



The Flip Side of Climate Risk

By Gwynne Taraska

April 18, 2017

The global climate effort—like so many other areas of international cooperation—is at a crossroads. More than 140 countries have now officially joined the Paris Agreement and are implementing their climate commitments.¹ At the same time, the United States—the second-largest national emitter of greenhouse gas pollution—is seeking to dismantle its federal-level environmental protections and climate policies.²

For the time being, it remains unclear what role the United States will play in the global movement toward clean energy over the next several years. It is not only a matter of whether the country will be a long-term member of the Paris Agreement—it is also a matter of whether it will constructively participate in the ongoing process. For example, countries are still negotiating major pieces of the agreement, such as the rules on transparent reporting of greenhouse gas emissions.³

It also remains unclear how the international opprobrium that follows any U.S. disengagement would affect other areas of cooperation, such as security and trade, and whether U.S. disengagement would erode the resolve of any other nations to reduce their greenhouse gas pollution.

The upcoming meetings of international forums—including the G-7 and G-20—will begin to provide some clarity on the U.S. position and the international response. In the meantime, there are indications that other major economies are steadfast in supporting the climate effort. The recent G-7 energy ministerial meeting, for example, produced an informal summary with a commitment—from all G-7 members except the United States—to facilitate decarbonization.⁴ Other countries were unwilling to produce the customary formal outcome document, which requires consensus and would have had to cut this commitment.

Given that the G-7 and G-20 aim to promote economic stability and prosperity, it is appropriate that the members of these forums insist on integrating climate change into their agendas.⁵ In fact, failure to integrate it would be economically perverse: It is increasingly understood that climate change poses a range of risks that could disrupt the global economy.

What is less commonly discussed, however, is that climate change also poses a range of opportunities. Major economies, including emerging economies, are positioning themselves to capture a market share of the expanding clean energy economy. China, India, and Brazil, for example, are among the top 10 countries in the world in terms of new renewable energy investment. As nations around the globe begin to implement their goals under the Paris Agreement, China in particular is aiming to dominate renewable energy exports.⁶ It is notable that 6 of the 10 largest photovoltaic cell manufacturers are Chinese companies.⁷

These countries and international forums are likely not motivated primarily by altruism or environmentalism. Rather, it is a matter of global economic stability and national competitiveness. This issue brief discusses the inevitability of the clean energy transition—and the subsequent climate risks—and develops the concept of transition opportunity. In light of these risks and opportunities, self-interested nations will avoid backsliding in their climate commitments—and will not accept backsliding from other nations.

A taxonomy of climate risk

It is manifest that the physical effects of climate change threaten economic stability. Severe weather events and slow-onset events—such as sea-level rise and desertification—can disturb food and water supplies, damage infrastructure, disrupt livelihoods, and drive human migration.⁸

But climate change does not pose only physical risk: It also poses transition risk.⁹ As governments respond to climate change with policies that mitigate greenhouse gas pollution—and as markets shift to favor nonpolluting energy—the value of assets will decline according to their carbon intensity.

The durability of the clean energy transition

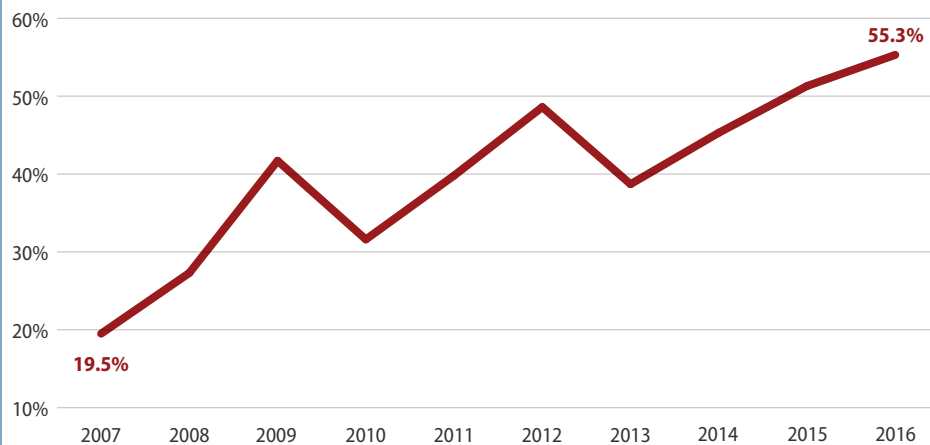
This transition to clean energy—and the associated risk—is resilient in the face of short-term political setbacks. While it would be naïve or disingenuous to claim that individual nations cannot damage the global climate effort by backsliding on their commitments to curb carbon pollution, there are policy and market indications that this would slow rather than reverse the overall trend toward clean energy.

