

8

Efficient Markets and Climate Change, or Soviet Cybernetics 2.0

Imagine two worlds: one characterised by risk, another by radical uncertainty. A world of risk would mean we lived in a system already fully constituted – a knowable system in which individual agents could see and understand everything directly. In this world the only limits on our decision-making would be our personal preferences and incomplete information that we could, in principle, complete, or approximate meaningfully. A world of uncertainty, by contrast, is a world in which the future is always ‘becoming’, in which there is no pre-determined political economic space that we can fully apprehend. Here, the present cannot be computed, let alone the future.¹ As I argued in the opening chapters, the first world is a purely theoretical construct. We live and die in the second. By the late twentieth century a threat was emerging in the physical world that was unprecedented, global, intensifying and potentially terminal – a perfect storm of man-made climate change, ocean acidification and the planet’s sixth mass extinction event, the first caused by man and potentially the most complete.² In this chapter I explore how neoclassical economics understands risk and how this has played out in neoliberal policy.

There is an overwhelming consensus in the international science community and, as of the 2015 Paris Climate Agreement, between 195 governments that temperature rises above 2°C from mid-nineteenth-century levels will be extraordinarily dangerous. Governments consequently committed to pursuing ‘ambitious efforts’ to limit the temperature

¹ Mark Blyth, ‘This Time It Really Is Different: Europe, the Financial Crisis, and Staying on Top in the Twenty-First Century’, in Dan Breznitz and John Zysman, *The Third Globalization: Can Wealthy Nations Stay Rich in the Twenty First Century* (Oxford: Oxford University Press, 2013), pp. 207–231, p. 210.

² Garardo Ceballos, Paul R. Ehrlich and Rodolfo Dirzo, ‘Biological Annihilation via the Ongoing Sixth Mass Extinction Signaled by Vertebrate Population Losses and Declines’, *PNAS* 114 (30) (2017): 6089–6096, p. 6089.

increase to 1.5°C above pre-industrial levels.³ The higher temperatures rise, the more complete the threat to global ecosystems and human civilisation. Beyond 2°C the onset of non-linear processes triggered by tipping points, such as the melting of permafrost and the polar icecaps or the collapse of the Amazon rainforest, shift from being probable to certain. These processes have already begun, however, and their tipping points are likely to pitch ecosystems into conditions of unrecoverable loss, or ‘ruin’, at uncontrollable rates.

As the author of the 2006 UK government-commissioned *Stern Review on the Economics of Climate Change*, Nicholas Stern warned, ‘[W]e are the first generation that through its neglect could destroy the relationship between humans and the planet, and perhaps the last generation that can prevent dangerous climate change.’⁴ Man-made geo-engineering solutions to the ecological emergency are unethical, untested, unaccountable and high risk, however understandable the wish for a technological silver bullet.⁵ In short, the natural science tells us that we need a system-wide transition as a matter of urgency – a global mobilisation akin to a war-footing. So why has this yet to happen?

There is no denying the fact that the nature of climate change makes political action difficult. The threat is hard to comprehend because it is total and unparalleled in scale, and environmental degradation has long been understood as a ‘collective action problem’. It was famously described by the ecologist Garrett Hardin as the ‘tragedy of the commons’, whereby individuals who act according to their self-interest within a system of shared resources may diminish or spoil those resources and so undermine the system for all users, including themselves.⁶

Environmental economists in the 1970s tended towards either a strong statism or a radical faith in markets in their hunt for solutions, a dichotomy Elinor Ostrom declared false for ignoring how people’s capacity to solve such dilemmas varied from situation to situation.

³ United Nations, ‘Paris Agreement’, 21st Conference of the Parties, Paris, December 2015.

⁴ Nicholas Stern, *Why Are We Waiting?* (Cambridge, MA: MIT Press, 2015), p. xxvii.

⁵ *Ibid.*, p. 23.

⁶ Garrett Hardin, ‘The Tragedy of the Commons’, *Science* 162 (1968): 1243–1248.

Ostrom had then used axiomatic-deductive, game-theoretic logic to show that individuals might rationally ‘contract’ with each other to pursue conservation under certain conditions and so re-establish the commons in a self-regulating form.⁷

From a political economic perspective, however, this dichotomy between bureaucratic centralisation and privatisation is false not only because of Ostrom’s potential for local cooperation but because it is ahistorical. Far from having only bureaucratic and centralising options, the democratic state can deploy diverse strategies for mobilising social action: that set out new opportunities, as well as rules, and offer financial and institutional support for adaptation and innovation without dictating it. Since in practice all economic orthodoxies are political orthodoxies that use state power whether they admit it or not, sterile debates about ‘how much’ states intervene are misleading. The questions we should ask is, ‘for whom, and for what, do they intervene?’⁸ In the current timeframe, moreover, the state alone has the power to galvanise environmental action on the necessary scale. Thus, to understand why neoliberal political elites continue to respond to an unprecedented global threat with light-touch regulation and market creation alongside the perpetuation of the fossil fuel economy, we need to look in detail at how neoclassical economics thinks about risk.

Approaching the question from Camp 2, Stern observes that climate change is ‘the greatest market failure the world has ever seen’.⁹ But the closed-system reasoning in Camp 1 has allowed neoliberalism to develop three core principles, and these have formed the foundations of UK climate policy. The first is that agents in all markets, including financial markets, are completely informed and rational in the face of future risk, though this belief is only viable in the fictional world in which risk probabilities can be accurately assessed through a combination of axiomatic deduction and past statistics. The second principle follows from the first, which is that economic forecasting and hence risk management are dependable methodologies. While useful for scenario planning, these methods have come to dominate neoliberal

⁷ Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge: Cambridge University Press, 2015), pp. 9–12.

⁸ Peter Evans, *Embedded Autonomy, States and Industrial Transformation* (Princeton: Princeton University Press, 1995), p. 10.

⁹ Nicholas Stern, *The Economics of Climate Change: The Stern Review* (London: HM Treasury, 2006).

policymaking and encouraged the illusion that, informed as we supposedly are, a policy of incremental change will serve. The last principle is that market competition is the source of efficient economic performance, forever and in all circumstances, and so the maximal acceptable role for the state is to ensure corporations give out the necessary information to allow for rational decision-making by all economic agents, from consumers to financial markets. Adjustments will follow that are equilibrium preserving. All three principles require a world free of radical uncertainty, so how have these arguments emerged?

Calculable Risk

Humility in the face of social change was the norm for the classical political economic thought of the eighteenth and nineteenth centuries, from Adam Smith to John Stuart Mill to Carl Menger.¹⁰ In the 1930s and 1940s, economists who disagreed on practically everything else still agreed that we live in an uncertain world. John Maynard Keynes and Friedrich August von Hayek both insisted that we will always be incapable of knowing what will happen next in a robust way, even as they disagreed on what to do about it.¹¹ For Keynes, markets were so plagued by imperfect information and herd behaviour they would forever require state intervention to stabilise them. Government had to intervene not because it knew more than ‘society’ but because it had the unique capacity to take precautions against the clear implications of uncertainty.¹² For Hayek, no government could transcend its own lack of complete knowledge to intervene successfully.¹³

By contrast, the neoclassical economics of the late nineteenth and twentieth centuries insisted that the idea of radical uncertainty was unduly defeatist.¹⁴ The British economist Stanley Jevons had started

¹⁰ Julia Köhn, *Uncertainty in Economics: A New Approach* (Cham: Springer Press, 2017), pp. 20, 27.

¹¹ Richard Bronk and Wade Jacoby, ‘Uncertainty and the Dangers of Monocultures in Regulation, Analysis and Practice’, MPfG Discussion Paper 16/6, p. 6.

¹² Robert Skidelsky, *Keynes: The Return of the Master* (New York: Public Affairs, 2009), p. 162.

¹³ Bronk and Jacoby, ‘Uncertainty and the Dangers of Monocultures’, p. 6.

¹⁴ Philip Mirowski, *More Heat than Light: Economics as Social Physics, Physics as Nature’s Economics* (Cambridge: Cambridge University Press, 1989), p. 218.

this tendency in the 1870s when he asserted that '[t]he Theory of economy... presents a close analogy to the Science of Statical Mechanics, and the Laws of Exchange are found to resemble the Laws of Equilibrium of a lever'.¹⁵ Leon Walras had adopted the mathematics of Newtonian mechanics to support his argument that economic agents have full knowledge or 'certainty' of 'a programmed external economic reality that governed all past, present and future economic outcomes'. In this view, notes Paul Davidson, '[t]he path of the economy, like the path of the planets under Newton's classical mechanics, was determined by timeless, immutable natural laws'.¹⁶ It is this belief that would go on to define the Camp 1 neoclassical understanding of future risk as something open to precise calculation.

What emerged was an argument for calculable uncertainty on the utilitarian assumption that economic agents optimise their trading possibilities based on full and relevant information and that errors in projected probabilities will be random but always within given parameters.¹⁷ But such faith in the accuracy of probability calculation is coherent only within a closed economic system, since it is only in a closed system that you can be rational and optimise, or irrational and predictably lose out.¹⁸ This approach was criticised from the outset, not least by Alfred Marshall, who pointed out that time had the terrible habit of undermining the stability of any actual factors as 'given', and hence the wiser methodological path would be towards economic 'biology'. Mechanical analogies might be easier to handle mathematically, but they were further from complex reality than organic analogies of 'living force and movement'.¹⁹

As Julia Köhn notes, these debates about uncertainty effectively split economics into two broad schools. On the one hand you had uncertainty purists, such as Keynes, who saw uncertainty as an inescapable challenge in the real economy and a fundamental constraint

¹⁵ Stanley Jevons, *The Theory of Political Economy* (Basingstoke: Palgrave Macmillan, 2013), Preface to the First Edition (1871).

¹⁶ Paul Davidson, 'Reality and Economic Theory', *Journal of Post-Keynesian Economics* 18 (4) (June 1996): 479–508, p. 479.

¹⁷ Richard Bronk, *The Romantic Economist: Imagination in Economics* (Cambridge: Cambridge University Press, 2009), p. 68.

¹⁸ *Ibid.*, p. 219.

¹⁹ Alfred Marshall, *Principles of Economics* (New York: Palgrave Macmillan, 2013), Preface to First Edition (1890), xxvi.

on how much we could ever know about how an economy works. On the other there were those neoclassical economists who acknowledged uncertainty but argued that utility-maximising choice on the basis of probabilistic knowledge was the ‘scientific’ way to manage it. Between 1920 and 1950 the two sides parted, so that from then on neoclassical economists would reinterpret uncertainty as risk and thereby neglect its fundamental significance for the economy, for economics and, by extension, for the planet.²⁰

In the decades after the Second World War the analytical focus on uncertainty had waxed and waned under conditions of unusually stable economic growth, in which even downturns appeared relatively manageable. As we know, however, when that economic stability broke down in the 1970s, it was the diagnoses and prescriptions of Camp 1 economists that came to the fore. Their argument was not that free markets were the safest way to manage the inescapable uncertainty of life, à la Hayek, but that ‘out there’ existed a world of rational expectations, calculable risk, optimising agents, informational certainty and, hence, fully efficient markets if only the state could be rolled back.²¹ Never mind that this was a grammar of justification that only made sense in the language of a closed, two-dimensional space.

The Global Financial Crisis

To understand why the Camp 1 framework is a misguided foundation for tackling the ecological emergency we need to look at two of its arguments in particular: for ‘rational expectations’ and ‘efficient markets’.²² Their continuing dominance in UK climate policy is all the more extraordinary because these theories sat at the intellectual root of the Global Financial Crisis of 2007–2008, and yet they persist in their practical authority. If we review them and the crisis they caused, we can understand their logic more fully and hear their Soviet echo.

The theory of rational expectations was developed by John Muth in 1961 and popularised by the Chicago economist Robert Lucas in the early 1970s. The efficient markets hypothesis (EMH) was developed

²⁰ Köhn, *Uncertainty in Economics*, p. 27

²¹ Bronk and Jacoby, ‘Uncertainty and the Dangers of Monocultures’, p. 6.

²² Gillian Tett, ‘Crisis of Faith for High Priests of Rational Markets’, *Financial Times*, 15 June 2009.

from the mid-1960s by the Chicago economist, and student of Milton Friedman, Eugene Fama. Muth's argument for rational expectations asserted that 'the economy does not waste information, and that expectations depend specifically on the structure of the entire system'.²³ The argument is logically compelling within a closed system but utopian in an evolving world of epistemological uncertainty and ontological indeterminacy. In answer to the criticism that neoclassical models were so often out of kilter with observed phenomena, Muth retorted that this was because dynamic economic models did not assume *enough* rationality. The subtlety of Muth's position was that he did not assert that all entrepreneurs would make correct predictions, or that their expectations were identical, but that *average* expectations would be 'accurate' and that since higher profits would accrue to those who made better forecasts, all agents would converge on the 'correct' outlook. The basis of this intuitively pleasing claim, however, was a model of short period price variations in an isolated market with a fixed production lag of a single commodity that could not be stored.²⁴ The resulting theory of rational expectations is thus another example of how an axiom derived from an economic island of two-dimensional simplicity would morph into a policy doctrine.

As a technical matter, the rational expectations principle is about model consistency: a rational expectations equilibrium imposes the consistency condition that each agent's choice is a best response to the choices made by others in the model. The assumption allows the modeler to tell a story about how agents can make decent probabilistic judgements about the pre-specified and limited point of uncertainty they want to 'test' within that model. The agents' assumed knowledge about the future follows from their total knowledge about the system and, epistemologically speaking, that knowledge is a gift from God, the modeller: it's just there. It follows that all the real-world challenges around information, its limitations, its interpretation and whose interpretations prevail are wished away in that technical assumption.

