

# U.S. and Chinese approaches to clean energy transition

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# Foreword

What are the roles of the United States and China in accelerating the global clean energy transition? On one hand, the global energy landscape is undergoing fundamental changes, which will have far-reaching geopolitical consequences. On the other hand, the energy transformation remains an area where various forms of inclusive, supranational structures are crucial for providing global public goods. The U.S. and China's ability to shape future energy systems hinge on their international strategies and efforts to persuade and work with partners and allies, to lead by example and to advance global norms and standards.

This report takes a narrow, diplomacy-focused perspective on the clean energy transition. It does not discuss whether or why to decarbonize or at which level is fair or adequate, nor does it seek to delve into U.S. and Chinese domestic and subnational efforts to meet each country's climate pledges and challenges, although domestic actions are considered in the context of international diplomacy. Rather, it aims to highlight the two countries' international clean energy policies and the intersection of foreign policy and the low- and zero-carbon economy, which previously have not been considered in a comprehensive manner. Additionally, the report briefly discusses recent U.S.-China energy engagement that informs future competition and cooperation between the two countries.

This report was written against the backdrop of intensifying U.S.-China strategic rivalry and heightened bilateral tensions over Taiwan, which triggered Beijing to suspend talks with Washington on climate. The diplomatic fallout from the growing rivalry makes it difficult for the two countries to collaborate on clean energy even when it is in their interest to do so. However, the climate emergency has become a social movement at the individual and business levels that necessitates stronger and more urgent collective actions, regardless of whether government leaders are on board

with cooperation. Nevertheless, efforts by the world's two largest economies and carbon emitters to support the global good play an outsized role in the global transition toward cleaner energy. It is our hope that mapping their international policies will provide insights into the trajectory of their priorities in the global fight against climate change, amid ever-changing geopolitical dynamics.

# Introduction

To limit the catastrophic effects of climate change—predominantly a consequence of burning fossil fuels—the global goal is to reduce greenhouse gas emissions enough to limit global warming to between 1.5 and 2 degrees Celsius from the pre-industrial level ([UN Climate Change](#) n.d.). As the energy sector produces over 70 percent of emissions worldwide, rapid energy transition at scale is critical to slowing global warming ([Ge & Friedrich](#) 2020). Clean energy transition refers to the global energy sector’s shift from fossil-based systems to produce and consume energy to renewable sources in an effort to decarbonize and ultimately reach net-zero-carbon. Carbon dioxide is the most important greenhouse gas, and net zero does not necessarily mean 100 percent renewable sources. Rather, it entails an energy supply mix that would result in the amount of carbon added to the atmosphere equaling the amount removed. Therefore, improving energy efficiency, adopting renewables at scale while phasing out fossil fuels, accelerating electrification and deploying technologies like carbon capture and storage are all drivers for this transition.

As of 2020, solar and onshore wind became the cheapest sources of power in most of the world ([Eckhouse](#) 2020). Since 2010, the cost of electricity generated from solar and wind power has fallen by 85 percent and 55 percent, respectively, and the costs of batteries that enable electrification have been reduced by 85 percent in the same period ([Cooper & White](#) 2022). These renewable resources are available almost universally, allowing countries to achieve energy self-sufficiency, which is a sharp contrast to the division between fossil-fuel rich countries and those dependent on energy imports due to unequal geographical distribution of finite resources. As shifts

towards renewables accelerate, their costs will further decline, which will accelerate the replacement of power-sector coal consumption that currently provides over 30 percent of energy ([International Energy Agency](#) 2021a). China has been the world’s number one contributor to renewable energy capacity additions while the United States is on track to expand its capacity significantly from the previous five years ([IEA](#) 2021f). However, other challenges, including post-COVID economic recovery, inflation and energy disruptions stemming from Russia’s invasion of Ukraine, have caused a shift in priorities towards energy security and economic rebound, resulting in short-term setbacks in the clean energy transition.

The United States and China are the world’s largest carbon emitters, largest energy consumers and largest economies. Together, the two countries account for 40 percent of global carbon emissions, almost 40 percent of combined energy consumption and just over 40 percent of the world’s economic output ([World Population Review](#) 2022; [Our World in Data](#) 2019; [Statistics Times](#) 2021). Washington and Beijing have pledged to achieve net zero by 2050 and 2060, respectively. What the two countries do separately and together, bilaterally and multilaterally, has far-reaching implications for the global decarbonization agenda, goals and progress.

The clean energy transition presents an enormous economic opportunity as new energy systems drive the demand for low-carbon products and solutions. It also has huge geopolitical consequences when the two countries compete and cooperate on climate. Jeff Colgan and Nicholas Miller introduced the concept of “rival hierarchies” when referring to the competition between the United States

and China to “attract smaller states to their respective spheres of influence.” They argued that this type of U.S.-China competition over green technologies can accelerate their proliferation and potentially benefit the global response to climate change, hence as effective as cooperative diplomacy (Colgan & Miller 2022). Despite the overall inconsistency and sporadicity, the two countries have been working together on the issue over the past four decades, with cooperative agreements on energy dating back to 1979. Even in highly competitive markets such as the alternative vehicles space, the two countries have collaborated to jointly develop standards for electric vehicles (EV) and charging plugs. They also cooperated through the multilateral Electric Vehicles Initiative to accelerate deployment of electric vehicles around the world ([Energy Department](#) 2011).

As this report will show, the U.S. and Chinese positions on climate and the need to decarbonize have converged over time, as China has risen to great power status. Despite talks of decoupling, both countries recognize their extensive interdependence on one another, especially on the issue of the clean energy transition and the associated technologies required to achieve it. However, the political will to work together is weakening as the two countries focus on gaining an upper hand over one another in securing leadership in the green future.

The following sections examine the international environment and U.S. and Chinese international policies on clean energy. The first section provides examples of multilateral initiatives of which both the U.S. and China are a part. The following two sections illustrate the history, rationale and details of respective domestic and international endeavors of cooperative diplomacy to build international credibility and coalitions and partnerships on clean energy.