First, the general political resolve to address climate change is unlikely to evaporate. More than 30 nations joined the Paris Agreement after the 2016 U.S. presidential election made it clear that the country was liable to surrender its claim to national-level climate leadership.¹⁰ Meanwhile, other major emitters—including China and the European Union—have reaffirmed their dedication to the pact.¹¹ Similarly, a range of subnational governments across the United States—including California and New York, which are the sixth- and 13th-largest economies in the world, respectively—remain committed to decarbonization.¹²

FIGURE 1

Renewable energy now accounts for the majority of new generating capacity

Global share of new electricity-generating capacity from renewable energy



Note: Electricity-generating renewable energy sources do not include hydropower producing more than 50 megawatts.

Source: Frankfurt School-United Nations Environmental Programme Collaborating Centre/Bloomberg New Energy Finance, "Global Trends in Renewable Energy Investment 2017" (2017), available at <http://fs-unep-centre.org/sites/default/files/publications/globaltrendsrenewableenergyinvestment2017.pdf>.

Second, the decreasing costs of renewable energy are driving increased deployment. Globally, the levelized costs of electricity generation from onshore wind and solar photovoltaics have consistently declined since 2009—and are expected to further decline by 41 percent and 60 percent, respectively, by 2040.¹³ Accordingly, renewable energy now represents the majority of new electricity generation capacity. (see Figure 1)

A measured or destabilizing transition

What is interesting about transition risk is that it is not directly caused by climate change. Rather, it is caused by policy changes and market forces that mitigate carbon pollution.

In a scenario in which warming is limited to within 2 degrees Celsius over preindustrial levels—which is the internationally recognized threshold for avoiding the worst effects of climate change—high-carbon assets will decline in value and trend toward obsolescence. By one estimate, one-third of global oil reserves, nearly 50 percent of gas reserves, and more than 80 percent of coal reserves should remain unburned in such a scenario prior to 2050.¹⁴

But seeking to impede the shift to nonpolluting energy—which is compelled by the empirical fact of climate change and its potentially catastrophic effects—would only increase future physical risks and ultimately necessitate a more sudden and disruptive transition.¹⁵

The question is therefore not whether assets will be repriced in light of their carbon intensity but whether the repricing will be measured or destabilizing.¹⁶ According to the International Energy Agency and the International Renewable Energy Agency, delaying climate action through 2025 would triple stranded assets compared with a scenario in which the transition to clean energy is orderly and unobstructed.¹⁷ Stranded assets in the power sector alone would be 25 percent—or \$80 billion—higher through 2050.¹⁸

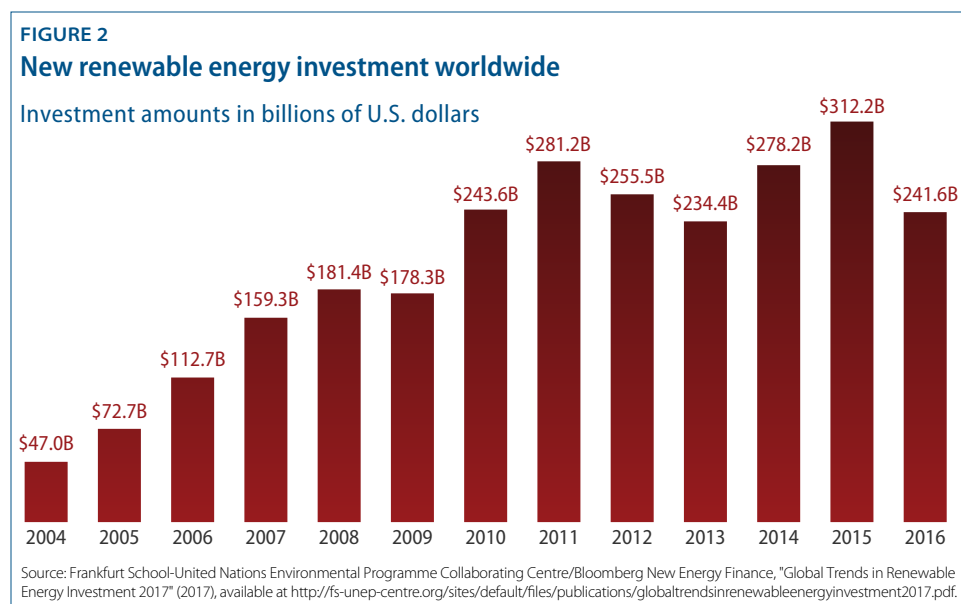
The flip side of transition risk: Opportunity