Drawing on Muth, Lucas's innovation was simply to assume that given sufficient transparency by government about policymaking, *everybody* would adjust their economic behaviour accordingly

²³ John Muth, 'Rational Expectations and the Theory of Price Movements', *Econometrica* 29 (1961): 315–335.

²⁴ *Ibid.*, pp. 316–317.

because they know exactly how the economy works.²⁵ As John Cassidy explains, Lucas took the Arrow and Debreu theory of general equilibrium and insisted that with slight modifications this was an accurate representation of reality and, by extension, a decent basis for real-world decision-making, something neither Kenneth Arrow nor Gerard Debreu had ever believed. Lucas's assertion had serious implications for Keynesian and interventionist policies in general. His reasoning was that if government cut taxes to encourage higher investment and demand then people wouldn't spend the money but anticipate the later, compensatory, tax hike and save. As Cassidy concluded, 'According to the rational expectations theorists, the government was either powerless or a source of trouble. Insofar as it behaved in a predictable manner, its policies wouldn't make any difference. Insofar as it adapted to this reality by continually surprising the markets, it would destabilize the economy.'²⁶

It was via the logic of rational expectations that a new theory, the EMH, came to enjoy the same ubiquity in financial economics rapidly achieved by Lucas's story in macroeconomics. Fama argued that prices in capital markets are always a reflection of their true value and that, contra Keynes, there is no distorting pessimism, optimism or ignorance to lead investors astray. Financial prices are based on fundamental values. In 1970 Fama refined his earlier claims with the idea that there were three forms of efficiency, weak, semi-strong and strong. The efficient market was duly defined as a highly competitive market of rational and informed profit maximisers who vied to predict future market values of individual securities. The EMH assumed prices incorporated all the available information on a market, which included historical financial information (weak form), all new public information (semi-strong form) and all private information regarding a financial asset (strong form).²⁷

According to the EMH you could assume that prices in capital markets always reflected true asset values because competitive pressures

²⁵ Robert Lucas, 'Economic Policy Evaluation: A Critique', *Carnegie-Rochester Conference Series on Public Policy* 1 (1976): 19–46.

²⁶ John Cassidy, *How Markets Fails: The Logic of Economic Calamities* (London: Penguin Books, 2009), pp. 100–101.

²⁷ Alexandra Gabriela Titan, 'The Efficient Markets Hypothesis: Review of Specialized Literature and Empirical Research', *Procedia Economics and Finance* 32 (2015): 442–449.

forced market participants to make optimal use of available information, avoid systematic errors in their forecasting and update their expectations rapidly in the face of new evidence.²⁸ Following Muth, the market economy wasted no information. Politically, the EMH legitimised the idea that not only commodity markets but also financial markets were almost perfectly self-adjusting. Deviations of market prices from the underlying fundamentals were merely the product of short-lived noise. It followed that while governments should require informational transparency between market participants, they should otherwise allow markets to play out their wisdom undisturbed.²⁹

These theories transformed global financial markets. The EMH instructed governments to weaken financial regulation, because risks had already been integrated into decision-making by the economic agents involved. Buyers could, and would, beware, hence regulation would only add informational noise and create needless costs. Even ‘risk management’ within a business was rejected as superfluous, since no additional information beyond that given by the market was useful.³⁰ The EMH encouraged the rise of the passive index funds that, trusting in the ‘strong’ form of efficiency, bought large baskets of stocks from a given index to replicate the performance of the overall market – a practice that allowed asset managers to drastically reduce their overheads and fees as they no longer had to interpret that market or assess the record of actual companies. For still ‘active’ funds adhering to the weaker, or semi-strong variant, the EMH powered the rise of quantitative finance: the dependence on complex models that assumed the probability of future losses was calculable on the basis of past data, and it encouraged the belief that such models could achieve high returns for any given level of risk.³¹ Camp 1 neoclassical theory had thus encouraged governments and financial and corporate actors to assume the markets assessed risk accurately and set prices that incorporated all available information. Real actors duly began to act as if this was true.

²⁸ Richard Bronk, ‘Uncertainty, Modelling Monocultures and the Financial Crisis’, *Business Economist* 42 (2) (2011): 5–18, p. 6.

²⁹ Ibid.

³⁰ Dave Ingram, Alice Underwood and Michael Thompson, ‘Risk Culture, Neoclassical Economics and Enterprise Risk Management’, Enterprise Risk Management Symposium, Chicago, 29 September–1 October 2014, p. 5.

³¹ Andrew Haldane, ‘Why Banks Failed the Stress Test’, Marcus-Evans Conference on Stress-Testing, Bank of England, London, 13 February 2009.

That the theories themselves had changed financial behaviour and hence the very nature of the current financial risks appeared to trouble no one. Rational expectations assumptions had encouraged new financial ‘derivatives’ that were actively misleading in their parcelling and re-parcelling of poor market risks. Since the models used to assess the risks in collateralised debt obligations (CDOs) were built on historical data these innovations alone guaranteed the future could not resemble the past,³² but intellectual coherence took a back seat to the profits to be made, which were vast. The hegemony of these ideas meant it came as a genuine shock when the crisis in the American subprime mortgage market revealed the over-exposure of the banking system to debts with no realistic prospect of repayment. It wasn’t just that the rational expectations and efficient markets hypotheses had been proved wrong. As Richard Bronk points out, the resulting assumptions had caused ‘highly correlated “errors” that were anything but random’.³³

Perfect Indirect Centralisation Revisited...

To see the utopianism of these ideas it helps to recognise them for what they are: the market analogue to the Soviet cybernetic theories of perfect indirect centralisation that emerged in the Kosygin-era debates over optimal planning. The rational expectations theorist Thomas Sargent had actually referred to the ‘communism of models’, whereby all agents ‘inside the model, the econometrician and God share the same model’.³⁴ Indeed, rational expectations models make frequent use of an assumed ‘social planner’ as their baseline.³⁵

What you find in both is the same mythic function (and logical necessity) that the economic agent has a complete knowledge of the plan/model/market economy in their minds, so that all data can be correctly interpreted, all forecasting errors can be eradicated and any need for the democratic state as an economic referee in an uncertain

³² Bronk, ‘Uncertainty’, p. 12

³³ Richard Bronk, ‘Epistemological Difficulties with Neo-classical Economics’, Southern Economic Association Conference Paper, 19–21 November 2011, Washington, DC, p. 4.

³⁴ George Evans and Seppo Honkapohja, ‘Interview with Thomas Sargent’, *Macroeconomic Dynamics* 9 (2005): 561–583, pp. 565–567.

³⁵ Johanna Bockman, *Markets in the Name of Socialism: The Left-Wing Origins of Neoliberalism* (Stanford: Stanford University Press, 2011), p. 174.

world rendered redundant. Under rational expectations, economic agents are, precisely, idealised social planners; they know the structure of the model, the values of the parameters and how any random shock will be distributed. In the EMH they can even converge on an accurate price for future technological potential. All the levels of the economic hierarchy in both theories, Soviet and capitalist, receive all the information they need. In both systems there will be feedback loops that do not waste or distort information but transmit it near perfectly, either through linear programming or through probabilistic calculation in a competitive market within dependable bounds of risk.

Thomas Sargent's only concession to the lack of realism in this argument was to say that

it is true that modern macroeconomics uses mathematics and statistics to understand behaviour in situations where there is uncertainty about how the future will unfold from the past. But a rule of thumb is that the more dynamic, uncertain, and ambiguous is the economic environment that you seek to model, the more you are going to have to roll up your sleeves and learn and use some math. That's life.³⁶

Except, of course, it isn't. The argument is reminiscent of Lenin because it depends on the shared conceit that, given a correct understanding of political economic 'science' – or sufficient mathematics in this case – we can read the world practically straight off the page. Even if the theory were true, so long as those with access to economic reality were limited to economics graduate students the arguments for the existence of informational feedback loops in the economy were going to remain seriously flawed as a representation of what the rest of us know at any time and consequently about how we were likely to behave.

Soviet cyberneticians' dream of the economy as a transparent, dynamic man-machine system, akin to the antimissile systems of the military from which much of the maths was drawn, would never be implemented, as Adam Leeds points out.³⁷ This suggests that the Brezhnevites operated with a higher level of social realism than the neoliberal governments of the 1990s and 2000s, which is quite the

³⁶ Art Rolnick, 'Interview with Thomas J. Sargent, Thomas Sargent's Rational Expectations', *Hoover Digest*, Number 1, 2012.

³⁷ Adam Leeds, 'Dreams in Cybernetic Fugue', *Historical Studies in the Natural Sciences* 46 (5) (2016): 633–668, p. 664.

indictment. The Soviet debate at least recognised that for cybernetics to work the whole economy would need to be precisely articulated and integrated within this computation in a dynamic manner. In the EMH, by contrast, it is simply axiomatic that stock prices offer a complete embodiment of all the underlying asset values. Market signals are taken as correct a priori and hence a sound basis for probabilistic forecasts, based on the historical patterns of previous price distributions.

The Soviets had eventually accepted that even cybernetic models would fail to deal with inner-system change: the changing uses of technology and innovation, the intervening layers of human error, partial knowledge, opportunism, institutional adjustment and discovery. They had also conceded that they lacked Godlike foreknowledge, infinite computing power, constant and complete real-time informational access and its perfect, dynamic interpretation and assimilation, and so they had pressed on instead with the imperfect methods of mechanical balance, input–output planning and linear programming. Meanwhile, in the Anglosphere, the EMH and the underlying assumption of rational expectations became the basis of government policy towards financial markets, and as we shall see, it remains the basis of UK government climate strategy.

One might have reasonably expected the Global Financial Crisis to discredit the ideas of predetermined economic mechanics, fully-informed coordinating mechanisms and dependable forecasting in human environments. As Colin Crouch showed in *The Strange Non-death of Neoliberalism*, however, these ideas had penetrated deep into the neoliberal culture.³⁸ We should consequently expect a neoliberal government to superimpose neoclassical logic onto its analysis of the environment. We can also expect neoliberal governments to argue that private economic agents at all levels, including corporate and financial actors, should be left to self-regulate around climate risk, on the basis that an efficient pricing of risk under rational expectations will prevail. The private sector, including the financial sector, should be protected as a privileged domain, free of government restraint. If climate change becomes more politically salient, then neoliberal governments have

³⁸ Colin Crouch, *The Strange Non-death of Neoliberalism* (Cambridge: Polity Press, 2011); Stephen Wilks, *The Political Power of the Business Corporation* (Cheltenham: Edward Elgar, 2013).

a fallback position, which is that they too can place a high degree of confidence in risk management, in forecasting and in audit. Where the precautionary principle would require they end the known causes of harm as soon as possible,³⁹ neoliberals instead seek to minimise new state interventions, even as the legacies of past interventions mean the corporate lobbies and structural dependencies attached to fossil fuels, and to other damaging materials and practices, remain strong.

Risk Management

If we go back to the concept of Kuhn-loss and ask, ‘what was lost when we forget about uncertainty?’ we must include the capacity of diverse social institutions, including the state, to take precautionary and strategic action: to develop new technologies, coordinate expertise and solve problems. Instead, neoliberal societies shifted ever more wholeheartedly towards what Michael Power describes as a ‘world level grand narrative of risk management’ across multiple areas of policymaking.⁴⁰ ‘Risk management’ has consequently come to be regarded as central to good government,⁴¹ as well as an effective substitute for the precautionary principle and the strategic thinking and active prioritisations that should go with it. The idea of insurable risk has operated effectively for centuries. The principle of insurance is that there are phenomena of such predictability about which we have accurate and reliable data, that an effective market can be built to manage risks through insurances. In insurance systems the premiums paid are used to smooth out future income losses caused by events, such as house fires, that occur with relatively stable frequency. Under neoliberalism, however, the concept of calculable risk has increasingly colonised policymaking arenas characterised by uncertainty.⁴²

³⁹ Joseph Norman, Rupert Read, Yaneer Bar-Yam and Nassim Nicholas Taleb, ‘The Precautionary Principle (with Application to the Genetic Modification of Organisms)’, Extreme Risk Initiative, NYU School of Engineering Working Paper Series, 4 September 2014.

⁴⁰ Michael Power, *Organised Uncertainty: Designing a World of Risk Management* (Oxford: Oxford University Press, 2007), viii.

⁴¹ Tom Horlick-Jones, ‘On Risk Work: Professional Discourse, Accountability and Everyday Action’, *Health, Risk and Society* 7 (3) (September 2005): 293–307.

⁴² Richard Brooks, *The Triumph of the Bean Counters and How They Broke Capitalism* (London: Atlantic Books, 2018).

Today's climate uncertainty relates not to the likelihood of catastrophic harm, which is certain without action, but to exactly when, in what order and at what magnitude ecological tipping points are likely to occur. This renders a government preference for a risk assessment, forecasting, monitoring, auditing and hence supposedly 'efficient' decarbonisation strategy both over-optimistic and, by definition, behind the curve of damaging cumulative effects. This is not to say that risk assessment is useless. Monitoring and assessment are informative, but risk management is the wrong primary paradigm. As Joseph Norman et al. explain, risk-assessment techniques such as cost-benefit analysis assume that decisions can be made by accounting for the effects of positive and negative outcomes and their probabilities, and they tend to assume that strategies are available to offset losses and mitigate harms. But these are not realistic options in cases of potential ruin.⁴³ Such approaches are nevertheless consistent with neoclassical reasoning in which no single or cumulative events are capable of shifting the economic world off its axis.

