

International Climate Cooperation in an Era of Geopolitical Turmoil

by Joshua Busby



Volunteers rescue dogs that were trapped in their flooded houses on May 11, 2024, in Porto Alegre, Brazil. A cold front caused heavy rains that exceeded 150 mm, causing severe damage to the city. JEFFERSON BERNARDES/GETTY IMAGES

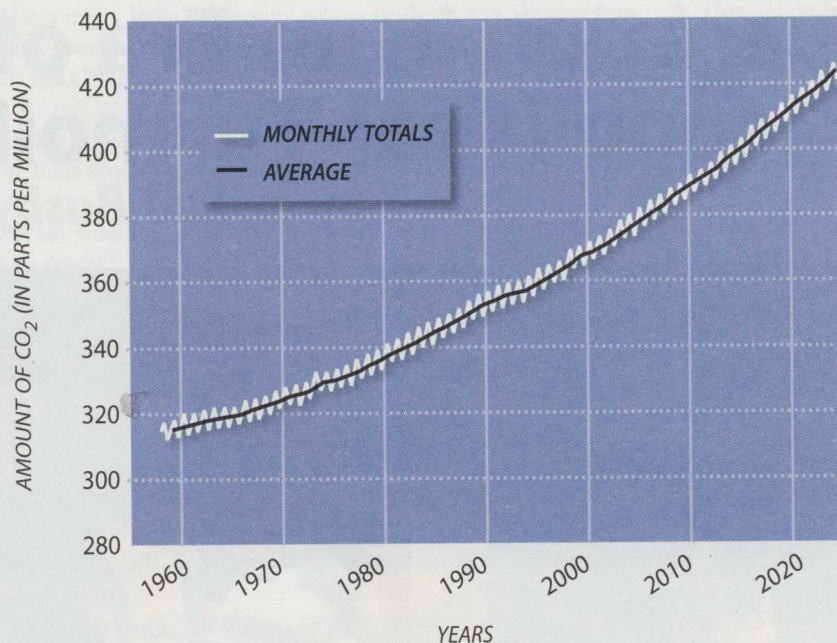
Over the past 30 years, climate change has become one of the central global challenges of the modern era, one that has hugely important consequences for the livability of the planet. In 2015, the international community jettisoned previous approaches to climate change and negotiated a new effort through the Paris Agreement. Prior agreements like the 1997 Kyoto Protocol were based on diplomats negotiating how soon and how fast countries should reduce their emissions of heat-trapping greenhouse gases through legally binding emission reductions.

The Paris Agreement was different. While aspects of the agreement such as reporting were legally binding, others—namely, emissions reductions targets—were not. It was a “bottom-up” agreement based on country pledges of intent to reduce emissions based on nationally determined

circumstances. Even if collective commitments were initially insufficient to avoid dangerous climate change, the hope was that over time countries would raise their ambition through revised pledges, so-called nationally determined

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SOURCE: The National Oceanic and Atmospheric Administration (NOAA)

contributions (NDCs). NDCs are to be updated every five years, with the next cycle due in 2025.

The primary advantage Paris had over prior efforts was that all the major emitters, including the U.S. and China, willingly took on obligations to reduce their emissions. The U.S. (14% of the world's emissions) and China (31%) are the two largest emitters of greenhouse gases, together accounting for more than 40% of emissions of carbon dioxide, the main greenhouse gas. The previous Kyoto Protocol did not have obligations for developing countries like China, which led the U.S. to spurn the agreement. Though President Bill Clinton signed the Kyoto Protocol in 1998, the U.S. did not ratify the agreement.

The Paris Agreement included obligations by all the major emitters. While emissions reductions pledges were not

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legally binding, Paris required states to periodically report on their actions to implement their NDCs and subject them to vigorous peer review. Sunlight, meaning transparency on emissions mitigation efforts, was thought to be an effective mechanism to keep countries honest. The first “global stocktake,” or worldwide assessment of progress, on the experience of implementing NDCs was completed at the 2023 United Nations Climate Change Conference of the Parties (COP28) in Dubai.

Since the Paris Agreement went into effect, the world has changed in major ways. For one, a transition to clean energy looks increasingly feasible with renewable energy sources like wind and solar becoming more affordable and sectors of the economy like transportation becoming more electrified. In the last decade, solar panel prices have declined by 90%, onshore wind prices have declined by 70%, and the cost of batteries has declined by more than 90% globally. These developments make the clean energy transition in key sectors much more feasible. However, other developments have made action

on climate more difficult, including political developments in the U.S., the Covid-19 pandemic, Russia's invasion of Ukraine, and rising tensions between the U.S. and China.

This essay surveys where we are on emissions of greenhouse gases, the current state of global cooperation on climate change, geopolitical impediments to future progress, and whether and how the U.S. can potentially contribute to international efforts going forward.

Where we are on climate change

Climate change is caused by the emissions of greenhouse gases, which trap heat in the atmosphere and change rainfall and temperature patterns in other ways. Emissions of greenhouse gases come from the burning of fossil fuels like coal and oil, which releases carbon dioxide, the main greenhouse gas, into the atmosphere where it can remain for more than 100 years. Emissions of carbon dioxide also come from deforestation and degradation of agricultural lands, as carbon dioxide locked up in trees and soils are released into the atmosphere. Carbon dioxide accumulates in the atmosphere. By 2024, the average concentration was more than 420 parts per million, the highest level in 2 million years. Emissions also come from other greenhouse gases such as methane, which can enter the atmosphere from leaky natural gas wells and remain in the atmosphere for about a decade.

