THE FUTURE OF THE INTERNATIONAL SYSTEMS

AUGUST 2021

The Future of the International System

Messy Multilateralism, Networked Technology, and Pioneering Innovation

Introduction

Heather A. Conley

The great American baseball player and "philosopher," Yogi Berra, famously said that if you come to a fork in the road, you should take it. Today, the international system stands at Berra's fork and is heeding his advice by taking two roads simultaneously. The first road is the well-trodden one: the international community continues to practice multilateral diplomacy and follow the post-1945 international patterns of cooperation—but with fewer productive results. The second is an as-yet unchartered path of new patterns of behavior marked by technological competition and coercion, the revitalization and modernization of industrial policies, and a radical rethink of the role of governance and diplomacy.

The terrain of this new road is explored with the help of three authors: Ayse Kaya, associate professor of political science, Swarthmore College; James A. Lewis, senior vice president, CSIS; and David Victor, professor, School of Global Policy and Strategy, University of California at San Diego. Each author was asked to write a short, imaginative essay that examined the three issues that will significantly shape the future international system: 1) global trade and inequality (Kaya), 2) the role of cyber and emerging technologies (Lewis), and 3) climate change and the global energy transition (Victor). The authors were tasked to answer what they believed the future nature of competition and conflict would be in their respective topic and what they considered the role or limitations of the nation state in addressing those challenges. Who will hold power in this new international system, and who may lose preferential status? What are the consequences of failure or resilience of national governments to address these global challenges?

CSIS | CENTER FOR STRATEGIC & INTERNATIONAL STUDIES

The international system has been advancing toward this fork in the road for the past 30 years, accelerated in recent years by a rapid decline in multilateralism as the United States returned to its historical state of retrenchment and as China challenges the U.S.-led global order and its presence in the Indo-Pacific. This structural shift of heightened Sino-American confrontation, very different from the bipolarity of the Cold War era, occurs at a time when trans-national challenges—climate change, technological innovation, a global pandemic, as well as ethnic, racial, and political tensions—confront all nations and spur calls for collective action. In this transitory period, fluid trans-, sub-state, and private sector coalitions have emerged to fill regional power vacuums. Increasingly, cross-regional alignments such as the proposed "alliance of democracies," the emergence of cities and private companies as independent foreign policy actors, and greater fusion between the public and private sectors are also features of this structural shift.

There is no Google map or Waze app to navigate this new road, and the travelers of it seem "too tired, too divided, and without victors to negotiate the kind of new, U.S.-led order that was hashed out at the end of World War II," as Professor Kaya notes in her piece, "Messy Multilateralism: Selective and Haphazard Cooperation in the New Global Economy." Messy is an apt description of the international system today and of global economic relations in general, wherein a powerful political backlash against globalization and rising social inequality have fueled demands for policy changes. Kaya draws on the fork in the road analogy to describe two paths for future global economic and trade relations as priorities shift away from multilateralism and toward national industrial policies and protection of supply chains. The first of these roads, "take control," foresees a future global economic order that has states seeking to regulate more rigorously while they look inward to shield domestic industries. In contrast, the second road encourages some positive reforms to the current international economic system, such as collective debt relief and emergency lending during economic crises, to help temper the worst instincts of the "take control" path. While suggesting that there are positive signs that a reform of the existing international economic system is possible, Kaya concludes with a sobering note by suggesting that the most likely way forward is a piecemeal renegotiation of the current multilateral economic system; in the meantime, a scaling back of international commitments and foreign economic policies based on individual domestic needs seems inevitable.

Just as cooperative patterns related to global trade are in flux, the role of new digitally networked technologies has also fundamentally shifted power in the international system, according to Jim Lewis in his essay, "The Role of Cyber and Emerging Technologies and its Impact on the International System." As Lewis argues, most countries with cyber capabilities use them to pursue their national objectives (espionage and surveillance), but for those countries that utilize cyber as a coercive tool—mainly Russia and China—cyber is now a "central arena for inter-state conflict." Within a framework of global technological competition, "countries that are strong in creating new technologies have advantages," and fortunately, for now, most "innovator nations" are Western democracies. But they confront forceful competitors. Lewis suggests that

"new groups with processes" are needed "to accelerate growth, ensure technological parity, and protect democratic values." While governments must ensure a framework for cooperation, the actual work will be done in the private sector. If Western nations can develop such processes, technological trends in power relations will shift in their favor.

David Victor's essay, "Rethinking Global Climate Strategy and Global Order," integrates Kaya's concept of messy multilateralism as well as Lewis' point on the need for new processes and interactions between governments and the private sector. Victor notes that 30 years of climate diplomacy has resulted in three global treaties but an increase in global emissions. When it comes to climate policy, a "radical rethinking of the role of governance and diplomacy" is needed. He observes, for example, that decarbonization success comes from "a series of revolutions that will begin within localized sectors and markets and then, with the right incentives, spread widely." These technological revolutions are pursued by risk-taking and innovative technology pioneers that focus on niche technologies. As these technologies begin to show promise, pioneering clubs of countries may be formed, which can more rapidly spread successful climate technologies. While these climate networks are neither business nor government controlled, for profound technology change to occur, they will require public investment, business models that reward innovation, and "joint searches between business and government to test out new ideas and learn what works."

