

A new paradigm for climate change

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How climate change science is conducted, communicated and translated into policy must be radically transformed if 'dangerous' climate change is to be averted.

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Framing the challenge

With the Rio+20 conference on sustainable development now over, it remains unclear how much attention policymakers, businesses and the public paid to scientific analyses of climate change. A question also remains as to how, objective and direct scientists were in presenting their evidence; politicians may well have left Rio without understanding the viability and implications of proposed low-carbon pathways.

We urgently need to acknowledge that the development needs of many countries leave the rich western nations with little choice but to immediately and severely curb their greenhouse gas emissions.^{1,2} But academics may again have contributed to a misguided belief that commitments to avoid warming of 2°C can still be realized with incremental adjustments to economic incentives. A carbon tax here, a little emissions trading there and the odd voluntary agreement thrown in for good measure will not be sufficient.

Scientists may argue that it is not our responsibility anyway and that it is politicians who are really to blame. The scientific community can meet next year to communicate its latest model results and reiterate how climate change commitments and economic growth go hand in hand. Many policymakers (and some scientists) believe that yet another year will not matter in the grand scheme of things, but this overlooks the fundamental tenet of climate science: emissions are cumulative.

Long-term and end-point targets (for example, 80% by 2050) have no scientific basis. What governs future global temperatures and other adverse climate impacts are the emissions from yesterday, today and those released in the next few years. Delaying an agreement on meaningful cuts to emissions increases the risk of exposing many already vulnerable communities to higher temperatures and worsening climate-related impacts. Yet, behind the cosy rhetoric of naively optimistic science and policy, there is little to suggest that existing mitigation proposals will deliver anything but rising emissions over the coming decade or two.

Hope and judgement

There are many reasons why climate science has become intertwined with politics, to the extent that providing impartial analysis is increasingly challenging and challenged. On a personal level, scientists are human too. Many chose to research climate change because they judge there is value in applying scientific rigour to an important global issue. It is not surprising then that they also hope that it is still possible to avoid dangerous anthropogenic interference with the climate system. However, as the remaining cumulative budget is consumed, so any contextual interpretation of the science demonstrates that the threshold of 2 °C is no longer viable, at least within orthodox political and economic constraints. Against this backdrop, unsubstantiated hope leaves such constraints unquestioned, while at the same time legitimizing a focus on increasingly improbable low-carbon futures and underplaying high-emission scenarios.^{3,4}

On a professional level, scientists are seldom trained to engage with policymaking; where opinions are encouraged and decisions informed as much by ideology as by judgement of the science, economics and so on. Policymaking is necessarily a messy process. Scientists, however, often assume that the most effective way of engaging is by presenting evidence, without daring to venture, at least explicitly, broader academic judgement. Perhaps, for narrowly defined disciplinary study, this is entirely appropriate. Yet many highly respected researchers are emerging with interdisciplinary expertise. Academic training has begun to foster the ability of researchers to embed quantitative analysis within a wider sociopolitical and economic context. Nevertheless, reluctance to proffer academic judgement confidently remains, particularly when such judgement raises fundamental questions about the viability of so-called real-world economics.

Economical with the science

Acknowledging the immediacy and rate of emission reductions necessary to meet international commitments on 2 °C illustrates the scale of the discontinuity between the science (physical and social) underpinning climate change and the economic

hegemony. Put bluntly, climate change commitments are incompatible with short- to medium-term economic growth (in other words, for 10 to 20 years).^{1, 5} Moreover, work on adapting to climate change suggests that economic growth cannot be reconciled with the breadth and rate of impacts as the temperature rises towards 4°C and beyond⁶ — a serious possibility if global apathy over stringent mitigation persists. Away from the microphone and despite claims of ‘green growth’, few if any scientists working on climate change would disagree with the broad thrust of this candid conclusion. The elephant in the room sits undisturbed while collective acquiescence and cognitive dissonance trample all who dare to ask difficult questions.

We need to understand how we have arrived at this compliant stasis. Certainly part of the story stems from how deeply the tendrils of economics have permeated into climate science.⁷ Contrary to the claims of many climate sceptics, in developing emission scenarios scientists repeatedly and severely underplay the implications of their analyses. When it comes to avoiding a 2 °C rise, ‘impossible’ is translated into ‘difficult but doable’, whereas ‘urgent and radical’ emerge as ‘challenging’ — all to appease the god of economics (or, more precisely, finance). For example, to avoid exceeding the maximum rate of emission reduction dictated by economists, ‘impossibly’ early peaks in emissions are assumed, together with naive notions about ‘big’ engineering and the deployment rates of low-carbon infrastructure. More disturbingly, as emissions budgets dwindle, so geo-engineering is increasingly proposed to ensure that the diktat of economists remains unquestioned.

At the same time as climate change analyses are being subverted to reconcile them with the orthodoxy of economic growth, neoclassical economics has evidently failed to keep even its own house in order. This failure is not peripheral. It is prolonged, deep-rooted and disregards national boundaries, raising profound issues about the structures, values and framing of contemporary society.

A new paradigm

This catastrophic and ongoing failure of market economics and the laissez-faire rhetoric accompanying it (unfettered choice, deregulation and so on) could provide an opportunity to think differently about climate change. Early signs of such a paradigm shift are already evident. As Alan Greenspan, former head of the US Federal Reserve and a pivotal figure in the economic orthodoxy revealed, he was “in a state of

shocked disbelief” at having “discovered a flaw in the [free market] model”.⁸ This is not just a minor flaw; it undermines a central tenet (self-regulation) of the laissez-faire ethos. It is to market economics what Copernican heliocentrism was to Ptolemaic astronomy.

Reinforcing the view that we may be on the cusp of a paradigm shift are the fundamental disagreements between orthodox economists as to how to respond to the crisis. This theoretical disarray has parallels with those rare occasions in history where established knowledge is superseded by new ways of thinking and understanding. Newton, Darwin, Einstein and Planck all represent such radical transitions. They are seldom achieved easily and the old guard typically hangs on kicking furiously to avoid relinquishing its grip on power. Ultimately, however, such protestations are futile in the face of the new insights and new ways of doing things that emerge with the new paradigm.

It is in this rapidly evolving context that the science underpinning climate change is being conducted and its findings communicated. This is an opportunity that should and must be grasped. Liberate the science from the economics, finance and astrology, stand by the conclusions however uncomfortable. But this is still not enough. In an increasingly interconnected world where the whole — the system — is often far removed from the sum of its parts, we need to be less afraid of making academic judgements. Not unsubstantiated opinions and prejudice, but applying a mix of academic rigour, courage and humility to bring new and interdisciplinary insights into the emerging era. Leave the market economists to fight among themselves over the right price of carbon — let them relive their groundhog day if they wish. The world is moving on and we need to have the audacity to think differently and conceive of alternative futures.

Civil society needs scientists to do science free of the constraints of failed economics. It also needs us to guard against playing politics while actively engaging with the processes of developing policy; this is a nuanced but nonetheless crucial distinction. Ultimately, decisions on how to respond to climate change are the product of many constituencies contributing to the debate. Science is important among these and needs to be communicated clearly, honestly and without fear.

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