# An International climate consensus

Of all the challenges on the international agenda, nothing is as pressing and wide-reaching as the threat of climate change. Impacts of extreme weather events are being felt around the world even if they are not evenly distributed, from record-breaking droughts in China to catastrophic floods in Pakistan, to extreme wildfires in the United States. The latest climate science estimates that avoiding a climate disaster would require global emissions to peak by 2025 and undergo a subsequent reduction of 43 percent by 2030, which necessitates deep emissions reduction across all sectors of the global economy ([Cooper & White](#) 2022). Unfortunately, emissions are moving in the wrong direction at an alarming pace. Energy-related emissions rose to their highest level in 2021 ([Twindale & Chestney](#) 2022). In May of this year, the world recorded the highest level of carbon dioxide in the atmosphere ([Knowles](#) 2022).

Multilateral coordination on climate aims at strengthening and hastening the international response to climate change. The United Nations—specifically the United Nations Framework Convention on Climate Change (UNFCCC)—is the principal global platform for brokering agreements and consensus aimed at reducing greenhouse gas emissions. UNFCCC’s annual UN Climate Change Conferences—also known as Conference of the Parties (or COP)—is where emission limitation and reduction negotiations between governments take place and progress is shared and monitored. The most important of all multilateral climate agreements is the Paris Agreement (PA), a binding international accord announced at the 2015 UN Paris Climate Conference (COP21) and adopted by almost all nations to take actions intended to limit global warming to well below 2 degrees Celsius above pre-industrial levels. It allowed

individual governments to self-define goals and action plans in line with their national circumstances with updated goals expected every five years.

Since then, over 100 governments, representing 80 percent of the world’s GDP, have proposed or formally discussed net-zero emissions targets ([COP26](#) 2021). Over three dozen countries have formulated these ambitions into law, proposed legislation and produced policy documents ([Climate Action Tracker](#) n.d.). Outside of the PA, there is no clear international consensus as to how fast and how comprehensive decarbonization needs to happen. But one thing is clear: net-zero emissions require a fundamental change in the way energy is produced and used, and no single fuel or technology alone can enable the entire energy sector to reach net zero. The International Energy Agency (IEA) projected the share of low-carbon electricity (wind, solar, hydro and nuclear), bioenergy, hydrogen and hydrogen-based fuel cells will expand to reach 40 to 70 percent in the energy mix by 2050, compared with the 10 percent today ([IEA](#) 2021e).

Energy is critical to development. Aligning self-interested countries with the global climate goals has already been a challenge; bridging the divergent paths between developed and emerging economies only adds to the challenge. The global North-South divide was further amplified during this year’s COP27 where the contentious issue of rich countries compensating developing states affected by the impacts of climate change made the agenda for the first time in decades ([Dickie & Abnett](#) 2022). The United States and Europe are responsible for most of the accumulated carbon dioxide in the atmosphere, and as their economies shift post-industrialization, they



moved from heavy industries and energy-intensive sectors to service-based economies. Their focus is thus on climate innovation to develop frontier technologies and incentivizing deployment of these technologies as well as enforcing environmental, social and governance (ESG)-related compliances.

In contrast, many emerging economies still rely on fossil fuels and continue to expand their fossil-fuel-powered capacity, primarily in the form of coal, to support economic growth. Starting from a low base and often plagued by energy poverty, these countries are expected to reach their highest growth in energy consumption in the coming decades and are projected to increase emissions from their share of 63 percent of global emissions today, with China included ([Center for Global Development](#) 2022). Affordable clean energy and climate action are 2 of the 17 Sustainable Development Goals (SDGs), which also include zero hunger, good health and well-being, strong institutions, industry, innovation and infrastructure ([UN](#) n.d.). These nations are interested in energy options that do not impede economic progress and are compatible with poverty alleviation. Balancing developmental challenges and climate concerns is difficult for lower-income countries absent financial and technological support from developed nations to achieve the common objective. In order to bring on board developing countries, the transition to clean energy must be easy, adaptable and affordable.

The newly announced “open and cooperative Climate Club” in June by the G7, the world’s advanced economies, seeks to address some of these challenges and right historic inequity in emissions and incomes through building inclusive partnerships to accelerate implementation of the energy transition in ways chosen by the developing country. The Climate Club commits to “a highly decarbonized road sector by 2030, a fully or predominantly decarbonized power sector by 2035, and prioritizing concrete and timely steps towards

the goal of accelerating phase-out of domestic unabated coal power ([G7](#) 2022).”

The World Bank Group, already the world’s largest multilateral provider of climate finance to developing countries, is also working to integrate climate efforts with poverty alleviation and has established a new Climate Change Action Plan 2021-2025. Given that climate change may push over 130 million people into poverty and cause over 200 million people to migrate by 2050, the Action Plan sets out to deliver record levels of climate finance to emerging economies in both mitigation and adaptation efforts ([World Bank](#) 2021).

Focusing on emerging economies, the IEA’s Clean Energy Transitions Program, launched in 2017, funds programs to support priority countries and regions in developing and implementing strategies for achieving national energy goals. Together, India, China, Indonesia and the Association of Southeast Asian Nations (ASEAN) countries received the biggest share of the program’s funding in 2021 ([IEA](#) 2022b).

Incorporating advanced and emerging economies with an economic-focused mandate, the Group of 20 countries (G20) third ministerial Energy Transitions Working Group in September 2022 unanimously agreed on a set of principles to accelerate and implement the energy transition without compromising the economic growth of emerging economies, focusing on affordability and inclusivity of cleaner energy systems ([G20](#) 2022). Collectively, the G20 accounts for over 81 percent of the world’s total energy-related carbon emissions ([Destatis](#) 2022). Led by the United States, the Clean Energy Ministerial (CEM) and Major Economies Forum on Energy and Climate (MEF) are high-level multilateral forums connecting both the developed and developing worlds to generate the political leadership needed to strengthen climate action and advance the adoption of clean energy and related technologies. Moreover, Mission Innovation was launched in 2016 to double

government spending on clean energy R&D by 2020 to make these solutions affordable, accessible and attractive for all countries. The United States and China are among the 24 members ([Mission Innovation](#) 2021).

