Feature Article

California's Foreign Climate Policy

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California has been at the forefront of environmental policy for decades, relying on its unique legal authorities and economic scale to influence out-of-state actors and drive technological innovation in multiple sectors. In the early 2000s, the state developed a comprehensive climate policy framework and has since emphasized its external leadership role under two successive governors. With the U.S. federal government withdrawing from international climate policy, California's place on the national and global stage has never been more prominent. Even though the U.S. Constitution formally prohibits states from having a foreign policy, when it comes to climate, California has one in all but name. Drawing on California's rich history of environmental policy, this article evaluates past and current efforts to build multilateral climate policy cooperation at the state level. California is at once a proactive outlier—a subnational government with the political will and regulatory capacity to rival even the European Union's policy regime—as well as a microcosm of the broader climate mitigation puzzle, where the problem of implementing aggressive targets looms large. In order to build on the state's successful legacy, California policymakers should pursue strategies to: increase transparency in domestic policy and between the state's partners abroad, increase cooperation within the state government, and minimize the legal risk of foreign policy preemption challenges.

Introduction

The election of President Donald Trump upended the emerging structure of global climate mitigation policy codified by the 2015 Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC). With national climate policy in retreat, the United States has no serious chance of meeting its Paris pledge (Larsen et al. 2017), the core of a lynchpin 2014 bilateral agreement between the United States and China that made the politics of Paris possible. If there were any lingering doubts about the U.S. emissions trajectory after the election, President Trump's June 2017 announcement that the U.S. plans to withdraw from the Paris Agreement settled the matter once and for all.

As the global community reckons with the abrupt reversal of U.S. federal climate policy, many are now looking to other U.S. actors to fill the gap. After all, global climate governance is a multi-layered regime of public and private actors operating at a variety of scales (Keohane and Victor 2011; Abbott 2012, 2014; Green 2013; Green and Auld 2016). As leadership at one level of governance retreats, it is hoped that another might take its place. Will subnational governments—cities, states, and provinces—step up in the absence of U.S. climate policy leadership?

This article provides an overview of California's role in United States and international climate policy, evaluating the state's increasingly prominent efforts against the challenge of developing a sustained intergovernmental policy regime shared between subnational public actors. Similar to previous studies of diffusion of Germany's clean energy policies (Steinbacher and

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Pahle 2016) and European Union (EU) climate leadership (Schreurs and Tiberghien 2007), the article begins with a history of the state's outward-facing efforts.

Armed with a comprehensive domestic legal regime and sophisticated regulatory institutions, California's governors have pursued a series of multilateral cooperative policy regimes over the past fifteen years. The state's foreign climate policy began under Governor Arnold Schwarzenegger during the federal George W. Bush Administration, when California led a coalition of subnational governments to develop a regional cap-and-trade program for greenhouse gases in the absence of federal policy and pursued the United States' first greenhouse gas standards for vehicles. California's external efforts matured under the Obama Administration, which re-engaged the UNFCCC process and pursued national legislative and regulatory climate policy regimes that built on state-level efforts. Under Governor Jerry Brown's leadership, California sent a delegation to the UNFCCC meeting in Paris to promote his signature effort: a nonbinding agreement between subnational governments, known as the Under2 MOU (memorandum of understanding). Governor Brown's public role has only grown after President Trump's withdrawal from the Paris Agreement. In the public eye, Brown has become a *de facto* national climate diplomat for the United States after recently meeting Chinese President Xi (Hernández and Nagourney 2017)—a privilege usually reserved for national heads of state. Capitalizing on his growing reputation, Brown announced that San Francisco would host a new global climate summit in 2018, at which California policymakers will showcase the state's leadership role in support of the UNFCCC and Under2 MOU processes.

Although California plays one of the most visible roles in the global climate policy conversation, its most prominent policy instrument—an economy-wide cap-and-trade program—has only a supporting part in practice. Contrary to common perception, conventional regulatory programs that build on decades of institutional experience are delivering the bulk of emission reductions attributable to policy (Wara 2014). As the state begins to plan for a much deeper climate target for 2030, regulators intend to stay the course, relying on cap-and-trade to deliver only a small fraction of the total reductions required for a globally ambitious goal (CARB 2017, 41). California policymakers emphasize the role of cap-and-trade as an economically efficient tool for reducing emissions and generating program links with other jurisdictions, but according to the California Legislative Analyst's Office, the first few years of the program have "likely not [had] much, if any, effect on overall emissions" (LAO 2017, 14). Whether and to what extent the role of cap-and-trade changes will depend on the choices state policymakers make over the coming years.

Going forward, the state will need to overcome a number of serious challenges that have the potential to frustrate its climate leadership ambitions. For example, significantly enhanced coordination between the executive and legislative branches of state government will be necessary to implement California's ambitious emission targets and deliver on pledges made with the state's external climate partners. Other challenges are more fundamental, however, and may require a change in policy strategy in the new federal political environment. Under the U.S. Constitution, states are precluded from participating in treaties with foreign governments, such as the UNFCCC. California has carefully complied by pursuing nonbinding

agreements, but its efforts could be challenged in court as preempted by federal foreign policy now that President Trump has begun the process of withdrawing the United States from international climate policy negotiations (Kysar and Meyler 2008; Wright 2016).

Legal and governance constraints at the state level illustrate the limitations of translating pledges into action, both at home and on the international stage. Those who want to see subnational governments like California fill the Trump Administration's climate policy gap may wish to reflect on a suite of similar efforts that peaked in the late 2000s, but left few tangible accomplishments in place a decade later. Recent history shows us that it is easy to make climate promises, but difficult to develop cross-border institutions that transcend a political moment.

Making progress at the subnational level is all the more important because California's broader challenge parallels the core problem in global climate policy, where ambitions are high and follow through uncertain (Rogelj et al. 2016; Schleussner et al. 2016; Victor et al. 2017). The relevant question, then, is not whether California leaders sign nonbinding agreements with likeminded partners: while a necessary first step, pledges alone will not solve the problem of harmonizing real policy actions. Over time, the key question will be whether or not California can develop and demonstrate policy models with the potential to scale to jurisdictions that lack California's unique institutional context. In its first two decades of foreign climate policy, California has laid the groundwork for successful long-term engagement; its leaders must now refine specific strategies to shift that framework into a policy model suited to export and diffusion.

A Brief History of California's Foreign Climate Policy

The history of state climate policy in California begins with earlier efforts to tackle local environmental problems. California has been on the cutting edge of energy and environmental policy since the mid-twentieth century. This reflects, in part, the state's geography and local climate, which contribute to some of the worst local air quality in the nation (American Lung Association 2017). California's poor air quality therefore demanded innovative responses. At the same time, however, one should not discount the role of California exceptionalism—the prevailing belief that California has a unique role to play in the world at large (Starr 2005), a concept with empirical support in the policy studies literature (Vogel 1997; Vogel and Swinnen 2011).

Pragmatism and ideology alike contribute to California's focus on external influence. Several of the state's landmark efforts to address air quality aim to affect investment decisions and supply chains that stretch far beyond state borders (Vogel 1997)—an ambition made possible by unique legal authorities, the massive scale of the California economy, and perhaps also necessity where technological innovation is a prerequisite to environmental solutions. Thus, when state climate policy emerged after California forged its identity and reputation as an environmental leader, it naturally reflected the outward-facing posture of California's energy and environmental policy.