What all three essayists convey is the need for something different in international governance. Old strategic doctrines and methods both restrain new thinking and are increasingly ineffectual—as climate diplomacy has demonstrated. In David Victor's words, a "radicalized theory of change" may be required to break out of the old multilateralism and into the new. This radicalization emanates from a sense of global urgency and civic activism and will be enormously uncomfortable for elites trying to manage the international system as they always have. But to be successful in the new international system, these authors suggest that it is likely that we will renegotiate traditional multilateral approaches, a reality that reflects changing domestic political requirements and greater integration of other important stakeholders.

Should these domestic requirements in part be fulfilled with a robust research and development base to support future technological innovation—which in turn fuels greater shared economic prosperity and incentivizes innovator nations to further develop more promising technologies which improve livelihoods globally —we might begin to see positive change in the international system and a new international approach. This is the promise, but it will be messy getting there. As Yogi Berra would say about the future, "It's pretty far, but it doesn't seem like it."

Heather A. Conley *is senior vice president for Europe, Eurasia, and the Arctic and director of the Europe, Russia, and Eurasia Program at the Center for Strategic and International Studies (CSIS) in Washington, D.C.*

STR/AFP via Getty Images

Messy Multilateralism: Selective and Haphazard Cooperation in the New Global Economy

Ayse Kaya

What trends will drive the future shape of the global economic order or the economic openness among countries governed by multilateral institutions? Under increasing pressure since the 2008 global financial crisis, the international economic system has been shaped by three overarching trends. These three trends will increasingly produce messy multilateralism with two realms of interaction between states, markets, and rules governing the global economy: (1) a "take control" sphere and (2) a "multilateral cooperation as we know it" with new cooperative struggles.

Background Trends

First, growing discontent with economic globalization will intensify, particularly following the global pandemic, as it has become painfully clear that global economic integration has left the **bottom classes in rich economies underserved**. Second, while one could dispute the extent to which heightened economic insecurity (as opposed to nativist anti-immigration attitudes) has fueled it, populism—featuring a backlash against elites and foreign influences—has been on the rise, especially in rich economies. Third, intertwined with these developments is that U.S.-China tensions have become more visible—at first awkwardly in the Obama administration's "Pivot to Asia" and then as a fully-fledged rivalry during the Trump administration. These tensions will likely persist during the Biden administration.

These developments suggest that the global economic order is at an inflection point. While disintegration and full reversal on economic integration and multilateral institutions are unlikely, the order is going to be marked by states' changing priorities (e.g., industrial policies and diversified supply chains), which will lead to messy multilateralism containing selective and haphazard cooperation.

Messy Multilateralism and Its Realms

One can think of messy multilateralism as containing two major realms, or spheres. Realm 1, the "take control" sphere, will feature states' continued attempts to wrestle back control from global economic integration and international rules over what they consider and claim to be sensitive industries and markets. Covid-19 has had a significant impact in this area. Realm 1 is thus about restoring domestic primacy from preexisting international rules of integration for the major economies, as well as regulating and reining in markets (particularly digital markets and platforms). To be sure, this realm does not mean the absence of multilateralism or cooperation, but rather a negotiated multilateralism that rolls back previous dictates of the global economy. Hence, it will be the realm of change—either because multilateral rules are being renegotiated or because there will be a hiatus from the existing rules.

Global economic order is at an inflection point. The order is going to be marked by states' changing priorities (e.g., industrial policies and diversified supply chains), which will lead to messy multilateralism containing selective and haphazard cooperation.

Realm 2 is the "multilateral cooperation as we know it" sphere, where states will continue to strive for cooperation under the rubric of existing multilateral institutions adorned with collaborative rhetoric. Even in this zone, however, struggles over cooperation will rise to the forefront.

These realms emerge from and impact the extant trends, suggesting that although the multilateral order will continue to prove sticky, states' changing priorities will nonetheless reshape it to produce a "messy multilateralism" consisting of selective and haphazard cooperation.

Realm 1: Take Control

The Trump administration targeted the multilateral system by highlighting its weaknesses and blaming it for its ills. The Biden administration seeks to restore and reform the multilateral economic system and end longstanding disputes. For example, the Biden administration ended the U.S. resistance to appointing the former Nigerian finance minister, Ngozi Okonjo-Iweala, as the new director-general of the World Trade Organization (WTO). The end of the Trump administration, however, did not change one of the underlying long-term drivers of populist and hostile rhetoric against international organizations that makes it difficult for American leaders to holistically support multilateral economic integration.

Although the multilateral order will continue to prove sticky, states' changing priorities will nonetheless reshape it to produce a "messy multilateralism" consisting of selective and haphazard cooperation.

Particularly, U.S. cheerleading for economic globalization has become difficult as distributional consequences of economic globalization in the country have come to the forefront, benefiting primarily high-income groups. Although there are many reasons for the widening income gap within the United States (including technology privileging higher-skilled

workers and **weakened labor institutions**), the impact of international trade—with China in particular—has created a non-negligible, "**China trade shock,**" which has been credited with fueling the rise of populist political candidates. Demonstrating greater political will for economic multilateralism and taming distributional effects of economic openness can partially alleviate structural constraints. Yet the reality remains: the United States must renegotiate economic openness to attenuate domestic inequalities and tame the rise of China.

