COLUMBIA | SIPA
Center on Global Energy Policy

THE GREENEST STIMULUS IS ONE THAT DELIVERS RAPID ECONOMIC RECOVERY

A federal government response that meets the scale and scope of the economic crisis caused by COVID-19 is key to regaining momentum for transformational climate policy in the United States

BY NOAH KAUFMAN
JUNE 2020

As governments plot their responses to the COVID crisis, it's difficult to find an influential voice who is not calling for economic stimulus legislation that simultaneously aims to achieve climate change goals.[1] As International Monetary Fund chief Kristalina Georgieva put it: "We are about to deploy enormous, gigantic fiscal stimulus and we can do it in a way that we tackle both crises at the same time."[2]

After all, governments will spend trillions of dollars to put people back to work. This could be a once-in-a-generation opportunity to shape massive government expenditures in a lower-carbon direction.

Europe appears poised to take this advice, with the European Commission crafting a "Green Deal" at the center of a recovery package.[3] Many European countries have strong climate policy frameworks in place, including emissions regulations and net zero targets. In these countries, clean energy investments within economic stimulus packages can combine with these existing policy frameworks to enable even faster and cheaper decarbonization.[4]

Here in the United States, the situation is starkly different. Expectations for climate progress from economic stimulus should be low, for two (related) reasons. First, the United States has no national climate plan in place, and the ability of clean energy spending to deliver emissions reductions without accompanying emissions regulations is very limited. Second, political opposition can prevent or severely weaken climate measures in economic stimulus for the foreseeable future. The climate measures with a plausible chance of inclusion in economic stimulus will, at best, enable the United States to continue muddling along on an incremental decarbonization pathway while temperatures rise to increasingly dangerous levels.

Of course, incremental progress is better than no progress, and clean energy spending that provides near-term stimulus belongs in economic recovery legislation.

However, unfortunately, the COVID-19 crisis is another setback to climate policy efforts in the United States. Prosperity and climate action are inextricably linked—the difficult work needed to pass transformative climate policy in the United States will not take place while the economy is spiraling toward a deep recession. Ironically, successfully inserting climate provisions into an economic stimulus may be less influential to climate outcomes than a federal government response that meets the scale and scope of the economic crisis, so that

economic security is delivered to as many Americans as possible, as quickly as possible.

In the meantime, climate-focused policy makers should not lose sight of the climate policies that matter most and were the backbones of the serious climate plans introduced by US policy makers in 2019: regulations of greenhouse gas emissions throughout the economy and major investments in low-carbon technologies, frontline communities, and fossil fuel workers—not because these investments quickly create jobs but because they can ensure an effective and equitable pathway to net zero emissions.[5]

What Is Fiscal Stimulus, and What Does It Have to Do with Climate Policy?

Over 40 million Americans have filed for unemployment in the last few months.[6] Trillions of dollars in spending from the US Congress have provided desperately needed relief to households and businesses during lockdowns. Climate priorities have not seriously entered the discussion.

The economic turmoil will extend beyond the end of the public health crisis, especially if the current relief measures expire without extensions. Americans' consumption expenditures fell over 13 percent in April,[7] which will induce a downward spiral of further layoffs and declines in consumer spending. Even when economies mostly reopen, the collapse in demand for goods and services will leave US production levels far below their potential. This is the "output gap" that expansionary fiscal policy (i.e., economic stimulus) intends to fill. Government spending can substitute for private spending and push economies closer to full employment levels.

An output gap is notoriously difficult to measure, but recent estimates suggest it could be $3 trillion in 2021,[8] roughly three times larger than the Congressional Budget Office's estimate of the equivalent metric in 2009.[9]

Once governments start crafting fiscal stimulus plans, any government spending can do the trick—John Maynard Keynes famously declared that successful stimulus could entail burying money underground and letting people dig it up.[10] That's why spending on climate change and other societal priorities enter these policy debates. After all, if the goal is to spend, might as well do so in a way that provides lasting benefits.

But economists have long recognized that successful economic stimulus ideally has other characteristics as well, commonly summarized by the three Ts: stimulus spending should be (1) timely, so benefits hit the economy quickly; (2) targeted, so funds are provided to the individuals and businesses most likely to spend it quickly; and (3) temporary, to minimize concerns about federal debt that could counteract the expansionary incentives of the stimulus.[11] Following these best practices leads to spending with high "multipliers," whereby the funds received by individual and businesses are rapidly spent again and again throughout the economy, creating an increase in economic activity that far exceeds the original spending. For instance, sending checks to lower-income households (instead of wealthier households) leads to a stimulus with higher multipliers because they are more likely to increase their spending as a result of the payments.