Notwithstanding the myriad of global initiatives, many countries are failing to meet their climate commitments. Only 26 out of 193 countries submitted more ambitious goals towards the Paris climate goals despite the promises made at last year's COP26 ([Bearak](#) 2022). Neither the U.S. nor China has pledged more this year, as bilateral climate talks had stopped for a few months. On the financing gap for adaptation, rich nations are failing to raise enough money to help developing countries adapt to climate change. By 2030, around \$340 billion might be needed to assist developing countries, but donor states only set aside \$29 billion for climate adaptation in 2020 ([Whiting](#) 2022).



# U.S. climate and clean energy diplomacy

Upon entering office in early 2021, President Joe Biden immediately made climate diplomacy a top priority by recommitting the United States to the Paris Agreement. He then followed with an executive order to “put the climate crisis at the center of the United States foreign policy and national security,” with an emphasis on the deployment of clean energy technologies and infrastructure, and appointed John Kerry as the Special Presidential Envoy for Climate ([White House 2021a](#)). Most recently, in August 2022, Biden signed into law a landmark climate bill, the Inflation Reduction Act (IRA), to renew American industrial policy and amplify U.S. strengths on clean energy. The newly released National Security Strategy (NSS) of 2022 signifies the simultaneous pursuit of competition and cooperation to tackle the climate challenge.

As the threat of climate change has become more prominent in recent years, so has the visibility of climate and decarbonization in U.S. foreign policy. However, international climate diplomacy has a long history in U.S. foreign policy and can be traced back to President George H. W. Bush, who first set the stage for U.S. leadership in climate change by elevating its significance within Congress. At the 1992 Rio Earth Summit, Bush signed the UNFCCC and committed to leading the global effort and reducing greenhouse gas emissions to 1990 levels by the year 2000, a target that the country met in 2020 with a 7 percent decrease from the 1990 levels ([Sessions 1993](#); [EPA 2022](#)). President Bill Clinton and Vice President Al Gore then further propelled this climate diplomacy by spearheading the 1997 Kyoto Protocol, although the Senate refused to ratify it due to political and economic considerations ([White House 2001a](#)).

During the George W. Bush administration,

energy security took center stage in U.S. foreign policy. President Bush did not commit to the UNFCCC goals but voluntarily announced in 2002 to reduce greenhouse gas intensity of the U.S. economy by 18 percent by 2012 ([White House 2003](#)). He created the National Energy Policy Development Group which published recommendations that focused on increasing domestic oil supply and diversifying foreign oil suppliers ([White House 2001b](#)). Unlike his predecessors, he opted to launch international partnerships outside of the UNFCCC domain. These included the Gen IV International Forum, the Carbon Sequestration Leadership Forum and the International Partnership for the Hydrogen Economy ([Pugh 2015](#)). These three partnerships prioritized the development of nuclear reactors, carbon capture and storage and hydrogen in decarbonization, politically and technologically. In 2006, the Bush administration launched the Asia-Pacific Partnership on Clean Development and Climate (APP) jointly with Australia, China, India, Japan and South Korea. The APP focused on forming public-private task forces in tackling climate change through a technology-centric R&D approach ([White House 2006](#)). Bush also announced the Major Economies Meeting on Energy Security and Climate Change in 2007 to bring together 17 major carbon emitters and the United Nations to build momentum towards the 2009 Copenhagen Climate Summit and collaborate on areas such as clean energy technologies and energy efficiency ([White House 2008](#)).

When President Barack Obama took office in 2009, this last initiative was relaunched as the Major Economies Forum on Energy and Climate (MEF) and has convened regularly since then. It aims to facilitate dialogue between developed and developing countries in advancing joint initiatives that reduce

greenhouse gas emissions, with much greater emphasis on UNFCCC negotiations. The Obama administration subsequently launched the Clean Energy Ministerial (CEM), a global forum that accelerates the clean energy transition by promoting various programs and policies among its 29 current members. Unlike the MEF, which has a broader focus, the CEM specifically convenes various countries' energy ministers, rather than officials focused on climate or environment. Moving away from the emphasis on private sector partnerships, the Obama administration championed a policy-centric approach and renewed leadership in global endeavors, culminating in the landmark 2015 Paris Agreement, for which the U.S. has secured an unprecedented joint statement with China that has catalyzed global actions. He promised the United States would reduce emissions by 26-28 percent below 2005 levels by 2025 ([White House 2015b](#)).

Obama actively sought to build and institutionalize cooperation with China on clean energy as the leading topic of bilateral cooperation by signing the 2009 Memorandum of Understanding to Enhance Cooperation on Climate Change, Energy, and the Environment ([Hachigian & Chen 2010](#)). The two governments established seven initiatives under this framework, including the U.S.-China Clean Energy Research Center (CERC) and the U.S.-China Energy Cooperation Program (ECP) ([White House 2009](#)). Presidential-level endorsement continued after Xi Jinping took office with deepening cooperation, including the creation of a high-level U.S.-China Climate Change Working Group with initiatives to work on emission reductions from transportation, smart grids, energy efficient buildings, carbon capture and storage and more. These initiatives have fostered commercial collaborations in the development and deployment of clean technologies, regulatory and standards harmonization and clean energy research by top researchers from both countries with mutually agreed upon Intellectual Property rules ([State Department](#)

2016).

During the Obama administration, clean energy engagement with China was generally considered the bright spot in the relationship. However, China's industrial policies and nonmarket practices had started to raise concerns in the United States. In 2012, the Commerce Department imposed anti-dumping duties on Chinese solar panels, which was followed by Chinese retaliatory tariffs on U.S.-produced polysilicon, which is used to make solar PV cells. The United States imposed additional tariffs on Chinese solar manufacturers two years later ([Downs et al. 2022](#)). These included anti-dumping duties of 26.71 to 78.42 percent on imports of most Chinese-made solar panels and anti-subsidy duties of 27.64 to 49.79 percent on Chinese modules ([Gardwell 2014](#)).

President Donald Trump strongly rejected climate diplomacy and multilateralism. His 2017 announcement to withdraw from the PA—making the U.S. the first country to leave the climate pact—was a hallmark of this shift ([White House 2017](#)). Another example is the 30 percent “safeguard” tariff Trump imposed on solar cells and modules from all countries, finding that imports were seriously hurting U.S. manufacturers ([USTR 2018](#)). Unlike Obama, Trump excluded climate change from a list of chief national security threats in his 2017 National Security Strategy, downplaying its role in U.S. national interests ([Boot 2017](#)).