Explicit state climate policy began during the George W. Bush Administration, which opposed legally binding federal policy. During this

era, California developed several major policy regimes: the state's comprehensive climate law, AB 32; a regional effort focused on developing a cap-and-trade program for greenhouse gases, known as the Western Climate Initiative (WCI); an effort to control deforestation in the tropics, the Governors' Climate & Forest (GCF) Task Force; and a forum for west coast policy coordination, the Pacific Coast Collaborative (PCC).

California's climate policies matured and expanded during the pro-climate Obama Administration, which supported California's engagement with foreign governments. Under President Obama, California promoted its climate policies through multilateral channels, supported the Obama Administration in nationalizing its aggressive state-level vehicle emission standards, and launched the Under2 MOU—a nonbinding pledging system that parallels the Paris Agreement, but for subnational governments that are not formal parties to the UNFCCC. In the early months of the Trump Administration, California has doubled down on its foreign climate policy ambitions, emphasizing the role of its carbon market and the Under2 MOU agreement in leading the national and global climate policy conversations.

An Environmental Policy Legacy

California's comprehensive climate policy reflects a longstanding history of environmental regulation, enabled by strong (and at times unique) legal authorities the state has developed over the past fifty years. State efforts to regulate air pollution from motor vehicles and in the electric power sector helped build the legal, institutional, and political foundations for state climate policy—a foundation that supports California's ambitions for exerting an influence on global climate policy to this day.

Vehicle Pollution Standards

The federal government has exclusive federal control over fuel economy standards for cars and trucks. When it comes to air pollution standards that apply to these mobile sources, however, legal authority is shared between states and the federal government. In the case of climate change, vehicle fuel economy and pollution rates go hand in hand because tailpipe carbon dioxide emissions are directly related to the fuel economy of the car or truck.

Under the Clean Air Act, the federal government generally sets minimum standards for pollution from different categories of motor vehicles.[1] California has the unique power to request a waiver from the Environmental Protection Agency (EPA) Administrator to set standards that exceed the federal levels. Critically, other states have only two options: either follow the federal standard, or adopt the stricter California standard, if one exists. California's distinct legal authority under the Clean Air Act is one of several factors that led its state air pollution regulator, the California Air Resources Board (CARB), to develop particular expertise and capabilities in policy innovation, since standards issued in California can easily be adopted by other states (Carlson 2003).

[1]*Clean Air Act § 209, 42 U.S.C. § 7543.*

California has requested its Clean Air Act waiver authority on well over fifty occasions, predominantly to set stricter standards that relate to local air quality (Vogel 1997; McCarthy and Meltz 2009). As the state began to prepare a comprehensive climate policy in the early 2000s, however, California policymakers decided that their goals required an expanded set of strategies for reducing greenhouse gas emissions from the transportation sector. Ultimately the state adopted a three-fold approach: (1) reduction in transportation demand through smart growth; (2) reduced climate pollution per mile traveled; and (3) reduced climate pollution per unit of fuel consumed for transportation (CARB 2008). (The second and third elements have direct implications for the state's foreign climate policy, whereas the smart growth provisions remain preliminary and focused on domestic policy.)

To develop the second element of the strategy—vehicle emissions standards—lawmakers passed AB 1493 in 2002. The new law required CARB to develop regulations to achieve the "maximum feasible and cost-effective reductions" of greenhouse gas emissions from vehicles (Carlson 2003). In 2004, CARB developed a set of standards that would increase the energy efficiency of its light-duty vehicle fleet by restricting the total pollution from new vehicle sales, with the standards applicable to vehicle model years 2009 through 2016. As part of the AB 1493 implementation process, CARB requested a waiver in 2005 to set stricter standards than the federal government, which had no such standards in place. Although the federal government has exclusive control over mileage standards for vehicles (through its CAFE standards, expressed in terms of miles per gallon or mpg), California characterized its approach as an environmental performance standard measured at the tailpipe (greenhouse gas emissions per mile traveled) and argued that a waiver would be appropriate under the Clean Air Act (McCarthy and Meltz 2009). The Bush Administration EPA delayed issuing a denial of the waiver until the end of December 2007, leading to litigation in federal court. The issue was ultimately resolved when the Obama Administration directed the EPA to issue joint regulations with the Department of Transportation to harmonize CAFE mileage standards with EPA's obligation to regulate greenhouse gas emissions from mobile sources, following the landmark 2007 Supreme Court decision in *Massachusetts v. EPA* that declared CO_2 as a "air pollutant" under the Clean Air Act. Thus, California's rules—pursued initially by one state, and joined by several others—became the national standard (Sunstein 2017).

When federal standards are not ratcheted up to match California's stricter rules on vehicle pollution regulations, the market share that California enjoys—along with the added effect from any states that adopt the California standard—has a sufficiently strong pull to affect national vehicle manufacturing supply chains. In these instances, manufacturers need to decide whether to develop different vehicle models targeted at California's market, or if it is more cost-effective to focus on a single model that can meet the California standard but is sold nationally. This dynamic is also relevant when federal standards are relaxed in the presence of a previously harmonized California waiver. For example, the Obama Administration set national climate pollution standards for light-duty vehicles in coordination with CARB for model years (MY) 2017 through 2025, and in parallel granted a waiver to California to enforce the same stringency over the same time period. As part of the final deal on national standards, the EPA agreed to conduct a mid-term review process in which the federal government would

decide whether or not to follow the rapidly increasing standards for MY 2022 through 2025. After the Trump Administration's nominee, Scott Pruitt, became EPA Administrator, the EPA promised to review the last-minute determination by outgoing Obama Administrator Gina McCarthy to approve the MY 2022–2025 standards. If the Trump Administration rolls back the federal vehicle standards, California will still have a waiver in place through MY 2025. In that case, vehicle manufacturers will need to decide whether or not to produce vehicles for a single national market or for a segregated pair of markets.

California's transportation policy contributes another measure to its foreign climate policy. The third component of state climate transportation strategy is a Low Carbon Fuel Standard (LCFS), which CARB implements via a tradable performance standard that requires transportation fuel providers to reduce the aggregate carbon intensity of fuels sold in the state. The LCFS is notable in at least two respects. For one thing, it was among the first environmental policies to incorporate lifecycle assessment methods as a core element of program design. (Lifecycle methods measure the full emissions profile of a product. For example, with gasoline or ethanol, lifecycle emissions include production, refining, transport to market, and combustion (Breetz 2015).) Second, industry opponents challenged the use of lifecycle assessment methods in the LCFS in an important and high-profile case, *Rocky Mountain Farmers Union v. Corey*. While other aspects of the case are ongoing at the time of this writing, the Ninth Circuit Court of Appeals ruled in 2013 that California's inclusion of out-of-state greenhouse gas emissions in the lifecycle calculations for ethanol biofuels did not facially discriminate against interstate commerce (Cullenward and Weiskopf 2014). The case therefore created an important precedent that supports the proposition that states can include the lifecycle greenhouse gas emissions associated with the products they consume—an essential authority for states that want to ensure that standards affecting domestic economic consumption send investment signals abroad, as markets for electricity and other fuels generally extend beyond state borders. Under the LCFS, for example, Brazilian sugarcane ethanol typically receives the lowest carbon-intensity scores among all ethanol producers, providing significant additional economic value to low-carbon Brazilian ethanol sold in California.