The precise interpretation of these best practices changes based on the circumstances. The current downturn, unfortunately, may be longer than a typical recession, which means that spending need not be quite as timely or temporary. Moreover, while stimulus focuses on propping up demand, separate measures are surely needed to address the current crisis in supply, like businesses that cannot come back or operate as they used to.

There is no shortage of climate-friendly measures that satisfy best practices for economic stimulus, simultaneously creating temporary jobs and long-term value. Over three million Americans work in the energy efficiency, solar, wind, nuclear, and alternative fuel vehicle industries.[12] These are among the country's fastest growing sectors: over three-quarters of new electricity generating capacity comes from solar and wind energy.[13] Even President Trump's team—no fan of climate action—compiled a list of 50 shovel-ready infrastructure projects in 2017 that included at least 16 that could be described as climate friendly, including projects related to mass transit, transmission, grid modernization, and improved hydropower production.[14]

Policy makers with the joint goals of economy recovery and decarbonization can therefore develop effective climate-focused (or at least partially climate-focused) economic stimulus legislation.

Still, the three Ts can help differentiate measures suited for economic stimulus from other types of government spending. For example, focusing on *temporary* spending should, in theory, avoid concerns about the creation of permanent new government programs. But addressing the risks of climate change calls for a host of sustained public sector investments; therefore, many categories of climate-friendly spending are critical for decarbonization plans but are not the best candidates for conventional economic stimulus legislation.

Transformational Climate Policy Is Needed from the United States

Government responses to COVID-19 show the importance of decisive action in the face of dire threats. The South Korean government took a series of decisive actions aimed at eradicating the virus—fast and free testing, expansive virus tracking, and strict isolation policies—and it has successfully limited deaths to a few hundred.[15] In contrast, the response of the US federal government has consisted of disorganized half measures that lack a clear goal or cohesive strategy—and the results have been catastrophic.[16]

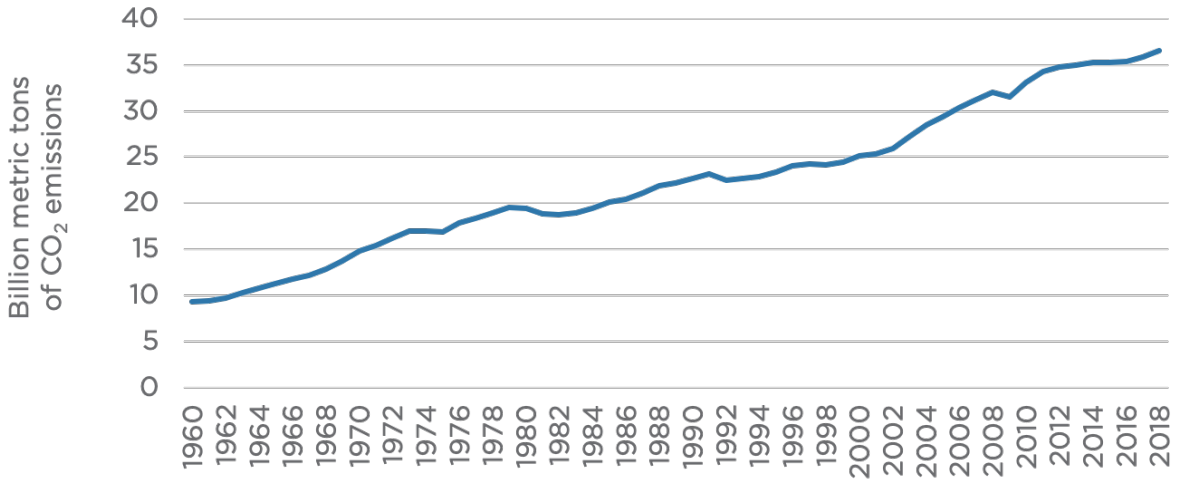
Climate change is another dire threat that requires a decisive response.

Nearly 30 years ago, the world's major nations pledged to stabilize temperatures at levels that would prevent dangerous climate change.[17] What has followed from the signatories of this treaty, with rare exceptions, are half measures. A recent study in *Nature* cataloged actions of 79 major countries between 2005 and 2015 and identified 2,100 energy efficiency policies, 1,736 renewable energy policies, and 659 climate policies.[18] These measures can be credited with important achievements like reduced air pollution, improved energy efficiency, and remarkable improvements in clean energy technologies.[19]

All the while, greenhouse gas emissions have marched upward. Stabilizing temperatures

requires net emissions to rapidly fall to zero, but global annual CO_2 emissions increased by over 60 percent between 1990 and 2018 (see figure 1).[20] The world uses more clean energy than ever, but it uses more dirty energy also. Fossil fuels have accounted for roughly 80 percent of primary energy production every year since 1990.[21] As the world economy grows (and, after a blip caused by COVID, it will continue to grow), it uses more energy, and temperatures continue to rise.