### ***Biden's approach***

Biden's embrace of a “whole-of-government” approach to climate change represents a drastic shift from that of his predecessor. Through the creation of new positions and interagency collaboration, the issue of climate change has been woven into various departments and agencies that were previously thought to have limited connection to environmental considerations including the Departments of Treasury and Defense

([Volcovici](#) 2021). Besides undoing Trump's extensive deregulatory actions, Biden has aimed to simultaneously reestablish American leadership in clean energy technologies by strengthening alliances and boosting domestic production of key inputs around clean energy. These actions will help drive the country towards Biden's commitment to cut greenhouse gas emissions to 50 to 52 percent of 2005 levels by 2030, announced during the 2021 Leaders' Summit on Climate ([White House](#) 2021b).

At the 2021 UN Glasgow climate summit (COP26), the U.S. helped launch various international initiatives, including the Global Finance Alliance, Global Energy Alliance and the Global Methane Pledge ([Gelles](#) 2022). The Biden team has also launched or revived a multitude of international partnerships that display a collaborative approach to energy diplomacy. This diverse portfolio of energy programs can be divided into three key categories: bilateral and multilateral technology cooperation on renewable energy and energy efficiency, advancing U.S. commercial interests and clean energy exports and interagency coordination for climate change negotiations ([NREL](#) 2008). During COP26, the U.S. and China issued a surprise "Joint Glasgow Declaration on Enhancing Climate Action in the 2020s" that included an intent to collaborate on accelerating the clean energy transition. This included cooperation on deployment of technologies like carbon capture, utilization and storage (CCUS) and direct air capture as well as policies related to energy efficiency and renewable energy ([DOS](#) 2021).

The United States has traditionally taken on the roles of multiplier and facilitator in multilateral initiatives due to the difficulty of passing bills through Congress that would provide substantive economic incentives to other countries. Thus, Washington's clean energy foreign policy typically involves spearheading voluntary joint commitments; promoting research, innovation, and

technology transfers; and catalyzing private investments. In considering both the global commons nature of climate change and the opportunities to enhance U.S. competitiveness, American diplomacy aims to lower the costs of clean energy technologies to benefit both agendas. For example, the 2022 IRA has provisions such as tax credits that support faster commercialization of technologies like carbon capture and storage and clean hydrogen ([DOE](#) 2022). Subsequent large-scale deployment can benefit lower-income countries if the appropriate technology transfer and knowledge-sharing take place. Supplementing these with development finance mechanisms can further draw private investment to clean energy projects abroad while supporting American companies that export these technologies.

In addition to serving only as a multiplier, Biden's International Climate Finance provides direct climate financing to help developing countries with mitigation and adaptation efforts. Various federal agencies oversee this funding for projects that align with the needs of the recipient country, provide technical support and emphasize climate in their public investments. Biden pledged to increase this financing to \$11.4 billion a year by 2024; however, Congress approved just \$1.1 billion in international climate finance for 2022. Additionally, the bill only allocated \$270 million for adaptation finance whereas Biden had pledged \$3 billion by 2024 ([Congressional Research Service](#) 2022; [White House](#) 2022d). The bill also did not include any funding for the UN's Green Climate Fund (GCF), to which the U.S. owes \$2 billion after Trump failed to follow through on a financial pledge made by the Obama administration ([Thwaites](#) 2022). These highlight the challenges of U.S. climate-related aid due to the nature of the country's domestic political system.

Biden has sought to advance other forms of energy diplomacy that do not rely on congressional approval. One example is

the Build Back Better World (B3W) initiative launched in June 2021 between the U.S. and G7 partners. It aims to address the \$40 trillion infrastructure gap in low- and middle-income countries through mobilizing development finance tools in global infrastructure investments ([White House 2021c](#)). As part of the B3W initiative, the Net Zero World initiative which was launched in November 2021 focuses specifically on energy. Led by the Department of Energy (DOE), it builds partnerships with countries such as Argentina, Chile and Egypt to harness technical capabilities across the U.S. government to create and implement unique technology road maps and investment strategies that will accelerate the clean energy transition in participating countries ([DOE 2021](#)). The intent is to mobilize at least \$10 billion by 2024 from federal agencies and philanthropies to provide participating countries with immediate and sustained access to research, analysis and implementation support. These capabilities include climate change impact assessment, smart building technologies, energy storage solutions and international technology deployments ([NREL 2022](#)).

Similarly, the United States Agency for International Development (USAID)-run Scaling Up Renewable Energy Program (SURE) relies on distributing American expertise as opposed to direct financing. USAID assists the 31 partner countries with renewable energy planning, procurement, grid integration and circular economy services. Private investment in, and competitive procurement of, clean electricity has mobilized \$7.1 billion between 2017 and 2021 to help these partner countries meet emissions reduction targets and strengthen energy security ([USAID 2022](#)).

In addition to reviving multilateralism, current U.S. energy diplomacy is also focused on restoring and rebuilding relationships with key partners through a lattice of relationships and frameworks. The Biden administration has either encouraged the adoption of a

clean energy component in existing forums or announced new initiatives that integrate this goal. An example of an existing partnership is the Quadrilateral Security Dialogue (or QUAD), which promotes cooperation between the United States, Australia, India, and Japan to advance a common vision of a free and open Indo-Pacific. QUAD was established in 2004 as a security-centric forum, but its agenda has shifted to a more public goods provision and standard-setting agenda, with 2021 marking the creation of various working groups, one of which is focused on climate change. The latest QUAD meeting emphasized the areas of energy supply chains, critical and emerging technologies and infrastructure ([White House 2022a](#)).

Other newly launched forums include the Indo-Pacific Economic Framework for Prosperity (IPEF) and the EU-US Trade and Technology Council (TTC). Although neither of these forums is positioned as climate or energy forums, there is an explicit directive to include these areas. The Biden administration launched the IPEF in May 2022, alongside 13 other countries that represent 40 percent of the global economy ([White House 2022b](#)). IPEF is a major trade initiative aimed at expanding U.S. leadership in the Indo-Pacific region and establishing a common set of rules among partner countries through four pillars: trade, supply chains, clean economy and fair economy ([Commerce Department 2022](#)). IPEF's impact on the energy transition remains to be seen, although one thing is clear: without the promise of benefits like increased market access or direct financing, these agreements struggle to entice members to abide by more stringent rules for clean energy ([Chen & Chen 2022](#)).

