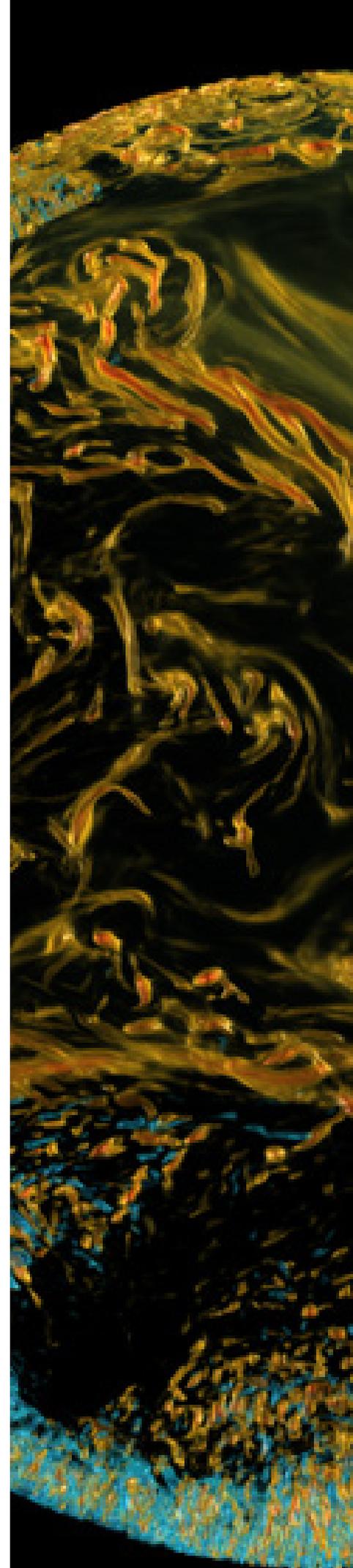
The remaining budget is affected both by uncertainties in past greenhouse gas emissions and estimates of the proportion of warming that is human-induced, the IPCC says. 'As a result, only *medium confidence* can be assigned to the assessed remaining budget values for 1.5°C and 2°C and their uncertainty'.⁷⁵ Medium confidence? The whole edifice of the 1.5°C net zero emissions trajectory and timetable has been erected on a foundation in which the IPCC itself expresses only medium confidence.

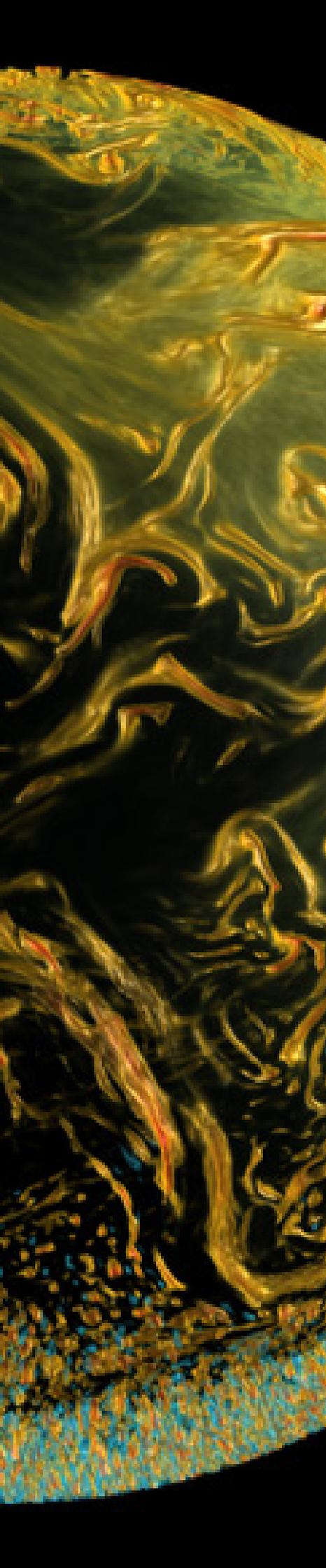
Based on the modest confidence it has in its own data and analysis, the IPCC asserts with *high confidence* that net carbon dioxide emissions must decline by about 45% from the 2010 level of 49 GtCO₂e by 2030, and reach net zero by around 2050.⁷⁶ The steep drop to 2030 is now steeper than implied by the IPCC. According to the UN Environment Programme, greenhouse gas emissions (including land-use change) grew at 1.3% a year in the decade to 2018, to 55.3 GtCO₂e equivalent.⁷⁷ A 45% reduction from 2010 levels would require a reduction of 22 GtCO₂e, to 27 GtCO₂e. Emissions growth since then means the 22 GtCO₂e reduction is now a 28 GtCO₂e reduction and a 45% reduction has become a 51% reduction.

6. Holes in IPCC climate science

'The science says...' is a statement oft repeated by politicians and climate activists, as if climate scientists descend from Mount Sinai bearing tablets of stone inscribed with the commandments for our planetary future. As we've just seen, estimates of future warming and remaining carbon budgets are manufactured and involve the subjective choices and judgments of climate scientists. In a critical review of the 1.5 special report for the GWPF, Professor J Ray Bates, adjunct professor of meteorology in the Meteorology and Climate Centre at University College Dublin, raises additional criticisms over and above those made by Nic Lewis:

- The IPCC does not discuss satellite-observed temperature trends, which show a warming trend of only 0.13°C per decade in the period 1979–2018, nor ask why they differ markedly from surface trends. A statistical analysis in which the prominent El Niño signal in the period 2000–16 is removed from the record finds the remaining warming trend is of the order of only 0.04°C per decade.⁷⁸
- From 1900 to 1980, observed land and sea surface temperatures rose and fell at the same rate over multi-decadal periods. From 1980, a strong divergence appears, with land temperatures rising much faster than sea surface temperatures. Why? Though consistent with greenhouse-induced warming, the much weaker rise in sea-surface temperature does not unambiguously exceed the





bounds of natural variability, Bates says.⁷⁹

Bates's most powerful criticism is the practice of 'tuning' climate models so they reproduce past temperature trends and not being open about it.

Tunings that have enabled models to successfully reproduce the late 20th century warming have not enabled them to reproduce either the marked early 20th century warming or the recent slow rate of tropospheric warming.⁸⁰

Bates cites a 2017 paper, 'The art and science of climate model tuning', by Frédéric Hourdin and fourteen other climate modellers, which partially lifts the lid on this practice. Although tuning can be characterised as an objective process of estimation, 'there is also subjectivity in climate model tuning'.⁸¹ In theory, tuning should be taken into account in any evaluation, they write. In practice, it isn't.

Why such lack of transparency? This may be because tuning is often seen as an unavoidable but dirty part of climate modelling, more engineering than science, an act of tinkering that does not merit recording in the scientific literature. There may also be some concern that explaining that models are tuned may strengthen the arguments of those claiming to question the validity of climate change projections. Tuning may be seen indeed as an unspeakable way to compensate for model errors.⁸²

Tuning strategies can also mislead climate scientists, the authors suggest.