To prevent dangerous climate change from occurring, scientists say that net emissions of greenhouse gases need to fall to zero by the middle of this century or soon thereafter. The 2015 Paris Agreement reaffirmed the long-standing goal of avoiding dangerous climate change by keeping global temperatures from rising more than 2°C (3.6°F) above what average global temperatures were at the start of the Industrial Revolution. The agreement also articulated a more ambitious aspiration of keeping global temperatures from rising 1.5°C (2.7°F) above pre-industrial levels.

That latter goal looks like it is out of reach. Global temperatures on average

are already more than 1.1°C (1.9°F) above pre-industrial levels. In 2023, average monthly temperatures temporarily exceeded 1.5°C (2.7°F) above pre-industrial levels. Global temperatures will likely stay consistently higher than 1.5°C (2.7°F) above pre-industrial levels by the early 2030s.

The United Nations Environment Program (UNEP) produces an annual Emissions Gap Report. In their 2024 report, UNEP noted that global greenhouse gas (GHG) emissions continue to rise. From 2022 to 2023, GHG emissions increased by 1.3% (a new record of 57.1 gigatons of carbon dioxide equivalent).

UNEP reviews the state of pledges of NDCs compared to what would be required to meet either the 1.5°C (2.7°F) or 2°C (3.6°F) goals. Countries make two kinds of pledges, *unconditional* pledges of intent (not taking into account the need for external resources) and *conditional* pledges of intent (what they might do with international support). The report estimated that if fully implemented there is a 66% chance that current unconditional pledges will lead to peak warming of 2.8°C (5°F) by the end of this century and 2.6°C (4.7°F) of warming if we take conditional pledges into account.

At the time the Paris Agreement was negotiated in 2015, global emissions were projected to increase 16% by 2030, but policies enacted since then have lowered the projected increase to 3%. However, that is still a far cry from what is needed to be on a path for avoiding a 2°C (3.6°F) increase. Global emissions would need to fall 28% below 2015 levels by 2030 to have a good chance of avoiding a 2°C (3.6°F) increase. If all the unconditional and conditional NDCs are implemented, emissions are projected to fall 2%–9% below 2015 levels by 2030. This is nowhere near the 28% needed.

The world still has the potential to avoid the worst effects of climate change by shaving off future temperature increases through concerted action to reduce emissions. Scientists say that every tenth of a degree matters, in part because while climate change is

a global phenomenon, the effects are not equally distributed. That means if global temperatures increase on average by 2°C (3.6°F), they are likely to increase by orders of magnitude more in some places such as the poles. Actions that reduce global average temperatures by a bit will thus be magnified for parts of the planet.

Current policies on climate change have already changed the likely trajectory of future warming, lowering projected future average temperature increases from well above 3°C (5.4°F) to below 3°C (5.4°F). More progress can be made if the clean energy transition unfolds more rapidly. In addition, action on gases like methane, which do not stay in the atmosphere very long, can show up in avoided warming more quickly. One estimate suggests action on methane and other short-lived gases could avoid as much as 0.5°C (0.9°F) of warming by 2050.

The architecture of global climate cooperation

Climate change has been considered the most difficult global collective action problem given the challenges of providing global public goods, the large number of actors whose behavior

must change, the fact that most benefits will accrue to future generations, and the centrality of fossil fuels to modern economies. Because of the absence of strong enforcement mechanisms in the international system, making promises between states is challenging and produces fears of cheating. Some liken it to a prisoner's dilemma where everyone would be better off cooperating, but countries have individual incentives to free ride and let others incur the costs of cooperating with an international agreement.

More recently, scholars have suggested that redistributive politics both within and between countries are a bigger impediment to action with incumbent fossil fuel intensive asset holders resisting the transition to clean energy even as other clean asset holders and those affected by climate change rally to change policy. Both collective action problems and redistributive politics impede effective climate cooperation and require nuanced policy responses.

When most people think of international climate action, they probably think of the annual climate negotiations where delegates and observers from around the world convene in different far-off locations to hammer out the rules for climate cooperation. Last year's negotiations



A sign warns visitors about the heat at Mesquite Flat Sand Dunes in Death Valley National Park during a heat wave impacting Southern California on July 7, 2024. Temperatures in Death Valley reached as high as 130°F (54°C), according to the National Weather Service. ETIENNE LAURENT/AFP VIA GETTY IMAGES

were held in Dubai and were attended by more than 80,000 people, with delegations from 199 parties to the United Nations Framework Convention on Climate Change (UNFCCC). In mid-November 2024, those negotiations were held in Baku, Azerbaijan.

Since 1992, countries that are parties to the convention have been meeting annually at the Conference of the Parties (COP). The meeting in Baku was the 29th meeting of the COP. This meeting presages the 2025 negotiations when countries are supposed to announce their updated NDCs under the Paris Agreement.

However, this image of the climate negotiations being the center of the universe for climate change action is somewhat misleading.

For one, the international architecture for climate action is largely in place, and we have entered a period of national implementation of climate commitments where countries need to get on with keeping their promises. Increasingly, what happens inside key polities—namely China, the U.S., India, and the European Union (EU)—is more important than what happens at these international gatherings.

Competitive target-setting in international climate meetings has

somewhat run out of steam. As Navroz K. Dubash, a professor at Princeton University writes, “This perspective is limiting. It focuses attention on the politically costly task of allocating obligations and reduces implementation to a technocratic second step. Instead, given diverse national contexts, implementation is not just a challenging second step, but, through the larger process of national policy-making, may be the driving force behind envisioning and realizing low-carbon futures. Implementation can drive these futures by generating context-specific narratives and supportive policies that shift domestic climate politics, including by generating political benefits.”