The EU-US TTC focuses on coordinating trade, economic and technology issues between the European Union and the United States. Established in June 2021, this collaboration has 10 working groups: group 2 is on climate and clean tech and group 3 is on secure supply



chain which has a focus on clean energy and critical minerals ([European Commission 2021](#)). A key deliverable for a May 2022 TTC ministerial was sustainability and energy security, emphasizing how accelerating the energy transition would be critical to national security ([U.S. Chamber of Commerce 2022](#)).

### ***U.S. competitive framing***

In the lead-up to the 2021 Leaders Summit on Climate, convened by the Biden administration, U.S. Secretary of State Anthony Blinken cast U.S. leadership in the renewable revolution as crucial to outcompeting China ([Manson & Hook 2021](#)). This set the stage for the framing of Biden's energy and industrial policy in the competitive sense, not only between rivals but also between competing goals of collaborative diplomacy and the protection of national interests. The 2022 NSS exemplifies this tension: the U.S. foreign policy approach around climate has to factor in China's growing sphere of influence more and more as time goes on. Even though collaboration between countries, including with China, is necessary for the clean energy transition, it often remains difficult to compartmentalize these issues, as China demonstrated by unilaterally suspending the climate talks, including the planned U.S.-China Climate Working Group, in reprisal for Speaker Pelosi's visit to Taiwan ([Preble et al. 2022](#)).

Even before Taiwan-related tensions, the United States had adopted an increasingly protectionist attitude towards China which had manifested in supply chain disruptions. In June 2021, the Biden administration banned solar raw materials from a Chinese company, Hoshine Silicon Industry Co. Ltd., over concerns about forced labor, leading to billions of dollars of solar projects being delayed. This ban also extended to other U.S.-China supplier relationships, including a few large manufacturers of key inputs in solar panel production ([Martina et al. 2021](#)). In the first half of this year, the Biden administration

chose to extend Trump-era tariffs on imported Chinese solar products for another four years, while pausing on imposing any new solar tariffs from Southeast Asian nations for two years to maintain a steady and cheap supply of solar products ([Renshaw & Groom 2022](#); [Mason 2022](#)).

The IRA demonstrates the implications for foreign policy of domestic legislation that channels \$391 billions into tax credits and rebates that incentivizes the clean energy transition. The U.S. government's domestic decarbonization goals rely upon increased PV installations, electric vehicle uptake, battery storage and more. Manufacturers of these technologies require key inputs that are primarily sourced overseas. Currently, an overwhelming proportion of critical minerals are processed and refined in China, including 50 to 70 percent of global lithium and cobalt refining ([IEA 2021d](#)). This heavy reliance has spurred the Biden administration into action in securing domestic clean energy supply chains not just through the IRA but also by diversifying suppliers and boosting strategic stockpiles ([Bordoff 2022](#)).

However, Biden's policy of "friend-shoring" or "ally-shoring" seems to be at odds with the objective of diversification. To promote U.S. leadership and counter China's increased influence, Washington will need buy-in from its allies and partners to boost a collective position in the clean energy supply chain that is resilient and diversified (away from China). As the IRA attempts to re-industrialize the United States, boost national strengths and revitalize dominant public investment in clean energy R&D, these subsidies can cause tensions with other countries, including allies, who are concerned about losing their own competitiveness. South Korea has already raised concerns about the EV-related provisions in the IRA that will disadvantage Korean carmakers and possibly violate the U.S.-Korea free-trade agreement ([The Korean Herald 2022](#)). There is a keen recognition

within current climate diplomacy of the need to treat these trade relationships with sensitivity because any trade war could impede the global progress of clean energy technology diffusion.

Under this administration, there is also an increased infusion of national security concerns into the clean technology sector. In September of this year, Biden issued an executive order for the first time in 50 years to provide guidance to the Committee on Foreign Investment in the United States (CFIUS) to regulate transactions involving inbound and outbound technology transfers that would affect U.S. national security. In the executive order, advanced clean energy and climate adaptation technologies are named as key areas where U.S. technological competitiveness needs to be protected and U.S. reliance on foreign supply chains needs to be curbed ([White House 2022c](#)).

### ***U.S. credibility***

Biden's energy and climate policy is a patchwork of domestic and international undertakings to restore U.S. leadership in the new energy future, albeit in some cases with conflicting agendas. Domestically, he directs huge public expenditures and investments to support the growth of the clean energy industry and national climate goals, which will shape the U.S. economy, workforce and society. The greater role played by the federal government to drive low-carbon energy production and consumption, coupled with closer alignments with its partners and allies, will also help address the drivers underpinning its strategic rivalry with China, especially around technology competition.

Internationally, despite the large numbers of forums and programs, the United States faces challenges in its international climate leadership and credibility. Rebuilding U.S. global climate credibility remains a key priority for U.S. foreign policy after the U.S. retreat from multilateral climate pacts during the Trump presidency. The U.S. is expected to lead by example by making ambitious

climate targets and following through on them. While the IRA represents a momentous step in allowing the U.S. to back up its own commitments with concrete domestic actions, other countries and partners will continue to closely observe the effects of its implementation. Moreover, the U.S. is under massive pressure to close the large deficit between its pledges to channel funding to developing countries dealing with the effects of climate change and the amount dispensed. The nature of the U.S. political system means that it is difficult for the government to mobilize the necessary financial resources to meet its international obligations. However, there are opportunities to leverage U.S. leadership in multilateral development banks and for U.S. companies and philanthropists to fill this gap. Additionally, the see-sawing of commitments between each political cycle leads to the fear that the United States may abdicate responsibilities within existing partnerships in the next administration. It remains to be seen how well Biden juggles conflicting objectives and priorities to motivate corporate America and strategic allies and partners to amplify U.S. impacts and influence on climate governance.