Figure 1: Global carbon dioxide emissions



Source: Global Carbon Project

To break this cycle, countries must take decisive actions—codifying long-term pathways to deep decarbonization and a set of policies and processes to ensure those pathways are achieved, including not only support for clean energy but also strong regulations (including prices and standards) of greenhouse gas emissions throughout the economy.

These are not just aspirational principles. It's what numerous countries in Europe have done: for example, the United Kingdom has a binding net zero emissions target and 5-year carbon budget cycles set 12 years in advance.[22] It's what California has done, with authority given to the Air Resources Board to ensure that policies are consistent with the state's near- and long-term targets. It was the basic framework of nearly all Democratic presidential candidates' climate plans released in 2019.

A mountain of evidence suggests that, if well-designed, climate policies are fully consistent with robustly growing economies.[23] Yet, in the United States, there are no serious federal regulations of greenhouse gas emissions, and the country is certainly not on a pathway to net zero emissions. Unless and until the largest economy in the world and the largest contributor to historical emissions[24] takes transformative actions on climate change that reflect a clear break from its past, there is little hope of steering the world away from increasingly dangerous levels of climate change.

The Spending within an Economic Stimulus Package Will Not Deliver Transformational Climate Policy to the United States

Spending on clean energy—without regulating emissions—has been a limited tool for achieving emissions cuts. Layer on the constraints of the US political system, and the effects of spending will be even more limited.

While the differences between today and 2009 are too numerous to list, the lessons from the early years of the Obama administration may still be instructive. After all, this period was not only the most recent time the US economy plunged into a deep recession but also the most recent chance for climate policy in the United States.

President Obama's team had a plan for addressing climate change during the recession. First, accelerate the progress of low-carbon technologies by passing an economic stimulus package that contained within it the largest ever investments in clean energy. Second, pass a cap-and-trade program with a pathway to deep decarbonization by midcentury and a price on emissions across the entire economy. One Obama adviser called the stimulus one blade of the scissors, cap-and-trade the other.[25]

The logic of this two-step plan was straightforward and appealing. The Obama administration knew that investments could make clean energy more competitive, but they would not cause a shift away from fossil fuels at the pace needed to respond to the risks of climate change.[26] Fossil fuels are simply too cheap and useful, especially when emissions are costless. That's why policies that directly regulate emissions and chart a course to a carbon-free economy are so critical (and effective clean energy investments make these policies work better).

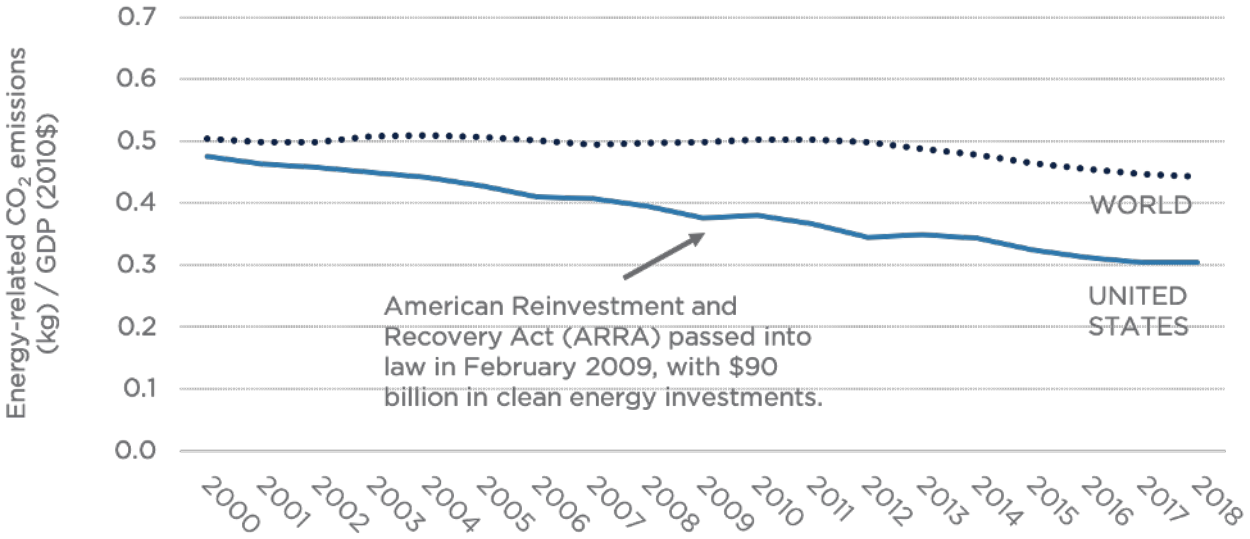
The first step went according to plan. In February 2009, President Obama signed an economic stimulus package, the $787 billion American Reinvestment and Recovery Act (ARRA), that included $90 billion in spending on clean energy, which dwarfed the handful of billions that the country typically spends on clean energy annually.[27]