Although tuning is an efficient way to reduce the distance between model and selected observations, it can also risk masking fundamental problems and the need for model improvements.⁸³

This danger of climate scientists deceiving themselves is especially acute concerning the values for the equilibrium climate sensitivity of carbon dioxide (ECS), which, in one form or another, drive temperature projections and define remaining carbon budgets for the 1.5 and 2 degrees specified in the Paris Agreement. Rather than use models to test possible values of ECS against observed temperature, the authors strongly imply models are tuned to confirm values that lie within a pre-ordained range. 'One can imagine changing a parameter that is known to affect the sensitivity', they write, 'keeping both this parameter and the ECS in the *anticipated acceptable range*'.⁸⁴ In other words, climate modellers feel constrained to tune climate models in a way that avoids producing results that might challenge the scientific paradigm of potentially dangerous CO₂-driven warming, a paradigm of fossil fuel emissions as the climate 'control knob' which Judith Curry calls a 'simple and seductive idea'. As Curry notes:

this is a misleading oversimplification, since climate can shift naturally in unexpected ways. Apart from uncertainties in future emissions, we are still facing a factor of three or more [of] uncertainty in the sensitivity of the Earth's temperature to increasing carbon dioxide in the atmosphere.⁸⁵

The IPCC has form in manipulating climate models to produce politically acceptable results. This scientifically dubious practice was discussed at the American Physical Society's climate workshop in 2014. The moderator, New York University theoretical physicist Steven Koonin, who also served as an undersecretary at the Department of Energy in the Obama administration, read an extract from Chapter 10 of the IPCC Fifth Assessment Report. Model-simulated responses to forcings – including greenhouse gas forcings – 'can be scaled up or down.'⁸⁶ To match observations, some of the forcings in some of the models had to be scaled down. But when it came to making the centennial projections, the scaling factors were removed, probably resulting in a 25–30% over-prediction of the 2100 warming, according to Koonin.⁸⁷

Responding to Koonin was Dr William Collins of the Lawrence Berkeley National Laboratory and a lead author of Chapter 9 of the Fifth Assessment Report on evaluation of climate models. Only the transcript does full justice to the exchange that followed.

Dr. Koonin: But if the model tells you that you got the response to the forcing wrong by 30 percent, you should use that same 30 percent factor when you project out a century.

Dr. Collins: Yes. And one of the reasons we are not doing that is we are not using the models as [a] statistical projection tool.

Dr. Koonin: What are you using them as?

Dr. Collins: Well, we took exactly the same models that got the forcing wrong and which got sort of the projections wrong up to 2100.

Dr. Koonin: So, why do we even show centennial-scale projections?

Dr. Collins: Well, I mean, it is part of the [IPCC] assessment process.⁸⁸

'It is part of the assessment process' is not a scientific justification for using assumptions that are known to be empirically wrong to produce projections to give scientific cover to a political narrative of a planet spinning towards a climate catastrophe. Corporations are held to much higher standards. If the IPCC were a publicly traded corporation and its centennial projections formed part of an IPO filing, it would be prosecuted for securities fraud and its directors sent to jail.

7. The IPCC's anti-growth bias

Bias also pervades the IPCC's discussion of economics and the costs and benefits of economic growth; the latter being almost entirely ignored. What is the most important development since the onset of the Industrial Revolution? True to its mission, the IPCC views the past exclusively through the lens of temperature change. 'Temperature rise to date has already resulted in profound alterations to human and natural systems', it says.⁸⁹ To view the Industrial Revolution as a climate phenomenon is wilfully perverse.

What the IPCC inelegantly calls ‘human systems’ were profoundly altered by the Industrial Revolution, and not by any indirect effect of temperature changes. These have been so small that few would have taken any notice had they not been constantly pummelled with scare stories about their effect.

It is the spectacular and historically unprecedented growth rates of industrialised market economies that sets them apart from all alternative economic systems. As economist William Baumol wrote in *The Free-Market Innovation Machine*:

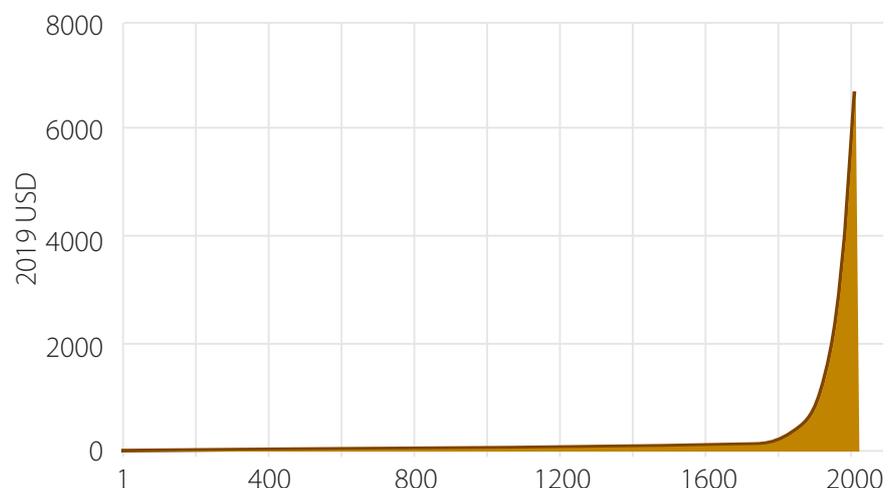
Average growth rates for about one and a half *millennia* before the Industrial Revolution are estimated to have been approximately *zero*, and, although there was undoubtedly some growth starting around the tenth century, it proceeded at a snail’s pace by modern standards. Even the most well-off consumers in pre-Industrial Revolution society had virtually no goods at their disposal that had not been available in ancient Rome. In fact, many consumption choices available at least to more-affluent Roman citizens had long since disappeared by the time of the Industrial Revolution. In contrast, in the past 150 years, per capita incomes in a typical free-market economy have risen by amounts ranging from several hundred to several thousand percent.⁹⁰

The extraordinary and unprecedented transformation in human welfare wrought by the Industrial Revolution is shown in Figure 1. Urbanisation, the intensification of agriculture and a near eight-fold population increase (from 910 million in 1800 to 7.7 billion in 2019)⁹¹ have changed the human environment vastly for the better and inevitably changed the natural environment as well. The idea that the most significant thing about the Industrial Revolution is a 1-degree change in global average temperature is absurd. Neither does the IPCC offer any evidence that humans or, for that matter, the planet would be better off if average global temperatures were 1 degree lower.

In the special report’s Framing and Context chapter, the IPCC grudgingly concedes that economic growth unleashed by the In-

Figure 1: World GDP per capita, 1–2000 AD.

Source: Statistics on world population, GDP and per capital GDP, 1–2008AD. Angus Maddison, IMF.



dustrial Revolution has some benefits, before quickly shifting to the negative consequences for the environment.