Norman et al. make a vital distinction between damage from innovation that is local and limited and risks under uncertainty that are potentially total, that is, uninsurable risks. In the first situation, risk management and cost-benefit analyses remain useful; the benefit of innovation can be coherently traded off against the risk of structurally recoverable harm. In the second, there is no acceptable trade-off, because losses are potentially total or systematically catastrophic. Climate change is the textbook case for the precautionary principle, precisely because it combines certainties of unrecoverable harm on present courses with uncertainty about the exact timing and trajectory of harm and because there is no institution capable of bailing out the biosphere. Forecasting and audit have nevertheless emerged as dominant climate risk-assessment techniques under neoliberalism, with Integrated Assessment Models (IAMs) and cost-benefit analyses playing a particularly important role.

IAMs combine climate science with the supposed economic impact of ecological change. Widely used for policy evaluation, including by the Intergovernmental Panel on Climate Change (IPCC), they take a standard neoclassical approach to exploring likely effects on aggregate, economy-wide welfare, where the challenge is to

⁴³ Norman et al., 'The Precautionary Principle', p. 3.

figure out the most efficient market solution to a social problem under the given parameters. Like all neoclassical models, they produce radically different outcomes depending on the axioms and values that govern the inputs. IAMs thus upload rational choice micro-foundations that make sense in ‘small worlds’, where all contingencies might genuinely be foreseen, to conditions of radical complexity and uncertainty.⁴⁴ As the Massachusetts Institute of Technology economist Robert Pindyck explains, the ‘damage function’ in IAMs defines the relationship between an increase in temperature and gross domestic product, but while there is relatively robust physical science to offer probability distributions around climate sensitivity, there is no theory or data to draw on from the economic side. The fact that climate change is known to hold uncertain but accelerating and non-linear risks for most, if not all economic factors, means IAMs tend to systematically underestimate risk because of the tendency to use historical parameter values.⁴⁵ IAMs also exclude key dimensions of climate change that cannot be described in neoclassical terms, such as the unparalleled loss of human life and mass extinction of species.⁴⁶

The risks of misdirection and moral evasion are equally high in cost-benefit analysis models if the choices of discounting and inter-temporal values for climate change are again assumed to be the same as those for which investment projects are usually assessed, that is, according to ‘steady-state’ conditions or historical capital markets trends.⁴⁷ The result is status quo bias again, because of the non-pricing of ecologically important factors and the impossibility of pricing in unanticipated ecological interactions. The same problems apply to corporate use of forecasting data: as the current market for ‘catastrophe bonds’ demonstrates, past data is no longer as reliable as it used to be for the pricing of nature-related risk-linked securities. How *do* you price the probability and likely costs of hurricanes, floods and wildfires under climate collapse?

⁴⁴ Antony Millner, Simon Dietz and Geoffrey Heal, ‘Ambiguity and Climate Policy’, Centre for Climate Change Economics and Policy Working Paper No. 28, December 2010, pp. 2–3.

⁴⁵ Robert Pindyck, ‘Climate Change Policy: What Do the Models Tell Us?’, *Journal of Economic Literature* 51 (3) (September 2013): 860–872, p. 862.

⁴⁶ Stern, *Why Are We Waiting?*, p. 148.

⁴⁷ *Ibid.*, p. 156–158.

As Power identified in *The Audit Society*, there is a further distinctive danger that arises from risk methodologies, namely that procedural formalism around quantification, monitoring and reporting can easily become a substitute for substantive action. As governments and corporations take up risk management by quantification, more effort can be put into systems of control, or even into systems of ‘control of control’, than into problem-solving itself. The temptations are great, as risk assessment and audit are cheaper than purposive action and provide ‘comforting signals to regulators and politicians’,⁴⁸ and the history of the Soviet Union shows us how debilitating such formalism can become. For neoliberal governments and businesses alike, the clear risk is that carbon targets, budgets and plans become dead letters the day they are published, and business-as-usual is resumed, as we wait for the wisdom of the market to see us through.

Summary

The more you rely on the assumptions of Camp 1, the more you will favour the wisdom of markets, though markets have historically failed to consider, let alone value, the eco-system, since nature is an unconsidered ‘externality’. For Camp 2 neoclassicists minded towards ‘liberal environmentalism’, such externalities are a market failure to be solved by regulations and new markets that price these ‘costs’ back in, as if everyone would suddenly define their own utility in terms perfectly consistent with the flourishing of the natural world and within a ceaselessly efficient market. It is outrageous hubris, however, to imagine that the two-dimensional neoclassical thought experiment could represent a dependable governance mechanism, not just for the human economy but, by implication, for the biosphere – that nature’s equilibrium and an entirely fictional general economic equilibrium can be made consistent with each other. In conditions of radical uncertainty about tipping points, the placement of all ecological factors into a linear scale of monetary value obscures the enormity – the totality – of the risks.

If we turn now to policy practice, we can see to what extent UK governments have reacted to the climate emergency with assumptions,

⁴⁸ Michael Power, *The Audit Society: Rituals of Verification* (Oxford: Oxford University Press, 1999), pp. 114–115.

policies and methods built on neoclassical economics. Based on the discussion so far, we would expect to find the following:

- The presumption of immutable system stability will tend to crowd out the precautionary principle. Neoliberal governments will consequently adopt the view that the private sector is a privileged domain that should be allowed to self-regulate around climate risk.
- Neoliberal governments under political pressure for state action will lean into risk-assessment techniques, cost–benefit analysis and IAMs as forecasting methods, despite their known weaknesses among climate specialists. Given the resilience of the underlying ideological beliefs this reliance is likely to degenerate into procedural formalism, such as non-compulsory target setting for private actors and carbon budgets and targets for governments that go unfulfilled.
- Even more moderate Camp 2 neoliberal governments will limit their interventions to the resolution of specific market failures in existing markets and they will tend to prefer purely market-friendly policy instruments under the illusion that market completion will be biosphere-consistent. Camp 1 governments that inherit such interventions will seek to eradicate these measures as unwarranted in markets that are presumptively rational and competitive. The unwillingness of both camps to intervene against existing markets will sustain the structural advantages held by those polluting producers and practices that continue to cause the ecological emergency.

The next section shows how the paradigm shift we urgently need is thwarted in the United Kingdom by utopian assumptions about the rationality of markets and the idea that risk can be fully calculated, hence modelled, hence forecast and hence fully integrated within existing market mechanisms.

The Politics of Climate Change in the United Kingdom

Before we look at government strategies in detail it is helpful to know the general direction of travel in UK climate politics, though it is important to note that after 1999 the Scottish Parliament, the National Assembly for Wales and the Northern Ireland Assembly also acquired varied responsibilities and some limited devolved powers to set further targets and climate strategies, and Scotland tends to be

more ambitious in its renewable energy targets,⁴⁹ as well as to reduce its emissions faster.⁵⁰ The history of climate policy in Westminster, however, is that of a growing acknowledgement of the threat, the introduction of targeted, ‘market-friendly’ policies under New Labour and the Conservative–Liberal Coalition and the significant reversal of those policies by the Camp 1 Conservative governments from 2015 to the time of writing.

Margaret Thatcher had accepted the evidence of the IPCC, established in 1988,⁵¹ and her decision to make a rapid switch from coal to gas also gave her a revolutionary victory at home, as the largely unmitigated shock to the UK coal industry devastated the strongly unionised, Labour-voting communities built around it. The 1992 Rio Earth Summit paved the way for the eventual agreement of the Kyoto Protocol in 1997, which committed the ratifying countries to greenhouse gas emissions reductions for 2008–2012. Thatcher’s successor, John Major, continued support in principle and the United Kingdom’s ‘dash for gas’ set it on course to deliver its Kyoto commitments for a 13 per cent reduction in carbon dioxide emissions relative to 1990.⁵²

New Labour had promised to be ‘the first truly green government that Britain has ever seen’. Its 1997 manifesto committed to reduce carbon dioxide emissions by 20 per cent from 1990 levels by 2010 and to ‘mainstream’ green policies into every department. It offered no policies, however, and the agenda was folded into the party’s general promise to champion technological modernisation.⁵³ It was three years before the Tony Blair Labour government created a Climate Change Programme to deliver the 1997 target, but its measures offered

⁴⁹ House of Commons Environmental Audit Committee, ‘Climate Change and Local, Regional and Devolved Government’, 28 July 2008 (HC 225), p. 32, www.publications.parliament.uk/pa/cm200708/cmselect/cmenvaud/225/225.pdf.

⁵⁰ The Climate Change Committee, ‘Scotland Still Outperforms the UK in Reducing Emissions but Transport and Agriculture Remain Significant Challenges’, 24 September 2018, www.theccc.org.uk/2018/09/24/scotland-still-outperforms-the-uk-in-reducing-emissions-but-transport-and-agriculture-remain-significant-challenges/.

⁵¹ Margaret Thatcher, ‘Speech at 2nd World Climate Conference’, Geneva, 6 November 1990, www.margaretthatcher.org/document/108237.

⁵² Jill Rutter, Edward Marshall and Sam Sims, ‘The “S” Factor, Lessons from IFG’s Policy Success Reunions’, Institute for Government, 2012, p. 111.

⁵³ The Labour Party, ‘Because Britain Deserves Better’, Party Manifesto, 1997.

only a 10.6 per cent reduction by 2010.⁵⁴ What had started as a bold claim for a new form of economic development had immediately been watered down to cohere with the neoclassical notion of ‘competitiveness’ at the domestic level.

Neil Carter’s extensive analysis shows the three main parties merely ‘covered their backs’ on climate change during the Blair years. The first Blair government (1997–2001) had helped secure the Kyoto Protocol, and the second (2001–2005) signed the United Kingdom up to the European Union’s Emissions Trading Scheme launched in 2005. But while Labour led at the international level, it retreated at home in the face of a business community that rejected decarbonising measures on Camp 1 grounds: as a pure cost and competitive disadvantage.⁵⁵ Facing continuous business pressure to ignore the climate risks, not least from the Confederation of British Industry, New Labour drove expansions of commercial aviation, road-building and non-intervention in regulatory terms around commercial and domestic buildings.⁵⁶ By November 2004, Greenpeace director Stephen Tindale concluded that ‘Blair’s record on climate change is almost entirely a record of fine words and no action’ and leading non-government organisations (NGOs) broke with the government.⁵⁷ There was little mention of climate change in Blair’s 2005 election campaign speeches and little pressure from the Conservative Party on an issue now avoided by both as ‘bad politics’.⁵⁸

It wasn’t until public concern over climate change began to grow, in 2006, that political parties began to compete over policy and lead from the front. Higher public awareness had been achieved by a wider dissemination of the science. Media coverage grew around the *Stern Review* of 2006 and, a year later, the ‘Report of the Fourth International Panel on Climate Change’. Crucially, the *Stern Review* had challenged the complacency of industry, business and finance,

⁵⁴ Oliver Illott, Joe Randall, Alex Bleasdale and Emma Norris, ‘Making Policy Stick: Tackling Long-Term Challenges in Government’, Institute for Government, 2016, p. 17.

⁵⁵ Neil Carter, ‘Combatting Climate Change in the UK: Challenges and Obstacles’, *Political Quarterly* 79 (2) (2008): 194–205, p. 198–199.

⁵⁶ *Ibid.*, p. 200.

⁵⁷ Marie Wolf, ‘Greens Declare War on Blair for “Failures” over Climate Change’, *The Independent*, 19 November 2004.

⁵⁸ Carter, ‘Combatting Climate Change’, p. 197.

though by no means eradicated it.⁵⁹ Encouraged by polls that showed some 80 per cent of the population felt ‘some concern’, mainstream political parties shifted to a ‘preference shaping’ strategy. Carter shows how David Cameron’s election as Conservative leader in May 2005, and his attention to shifting public opinion, forced Labour to focus. Blair’s failure to act had mobilised a broad coalition of NGOs and charities to call for a Climate Change Bill. When Cameron signed up in its favour it was a political coup. As his advisor Nick Boles put it, a strong stance on climate change would give the Conservatives a necessary ‘eye catching yank into a new place’,⁶⁰ and the Labour government came under further pressures as the Liberals joined too. In October, Environment Secretary Ed Miliband declared the government would introduce a Bill and instruct a new unit, the Office of Climate Change (OCC), to change the course of policymaking. All three major parties whipped in favour, and the Climate Change Bill became law in November 2008.⁶¹

The Climate Change Act projected three carbon budgets to set out reductions in emissions: a 28 per cent reduction on 1990 levels through 2008–2012; a 29 per cent reduction through 2013–2017 and a 35 per cent reduction through 2018–2022; it further set a target for 2050: for an 80 per cent reduction on 1990 levels. It also committed governments to pass further budgets in the future. The 2050 target was defined as a legal duty: a world first. The Act required governments to publish plans to meet those commitments and drove a major investment in institutional capacity in the form of a politically independent and multi-disciplinary expert Climate Change Committee (CCC) to ensure targets were evidence-based and independently assessed. The CCC would establish ‘the vision and the strategic direction’ of policy and an Adaptation Sub-committee to advise on climate risks and assesses progress and would report to Parliament on the progress.⁶² To help organise action the government

⁵⁹ Neil Carter, ‘The Politics of Climate Change in the UK’, *WIRE’s Climate Change* 5 (3) (2014): 423–433, pp. 425, 427.

⁶⁰ Institute for Government, ‘Policy Reunion on the Climate Change Act (2008)’, Institute for Government, London, 6 October 2010, p. 115.

⁶¹ Ilott et al., ‘Making Policy Stick’, p. 19.