The recent increased awareness of transition risk is due largely to the efforts of the Financial Stability Board, or FSB, an international body that created the Task Force on Climate-related Financial Disclosures at the request of the G-20. The task force is developing guidelines for companies to provide information on climate risks in their financial reporting and will present their final recommendations to the FSB in June 2017.¹⁹

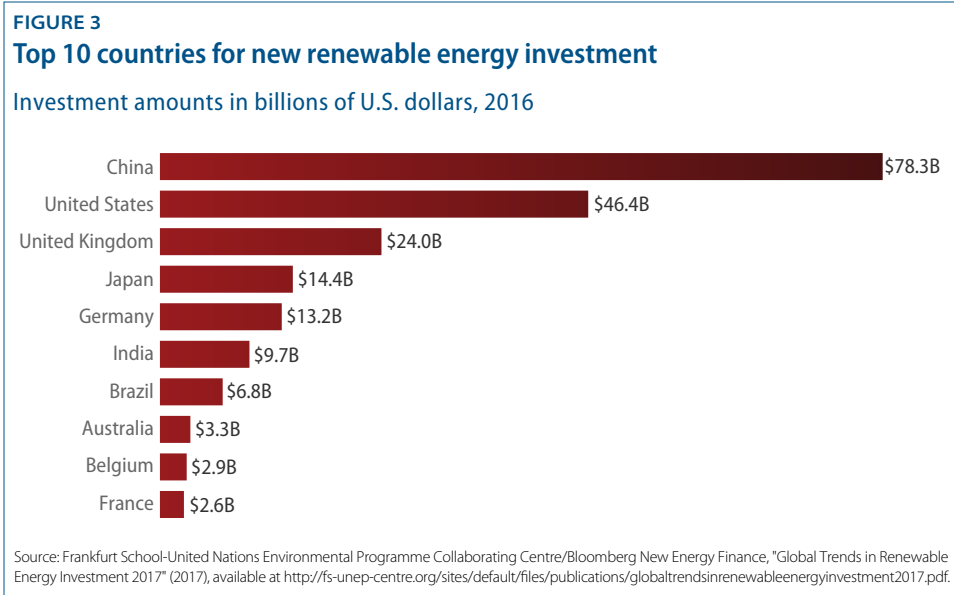
To date, however, there has been less awareness of the flip side of transition risk: transition opportunity. As carbon-intensive assets decline in value, low-carbon alternatives will increasingly be in demand.

Global installation of renewable generation capacity reached a record high in 2016 and accounted for 55 percent of new generation capacity.²⁰ Going forward, solar and wind electricity generation are estimated to increase 18 percent and 12 percent by year, respectively, for the next 15 years—and become the largest electricity sources globally by 2030—in a scenario that limits warming to 2 degrees Celsius through consistent climate action.²¹

Meanwhile, new investment in renewable energy was \$241.6 billion in 2016 and reached a record of \$312.2 billion in 2015.²² (see Figure 2) It is notable that investment in new renewable generation capacity was approximately twice the investment in fossil fuel generation in 2016.²³



But not all countries are investing equally. China is currently the global leader in new renewable energy investment, with a total of \$78.3 billion in 2016. This is 69 percent higher than the U.S. level. (see Figure 3) Overall, developing countries now rival developed countries in new renewable energy investment—even surpassing developed countries in 2015. (see Figure 4)