The international negotiations still serve a purpose. Because these gatherings are global, they serve as one of the primary venues where developing countries can express their concerns. Developing countries have the least responsibility for climate change but are most vulnerable to its impacts. These countries have been able to make common cause and articulate the importance of expanded ambition to address climate change as well as the need to deal with the impacts they are already experiencing.

For example, at COP26 in 2021, the

EU and the U.S. announced the Global Methane Pledge, a voluntary initiative to reduce emissions of methane by 30% below 2020 levels by 2030. While non-binding, this pledge focused action on a piece of the climate problem. Those involved could share best practices and elevate ambition to avoid significant warming in the short-run.

The 2023 climate negotiations in Dubai led to an agreement to create a new Loss and Damage Fund to compensate countries for climate damages they have already experienced. Pledges to that fund totaled \$700 million, while estimates of annual damage suggest developing countries may need as much as \$70 billion to \$100 billion a year by 2050. Those optimistic about climate negotiations heralded the creation of the fund, which is to be managed by the World Bank, though those more pessimistic note the small size of the resources the fund will initially command relative to the need.

In addition, those bullish about international climate negotiations will note that after much debate, last year’s gathering in Dubai included a roadmap text supporting a “transition away from fossil fuels.” Those more bearish on these negotiations emphasize that nonbinding texts are not self-executing and that the transition will ultimately depend on actions by states and private sector actors making investment choices. Whatever your take on the relative significance of the climate negotiations broadly, the 2025 COP, which will be held in Brazil, will be among the most important as countries will be asked to update their NDCs in advance of that meeting.

That said, media accounts of these negotiations continue to imbue them with a sense of possibility and expectation that is somewhat misplaced. Much of the real action is happening elsewhere, namely inside states through policies such as the Inflation Reduction Act (IRA) in the U.S. and policies enacted by China to support deployment and export of clean energy technologies. There have been a few breakthroughs in international negotiations like the new Loss and Damage



A woman walks near the COP29 stand in Baku, Azerbaijan, on July 28, 2024. The 2024 UN Climate Change Conference (COP29) convened in November 2024 in Baku. AZIZ KARIMOV/GETTY IMAGES

Fund created last year to compensate countries for climate impacts they have already experienced. However, we have to rebalance our understanding of what the international climate negotiations can deliver at this point.

A second observation is that the climate negotiations are not the only international venue where climate change is being discussed. In 2011, the political scientists Robert Keohane and David Victor wrote about the so-called regime complex for climate change. Regimes are the constellations of rules and institutions that govern decision-making in a particular issue area. For climate change, unlike other problems such as the ozone hole over Antarctica caused by atmospheric chemical pollution, there is no central dominant organization that has hierarchical control. Rather, pieces of the climate change problem are dealt with in different forums: shipping emissions through the International Maritime Organization and aviation emissions through the International Civil Aviation Organization. Other organizations like the World Bank deal with climate finance.

As climate touches additional areas of economic life, from electricity to transport to forests to the movements of peoples to security, organizations with a remit in those areas increasingly have a climate component to their work. There are scores of ad hoc and bilateral and mini-lateral efforts that take on a piece of the climate change crisis, such as the transnational Minerals Security Partnership, which seeks to organize consumers of critical minerals to sustainably and ethically source materials necessary for the clean energy transition.

Keohane and Victor write about regimes, “When states invest resources in building regulatory regimes, the outcomes can vary along a continuum. At one extreme are fully integrated institutions that impose regulation through comprehensive, hierarchical rules. At the other extreme are highly fragmented collections of institutions with no identifiable core and weak or nonexistent linkages between regime elements.”

Climate change, in their view, is somewhere in the middle of these



Boya Ali Karani, 64, wades through floodwaters in his inundated neighborhood in Garissa, Kenya, on May 9, 2024. This was one of Kenya's worst floods in recent history, one of a string of weather catastrophes following weeks of extreme rainfall that scientists have linked to a changing climate. LUIS TATO/AFP VIA GETTY IMAGES

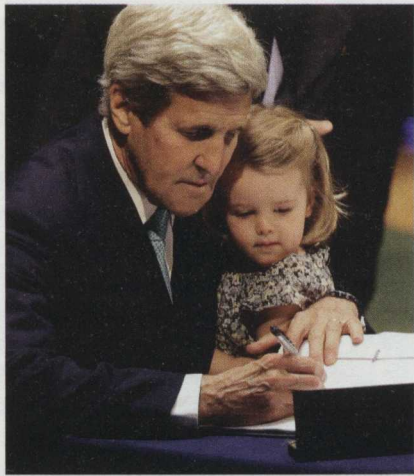
extremes, a product of the constellation of state interests and the challenges of forging cooperation in this space. They counseled that policymakers should turn this fragmentation and diversity into a source of strength with innovation and tailored problem-solving in different venues: “At the present juncture, however, both political reality and the need for flexibility and diversity suggest that it is preferable to work for a loosely linked but effective regime complex for climate change.”

There was a moment after the Paris Agreement when there was optimism that the agreement and the annual climate meetings would take on a more central coordinating role between these various forums. Since then, a variety of developments have led to that promise being unfulfilled. As Columbia Law School Professor Charles Sabel and Professor David Victor at the University of California–San Diego School of Global Policy and Strategy write, “The expectation (including, for a time, ours) has been that Paris was destined to become the central node in this regime complex, loosely coordinating both national programs and international organizations....The reality, as we see it, is that Paris is and for the foreseeable future will remain less

central than hoped.” They expressed disappointment that reporting and peer review mechanisms of the Paris Agreement were insufficiently rigorous and that the agreement as a whole did not do enough to encourage experimentation and learning.