Retrospectives of ARRA often focus on the successful clean energy outcomes, like the loans and grants to wind and solar projects that kept these fledging industries afloat and the energy efficiency retrofits for hundreds of thousands of US homes.[28]

Unfortunately, ARRA was also followed by the collapse in the (already sparse) support within the GOP for climate legislation, including the failure of cap-and-trade legislation[29] and a decade (and counting) in the wilderness for serious congressional action on climate.

The Obama administration got only one blade of its scissors, and it is difficult to cut emissions when one blade is missing. Figure 2 shows the carbon intensity of the US and global economies, a useful metric for historical progress on decarbonization. The carbon intensity of US economy has gradually declined in recent decades—through a combination of technological progress, offshoring, and federal and state policies—and ARRA contributed to maintaining that ongoing trend. However, for global climate outcomes, the late 2000s were a missed opportunity.

Figure 2: Carbon intensity of the US and global economies



Sources: World Bank Group for GDP data and Global Carbon Project for CO_2 emissions data

Today, anyone who closely followed the climate debates of the early Obama administration may be having déjà vu, as the attention devoted to climate legislation in 2019 is diverted to a "green stimulus." The specifics differ, because clean energy technologies are in a different place with a different set of needs, but proposals today draw from the same playbook as in 2009: subsidies for clean energy technologies, improvements to the electricity grid, "shovel-ready" infrastructure projects, and funding for building retrofits.[30] They naturally focus on spending, and, with rare exceptions[31], exclude the emissions standards and prices that are critical components of climate strategies.

The political prospects for a climate-focused stimulus are worse than in 2009. President Obama campaigned on climate and entered office as a massively popular president with large Democratic party majorities in both chambers of Congress and a handful of GOP senators actively engaged in crafting climate legislation.[32] He was able to garner over 60 votes in the Senate for ARRA, avoiding a filibuster, with the Republican leadership opposing the bill. Today, the Republican party controls 53 Senate seats, and chances are that either Republicans or Democrats will have a slight majority after the November elections. In the context of economic stimulus, the GOP leadership appears committed to deriding climate-related proposals as attempts to insert partisan priorities into the economy recovery.[33]