Renewable Energy and Energy Efficiency Policies

California has a rich history in developing renewable and energy efficiency policies, both in terms of policy substance and regulatory capacity. One key institution is the California Energy Commission (CEC), an energy regulatory and analytical body that was created by statute in 1974. In addition to managing the permitting process for siting and approving power plants, the CEC is perhaps best known for establishing California's energy efficiency standards for appliances and buildings. Most notably, state-level appliance standards developed in the 1980s were the first of their kind and eventually led to national standards (Nadel 2003).

California's energy efficiency policies extend far beyond CEC standards. They also include a suite of incentives and requirements developed by the California Public Utilities Commission (CPUC) for the state's major investor-owned utilities. The combination of CEC appliance and building standards, along with CPUC utility regulation, make California one of the

leading jurisdictions for energy efficiency policy (Grueneich 2015)—though the state's moderate climate and economic structure explain more of California's progress in keeping per capita electricity consumption flat since the 1970s than its energy efficiency policies (Sundarshan 2013).

California has also pursued ambitious renewable energy support mandates, principally in the form of a renewable portfolio standard (RPS). Current state law provides for a minimum of 50 percent of state electricity to come from qualified renewable sources by 2030 (Mormann, Reicher, and Hanna 2016). As of this writing, a new legislative proposal, SB 100, is under consideration to increase the share of renewable energy to 60 percent by 2030 and set up a process to reach 100 percent of electricity consumption coming from zero-carbon sources by 2045. In part because of the ambition of California's renewable and low-carbon electricity goals, the state is also exploring expansion of its electricity market (known as CAISO) to include neighboring states in the Western United States. The broader the geographic region over which one integrates renewables, the lower the costs and greater the reliability. However, expanding the California electricity market's governance structure to include states that focus primarily on costs and not environmental outcomes has proven a challenge (Lenhart et al. 2016). Given the need to include out-of-state renewable energy for both legal and economic reasons, it is likely that further regional governance innovations will be required to facilitate California's commitment to low-carbon electricity.

A Comprehensive Domestic Climate Policy Regime

California's comprehensive climate policy architecture traces its course to 2006, when a bill known as AB 32 became law. Passed by a Democratic majority in the legislature and signed by Republican Governor Arnold Schwarzenegger, AB 32 represents the culmination of several years of active negotiation and almost a decade of preparatory work establishing the data, regulatory capacity, and policy options available for controlling greenhouse gas emissions.

At its core, AB 32 established the overarching requirement that California return its statewide greenhouse gas emissions to their 1990 levels by 2020 (Bang, Victor, and Andresen 2017). Notably, AB 32 delegated broad authority to the state's air pollution regulator, CARB, which had already begun to develop experience in climate policy via implementation of the vehicle emission standards discussed above. CARB then set out to develop a suite of policies designed to achieve the 2020 target. In 2008, CARB finalized its Scoping Plan, which called for a broad set of regulatory measures—many already being implemented by other agencies, like the CEC and CPUC—as well as an economy-wide cap-and-trade program. Although California's cap-and-trade program is arguably its best-known climate policy, CARB's planning relied on regulations to accomplish most of the needed reductions, leaving the cap-and-trade program as "backstop" policy to ensure that emissions hit the 2020 target (Wara 2014). In practice, the cap-and-trade program has functioned a lot like a modest carbon tax, as a result of persistent oversupply conditions in which the supply of available compliance instruments significantly exceeds demand for those instruments (Cullenward and Coghlan 2016).

In 2016, California extended its comprehensive climate policy architecture with SB 32, a bill named after its predecessor, AB 32. SB 32 set a statewide

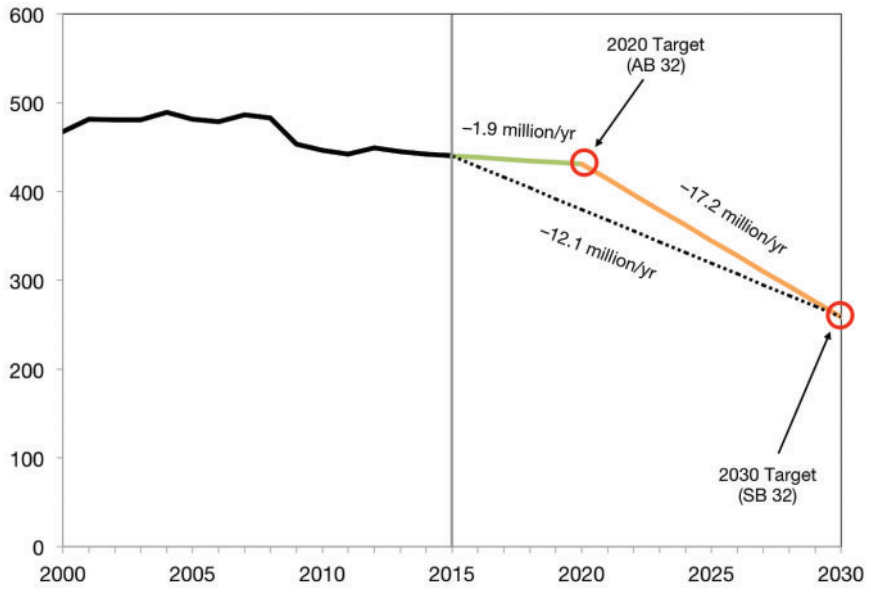

Figure 1 Statewide greenhouse gas emissions and targets (million tons CO_2e). *Source*: (CARB 2017).

emissions target of 40 percent below 1990 levels by 2030, matching the EU's Paris pledge and requiring CARB to develop policies to achieve this ambitious target—one that will require perhaps six to nine times the rates of emission reductions that are needed to reach the 2020 target (see figure 1). As discussed later in this article, however, the technical, legal, and political challenges of implementing this target are not yet resolved.

Multilateral Climate Policy Initiatives

Building off of its institutional capacity and legal authorities to effect change in environmental policy, California has pursued multilateral climate agreements with neighboring states and policy allies around the world under two successive governors, Republican Arnold Schwarzenegger (2003–2010) and Democrat Jerry Brown (2011–2018).

The WCI

Three regional North American climate policy efforts emerged under the Bush Administration—the WCI, the Midwest Greenhouse Gas Reduction Accord (MGGRA), and the northeastern states' Regional Greenhouse Gas Initiative (RGGI) (Rabe 2016).