Rigorous or not, the UN released the first “global stocktake” report at the 2023 climate negotiations, reflecting on the experience of implementation of the Paris Agreement six years after it had entered into force. These stocktakes are to be carried out every five years. While many countries now have pledges to lower their emissions to net zero by the middle of this century or soon thereafter (97 parties covering 81% of global emissions, according to UNEP), there are insufficient policies to get there.

The upshot of these observations is that we should pay as much attention to local, bilateral, and international developments and gatherings as we do to the international climate negotiations. For example, international financial institutions like the World Bank have been struggling to mobilize more climate finance. More attention ought to be paid to efforts to reform the World Bank and other financial institutions to mobilize more low-cost finance to



U.S. Secretary of State John Kerry holds his granddaughter Isabelle Dobbs Higginson while he signs the Paris Agreement on Climate Change at the UN Headquarters in New York City on April 22, 2016. UPI/ALAMY

support the clean energy transition. There is also the sense that ongoing debt problems in developing countries require a new round of debt relief to give the countries the fiscal space to invest in clean energy and adaptation, with the Paris Club, the Group of 20 (G20), and other major creditor groups potentially important for debt-for-climate compacts. Similarly, the Group of Seven (G7) has debated phaseout of fossil fuel subsidies for more than a decade. Covid-19 and Russia's invasion of Ukraine may have complicated that agenda, but it is another area of ongoing work and one where students of climate cooperation ought to pay attention.

Many initiatives dovetail with and convene at the climate negotiations, such as the Powering Past Coal Alliance, a coalition of states, subnational authorities, and other actors committed to moving past coal as a source of energy. Efforts like these illustrate that the climate change challenge extends beyond the work of nation-state, and that private sector actors, nongovernmental organizations, and subnational governments are all important in both reducing emissions of greenhouse gases and in preparing for the consequences of climate impacts. On the private sector side, we have seen efforts like Bill Gates's Breakthrough Energy, a network to mobilize capital and new

technology to support the clean energy transition. Other initiatives like the C40 Cities Climate Leadership group and the Under 2 coalition seek to mobilize mayors and subnational governments respectively from across the world to share best practices.

A number of scholars have been quite optimistic about the prospects for non-state actors and subnational governments to act as change agents to spur the clean energy transition and have sought to document their contributions to global climate action. Early studies of their impacts show mixed results, but nonetheless these actions suggest that they merit significant attention in their own right.

Ultimately, these examples demonstrate that the climate change problem is now widely anchored in many different international institutional forums beyond the climate negotiations and involve states, subnational governments, private companies, and nongovernmental organizations. As different venues tackle pieces of the problem, it can be useful to examine both whether

the entire universe is delivering on aspirations and promises and whether specific problem-focused initiatives are bearing more fruit than others.

Climate change and the return of geopolitics

Why has cooperation on climate change become more difficult since the enactment of the Paris Agreement?

First, political developments in the U.S. removed the country from a leadership position on climate for four years from 2016 to 2020. After the Obama administration successfully helped negotiate the 2015 Paris Agreement, the 2016 U.S. election brought to power Donald Trump, who opposed action on climate change. President Trump temporarily withdrew the U.S. from the Paris Agreement. He announced his intention to withdraw the U.S. in 2017, but that withdrawal only became legally effective in November 2020 under the rules of the Paris Agreement.

While the U.S. immediately rejoined the Paris Agreement in January 2021

Climate finance—An umbrella term for grants, loans, bonds, and policies that aim to provide funding and incentivize the direction of material resources (particularly monetary) toward substantial action to mitigate and adapt to climate change. This can include funding-related investing in renewable energy, reforestation, or infrastructure projects designed to prepare countries for extreme weather events and rising sea levels. Climate finance can be sourced from either private or public funds, including corporate investments such as foreign direct investment (FDI), international organizations, development banks, financial institutions, and governments.

G7—An informal group of advanced democracies that meet to discuss global economic policy and transnational issues. They focus on reducing greenhouse gas emissions and coming up with adaptation strategies that deal with the effects of climate change.

G20—An informal group of nations with the largest economies that meet to discuss issues regarding economic growth, trade, sustainable development, food security, and more. They shape international cooperation on these topics and address many ongoing issues, such as biodiversity, climate finance, and emissions reduction.

Paris Club—A group of creditor governments who work together to find solutions to payment problems faced by nations with severe debt. The Paris Club restructures and reschedules debt so countries can maintain financial stability. It also strives to create debt solutions that are aligned with broader sustainable economic goals.

after Joe Biden took office, under Trump the U.S. had done little to implement the Paris Agreement at home and did not play a positive role in the negotiations as the rules of the Paris Agreement were finalized. The Trump administration's actions also gave cover to other governments like Brazil and Australia, which were at the time also hostile to action on climate change.

A second reason why the progress and cooperation on climate change became more challenging was the interruption caused by the Covid-19 outbreak. COP25 was held in Madrid in December 2019, but COP26 was postponed in the wake of the Covid outbreak until the end of October 2021. Even then, Covid-19 restrictions limited the number of participants, though an impressive 40,000 people ultimately attended the 2021 negotiations in Glasgow. The annual climate negotiations are only part of the work, as there are usually interim substantive technical meetings between the annual negotiations. The pandemic made it much more challenging to carry out face-to-face gatherings, though there was a pivot to more virtual engagements online.

More important than the delay in the meetings was the diversion of attention and resources that responses to the pandemic required. The pandemic led to a steep drop in global economic activity and a temporary drop in emissions of greenhouse gases of about 5% in 2020 before rebounding and increasing in subsequent years. As governments engaged in stimulus activity to support their citizens affected by the pandemic, there was hope that those funds would support low-carbon activities and the clean energy transition. However, scholars found that governments directed a relatively small share of resources, some 6% of \$14 trillion in economic stimulus, to activities that would reduce emissions. This development underscores that governments had other priorities during this period than climate change and were focused on addressing the health crisis, maintaining access to key goods, and preventing global economic collapse.