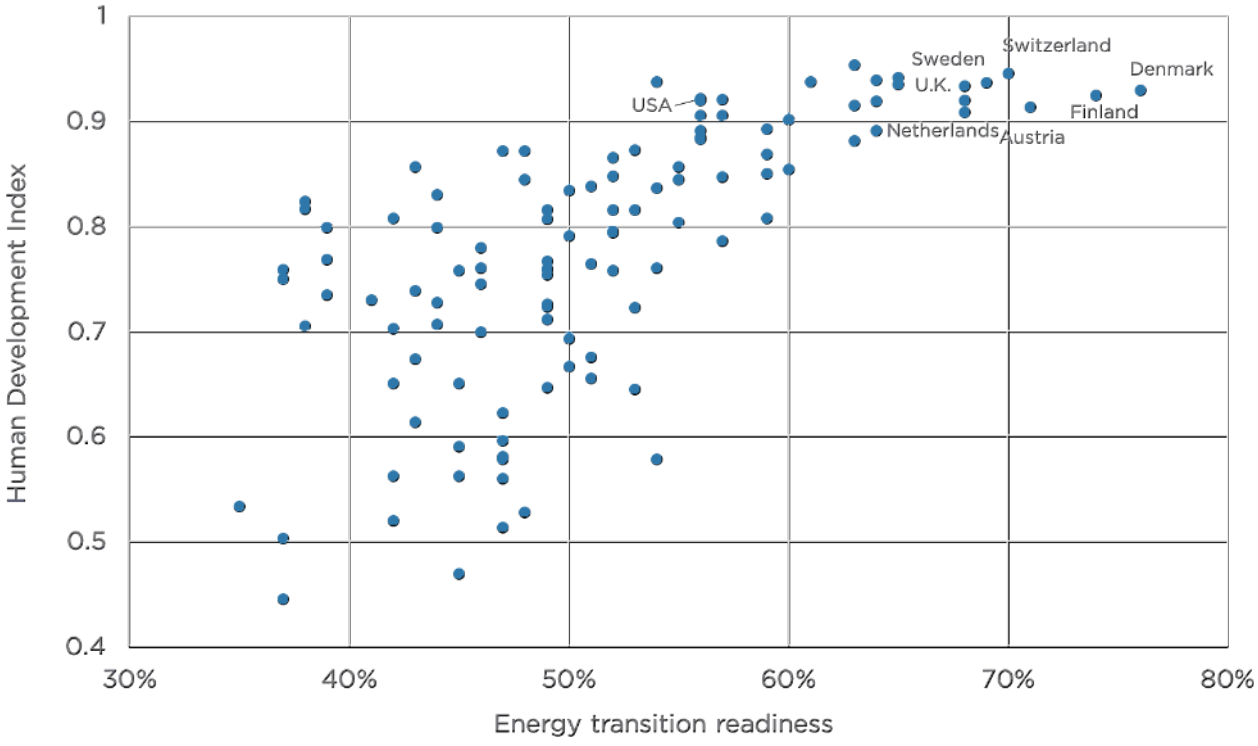
Predicting what is politically possible, even a few months from now, may be a fool's errand. Political winds change. In fact, transformational climate policy in the United States demands they change. But creating and sustaining this change involves building a diverse coalition of supporters for climate policy and overcoming powerful interests that oppose such policies. This is difficult work that is unlikely to take place while the US economy is spiraling toward a deep recession.

An Economic Recovery Is the First Step to Regaining Momentum for Climate Policy

Climate change may be the most intractable political problem the world has ever faced. Actions must be taken decades before their effects on the climate are noticeable.[34] The costs of actions are localized and opposed by powerful and deep-pocketed domestic constituents, while the benefits accrue across the entire globe.

Economic hardships compound these political difficulties. An irony of climate action is that achieving widespread economic security is both the cause of the problem—due to the emissions associated with economic growth—and also the enabler of solutions. Figure 3 plots countries based on metrics for well-being (on the y-axis) and "readiness" for a transition to a clean energy economy (on the x-axis). Countries that are relatively unprepared for a clean energy transition, like the United States, span a wide range of levels of well-being. In contrast, every single leading country on energy transition is markedly prosperous.

Figure 3: Correlation between well-being and clean energy transition



Sources: Human Development Index data from the United Nations Development Programme: http://hdr.undp.org/en/data. "Energy transition readiness" is a metric developed by the World Economic Forum, based on "the stability of the policy environment and the level of political commitment, the investment climate and access to capital, the level of consumer engagement, the development and adoption of new technologies, etc." (https://www.weforum.org/reports/fostering-effective-energy-transition-2020).

Measuring the degree to which economic downturns influence support for transformational climate policies is more difficult, largely because such policies are so few and far between. For example, Americans' support for climate policy fell sharply during the Great Recession, but there were other conflating factors.[35] One recent empirical analysis using a database of 1,800 climate laws in 198 jurisdictions shows that passing climate legislation becomes more difficult during economic downturns,[36] which is a highly intuitive finding—after all, environmental regulations,[37] foreign aid,[38] and long-term investments[39] all notoriously lose support during periods of high unemployment, and climate action brings together elements of each. While Americans worry about paying rent and putting food on the table, an intergenerational problem naturally loses salience.

Regaining momentum for climate policy requires avoiding an economic depression and providing economic security to Americans as rapidly as possible. The experience of the Obama administration may be instructive here as well. The most important accomplishment of ARRA was in successfully injecting hundreds of billions of dollars into the economy when it was desperately needed, thus making a painful time less painful for millions of Americans. (Studies suggest ARRA may have raised gross domestic product by a few percentage points and created or saved a few million jobs.[40]) However, as economic stimulus, ARRA was far too small.[41] And congressional support for the economy recovery collapsed after ARRA passed, contributing to the notoriously slow economic recovery: unemployment rates lingered above 8 percent into 2012.[42]

The current economic crisis is likely to require stronger and more sustained federal government interventions than during the Great Recession. Such productivity from Congress during the most polarized era since the Civil War[43] will be difficult, if not impossible, to sustain when the immediate health crisis subsides. The first priority for policy makers concerned with long-term climate outcomes should be avoiding the disastrous consequences of a failed government response to the economic crisis.