As a result, aspects of the Trump administration's policies toward the global economic order will persist under Biden. Although the Biden administration endorsed the preferred head for the WTO, for example, it continued the American refusal to consider any new nominees for appointment to the institution's appellate body, which reviews the cases referred from the panels in the institution's dispute settlement mechanism (DSM). The Biden administration appears to agree with its predecessor that the DSM—**contrary to what the numbers suggest**—has not worked for the United States and is too deferential to international rules over national priorities.

Additionally, a growing U.S.-China rivalry also has repercussions for the international trading system. The Biden administration, in one example, affirmed goods from Hong Kong labeled as "Made in China" despite protestations from Hong Kong. The Biden administration has also continued to maintain the U.S. policy position of China as a non-market economy (NME) in trade remedy cases, which has been a U.S. position since the 1980s. China's 2001 accession to the WTO enhanced the importance of this issue as China claimed its WTO accession required the NME status to be changed by 2016 and launched a case against the United States and the European Union. The case ended up being suspended upon China's request in 2019 when the Chinese realized they were unlikely to be victorious. NME status assumes heavy state intervention in the Chinese economy and eases the Department of Commerce's imposing of anti-dumping duties on Chinese imports (dumping by China means products are sold at a lower cost than the cost of production or lower than in the Chinese market). From the U.S. perspective, NME status is necessary to maintain fair trade for U.S. producers, but from the Chinese perspective—and those relying on Chinese goods for their own production in the United States—it distorts multilateral trading.

The United States must renegotiate economic openness to attenuate domestic inequalities and tame the rise of China.

Some continuation of Trump-era policies within the Biden administration can also be expected on the foreign direct investment (FDI) front. The Trump administration fully utilized an interagency committee, the Committee on Foreign Investment in the United States (CFIUS), which screens investment deals with national security implications by expanding the definitional flexibility in what constitutes national security, giving the com-

mittee greater power. The Trump administration bolstered this committee's purview by requiring deals in 27 "critical technologies," such as biotechnology or semiconductors, to be reported to the committee. This revision was directly linked to concerns about Chinese investments in these sectors. Since CFIUS investigations are generally not made public, it is difficult to detail how much the strengthened body has impacted Chinese investments. Yet the interagency's bolstered position will remain, thanks to **bipartisan support** for heightened vigilance on foreign investments in the United States.

Further boosting the "take control" sphere is Covid-19, which has underscored that all economies can be vulnerable to dependencies in various critical sectors and supply chains, such as the manufacture of personal protective equipment (PPE) and semiconductors. Critics of the Washington Consensus—development policies centered around liberalization and privatization of markets and their deregulation—have long argued that not all sectors are best left to the vagaries of interdependence and globalization, but Covid-19 intensified these concerns. Supply chain vulnerabilities and reliance on other countries for critical equipment rose to prominence during Covid-19, highlighting questions such as "who makes and exports medical equipment?" In 2018, China **supplied over 40 percent** of the world's personal protective equipment (PPE), for instance. Once the crisis deepened, the question turned to restrictions on exports of medicine and vaccines. Both the Biden and Trump administrations have invoked the **Defense Production Act** in order to accelerate vaccine production in the United States. While the invocation has aimed to ease supply chain restrictions within the United States, **critics have argued** that it has caused supply problems elsewhere in the world. Overall, Covid-19 is a reminder that one can end up on the wrong side of Adam Smith's powerful idea of division of labor, especially in a world where nationalistic instincts can easily impede global cooperation. Hence, it is best to take back control.

To be sure, states should be expected to bolster their efforts to rein in the markets for reasons that predate Covid-19. Particularly, there is a pressing imperative to ensure mobile capital returns greater societal benefit at a time of increasing social dissensus and deferred infrastructural maintenance in rich economies. Statutory corporate tax rates have been in decline **since the 1980s,** and the growing monopoly power of large technology companies accentuates gross disparities in the economic system. In this light, the Biden administration and the European Union recently announced their intentions to seek more tax revenue from capital and to channel it toward repairing infrastructure and post-Covid economic recovery, respectively.

The current moment offers an opportunity to tax capital more rigorously: states can move more firmly toward global rules on capital and business. Yet, some states will resist global standards because they undercut their own economic model, and the temptation to not coordinate will persist, with some countries moving quickly to take advantage of global capital, especially in the post-Covid-19 world. Simply, not everyone will be on board with scaling up regulation of global capital, which means states will be jostling among themselves to attract capital yet again. The temptation to not cooperate may be particularly appealing because the post-Covid-19 world will witness supply chain relocations and diversification as companies reconsider their production locations during the pandemic. To take control, however, states need to utilize this opportune moment cooperatively. In

this respect, Realm 1 also offers an opportunity to fill the voids of international regulation. Hence, in this sphere, one might not just witness a retreat from multilateral rules but also a renegotiation of existing rules or the making of new ones when the control of markets are concerned.

Realm 2: International Cooperation as We Know It

Realm 2 is marked by the status quo and states continuing cooperation over critical economic matters as they have done in the past. As global markets have become more integrated, global crises have become more frequent. In this context, the benefits of multilateral cooperation for facilitating financial and economic stability have only become more obvious.