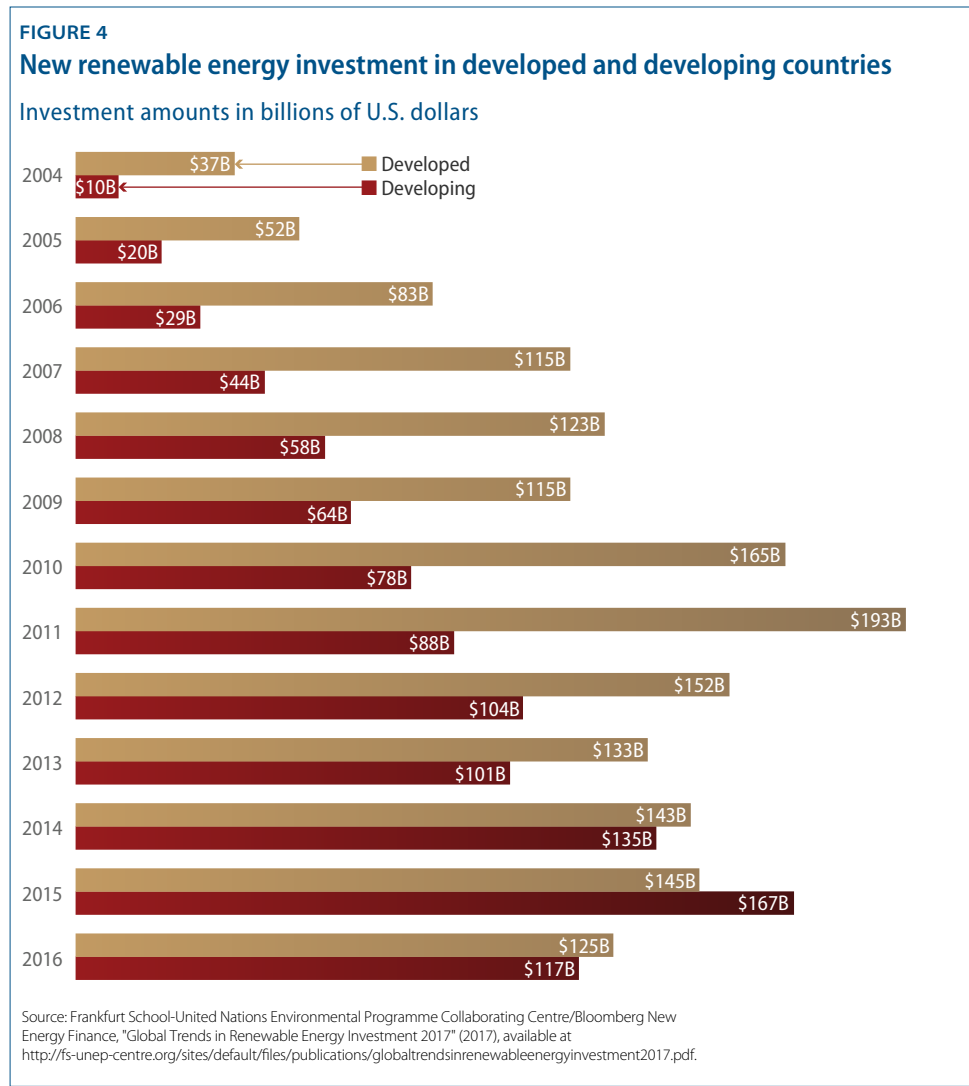
Self-interest and its policy tools

Self-interested governments will avoid equivocating on the commitment to reduce carbon pollution, will not accept equivocation from other countries, and will press ahead with their climate agendas in international forums. The alternative would entail heightened physical and transition risks and missed economic opportunities. The familiar claim that climate policies would cause irreparable economic damage is false and anachronistic.