Measures that promote clean energy belong in economy recovery packages, but do not expect them to knock the United States off its dangerous emissions pathway. Fortunately, for an intergenerational challenge like climate change, policy makers can take a slightly longer view. US leadership on climate change requires transformational legislation that ensures a rapid and equitable pathway to net zero emissions.

Notes

1. For three examples, see the United Nations, https://www.un.org/en/un-coronavirus-communications-team/un-urges-countries-%E2%80%98build-back-better%E2%80%99; the International Energy Agency, https://www.iea.org/commentaries/put-clean-energy-at-the-heart-of-stimulus-plans-to-counter-the-coronavirus-crisis; and a prominent group of economists, https://www.theguardian.com/environment/2020/may/05/green-stimulus-can-repair-global-economy-and-climate-study-says.

2. Megan Darby, "IMF Chief: $1 Trillion Post-coronavirus Stimulus Must Tackle Climate Crisis,"

Climate Home News, April 29, 2020, https://www.climatechangenews.com/2020/04/29/imf-chief-1-trillion-post-coronavirus-stimulus-must-tackle-climate-crisis/.

3. European Commission, "Europe's Moment: Repair and Prepare for the Next Generation," May 27, 2020, https://ec.europa.eu/commission/presscorner/detail/en/IP_20_940?utm_source=newsletter&utm_medium=email&utm_campaign=newsletter_axiosgenerate&stream=top.

4. US House of Representatives, Committee on Energy & Commerce, Subcommittee on Environment and Climate Change, hearing on "Building a 100 Percent Clean Economy: Solutions for Economy-wide Decarbonization," testimony by Noah Kaufman, PhD, December 5, 2019, https://energycommerce.house.gov/sites/democrats.energycommerce.house.gov/files/documents/Witness%20Testimony_12.05.19_Kaufman.pdf.

5. For three examples, see the Democratic presidential candidates' climate plans, "Candidate Tracker," March 9, 2020, https://www.rff.org/publications/data-tools/candidate-tracker/; the legislative proposal from the House of Representative Energy & Commerce Committee, https://energycommerce.house.gov/newsroom/press-releases/ec-leaders-release-draft-clean-future-act-legislative-text-to-achieve-a-100; and proposed legislation from two Democratic senators and congressman, https://www.coons.senate.gov/news/press-releases/sens-coons-and-feinstein-rep-panetta-introduce-bill-to-price-carbon-pollution-invest-in-infrastructure-randd-and-working-families.

6. Michael Hartman, "COVID-19 Jobless Claims Are Now over 40 Million. Many Are Still Waiting for Unemployment Benefits," Marketplace, May 28, 2020, https://www.marketplace.org/2020/05/28/covid-19-jobless-claims-unemployment-benefits-waiting/.

7. US Bureau of Economic Analysis, "Personal Income and Outlays: April 2020," May 29, 2020, https://www.bea.gov/news/2020/personal-income-and-outlays-april-2020.

8. For two examples, see Izabella Kaminska and Claire Jones, "An Absolutely Enormous Output Gap Is forming," *Financial Times*, May 4, 2020, https://ftalphaville.ft.com/2020/05/01/1588344147000/An-absolutely-enormous-output-gap-is-forming/; and J. W. Mason, "How Much Stimulus Do We Need?," the Roosevelt Institute, March 19, 2020, https://rooseveltinstitute.org/how-much-stimulus-do-we-need/.

9. Congressional Budget Office, "The Budget and Economic Outlook: Fiscal Years 2009 to 2019," January 2009, https://www.cbo.gov/sites/default/files/111th-congress-2009-2010/reports/01-07-outlook.pdf.

10. Michael Grunwald, *The New New Deal. The Hidden Story of Change in the Obama Era* (New York: Simon & Schuster, 2012).

11. Congressional Research Service. "Fiscal Policy Considerations for the Next Recession," June 20, 2019. https://fas.org/sgp/crs/misc/R45780.pdf.

12. Energy Futures Initiative and the National Association of State Energy Officials. "The 2020 U.S. Energy & Employment Report." https://www.usenergyjobs.org/.

13. US Energy Information Administration, "New Electric Generating Capacity in 2020 Will Come Primarily from Wind and Solar," January 14, 2020, https://www.eia.gov/todayinenergy/detail.php?id=42495.

14. Lynn Horsley, Steve Vockrodt, Walker Orenstein, and Lindsay Wise, "Exclusive: Trump team Compiles Infrastructure Priority List," McClatchly, January 24, 2017, https://www.mcclatchydc.com/news/politics-government/white-house/article128492164.html.

