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Energy Innovation is a Key Part of What Made Paris a Success

By Jason Bordoff [1]

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The Paris climate summit is rightly being hailed as a historic achievement. That is largely because of the new Paris Agreement, a landmark accord that provides a foundation for both developed and developing countries to curb emissions through increasingly ambitious domestic climate policies over time. The attention paid to the accord struck on the summit's final day, however, has risked obscuring the significance of the summit's first day, when philanthropist Bill Gates unveiled the world's largest clean energy research and development partnership, and a group of nations including the United States agreed to double their clean energy R&D budgets.

Mission Innovation and the Breakthrough Energy Coalition

The historic research commitments in Paris make the national targets and policies that form the Paris Agreement more credible, and will enable more aggressive emissions reductions over time. Deep carbon reductions will require new breakthroughs in clean energy, not merely increased use of wind, solar or even nuclear power. To succeed, the new negotiating framework of national plans to reduce emissions, therefore, will need to be accompanied by a dramatic increase in clean energy R&D in both the public and private sectors.

Unfortunately, to date, the trend has been the reverse. US government investment in energy innovation has declined for decades, with energy research funding smaller than in other sectors like biotech or than in other industrialized nations.

A vast economics literature recognizes that the private sector underinvests in early-stage R&D because it is able to capture only a small share of the social value of such breakthrough innovations. Government funding is therefore needed to target long-term, high-risk R&D efforts, such as the sort pursued by the Department of Energy's Advanced Research Projects Agency—Energy (ARPA-E). Examples might be advanced batteries, fusion, or nanotechnology. This is why Mission Innovation is so important, through which the United States commits to double R&D spending—an increase of nearly $5 billion per year—along with commitments from 19 other nations to double clean energy R&D as well.

Government spending can only go so far, however. Private capital is going to fund much of the new technology breakthroughs, and certainly the very large amounts of capital that will be necessary for their deployment in the energy system. As entrepreneur (and Columbia University Center on Global Energy Policy Advisory Board member) Reid Hoffman put it, in explaining why he was joining Bill Gates and other business leaders to create the Breakthrough Energy Coalitions, "Technologies are pioneered in lab settings, but tested, improved, and mainstreamed in commercial markets."

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[1] Jason Bordoff is a Professor of Professional Practice in International and Public Affairs and Founding Director of the Center on Global Energy Policy at Columbia SIPA.

Through the Breakthrough Energy Coalition, many of the world's wealthiest individuals have committed to deploy not only their resources, but their business skills and commercial savvy to help the most promising clean energy technologies pass the daunting "Valley of Death" that has challenged many new technologies that require large capital deployments to scale.

As Hoffman noted: "Promising technologies that are ready for real-world testing and iteration but are not yet mature or risk-free enough to attract traditional investors cannot find the funding they need to survive this key stage of their development."

The Paris Agreement

All this exciting new technology will only be viable, of course, if national policies create markets for them—and that is where the Paris Agreement comes in.

The Paris Agreement moves away from the Kyoto Protocol, which prevailed for the last 20 years of climate negotiations and attempted to encourage through international law mandatory emission-reduction obligations for developed countries.

The new framework is important, in part, because it does away with the rigid distinctions between developed and developing countries with respect to limiting emissions. Nearly every country submitted national targets and policy actions—known as Intended Nationally Determined Contributions (INDCs)—that collectively cover nearly all global emissions (as opposed to the 14 percent of emissions covered today by the Kyoto Protocol).

The Paris Agreement creates a process whereby countries come together every five years to put forward more ambitious targets and policies. And it creates important transparency requirements for monitoring, reporting and verification—a crucial confidence-building measure.

Importantly, but less noticed, are the provisions for international policy linkages through "internationally transferred mitigation outcomes," which lay the foundation for the use of carbon markets to meet the national policy goals.

Currently, the price of fossil fuels like coal is relatively cheap because the environmental damages from using it—what economists call "social costs"—are not reflected in the price. The most cost-effective way to correct such a market failure is by internalizing those social costs through a market-based mechanism like a carbon tax or cap-and-trade system.

As the Environmental Defense Fund's Nat Keohane wrote of the deal, "The role of markets may not be in this week's headlines – but a decade from now, it will be one of the enduring legacies of Paris."

The deal reaffirms the goal of limiting global temperature increase to 2 degrees Celsius (3.6 degrees Fahrenheit), and sets a new aspiration to limit the increase to 1.5 degrees Celsius (2.4 degrees Fahrenheit). While politically necessary, along with additional adaptation financing, to strike a deal with poorer countries, this increased ambition is unlikely to materially affect the stringencies of national policies, which are still very far from being able to achieve even the 2 degree target.

Indeed, critics have seized on this fact—that the national targets in the deal do not keep global temperatures from rising above the 2 degree Celsius threshold adopted by the United National Convention on Climate Change. There are two reasons this should not be perceived as failure, however.

First, even achieving the targets in the deal would bring substantial benefits. The climate change damages that would result from the 2.7 to 3.7 degrees Celsius (4.9 to 6.7 degrees Fahrenheit) of warming these initial cuts would provide, while severe, are still much lower than would result from the 4 to 6 degrees Celsius (7.2 to 10.8 degrees Fahrenheit) of warming expected without them.

Moreover, the Paris Agreement explicitly builds in a mechanism to ratchet up ambition and stringency over time. As confidence builds that the burden of climate action is being shared, and public support for more action builds too, it will become easier for countries to take more aggressive steps. Because climate change is the ultimate tragedy-of-the-commons, free-rider problem—a ton of carbon does the same damage regardless of where it is emitted—countries cutting emissions need to know that others are as well.

There is no legal commitment that compels countries to achieve their targets or ratchet them up in five years—another reason some have criticized the Paris Agreement. But international law has proven to be a rather feckless way to deliver climate action in the past. The new framework recognizes that the biggest obstacle has been mobilizing political support for more robust domestic climate policies. And the new approach relies on public pressure and shame to persuade countries not to become laggards in meeting their obligations, an approach bolstered by the robust and transparent reporting mechanisms.

Conclusion

Amid all the praise for the Paris Agreement, a sober reminder is warranted of just how difficult and dramatic the transformation of the global energy system is going to need to be over the longer term to address the threat of climate change. It is far from clear at this point whether countries will really be willing to take the steps needed to decarbonize the global economy. But with a framework that places new focus on national climate policies that can ratchet up over time, supported by dramatic increases in public and private sector R&D funding for new technologies, the Paris climate talks should rightly be judged a success.