There are many ways that forums could build upon their work to facilitate financial stability and prosperity.²⁴ For example, they could work to build broad private-sector adoption of the guidelines of the Task Force on Climate-related Financial Disclosures; make continued progress on fossil fuel subsidy reform; and continue dialogues on carbon pricing systems. Countries can also cooperate on clean energy research and development through initiatives such as Mission Innovation.²⁵

International forums could also promote integration of the costs of climate change into decision-making on national regulations, infrastructure, and international development finance. This practice—known as proxy carbon pricing—is particularly valuable from the dual perspective of climate risk and opportunity: It steers investment away from high-carbon projects that could face early obsolescence and toward projects that will remain financially viable in the ongoing pivot toward nonpolluting

energy.²⁶ Proxy pricing is seeing increased uptake in the private sector as companies seek to preserve their long-term profitability. There was a 23 percent increase from 2015 to 2016 in companies that disclosed current or imminent plans to internally price carbon through methods including proxy pricing and internal fees.²⁷



These policy tools and collaborations should transcend ideology. In the United States, for example, it is notable that finance for innovation has a history of bipartisan support: President George W. Bush signed the law that created the U.S. Department of Energy’s Advanced Research Projects Agency-Energy, and Congress voted to increase the agency’s budget just last year.²⁸ Other tools that are in the interest of national and global economic stability and prosperity deserve similarly broad support.

Gwynne Taraska is the Associate Director of Energy and Environment Policy at the Center for American Progress. The author thanks Luke Bassett, Associate Director of Domestic Energy and Environment Policy at the Center, for comments on this brief, and Howard Marano, Research Assistant for the Energy and Environment Policy team at the Center, for research on this brief.