A third reason climate cooperation has become harder is Russia's invasion of Ukraine in February 2022. This has had mixed implications for the EU's decarbonization goals. The EU was in a precarious position vis-à-vis Russia, importing 40% of its natural gas from Russia in 2021, before the war. There were real concerns that Russia would shut off natural gas supplies in the dead of winter in retaliation for Europe's support for Ukraine. Europe's policy responses to avert such an outcome have in the short-run put at risk some of the climate goals Europe has in place. Not only has a land war near the EU diverted considerable attention and resources to defend Ukraine and the frontline states of Eastern Europe, but Europe has invested considerable resources to reduce its reliance on Russia for gas and to a lesser extent petroleum.

That effort has largely been successful, with the EU's reliance on Russian gas declining to 8% of its needs in 2023. To achieve that, Europe has heavily sourced gas from other natural gas producers such as the U.S. Countries like Germany have built emergency terminals for imported liquified natural

gas, deepening Europe's infrastructure for and use of natural gas, which makes decarbonization of its energy system more challenging in the short-run. However, Europe has also used the moment to invest in renewables and broader decarbonization, which may ultimately facilitate the EU's transition to net zero in the longer run.

The fourth and perhaps most important reason the prospects for global cooperation on climate change have become more challenging is the rise of geopolitical rivalry between the U.S. and China. The Paris Agreement was possible because the U.S. and China had held a series of bilateral conversations in the lead-up to the agreement and ultimately blessed the approach that came out of the negotiations. It is hard to imagine that a similar agreement could be possible now, given the degree of rancor between the two countries.

China has become much more forceful about defending its interests and extraterritorial ambitions in the South China Sea. China has successfully absorbed Hong Kong into its orbit following the British handover of the territory in 1997. By repressing local



Thousands of advocates representing climate-impacted communities, youth, labor unions, anti-coal and renewable energy campaigners, and more joined the Global Climate March on November 28, 2015, in Quezon City, Philippines. The marchers called for climate justice on behalf of vulnerable nations like the Philippines and demanded an ambitious global climate agreement ahead of the international UN climate talks. PACIFIC PRESS MEDIA PRODUCTION CORP./ALAMY

activists and neutering Hong Kong's democratic institutions, China has hardened U.S. perceptions that it has wider ambitions to remake the region (and beyond) in its own image. Since 2015, the U.S. has elevated China as a strategic competitor in its national security doctrine and its national defense strategies under both Republican and Democratic presidents.

Mainland China also sees Taiwan as part of its territory. Though Taiwan has its own democracy, the island has long held an ambiguous position internationally, since it is not recognized as a state. The U.S. has provided aid to Taiwan to retain its ability to defend itself while also maintaining a position of strategic ambiguity about whether it would come to Taiwan's defense in the event of a Chinese invasion. This is meant to both deter China from invading and deter the Taiwanese from declaring independence, lest that trigger a war. In August 2022, then U.S. Speaker of the House Nancy Pelosi visited Taipei to support Taiwan's democracy, making her the highest-ranking U.S. official to have visited the island in 25 years. That move led the Chinese to temporarily suspend bilateral climate conversations with the U.S. government.

In July 2023, then U.S. Climate Envoy John Kerry traveled to Beijing

to try to restart conversations. It wasn't until November 2023 that the U.S. and China announced a new working group on climate cooperation in the Sunnylands Statement, which came out of a bilateral meeting between Presidents Biden and Xi in San Francisco. Technical cooperation on methane and carbon capture were among the areas where the countries agreed to work together. In early May 2024, the working group met in Washington, DC, with a follow-on event about subnational cooperation held at the end of the month in San Francisco. These meetings mostly kept the conversation going through a series of information exchanges.

Despite this apparent progress, the degree of technical cooperation between the U.S. and China has become more fraught, not simply because of enhanced geopolitical tension between the two countries but also because of intense economic competition. China's immense manufacturing capacity has been buttressed by industrial policy of state subsidies, leading Western policymakers to fear that China will dominate manufacturing in more sectors of the global economy, including growth sectors like clean technology.

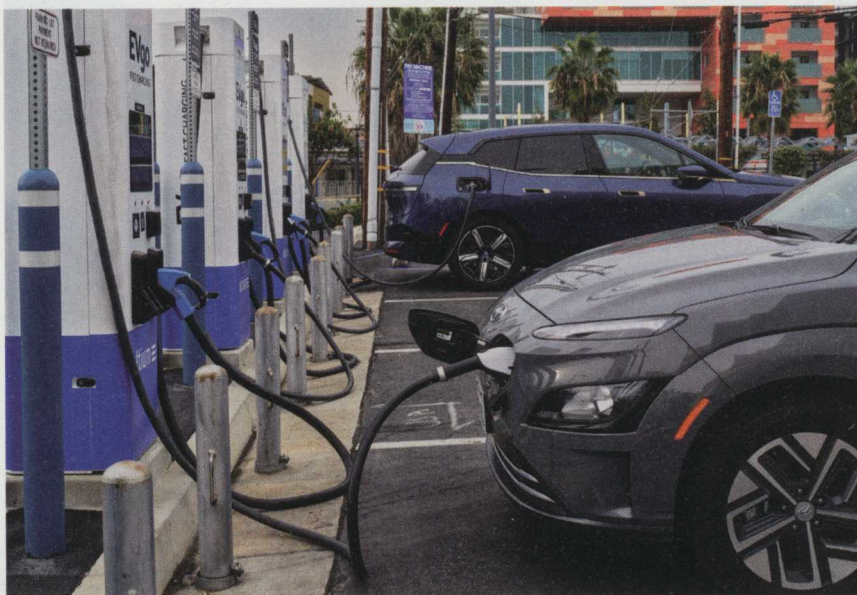
China has come to dominate manufacturing in solar panels as well as in

the processing of critical minerals and batteries for the electric vehicle supply chain. Many of the original technological breakthroughs for those innovations were developed in the U.S. and Europe, but they deployed at scale in China. In the 1990s, Western companies thought transfer of intellectual property to China might be a price worth paying if they could gain access to a lucrative and large Chinese market. However, for a variety of reasons, that hasn't been as successful as Western companies had hoped.