15. Derek Thompson, "What's behind South Korea's COVID-19 Exceptionalism?," *Atlantic*, May 6, 2020. https://www.theatlantic.com/ideas/archive/2020/05/whats-south-koreas-secret/611215/.

16. Johns Hopkins University, "How Does Mortality Differ across Countries?," May 31, 2020, https://coronavirus.jhu.edu/data/mortality.

17. United Nations, *United Nations Framework Convention on Climate Change* (New York: United Nations, 1992), http://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf.

18. Corinne Le Quéré et al., "Drivers of Declining CO_2 Emissions in 18 Developed Economies," *Nature Climate Change* 9 (2019): 213–17, https://doi.org/10.1038/s41558-019-0419-7.

19. Department of Energy, "Revolution...Now," September 2016, https://www.energy.gov/sites/prod/files/2016/09/f33/Revolutiona%CC%82%E2%82%ACNow%202016%20Report_2.pdf.

20. See Global Carbon Project at https://www.globalcarbonproject.org/carbonbudget/19/data.htm.

21. Data compiled from World Bank (see https://data.worldbank.org/indicator/EG.USE.COMM.FO.ZS) and BP Statistical Review of World Energy (see https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2019-full-report.pdf.)

22. European Environmental Agency, "National Policies and Measures on Climate Change Mitigation in Europe," November 2019, https://www.eea.europa.eu/themes/climate/national-policies-and-measures/national-policies-and-measures-on-1.

23. For two examples, see Diamond and Zodrow (2018), https://energypolicy.columbia.edu/sites/default/files/pictures/CGEP_Effects_of_CarbonTaxPolicies_US_Economy_Welfar_of_Households.pdf; and "Special Issue on EMF 32 Study on U.S. Carbon Tax Scenarios," ed. A. A. Fawcett, J. McFarland, A. C. Morris and J. P. Weyant, *Climate Change Economics*, https://www.worldscientific.com/toc/cce/09/01.

24. Jeff Tollefson, "The hard truths of climate change — by the numbers," *Nature*, Sept. 18, 2019, https://www.nature.com/immersive/d41586-019-02711-4/index.html.

25. Michael Grunwald, *The New New Deal: The Hidden Story of Change in the Obama Era* (New York: Simon & Schuster, 2012), 163.

26. Noah Kaufman, "Dear Republicans: Innovation Is Not Climate Policy," the Hill, January 2020, https://thehill.com/opinion/energy-environment/480545-dear-republicans-innovation-isnt-climate-policy.

27. Colin Cunliff. "Energy Innovation in the FY 2021 Budget: Congress Should Lead," ITIF, March 30, 2020, https://itif.org/publications/2020/03/30/energy-innovation-fy-2021-budget-congress-should-lead.

28. US Council of Economic Advisors, *A Retrospective Assessment of Clean Energy Investments in the Recovery Act*, US Council of Economic Advisors, Executive Office of the President, Washington, DC, February 2016, https://obamawhitehouse.archives.gov/sites/default/files/page/files/20160225_cea_final_clean_energy_report.pdf.

29. Note: the "Waxman-Markey Bill" that passed the US House of Representatives in 2009 but failed in the US Senate in 2010 was a comprehensive climate change legislation that included far more than just a cap-and-trade bill. For a summary, see https://www.wri.org/blog/2009/07/wri-summary-hr-2454-american-clean-energy-and-security-act-waxman-markey.

30. For one example, see Breakthrough Energy Institute, "Low-Hanging Fruit for COVID Stimulus and Decarbonization," April 2020, https://s3.us-east-2.amazonaws.com/uploads.thebreakthrough.org/Low-Hanging-Fruit-Memo.pdf.

31. "A Green Stimulus to Rebuild Our Economy," Medium post, March 22, 2020, https://medium.com/@green_stimulus_now/a-green-stimulus-to-rebuild-our-economy-1e7030a1d9ee.

32. Ryan Lizza, "As the World Burns," *New Yorker*, October 2010, https://www.newyorker.com/magazine/2010/10/11/as-the-world-burns.

33. Jeff Brady, "Climate Change Push Fuels Split on Coronavirus Stimulus," NPR, March 24, 2020, https://www.npr.org/2020/03/24/820268157/climate-change-push-fuels-split-on-coronavirus-stimulus.

34. Skeptical Science, "A Glimpse at Our Possible Future Climate, Best to Worst Case," February 2013, https://skepticalscience.com/print.php?n=1866.