⁶² The Climate Change Committee, ‘The UK Climate Change Act’, www.theccc.org.uk/wp-content/uploads/2020/10/CCC-Insights-Briefing-1-The-UK-Climate-Change-Act.pdf.

also established a new Department for Energy and Climate Change (DECC) to consolidate energy and climate change issues into one leading organisation.

The Act's focus was strikingly narrow, however. Climate change mitigation was not embedded into any wider sustainable development objectives – a serious omission given the interdependent losses in global biodiversity and the growing threat of resource scarcity. Even more significantly, the Act understood the role of government in Camp 2 neoclassical terms. Government was there to correct market failures and otherwise rely on markets to be 'guided' via targets and market incentives. Beyond the establishment of new energy markets, it tended to eschew statutory requirements or direct channels of public investment, decisive regulatory intervention or funded empowerment of local authorities.⁶³ Lauded as radical, the Act epitomised the neoclassical Treasury playbook at its most interventionist: scenario planning, economy-wide targets and performance monitoring, with government action limited to making markets or to imitating them via targets and quotas.

By autumn 2008, the Global Financial Crisis had struck, and the financial sector bailout and the challenges of economic recovery became paramount. In Coalition after the 2010 election, Conservative interest in the environment was revealed as an electoral expedient to help 'detoxify' the Conservative brand in opposition, and the party now reverted to Camp 1 doctrine as the calculus of political competition changed. Cameron made only two speeches officially labelled as climate-related through his entire first term, and only one of them mentioned 'climate change' and 'global warming'.⁶⁴ In the face of the government policy of austerity, climate change would peak as the sixth most important issue facing the United Kingdom in 2007 until the late 2010s.⁶⁵

As one of only two major policy departments with a Liberal secretary of state, the DECC had initially survived the 2010 austerity

⁶³ Sam Fankhauser, Alina Averchenkova and Jared Finnegan, 'Ten Years of the UK Climate Change Act', Grantham Research Institute on Climate Change, LSE, April 2018.

⁶⁴ Simon Bushell, Mark Workman and Thomas Colley, 'Towards a Unifying Narrative of Climate Change', Grantham Institute Working Paper, Number 18, April 2016.

⁶⁵ Carter, 'The Politics of Climate Change', p. 427.

cuts; indeed, it increased its headcount by 40 per cent.⁶⁶ In 2011 the Fourth Carbon Budget was set at a 50 per cent reduction of 1990 levels through 2023–2027, in line with CCC advice. As Carter and Ben Clements show, however, although the Coalition implemented some important measures, on which more later, these were driven by the Liberals in the teeth of hardening Conservative resistance. In 2008, a third of Conservative MPs had questioned the validity of climate science, and by 2010 that hostility was open, and George Osborne reset the government line.⁶⁷ That the chancellor was determined to enact Camp 1 policy would prove lethal to climate realism given the Treasury's fiscal authority and Cameron's deference to Osborne on political strategy.⁶⁸ Conservatives increasingly played climate change for its potential to divide voters in their favour, a 'positional' issue. The Conservative right would duly designate climate change a socialist-conspiracy-by-stealth,⁶⁹ in line with Camp 1 logic.

In October 2011, Osborne told the Conservative Party Conference that 'we're not going to save the planet by putting our country out of business' and promised to stop the United Kingdom from cutting emissions more quickly than its European counterparts in a direct appeal to the principle of jurisdictional competition.⁷⁰ In February 2012, 101 Conservative MPs wrote to the prime minister to call for dramatic reductions in subsidies to wind power.⁷¹ Osborne wrote to the energy secretary that summer demanding that unabated gas continue to play a core role in electricity generation to at least 2030, that government should set no 2030 target for electricity emissions and that a cap should be set on those decarbonisation policy costs financed

⁶⁶ Ilott et al., 'Making Policy Stick', p. 19.

⁶⁷ Neil Carter and Ben Clements, 'From "Greenest Government Ever" to "Get Rid of All the Green Crap": David Cameron, the Conservatives and the Environment', *British Politics* 10 (2) (2015): 204–225, p. 209.

⁶⁸ Francis Elliott and James Hanning, *Cameron: Practically a Conservative* (London: Fourth Estate, 2012), p. 423.

⁶⁹ Carter and Clements, 'From "Greenest Government Ever" to "Get Rid of All the Green Crap"', p. 222.

⁷⁰ Greg Philo and Catherine Happer, *Communicating Climate Change and Energy Security* (Abingdon: Routledge, 2013), p. 3.

⁷¹ Patrick Hennessy, '101 Tories Revolt over Wind Farms', *The Telegraph*, 4 February 2012.

through energy bills.⁷² By November 2013, Cameron had moved from declaring that the Coalition would be ‘the greenest government ever’ to privately ‘going round Number 10 saying: “We have got to get rid of all this green crap” “We used to say, ‘Vote Blue, Go Green’, now it’s ‘Vote Blue, Get Real’”⁷³ – a statement that demonstrates how confused the concept of ‘realism’ had become.

In 2014, the European Union set targets of a 40 per cent carbon cut and a 27 per cent share of renewables by 2030.⁷⁴ At the start of 2015, a bipartisan agreement was brokered by the Green Alliance think tank and supported by Christian Aid, The Catholic Agency for Overseas Development, Greenpeace, the Royal Society for the Protection of Birds and the World Wildlife Fund in anticipation of the year-long negotiations in the run-up to the Paris Summit in December. Under renewed media attention, the three main party leaders David Cameron, Ed Miliband and Nick Clegg pledged ‘To seek a fair, strong, legally binding, global climate deal which limits temperature rises to below 2°C; To work together, across party lines, to agree carbon budgets in accordance with the Climate Change Act; To accelerate the transition to a competitive, energy efficient low carbon economy and to end the use of unabated coal for power generation’.⁷⁵ Starting in May 2015, however, Cameron’s second, now standalone, Conservative government enacted comprehensive policy reversals, explored later. In June 2016, Cameron resigned over the failure of his ‘Remain’ position in the Brexit referendum, and Theresa May replaced him as the Conservative prime minister.

May abolished DECC on her second day in office and moved climate change responsibilities into the new Department for Business, Energy and Industrial Strategy (BEIS).⁷⁶ The Fifth Carbon Budget was

⁷² Matthew Lockwood, ‘The Political Sustainability of Climate Policy: The Case of the UK Climate Change Act’, *Global Environmental Change* 23 (2013): 1339–1348, pp. 1340–1341.

⁷³ Andrew Sparrow, ‘Did Cameron Tell Aides to “Get Rid of All the Green Crap”?’ *The Guardian*, 21 November 2013.

⁷⁴ European Commission, ‘2030 Climate and Energy Framework’, https://climate.ec.europa.eu/eu-action/climate-strategies-targets/2030-climate-energy-framework_en.

⁷⁵ Climate Change Committee, ‘CCC Welcomes Climate Change Agreement’, 16 February 2015, www.theccc.org.uk/2015/02/16/ccc-welcomes-climate-change-agreement/.

⁷⁶ Ian Johnston, ‘Climate Change Department Closed by Theresa May in “Plain Stupid” and “Deeply Worrying” Move’, *The Independent*, 14 July 2016.

set at 57 per cent reduction on 1990 levels through 2028–2032, again, in line with the independent advice of the CCC. However, in its 2017 progress report, the CCC warned that neither the Fourth nor the Fifth Carbon Budgets would be met, as existing strategies and policy had been insufficient since 2015. By 2017, most of the success in reducing emissions had come from sharp reductions in the power and waste sectors but there was a critical lack of progress elsewhere: in agriculture, private housing (reductions in public and commercial buildings were deemed hardly to have begun), industry, transport and fluorinated gases (e.g., refrigerants). The CCC also warned that since much of the policy driving environmental improvements came from the European Union, Brexit would mean domestic replacements were urgently needed. It concluded that ‘by 2030, current plans would at best deliver around half of the required reduction in emissions, 100–170 MtCO₂e per year short of what is required by the carbon budgets’.⁷⁷

The 2017 Conservative manifesto, ‘Forward Together’, made no proposals on climate change and the first of its ‘Five Giant Challenges’ was to create a strong, high-growth economy.⁷⁸ It also pledged continued support for the oil and gas industries and for fracking, though fundamentally incompatible with the United Kingdom’s international commitments. In October 2017, the now minority Conservative government revealed a much-delayed Clean Growth Strategy, which promised to combine transition to a low-carbon economy with increased economic growth while insisting that ‘[e]very action to cut emissions must be taken while ensuring our economy remains competitive’.⁷⁹ The CCC concluded that ‘even taking account of the Strategy’s aspirations, a gap in meeting the fourth and fifth carbon budgets remains. Urgent policy development is therefore required’.⁸⁰

⁷⁷ Climate Change Committee, ‘2017 Report to Parliament: Meeting Carbon Budgets – Closing the Policy Gap’, 29 June 2017, Executive Summary.

⁷⁸ The Conservative and Unionist Party, ‘Forward Together: Our Plan for a Stronger Britain and a Prosperous Future’, Party Manifesto, 2017.

⁷⁹ HM Government, ‘The Clean Growth Strategy: Leading the Way to a Low Carbon Future’, October 2017, pp. 10, 43, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/700496/clean-growth-strategy-correction-april-2018.pdf.

⁸⁰ Climate Change Committee, ‘An Independent Assessment of the UK’s Clean Growth Strategy’, January 2018, p. 5, www.theccc.org.uk/wp-content/uploads/2018/01/CCC-Independent-Assessment-of-UKs-Clean-Growth-Strategy-2018.pdf.

When the Conservative government was supposed to develop the strategy further with ‘A Green Future: Our 25 Year Plan to Improve the Environment in 2018’, it spoke in Panglossian terms of development that produced ‘environmental net gains’ while ‘ensuring economic growth and reduced costs, complexity and delays for developers’.

Both May administrations in practice endeavoured to shut down key mitigation policies dating from the Climate Change Act. They also supported a massive expansion of UK aviation, as documented in ‘Aviation 2050: The Future of UK Aviation’.⁸¹ From 2019, the governments of Boris Johnson were more rhetorically green even as they threw climate policy more completely into reverse with support for a new coal mine, the issuance of new licences for oil and gas exploration, the halving of overseas aid, slashed incentives for electric cars, the closure of the green homes grant and support for airport expansion.⁸² By 2021 the CCC was trenchant in its criticism of his government’s inaction.⁸³

In sum, as the leaders of explicitly ‘modernising’ movements within their parties, both Blair and Cameron had squandered their opportunities to change the narrative. Instead, when faced with domestic political risks they had taken the path of least resistance as defined within the neoclassical paradigm. With the exception of the Camp 2 efforts of 2006–2010, what followed was a restoration of the Camp 1 conceptual framework. No British government has attempted to build a political consensus for a substantial, rapid and potentially hugely positive institutional and social transition towards a green political economy.⁸⁴ Two major programmes of climate action had

⁸¹ Department of Transport, ‘Aviation 2050: The Future of UK Aviation’, December 2018 (CM9714), www.assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/769695/aviation-2050-web.pdf.

⁸² Fiona Harvey, ‘Boris Johnson Told to Get Grip of UK Climate Strategy before COP 26’, *The Guardian*, 12 April 2021.

⁸³ Climate Change Committee, ‘2021 Progress Report to Parliament’, 24 June 2021, www.theccc.org.uk/publication/2021-progress-report-to-parliament/.

⁸⁴ The Grantham Institute, ‘Climate Change Communication: Taking a Leaf from the Brexit Book’, 10 June 2016, Grantham Institute, Imperial College, London, www.granthaminstitute.com/2016/06/10/taking-a-leaf-from-the-brexit-book-what-climate-change-communicators-can-learn-from-the-eu-referendum-campaigns/.

been established – the Climate Change Programme of 2000 and the Climate Change Act of 2008 – but both were fatally weakened by subsequent governments. As one senior policy analyst commented in the Grantham Centre’s ten-year review of the Climate Change Act, ‘the [Theresa May] government may support the Act, “but they got rid of almost all the policies designed to implement it”’.⁸⁵ If we run through the detail of UK climate policy, we see how the already narrowly conceived Climate Change Act was effectively overridden by the Camp 1 dogma of market rationality.

The Privileged Domain

The contradiction at the heart of neoliberal policy is that if economic actors were, in fact, rational in the face of future risk, we would not be where we are. The United Kingdom’s corporate and financial sectors have nonetheless been designated privileged domains, as predicted. There are no legal requirements for corporations to address long-term climate-related systemic risk, and their fiduciary duties remain around the maximisation of shareholder value. At the time of writing, the policy debate has been stalled between government, Parliament and the regulatory authorities on the question of whether climate-related financial risk *reporting* should remain voluntary or mandatory – codified or ad hoc.

The Companies Act 2006 and further 2013 regulations required the Directors’ Business Report of traded financial or non-financial firms to include the environment, but in reporting terms only. The report must include the main trends and factors likely to affect the future development, performance and position of the company’s business and information about (1) environmental matters (including the impact of the company’s business on the environment), (2) the company’s employees and (3) social and community issues.⁸⁶ Further 2013 regulations added greenhouse gas (GHG) emissions to this list. New regulations in 2016 added more environmental impact reporting for traded, banking and insurance companies, and 2018 additions introduced obligations to report on energy use in large unquoted companies and limited

⁸⁵ Fankhauser, Averchenkova and Finnegan, ‘Ten Years’, p. 26.

⁸⁶ Companies Act 2006, Section 417. www.legislation.gov.uk/ukpga/2006/46/section/417/2007-10-01?view=plain.

liability partnerships.⁸⁷ But no external verification is required around the quality of this reporting, and investors can respond as they choose.