Even amid rivalries and oscillations in U.S. multilateralism, these institutions have been able to rely on their existing apparatus to function and lend funds because they do not only consist of state representatives but also international bureaucrats with an interest in the perpetuation of these institutions. Figure 1 below shows International Monetary Fund (IMF) lending since the 1980s, displaying remarkable levels of lending during the Covid-19 pandemic. The World Bank also **reported** to have made $160 billion available, with about 30 percent of these funds as grants or on concessional terms. Meanwhile, newcomers to development finance, particularly the Asian Infrastructure Investment Bank, have also **revamped their lending lines** to provide funds for the Covid-19 pandemic.

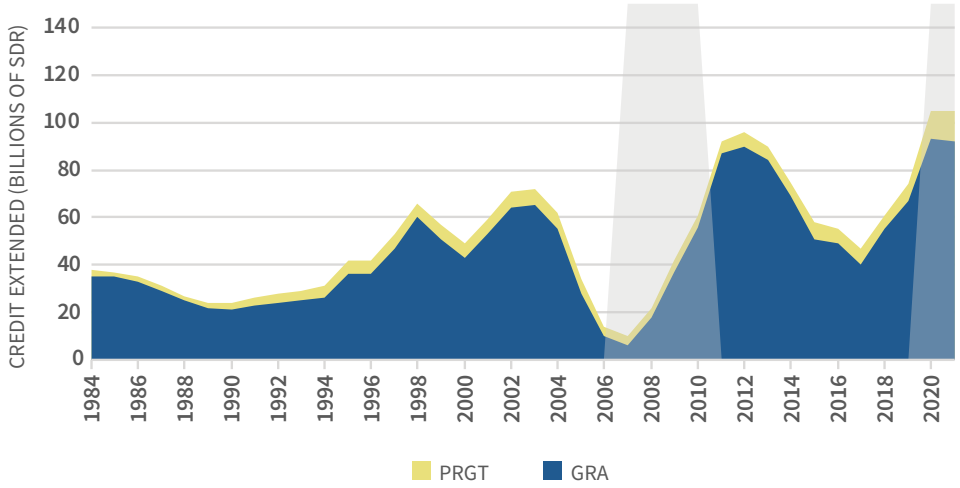
Even with growing U.S.-China rivalry taken into consideration, international financial institutions will continue as central platforms. Undoubtedly, existing institutions are beset with problems that undermine their sturdiness. For instance, IMF conditionality has been controversial, and the institution is widely perceived as working more at the behest of its advanced economy member states—particularly the United States and the European Union, with the greatest voting power—than its developing country members. This has led to the build-up of foreign exchange reserves (as bulwarks against crises instead of borrowing from the IMF), particularly in Asia, as well as regional monetary cooperation. A new addition to these regional mechanisms is the BRICS' (Brazil, Russia, India, China, and South Africa) Contingent Reserve Arrangements (CRA). These arrangements are, however, not ready to replace the IMF. In the case of the CRA, to access some of the funds, countries need to have a loan arrangement with the IMF, for example.

The IMF has also been partially effective in its reform efforts. While incremental on the surface, **reforms since 2008** reinvested some of the emerging economies' energies back into the institution. In one example, the staff and the Executive Board utilized flexible rules to include Chinese currency in the basket of currencies that constitute the institution's own unit of account, the Special Drawing Right (SDR). This has satisfied China's long-term desire while also getting the country officials to recommit to IMF-preferred policies. Just as it is important not to exaggerate the institution's changes, it is also crucial not to overlook them since they have given the institutions some renewed strength.

The next test for international financial institutions will be coordination on debt relief, as many lower-income economies are burdened with crushing levels of debt. The fact that Covid-19 funds from multiple multilateral economic institutions have been dispensed without tight coordination among different lenders (the Bretton Woods institutions attempted at **some coordination**) raises particular concerns about debt in a fragmented

multilateral lending system. Moreover, the rise of **bilateral lending by China**, which is not wholly transparent, compounds these concerns. Advanced countries are saddled with their own debt problem exacerbating the debt dynamics, and only one state, the United States, has the "exorbitant privilege" of issuing the world's reserve currency. Even in Realm 2, multilateralism may look messier than usual, but this realm shows that the multilateral system will retain a number of its cooperative characteristics.

Figure 1: IMF Lending over Time



Note: The figure shows total outstanding IMF credit in the institution's own unit of accounting (Special Drawing Right, SDR). GRA stands for General Resources Account, and PRGT denotes the Poverty Reduction and Growth Trust, which is reserved for low-income countries. The gray-shaded areas show the 2008 global crisis and the start of the Covid-19 pandemic.

Source: Author's calculations from IMF, "IMF DATA," online database, https://www.imf.org/en/Data.