# China's climate and clean energy diplomacy

China occupies the center stage of the global clean energy transition. In 2019, the IEA called China “the undisputable global leader of renewable energy expansion worldwide ([Zinglensen](#) 2019).” In 2020, President Xi Jinping committed China to its most ambitious climate pledge to date: peaking emissions before 2030 and achieving carbon neutrality by 2060 ([UN News](#) 2020). The following year, he vowed to stop building and financing coal-fired power plants overseas. As the world's largest international financier of coal plants, this new policy sends a strong signal to the world that the country is working toward transitioning away from coal ([Paybarah](#) 2021). The world expects much of China's climate leadership, but to a certain extent, international expectations are in contrast with its national circumstances, which favor a slower, phased approach to replacing coal. This exemplifies China's paradox in its clean energy policy and diplomacy, where the transition to a renewable energy system does not necessarily remove the reliance on fossil fuels, as energy consumption continues to grow rapidly.

Until the 2010s, China had taken the position that industrialized, rich countries should do the most to address climate change and has repeatedly rejected calls for it to commit to binding emissions targets and timetables. Portraying itself as a “major developing country,” its foreign policy had been focused on strengthening unity and cooperation with the developing world, enforcing its narrative that climate issues are primarily a North-South struggle ([Hu](#) 2009). Even though domestic policies to improve energy efficiency and sustainability were in place, they were subordinate to economic policy. In less than three decades, China became the world's largest polluter and the largest energy and coal consumer, but also the largest producer of

solar and wind energy and the largest investor in green energy projects.

China's involvement in international climate negotiations can be traced back to its participation in the negotiations that established the UNFCCC, the foundational global agreement to stabilize greenhouse gas intensity ([UN Treaty Collection](#) 1992). At the 1992 Rio Earth Summit, then Chinese Premier Li Peng promoted “common but differentiated responsibilities and respective capabilities,” a UNFCCC formulation that recognizes historical emitters' greater responsibility to mitigate climate change than developing countries. Additionally, Li championed state sovereignty over an individual country's domestic policies and arrangements ([State Council](#) 1992). China's commitment to these principles and the UNFCCC continue to this day, as reflected in official statements by its leadership.

China repeated the same narratives during the Kyoto Protocol negotiations that started in 1997 and rejected any commitment to emission targets. The negotiations proved challenging: the United States, along with other developed countries, withdrew from the Kyoto Protocol, citing concerns about the lack of commitment from emerging economies. China later ratified the Kyoto Protocol in August 2002. In its announcement, then Chinese premier Zhu Rongji remarked that the ratification illustrated China's intent to take “an active part in multilateral environmental cooperation ([China Daily](#) 2002).”

By then, China had experienced rapid economic growth since the “reform and opening up” policy began in the 1980s, and consequentially, energy-intensive and coal-powered industrial activities led to massive air pollution, which had rapidly climbed up the

domestic policy agenda. Climate change and “new and renewable energy” were mentioned for the first time in the 10th Five Year Plan for National Economic and Social Development (2001-2005), the domestic blueprint for development. It laid out policies to incentivize renewable energy investment to reduce reliance on coal production and consumption as well as the commercialization of PV and wind technologies and battery systems ([IEA 2021c](#)). Under President Hu Jintao, China passed the Renewable Energy Law (amended in 2009). It set renewable energy development goals at central and provincial levels, formed the basis to direct national R&D investment to renewable energy as the preferential area for high-tech industrial development in the national program and rolled out a host of subsidies and incentives to support green technology development ([Ministry of Commerce 2013](#)).

In 2007, China issued the National Climate Change Program, requiring the government to swiftly adopt measures to reduce greenhouse gas emissions while maintaining a degree of flexibility in its approach based on the country’s developmental stage. The initiative not only provides a wide array of guidelines for domestic industries and technology advancement, but also promotes a larger and proactive role for China to initiate and strengthen cooperation with other countries in mitigation, adaptation, technology and financing to address climate change ([NDRC 2007](#)). Shortly after the announcement, China said it would eliminate export tax rebates for 553 “highly energy-consuming and resource-intensive” products to disincentivize the export of products such as cement, fertilizer and non-ferrous metals ([Shangguan 2007](#)). Furthermore, the Ministry of Foreign Affairs announced a Climate Change International Working Group to be chaired by then Foreign Minister Yang Jiechi to coordinate cooperative initiatives with other countries ([Wang 2009](#)). The announcement was short on details of the group’s specific focus and implementation. Internationally, there was increased pressure

on China to do more to reduce emissions, as its economy grew and became the world’s largest emitter (since 2006). Beijing often found itself in a position to defend its reluctance to commit to international climate obligations. Leading up to the 2008 Beijing Olympics, Yang said the push by the international community for China to shoulder more climate responsibilities is unfair, highlighting other countries’ “transfer emissions” by using China as a manufacturing hub for cost reduction ([Reuters 2008](#)). This reinforced China’s approach to climate change through climate equity and justice.

Prior to the Copenhagen climate summit (COP15) in 2009, China promised to cut its carbon intensity per unit of GDP by 40 to 45 percent from the 2005 levels by 2020. Despite this target being Beijing’s first voluntary commitment, it was seen by many as insufficiently ambitious. First, intensity-based targets do not ensure actual emissions reduction has occurred and allow for emissions to grow as the economy grows. Second, with the range of domestic policies and incentives in place, China was already well on track to attain it; in fact, the target was met in 2017, three years ahead of schedule ([Xinhua 2018](#)). At COP15, Hu delivered a speech calling for concerted international effort and asserting developing countries’ rights to development, casting China as a champion of multilateralism and a leader of the Global South in the international climate scene ([Xinhua 2009](#)).

Developing countries have supported China’s leadership on climate change, including the Group of 77 (G77), an international coalition of now more than 130 developing countries aimed at promoting their collective interests and enhancing their joint negotiating capacity on global issues. Although not a formal member, China’s alignment with the G77 is evident in the “G77 + China” or “G77 and China” grouping. Closely connected to this is the bloc of advanced developing countries formed by Brazil, South Africa, India and China

(BASIC) to negotiate as a united position during UN climate summits. Similar to G77, BASIC accepts China's leadership and regards China as "the common voice of developing countries in the climate change negotiations ([Hochstetler](#) 2013)." The group champions equity, South-South cooperation and prioritizing climate funding to the least developed countries and small island developing states ([Economy](#) 2010).