California participated in, and is one of the leaders of, the WCI. With the goal of creating a regional cap-and-trade program that would link subnational governments together despite the lack of support from federal governments in the United States and Canada, the WCI began with a 2007 agreement between the Governors of Arizona, California, New Mexico, Oregon, and Washington state. At its peak in 2010, WCI had eleven formal partners, including four Canadian provinces, and an additional fifteen

Table 1 WCI membership

Year	Partners	Observers
2007	United States (5): Arizona, California, New Mexico, Oregon, Washington	—
2010 (Peak)	United States (7): Arizona, California, Montana, New Mexico, Oregon, Utah, Washington Canada (4): British Columbia, Manitoba, Ontario, Québec	United States (6): Alaska, Colorado, Idaho, Kansas, Nevada, Wyoming Canada (3): Nova Scotia, Saskatchewan, Yukon Territory Mexico (6): Baja California, Chihuahua, Coahuila, Nuevo Leon, Sonora, Tamaulipas
2017	United States (1): California Canada (4): British Columbia, Manitoba, Ontario, Québec	—

observing parties in the United States, Canada, and Mexico (see table 1). Formal partner jurisdictions accounted for 19 percent of U.S. population, 20 percent of U.S. GDP, 79 percent of the Canadian population, and 76 percent of Canadian GDP (WCI 2010). Notably, WCI envisioned an economy-wide carbon market that included electricity, industry, and transportation fuels; in contrast, the EU's carbon market—the largest carbon market in the world—only covers the electricity and industrial sectors (Ellerman, Marcantonini, and Zaklan 2016).

A decade after WCI's launch, however, only three of its members actually implemented a cap-and-trade program: California, Québec, and Ontario (Houle, Lachapelle, and Purdon 2015). Although these programs began in isolation, California and Québec linked their carbon markets in 2014 (Benoît and Côté 2015; Cullenward 2015) and Ontario is considering joining the California–Québec market as well.[2] WCI member British Columbia also put a price on carbon, but did so via a carbon tax policy instead (Rhodes and Jaccard 2013; Murray and Rivers 2015). Thus, while the WCI served an important role in facilitating regional climate policy conversations in the absence of federal leadership (whether in the United States or in Canada), its practical impact has been much more limited in geographic scope. For its remaining participants, the WCI continues as a core mechanism of

[2]*There is some uncertainty as to whether Québec and Ontario will satisfy emerging federal Canadian climate policy standards via participation in the joint California carbon market, though given that both provinces are considered climate leaders in Canada it is likely that their chosen policy instruments will suffice. Under the 2016 Pan-Canadian Framework on Clean Growth and Climate Change, the Canadian Government established minimum carbon pricing policy requirements. Provinces can choose direct price instruments (such as a carbon taxes) that achieve a minimum CAN $10 per tCO_2e in 2018, rising at CAN $10 per year to CAN $50 per tCO_2e in 2022. Alternatively, provinces can implement a cap-and-trade program, as Québec and Ontario have done. Provinces with cap-and-trade programs must have (1) 2030 emission reduction requirements that are at least as strict as Canada's national target and (2) declining annual program caps through 2022 that are at least as strict as emission reductions projected from carbon pricing via direct price instruments (Government of Canada 2016, 49). As of this writing, the second element of this federal requirement is not fully developed and the post-2020 market designs in Québec and Ontario are not finalized.*

Table 2 GCF task force

Country	GCF Member States
United States	California, Illinois
Brazil	Maranhão, Amapá, Tocantins, Pará, Mato Grosso, Amazonas, Rondônia, Acre
Columbia	Caquetá
Indonesia	Aceh, North Kalimantan, West Kalimantan, East Kalimantan, Central Kalimantan, West Papua, Papua
Ivory Coast	Cavally, Bélier
Mexico	Jalisco, Yucatán, Quintana Roo, Campeche, Tabasco, Chiapas
Nigeria	Cross River
Peru	Amazonas, Piura, Loreto, San Martín, Huánuco, Ucayali, Madre de Dios
Spain	Catalonia

intergovernmental climate policy cooperation—though as discussed below in the context of California's unilateral market design reforms for the post-2020 period, perhaps more as a forum for policy diffusion rather than coordinated policy development.

All three regional North American partnerships led to model carbon trading rules, but only two programs were ever implemented. As discussed above, California, Québec, and Ontario adopted the WCI carbon market design, though the other then-members of the WCI did not. The Midwest Greenhouse Gas Reduction Accord (MGGRA) developed a model rule, but the policy process was put on indefinite hold without implementation (Rabe 2016). The northeastern RGGI states also developed a model market rule that all ten participating states adopted (Huber 2013)—though one participating state, New Jersey, subsequently withdrew. While the RGGI carbon market applies only to the electricity sector, and not the economy-wide coverage found in WCI, RGGI played a particularly important role as a model for the federal Clean Power Plan greenhouse gas regulations for power plants proposed under President Obama's Environmental Protection Agency (Hogan 2015).

The GCF Task Force

Efforts to manage forest carbon have been a part of the UNFCCC climate negotiations for many years, where they have taken on the name Reducing Emissions from Deforestation and Forest Degradation (REDD+) (Agrawal, Nepstad, and Chhatre 2011). In parallel to the UNFCCC negotiations, a number of stakeholders began to consider subnational strategies for cooperating on managing forest carbon and developing policies to address REDD+ issues. A group of ten subnational governors from Indonesia, Brazil, and the United States (including California) decided to form the GCF Task Force in 2009 (Nepstad et al. 2013). Over time, membership grew to thirty-five subnational governments (see table 2), representing approximately one-quarter of the world's tropical forests, including three-fourths of forests in Brazil and Peru, as well as one-half of forests in Indonesia.

As one of many activities, GCF Task Force partners advocate for sectoral REDD+ crediting under California's carbon market (Nepstad, Swette, and Horowitz 2014). In turn, California policymakers have pursued efforts to link its carbon market to sectoral REDD+ crediting via a MOU with two GCF jurisdictions—Acre, Brazil, and Chiapas, Mexico (CARB 2015, 2016).

At this time, the future of bilateral REDD+ programs or a broader GCF integration is unclear. Although the particular mechanism that CARB ultimately proposed for sectoral REDD+ crediting was a market link—comparable to the interaction between cap-and-trade programs in California and Québec—sectoral REDD+ credits are nevertheless a type of carbon offset: a reduction in greenhouse gas emissions outside of the sectors covered by a cap-and-trade program that generate financial instruments that can be used by regulated companies for compliance with the cap-and-trade program (Haya et al. 2016). In recent years, the environmental justice community has opposed carbon offsets (Megerian 2017), culminating in an environmental justice advisory board to ARB recommending against the use of offsets (EJAC 2016). Others see benefits, such as regulated industries that look to offsets as a cost containment mechanism and nonprofit organizations dedicated to forest conservation, which seek additional sources of much-needed revenue.

Recent legislation to extend California's carbon market beyond 2020 reflected the debate over carbon offsets. A new bill, AB 398, significantly restricted the role for out-of-state offsets in response to environmental justice and environmental integrity concerns. AB 398 reduces the maximum number of out-of-state carbon offsets down from 8 percent of total compliance obligations in the pre-2020 period to 2 percent in 2021–2025 and 3 percent in 2026–2030.[3] This will put a practical upper limit on the integration of California policy and GCF activities, since currently operating offset protocols may be able to supply most of the out-of-state offsets permitted in California's program.

The PCC

Launched in 2008 as an agreement between the four U.S. states and one Canadian province on the Pacific Coast—from south to north, California, Oregon, Washington, British Columbia, and Alaska—the PCC is a forum for regional cooperation on energy and environmental issues. In practice, however, its scope is somewhat smaller. Although Alaska initially joined the PCC, it quickly withdrew into an "observer" status and has not signed any of the post-launch MOUs and other public statements.