Effective multilateral cooperation in Realm 2 can tame the self-help tendencies of Realm 1 and even offer common solutions to undesirable dimensions of economic globalization. This is unlikely to be a linear process, however. The world seems too tired, too divided, and without victors to negotiate the kind of new, U.S.-led order that was hashed out at the end of World War II. The current U.S. policy consensus, for example, appears in favor of reorienting U.S. foreign economic policy to be adjusted to work for the U.S. "**middle class**," which calls for making trade "fair" for the public in conjunction with a national competitiveness strategy. This reorientation implies the United States needs to simultaneously renegotiate the existing order while also trying to scale back on its commitments, with the aim of having foreign policy more robustly serve domestic goals. Therein might lie the contradiction: U.S. leaders may find it difficult to both simultaneously reduce commitments while also renegotiating the economic system. Indeed, Realm 1's potential for self-help inclinations can only be attenuated if the system has strong political leadership and a creative vision. But perhaps political vision and energies can be channeled to incrementally renegotiate that order, as the discussions on global capital taxation suggest. Unfortunately for this kind of focused or tidy multilateralism, the world will become more familiar with a United States that returns to multilateralism in a piecemeal and selective fashion as

both the United States and its European partners look inward to overcome their domestic woes and outward to tame an ambitious Chinese global economic agenda.

U.S. leaders may find it difficult to both simultaneously reduce commitments while also renegotiating the economic system.

Ayse Kaya *is Associate Professor of Political Science at Swarthmore College.*

The author thanks Mark Kuperberg, Jonathan Kay, and Matthew Salah for insightful comments on this piece.

KIRILL KUDRYAVTSEV/AFP via Getty Images

The Role of Cyber and Emerging Technologies and its Impact on the International System

James A. Lewis

New technologies create economic and military power. This has been true for more than a century. The immediate focus is on digital, networked technologies. The centrality of digital network technologies to human activity puts a spotlight on their relevance for national security and highlights the importance of cyber operations.

Cyberspace is a new and not always well-understood domain. The powerful influence of outdated strategic doctrine constrains new thinking that could help the United States and other democracies better defend their position in an era of strategic competition. The nature of cyber operations is significantly different from kinetic action, rendering some precedents from international affairs less useful. And while the private sector plays a key role in supplying software and services and expects to play a similarly key role in international cyber policy, it has an incomplete grasp of the requirements for a durable international strategy. All of these factors complicate democracies' development of effective policies.

Cyber does not fundamentally change trends in international power. These trends are the decreased utility of post-1945 institutions and rules, the decline in Western global influence (particularly in Europe), and the emergence of new powers. The growing number of countries with cyber capabilities see them as another tool to pursue their national ob-

jectives. For most, this means espionage and surveillance, but for a few, cyber operations are a tool of coercion. Unfortunately for western democracies, the leading coercive actors are Russia, China, and in some instances, Iran (although its actions are mainly against its neighbors). This is not "grey zone conflict"—a nineteenth-century notion which implies some middle ground between war and peace. Cyber is not a grey zone but a central arena for inter-state conflict.

Russia is the source of the most dangerous coercive actions. Its intent is to weaken democratic opponents and create political unrest among allies, and it builds on its expertise and history of political interference. It has a well-developed doctrine for coercive cyber techniques. Russia has had some success and shows no sign of abandoning its long, occasionally covert campaign against the North Atlantic Treaty Organization (NATO) members. The failure of the West to react in any meaningful way has only encouraged the Russians and increased their influence.

China, while it has studied Russia's coercive cyber operations, emphasizes cyber espionage as a key part of its national strategy. This important change highlights how the contours of interstate conflict have changed from Cold War-style military contests. This is not conventional political-military espionage, but spying **aimed** to provide China with commercial advantages and technological leadership, and ultimately a dominant global position. It, too, has had remarkable success; cyber espionage, combined with predatory commercial and trade practices and heavy government spending (often in contravention of China's World Trade Organization (WTO) commitments), has made China the second most powerful economy in the world. China is strong in some technologies, such as autonomous vehicles, genetic engineering, and quantum encryption, but it lags across the board and Xi Jinping's quest for tighter political control may slow its ability to innovate.

Cyber is not a grey zone but a central arena for inter-state conflict.

China's economic success and Russian aggression are one way technology has fundamentally shifted the balance of power. China and Russia are not dominant, but they hope to exploit the fraying of the post-1945 international order to advance their interests, undercut the democratic narrative, and reassert sovereign rights over universal values. Chinese leaders are firm in their belief that the United States and Europe are in irreversible decline and that Western policies are a form of containment. The Kremlin also believes the West is in decline due to their decadence (democratic values) and polarization (which their policies foment), but Russian leaders require contestation with the West to preserve the regime. Chinese leaders prefer Western acquiescence but are prepared for increased contestation.

Cyber technologies enable coercive action and espionage. They also enable a struggle for control of the global political narrative and international operating system that shapes international power. Both Russia and China realize this, but both have had difficulty in

articulating a compelling alternative narrative externally while maintaining complete control internally. Russia utilizes information as a weapon but does so as a defensive measure. Information is not a weapon, but it is a threat to internal political stability, especially to governments that lack mechanisms for accommodating dissent and political change. Both countries have their own constraining domestic political and economic dynamics and should not be viewed as unstoppable giants. But they have chosen conflict, albeit in unconventional forms, and cyber is the premier point of engagement.