Global economic growth has been accompanied by [note: a fairer phrase would be 'has caused'] increased life expectancy and income in much of the world; however, in addition to environmental degradation and pollution, many regions remain characterised by significant poverty [i.e. have not industrialised] and severe inequality in income distribution and access to resources... The spread of fossil-fuel-based material consumption and changing lifestyles is a major driver of global resource use [i.e. a bad thing], and the main contributor to rising greenhouse gas (GHG) emissions [a terrible thing].⁹²

In other words, the IPCC is implicitly admitting that poverty reduction and rising living standards are the main drivers of global warming. For the IPCC though, the Industrial Revolution imposes costs without benefits, as is clear from the sentence that immediately follows the one just quoted above: 'The overarching context of this report is this: human influence has become a principal agent of change on the planet.'⁹³ The implication is that humanity's planetary footprint is necessarily a bad thing and should be minimised. This is not science; it is an ideologically-driven value judgment.

In this way, the IPCC ducks the central dilemma of any appraisal of possible policy responses to man-made global warming: What is the impact on growth, living standards and poverty reduction of decarbonisation policies? In the Summary for Policy Makers, the IPCC says risks to economic growth due to climate change impacts are projected to be lower at 1.5°C than at 2°C, but that 'this excludes the costs of mitigation.'⁹⁴ An analysis of climate policy that only counts benefits and excludes policy costs is worthless. One point five rather than 2°C 'could reduce the number of people both exposed to climate-related risks and susceptible to poverty by up to several hundred million by 2050 (*medium confidence*)' – if, as the IPCC does, climate policy costs are taken out of the equation.⁹⁵

Rather than present hard analysis, the IPCC incants sustainable development mumbo jumbo: 'Sustainable development supports, and often enables, the fundamental societal and systems transitions and transformations that help limit global warming to 1.5°C', it says.⁹⁶ What on earth does that actually mean? It should disabuse anyone still believing the IPCC is a serious scientific body untainted by ideology or bias.

8. A policy prescription failing every conceivable cost-benefit test

Limiting the rise in temperature to 1.5°C above pre-industrial levels would require 'transformative systemic change' and 'rapid and far-reaching changes in energy, land, urban and infrastructure and industrial systems' that would be unprecedented in scale.⁹⁷ These

changes imply 'very ambitious, internationally cooperative policy environments that transform both supply and demand'.⁹⁸ This will involve 'unprecedented policy and geopolitical challenges' and requires 'stringent and integrated policy interventions'.⁹⁹ Implementing them will require 'enhanced institutional capabilities in all countries, including building the capability to utilise indigenous and local knowledge (*medium evidence, high agreement*)'.¹⁰⁰

Indigenous and local knowledge? You might be forgiven for thinking the IPCC's policy analysis is driven more by politics and fashion than mathematical rigour. As it turns out, to the limited extent numbers feature in the special report, they show decisively that the 1.5 target does far more harm than good. But it isn't hard to fathom the anti-democratic implications of 'enhanced institutional capabilities' and 'stringent policy interventions' or their incompatibility with free markets and capitalism.

What do these forceful policy interventions look like? 'Energy-demand reduction measures are key to reducing carbon dioxide emissions', the IPCC says, while noting the potential over-estimation of their effectiveness.¹⁰¹ Reductions in energy demand for space heating and air conditioning are suggested, with a one-third cut in emission from the reference scenario.¹⁰² Does this mean it wants to limit access to air conditioning for people in emerging economies? The IPCC doesn't say.

It goes on to make the heroic assumption that renewables could supply 70–85% of global electricity by 2050, even though there are no economic grid-scale storage technologies on the horizon capable of storing intermittent wind and solar electricity. The IPCC places a massive bet on 'cheap' renewable electricity, ignoring evidence that countries with the highest proportion of wind and solar capacity also have the highest electricity prices in the world.¹⁰³ Elsewhere the IPCC concedes that there is 'deep uncertainty' about energy and land use in the current century.¹⁰⁴ Quite where this leaves the IPCC's central planners is not made clear.

More damning is the IPCC's admission that higher energy costs would damage the health of poorer people in developing countries by forcing them to continue to use biomass (wood and animal dung) for cooking. Scenario studies that quantify the interactions between climate mitigation – i.e. emissions cuts – and energy access indicate that stringent climate policy, which would affect energy prices, could significantly slow down the transition to clean cooking fuels, such as liquefied petroleum gas or electricity.¹⁰⁵ Despite this, the IPCC still supports policies that worsen public health and shorten people's lives in poorer countries.

Transportation is to suffer a similar fate as energy, with a 'mix of additional and stringent policy actions preventing (or reducing) the need for [it]'.¹⁰⁶ There is, however, no silver bullet to deliver the 60% emissions reduction from transport. 'Every possible measure would be required to achieve this stringent emissions outcome', the IPCC says.¹⁰⁷

Dietary shifts could contribute one fifth of the emissions cuts

needed to keep warming below 2°C 'by targeting the demand for meat and other livestock products, particularly where consumption is higher than suggested by human health guidelines'.¹⁰⁸ But then, they might not. 'There, however, remains *limited evidence* of effective policy interventions to achieve such large-scale shifts in dietary choices, and prevailing trends are for increasing rather than decreasing demand for livestock products'.¹⁰⁹

The IPCC's planned energy transformation and the dietary shift from meat and dairy necessitate massive changes in land use, with bioenergy planned to be a major contributor of primary energy.¹¹⁰ Agriculture has to cut its emissions too and food production squeezed. According to the IPCC, mitigation efforts that require land are to come mainly 'at the expense of agricultural land for food and feed production'.¹¹¹ Thus agricultural land is to be converted to forest, requiring 'distinct policy and government measures'.¹¹²

Overall, the IPCC envisages a 0.5–11 million km² reduction in pastureland.¹¹³ To get some idea of the scale of this, the surface area of the United States is 9.8 million km². 'Such large transitions pose profound challenges for sustainable management of the various demands for human settlements, food, livestock feed, fibre, bioenergy, carbon storage, biodiversity and other ecosystem services', the IPCC notes.¹¹⁴ Yet, the IPCC can't agree on the sign of the required change for some of these huge transitions (e.g. for non-pasture agricultural land and for forestry).¹¹⁵ In a rare admission that poor people globally will suffer most from IPCC climate policies, the IPCC concedes that deployment of large-scale land use policies could 'compete with food production and hence raise food security concerns (*high confidence*)'.¹¹⁶

The global industrial sector isn't to be spared either. Industry consumes about one third of final energy and contributes directly and indirectly about one third of global greenhouse gas emissions. To meet the 1.5°C limit, the IPCC reckons the industrial sector will have to cut its emissions by between 67 and 91% by 2050.¹¹⁷ Quite how this can be achieved, short of a massive contraction in industrial output making the 1930s Great Depression look like a mild recession, the IPCC doesn't say.

What renders the IPCC's analysis worthless as a guide to policy is its refusal to grapple with cost. As previously noted, cost is barely mentioned. In something of an understatement, the IPCC admits that 'knowledge gaps' exist on economy-wide costs of limiting warming to 1.5°C. In the few places where cost is mentioned, it is devastating. Decarbonisation could exacerbate short-term economic and social tensions, the IPCC admits. 'The challenge is therefore how to strengthen climate policies without inducing economic collapse or hardship'.¹¹⁸ It's a challenge that the IPCC then flunks. 'Any comparison between 1.5°C and higher levels of warming implies risk assessments and value judgments and cannot be straightforwardly reduced to a cost-benefit analysis', the IPCC opines.¹¹⁹ Whose values? Whose judgments?

