



More than 50 governments are gathered in Colombia this week to design a roadmap to phase out oil, gas and coal. This aim, repeatedly proposed in UN climate conferences, has never seriously been pursued. Current fuel market shocks give it new urgency beyond climate change. The [Santa Marta conference](#) provides a promising platform to start work. And there is a model for how to pursue it, which offers sharp strategic lessons that have not been heeded: the phaseout of ozone-depleting chemicals under the Montreal Protocol.

Ending reliance on fossil fuels presents a paradox, which has deadlocked climate policy for decades: it is essential, and impossible. Deep cuts are widely claimed impossible, for both technical and political reasons. These fuels provide 80% of world energy and transforming the global energy system is like turning a supertanker: slow under any conditions, even harder when the formidable political power of the fossil enterprise holds the wheel. Yet ending fossil reliance is also essential, due to these fuels' major role in driving severe climate threats. Shifting to "net zero" targets obscures this necessity but does not avoid it. By assuming continued high emissions will be offset by future atmospheric removals, net-zero relies on rosy assumptions of extreme removal scale-up even with no viable policy

or payment model to support it, while the elastic meaning of “net emissions” accounting weakens incentives for emissions cuts that are faster, cheaper, and more reliable than vaporware future removals. Similarly, rapid advances in clean energy obscure but do not avoid the hard need to end reliance on fossil fuels. Stopping climate change requires both rapid growth of clean new technology and an early end to dirty old technology. This is not how past energy transitions happened – old fuels lost share to new ones but did not disappear or even always shrink – and it won’t happen this time without strong efforts on both new and old.

This paradox has stalled effective climate action for 40 years but might now be surmountable.

The two keys are, first, exploiting the paradox’s time dimension – impossibility isn’t absolute, but depends on how fast, with how much effort – and second, aligning incentives of key actors, including major players in the world fossil economy, to provide the needed efforts. These actors’ incentives – both for how they steer their businesses and how hard they fight to block climate action – depend on how long they think they can keep their current businesses alive. For 40 years they have believed that by fighting hard enough they can stretch out fossil lifetimes indefinitely. But if enough key players come to recognize these businesses are going to end, their incentives will reverse. Instead of fighting rear-guard actions to resist the inevitable, they would bring a desperate urgency – and vast resources and expertise – to finding viable business models through the transition and after the fossil era, and – crucially – not being the last to leave the sinking ship.

Sound implausible? This has happened before. In the mid-1980s, ozone-depleting chemicals threatened the global ozone layer. Efforts to cut the chemicals had stalled for 10 years, except one consumer use, aerosol sprays, that was quickly replaced by other growing uses. Large cuts were widely thought impossible, because many of the chemicals’ uses were essential. Then in 1986 and 1987, a breakthrough occurred, mainly through intense efforts of a few committed governments. An 1987 international treaty, the Montreal Protocol, adopted quick caps and future cuts on production and consumption of the chemicals. It also set up a structure of periodic review to consider stronger cuts, advised by independent expert panels. This structure created a virtuous circle, by which repeated tightening of controls and intense private-sector innovation spurred each other toward worldwide phaseouts of the chemicals faster than anyone had believed possible. The key to success was flipping the incentives of firms producing and – crucially – using and relying on the chemicals, based on a credible, widely believed threat that

they were going away. But while the system motivated intense efforts toward goals initially beyond reach, it did not actually require the impossible. As chemicals' end-dates approached, exemptions let small amounts continue for essential uses with no alternatives, with time limits and under review by an impartial technical body to keep strong incentives for further cuts. In the end, a major industrial sector was transformed to avoid an environmental threat, with virtually no disruption to consumer markets or development paths. Hardly anyone outside the issue noticed.

The Montreal Protocol is periodically proposed as a model for climate change but often dismissed, as an allegedly easy issue not relevant to the harder problem of greenhouse gases – mostly based on claims that alternatives to the chemicals were known and available before the key decisions to restrict them. This account is almost entirely wrong. Alternatives were not known and ready to go. Claims that society would collapse without ozone-depleting chemicals were as loud as parallel claims about fossil fuels today. It was the looming threat of deep cuts that drove the crucial advances to deploy alternatives and reduce reliance on the chemicals, by both producers and users of the chemicals. The parallels to fossil fuels today are striking.

The two crises are not the same, but their parallels offer several points of clear strategic guidance for fossil phaseouts, based on how Montreal Protocol architects surmounted specific challenges.

- Do not work through a universal global process, which gives a veto to those who would block progress. Instead, start with a club of the most ambitious actors, big enough to command attention and provide critical mass and incentives for further expansion;
- Focus action on reducing fossil fuel production and use – clearly visible, controllable metrics linked to the environmental aim – not an easily manipulable abstraction like net emissions;
- Adopt staged, increasingly tight limits on these, starting near current levels then cutting supply and demand in parallel, reaching zero at a time near enough to focus intense immediate effort but far enough to avoid severe societal disruption;
- Adjust phasedown schedules adaptively, based on advancing knowledge and experience – including, as phaseout dates approach, a system of temporary exemptions for essential uses, to provide a pressure-relief valve that lets the phaseout strategy bend without breaking.

Until now, fossil fuels have enjoyed the privilege of incumbency, while phase-out calls have borne the burden of showing, even before the first step, that doing so is necessary, feasible, cheap, and benign to all affected interests – an impossible task for any major socio-technical transformation. The current energy crisis and Santa Marta conference offer a chance to flip the script, so the default presumption is that fossil fuels must end and calls to keep them carry the burden of showing specific uses or amounts must continue. This is how the world saved the ozone layer, and a broadly parallel approach shows enough promise for fossil fuels to merit serious consideration – particularly since nothing else has worked thus far.