Cyber actions and informational conflict take place in the context of a larger technological competition. Countries that are strong in creating new technologies have advantages, but there are only a handful of such countries, with China and Russia among them. Most "innovator nations" are Western democracies, but they now face forceful competitors. While many technologies are commercially available (so those who cannot make can buy), the leaders in innovation will always have a long-term advantage, and this favors the West.

In this contest, Europe and the United States have been handicapped by their own politics. In the 1990s, the United States cut investment in crucial public goods like science, technology, engineering, and mathematics (STEM) education and fundamental research. This weakened its innovation ecosystem. The European Union's governance shortcomings and internal tensions between member states on industrial policy hampered the European Union's ability to create and capitalize on new technologies. One result of this was Europe's failure to take advantage of the digital technology revolution that began in the 1990s. While the current leadership in Brussels is taking steps to remedy this, it faces a difficult task—especially since the departure of the United Kingdom means the loss of the European Union's only major cyber power and of one of the world's premier centers for technological innovation.

Europe has a strong research and engineering base, but a predilection for regulation can interfere with innovation and growth. Innovation is half the story; the other is entrepreneurship. Entrepreneurs turn research into product, but this requires an acceptance of risk not always found in European business culture. The result is that China has not displaced the United States technologically; it has displaced Europe.

This is not in the interest of the United States since it changes the international order in ways that are adverse for U.S. interests because a strong Europe is essential for American strategic interests. While Europe's confidence in the United States has been shaken—leading to more calls for "strategic autonomy"—and while its concern over its place in the digital world has led to similar calls for technological sovereignty, rebuilding a transatlantic partnership in digital technology is **in the interest** of both the United States and Europe. The formation of such a partnership remains ill-defined. The Biden administration has begun to change this, but it faces other issues, such as a lack of common transatlantic understanding of data protection, competitiveness policy, and content regulation.

One problem for the United States is that while it is likely the world's leader in cyber espionage capabilities, it is espionage in service of what was, until recently, an erratic national strategy. The best intelligence in the world did not compensate for this. Additionally, while the United States still leads the world in technological innovation (although not by as much in the past), it is recovering from two decades of misdirected resources. Had even

a fraction of the trillions of dollars spent in Iraq and Afghanistan been devoted to technology and innovation, the United States would be in a much stronger position in any global technology race. A lack of strategic focus in these new domains means that, in colloquial terms, the United States has been "punching below its weight" on the global stage.

Technology competition comes at a moment when today's technological environment is being rapidly reshaped by cloud computing, artificial intelligence, and 5G (soon 6G) networks. There is a movement toward a hybrid environment where virtual and physical blend seamlessly. The nations that lead in this will have increased military and economic advantage. These current technologies will be followed by some hybrid realties applications, genetic engineering, and widespread automation. Technological change will remake business and societies by changing incentives and costs. This does not mean, however, that there will be mass unemployment. People will find new ways to create value. This has been true since the dawn of automation, and it will probably involve creating intangible goods and services. The fact that the creation of value and new jobs does not involve a linear, easily predictable process probably explains much of the anxiety and uncertainty over the next technological transition.

Compensating for the inevitable shifts in power created by digital technologies (combined with other factors) requires the United States to develop new ways to work with allies in Japan, Australia, and Europe to develop the commercial and military applications of emerging technologies such as quantum, biotech, and artificial intelligence. This cannot be an anti-China coalition but rather a new group with processes to accelerate growth, ensure technological parity, and protect democratic values. The central dilemma is that while governments must ensure a framework for cooperation, the actual work will be done in the private sector. If Western nations can develop such processes, it will shift the technological trends in power relations in their favor.

James A. Lewis *is a senior vice president and director of the Strategic Technologies Program at CSIS.*

BRENDAN SMIALOWSKI/AFP via Getty Images

Rethinking Global Climate Strategy and Global Order

David G. Victor

2021 marks the 30th anniversary of the start of UN-sponsored talks to address climate change. Over that period, climate diplomacy has become a nearly continuous activity that has produced three treaties: the UN Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol, and the Paris Agreement. These agreements work by global consensus, which helps explain why the effect of this diplomacy on reducing actual warming is hard to discern. Global emissions

have risen nearly every year since diplomacy began. The global temperature, already having warmed 1.2°C since pre-industrial times, is set to blow through the widely discussed goal of stopping warming at 2°C.

Stopping warming requires cutting emissions of carbon dioxide ($CO_{2)}$ and other warming pollutants nearly to zero. For advanced economies, this is expensive and hard to initiate because it implicates the competitiveness of modern industrial economies and could cause catastrophic harm to incumbent industries that are well organized politically. The need to help pay some of the costs of emissions control for developing nations is another obstacle to international cooperation through diplomatic negotiations. Overcoming such obstacles requires a radical rethinking of the role of governance and diplomacy. It requires active efforts to create new industries—and thus create new political interests—and it requires new thinking about which countries and industrial sectors will lead and follow. In a world where advanced market economies, led reliably by the United States, could set the pace for governance, it is possible to imagine that effective international arrangements might arise through institutionalized global diplomacy. But in the modern world, with fragmented control and ephemeral leadership, something different is needed.