While there are still areas like carbon capture and methane emissions reduction where there is scope for broader U.S.-China technical cooperation, there are heightened concerns about intellectual property transfer, particularly for dual-use technologies like semiconductors, which have military applications. The U.S. has imposed export restrictions on China's access to high-end semiconductor technology. Such concerns may make it more challenging for U.S.-China technical cooperation in the climate and climate-adjacent space.

At the same time, China is now at the technological frontier of the manufacture of clean technologies, having developed the capacity to build solar panels, batteries, and electric vehicles. China is deploying more renewable energy technologies at home annually than the rest of the world combined. In 2023, China accounted for 63% of global renewables installations. China has immense manufacturing capabilities to export clean technologies around the world. In 2024, 81% of solar panels were produced by China, much of that for domestic production, but China's supply of panels was nearly three times that of global demand for panels. That has led to steep price declines for solar panels, which is a boon for installing clean electricity around the world.

However, producers of those same goods in other markets are finding it difficult to stay in business, given the immense scale of China's capacity, which is starting to show up in other sectors such as electric vehicles. The prospects of high-quality, low-cost electric vehicles from Build Your



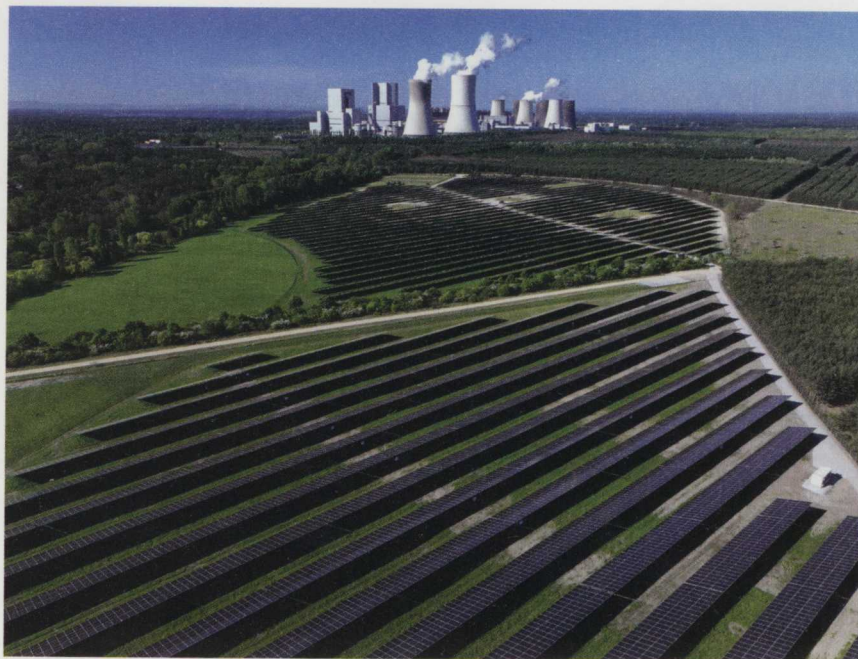
An electric vehicle charging station in a parking lot in Santa Monica, California, on January 24, 2024 PHILIP CHEUNG/THE NEW YORK TIMES/REDUX

Dreams (BYD) and other Chinese automakers have spurred a round of tariffs from both the U.S. and the EU. There are worries that protectionist measures could slow down the clean energy transition. In this context of geopolitical rivalry and economic competition, the jury is still out on whether this competitive landscape can spur a race to the top and work for climate protection rather than against it.

Can the U.S. lead?

Countries can take on leadership roles in addressing climate change in a variety of ways. They may have *material* power to shape the actions of others by mobilizing finance or access to their markets. They can provide *directional* leadership through the power of their own example. They can also offer *intellectual* leadership through innovation of new ideas such as direct air capture to take carbon dioxide out of the air or new battery chemistries for electric vehicles. They can also offer *instrumental* leadership by creating new coalitions such as the Global Methane Pledge or the Minerals Security Partnership. Leading countries need both the capability to lead and the will. They also need followers to respond to their leadership efforts, and states vary in their receptiveness to environmental messages and capacity to implement climate policies.

While the U.S. is still by far the world's dominant military power, economic power has become more diffused with the rise of the EU and China. Still, the U.S. has the largest economy in the world and is the second-largest emitter of greenhouse gases behind China. Policies like the 2022 Inflation Reduction Act (IRA) shape access to the U.S. market. Between August 2022 and July 2024, the IRA already crowded \$94 billion in investment into the U.S., including more than \$21 billion from Japan and \$19 billion from South Korea. Internationally, the U.S. is the largest provider of foreign assistance and has a strong role in international finance institutions. Though the Chinese government may possess more capacity to directly support state-owned enterprises



The Boxberg coal-fired power plant stands behind the newly inaugurated PV-Park Boxberg solar energy park on April 30, 2024, in Nochten, Germany. LEAG, the energy company that owns both, is building what it claims will be Germany's biggest concentration of green energy production, with solar energy parks and wind farms that will have a capacity of 7 gigawatts by 2030 under the so-called GigawattFactory project. Germany is seeking to shutter its coal-fired energy production by 2038. SEAN GALLUP/GETTY IMAGES

internationally, U.S. government institutions like the U.S. International Development Finance Corporation can also shape efforts by American companies abroad. Clearly, the U.S. retains material capacity to lead.