There is a reason for the IPCC jettisoning any pretence of objectivity. The IPCC couldn't perform a cost-benefit analysis because it doesn't know what the additional costs of 1.5°C are. 'Projections of the magnitudes of global economic costs associated with 1.5°C-consistent pathways and their sectoral and regional distributions from the currently assessed literature are scant', noting that *marginal* abatement costs indicated by carbon prices would increase 3–4 times compared to a 2°C pathway.¹²⁰ The IPCC didn't even try to put a price tag on 1.5°C. Not only is the IPCC clueless about the cost of eliminating net emissions of carbon dioxide; its view amounts to: 'You must do 1.5°C whatever the cost'.

While the IPCC fails to provide a comparison of total costs and benefits of a 1.5°C target, the failure of benefits to outweigh costs is clearly visible in the IPCC's discussion of marginal costs. This is revealed by the inclusion of implicit or shadow carbon dioxide emission prices of the 1.5°C and 2°C pathways (Table 2). The 'shadow' cost can be thought of as an estimate of the emission tax that would be required to get global emissions down to the required target. The more ambitious the target (i.e. 1.5°C vs. 2°C), the higher the shadow cost. However, the relationship is not linear: The shadow cost rises exponentially as the target becomes more stringent.

For 2030, the 1.5°C pathway implies a shadow price per tonne 9–27 times higher than the 2°C pathway. In other words, the marginal cost per tonne of abated carbon dioxide of choosing a 1.5°C pathway over the 2°C pathway is one to two orders of magnitude higher. In 2030, the marginal abatement cost of a tonne of carbon dioxide ranges from \$135 to \$6,050, rising to \$245 to \$14,300 per tonne in 2050. To anyone with the slightest social conscience, the costs of the 1.5°C pathway are an obscenity. No conceivable amount of welfare redistribution can offset the hit to poorer people for the colossal amount of resources consumed in cutting emissions, raising the direct costs, not only of energy, but also of food, of manufactured goods and of housing. The impact of the

Table 2: Price of carbon dioxide emissions.

	Pathway			Social cost of carbon (SCC)*		
	<1.5°C	> 2°C	1.5°C/ 2°C			1.5°C/SCC
	0% \$	0% \$		3% \$	0% \$	
2030	135–6,050	15–220	9–27.5	52	94	1.4–64
2050	245–14,300	45–1,050	5.4–13.6	72	234	1.0–61
2070	420–19,300	120–1,110	3.5–17.4	—	—	—
2100	690–30,100	175–2,340	3.9–12.9	—	—	—

Undiscounted 2010 US Dollars. *As calculated by the Obama administration. Sources: IPCC, Special Report: Global Warming of 1.5°C (2018), p. 152; Interagency Working Group on Social Cost of Greenhouse Gases, USG, Technical Support Document: - Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis (August 2016), Table ES-1.

1.5°C pathway on the world's poor will be devastating and long-lasting.

It is also instructive to compare these marginal costs of emission reduction with estimates of the marginal benefits, which are based on the estimates of the so-called social cost of carbon (SCC). The SCC aims to identify the estimated discounted net damages of each additional tonne of carbon dioxide, which also equates to the benefit of reducing emissions by the same amount. Table 2 therefore includes the Obama White House estimates of the SCC, and specifically the central value of SCC estimates derived from the average, discounted by three percent, inflated by the US GDP deflator, and then undiscounted for consistency.

It shows that in 2030, the undiscounted value of Obama White House estimate of the net damage from the marginal (i.e. the most damaging) tonne of carbon dioxide is \$94 – nearly 30% lower than the low end of the marginal cost of hitting the 1.5°C pathway, and 98% lower than the high end. Put another way, the IPCC and the Obama Administration numbers show that the marginal cost of achieving the 1.5°C target would be between 1.4 and 64 times larger than the marginal benefits. The ratio does not improve over time. For 2050, the SCC is still below the bottom of the range of the marginal shadow cost of reaching the 1.5°C pathway and, at the upper end, the ratio of marginal costs to marginal benefits is 61:1.

Thus, even granting that the IPCC has over-stated the benefits and under-stated the costs of achieving the 1.5°C target, their pathway recommendation still fails to yield benefits remotely commensurate with the costs. On the basis of these numbers, it would be reasonable to infer that net zero is being driven by fanatics and zealots who put little value on human welfare.

Net zero also stands as an indictment of the cravenness and stupidity of governments, especially western governments that should have known better. They signed up to the Paris Agreement goal of 'pursuing efforts' to limit temperature increase to 1.5°C on the basis of the fable of sinking small islands. Then, led by Britain, many of them committed themselves to eliminating net greenhouse gas emissions by 2050, a much more demanding goal than that set out in Article 4 of the Paris Agreement. They did this without having any idea how they could meet it or how much it would cost.

Net zero could only happen if all major emitters in the developing world follow suit, which, to date, they've shown no sign of doing; in fact, quite the opposite. Indeed, the principal merit of the IPCC 1.5°C special report is in setting out why they should not do so: it would crush their economies and immiserate their people. The top-down re-ordering of the global economy, the sacrifices it entails, and the highly intrusive level of global governance it requires all make it both impossible and undesirable.

Net zero by mid-century isn't going to happen because of IPCC-style emissions cuts. If hydrocarbon emissions disappear by mid-century, it will only be because a superior technology – as yet undeveloped – will have made fossil fuels obsolete as civilisation's main source of energy. For those set on net zero, genuine innovation is the only sane and humane option.

9. Conclusion: The coronavirus pandemic and the 1.5 degree limit

Shutting down the whole economy is the only way of limiting global warming to 2°C, the former UN climate chief Yvo de Boer said in 2013.⁵⁶ To limit global warming to a 1.5°C limit requires industrial emissions to be cut by at least two thirds, says the IPCC, something that implies a huge, decades-long contraction in industrial output.

We can now see what shutting down the world economy looks like. In the wake of the coronavirus pandemic, most governments want a V-shaped recovery. Decarbonisation is different. It's not something economies recover from. With net zero costing many multiples of hypothetical climate benefits, aggressive decarbonisation will act as a brake on any post-pandemic recovery. As the IPCC makes clear, the 1.5°C target requires fundamental restructuring of global supply and demand. The economy would be permanently smaller, people would be poorer and the vast debts incurred during the pandemic would weigh more heavily.

As the virus spreads globally, and in particular into poorer countries, it will become clearer that it is rich countries that can afford prolonged lockdowns. They can pay for expensive health-care systems to treat the sick. They can invest in preparedness for subsequent pandemics. Social distancing is more tolerable for the wealthy and inflicts hardship on the poor. In cities such as New York, Chicago and Los Angeles, minorities suffer disproportionate fatalities from Covid-19. By slowing economic progress, climate policies increase the vulnerability to pandemics of the less well off in rich countries and shrink the options to deal with them in poorer ones.

