

From global epidemics to global economic markets to the global climate, understanding complex systems calls for solid data and sophisticated maths. My advice to young scientists contemplating a career in research is: “If you’re good at maths, keep it up!”

I’m no mathematician – my research career has focused largely on the complexities of infection and immunity. But as recently retired Board Chair of the [ARC Centre of Excellence for Climate System Science](#), I’ve been greatly informed by close contact with mathematically trained meteorologists, oceanographers and other researchers, who analyse the massive and growing avalanche of climate data arriving from weather stations, satellites, and remote submersibles such as Argo floats.

Read more: [**Why Australians need a national environment protection agency to safeguard their health**](#)

My perception, based on a long experience of science and scientists, is that these are outstanding researchers of impeccable integrity.

Among both the climate research community and the medically oriented environmental groups such as the [Climate and Health Alliance](#) and [Doctors for the Environment Australia](#) with which I have been involved, there is increasing concern, and even fear, about the consequences of ever-climbing greenhouse gas levels in the atmosphere.

The growing climate problem

Following the thinking of the late Tony McMichael, a Canberra-based medical epidemiologist who began studying lead poisoning and then went on to become a primary author on the health section of the Intergovernmental Panel on Climate Change’s five-yearly [Assessment Reports](#), I have come to regard human-induced global warming as similar in nature to the problem of toxic lead poisoning.

Just like heavy metal toxicity, the problems caused by atmospheric greenhouse gases are cumulative, progressive, and ultimately irreversible, at least on a meaningful human timescale.

Regrettably, this consciousness has not yet seeped through to enough members of the Australian political class. The same lack of engagement characterises current national politics in Russia and the United States – although some US states, particularly [California](#) are moving aggressively to develop alternative energy sources.

The latter is true for much of Western Europe, while China and South Korea are committed both to phasing out coal and to leading the world in wind and solar power technology. In collaboration with the US giant General Electric, South Korean and Japanese companies are working to develop prefabricated (and hopefully foolproof) small nuclear reactors called [SMRs](#) .

At this stage, China (currently the [world's biggest greenhouse gas emitter](#)) is humanity's best hope – if it indeed holds to its [stated resolve](#)

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Political paralysis

Politically, with a substantial economic position in fossil fuel extraction and export, Australia's federal government seems paralysed when it comes to taking meaningful climate action. We signed on to the [Paris Agreement](#) but, even if we meet the agreed reductions in emissions, precious little consideration is given to the fossil fuels that we export for others to burn. And while much of the financial sector now accepts that any new investments in coalmines will ultimately become “[stranded assets](#)”, some politicians nevertheless continue to pledge tax dollars to fund such projects.

What can be done? Clearly, because meaningful action is likely to impact both on jobs and export income, this is an impossible equation for Australia's elected representatives. Might it help to give them a “backbone” in the form of a fully independent, scientifically and economically informed statutory authority, endowed with real powers? Would such an initiative even be possible under Australian law?

Realising that reasoned scientific and moral arguments for meaningful action on climate change are going nowhere fast, some 41 Australian environmental organisations sought the help of the Australian Panel of Experts on Environmental Law ([APEEL](#)) to develop the case for a powerful, independent Commonwealth Environmental Commission (CEC) linked to a National Environmental Protection Agency (NEPA).

This week in Canberra, at the culmination of a two-year process, the environmental groups will [present their conclusions](#) , preceded by a more mechanistic analysis from the lawyers.

In very broad terms, the new agencies would do for environmental policy what the Reserve Bank currently does for economic decisions. That is, they would have the power to make calls on crucial issues (whether they be interest rates or air pollution limits) that cannot be vetoed by the government.

Of course, that would require a government that is willing to imbue them with such power in the first place.

Read more: [***Australia needs stricter rules to curb air pollution, but there's a lot we could all do now***](#)

While it's a good bet that developing such a major national initiative will, at best, be a long, slow and arduous process, it is true that (to quote Laozi): "A journey of a thousand miles begins with a single step".

What is also clear is that "business as usual" is not a viable option for the future economy, defence and health of Australia.

Peter C. Doherty is currently funded as a chief investigator on an NHMRC Program Grant focused on immunity to the influenza A viruses. He is a member of the scientific committee for Doctors for the Environment, Australia and and the advisory committee for the Melbourne Sustainability Society Institute.

Authors: Peter C. Doherty, Laureate Professor, The Peter Doherty Institute for Infection and Immunity

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