Since its launch, the PCC has led to a number of nonbinding coordinating statements on energy investment, long-term climate goals, and cooperation on infrastructure planning between the remaining four member jurisdictions (see table 3). PCC members and the Mayors of Los Angeles, San Francisco, Oakland, Portland, Seattle, and Vancouver all pledged to coordinate efforts on low-carbon buildings, renewable energy, electric vehicles, and low-carbon waste systems. The PCC members also pledged to implement the

[3]*Offsets limits apply at the entity level. Including both in-state and out-of-state projects, regulated parties can submit offset credits for now more than 4 percent of total emissions in 2021–2025 and 6 percent in 2026–2030. See Cal. Health & Safety Code § 38562(c)(2)(E). The 8 percent limit that applies in the earlier market periods does not distinguish between in-state and out-of-state credits.*

Table 3 PCC agreements

Year	Subject	CA	OR	WA	BC	AK
2008	Establishment of the PCC as a multilateral forum	X	X	X	X	X
2010	Ocean conservation and coastal climate change adaptation	X	X	X	X	
2010	Action plan on renewable energy, energy efficiency, and transportation	X	X	X	X	
2012	Coordinated work plan on Japanese tsunami debris	X	X	X	X	
2012	Regional action plan on clean energy job creation	X	X	X	X	
2012	Established the public-private West Coast Infrastructure Exchange	X	X	X	X	
2013	Long term climate goals and policy implementation strategies	X	X	X	X	
2016	Cooperation on Paris Agreement targets and Under2 MOU	X	X	X	X	
2016	Climate leadership agreement	X	X	X	X	
		Signed by mayors of Los Angeles, San Francisco, Oakland, Seattle, Portland, and Vancouver				

Under2 MOU, as described below, and generally support the implementation of the Paris Agreement at a subnational level.

The Under2 MOU

Perhaps the most significant undertaking of Governor Brown's foreign climate policy is the Under2 MOU, a global framework launched by California and the German state of Baden-Württemberg. The MOU requires signatory subnational governments to pledge long-term emission reduction targets and allows endorsing national governments to indicate support for their subnational governments' ambitions.

Like the UNFCCC Paris Agreement, the Under2 MOU is also a voluntary agreement. The document itself states that it is "neither a contract nor a treaty." By signing the Under2 MOU, jurisdictions pledge to limit total global warming to less than 2°C above pre-industrial temperatures, the same minimum ambition listed in Article 2 of the Paris Agreement. Compared to the Paris Agreement, however, the Under2 MOU exhibits greater specificity about what this means in terms of how signatories should comply with the long-term warming limit. In the Paris Agreement, national governments express their voluntary emission targets for a time and level of their own choosing. In Section II.A of the MOU, signatories agree that limiting warming to 2°C requires either (1) emission reductions of 80–95 percent below 1990 levels by 2050 or (2) achieving annual per capita emissions of less than 2 metric tons of carbon dioxide equivalent by 2050. The first condition is roughly consistent with what global carbon budgeting suggests is necessary from wealthy countries, whereas the second condition is expressed in terms that low-income countries have advocated for in the UNFCCC process. Both require deep and transformative changes in energy

systems that far exceed the pledges made under the Paris Agreement (Rogelj et al. 2016).

In addition to pledging to meet one of two kinds of 2050 emission targets, Under2 MOU signatories also agree to set individually determined mid-term targets for 2030. In this respect, the Under2MOU is essentially identical to the Paris Agreement, for which countries have generally submitted individually determined targets for either 2025 or 2030, according to their own preferred methods for calculating and assessing the viability of their pledges. An online guidance document provides nonbinding suggestions for what Under2 MOU signatories might include in their appendices, such as: emission targets, emission metrics (percentage change, absolute target, per capita target), baseline years of measurement, implementation policies, institutional capacities, and climate adaption measures. Thus, like the Paris Agreement, the Under2 MOU itself does not resolve the question of how to assess transparency of pledges or monitor implementation. Unlike the Paris Agreement, however, the Under2 MOU is an entirely new creation, without the UNFCCC's twenty-plus years of engagement with governments, businesses, and civil society.

With over 177 jurisdictions signing or endorsing the Under2 MOU at the time of this writing (see table 4), the MOU has reached a level of prominence not seen in international climate negotiations since the Paris Agreement itself. How this promising but young institution evolves over time remains to be seen. Many but nowhere near all of the MOU signatories have submitted appendices with their pledges. This contrasts with the Paris Agreement, under which all but a handful of signatories have submitted pledges. Despite near-universal participation and the attention the Paris Agreement has received from civil society and governments alike, countries' implementation of nationally determined pledges have generally suffered from a lack of detail and public transparency (Victor et al. 2017). The challenge facing the Under2 MOU is no different and is arguably more daunting, as most subnational governments have substantially less administrative capacity than their national counterparts—especially in the developing world.

The U.S. Climate Alliance

In the immediate aftermath of President Trump's announcement of intent to withdraw from the Paris Agreement, Governors Brown (California), Cuomo (New York), and Inslee (Washington State) launched the U.S. Climate Alliance, an informal expression of support for the U.S. Paris pledge. As of this writing, thirteen states and the government of Puerto Rico have joined the U.S. Climate Alliance. Press releases accompanying the creation of this informal organization indicate that its membership is committed to the U.S. pledge under the Paris Agreement, though beyond generic expressions of support for U.S. climate policy and re-iterations of members' own existing energy and climate policies it is not yet clear what membership entails. Whatever its ambitions and future accomplishments, the organization's existence testifies to the growing salience of climate policy in U.S. politics and is expected to be featured at Governor Brown's 2018 climate summit in San Francisco.

Table 4 Under2 MOU signatories (as of August 2017)

Category	Signatories
North America	United States (10): California, Connecticut, Massachusetts, Minnesota, New Hampshire, New York, Oregon, Rhode Island, Vermont, Washington
	Canada (4): British Columbia, Northwest Territories, Ontario, Québec
Latin America	Brazil (7): Acre, Amazonas, Mato Grosso, Pernambuco, Rondônia, São Paolo, Tocantins
	Columbia (2): Guainía, Guaviare
	Mexico (10): Aguascalientes, Baja California, Chaipas, Hidalgo, Jalisco, Mexico State, Michoacán, Quintana Roo, Tabasco, Yucatán
	Peru (3): Loreto, San Martín, Ucayali
Europe	Austria (1): Lower Austria
	France (7): Alsace, Aquitaine, Auvergne-Rhône-Alpes, Bas-Rhin, Brittany, Midi-Pyrénées, Pays de la Loire
	Germany (6): Baden-Württemburg, Bavaria, Hesse, North Rhine-Westphalia, Schleswig-Holstein, Thuringa
	Italy (7): Abruzzo, Basilicata, Emilia-Romagna, Lombardy, Piedmont, Sardinia, Veneto
	The Netherlands (4): Drenthe, North Brabant, North Holland, South Holland
	Portugal (2): Azores, Madeira
	Spain (4): Andalusia, Basque Country, Catalonia, Navarra
	Sweden (1): Jämtland Härjedalen
	Switzerland (2): Basel-Landschaft, Basel-Stadt
	United Kingdom (2): Scotland, Wales
Africa	Kenya (1): Laikipia County
	Ivory Coast (33): Assemblée des Régions de Côte d'Ivoire (ARDCI)
	Nigeria (1): Cross River State
	South Africa (2): KwaZulu-Natal, Western Cape
Asia	China (2): Jiangsu, Sichuan
	India (2): Chhattisgarh, Telangana
	Indonesia (3): East Kalimantan, South Sumatra, West Kalimantan
	Japan (1): Gifu Prefecture
	Nepal (1): Kathmandu Valley
Oceana	Australia (3): Australian Capital Territory, South Australia, Victoria
National observers	Canada, Costa Rica, Czech Republic, Denmark, Fiji, France, Germany, Italy, Luxembourg, Mexico, The Netherlands, Norway, Panama, Peru, Sweden, United Kingdom
Cities	Alliance of Peaking Pioneer Cities (twenty-three cities in China), Austin (USA), Bristol (UK), Budapest (HU), Greater Manchester (UK), Guédiawaye (SN), Los Angeles (USA), Mexico City (MX), Nampula (MZ), New York City (USA), Oakland (USA), Portland (USA), Sacramento (USA), San Francisco (USA), Santiago (CL), São Paolo (BR), Seattle (USA), Vancouver (CAN)