In a rational world, climate policy would be subordinated to the imperative of economic recovery and repowering the jobs lost during the shutdown. Of course, there will be governments – encouraged by green interests – that put their faith in a low-carbon recovery. It is a rare politician who is honest about the inevitable trade-offs. Emmanuel Macron is one. No one hesitates 'to make very profound, brutal choices when it's a matter of saving lives,' Macron told the *Financial Times*. 'It's the same for climate risk.'¹²¹ Countries that do will experience weaker growth, and the living standards of their citizens will suffer commensurately. It will accelerate Europe's decline into economic and social senescence as it opts out of the 21st-century economic growth race. This should constitute sufficient reason to dump the 1.5°C target. But, as this report shows, in a rational world, a 1.5°C target would never have been adopted in the first place. When it comes to climate policy, rationality has not prevailed.

There is, however, another factor that will, namely international relations. The Paris Agreement contains a ratchet mechanism. Article Three requires each party's nationally determined contribution to represent a progression beyond its previous one

and reflect 'its highest possible ambition'.¹²² The next UN climate conference will test the effectiveness of the Paris ratchet, and reveal whether Paris is a dead letter like previous climate agreements. Columbia University's Adam Tooze, who is writing a history of international climate politics, has gone so far as to dub COP26, planned for Glasgow, a 'key moment in global history'.¹²³ It would be the fulcrum to lever up countries' second round of nationally determined contributions and show whether the IPCC's timeline of halving global emissions by 2030 was realistic or little more than a midnight howl at the moon. Thanks to the pandemic, the conference has been postponed.

The agreement itself is a product of a fleeting geopolitical moment that has passed. Its genesis lay in the lesson the Obama administration took away from the fiasco of the 2009 Copenhagen climate conference: that the key to a new global climate pact lay in Beijing. The prospects for an agreement improved when Xi Jinping assumed power in 2012 and signalled that the Communist party recognized that Chinese people wanted cleaner air. 'Our people have an ardent love for life,' Xi said in November 2012. 'They wish to have better education, more stable jobs, more income, greater social security, better medical and health care, improved housing conditions, and a better environment.'¹²⁴

At his first meeting as president with Barack Obama in June 2013, Xi laid out his *quid pro quo* – a new model of major-country relations, with China being treated more as an equal to the United States. Intensified dialogue led to the November 2014 Beijing joint announcement on climate change. The two presidents resolved to work closely together and address 'major impediments to reaching a successful global climate agreement in Paris.'¹²⁵ As Obama observed at a subsequent meeting with Xi, 'Our cooperation and our joint statements were critical in arriving at the Paris agreement.'¹²⁶

Any climate pact must include China, if only for appearances' sake. It overtook the US as the world's largest emitter of greenhouse gases over a decade ago. It burns half the world's coal, which supplies it with over two thirds of its energy. However, even before the emergence of the novel coronavirus in Wuhan, there was evidence that China's interest in the Paris process was not all that it was cracked up to be. In a 2018 report for the GWPF, Patricia Adams, a Canadian economist, environmentalist and long-time China analyst, argues that the UN climate process no longer serves the Communist party's two primary domestic needs: securing a share of the promised \$100bn a year of climate finance and securing energy to fuel China's economy.¹²⁷

Despite being feted as a climate saviour, China's drive for coal continued unabated. A 2018 plant-by-plant survey by CoalSwarm found that 259 gigawatts (GW) of new capacity are under development in China, comparable to the entire US coal fleet (266 GW). If completed, the new plants



will increase China's current coal fleet of 993 GW by 25%.¹²⁸ Abroad, China is involved in 240 coal-fired power projects in 25 countries as part of its Belt and Road Initiative.¹²⁹

And now the pandemic changes everything; its consequences are, as Zhou Enlai reputedly said of the French Revolution, 'too early to say' (Zhou was actually referring to the 1968 French students' revolt).¹³⁰ The fact that the coronavirus emerged from China, that the Chinese authorities ruthlessly suppressed news about its spread and transmissibility, that Chinese officials continued to lie by spreading rumours of American involvement in starting the pandemic¹³¹ – all mean that China's communist regime will henceforth be regarded with the deepest suspicion, its *bona fides* as a reliable partner destroyed by the virus it could and should have contained.

Coming out of the pandemic, the twin priorities for China's near neighbours will be to strengthen their economies and their national security. Japan, the world's third largest economy and – based on its climate pledges – a covert climate change agnostic, is not going to imperil its security by embracing net zero. Other countries in the region, such as South Korea, are not regarded as 'developed' by the UN climate process, so escape scrutiny as prime emitters.

Most consequential of all will be the long-term impact on Sino-American relations. Whoever wins the White House in November 2020, Xi's ambition of a new model of major-country relations is dead. For Donald Trump, China's behaviour is vindication of his rejection of the previous bipartisan consensus that engagement with China – something Trump argued was done on terms that disadvantaged the United States economically and strategically – would liberalise the regime. Xi's historic accomplishment is falsifying the globalists' liberalisation thesis.

If Trump is reelected, overt Sino-American rivalry could well define a new paradigm of international relations. This would relegate the UN climate talks from being a chapter heading, to a footnote in history. It is no coincidence that global warming first gained traction as the Cold War came to a close and that the 1992 UN climate change convention came into being after it had ended. Easing of geopolitical tensions was a prerequisite for the UN climate talks to develop momentum. Likewise, their re-emergence would put global warming on the backburner. As with the coronavirus today, the world would have far more important matters to worry about. 1981 was the last year when the West's carbon dioxide emissions exceeded those of the rest of the world. By 1989 and the fall of the Berlin Wall, the West's emissions were 46% of global emissions. Before the pandemic struck, they accounted for around 25%. The tail of the Western decarbonisation isn't going to wag the global dog. To attempt net zero would indeed be a profound and brutal decision – in favour of extinction on the world stage.