New Organizing Principles for Climate Governance: Niches and Clubs

Elimination of emissions or decarbonization of the economy requires technological revolutions in each of the emitting industries. But revolutions are rarely planned by consensus committees. Instead, they emerge in niches where pioneers see an advantage from change. Technologies advance in these niches, and the firms that back them gain political power in tandem with market share. In turn, those synergistic technological and political forces make it easier for new entrants to rewrite market rules to their advantage and, in time, crush polluting incumbents. This is a costly and risky sport and thus must initially occur in arenas that will tolerate or invite the changes. Pioneers bear the cost of first movement, but they also gain the reward by demonstrating and leading new business models that create confidence and erode political opposition elsewhere. Put differently, the leadership of pioneering action makes followership in the rest of the global market easier—and through the globalization of manufacturing and deployment of technology, this dynamic of leadership and followership can play out on a planetary scale. In climate change, it is followership that really matters, for most global emissions and growth in global emissions come from places that are far from the technological and political frontier.

This niche-focused, pioneering approach to radical technological change is already playing out— although not fast enough nor as pervasively as needed for global transformation. For example, cheap solar power today is **the result of niches created by pioneers**, such as in Germany, where its bold, unilateral *Energiewende* policy and its precursors drove down costs through a rapid expansion in procurement. Now the rest of the world is enjoying a solar revolution that was initially funded by German taxpayers and electricity ratepayers. In time, the dominant position in solar manufacturing shifted to China, which is making solar panels at much lower prices—a benefit of globalization that is helping to accelerate the solar revolution across the planet. Revolutions in electricity storage (batteries), hydrogen production (electrolyzers), electric vehicles, clean steel, clean cement, and carbon capture and storage (CCS) are at various stages in the revolution—all emerging in niches.

Pioneers bear the cost of first movement, but they also gain the reward by demonstrating and leading new business models that create confidence and erode political opposition elsewhere.

By this logic, the role of global diplomacy, tethered to global consensus, is relatively minor. At best, global diplomacy provides cover, justification, and legitimacy for niche policy investments that must occur rather than global planning. But the real work will happen in more focused settings, such as in distinct "clubs" of governments and industries in the sectors and the markets that are willing to go first—whether out of fear of being seen as a laggard or the hope of outsized opportunity that comes from going first.

Today, Europe is at the center of most of these "climate clubs." One example of how a climate club has formed is the North Sea **Northern Lights** project—a huge system backed by Norway, the European Union, and three energy companies—that demonstrates how to use carbon capture and storage (CCS) technologies to cut industrial CO2 pollution in the North Sea.

Example of a Club for Carbon Capture and Storage: The North Sea Northern Lights project

CCS technologies could play a central role in deep decarbonization but making this approach economical hinges on achieving large-scale deployment—the capacity to apply CCS to huge volumes of emissions. Industrial hubs could play a central role in this process because many different highly concentrated industrial CO_2 sources—steel and cement plants, refineries, and power plants, for example—could be aggregated, and then the hubs could utilize a common infrastructure to move and inject the CO_2 safely underground.

There have been many ideas for industrial CO_2 hubs, but most of those ideas are little more than breezy speculation and some chalk lines drawn on maps. One of the few industrial hub CO_2 projects to advance is "Northern Lights"—a network of ships that will carry liquefied CO_2 from industrial sites around the North Sea to a common point in southern Norway and then injected underground at an offshore location. The project, a first of a kind, is not economical at current costs for emitting CO_2 and current regulations. Rather, it is a bet on a future where such projects will become economical once technologies improve and real firms have experience managing these systems. Because of its high risk, the project requires a public-private partnership with huge financial backstops from government. Following a vote of the Norwegian Parliament in December 2020, the project has reliable financial backing from Norway and is also making use of EU funding. The three industrial firms at the center of the project—Equinor, Shell, and Total—all have extensive experience with related projects and see experience earned through Northern Lights as a way to help create industries for a low-carbon future.

The project reveals why working in small clubs is so important. The complex coordination needed to design and implement an industrial project is greatly facilitated by restricting membership to a small group of highly motivated firms with one clear lead (Equinor). What is most important is that the political arrangements needed to secure funding and implicit regulatory support for the project are easier to hammer out with fewer players—with the government of Norway in the lead. And because the matter was debated openly (and supported) in the Norwegian parliament, the policy support essential to moving the project forward was highly credible.

Winners and Losers in the Decarbonization Revolution

Already it is possible to identify the characteristics of the likely winners and losers in the international system from this technological view of climate governance and politics. In terms of industries, the winners are certain to be electric power and industries that expand the utilization of electric power—from heat pumps to grid control systems designed to accommodate large amounts of clean renewable power. Almost every technical study of deep decarbonization arrives at the conclusion that decarbonization requires electrification. Compared to today, the world's electric grids seem poised to supply two to three times the volume of electricity in a decarbonized world. The future of decarbonization is steeped in uncertainty, but the one thing that is virtually certain is that a clean future will be an electric one. After electricity, however, it is much harder to see exactly which industries are assured a prominent place in a decarbonized future.

Looking to governments, the winners are likely to be nations that are skilled at opening, protecting, and expanding the niches where radical new low-carbon technologies will emerge—a task that, in effect, is climate industrial policy. Not all governments are good at doing this, for it requires the capacity to intervene heavily in the market yet not to pour state capital and other resources into white elephants in the desert. With awareness of the need for deep decarbonization, the flower of industrial policy is blooming again—albeit with little attention, for the most part, to where and how governments direct and maintain these skills.