Many experts observed a shift in China's international identity after Copenhagen, during which China has reframed climate change from a burden to itself to a duty that it can constructively perform as a leader. This shift was in line with the country's increasingly assertive stance on the international stage. China expert and former Australian Prime Minister Kevin Rudd put forward that China's domestic "war on pollution" declared at the onset of the 18th National Congress was a major factor that drove a behavioral change within the country, pushing it to rapidly step up international cooperation on climate to secure the Communist Party's legitimacy ([Rudd](#) 2020). Internationally, China's increased economic and military power has fueled its ambition to shape the global governance system in its favor and differentiate itself from the West, including on the issue of climate and energy. China increasingly viewed the international order as flawed, especially after the 2008 financial crisis, and itself as uniquely positioned to offer its own ideas to improve the order ([Fu](#) 2016). Not only did China proactively participate in shaping the landmark Paris Agreement, it also has promoted new concepts in global climate governance, such as the emphasis on the values of justice, sovereignty and common development. At the UN Paris conference, President Xi Jinping declared that "tackling climate change is a shared mission for mankind" and pledged to establish a \$2.8 billion (20 billion RMB) South-South Climate Cooperation Fund and other programs focused on technology transfers and capacity building, such as building low-carbon industrial parks

and training programs in developing countries ([Xi](#) 2015). The unprecedented joint statement put out by China and the United States, as the world's two largest carbon emitters, was central to galvanizing global climate efforts and progress toward the Paris Agreement.

### *Xi's approach*

Since President Xi took office in 2012, climate and clean energy diplomacy have taken center stage. He has repeatedly promoted the ideas of sustainable development that minimizes ecological sacrifices and "building a community with a shared future for mankind" focusing on common development ([Xi](#) 2017b). By committing China to ambitious climate goals and multilateral cooperation to respond to climate change, Xi is aligning his domestic and international priorities by linking China's domestic climate progress and its role in global climate governance with his own personal legacy.

Xi's vision for China to enter a stage of high-quality economic growth that prioritizes innovation has propelled its green energy sector. Other domestic imperatives driving this shift is the need for energy security and the building of homegrown capabilities amid a turbulent international security environment. Under Xi, China has issued numerous industrial policies and government interventions to support clean energy tech as a strategic industry. Low-carbon manufacturing and energy are weaved into the 2015 "Made in China 2025" plan, which is considered to be the country's most important industrial policy on indigenous innovation. It has helped direct state strategic investments to support the development and mastery of core technologies for EVs and batteries, with the aim of securing the supply chain for these goods and for Chinese products to compete at "internationally advanced levels ([State Council](#) 2015/2022)." This strategy is echoed later in Xi's speech at the 19th Party Congress in 2017, which laid out an innovation-driven development approach

that is “innovative, coordinated, green and open” through advancing existing legal and policy framework to promote a robust green economy that is low-carbon and circular ([Xi 2017d](#)).

In 2017, China surpassed the U.S. as the world’s largest oil importer. Even before that, China was aware of its growing dependence on foreign oil and gas. As early as 2014, Xi added energy security to a broader framework of national security and called for a “revolution in energy production and consumption.” China’s strategy focuses on reducing energy consumption, increasing energy efficiency by reforming its energy industry and building a diversified, multi-energy supply system to include clean coal, oil, gas, nuclear and new and renewable energy ([Du 2014](#)). A key piece to reducing energy consumption is the government’s push to increase the number of electric cars on China’s roads through providing purchase subsidies and tax rebates for new energy vehicles, deployment of charging infrastructure and subsidies for battery suppliers ([IEA 2021b](#)).

In May 2020, Xi articulated his economic vision for the Dual Circulation Strategy (DCS) to achieve greater self-reliance and economic independence from the rest of the world. The strategy emphasizes the domestic market as the primary driver of growth while reducing external demand by achieving self-sufficiency in key sectors and ensuring access to critical inputs. Chinese experts expect this new strategic focus of turning inward would result in more investments in solar PV manufacturing, energy storage and EVs to ensure all aspects of the supply chain needed to produce these products domestically are secured and to rapidly build up their domestic consumption ([Economist Intelligence Unit 2020](#)).

### ***Greening the Belt and Road Initiative***

Compared to the myriad of national policies and initiatives to build a domestic low-carbon

economy, China’s plans to implement green projects overseas are less clear. In 2015, the Chinese government released a white paper, “Vision and Actions in Jointly Building Silk Road Economic Belt and 21st Century Maritime Silk Road,” which outlines efforts to promote green and low-carbon infrastructure construction and cooperation with BRI recipient countries on new energy technology ([Foreign Ministry 2015](#)). The 13th Renewable Energy Development Five Year Plan (2016-2020) maps out a comprehensive strategy to deepen international energy cooperation through the BRI, Xi’s signature infrastructure-focused project connecting East Asia to Europe by land and sea. The plan promotes the idea of power grid regionalization, green and low-carbon infrastructure construction and management and enhanced cooperation on both fossil fuels and renewable energy sources ([NDRC 2016](#)).

In 2017, Xi announced green development as a core tenet of the BRI at the first Belt and Road Summit ([Xi 2017c](#)). The “Guidance on Promoting Green Belt and Road” released in the same year encouraged Chinese companies carrying out BRI projects overseas to prioritize green and low-carbon building materials and processes as well as to project the image of observing and respecting local environmental protection ([Ministry of Ecology and Environment 2017](#)). A range of green development initiatives was rolled out two years later at the second Belt and Road Summit, including the establishment of the BRI International Green Development Coalition aimed at working with BRI recipient countries to ensure that investments are environmentally sustainable. Other initiatives focused on dialogues, information sharing and capacity building to promote energy-efficient technologies in various industries. Notably, the joint communique from the Summit highlighted the importance of international cooperation to implement the Paris Agreement, reinforcing China’s commitment to multilateral climate cooperation ([BRF 2019](#)).