Notes

- 1 Peter James Spielman, 'U.N. predicts disaster if global warming not checked', AP News, 30 June 1989 <https://apnews.com/bd45c372caf118ec99964ea547880cd0>.
- 2 UN News, 'Stop Tuvalu and 'the world from sinking' UN chief tells island nation facing existential threat from rising seas', 30 May 2019 <https://news.un.org/en/story/2019/05/1038661>.
- 3 William Cummings, 'The world is going to end in 12 years if we don't address climate change', Ocasio-Cortez says', *USA Today*, 14 December 2019. <https://eu.usatoday.com/story/news/politics/onpolitics/2019/01/22/ocasio-cortez-climate-change-alarm/2642481002/>.
- 4 <https://www.wemeanbusinesscoalition.org/step-up/> (accessed on 26 November 2019).
- 5 Robin Hicks, 'Can sustainable business really save the world?', *Eco Business*, 29 August 2019 <https://www.eco-business.com/news/can-sustainable-business-really-save-the-world/>.
- 6 Climate Finance Leadership Initiative, *Financing the Low-Carbon Future* (September 2019), p. 3 and p. 15.
- 7 Moody's Investors Services, 'Moody's changes ExxonMobil's outlook to negative', 19 November 2019.
- 8 <https://www.wemeanbusinesscoalition.org/step-up/> (accessed on 26 November 2019).
- 9 Coral Davenport, 'Climate change poses risks to financial markets, regulator warns', *New York Times*, 11 June 2019.
- 10 Matthew Arnold, 'Lagarde bid to put climate change at centre of ECB monetary policy', *Financial Times*, 28 November 2019.
- 11 'Bankers aren't climate scientists', *Wall Street Journal*, 15 November 2019 <https://www.wsj.com/articles/bankers-arent-climate-scientists-11573861841>.
- 12 IPCC, Summary for Policymakers in *Global Warming of 1.5°C* (2018), p. 15.
- 13 UNFCCC, 'Proposal by the President', 18 December 2009 <https://unfccc.int/resource/docs/2009/cop15/eng/l07.pdf>.
- 14 UNFCCC, 'Draft Paris outcome', 5 December 2009 <https://undocs.org/FCCC/ADP/2015/L.6/Rev.1>.
- 15 Leslie Hook, 'A climate leader turns laggard', *Financial Times*, 26 November 2019.
- 16 Business Roundtable, 'Statement of corporate purpose', 19 August 2019, <https://opportunity.businessroundtable.org/wp-content/uploads/2019/09/BRT-Statement-on-the-Purpose-of-a-Corporation-with-Signatures-1.pdf>.
- 17 Clayton M Christensen, Efosa Ojomo and Karen Dillon, *The Prosperity Paradox: How Innovation Can Lift Nations Out of Poverty* (2019), p. 36.
- 18 António Guterres, 'Progress towards sustainable development is seriously off-track', *Financial Times*, 4 November 2019.
- 19 Goldman Sachs, *Annual Report 2018*, p. 104.
- 20 Goldman Sachs, *Annual Report 2018*, p. 9.
- 21 Axel Leijonhufvud, 'Monetary muddles', *Cato Journal*, Vol. 35, No. 2, p. 188.
- 22 Ludwig von Mises, *Socialism: An Economic and Sociological Analysis* (Indianapolis, 1981), p. 30.
- 23 Klaus Schwab, 'Davos Manifesto 2020: The universal purpose of a company in the Fourth Industrial Revolution', 2 December 2019. <https://www.weforum.org/agenda/2019/12/davos-manifesto-2020-the-universal-purpose-of-a-company-in-the-fourth-industrial-revolution/>.
- 24 Martin Wolf, 'How to reform today's rigged capitalism', *Financial Times*, 3 December 2019 <https://www.ft.com/content/4cf2d6ee-14f5-11ea-8d73-6303645ac406>.
- 25 George Shultz, Michael Boskin, John Cogan and John Taylor, 'Some thoughts on the Business Roundtable's statement of corporate purpose', RealClear Markets, 5 February 2020 https://www.realclearmarkets.com/articles/2020/02/05/some_thoughts_on_the_business_roundtables_statement_of_corporate_purpose_104069.html.

- 26 David Henderson, *The Role of Business in the Modern World: Progress, Pressures and Prospects for the Market Economy* (2004), p. 60. Emphasis in the original.
- 27 David Henderson, *The Role of Business in the Modern World: Progress, Pressures and Prospects for the Market Economy* (2004), pp. 60–61.
- 28 George Shultz, Michael Boskin, John Cogan and John Taylor, 'Some thoughts on the Business Roundtable's statement of corporate purpose', RealClear Markets, 5 February 2020 https://www.realclearmarkets.com/articles/2020/02/05/some_thoughts_on_the_business_roundtables_statement_of_corporate_purpose_104069.html.
- 29 David Henderson, *The Role of Business in the Modern World: Progress, Pressures and Prospects for the Market Economy* (2004), p. 61. Emphasis in the original.
- 30 William J Baumol, *The Free-Market Innovation Machine: Analyzing the growth miracle of capitalism* (2002), p. viii. Emphasis in the original.
- 31 William J Baumol, *The Free-Market Innovation Machine: Analyzing the growth miracle of capitalism* (2002), p. ix.
- 32 George Shultz, Michael Boskin, John Cogan and John Taylor, 'Some Thoughts On the Business Roundtable's Statement of Corporate Purpose', RealClear Markets, 5 February 2020 https://www.realclearmarkets.com/articles/2020/02/05/some_thoughts_on_the_business_roundtables_statement_of_corporate_purpose_104069.html.
- 33 George Shultz, Michael Boskin, John Cogan and John Taylor, 'Some Thoughts On the Business Roundtable's Statement of Corporate Purpose', RealClear Markets, 5 February 2020 https://www.realclearmarkets.com/articles/2020/02/05/some_thoughts_on_the_business_roundtables_statement_of_corporate_purpose_104069.html.
- 34 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 73.
- 35 Richard Swedberg, *Joseph A Schumpeter: His Life and Work* (1991), p. 150.
- 36 <https://www.youtube.com/watch?v=9TMb9huYTy0> from 26 mins 15 secs.
- 37 GWPf Press Release. Polar Bear Scientists May Be Hiding Good News, 27 February 2020 <https://www.thegwpf.org/polar-bear-scientists-may-be-hiding-good-news/>.
- 38 Reuters, 'Maldives sends climate SOS with undersea cabinet', 17 October 2009. <https://www.reuters.com/article/us-maldives-environment/maldives-sends-climate-sos-with-undersea-cabinet-idUSTRE59G0P120091017>.
- 39 Mark Lynas, 'The Copenhagen conference means life or death for the Maldives', theguardian.com, 14 December 2009 <https://www.theguardian.com/environment/cif-green/2009/dec/14/copenhagen-climate-change-maldives>.
- 40 Barbara Ward and René Dubos, *Only One Earth* (1972), p. 266.
- 41 Barbara Ward and René Dubos, *Only One Earth* (1972), p. 266.
- 42 <https://unfccc.int/process-and-meetings/conferences/past-conferences/cancun-climate-change-conference-november-2010/cancun-climate-change-conference-november-2010-0>.
- 43 J Ray Bates, *Deficiencies in the IPCC's Special Report on 1.5 Degrees*, GWPf Briefing 36 (2018, revised and updated), p. 3.
- 44 Climate Vulnerable Forum, 'Manila-Paris Declaration', 30 November 2015 <https://thecvf.org/the-manila-paris-declaration/>.
- 45 AOSIS Opening Statement for the 21st Conference of Parties to the UNFCCC, https://unfccc.int/sites/default/files/cop21cmp11_hls_speech_aosis_maldives.pdf.
- 46 Charles Darwin, *The Voyage of the Beagle* (first published 1839; Penguin 1989), p. 338.
- 47 Charles Darwin, *The Voyage of the Beagle* (first published 1839; Penguin 1989), p. 346.
- 48 P.S. Kench; D. Thompson; M.R. Ford; H. Ogawa; R.F. McLean, 'Coral islands defy sea-level rise over the past century: Records from a central Pacific atoll', *Geology* (2015) 43 (6): 515–518, <https://pubs>.