Advising and Capacity Building

Finally, one of the most important aspects of California's foreign climate policy is the role its regulatory institutions play with respect to their counterparts in other jurisdictions. State climate regulators (CARB) and energy

regulators (CEC and CPUC) have a long history of working with their counterparts in other governments, participating in high-level leadership conversations and staff-level capacity-building exercises. The impact of these engagements is both among the most promising aspects of California's foreign climate policy as well as the most difficult to measure.

Challenges to California's Foreign Climate Policy

California's foreign climate policy rests on decades of institutional experience, a powerful set of state and federal legal authorities, and a recent history of multilateral climate initiatives. Going forward, however, the state will need to confront three key challenges. First, California will need to develop strategies that address the gap between pledges and implementation, both at home and in its multilateral initiatives. Second, the state will need to develop greater cooperation between the legislative and executive branches of the state government. Third, California needs to ground its foreign climate policy in a clear-eyed and comprehensive assessment of the legal risks present under federal government that actively opposes legally binding climate policy.

Moving from Pledges to Implementation

California faces a critical challenge in bridging the gap between climate policy pledges and implementation, both at home and abroad. While the gap between targets and action is the biggest barrier to the state's success, this is a problem that is common to all climate mitigation efforts (Victor et al. 2017). That very challenge also presents an opportunity for the state to develop creative ideas that might serve as models for other similarly ambitious goals in other jurisdictions, but success requires the state to be more transparent about its actual implementation strategies as well as to prioritize the exportability of its domestic policy choices.

Ultimately, California's potential to accelerate implementation through its multilateral processes will be closely related to the performance and transparency of its domestic policy portfolio. California's climate regulator, CARB, produces so-called "Scoping Plans" that describe the state's suite of climate policy efforts (Wara 2014). State law requires periodic updates to assess progress toward the state's formal targets—returning to 1990 emissions by 2020, and reducing emissions another 40 percent below that level by 2030. Scoping plan documents are essentially one-off affairs, however, and thus far have not been used to dynamically assess policy implementation. They rely on long-term forecasts both of business-as-usual emission trends and the impact of a long list of energy and climate policies designed to reduce emissions. The challenge with this approach is that long-term forecasts are notoriously inaccurate and fundamentally uncertain (Craig, Gadgil, and Koomey 2002). For example, CARB's initial 2008 Scoping Plan was created before the effects of the global economic recession were properly understood. As a result, the projected business-as-usual scenario and the estimated impacts of individual policies from the 2008 Scoping Plan are unrepresentative of the last few years of actual experience.

As of this writing the state appears to be on track to achieve its 2020 climate target, needing only a modest rate of reduction between the most

recent year of greenhouse gas inventory data for 2015 and the 2020 target (about 1.9 million tons of carbon dioxide equivalent, or $MMtCO_2e$). From 2020 to 2030, however, the rate of additional mitigation must increase substantially to 17.2 $MMtCO_2e$ per year (see figure 1), nine times the ambition required to reach the 2020 target. It is likely that statewide emissions will fall below the 2020 target, suggesting that the needed annual rate of post-2020 mitigation could be lower if the state accelerates its 2030 implementation plans ahead of 2020. This would require on average 12.1 $MMtCO_2e$ per year in additional reductions between 2016 and 2030, or about six times the ambition required to reach the 2020 target. As these numbers indicate, the SB 32 target for 2030—comparable to the EU's pledge under the Paris Agreement—represents a very ambitious goal.

Managing uncertainty is all the more important when goals are bold. The best studies of long-term climate policy planning in this context emphasize the importance of economic growth and oil prices in determining business-as-usual emission trends, two key variables over which a subnational government exerts little control (Borenstein et al. 2016) (Borenstein, Bushnell, and Wolak 2017). Thus far, however, CARB's Scoping Plan efforts—including a planning process now underway to chart a course to the 2030 target—do not address uncertainty, and instead assume a perfect, deterministic forecast of business-as-usual trends and policy outcomes (Inman et al. 2017). Similarly, CARB has not conducted a retrospective analysis to isolate the effects of the economic recession, policy outcomes, technological change, and other factors that affect its future planning. The need to better study these effects is all the more pressing because, as discussed below, most of the reductions attributable to policy are due to California's regulatory programs, not the state's cap-and-trade program. Thus, the emphasis on cap-and-trade in the state's outward-facing image is at odds with the actual course of domestic policy implementation, though California may need to rely much more on this instrument going forward to maintain its ambitions—and likely with significantly higher costs.

Developing a richer and more transparent understanding of what has worked in the state's policy portfolio and what has not will be critical to informing the state's ambitious emission targets as well as the international climate policy conversation. California's greatest potential contribution comes not from the scale of its emissions—about 1 percent of the global total—but from the opportunity to test policy strategies in a large and wealthy economy. The theory of bottom-up climate policy evolution requires not only that jurisdictions try new ideas, but also that they create mechanisms to: evaluate the impact of those efforts; change strategy where appropriate; and iterate on successes and failures with like-minded partner jurisdictions (Sabel and Victor 2015). Although CARB produces rich data and thoroughly documented projections, the state's domestic policy institutions do not sufficiently evaluate past efforts and include this evidence-based decision-making process in the development of future strategies.

Improving on these capacities will be necessary to support California's key multilateral initiatives. In particular, the Under2 MOU has thus far only focused on compiling partner jurisdictions' targets and has not yet developed formal processes for tracking progress or sharing lessons learned. Given identical challenges under the Paris Agreement, Under2 MOU participants will need to proactively confront this problem in the near future.

Cooperation between the Legislative and Executive Branches

New state legal regimes are necessarily borne out of a meeting of the minds between the Legislature and the Governor. California's comprehensive state climate law, AB 32, is no exception. Nevertheless, several features specific to AB 32 and California's constitutional order have exacerbated the potential for tension between these two branches of state government.