On other leadership dimensions, the U.S. is still relevant, as the second-largest emitter of greenhouse gases, as the source of major scientific breakthroughs and innovation, and as the creator of new clubs and venues to address different dimensions of the climate problem. China's importance has risen given its share of global emissions, its own scientific advances, and efforts like the Belt and Road Initiative to finance infrastructure projects around the world. Nonetheless, the U.S. still has leadership capabilities of its own given its rich history of fostering innovation. Indeed, advocates think the IRA may lead to innovations in key industrial sectors and help bring down the cost of clean energy technologies, which could benefit the rest of the world.

It is worthwhile to expand on the scale and scope of the IRA and how it might enhance the capacity of the U.S. to lead by example. The IRA was

advertised as providing \$369 billion to support clean energy. By one estimate, roughly \$270 billion of those funds consisted of tax incentives to support domestic manufacturing of renewables, clean fuels, clean hydrogen, nuclear power, energy efficiency, carbon sequestration, and other uses. The act also included consumer credits for electric vehicles, efficient appliances, and home remodeling. The act enhanced the lending authority of the government to support clean energy, including the Department of Energy's Loans Office, expanding existing lending authority by \$100 billion and creating a new lending authority for energy infrastructure up to \$250 billion.

These investments should show up in reduced emissions of greenhouse gases, putting pressure on other governments to expand their climate ambition. The first NDC from the U.S. pledged to reduce U.S. emissions 50%–52% below 2005 levels by 2030. Without the IRA, U.S. emissions were projected to decline only 24%–35% below 2005 levels by 2030. Independent studies estimate that with the IRA, U.S. emissions will fall further, 31%–44% below



A man walks through a debris-covered street after flash floods hit the Sedavi region of Valencia, Spain, on October 30, 2024. Spanish authorities reported that at least 62 people had died in the area overnight after flash flooding followed heavy rain. DAVID RAMOS/GETTY IMAGES

2005 levels by 2030 by one estimate and 37%–41% by another. While that isn't enough to meet the goals of the NDC, the IRA will help get the U.S. closer to the 50%–52% 2030 target. Moreover, IRA investments could have transformational impacts on the energy sector and emissions as the U.S. decarbonizes, driving down the cost of emergent clean energy technologies in industrial emissions with benefits for the rest of the world.

The transformational effects of the IRA may also be underestimated. The amount of money associated with IRA tax incentives was based on an assessment of the likely take-up by private sector actors, but the IRA does not cap the level of incentives. Tim Sahay, co-director of the Net Zero Industrial Policy Lab at Johns Hopkins University, describes the uncapped incentives as “bottomless mimosas.” The Congressional Budget Office initially scored the IRA clean energy tax credits as costing \$390 billion over 10 years, but more recent forecasts from the Brookings Institution suggested higher take-up of these incentives could increase the overall cost to \$1 trillion over the same time period. If those funds are put to good use, that could speed the transition to clean energy in

the same way that China's support for renewables have dramatically helped spur price declines in wind energy production, solar power, and batteries.

That said, the IRA also complicates U.S. leadership. A portion of the electric vehicle tax credits that the U.S. enacted through the IRA only extends to companies from countries that have free trade agreements (FTAs) with the U.S. Lacking such an FTA, Japan successfully lobbied for its minerals' exports to the U.S. to be considered eligible for the tax credits. Other countries like Indonesia have not yet been so successful. As more countries embrace industrial policy and national economic competitiveness, U.S. industrial policy could complicate global efforts to address climate change, which relies on interdependent clean technology supply chains. The broader economic challenge posed by China and its efforts to reduce its own reliance on coal may spur the U.S. and other countries to enact border tax adjustments and other trade measures to restrict Chinese imports into their territory. Whether these ultimately enhance climate protection is unclear.

In other areas, the U.S. has had more trouble playing a leadership role, not because of limited capability but

because of insufficient domestic political will. Over the past 30 years, the U.S. has inconsistently sought to lead on climate change, with its climate policy frequently oscillating depending on which political party has control of the White House. When Democrats have controlled the White House, they have sought to support international processes like the Kyoto Protocol and the Paris Agreement, while Republicans have largely opposed those agreements.

Political constraints also limit Congressional support for international climate finance. Developing countries have large needs for finance to support the clean energy transition and adaptation to climate impacts. Under the Paris Agreement, the international community promised to mobilize \$100 billion per year of public and private money for developing countries by 2020. That may have been finally met in 2023.

For its part, the Biden administration promised to double climate finance to \$11.4 billion by 2024, with \$3 billion to support adaptation to climate change as part of the President's Emergency Plan for Adaptation and Resilience. In its 2023 progress report, the administration claimed that it was on track to meet both goals, but independent analysis suggests a large gap between what the administration has asked for in recent fiscal years (\$4.5 billion and \$5.6 billion in 2023 and 2024) and what Congress has appropriated as explicit climate finance funds (slightly more than \$1 billion each year). If the administration is claiming its targets are met, it may be through creative accounting that counts other policy areas towards its climate commitments. Even if these commitments are met, the overall \$100 billion pledge itself is a far cry from what is needed, and the U.S. share in any case is inadequate.