In 2020, the law firm Client Earth reviewed the annual reports of the largest 250 companies listed on the Main Market of the London Stock Exchange and found that only 4 per cent made a clear reference to climate change-related factors in their financial accounts. Some 40 per cent of companies referred to climate among their principal risks and uncertainties, but only 31 per cent disclosed a target to reduce emissions. Despite improvements, the overall picture was of rising rhetorical attention, low clarity about strategies for change and a significant gap in accountability and enforcement.⁸⁸ These trends should be understood in the context of financialisation, discussed in Chapter 7, and they were also mirrored internationally.

At the international level a Financial Stability Board had been founded in 2009 in response to the Global Financial Crisis. It brought together senior policy makers from finance ministries, central banks and supervisory and regulatory authorities from the G20 countries plus Hong Kong, Singapore, Spain and Switzerland. Its remit was to 'promote global financial stability by coordinating the development of regulatory, supervisory and other financial sector policies'.⁸⁹ At the request of the G20 in 2015, the board established a private sector, industry-led Task Force on Climate-Related Financial Disclosures (TCFD), with a mandate to develop consistent, comparable, clear and reliable disclosures around climate-related financial risks for companies, which they did. However, despite several members fighting for mandatory rules, the resulting disclosure framework was voluntary. By 2018, only 15 per cent of Financial Times Stock Exchange (FTSE) companies reported in line with TCFD requirements and hydrocarbons were the standout sector: 100 per cent of FTSE 100 electricity, gas and oil companies were fully aligned with the TCFD recommendations.⁹⁰

⁸⁷ HM Government, 'Environmental Reporting Guidelines: Including Streamlined Energy and Reporting Guidelines', March 2019, p. 26, www.gov.uk/government/publications/environmental-reporting-guidelines-including-mandatory-greenhouse-gas-emissions-reporting-guidance.

⁸⁸ Client Earth, 'Accountability Emergency: A Review of UK Listed Companies Climate Change-Related Reporting (2019–2020)', February 2021, Executive Summary.

⁸⁹ Financial Stability Board, www.fsb.org.

⁹⁰ Eco-Act, 'The Sustainability Reporting Performance of the FTSE 100', 10th Annual Report, 23 September 2020, p. 18.

The most destructive companies on earth thus remained fully compliant with international best practice.

On the finance side there are no legal requirements on fund managers, sell-side researchers, credit rating agencies or investment consultants to review corporate disclosures around environmental risks or to advise their investors on the implications for their portfolios. The dominant culture of maximising the ratio of profit to investment (as distinct from thinking of the sustainability and potential of the combined assets) continued to dominate. By June 2021 the world's leading index fund, Blackrock, controlled assets under management of some \$9.5 trillion worldwide, or roughly equivalent to the entire global hedge fund, private equity fund and venture capital fund combined.⁹¹ The EMH had provided the rationale for passive funds, but their ecological record has been dismal, with a clear tendency to vote against shareholder resolutions for improved scenario planning and risk reporting.⁹² In 2021 Blackrock's CEO, Larry Fink, had made great play of declaring that CEOs should report how they would transform their businesses to become compatible with net zero,⁹³ but his fund retained \$85 billion worth of investment in coal companies a whole year after its January 2020 pledge to disinvest.⁹⁴ Blackrock's former head of sustainable investing-turned-whistle blower, Tariq Fancy, concluded in the same year that nothing would steer Wall Street from short-term profit maximisation at any cost until corporate carbon emissions were taxed.⁹⁵ In 2022 Blackrock announced it would reject most shareholder resolutions on climate change in the coming financial year on the basis that they had become too extreme or too prescriptive.⁹⁶

⁹¹ Robin Wigglesworth, 'The Ten Trillion Dollar Man: How Larry Fink Became the King of Wall Street', *Financial Times*, 7 October 2021.

⁹² Attracta Mooney, 'Blackrock and Vanguard's Climate Change Efforts Are Glacial', *Financial Times*, 15 October 2017.

⁹³ Larry Fink, 'Larry Fink's 2021 Letter to CEOs', www.blackrock.com/us/individual/2021-larry-fink-ceo-letter.

⁹⁴ Jasper Jolly, 'BlackRock Holds \$85 Billion in Coal Despite Pledge to Sell Fossil Fuel Shares', *The Guardian*, 31 January 2021.

⁹⁵ Andrew Brown, 'ESG Whistle-Blower Calls Out Wall Street Greenwashing', *New Economy Daily*, Bloomberg, 2 October 2021.

⁹⁶ Brooke Masters, 'Blackrock Warns It Will Vote against More Climate Resolutions This Year', *Financial Times*, 22 May 2022.

British investment funds in general ranked worst in Europe by 2017 for climate change impact and for assessing the investment risks of global warming,⁹⁷ a situation unlikely to improve as UK investors shifted towards the passive funds, led by Blackrock.⁹⁸ The EMH had assumed that competitive pressures forced all market participants to make optimal use of available information and update their expectations in the face of new evidence, but in practice it has been used to justify an emerging oligopoly of asset management firms that now leverage their exceptional market power to slow the climate transition. The upshot is a regime of asset control that cleaves ever more towards its Soviet shadow: a growing concentration of corporate control justified by a fiction of universal rationality. The Soviet system too had demanded enterprises exceed their annual targets regardless of their environmental impact, and that too had marched on, heedless of the devastation it caused.

When it became apparent that even pension funds were tending to ignore climate-related risks, the United Kingdom's Environmental Audit Committee ran an inquiry into Greening Finance. This concluded that the structural incentives for short-termism constituted a significant systemic risk and proposed that 'government should clarify in law that pension schemes and company directors have a duty to protect long-term value and should be considering environmental risks in the light of this'. In November 2018, the Conservative government refused the committee's recommendation to make climate risk disclosures mandatory and insisted on the sufficiency of corporate choice, though no environmental group agreed. On the contrary, those groups pointed out that given the multiple intermediaries down the asset chain, from asset owners, asset managers, asset consultants and legal advisors to accountants, at minimum the TCFD standards needed to be locked into legal contracts throughout that chain, a position agreed by the committee but, again, rejected by the government.⁹⁹ At the same time,

⁹⁷ Attracta Mooney, 'British Companies Rank Worst in Europe for Climate Change Impact', *Financial Times*, 15 November 2017.

⁹⁸ The Investment Association, 'Asset Management in the UK 2015–2016', The Investment Association Annual Survey, September 2016 and September 2018 editions.

⁹⁹ House of Commons Environmental Audit Committee, 'Greening Finance: Embedding Sustainability in Financial Decision Making', 23 May 2018 (HC 1063), p. 41, www.publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/1063/1063.pdf.

neither the Financial Reporting Council (responsible for the oversight of statutory audit) nor the Financial Conduct Authority (responsible for the oversight of corporate governance) has appeared willing to clampdown on failures to disclose information even within the weak existing rules. Recall that even the EMH insists that governments must enforce corporate informational transparency, but UK policy operates at sub-EMH standards when it comes to climate-related financial risk reporting. Moreover, the Camp 2 solution of a shift to mandatory and codified risk reporting remains a utopian solution. Though a positive step in itself, it is still an EMH conceit to believe that a reduction in the marginal cost of collecting information must cause market prices to adjust to reflect true asset values, and that all financial actors will respond accordingly.

Public Finance

When it comes to financing new technologies, the cost of borrowing tends to increase with the project's perceived riskiness, with the options for equity stakes in the firms involved, and the creditworthiness of the borrower. The more established the technologies, such as fossil fuels, the cheaper their finance.¹⁰⁰ Public financing is consequently vital for a green transition since states can borrow at the lowest interest rates of all. In UK policy, however, this fact was pushed aside by doctrine. Following hard on the heels of the Climate Change Act, the new Coalition government had acknowledged that green technologies played at a disadvantage and established a Green Investment Bank (GIB) with initial investment capital in 2012. From its launch, and for the duration of 2015–2016, the GIB was wholly publicly owned. Its remit was to aid investment in green infrastructure, mobilise private sector capital and support projects that would otherwise lack funding. By 2015 the GIB had invested £2.3 billion of public money into sixty projects with a total value of over £10 billion.¹⁰¹

In line with Camp 1 reasoning, however, the next Conservative government announced the GIB's privatisation, in June 2015. The business

¹⁰⁰ Stern, *Why Are We Waiting?*, p. 66.

¹⁰¹ House of Commons Environmental Audit Committee, 'The Future of the Green Investment Bank', 16 December 2015 (HC 536), p. 4, www.publications.parliament.uk/pa/cm201516/cmselect/cmenvaud/536/536.pdf.

secretary, Sajid Javid, argued that privatisation would provide better access to capital, though the inadequacy of private finance was the reason the bank had been created. The Environmental Audit Committee ran an inquiry into whether privatisation could deliver improvements, only to conclude that more capital could have been achieved by public sector borrowing and that the privatisation was happening ‘without due transparency, publication of relevant evidence, consultation or proper consideration of alternatives’. The inquiry also noted that once privatised, the bank would invest in areas that would undermine its role.¹⁰² The government also ignored warnings that the preferred bidder, Macquarie Group Limited, would asset-strip the GIB, and the bank was sold to Macquarie in August 2017.

The sale was part of a wider £20 billion privatisation drive that included stakes in Lloyds Banking Group and Bradford & Bingley and the government’s largest-ever sale of student loans.¹⁰³ The government insisted the GIB sale made ‘£186 million profit for the taxpayer’, but this was a short-term saving in the context of a structural shortfall in investment for the energy transition and the imminent Brexit-induced loss of European Investment Bank support for renewables. Although another function of a public investment bank is to lower the risk premium on private capital by signalling a long-term policy commitment, the GIB sale did the opposite. Macquarie immediately declared its plans to offload some of the bank’s early stage green investments in deals approaching £230 million in the first instance.¹⁰⁴ The National Audit Office concluded that the sale price was too low and that while officials had secured some commitments from Macquarie to continue its green goals these were not legally binding.¹⁰⁵

The approach to green public finance found little improvement after Brexit. In 2021 Chancellor Rishi Sunak announced the creation of a new National Infrastructure Bank that would invest significantly less per year than the European Investment Bank had done. On a more positive note, the first post-Brexit budget also established a new mandate

¹⁰² *Ibid.*, p. 3.

¹⁰³ Gill Plimmer and Jim Pickard, ‘Green Investment Bank Sold to Australia’s Macquarie for £2.3 Bn’, *Financial Times*, 20 April 2017.

¹⁰⁴ Ben Martin, ‘Macquarie Denies Asset Stripping Plan as It Buys Green Investment Bank for £2.3 Billion’, *The Telegraph*, 20 April 2017.

¹⁰⁵ Adam Vaughan, ‘Green Investment Bank Sold Too Cheaply, Watchdog Says’, *The Guardian*, 12 December 2017.

for the Bank of England that said monetary policy must ‘reflect the importance of environmental sustainability and the transition to net zero’. The measure was likely to alter the bank’s asset purchases and foster market creation in keeping with Camp 2 reasoning. The 2021 budget also promised a £15 billion green gilt issue, where the money raised from the bonds would be earmarked for green investments, although the functionality of this measure would depend on the money going to wholly green investment and on the repayment of the bonds coming from profits from green activities. Sunak also declared a new green saving instrument on National Savings and Investments, though there was no detail on how those funds would be spent.¹⁰⁶

These measures were the sum of Sunak’s strategy, however, and this budget confirmed his rejection of more direct state intervention in favour of financial market stimuli. Here was a Camp 2 nudge to help the City of London develop as a centre for green investment but within the assumption of the privileged domain, and with no limits on ‘dirty’ finance. Just weeks before the government was to host, and hence supposedly lead, the COP26 climate summit, Sunak’s 2021 October budget *reduced* air passenger duty on domestic flights and froze fuel duty for the twelfth year in a row, while making no mention at all of the climate crisis. The investment stimulus was welcome but wholly inadequate to the emergency at hand. To draw a Conservative analogy, it was as if Winston Churchill had assessed the looming threat of invasion in July 1940 and resolved to organise a limited stimulus to the market for Spitfires.

Forecasting, Carbon Budgets and the Rise of Procedural Formalism

It is worth reiterating that forecasting models per se can be helpful in scenario planning and even monitoring, when used in an ecumenical way. Where models involve long-range, contingent factors with poorly understood inter-relationships, however, like the feedback loops from climate change, they offer governments a dangerous illusion of prediction and control. Hence it matters how forecasts are used and whether they are allowed to morph into the main basis of policymaking.

¹⁰⁶ Joshua Oliver, ‘UK Plans One of Europe’s Biggest Green Bond Issuance Programmes’, *Financial Times*, 3 March 2021.

The CCC has used updated IAMs for its major assessments, but it has always highlighted their limitations, and their model-derived documents are peppered with caveats around the incomplete nature of the estimates and the inability of models to capture potentially important non-linear shifts in climate or their compound effects.¹⁰⁷ The committee's five UK carbon budgets are similarly upfront about the contingency of projecting forward to likely carbon prices and emissions pathways and any 'cost effective' path forward. The CCC consistently uses IAMs but highlights the precautionary strategies that ought to be taken. The fact remains, however, that by choosing carbon budgets and their internal economic forecasting as the core strategic instrument, and by seeking to achieve those budgets through market-making or market-imitating strategies, UK governments have used a governmental toolkit that makes sense only in a stable, closed-system world to solve the unprecedented collapse of biological systems.