For one thing, AB 32 is what lawyers refer to as a delegation statute: it transfers broad policymaking authority from the legislature to CARB, an administrative agency in the executive branch. Under AB 32, CARB has the legal power to design, implement, and enforce legally binding regulations to achieve the statewide 2020 greenhouse gas emissions limit. When CARB has been sued over matters related to exercising this discretion, California courts have generally deferred to the agency's interpretation of the broad authority the legislature provided in AB 32 (Coghlan and Cullenward 2016). As a result, state policymaking unfolded for ten years almost entirely within the executive branch (Bang, Victor, and Andresen 2017).

Two related forces have further exacerbated the information asymmetry between the legislative and executive branches. As an institution, CARB is better informed about the history and status of negotiations over climate policy implementation. The agency boasts a large, well-funded, and technically sophisticated staff. It has also become the *de facto* institutional home for substantive policy negotiations because most stakeholder interests could be accommodated (if not necessarily reconciled) within CARB's broad legal authority under AB 32.

Beyond the natural concentration of experience and engagement in an expert agency, constraints on legislative capacity also play an important role. California has strict term limits for elected legislators. As an iconic example of what this means in practice, former State Senator Fran Pavley—the author of key climate laws AB 1493 (vehicle standards), AB 32 (climate legal architecture), and SB 32 (the 2030 climate target)—termed out at the end of 2016. Only a very small number of current elected officials have substantive environmental policy experience that extends back to the era of AB 32 in 2006. While some legislative staff have remained in career civil service positions during this entire time, there is no question that the current legislature has far fewer connections to the policy design and political arrangements that led to AB 32 than do senior CARB staff and CARB Board Members. Indeed, CARB's powerful Chair, Mary Nichols, was appointed by Governor Schwarzenegger in 2007 and re-appointed by current Governor Brown. She previously served as CARB Chair from 1979-83, under Jerry Brown's first term as California Governor. Thus, the connections between CARB and Governor Brown are as strong as could be, whereas the institutional memory of the legislature is significantly constrained by term limits.

The ongoing debate over the future of California's cap-and-trade program illustrates the potential for asymmetric information and divergent government priorities to frustrate the potential for sustainable state climate policy regimes. California's cap-and-trade program is arguably the centerpiece of the state's outward-facing policy efforts (Bang, Victor, and Andresen 2017) (Cullenward 2014). Domestically, however, the program plays a much smaller role in driving emission reductions (Wara 2014) (Cullenward 2014) and has attracted opposition from the environmental justice community, which perceives the market as ineffective and full of loopholes developed

by status-quo polluter interests (EJAC 2016) (Bang, Victor, and Andresen 2017).

The crisis of confidence expanded beyond the environmental justice community when the state's quarterly allowance auctions—which should bring in more than $2 billion per year—collapsed dramatically in May 2016, depriving the state's Greenhouse Gas Reduction Fund of discretionary revenue. Multiple factors explain the collapse. The most obvious is that program caps were set above emissions in capped sectors, a condition that has led to an excess supply of compliance instruments (Busch 2017). Because the quarterly auctions include a minimum auction reserve price below which the government will not sell new allowances to the market, an oversupply condition naturally leads to undersubscribed auctions. That outcome also illustrates the deep legal and political uncertainty present in 2016 with respect to the program's future. In the fall of 2016, CARB proposed regulations to extend the cap-and-trade program through 2031, including setting the caps to achieve a proportional share of the statewide SB 32 target of 40 percent below 1990 emissions by 2030. By that point the deep reductions required from capped sectors (electricity, industry, and transportation) should lead to a scarcity of allowances and therefore an increase in their value. Because CARB allows for unlimited allowance banking—that is, allowances in any one year can be used for demonstrating compliance with that year's cap, or the cap in any future year—the higher value of allowances implied by the scarcity through 2030 should have increased demand at quarterly auctions. Nevertheless, CARB's proposal did not have that effect.

Ultimately, the reason why cap-and-trade allowance auctions collapsed in 2016 is that AB 32 explicitly authorized the carbon market only through the end of 2020. Market participants were not convinced that CARB's assurances about its legal authority—despite a clear sunset date in its enabling statute—were credible enough to take to the bank (Cullenward and Coghlan 2016). Without legal certainty, there is little point in risking private capital to purchase compliance instruments that are valuable, if and only if, the program is extended without significant reforms.

By 2017, nearly all stakeholders recognized that new legislation was required, but the task required a heavy lift. Under the requirements of an anti-tax ballot initiative known as Proposition 26 that the voters approved in 2010—four years after AB 32 became law—new laws that lead to higher taxes now require a 2/3 supermajority. Because the cap-and-trade program raises government revenue through the sale of allowances at quarterly auction, legislation to extend the current cap-and-trade program almost certainly constitutes a tax for the purposes of Proposition 26's supermajority voting requirement (Coghlan and Cullenward 2016). State leaders called for an extension and, after a difficult and contentious negotiation, a successor bill called AB 398 was approved by a 2/3 bipartisan vote in both houses of the state legislature signed into law in July 2017.

Although AB 398 secures the basic legal authority to continue cap-and-trade through 2030, increased cooperation between the legislative and executive branches will be needed on an ongoing basis. For one thing, the state's climate policy portfolio will take on an increased economic significance as California pursues a globally ambitious target for 2030. A market-based policy like cap-and-trade can help contain costs, but CARB has indicated it does not intend to rely on cap-and-trade to drive the state's mitigation plans: a draft 2030 Scoping Plan indicates that CARB

expects cap-and-trade to contribute only 28% of total emission reductions through 2030 (CARB 2017, 41). In other words, California is set to promote a market-based model while implementing a predominantly regulatory strategy, though the architecture of AB 398 would permit a future administration or legislature to change the balance of market-based and regulatory measures.

Even maintaining the course likely requires additional coordination between the legislative and executive branches because AB 398 delegated nearly all important post-2020 market design decisions to the regulator, CARB. This flexibility is no small matter: assuming the current market design is maintained, by 2030 prices under the market could plausibly rest at the price floor (about $25 per metric ton CO_2) or at one proposed price ceiling ($60 above the price floor, or about $85 per tCO_2) (Borenstein, Bushnell, and Wolak 2017). Likely market outcomes will depend on CARB's design choices in implementation, such as whether to address the market's chronic market oversupply problem (Busch 2017). If oversupply conditions persist, prices will tend to stay low and emissions will not fall as fast as needed to meet the state's 2030 target—a similar challenge facing the EU's carbon market (Edenhofer 2014). On the other hand, if CARB reduces or eliminates market oversupply in order to maintain progress toward its 2030 target, market prices will increase. Whether higher and more visible cap-and-trade prices are politically tolerable will likely depend on how consumers react to higher gasoline prices, but AB 398 contained no rebates or other compensation mechanisms to address these concerns. New legislation will be needed if more consumer protections are desired, whether as a matter of progressive economic policy or political necessity.

Beyond any future discussion of consumer rebates, the legislature and executive branches share authority over cap-and-trade revenue use. Many of the current spending requirements reflect the executive branch's goals—such as Governor Brown's high-speed rail project to connect Los Angeles and San Francisco, which automatically receives 25 percent of all program revenues—whereas others reflect legislative priorities. At present, a simple legislative majority can pass legislation to determine how program revenues are spent. As part of the deal to extend cap-and-trade to 2030, however, the legislature passed ACA 1—a companion measure to AB 398 that secured swing Republican votes in the state assembly necessary for a 2/3 coalition. ACA 1 will place on item on the state ballot to require a 2/3 legislative vote to appropriate any funds from the cap-and-trade auctions beginning in 2024. If the voters approve ACA 1, Republican legislators will likely have a much greater role in determining future program spending.