- geoscienceworld.org/gsa/geology/article-abstract/43/6/515/131899/Coral-islands-defy-sea-level-rise-over-the-past?redirectedFrom=fulltext.
- 49 https://twitter.com/mark_lynas/status/606790262149554176 (retrieved 2 December 2019).
- 50 Northumbria University, 'Rising sea levels may build, rather than destroy, coral reef islands', *phys.org*, 13 November 2018 <https://phys.org/news/2018-11-sea-coral-reef-islands.html>.
- 51 *Phys.org*, "'Sinking" Pacific nation is getting bigger: study', 9 February 2019 <https://phys.org/news/2018-02-pacific-nation-bigger.html>.
- 52 Judith Curry, 'Madrid', blogpost on Climate Etc, 2 December 2019 <https://judithcurry.com/2019/12/02/madrid/#more-25458>.
- 53 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 232.
- 54 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 51.
- 55 OSIS, 'COP 25 closing statement', posted 15 December 2019 <https://www.aosis.org/2019/12/15/cop-25-aosis-closing-statement/>.
- 56 Alex Morales, 'Kyoto Veterans Say Global Warming Goal Slipping Away', *Bloomberg News*, 4 November 2013 <https://www.bloomberg.com/news/articles/2013-11-04/kyoto-veterans-say-global-warming-goal-slipping-away>.
- 57 Rupert Darwall, *Green Tyranny* (2017), p. 122.
- 58 Bert Bolin, *A History of the Science and Politics of Climate Change: The Role of the Intergovernmental Panel on Climate Change* (2007), p. 39. Emphasis in the original.
- 59 IPCC, *IPCC Second Assessment Report Climate Change 1995: The Science of Climate Change*, p. 5.
- 60 Paul N Edwards and Stephen H Schneider, 'The 1995 IPCC Report: Broad consensus or 'Scientific Cleansing'?', *Ecofable/Ecoscience* 1:1 (1997), pp. 3–9 <https://pne.people.si.umich.edu/PDF/ecofables.pdf>.
- 61 Rupert Darwall, *The Age of Global Warming: A History* (2013), p. 197.
- 62 Josef Joffe, 'The Religion of Climatism: A new faith emerges', *Commentary*, November 2019 <https://www.commentarymagazine.com/articles/the-religion-of-climatism/>.
- 63 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 319.
- 64 Chris Giles, 'Piketty findings undercut by errors', *Financial Times*, 23 May 2014 <https://www.ft.com/content/e1f343ca-e281-11e3-89fd-00144feabdc0>.
- 65 Nic Lewis, 'Remarkable changes to carbon emission budgets in the IPCC Special Report on Global Warming of 1.5C', blogpost on Climate Etc, 18 October 2018 <https://judithcurry.com/2018/10/18/remarkable-changes-to-carbon-emission-budgets-in-the-ipcc-special-report-on-global-warming-of-1-5c/>.
- 66 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 107.
- 67 Millar, R., Fuglestedt, J., Friedlingstein, P. *et al.* Emission budgets and pathways consistent with limiting warming to 1.5°C. *Nature Geosci* 10, 741–747 (2017). <https://doi.org/10.1038/ngeo3031>.
- 68 Ben Webster, 'We were wrong – worst effects of climate change can be avoided, say experts', *The Times*, 19 September 2017 <https://www.thetimes.co.uk/article/we-were-wrong-worst-effects-of-climate-change-can-be-avoided-say-scientists-k9p5hg5l0>.
- 69 Ben Webster, 'We were wrong – worst effects of climate change can be avoided, say experts', *The Times*, 19 September 2017 <https://www.thetimes.co.uk/article/we-were-wrong-worst-effects-of-climate-change-can-be-avoided-say-scientists-k9p5hg5l0>.
- 70 Ben Webster, 'We were wrong – worst effects of climate change can be avoided, say experts', *The Times*, 19 September 2017 <https://www.thetimes.co.uk/article/we-were-wrong-worst-effects-of-climate-change-can-be-avoided-say-scientists-k9p5hg5l0>.
- 71 Nic Lewis, 'Remarkable changes to carbon emission budgets in the IPCC Special Report on Global Warming of 1.5C', blogpost on Climate Etc, 18 October 2018 <https://judithcurry.com/2018/10/18/remarkable-changes-to-carbon-emission-budgets-in-the-ipcc-special-report-on-global-warm->

ing-of-1-5c/.

- 72 Lewis is referring to Gillett, N. P., et al., 2013: 'Constraining the ratio of global warming to cumulative CO₂ emissions using CMIP5 simulations', *Journal of Climate* 26.18, 6844–6858.
- 73 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 106.
- 74 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 107.
- 75 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 107. Emphasis in the original.
- 76 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 12. Emphasis in the original.
- 77 UNEP, *Emissions Gap Report 2019*, p. 3.
- 78 J Ray Bates, *Deficiencies in the IPCC's Special Report on 1.5 Degrees*, GWPF Briefing 36 (2018, revised and updated), p. 4. The statistical analysis is contained in Scafetta et al., 'Natural climate variability, part 2: Interpretation of the post 2000 temperature standstill', *International Journal of Heat and Technology* 2017; 35 (Special issue 1): S18-S26.
- 79 J Ray Bates, *Deficiencies in the IPCC's Special Report on 1.5 Degrees*, GWPF Briefing 36 (2018, revised and updated), p. 6.
- 80 J Ray Bates, *Deficiencies in the IPCC's Special Report on 1.5 Degrees*, GWPF Briefing 36 (2018, revised and updated), p. 8.
- 81 F Hourdin et al., 'The art and science of climate model tuning', *Bulletin of the American Meteorological Society*, March 2017, p. 590.
- 82 F Hourdin et al., 'The art and science of climate model tuning', *Bulletin of the American Meteorological Society*, March 2017, p. 590.
- 83 F Hourdin et al., 'The art and science of climate model tuning', *Bulletin of the American Meteorological Society*, March 2017, p. 595.
- 84 F Hourdin et al., 'The art and science of climate model tuning', *Bulletin of the American Meteorological Society*, March 2017, p. 599. Emphasis added.
- 85 Judith Curry, 'Madrid', blogpost on Climate Etc, 2 December 2019 <https://judithcurry.com/2019/12/02/madrid/#more-25458>.
- 86 American Physical Society, 'Climate Change Statement Review Workshop – Transcript of Proceedings', January 8, 2014, p. 253, <http://www.aps.org/policy/statements/upload/climate-seminar-transcript.pdf>.
- 87 American Physical Society, 'Climate Change Statement Review Workshop – Transcript of Proceedings', January 8, 2014, p. 259.
- 88 American Physical Society, 'Climate Change Statement Review Workshop – Transcript of Proceedings', January 8, 2014, pp. 269–270.
- 89 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 53.
- 90 William J Baumol, *The Free-Market Innovation Machine: Analyzing the growth miracle of capitalism* (2002), p. 3.
- 91 Our World in Data, <https://ourworldindata.org/world-population-growth> (accessed 19 December 2019).
- 92 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 53.
- 93 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 53.
- 94 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 9.
- 95 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 9.
- 96 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 22.
- 97 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 315 and p. 15.
- 98 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 15.
- 99 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 148.
- 100 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 315.
- 101 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 137 and p. 149.