35. For example, see the following two papers: Matto Mildenberger and Anthony Leiserowitz, "Public opinion on climate change: Is there an economy–environment tradeoff?" *Environmental Politics* 26, no. 5 (2017): 801–824, https://doi.org/10.1080/09644016.2017.1322275; Lyle Scruggs and Salil Bengal, "Declining Public Concern about Climate Change: Can We Blame the Great Recession?" *Global Environmental Change* 22, no. 2 (May 2012): 505–15, https://www.sciencedirect.com/science/article/abs/pii/S0959378012000143.

36. Shaikh Eskander, Sam Fankhauser, and Joana Setzer, "Lessons from Global Trends in Climate Change Legislation and Litigation," paper for the 2nd Annual NBER Environmental and Energy Policy and the Economy Conference, May 7, 2020, http://conference.nber.org/conf_papers/f131875.pdf.

37. Matthew E. Kahn and Matthew J. Kotchen, "Environmental Concern and the Business Cycle: The Chilling Effect of Recession," NBER Working Paper No. 16241, issued July 2010; John Kenny, "Economic Conditions and Support for the Prioritisation of Environmental Protection during the Great Recession," *Environmental Politics* (2019), https://doi.org/10.1080/09644016.2019.1680074.

38. V. Bruce and J. Tolentino, "Foreign Aid & the Global Economic Crisis," April 1, 2009, https://asiafoundation.org/2009/04/01/foreign-aid-the-global-economic-crisis/.

39. John Irons, "Economic Scarring: The Long-Term Impacts of the Recession," September 30, 2009, https://www.epi.org/publication/bp243/.

40. Dylan Matthews, "Did the Stimulus Work? A Review of the Nine Best Studies on the Subject," *Washington Post*, August 24, 2011, https://www.washingtonpost.com/blogs/ezra-klein/post/did-the-stimulus-work-a-review-of-the-nine-best-studies-on-the-subject/2011/08/16/gIQAThbibJ_blog.html.

41. J. Bradford Delong, "Stimulus Too Small," *Wall Street Journal*, January 24, 2010.

42. Michael Grunwald, *The New New Deal: The Hidden Story of Change in the Obama Era* (New York, Simon & Schuster, 2012).

43. Laura Paisley, "Political Polarization at Its Worst since the Civil War," USC News, November 8, 2016, https://news.usc.edu/110124/political-polarization-at-its-worst-since-the-civil-war-2/.

Acknowledgments

The author would like to thank three anonymous reviewers who provided useful comments and feedback. The author would also like to acknowledge the contributions of Jason Bordoff, Jon Elkind, David Sandalow, Peter Marsters, Matthew Robinson, Christina Nelson, Artealia Gilliard, Genevieve Morton, and Anna Gossett.

The views in this commentary represent those of the author. This work was made possible by support from the Center on Global Energy Policy. More information is available at http://energypolicy.columbia.edu/about/mission.

About the Author

Dr. Noah Kaufman is an economist and research scholar at the SIPA Center on Global Energy Policy (CGEP) at Columbia University. He conducts research on climate change policies, directs CGEP's Carbon Tax Research Initiative, and teaches a course on Energy Decarbonization.

Under President Obama, Noah served as the deputy associate director of Energy & Climate Change at the White House Council on Environmental Quality. At World Resource Institute, Noah led projects on carbon pricing, the economic impacts of climate policies, and long-term

decarbonization strategies. Previously, he was a senior consultant in the Environment Practice of NERA Economic Consulting.

Noah received his BS in economics from Duke University and his MS and PhD in economics from the University of Texas at Austin, where his dissertation examined optimal policy responses to climate change.

ABOUT THE CENTER ON GLOBAL ENERGY POLICY

The Center on Global Energy Policy provides independent, balanced, data-driven analysis to help policymakers navigate the complex world of energy. We approach energy as an economic, security, and environmental concern. And we draw on the resources of a world-class institution, faculty with real-world experience, and a location in the world's finance and media capital.

Visit us at www.energypolicy.columbia.edu

@ColumbiaUenergy

ABOUT THE SCHOOL OF INTERNATIONAL AND PUBLIC AFFAIRS

SIPA's mission is to empower people to serve the global public interest. Our goal is to foster economic growth, sustainable development, social progress, and democratic governance by educating public policy professionals, producing policy-related research, and conveying the results to the world. Based in New York City, with a student body that is 50 percent international and educational partners in cities around the world, SIPA is the most global of public policy schools.

For more information, please visit www.sipa.columbia.edu