The future of decarbonization is steeped in uncertainty, but the one thing that is virtually certain is that a clean future will be an electric one.

The winners in low-carbon revolutions won't be "industries" or "governments," but combinations of the two as neither the private sector nor the state have the sole capacity needed to create the conditions needed for low-carbon technologies to thrive. Those conditions, many studies suggest, include: keeping the costs of capital low first and foremost, which means creating certainty for investors, such as assuring policy stability, while adopting

business models that are insulated against risk. The energy systems of a carbon-free economy will probably have very low operating costs (e.g., little need to purchase coal or oil) in exchange for high fixed assets that will be affordable only if their costs are amortized over long time horizons. A growing number of studies show that deep decarbonization might be surprisingly **inexpensive** for society—free, perhaps—and essentially all of these studies hinge on the assumption of cheap capital that is adroitly deployed and well amortized. A second condition is skill in identifying promising new technologies. Often these technologies arise in networks that neither business nor government controls on its own—for example, electric vehicles that depend on global supply chains for materials and batteries, distinct supply chains for the vehicles themselves, and charging networks available at the same pace that customers need them. A third condition is continued profound technological change, which depends partly on investment in the public good of new knowledge, partly on firms with business models that reward innovation, and partly on joint searches between business and government to test out new ideas and learn what works.

It is a useful exercise to ask which marriages of business and government will thrive under these conditions. There are many sector-government partnerships in Europe and in other places as well—from the electric utilities and suppliers in the California market to the state-based nuclear power agency in Abu Dhabi, where access to inexpensive capital has led to the construction of the first nuclear complex in the Arab world. One of the challenges in the United States will be that federal politics has become so polarized that it is increasingly difficult for the federal government to provide the kind of policy stability needed for success with deep decarbonization. In such settings, success in the real world may be found in domains within the country—state and local levels, often working with highly regulated firms and industries—rather than nationally. Most of the computer models used to assess the speed and cost of deep decarbonization are essentially unaware of how these conditions will condition the real-world deployment of capital and technology.

For strategists who are thinking about how these kinds of conditions affect international governance, at least two broad implications will follow. One is that there will be large heterogeneity in the national response to deep decarbonization, not just because of variation in preferences but also because of variation in the marriages of these industry-government pairs. Successful systems for international governance will need to create space for the successful marriages to transform the world, rather than connecting the whole planet via consensus to the worst marriages around the planet.

Second, successful decarbonization industrial policy will be indistinguishable from nationalistic industrial policy. Both involve deep intervention in the economy, propping up of national champions, and prodigious use of border measures (and other policies) to nurture infant industries. Down one path, the world's suites of technologies are transformed, and climate change gets better. Down the nationalistic path, there is extensive onshoring of production lines but little of the synergistic technological advance needed to solve the planetary challenge of warming. The first path creates national benefits *and* international cooperation; the second path creates nationalism and erodes cooperation, similar to a "security dilemma" found in arms control where a country that seeks to bolster defense and produce more security often triggers a counter-buildup by others, eroding security. A decarbonization policy dilemma seems likely to unfold with similar logic.

The Consequences of Being Slow

Decarbonization success must come from a series of revolutions that will begin within localized sectors and markets and then, with the right incentives, spread widely. These processes will take time to gestate and may look like "muddling through" by actors who do not feel a sense of urgency. This is due to the fact that pervasive revolutions aren't planned and orchestrated by central committees with command of every filigree in the global economy. Rather, they emerge from the filigrees.

One result will be growing impatience. The interest groups concerned with climate are likely to become even more radicalized, which, frankly, has been the source of most climate policy and investment action thus far. When activists send letters about the need for climate action, firms forward them to the corporate social responsibility department. When activists chain or superglue themselves to the front door of the headquarters, the CEO pays attention.

Decarbonization success must come from a series of revolutions that will begin within localized sectors and markets and then, with the right incentives, spread widely.

Responses to radicalized actions work not like an elegant carbon tax that tinkers with incentives to decarbonize at the margin. Rather, radicalization is a big sledgehammer that can be reckless in application, create catastrophic brand risks, and yield other severe consequences. The good news in this radicalization is that such forces will inspire more firms and governments to invest massively in finding solutions. This radicalized theory of change, which sits uncomfortably for elites, needs a lot more attention. Occupying the policy center of the road in these debates, as many analysts and leaders like to do, seems likely to generate a lot of policy roadkill.

Tragically, the slowness of these revolutions means that we are in for significant global warming. What will we do if climate change exceeds control? Technologies could be readied—with modest effort—to manage solar radiation and cool the planet, also known as geoengineering. The side effects are unknown and probably unknowable without deployment. The collective action problems, however, are easy to see: a big nation could do this on its own and thus transform the problem of difficult mutual transformation to restrain emissions into a problem of mutual restraint. In desperation, restraints may be hard to make fast.

David G. Victor *is a professor of innovation and public policy at the School of Global Policy and Strategy at UC San Diego.*

This report is made possible by the Ministry of Foreign Affairs of Norway.