- 102 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 142.
- 103 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 111.
- 104 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 109.
- 105 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 464.
- 106 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 149.
- 107 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 142.
- 108 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 327.
- 109 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 327.
- 110 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 131.
- 111 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 144.
- 112 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 145.
- 113 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 16.
- 114 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 16.
- 115 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 16.
- 116 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 21.
- 117 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 334.
- 118 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 319.
- 119 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 55.
- 120 IPCC, *Special Report: Global Warming of 1.5°C* (2018), p. 321.
- 121 Victor Mallet & Roula Khalaf, 'Thinking the unthinkable,' *Financial Times*, 17 April 2020. <https://www.ft.com/content/3ea8d790-7fd1-11ea-8fdb-7ec06edeef84>.
- 122 UNFCCC, Paris Agreement, Article 4.
- 123 Gideon Rachman, 'China, not America, will decide the fate of the planet,' FT.com, 27 January 2020 <https://www.ft.com/content/2da15374-40e7-11ea-bdb5-169ba7be433d>.
- 124 Xi Jinping, 'Remarks on the Occasion of Meeting with the Chinese and Foreign Press by Members of the Standing Committee of the Political Bureau of the Eighteenth Central Committee of the Communist Party of China,' 15 November 2012 http://www.china.org.cn/china/18th_cpc_congress/2012-11/16/content_27130032.htm.
- 125 The White House, 'US-China Joint Announcement on Climate Change,' 12 November 2014 <https://obamawhitehouse.archives.gov/the-press-office/2014/11/11/us-china-joint-announcement-climate-change>.
- 126 The White House, 'Remarks by President Obama and President Xi of the People's Republic of China Before Bilateral Meeting,' 31 March 2016, <https://obamawhitehouse.archives.gov/the-press-office/2016/03/31/remarks-president-obama-and-president-xi-peoples-republic-china>.
- 127 Patricia Adams, *The Road from Paris: China's climate U-turn*. Note 15, The Global Warming Policy Foundation, 2018, p. 1.
- 128 Christine Shearer, Aiqun Yu & Ted Nace, *Tsunami Warning. Can China's Central Authorities Stop A Massive Surge In New Coal Plants Caused By Provincial Overpermitting?* (Coalswarm, 2018), p. 3. <https://endcoal.org/wp-content/uploads/2018/09/TsunamiWarningEnglish.pdf>.
- 129 Patricia Adams, *The Road from Paris: China's climate U-turn*. Note 15, The Global Warming Policy Foundation, 2018, p. 2.
- 130 *South China Morning Post*, 'Not letting the facts ruin a good story,' (undated) <https://www.scmp.com/article/970657/not-letting-facts-ruin-good-story>.
- 131 Steven Lee Myers, 'China spins tale that the US army started the Coronavirus epidemic,' *New York Times*, 13 March 2020. <https://www.nytimes.com/2020/03/13/world/asia/coronavirus-china-conspiracy-theory.html>.

About the Global Warming Policy Foundation

The Global Warming Policy Foundation is an all-party and non-party think tank and a registered educational charity which, while openminded on the contested science of global warming, is deeply concerned about the costs and other implications of many of the policies currently being advocated.

Our main focus is to analyse global warming policies and their economic and other implications. Our aim is to provide the most robust and reliable economic analysis and advice. Above all we seek to inform the media, politicians and the public, in a newsworthy way, on the subject in general and on the misinformation to which they are all too frequently being subjected at the present time.

The key to the success of the GWPF is the trust and credibility that we have earned in the eyes of a growing number of policy makers, journalists and the interested public. The GWPF is funded overwhelmingly by voluntary donations from a number of private individuals and charitable trusts. In order to make clear its complete independence, it does not accept gifts from either energy companies or anyone with a significant interest in an energy company.

Views expressed in the publications of the Global Warming Policy Foundation are those of the authors, not those of the GWPF, its trustees, its Academic Advisory Council members or its directors.

THE GLOBAL WARMING POLICY FOUNDATION

Director

Benny Peiser

Honorary President

Lord Lawson

BOARD OF TRUSTEES

Terence Mordaunt (Chairman)

Dr Jerome Booth

Chris Gibson-Smith

Kathy Gyngell

Professor Michael Kelly

Dr Ruth Lea

Lord Lilley

Charles Moore

Baroness Nicholson

Graham Stringer MP

Lord Turnbull

ACADEMIC ADVISORY COUNCIL

Professor Christopher Essex (Chairman)

Sir Samuel Brittan

Sir Ian Byatt

Dr John Constable

Professor Vincent Courtillot

Christian Gerondeau

Professor Larry Gould

Professor Ole Humlum

Professor Gautam Kalghatgi

Professor Terence Kealey

Bill Kininmonth

Professor Deepak Lal

Professor Richard Lindzen

Professor Ross McKittrick

Professor Robert Mendelsohn

Professor Garth Paltridge

Professor Ian Plimer

Professor Gwythian Prins

Professor Paul Reiter

Dr Matt Ridley

Sir Alan Rudge

Professor Nir Shaviv

Professor Henrik Svensmark

Professor Anastasios Tsonis

Professor Fritz Vahrenholt

Dr David Whitehouse

RECENT GWPF REPORTS

10	Whitehouse	The Global Warming Standstill
11	Khandekar	The Global Warming-Extreme Weather Link
12	Lewis and Crok	Oversensitive
13	Lewis and Crok	A Sensitive Matter
14	Montford, Shade	Climate Control: Brainwashing in Schools
15	De Lange, Carter	Sea-level Change: Living with Uncertainty
16	Montford	Unintended Consequences of Climate Change Policy
17	Lewin	Hubert Lamb and the Transformation of Climate Science
18	Goklany	Carbon Dioxide: The Good News
19	Adams	The Truth About China
20	Laframboise	Peer Review: Why Scepticism is Essential
21	Constable	Energy Intensive Users: Climate Policy Casualties
22	Lilley	£300 Billion: The Cost of the Climate Change Act
23	Humlum	The State of the Climate in 2016
24	Curry et al.	Assumptions, Policy Implications and the Scientific Method
25	Hughes	The Bottomless Pit: The Economics of CCS
26	Tsonis	The Little Boy: El Niño and Natural Climate Change
27	Darwall	The Anti-development Bank
28	Booker	Global Warming: A Case Study in Groupthink
29	Crockford	The State of the Polar Bear Report 2017
30	Humlum	State of the Climate 2017
31	Darwall	The Climate Change Act at Ten
32	Crockford	The State of the Polar Bear Report 2018
33	Svensmark	Force Majeure: The Sun's Role in Climate Change
34	Humlum	State of the Climate 2018
35	Peiser (ed)	The Impact of Wind Energy on Wildlife and the Environment
36	Montford	Green Killing Machines
37	Livermore	Burnt Offering: The Biomess of Biomass
38	Kelly	Decarbonising Housing: The Net Zero Fantasy
39	Crockford	The State of the Polar Bear Report 2019
40	Darwall	The Climate Noose: Business, Net Zero and the IPCC's Anticapitalism

For further information about the Global Warming Policy Foundation, please visit our website at www.thegwpf.org.

The GWPF is a registered charity, number 1131448.