There are more urgent problems that speak to the willingness of the U.S. to lead on climate change. The U.S. held its presidential election in early November 2024, and former President Donald Trump won. He will likely seek to withdraw the U.S. from the Paris Agreement again and is hostile to many of the climate initiatives set in motion

through the IRA. The 2024 U.S. election had a major bearing on the tenor of climate negotiations in Azerbaijan, which were held shortly after the U.S. presidential election.

The biggest item agenda for the climate negotiations was determining a “new collective quantified goal” on climate finance for developing countries to replace the \$100 billion pledge discussed earlier. Advocates would like this goal to be increased by orders of magnitude to several hundred billion dollars per year upwards to \$1 trillion or more. This would include government and private sector money, and key sources of diplomatic friction are about which governments would be expected to contribute (would countries like China be included?) and whether the money would come more in the form of grants or loans.

Even if Donald Trump had not won the 2024 U.S. election, a Kamala Harris administration would have found it difficult to up the U.S. pledge because appropriations of foreign aid are made by Congress. President Biden struggled to get more financial support for overseas climate finance even when his party controlled all branches of government. While other countries may step in to fill the void, it is hard to imagine that the U.S. government will play a meaningful role on climate finance for the foreseeable future.

Moreover, those hostile to climate action in the U.S. hope to incapacitate the U.S. government from playing a leadership role on climate by withdrawing the U.S. from the 1992 UNFCCC. Withdrawal from the UNFCCC was formally proposed in the 920-page Project 2025 conservative road map written by the Heritage Foundation. The UNFCCC was ratified by the U.S. Senate during the presidency of George H. W. Bush. Because the U.S. was already party to the UNFCCC, the Obama and Biden administrations treated the Paris Agreement as one they could join (and rejoin) through executive action without submitting it to the Senate for advice and consent. While it is not clear if the U.S. can under its own legal rules withdraw from the UNFCCC, a Supreme

Court with a conservative supra-majority would likely bless the Trump administration’s efforts to withdraw from the UNFCCC. If that were to happen, the U.S. would have a very difficult time rejoining either the Paris Agreement or the UNFCCC since ratifying the UNFCCC would require an affirmative vote of two-thirds of the U.S. Senate.

That high treaty bar has made it increasingly rare for the U.S. to ratify environmental treaties, complicating periodic U.S. aspirations to lead in this space. The Paris Agreement, with emissions reductions pledges being voluntary, was designed to avoid being sent to the Senate for advice and consent. One prominent exception is the Kigali Amendment to the 1987 Montreal Protocol, which is an international agreement to phase down hydrofluorocarbons (HFCs). Like methane, HFCs are potent greenhouse gases but do not persist in the atmosphere for very long, meaning that efforts to reduce emissions from them in the next decades will avoid near-term warming. In September 2022, the Senate by a vote of 69 to 27 provided its advice and consent in support of the Kigali Amendment, a move which was broadly supported by U.S. industry. Ratification of Kigali is something of an outlier, as it was the first climate treaty supported by the U.S. Senate since the 1992 framework convention and is one of only a handful environmental treaties supported by the U.S. Senate in the 2000s.

When Donald Trump announced that the U.S. would withdraw from the Paris Agreement during his first administration, a variety of non-state actors and subnational actors sought to fill the void by supporting the We Are Still In coalition, which was financed by former New York City Mayor Michael Bloomberg. At the subsequent climate negotiations, the We Are Still In coalition hosted receptions and dialogues to signal that civil society and subnational governments in the U.S. were still committed to action on climate. Something like that will likely happen once more now that Donald Trump has won the presidency again. Such efforts will

likely crystallize if and when Trump signals his intent to withdraw from the UNFCCC and/or the Paris Agreement. However, such civil society and subnational action are not a substitute for continued federal government commitment to such processes.

Domestically, the Trump victory will likely be a mixed bag for continued implementation of the IRA. While documents like Project 2025 call for repeal of the IRA, full repeal is unlikely given how many Republican-governed states have been the primary beneficiaries of IRA incentives. That said, the Trump administration will likely slow to a trickle Department of Energy lending for clean energy under the IRA and seek to roll back any executive orders related to electric vehicles and other executive branch rules intended to address climate change. These predictions will be put to the test when the new administration comes into office.

As this essay has detailed, cooperation on climate change is both urgent and difficult, given the state of global emissions, fragmentation in international climate governance, setbacks since the Paris Agreement was signed in 2015, and the uncertain leadership of the U.S. after a contentious election. That said, even if the U.S. government retreats from the global scene as a leader on climate change, clean technologies, including renewables and electric vehicles, are now cost-competitive growth sectors for other governments, notably China. They have a commercial logic of their own which, optimistically, may deliver a clean energy transition and lower emissions, even if the diplomatic arena stalls. With China now the largest source of emissions globally, the actions that China takes on climate may matter more than what any other country does. Despite all these challenges, scientists counsel that progress is possible and that efforts to reduce emissions can prevent runaway climate change from occurring. While some climate change is already happening and inevitable, actions taken today can blunt future warming and provide a pathway to adapt our societies to cope with climate impacts.

Discussion questions

1. What are the potential impacts of rising geopolitical tensions on global climate cooperation, and how can these challenges be mitigated?
2. How do you think the current U.S. stance on the Paris Agreement will shift with the new U.S. presidency?
3. How can countries hold each other accountable for meeting their climate targets while respecting one another's sovereignty?
4. What strategies can help bridge the gap between long-term climate goals and short-term political priorities?
5. What role should the private sector play in international climate negotiations and cooperation efforts?
6. How do countries benefit by coming together to combat issues such as climate change? What would happen if countries tried to navigate climate change on their own, without treaties like the Paris Agreement?

Suggested readings

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Keohane, Robert O., and David G. Victor. "The Regime Complex for Climate Change." *Perspectives on Politics* 9, no. 1 (2011): 7–23.

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