Under Xi, China ramped up efforts to promote the global clean energy transition by leveraging technologies: since 2011, it has supported other developing countries with financial aid totaling \$165 million (1.2 billion RMB) and signed numerous agreements with these countries to develop low-carbon technologies, provide meteorological satellite service and export solar PV, wind technology and new energy vehicles (primarily electric vehicles) ([Xinhua](#) 2021). China's domestic capacity and its quest for technological supremacy has contributed to these international efforts. While U.S. President Donald Trump rejected the Paris Agreement and multilateralism, Xi reaffirmed China's commitment and adherence. It has cast itself as the responsible power and a defender of multilateralism by calling out America's unilateral approach while deepening Chinese cooperation with other countries. Notably, at the 2017 World Economic Forum, Xi touted China's crucial role in global climate governance by upholding the legitimacy and efficacy of the multilateral process through solidarity and real action ([Xi](#) 2017a). At the 19th National Congress in late 2017, he declared that China has "taken a driving seat in international cooperation to respond to climate change ([Phillips](#) 2017)."

Most recently, China rolled out a set of policies to boost Chinese exports of green technologies through the BRI. In 2021, China launched the "Initiative for Belt and Road Partnership on Green Development" jointly with other 28 countries to share energy technologies and fast-track green infrastructure and power storage facilities buildout, with the Chinese Exim Bank and the Asian Infrastructure Investment Bank providing the funding ([Foreign Ministry](#) 2021). To further operationalize green development in BRI projects, the Chinese government in April 2022 published "Opinions on Jointly Promoting Green Development of the Belt and Road," which proposes key initiatives and timelines to "green" the Silk Road. Programs under this new initiative focus on deepening international

exchanges and cooperation on climate in BRI projects—ranging from green infrastructure, green energy, green transport and green finance—by 2025 and fully integrating green development in BRI by 2030 ([NDRC et al.](#) 2022).

Now dubbed as the Green Belt and Road Initiative, it aims to develop cooperative frameworks to support green and low-carbon energy development in developing countries through improving the technical reliability and resilience of green energy supply, creating a conducive green energy investment environment and strengthening cooperation in energy technological innovation. One example was the Mozura Wind Park in Montenegro, a \$105 million (€92 million) onshore wind project that began in November 2017. It entails the construction of 23 smart wind turbines to improve grid stability and reduce power outages that have handicapped the country's fast-growing tourism industry ([Xinhua](#) 2019). Another example was the Kaléta Dam, a 240 megawatt hydroelectric station located in the Konkouré river basin in Western Guinea to provide uninterrupted energy access for households and businesses in Conakry, the national capital, and 11 neighboring provinces ([Chen & Zhang](#) 2015).

### ***China's credibility***

The country's climate credibility lies in its ability to mobilize all instruments of state power toward reducing greenhouse gas emissions. Xi's 2020 climate pledges demonstrate his level of ambition and confidence in China's path to decarbonize and the nation's competitiveness in the new global green economy. In 2021, the government formulated a range of domestic actions specifically to achieve the peaking of emissions by 2030, including setting local decarbonization goals, further cutting steel capacity and instituting a market-based carbon emission trading system ([NDRC](#) 2021). However, its heavy reliance on coal raises questions about implementation.



Despite a gradual decline in coal's share in the total energy mix, it still accounted for about 55 percent of China's total energy consumption in 2021 ([U.S. Energy Information Administration 2022](#)). Severe droughts and record-breaking heat waves that hit hydroelectricity this summer have led to a resurgent and unprecedented demand for coal ([He 2022](#)). To offset emissions from burning fossil fuels (primarily coal), China is set to build eight large-scale carbon capture, utilization and storage (CCUS) facilities by 2025. It is expected that the deployment of CCUS technologies could remove as much as 60 percent of emissions by 2050 ([Ng 2021](#)).

China's vision and ability to deploy clean technologies at scale and to dominate key links of the green supply chain give it a unique edge in the global energy transition. China led all nations in its investment of \$380 billion in clean energy, and Chinese companies already dominate the industries fueling the global clean energy transition ([Odonkor 2022](#)). It now controls 80 percent of all battery cell manufacturing capacity, and its share in all key manufacturing stages of solar panels is projected to reach 95 percent in the coming year ([BloombergNEF 2021](#); [IEA 2022a](#)). Earlier this year, Shenzhen-based automaker BYD, which already dominates the electric bus market, became the world's largest EV producer, thanks to domestic purchase subsidies and incentives amounting to \$28 billion (200 billion RMB), which has rapidly driven up EV consumption ([Bradbury 2022](#); [Interesse 2022](#)). China has successfully leveraged the domestic energy transition to be an indispensable player in the global low-carbon economy.

The jury is out on whether China should take greater responsibility to help the world decarbonize, but the country's commitment to multilateralism and willingness to do more and to work with both the developed and developing worlds under the UN framework make China a credible partner in global climate politics. The world will keep an eye on the

outcomes of the implementation of the Green BRI projects and how comprehensive and far China would go to reinvent the BRI from a program that primarily builds energy-intensive conventional infrastructure in poorer countries to one that shapes recipient countries' paths toward more sustainable and low-carbon energy systems. As China has successfully transitioned from a developing country to a green superpower, its success in pushing richer countries to channel funding, technology and knowhow to developing countries will further boost its legitimacy, which could be made easier by resuming climate talks with the United States.



# Conclusion

In 2015, the Obama administration stated that “The United States welcomes the rise of a stable, peaceful, and prosperous China” and portrayed its climate cooperation with China as critical to the U.S. leadership in the global response to combat climate change ([White House 2015a](#)). That same year, the two countries issued the unprecedented U.S.-China Joint Presidential Statement on Climate Change, which was instrumental in catalyzing other countries to join the Paris Agreement. Fast forward to 2022, and Washington has shifted to seeing China as a “pacing challenge” to the U.S.-led international system. Biden considers China as “the only competitor with both the intent to reshape the international order and, increasingly, the economic, diplomatic, military, and technological power to do it ([White House 2022](#)).” Beijing did not shy away from calling out on U.S. missteps and promoting the idea that the United States is in decline. Just last year, shortly after Russia’s invasion of Ukraine—which Beijing believes was a result of the U.S. and its allies’ instigation—Xi said to reporters, “The United States is the biggest threat to our country’s development and security ([Buckley 2021](#)).” Although the persistent prominence of inimical rhetoric may portend a tougher road ahead for bilateral climate and clean energy engagement, hope remains that the two countries’ competition in developing the best and most affordable clean technologies can hopefully produce unintended, constructive consequences for a greener world.

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## Conclusion

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