The real politics of climate policy could be hidden from the start via the accounting system used in the carbon budgets themselves. The United Kingdom's carbon budget targets, and hence the pace of decarbonisation, have been reduced by limiting its formal, as distinct from its actual, liabilities via discrete accounting decisions decided in the Paris Agreement. Paris decided that countries should account for the emissions produced on their territory. But the United Kingdom's consumption footprint is larger than its territorial footprint, and the result is a reduction pathway that systematically underestimates its real responsibilities. The use of production rather than consumption accounting means, for example, that we have poor accounting for the United Kingdom's proportion of international shipping and aviation, but we also exclude imported products, including clothing, electronics and processed foods. Thus, by 2017, some 46 per cent its consumption footprint remained uncounted for,¹⁰⁸ and government rejected the CCC's repeated calls for shipping and aviation, with their heavy footprints, to be included.

Even before the Conservative governments started to actively reverse many climate policies, DECC's own probabilistic measures admitted that existing strategies under the Climate Change Act offered

¹⁰⁷ Climate Change Committee, 'UK Climate Action Following the Paris Agreement', 13 October 2016, www.theccc.org.uk/publication/uk-action-following-paris/.

¹⁰⁸ Climate Change Committee, 'Sixth Carbon Budget', 9 December 2020, p. 345, www.theccc.org.uk/publication/sixth-carbon-budget/.

a 63 per cent chance of *exceeding* 2°C.¹⁰⁹ By 2020 this meant that the UK government emissions pathway awarded itself a carbon budget at least a factor of two greater than its fair contribution to deliver on its Paris commitments.¹¹⁰ As we shall see, the targets rendered too low by the accounting system were then pursued through largely market-imitating price and quota-based measures,¹¹¹ alongside the privileged domain norms in regard to the corporate and financial sectors.

Risk Assessment

The Climate Change Act addressed not just emissions reduction – mitigation – but also resilience – adaptation. It did this by prescribing continuous adaptation planning to accommodate the fact that unforeseen impacts would materialise over time. The Act had mandated a rolling five-year Climate Change Risk Assessment (CCRA). Government submitted the first UK CCRA to Parliament in January 2012, and it exemplified the problems with this process in this context. As the CCRA’s consultants noted of their own literature survey, the gaps in evidence were huge, which included identification of potential threshold effects, the limits of adaptation and hence lack of knowledge about real points of vulnerability, effects not scoped and many more not quantified. They noted considerable uncertainty around the risks and impacts that were quantified and challenges on the definitions of baselines, and around the nature and timing of the impacts. The list went on, all the way to the standard observation that different methods would produce different results.¹¹² The dependence on past data also meant conservatism was baked in. The exercise was further hampered

¹⁰⁹ House of Commons Environmental Audit Committee, ‘Progress on Carbon Budgets’, 8 October 2013 (HC 60), p. 8, www.publications.parliament.uk/pa/cm201314/cmselect/cmenvaud/60/60.pdf.

¹¹⁰ Kevin Anderson, John F. Broderick and Isak Stoddard, ‘A Factor of Two: How the Mitigation Plans of “Climate Progressive” Nations Fall Far Short of Paris-Compliant Pathways’, *Climate Policy* 20 (10) (2020): 1290–1304.

¹¹¹ Samuel Fankhauser, Cameron Hepburn and Jisung Park, ‘Combining Multiple Climate Policy Instruments: How Not to Do It’, Grantham Research Institute on Climate Change and the Environment, Working Paper Number 38, February 2011, p. 4.

¹¹² Paul Watkiss, Alistair Hunt and Lisa Horrocks, ‘Literature Review for Scoping Study’, Defra Contract GA0208, Metroeconomica AEA Group and Paul Watkiss Associates, 2009, p. 10.

by spending cuts. Discontinuity at the Department for Environment, Food and Rural Affairs (DEFRA), the lead department, was caused by severe budget cuts to the adaptation team. Adaptation Sub-committee membership was also cut back.¹¹³

In 2014 the Coalition government commissioned the Adaptation Sub-committee to lead CCRA2, presented in January 2017. CCRA2 was designed to escape the worst flaws of CCRA1, not least those imposed by the rigid adherence to modelling requirements at the cost of information. CCRA2 limited itself to the academic literature and expertise instead of creating new ‘response functions’ for each risk or opportunity, previously outsourced at great expense to private consultancies.¹¹⁴ The second report had made the uncertainty involved explicit and showed how experts made judgement calls. The operating assumptions in CCRA1 had driven its outcomes and cost £3.2 million. The more intellectually honest CCRA2 cost £650,000.¹¹⁵ The CCRA was thus improved, but its authors still warned it was ‘not designed to act as a basis for making decisions on specific policies or practices to manage the risks or opportunities described here’. In other words, the need for political leadership and precautionary government action remained.

In their review of the 2008 Climate Change Act, the LSE’s Grantham Institute noted how, when it came to adaptation, the Act had focused on processes for monitoring adaptation but set no requirements that the risks themselves be reduced. Ten years on, the Institute struggled to identify any concrete area of adaptation action (as distinct from mitigation) driven by the Act, even for already intensifying events such as flooding.¹¹⁶ Here was Power’s ‘empty formalism’, as the Adaptation Sub-committee chair, Lord Krebs, warned, as he stood down in 2017.¹¹⁷

¹¹³ Fankhauser, Averchenkova and Finnegan, ‘Ten Years’, pp. 28–29.

¹¹⁴ The Climate Change Committee, ‘2017 UK Climate Change Risk Assessment: Synthesis Report – Priorities for the Next Five Years’, July 2016, www.theccc.org.uk/wp-content/uploads/2016/07/UK-CCRA-2017-Synthesis-Report-Committee-on-Climate-Change.pdf.

¹¹⁵ Rachel Warren, Robert Wilby, Kathryn Brown et al., ‘Advancing National Climate Change Risk Assessment to Deliver National Adaptation Plans’, *Philosophical Transactions*, 28 (June 2018): 1–19, Section 4: Discussion.

¹¹⁶ Fankhauser, Averchenkova and Finnegan, ‘Ten Years’, p. 29.

¹¹⁷ Lord Krebs, ‘Lord Krebs Letter to Rt Hon Andrea Leadsom’, 24 January 2017, www.theccc.org.uk/publication/letter-lord-krebs-writes-to-the-rt-hon-andrea-leadsom-as-he-steps-down-as-asc-chair/.

Market-Making and Competitiveness

The introduction to CCRA3 in 2022 stated that '[c]limate change is happening now', but you would scarcely detect this from the evolution of UK policy.¹¹⁸ Camp 2 neoclassical thought recommends that insofar as the state acts, it should intervene to resolve specific market failures and ideally in a 'market-friendly' form. The flaws in this way of thinking range from the anti-investment bias that comes with the typically narrow interpretation of competitiveness as short-term cost reduction to the implicit assumption that no new market failures will emerge within the new market or 'market-like' architecture supposed to resolve the failures identified.

New Labour policies had tended to follow Camp 2 theory: the difficulties renewables had faced to break through in energy markets were treated with targeted, market-making remedies such as quota-setting within new regulatory frameworks. Labour governments nevertheless proved unwilling to intervene in any ways that could be seen as restrictive of existing businesses, for example in agriculture, aviation or, as it turned out, fossil fuels. Under the Coalition and the Conservative majority governments that followed, the United Kingdom has seen a more complete shift towards the reduction of any short-term financial costs to business as the overriding concern. This is in line with the standard neoclassical assumption that state-imposed costs represent a distortion of prices that would otherwise tend towards competitive equilibrium, as if the costs to business from increasing environmental breakdown will not be terminal. If we walk through the key dimensions of policy, we can see how this has played out.

Regulation

Ministers have required a justificatory 'business case' for regulation ever since the advent of New Public Management, and to construct these cases officials use Treasury guidelines rooted in neoclassical theory. With the return of Camp 1 economic policy after 2010 one of its most dogmatic applications arose in the form of the One In, One

¹¹⁸ HM Government, 'UK Climate Change Risk Assessment 2022', 17 January 2022, p. 3, www.assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1047003/climate-change-risk-assessment-2022.pdf.

Out, or ‘OIOO’, rule introduced by the Department for Business, Education and Skills (BEIS) under the Coalition in 2011. OIOO was based on the Treasury Green Book and the Impact Assessment Toolkit. The grounds for OIOO decisions were impact assessments rooted in cost–benefit analysis. The premise of the new OIOO methodology was simple, and it applied to *all* central government departments and all executive agencies. The objectives of the new rule were, and I quote, to:

- Bear down on the cost and volume of regulation in the economy.
- Encourage departments to implement regulation only as a last resort, having first considered the use of non-regulatory alternatives.

Key principles for this new methodology were as follows:

- The initial scope of OIOO includes any new UK legislation that imposes a direct annual net cost on business or civil society organisations (IN).
- For any direct net cost imposed on business and civil society organisations, departments must identify and remove existing regulations with an equivalent value (OUT).
- Departments will be asked to identify compensatory OUTs at the same time that INs are cleared by the Reducing Regulation Sub-committee.

Measures for which OUTs have not been identified will normally be delayed:

- To ensure the smooth operation of the OIOO rule, officials need to think about identifying OUTs early in the policymaking process.
- Departments will be required to report on direct net costs to business and civil society organisations.¹¹⁹

OIOO was too technical to make headlines, but it reduced the state’s capacity to intervene where social or environmental harms needed consideration above those of short-term business gain. There were exceptions: taxes, including environmental taxes, were out of scope, as were the results of court or tribunal decisions. In all other areas,

¹¹⁹ Department for Business, Innovation and Skills, ‘One-In, One Out Methodology’, July 2011, (URN 11/761), p. 3, www.regulation.org.uk/library/2011_oioo_methodology.pdf.

however, the rule put an immediate chill on the government's ability to manage the deepening ecological crisis.

Lorenzo Marvulli was an academic participant observer in DEFRA through 2010–2011 and witnessed how, under OIOO, the Equivalent Annual Net Cost to Business became the decisive factor in policy debate. Treasury guidance was there to help the department's economists decide how to monetise factors that lacked a market price, but the result was a deepening tension between policy officers with sectoral knowledge, their economic advisors and the economists of the new, pan-departmental, Regulatory Policy Committee whose job, according to a senior officer, was to 'thwart and delay regulation'. Whereas policymaking debates prior to OIOO had focused on the wider consequences of government action, DEFRA's policy officers now found environmentally related initiatives 'side-lined, delayed or simply abandoned on the basis of economic considerations'. To illustrate, Marvulli describes a discussion about how to manage the United Kingdom's increasing water scarcity. Though the chair had noted the water market suffered 'imperfections', the economists rejected state intervention because of the unclear financial incentives for utility companies to buy into the problem. The result – and recall the financialisation of utility firms discussed in Chapter 5 – was that the utilities should be encouraged 'to think about it'.¹²⁰

By 2012 the policy was strengthened to One In, Two Out. Thereafter, no new regulation could be introduced without the prior removal of two calculated to operate at twice the costs to business. The government also placed a 'marketing freeze' on all advertising, sponsorship or information campaigns. This halted DEFRA's information campaigns around environmental sustainability. Under a new 'Red Tape Challenge', policy officers learned that the requirement was 'to consider regulatory policy options only as last resort'.¹²¹ BEIS had effectively foreclosed environmental action by a pan-governmental methodological rule that only made sense in Camp 1 terms. But, by 2014, those departments ranked highest for stripping out regulation

¹²⁰ Lorenzo Marvulli, 'Towards Sustainable Consumption: An Ethnographic Study of Knowledge Work and Organizational Action in Public Policy Development and Implementation', doctoral thesis, University of Cardiff, 2017, pp. 210–216.

¹²¹ *Ibid.*, p. 314.

by cost to business were the Department for Work and Pensions and the Department of Energy and Climate Change. DEFRA came fifth.¹²²

Marvulli's study is a testament to the mindless rigidity of 'governance by numbers'¹²³ – as if the only role of government was to sustain cost competition within some hypothesised competitive equilibrium, a theory conceived in purely logical, as distinct from historical, time,¹²⁴ let alone the living environment. To conceive of competitive production as maximum output from a given input with no distortionary 'regulatory' costs ignores the challenge of how to sustain those inputs in an era of ecological collapse. In 2016 Secretary of State for Business Savid Javid raised the 'better regulation' rule to 'One in, Three Out' (OITO). Under OITO, new regulations could not be submitted until three were removed of equal financial impact, and arguments about the benefits of the regulation could no longer be submitted as a trade-off in the justification process. By 2016 the methodology concerned costs alone, and costs were taken to include policy costs (e.g., arising from compliance), one-off costs (e.g., staff training), financial costs (e.g., new taxes) and administrative costs (e.g., book-keeping).¹²⁵ In the wake of the Grenfell Tower disaster, 700 organisations signed a letter to the prime minister that said OITO had played a central part in that wholly avoidable tragedy. At the time of writing, the policy still prohibits the development of regulation around the climate crisis that cannot be shown to actively promote short-term business financial gain.

Taxes and Levies

Rather than a direct, steadily rising carbon tax or carbon price floor, New Labour preferred to design consumption taxes and levies as a

¹²² Department for Business, Innovation and Skills, 'The Ninth Statement of New Regulation: Better Regulation Executive', December 2014, Table 3, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/397237/bis-14-p96b-ninth-statement-of-new-regulations-better-regulation-executive.pdf.

¹²³ Alain Supiot, *Governance by Numbers: The Making of a Legal Model of Allegiance*, translated by Saskia Brown (Oxford: Hart Publishing, 2017).

¹²⁴ Joan Robinson, 'Time in Economic Theory', *KYKLOS* 33 (1980): 219–229.