Endnotes

- 1 U.N. Framework Convention on Climate Change, "Paris Agreement - Status of Ratification," available at http://unfccc.int/paris_agreement/items/9444.php (last accessed April 2017).
- 2 For historical emissions by country, see World Resources Institute, "CAIT Climate Data Explorer," available at <http://cait.wri.org/historical/Country> (last accessed April 2017).
- 3 Gwynne Taraska and Howard Marano, "The Perversity of Cutting the International Climate Budget," Center for American Progress, March 16, 2017, available at <https://www.americanprogress.org/issues/green/news/2017/03/16/428450/perversity-cutting-international-climate-budget/>.
- 4 Italian G7 Presidency 2017, "G7 Rome Energy Ministerial Meeting: Chair's Summary" (2017), available at http://www.g7italy.it/sites/default/files/documents/energy_chairs_summary.pdf.
- 5 Gwynne Taraska and others, "Advancing Climate-Compatible Infrastructure Through the G-20" (Washington: Center for American Progress, 2016), available at <https://www.americanprogress.org/issues/green/reports/2016/12/22/295522/advancing-climate-compatible-infrastructure-through-the-g-20/>.
- 6 Melanie Hart, "3 Things Americans Should Know About China in the Paris Climate Agreement," Center for American Progress, February 9, 2017, available at <https://www.americanprogress.org/issues/green/news/2017/02/09/414850/3-things-americans-should-know-about-china-in-the-paris-climate-agreement/>.
- 7 Power Technology, "The world's biggest solar photovoltaic cell manufacturers," April 25, 2016, available at <http://www.power-technology.com/features/featurethe-worlds-biggest-solar-photovoltaic-cell-manufacturers-4863800/>.
- 8 In 2016, losses for weather-related events—including storms, floods, and drought—were \$127 billion globally. Munich Re, "Topics Geo: Natural Catastrophes 2016: Analyses, assessments, positions" (2017), available at https://www.munichre.com/site/touch-publications/get/documents_E-271800065/mr/assetpool.shared/Documents/5_Touch_Publications/TOPICS_GEO_2016-en.pdf; Munich Re, "NatCatSERVICE," available at <https://www.munichre.com/en/reinsurance/business/non-life/natcatservice/index.html> (last accessed April 2017).
- 9 Mark Carney, "Speech: Resolving the climate paradox" (Berlin: Bank of England, 2016), available at <http://www.bankofengland.co.uk/publications/Documents/speeches/2016/speech923.pdf>.
- 10 U.N. Framework Convention on Climate Change, "Paris Agreement - Status of Ratification."
- 11 Ben Blanchard and Alister Doyle, "China, EU reaffirm climate pledges after Trump backs away," Reuters, March 29, 2017, available at <http://www.reuters.com/article/us-usa-trump-global-idUSKBN1701DN>.
- 12 Office of Gov. Andrew Cuomo, "Governor Cuomo and Governor Brown Reaffirm Commitment to Exceeding Targets of the Clean Power Plan," March 28, 2017, available at <https://www.governor.ny.gov/news/governor-cuomo-and-governor-brown-reaffirm-commitment-exceeding-targets-clean-power-plan>.
- 13 Frankfurt School-UNEP Collaborating Centre for Climate and Sustainable Energy Finance and Bloomberg New Energy Finance, "Global Trends in Renewable Energy Investment 2017" (2017), available at <http://fs-unesp-centre.org/sites/default/files/publications/globaltrendsinrenewableenergyinvestment2017.pdf>; Bloomberg New Energy Finance, "Coal and gas to stay cheap, but renewables still win race on costs," June 12, 2016, available at <https://about.bnef.com/blog/coal-and-gas-to-stay-cheap-but-renewables-still-win-race-on-costs/>.
- 14 Christophe McGlade and Paul Ekins, "The geographical distribution of fossil fuels unused when limiting global warming to 2 °C," *Nature* 517 (2015): 187–190, available at www.nature.com/nature/journal/v517/n7533/full/nature14016.html.
- 15 See Carney, "Speech: Resolving the climate paradox." See also European Systemic Risk Board, "Too late, too sudden: Transition to a low-carbon economy and systemic risk" (2016), available at https://www.esrb.europa.eu/pub/pdf/asc/Reports_ASC_6_1602.pdf.
- 16 Ibid.
- 17 International Energy Agency and International Renewable Energy Agency, "Perspectives for the Energy Transition: Investment Needs for a Low-Carbon Energy System" (2017), available at http://www.irena.org/DocumentDownloads/Publications/Perspectives_for_the_Energy_Transition_2017.pdf.
- 18 Ibid.
- 19 For the penultimate report of the task force, which will be finalized after public consultation, see Task Force on Climate-related Financial Disclosures, "Recommendations of the Task Force on Climate-related Financial Disclosures" (2016), available at <https://www.fsb-tcdf.org/publications/recommendations-report/>.
- 20 Frankfurt School-UNEP Collaborating Centre for Climate and Sustainable Energy Finance and Bloomberg New Energy Finance, "Global Trends in Renewable Energy Investment 2017."
- 21 In this scenario of the International Energy Agency, there is a 66 percent chance of limiting warming to 2 degrees Celsius.
- 22 The decrease from 2015 to 2016 was due to the decrease in renewable energy costs, as well as a deceleration of investment in China and Japan. Frankfurt School-UNEP Collaborating Centre for Climate and Sustainable Energy Finance and Bloomberg New Energy Finance, "Global Trends in Renewable Energy Investment 2017."
- 23 Ibid.
- 24 Taraska and others, "Advancing Climate-Compatible Infrastructure Through the G-20."
- 25 Mission Innovation, "Second Mission Innovation Ministerial," available at <http://mission-innovation.net/our-work/mi-2/>.
- 26 See, for example, Gwynne Taraska and Ori Gutin, "The Potential of Proxy Carbon Pricing in International Development Finance" (Washington: Center for American Progress, 2016), available at <https://www.americanprogress.org/issues/green/reports/2016/05/25/138123/the-potential-of-proxy-carbon-pricing-in-international-development-finance/>.
- 27 CDP, "Embedding a carbon price into business strategy" (2016), available at https://b8f65cb373b1b7b15feb-c70d8ead6ced550b4d987d7c03fcd1d.ssl.cf3.rackcdn.com/cms/reports/documents/000/001/132/original/CDP_Carbon_Price_report_2016.pdf?1474899276.
- 28 Advanced Research Projects Agency-Energy, "ARPA-E History," available at <https://arpa-e.energy.gov/?q=arpa-e-site-page/arpa-e-history> (last accessed April 2017); *Further Continuing and Security Assistance Appropriations Act, S.Amdt.3802 to S.Amdt.3801*, 114 Cong. 2 sess. (Government Printing Office, 2016), available at <https://www.congress.gov/amendment/114th-congress/senate-amendment/3802/text>.