Disruptive technology, Ming Dynasty-style. Vmenkov/Wikimedia Commons, CC BY-SA

In the early 15th century the Ming Dynasty in China undertook a series of expensive oceangoing expeditions called the Treasure Voyages. Despite the voyages' success, elements of the elite opposed them. "These voyages are bad, very bad," we can imagine them tweeting. "They are a bad deal for China." Eventually these inward-looking, isolationist leaders gained enough power to prevent future voyages .

But this was an own goal. The parochial elites who killed off the Treasure Voyages could stop Chinese maritime innovation, but they could do nothing to prevent it elsewhere. Decades later, European sailors mastered the art of sailing vast distances across the ocean, and created fortunes and empires on the back of that technology (for better or worse). It is hard to see how China's strategic interests were served by abandoning a field in which they led.

There are some striking parallels in the Trump administration's decision to renege on the Paris climate agreement .
It has been cast as a move to protect America, but in the long run it won't derail the world's transition to a low-carbon economy, and instead the US will find itself lagging, not leading.

Trump's repudiation of the Paris deal is regrettable for at least three reasons. First, because the US is a technological leader whose entrepreneurs are extremely well placed to lead the global low-carbon transition; second, because America's abdication of climate leadership weakens the global order
and sends a wink and a nod to other fossil-fuelled recalcitrants like Saudi Arabia and Russia; and finally because having the world's second-highest emitter outside the agreement is a clear negative.

That said, US flip-flopping on climate is nothing new. The nation played a strong role in shaping the Kyoto Protocol, only to fail to ratify it. And while that did not help matters, it did not derail international efforts to combat climate change. In fact, the momentum behind climate-friendly initiatives has grown several-fold since the early 2000s .

Viewed in the long run, the latest US defection changes little. Any conceivable future Democrat administration will rejoin the Paris Agreement. But more importantly, the transition to a low-carbon future is not dependent on the actions of a single player.

The criteria for successful climate change policy are hard to achieve but easy to describe: success will come when non-emitting technologies economically outcompete fossil fuels, pretty much everywhere in the world, in the main half-dozen or so sectors that matter.

Beating the ‘free-rider’ issue

A stable climate is what we call a “ public good ”, similar to fresh air or clean water. The US political scientist Scott Barrett has pointed out that climate change is an “aggregate efforts public good”, in the sense that everybody has to chip in to solve the problem of safeguarding the climate for everyone.

“Aggregate efforts” public goods are especially hard to preserve, because there is a strong incentive to free-ride on the efforts of others, as the US now seeks to do.

But technology can transform this situation, turning an aggregate efforts public good into a “best-shot public good”. This is a situation in which one player playing well can determine the whole outcome, and as such is a much easier problem to solve.

We have seen technology play this role before, in other global environmental issues. The ozone hole looked like a hard problem, but became an easy one once an inexpensive, effective technological fix became available in the form of other gases to use in place of ozone-harming CFCs (ironically, however, the solution exacerbated global warming).

Something similar happened with acid rain, caused by a handful of industrial pollutants . Dealing with carbon dioxide emissions is harder in view of the number of sources, but breakthroughs in five or six sectors could make a massive dent in emissions.

Technology trumps politics

This suggests that solving climate change relies far more heavily on technological innovation and successful entrepreneurship than it does on any single government. Policies in specific jurisdictions can speed climate policy up or slow it down, but as long as no single government can kill the spirit of entrepreneurship, then no country's actions can alter the long-run outcome.

This is why German climatologist John Schellnhuber is right to say that "if the US really chooses to leave the Paris agreement, the world will move on with building a clean and secure future".

The low-carbon race is still on, and the main effect of Trump's decision is to put US innovators at a disadvantage relative to their international competitors.

We have seen these technological races before, and we have seen what recalcitrance and isolationism can do. Just ask the Ming Dynasty, who ceded their maritime leadership and in doing so let Europe reap the spoils of colonialism for half a millennium.

Similarly, the Trump administration can ignore basic physics if it likes, although this is electorally unsustainable – young Americans can see that it is in their own interest to support climate policy. Democracies are imperfect, but over time they have the ability to self-correct.

Developing polices that regulate the release of environmentally damaging gases is important. Pricing carbon is important. But government policy is not everything. Ultimately, this problem will be solved mainly by technology, because the way out of the jam is by finding new, inexpensive ways for humans to flourish without harming the planet.

Dave Frame does not work for, consult, own shares in or receive funding from any company or organisation that would benefit from this article, and has disclosed no relevant affiliations beyond the academic appointment above.

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