¹²⁵ Report by the Comptroller and Auditor General, 'The Business Impact Target: Cutting the Cost of Regulation', 27 June 2016, www.nao.org.uk/wp-content/uploads/2016/06/The-Business-Impact-Target-cutting-the-cost-of-regulation.pdf.

form of price-signalling to encourage presumptively rational and fully informed firms and households to adjust their behaviour accordingly.¹²⁶ But, as discussed in Chapter 7, Camp 1 doctrine understands taxes as anti-competitive within a *given* set of endowments, particularly in tradeable sectors such as manufacturing. As a result, the few environmental taxes put in place following the Climate Change Act have been steadily reduced by Camp 1 Conservative chancellors since 2010. The first New Labour government had announced a Climate Change Levy (CCL) in 1999. As David Pearce explains, the CCL was effectively an indirect, single-stage sales tax on energy consumption and it was levied on industry, including agriculture and the public sector. It used the tax system to alter the price signal to industry, and households were formally exempted because of Labour's concerns about regressive taxation, not to mention the political backlash that had greeted the previous Conservative government's addition of value-added tax to household energy bills. The levy thus applied to all non-household use of coal, gas electricity and non-transport liquefied petroleum gas.

In a sophisticated design, revenues from the CCL were significantly recycled back to CCL-paying industries as reductions in employer contributions to social security taxation so you could discourage hydrocarbon energy while encouraging employment.¹²⁷ A portion of revenues was also used to subsidise energy efficiency schemes coordinated through the new Carbon Trust – a mentor organisation to help organisations adjust. Energy-intensive industries could gain an 80 per cent discount on the CCL if they took efficiency measures to achieve targets based on government criteria, namely Climate Change Agreements (CCAs).¹²⁸ Businesses that failed to achieve their agreed targets would lose their tax discount.

What ensued was a discrete but substantial weakening of the CCL. Policy-defeating concessions were present from the start. In contrast to a pure carbon tax there was no differentiated price between coal

¹²⁶ Alex Bowen and James Rudge, 'Climate Change Policy in the United Kingdom', Centre for Climate Change, Economics and Policy, Policy Paper, August 2011, pp. 16–17.

¹²⁷ David Pearce, 'The Political Economy of an Energy Tax: The United Kingdom's Climate Change Levy', *Energy Economics* 28 (2006): 149–158, pp. 152–157.

¹²⁸ Stephen McGinness and Grahame Danby, 'The Climate Change Levy', House of Commons Research Paper, 99/93, 24 November 1999.

and gas because of concerns about the ongoing viability of the UK coal industry.¹²⁹ Confronted with opposition from the energy-intensive industries, Labour governments kept CCL rates flat through 2001 to 2007.¹³⁰ The 2007 National Audit Office report on the levy and agreements noted that both were designed to encourage energy efficiency rather than reduce absolute emissions. It also noted the formal constraint that ‘carbon savings should be promoted without harming competitiveness’. The National Audit Office observed that industry had influenced the design of the CCAs and that the ‘targets have been flexed by various means which reduce the effectiveness of Agreements in terms of cutting absolute emissions’.¹³¹ Government, in other words, had designed a complex policy on the basis that indirectly taxing consumption rather than directly taxing carbon production would educate rational consumers and then retreated when that policy was gamed.

The CCL was finally allowed to rise gradually when Gordon Brown became the prime minister, under the 2010–2015 Coalition. By 2015, however, a new Conservative government was in power and in that summer’s budget Osborne removed CCL exemptions from renewable electricity with less than a month’s notice, creating a shock in the investment market for UK renewables. The move ended the effective tax exemption for organisations that turned to renewables and left few tax incentives for industry to make a forward-thinking choice.¹³² Levy rates were raised in the 2016 budget, but the discount rates available to carbon-intensive industries were also increased, protecting them from the higher rates. In 2017 the CCL rate was set to increase only in line with the Retail Price Index.

Where the CCL had specifically targeted industry and agriculture, further schemes following the Climate Change Act had also been ‘levy funded’ to encourage the development of low carbon energy sources. Under these various schemes, government obliged energy suppliers to

¹²⁹ Pearce, ‘The Political Economy’, p. 154

¹³⁰ Environmental Audit Committee, ‘Reducing Carbon Emissions from UK Business: The Role of the Climate Change Levy and Climate Change Agreements’, 10 March 2008 (HC 354), p. 12, www.publications.parliament.uk/pa/cm200708/cmselect/cmenvaud/354/354.pdf.

¹³¹ National Audit Office, ‘Review for Environmental Audit Committee: The Climate Change Levy and Climate Change Agreements’, 1 August 2007, p. 6, www.nao.org.uk/wp-content/uploads/2012/11/climate_change_review.pdf.

¹³² Pilita Clark, ‘Summer Budget: End of Climate Levy Relief Undermines Drax Shares’, *Financial Times*, 8 July 2015.

increase their renewable energy sources and cover the upfront costs. They could then claw back those costs from customers: the ‘levy’ in question.

When Osborne became the Coalition chancellor in 2010, however, his Treasury created a Levy Control Framework (LCF) to set a cap on those costs. The LCF required the governing department – DECC, later BEIS – to take early action to reduce costs if *forecasts* exceeded this cap, with urgent action required if forecasts exceeded a 20 per cent ‘headroom’ above the cap. If the concern was to reduce consumer costs, the LCF was incoherent. It neither monitored nor capped the full range of levy costs, which included the Warm Home Discount, the Energy Company Obligation for energy efficiency and the Capacity Market (largely a subsidy to fossil fuel technology).¹³³ Nuclear funding also appeared to have its own, far from transparent, funding pot, despite its massive expense.¹³⁴

As it turned out, the LCF forecasts were also badly ‘off’, though for reasons that remained unclear because of the Treasury’s coyness around their methodology.¹³⁵ In early 2015 the DECC had predicted that costs in 2020–2021 would be £500 million beneath the cap, but by June 2015 the department projected costs to be £1.5 billion over the cap: a £2 billion swing.¹³⁶ The LCF thus forced DECC to make abrupt changes to the levy-supported schemes to cut costs: a huge policy decision effectively forced by a methodological rule. The Renewables Obligation relating to onshore wind and solar photovoltaic projects was closed a year early. DECC also removed guaranteed rates of support for certain solar photovoltaic cells, biomass co-firing and biomass conversions stations,¹³⁷ and it imposed new limits on the amount of renewable electricity feed-in tariffs would support by setting a lower tariff. In November 2015 the

¹³³ House of Commons Energy and Climate Change Committee, ‘Investor Confidence in the UK Energy Sector’, 23 February 2016 (HC 542), p. 24, www.publications.parliament.uk/pa/cm201516/cmselect/cmenergy/542/542.pdf.

¹³⁴ Emily Cox, Phil Johnstone and Andy Stirling, ‘Understanding the Intensity of UK Policy Commitments to Nuclear Power’, SPRU Working Paper Series, 2016–16.

¹³⁵ Report by the Comptroller and Auditor General, ‘Controlling the Consumer-Funded Costs of Energy Policies: The Levy Control Framework’, 18 October 2016 (HC 725), p. 10, www.nao.org.uk/wp-content/uploads/2016/10/Controlling-the-consumer-funded-costs-of-energy-policies-The-Levy-Control-Framework-1.pdf.

¹³⁶ *Ibid.*, p. 8.

¹³⁷ Matthew Lockwood, ‘The UK’s Levy Control Framework for Renewable Electricity Support: Effects and Significance’, *Energy Policy* 97 (2016): 193–201, p. 196.

government cancelled its £1 billion competition for carbon capture and storage technology only six months before it was due, which was an urgent priority according to the CCC and a 2015 Conservative manifesto pledge.¹³⁸ In the meantime, ministers had begun to fast-track fracking in the midst of this 90 per cent cut of the subsidy for solar installation.¹³⁹ Between 2015 and 2016 the UK position on the Renewable Energy Country Attractiveness Index duly fell from eighth to thirteenth. The ‘big six’ top energy suppliers, the UK energy industry’s trade association, renewable energy trade organisations, energy market analysts, opposition MPs and the National Audit Office all called for greater transparency around the LCF and its assumptions, but to no avail.¹⁴⁰

In November 2015, more of the burden of paying for framework schemes was shifted onto consumers to make the energy-intensive industry exempt from some costs, a decision expected to add £5 to the average household bill from 2017–2018 onwards, and to void the short-term savings achieved by the cuts.¹⁴¹ The climate and cost perversity of the decision was picked up by the National Audit Office, which pointed out that the low carbon support schemes under the framework would have reduced energy costs and that the government’s own internal forecasts showed average annual energy bills had fallen by £268 in under two years.¹⁴²

The CCC noted that even if there was overspend this was proof of greater deployment of renewables within an urgent strategy for the deployment of renewables. As it was, the cuts created a stop–start investment profile that hindered cost reduction and industry development, undermined investor confidence, increased the cost of low carbon generation and thwarted essential projects.¹⁴³ The LCF had

¹³⁸ Damian Carrington, ‘UK Cancels Pioneering £1Billion Carbon Capture and Storage Competition’, *The Guardian*, 25 November 2015.

¹³⁹ Damian Carrington, ‘UK Government Is Going into Reverse on Clean Energy, Says Former Environment Agency Head’, *The Guardian*, 15 December 2015.

¹⁴⁰ Simon Evans, ‘Levy Control Framework: The Unanswered Questions’, *Carbon Brief*, 25 January 2016.

¹⁴¹ Comptroller and Auditor General, ‘Controlling the Consumer-Funded Costs’, HC 725, p. 29.

¹⁴² *Ibid.*, p. 9

¹⁴³ Climate Change Committee, ‘Budget Management and Funding for Low-Carbon Electricity Generation’, Briefing Note, 14 September 2015, www.theccc.org.uk/publication/technical-note-budget-management-and-funding-for-low-carbon-electricity-generation/.

also shifted the control of a DECC policy to the Treasury. In so doing it switched the policy driver from the fulfilment of the carbon budgets to the satisfaction of Osborne's fiscal hawkishness,¹⁴⁴ with the result, according to the chair of the Energy and Climate Change Committee, that DECC had become 'pennywise and pound-foolish for today. They see all investment today as costs and that's a huge problem'.¹⁴⁵ It is also, of course, a pure expression of Camp 1 reasoning. The CCC concluded that damage to investor confidence could be limited if the LCF into the 2020s was clarified as soon as possible.¹⁴⁶ Instead, in the 2017 autumn budget, Osborne's successor Philip Hammond announced there would be no new low carbon electricity levies until 2025 beyond the money already committed. A later document said new levies would be considered only once the total cost of support was falling.¹⁴⁷

Seen in total, environmental tax revenue as a percentage of total tax and social contributions peaked in 1998.¹⁴⁸ There has been no greening of the tax regime, and the impulse towards it spurred by the Climate Change Act was actively reversed under Conservative chancellors from 2010 to the time of writing.¹⁴⁹ As shadow chancellor, Osborne had made great play of deploring the Treasury's historical position on climate change as 'at best indifferent, and at worst obstructive' and promised that '[u]nder a Conservative Government the Treasury will no longer be the cuckoo in the nest'.¹⁵⁰ By 2015 he had promised to review the environmental taxes faced by businesses and an explicit end to the 2010 manifesto commitment to increase environmental taxes' share of government revenue.¹⁵¹

¹⁴⁴ Lockwood, 'The UK's Levy Control Framework', p. 199.

¹⁴⁵ Evans, 'Levy Control Framework'.

¹⁴⁶ Climate Change Committee, 'Budget Management'.

¹⁴⁷ Carbon Brief, 'Autumn Budget 2017: Key Climate and Energy Announcements', Carbon Brief, 22 November 2017.

¹⁴⁸ Office for National Statistics, 'Environmental Taxes 2014', www.ons.gov.uk/economy/environmentalaccounts/articles/environmentaltaxes/2015-06-01/relateddata.

¹⁴⁹ Treasury Committee, 'Fuel Duty Fiction Clouds Fiscal Forecasts', 23 January 2023, <https://committees.parliament.uk/committee/158/treasury-committee/news/175536/treasury-committee-fuel-duty-fiction-clouds-fiscal-forecasts/>.

¹⁵⁰ George Osborne, 'A Sustainable Government, a Sustainable Economy', Speech at Imperial College, London, 24 November 2009.

¹⁵¹ Simon Evans, 'Budget 2015: Key Climate and Energy Announcements', Carbon Brief, 8 July 2015.

There isn't space here to consider the European Union's Emissions Trading Scheme (ETS) in full, but should you explore it you would find another example of how neoliberal doctrine promotes a dysfunctional theatre of markets, and the EU ETS has consequently been revised multiple times. Briefly, the goal in Camp 2 neoclassical terms was to get corporations to stop thinking of GHG emissions as a cost-free 'externality'. The European Union duly established the ETS in 2005 as part of the memberships' commitments to the Kyoto protocols and it became the European Union's flagship climate change adjustment measure. At the time of writing, the scheme covers around 11,000 power stations, manufacturing plants and aviation activities in the EU member states and the European Economic Area. Around 41 per cent of total EU GHG emissions are regulated by the EU ETS. The scheme works by putting a limit on overall emissions from covered installations: a limit reduced each year by a percentage that has risen as the EU revised its targets upwards. Within this limit, companies can buy and sell emission allowances as needed.¹⁵²

Where a predictably escalating carbon tax would have made the rising costs of non-adjustment clear and left firms to decide how much to use and pay each year, the effectiveness of cap and trade depended on the trading element being an efficient market mechanism for raising the price of carbon. By establishing supply and demand for emissions allowances the ETS was supposed to establish an efficient market price for GHG emissions. This would incentivise companies to invest in low carbon technologies, reduce emissions and sell on their allowances to larger emitters, the cap ensuring an aggregate improvement.¹⁵³

Planning the allowances was always going to be hard, however, as well as paradoxical for 'a market', but like public sector outsourcing, it was justified by the model-based illusion that states would set up the market game and then take no interest in how it played out. In practice, the ETS established tradeable allowances under governments convinced by the neoliberal doctrine that restrictive allowances put their companies at a competitive disadvantage, though mutual restriction was precisely the point. 'Cost effectiveness' duly became

¹⁵² European Commission, 'The EU Emissions Trading System', https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets_en.

¹⁵³ David Hirst, 'Carbon Price Floor (CPF) and the Price Support Mechanism', House of Commons Briefing Paper, Number 05927, 8 January 2018.

a euphemism for rigging the market for allowances to avoid action altogether, and there were further problems with financial fraud.¹⁵⁴ The market-imitating mechanism proved no less political than the tax would have been, just less transparent, and it was only as the scale of the climate emergency started to sink in, and the European Union committed to reduce allowances between 2019 and 2023, that the carbon price started to rise through 2018. Up until this point, however, and through a policy that proved more bureaucratic than a tax, Europe witnessed a dash for coal, with Germany being the standout case.¹⁵⁵ In effect, the government failure in the new carbon trading quasi-market to solve the market failure in wider markets all historically co-constructed by states encouraged investment in high carbon production until re-regulation forced up the price, as if government must constantly surprise itself by its own non-neoclassical behaviour in frameworks that require it.

How did carbon pricing play out in the United Kingdom in this context? The persistent failures of the EU ETS had prompted the United Kingdom's Conservative–Liberal Coalition, still in its initial flush of activism, to announce the introduction of a carbon price floor (CPF) from 1 April 2013 in its 2011 budget. The CPF was meant to rise every year until 2020 to reach a price of £30/tCO₂, but this commitment lasted a year, reversed by lobbying from the Confederation of British Industry and the Engineering Employers Federation. In the 2014 budget, Osborne capped the CPF component at a maximum of £18/tCO₂ from 2016 to 2020 on the basis that raising the minimum price floor disadvantaged UK businesses because of their comparatively higher energy bills. The freeze was extended to 2025 in the 2017 Conservative budget, with no commitments to adjust it if the EU ETS price changed and with no plans for carbon pricing post-Brexit.¹⁵⁶

¹⁵⁴ Tim Laing, Misato Sato, Michael Grubb and Claudia Comberti, 'Assessing the Effectiveness of the EU's Emissions Trading Scheme', Grantham Research Institute on Climate Change and the Environment, Working Paper, Number 106, 2013.

¹⁵⁵ Dieter Helm, 'Energy and Climate Policy after Brexit', Energy Futures Network, Paper 21, 10 October 2016, p. 3.

¹⁵⁶ Bob Ward, 'Treasury Freeze of Carbon Price Support Rate Could "Endanger" UK 2030 Emissions Targets – Response to Autumn Budget Announcement', Grantham Research Institute on Climate Change and the Environment, LSE, Press Release, 22 November 2017.

Government Spending

Published UK government spending data is split into Environmental Protection and a fluid category under the broad theme of ‘decarbonisation’. Environmental Protection Expenditure (EPE) is relatively transparent and includes all activities whose main purpose is the prevention, reduction and elimination of pollution or any other degradation of the environment, such as sewerage, waste management and treatment of exhaust gases and protection of natural landscapes. UK EPE as a percentage of total government spending has stayed essentially unchanged since 2000 and ranged from 1.2 per cent to 2.2 per cent at its highest (2001–2002) even as environmental challenges have increased. In 2018, for example, EPE stood at 1.7 per cent and waste management constituted some 80 per cent of that total, with spending on education, research and development and administration all reduced from the previous year.¹⁵⁷ Between 2010 and 2021, funding for the Environment Agency, the monitoring and enforcement agency for environmental regulation, was cut by two-thirds. Justified as deregulation in Camp 1 terms, these cuts were a green light to corporate malpractice. That the Environment Agency cuts were a false economy was demonstrated beyond doubt by the late 2010s when, to take just one example, multiple private water utilities were found to have not only routinely discharged untreated sewage into English waterways but done it at the rate of 200,000 times in 2019 and 400,000 times in 2020.¹⁵⁸

Government financial data does not exist on ‘decarbonisation’ in so clearly disaggregated or comparable form, however. Transparency has been hampered by changes in accounting categories, not least when DECC was folded into BEIS, which then further changed its categories to leave only piecemeal public sources. It is consequently far harder than it should be to track ongoing public subsidies around energy. The Camp 1 view says that government subsidy distorts producer and consumer behaviour and so damages social welfare. Subsidies are modelled for the ‘deviation’ they create in terms of the prices and quantities of goods exchanged from a hypothesised perfect equilibrium market

¹⁵⁷ Office for National Statistics, ‘Environmental Protection Expenditure: UK 2018’, www.ons.gov.uk/releases/environmentalprotectionexpenditureuk2018.

¹⁵⁸ ‘The Times View on Utility Companies Discharging Sewage into Rivers and Seas: Water Works’, *The Times*, 23 December 2021.

price. Rather than use the state to drive a comprehensive energy transition away from fossil fuels, however, neoliberal governments have preferred to continue existing subsidies for the least sustainable forms of energy production.

By 2015, the scientific evidence was pointing to the conclusion that to avoid a higher than 2°C rise it was necessary to keep a third of oil reserves, half of gas reserves and over 80 per cent of current coal reserves globally in the ground and unused before 2050.¹⁵⁹ The only responsible government support was consequently around de-commissioning and employment consequences. Nevertheless, beyond carbon pricing and a commitment to phase out unabated coal-fired power stations by 2025, UK governments have still offered no specific policies to phase out fossil fuels despite having made rhetorical commitments to phase out fossil fuel subsidies every year since 2009. Indeed, the United Kingdom lags behind other European governments in neither reporting nor publishing any inventory of fossil fuel or other environmentally damaging subsidies.¹⁶⁰

This lack of transparency raises a barrier to public scrutiny, and a 2013 report by Parliament's Environmental Audit Committee objected to the Coalition's lack of clear analysis and statistics for energy subsidies; to its blurring of the boundaries of subsidy definition in its support for fracking and nuclear, despite manifesto commitments not to use public money for new nuclear power and to move away from fossil fuel use; and, finally, to the continuation of high subsidy for fossil fuels both domestically and through international financing support and aid operations. The committee concluded that 'energy subsidies in the UK are significant, cover all types of energy technology and run to about £12bn a year. Much of this is directed at fossil fuels'.¹⁶¹ By 2020, an International Monetary Fund working paper put implicit and explicit UK fossil fuel subsidy at £17.5

¹⁵⁹ Christopher Glade and Paul Elkins, 'The Geographical Distribution of Fossil Fuels Unused When Limiting Global Warming to 2 °C', *Nature* 517 (January 2015): 187–190.

¹⁶⁰ Laurie van der Burg and Matthias Runkel, 'Phaseout 2020: Monitoring Europe's Fossil Fuel Subsidies: The United Kingdom', Overseas Development Institute, September 2017, p. 2.

¹⁶¹ House of Commons Environmental Audit Committee, 'Energy Subsidies: Volume 1', 2 December 2013 (HC 61), p. 3, www.publications.parliament.uk/pa/cm201314/cmselect/cmenvaud/61/61.pdf.

billion.¹⁶² Despite the constant use of neoclassical rhetoric against state intervention, the United Kingdom's neoliberal governments have thus continued to subsidise fossil fuels at a significantly higher rate than renewables, a policy that is lose-lose. It diverts investment from low carbon and renewable technologies while directing high volumes of investment towards assets that cannot be exploited without catastrophic effects.¹⁶³ The subsidies are lethal if the fuels are used and create an enormous financial bubble through the overvaluation of hydrocarbon assets if they are not.

Conclusion

According to the IPCC the 'action gap' between the Paris Agreement and current policy internationally puts us at a worst-case-scenario risk of a 4.4°C temperature increase by 2100 relative to 1850–1900 levels.¹⁶⁴ We remain on a credible path to global ruination and dramatically off track to secure the best-case scenario. Although the reasons for this gap vary by country, the hegemony of the neoclassical economics of risk has demonstrably played a significant role. Faith in the neoclassical utopia has rendered neoliberal governments blind, not just to the dynamic realities of the capitalist economy but also to the total dependency of all human agents, economic or otherwise, on the health of the biosphere.

Faced with existential threat, a reasoning government would mobilise all the useful institutions of its political economy, but the United Kingdom's neoliberal governments have kicked the can of necessary action down the road in the belief that self-regulating markets will best perform whatever job of governance is required: through rational expectations, efficient financial markets and 'competitiveness' conceived of in terms that are only coherent in the timeless world of neoclassical logic. Worse, the empty formalism identified by Power

¹⁶² Ian Parry, Simon Black and Nate Vernon, 'Still Not Getting Energy Prices Right: A Global and Country Update of Fossil Fuel Subsidies', IMF Working Paper, September 2021, WP/21/236.

¹⁶³ Elizabeth Bast, Alex Doukas, Sam Pickard, Laurie van der Burg and Shelagh Whitley, 'Empty Promises, G20 Subsidies to Oil, Gas and Coal Production', Overseas Development Institute, December 2015, p. 12.

¹⁶⁴ Adam Vaughn, 'Earth Will Hit 1.5°C Climate Limit within 20 Years, Says IPCC Report', *New Scientist*, 9 August 2021.

in *The Audit Society* has been instrumentalised by Conservative governments since 2015, in particular in the service of an intense ‘greenwashing’ – a pretence of action through target-setting and continued reporting that diverts public attention from their substantive reversals of policy. In the meantime, these same governments have continued to support fossil fuel production and quite obviously unsustainable corporate and financial practices that bear no resemblance to the promises of orthodoxy.

While most policy domains benefit from a compromise between the patterns we know about and those we can imagine, the unprecedented challenges around climate change should shatter our complacency about the predictability of the economic world that we have made. The reality is that when a Camp 1 economist tells government to relax around climate change because markets are rational and a climate scientist tells government to comprehend the total nature of the climate emergency and act now, the economist is dreaming and the climate scientist is reporting. Only the natural scientists’ conclusions are based on the application of the scientific method over a century of multi-disciplinary investigation and counter-investigation, anchored by dependable laws of thermodynamics, which is why the fossil fuel industry suppressed the warnings of its own scientists for over three decades.¹⁶⁵ Without the transformative greening of our production and consumption regimes, the global political economy will bear ever less resemblance to the past as we become subject to devastating threshold effects, tipping points and unparalleled conflicts for resources within failing ecosystems.

Where scientific thinking in the physical sciences continuously evolves in the light of new evidence, Camp 1 neoclassical orthodoxy has apparently become the useful idiocy for the most regressive corporate and financial actors in the British economy and their political allies who have side-lined strategic thinking in policymaking in favour of axioms already proved foolhardy by the Global Financial Crisis for which the public is still paying. Today’s school children grasp the ecological reality that neoliberal governments do not – that when faced with a non-zero probability of ruin, the only sensible, ethical basis for policy is the precautionary principle.

¹⁶⁵ Shannon Hall, ‘Exxon Knew about Climate Change Almost Forty Years Ago’, *Scientific American*, 25 October 2015.

The survival of a habitable world requires that we reject the dangerous illusions of the neoclassical utopia and replace them with reflexive analyses that integrate multiple values, of which ecological renewal is the most important for the foreseeable future.¹⁶⁶ The policy instruments available are many: they include the setting of clear and dependably rising carbon taxes and the introduction of game-changing sustainable technologies such as tidal energy for the island United Kingdom, which is currently stalled in the absence of the necessary investment in engineering infrastructure. Government could also look to public banks and horizontal industrial policies to drive the transition and the parallel cessation of public subsidy for fossil fuels beyond de-commissioning, retraining and developmental investment for the communities affected. Further options include a spectrum of changes in company law and fiduciary duties that range from compulsory long-range financial reporting on carbon footprints and value at risk to new legal obligations around investment decisions, the relegation of shareholder primacy to include ecological values and stakeholders and strict rules on best available technologies (as already exist in environmental pollution legislation). In the meantime, an altogether different paradigm of prosperity *with degrowth in energy and material throughputs* needs to be justified, encouraged and institutionalised wherever possible.¹⁶⁷

A common neoliberal accusation is that environmental action is a Trojan horse for socialism and centralisation, as if Britain's neoliberal governments have not been the most centralising and bureaucratic in its history. But decisive action does not require state centralisation, only the rejection of the fantasy that markets inexorably tend towards the universally correct pricing of future risks in a world of stable endowments. The history of political economy teaches us that the virtues of markets and states are more or less available depending on their mutually disciplinary effects, and governments can intervene to enable sustainable corporate and financial actors to thrive, and dirty finance to disappear, confident that they break no natural laws when they

¹⁶⁶ David Fleming, *Lean Logic: A Dictionary for the Future and How to Survive It* (White River Junction: Chelsea Green Publishing, 2016), pp. 184–185.

¹⁶⁷ See, for example, Tim Jackson, 'Prosperity without Growth: The Transition to a Sustainable Economy', Report of the Sustainable Development Commission, 2009.

do so. The insistence by neoliberal governments that their economic assumptions are good for all times is fatally wrong and potentially for all time, everywhere. As Norman et al. point out, 'We have only one planet. This fact radically constrains the kinds of risks that are appropriate to take at a large scale... Push a complex system too far and it will not come back.'¹⁶⁸ The current prospect of unrecoverable ruin should be enough to make a responsible government act.

¹⁶⁸ Joseph Norman, Rupert Read, Yaneer Bar-Yam and Nassim Nicholas Taleb, 'Climate Models and Precautionary Measures', The Black Swan Report, 15 May 2015.