As these examples illustrate, market design and revenue spending decisions are likely to receive more, rather than less, legislative attention in the years to come. Until very recently, however, the state legislature had minimal oversight over the complex portfolio of instruments CARB manages. As part of the push to extend state climate policy to 2030, the legislature passed a reform bill called AB 197 in 2016. Among other things, AB 197 established a Joint Legislative Committee on Climate Change Policies—a bicameral oversight committee with four members each from the State Assembly and State Senate. Similarly, AB 398 set up an Independent Market Advisory Committee, to be staffed by five outside experts with the statutory mandate to advise CARB and the Joint Legislative Committee. Time will tell what

role these new institutions will play, but they may facilitate a broader re-engagement between the legislative and executive branches going forward.

Market Links and Federal Preemption Risks

Finally, California's third major challenge is to confront the legal risks that apply to its foreign climate policy ambitions when the federal government opposes the state's preferences. After all, the climate mitigation problem will play out over decades and centuries, not months and years, so it is imperative for policy strategies to be resilient in periods when subnational governments are at odds with their national counterparts—a phenomenon that will not be unique to the Trump Presidency. As described in the previous section, however, most of the state's foreign climate policy strategies evolved under the supportive Obama Administration, when state and federal climate policy interests were in near complete alignment. Going forward, the state's goals will be best served by a clear-eyed assessment of the potential risks of different approaches.

Perhaps the most vulnerable component of the state's policy portfolio is California's international carbon market linkages.[4] It is possible that a court could conclude that these links are preempted as operating in conflict with the federal government's foreign policy. In *American Insurance Association v. Garamendi*, the U.S. Supreme Court struck down a California state law requiring insurance companies to disclose outstanding Holocaust-era claims because the Court held it was preempted by conflicting yet unilateral executive branch foreign policy. Under the U.S. Constitution, it is well understood that a federal statute or U.S. Senate-ratified international treaty will preempt an otherwise valid state law. But *Garamendi* and earlier Supreme Court cases expanded these familiar categories of joint legislative and executive action by recognizing the possibility that unilateral Presidential authority could preempt state law (Kysar and Meyler 2008).

The parallels to the Trump Administration's intended withdrawal from the Paris Agreement are direct. Significant legal uncertainty now exists with respect to whether or not conflicting federal foreign policy on climate could preempt state carbon market links with international partners (Welton 2012; Wright 2016). Preemption risks need not be fatal to market operation, but it is not clear what would happen to allowance prices and market dynamics if California's international market links were challenged in court. Developing an explicit resolution process in formal regulations might allow market participants to price these risks without undue complications, but no solution is without consequences. Research suggests that the presence of de-linking risks can lead to higher costs and price divergence between market currencies (Pizer and Yates 2015).

Beyond legal risks, California has not addressed the governance challenges associated with broad-based intergovernmental market links and therefore has not yet demonstrated the capacity to pursue a bottom-up strategy for integrating global carbon markets. One theory suggests that the failure to impose top-down markets via the UNFCCC will be remedied by the creation of bottom-up markets that link together to replicate the broad

[4]*Other legal risks include several planned measures in CARB's proposed 2030 Scoping Plan that rely on cooperation between state and federal regulators on climate, such as for future Clean Air Act waivers for vehicle regulations or measures to reduce short-lived climate pollutants (Inman et al. 2017).*

coverage attempted in past UNFCCC agreements (Ranson and Stavins 2016). California's existing link and pending links with Canadian programs might appear promising in this regard, but linking with two WCI members that are much smaller than California in terms of emissions and share a consistent market design is relatively straightforward. Where other jurisdictions have programs that address different sectors or use different market designs (the northeastern states' RGGI), are comparably large (the European Union ETS), or are implemented in the context of a distinct legal culture (China), the challenges of maintaining functional market links are much greater. California policymakers promote market links as the primary mechanism for foreign climate policy diffusion, but in practice have developed market links only in the context of partner jurisdictions that have comparable program coverage, identical market designs, smaller program sizes, and Western legal cultures. Under these conditions California's regulatory structure dominates that of its linked partners. Such an arrangement can be an asset to partner jurisdictions that wish to rely on CARB's expertise and California's market liquidity in delegating control over domestic program outcomes, but it can also deter jurisdictions that wish to retain their policy autonomy—a concern observed in similar discussions about expanding California's electricity markets to include other western states (Lenhart et al. 2016).

Rather than focus on formal carbon market links with international partners, California would be well served by a shift in priorities for this policy instrument. The state should de-emphasize the role of new market links in its outward-facing leadership role because new international links present both legal risks and practical challenges. With a current link with Québec and a pending link with Ontario, California has engaged all of the jurisdictions that adopted domestic versions of the WCI carbon market design. It is not clear how many additional jurisdictions would be interested in following suit. On the other hand, any neighboring states with comparable climate policy ambitions—and here, PCC members Oregon and Washington are the most obvious candidates—might be eligible linking partners if those states develop their own cap-and-trade programs and wish to join a linked market dominated by California's size. Domestic market links present significantly fewer legal risks (Welton 2012) and offer potentially greater opportunities to coordinate on shared climate policy ambitions in a coherent legal and institutional context.

Instead of focusing on generating new market links, California should instead concentrate its international efforts on transparency and capacity building. This does not require a change in strategy away from its cap-and-trade program. If anything, California's experience with cap-and-trade is most valuable in sharing lessons learned and program design details with other interested jurisdictions, whether or not those jurisdictions will ever formally link their markets with California's. For example, CARB staff and Chinese climate policymakers have collaborated for some time on the design of Chinese carbon markets. It seems very unlikely that a formal link between California's existing program and China's national plans is plausible in the immediate future, but no one could reasonably question the value of the collaboration between regulators. Policymakers around the world already look to California's example, and will continue to do so whether or not there are additional market links.

Creating Lasting Change

The potential for subnational leaders like California to shape international climate policy discussions remains significant and, to a large extent, untested. Fifteen years ago, a similarly ambitious set of multilateral subnational efforts developed with participant lists that rival contemporary efforts in terms of the economic scope, if not the sheer breadth of geographic reach of the Under2 MOU. Some of these earlier efforts—such as RGGI in the northeast and WCI in California and eastern Canada—reached adolescence and matured into permanent features of their policy environments. Others fell into obscurity.

To observe that climate policy has been through a similar period in the past does not cast doubt on the sincerity or promise of current efforts. However, past efforts ground today's aspirations in practical experience. In the wake of the Trump Administration's planned withdrawal from the Paris Agreement, many naturally look to subnational actors to pick up the slack and, as a result, California's past successes and current ambitions appear in their most favorable light. The question is, what can California and its partners do to capitalize on this enthusiasm and develop strategies for multilateral cooperation that are sustainable beyond the politics of the moment? In order to achieve its full potential, it seems, California's foreign climate policy must successfully address three challenges.

First, California will need to pivot from policy pledges to focus on implementation. California's most prominent multilateral forum, the Under2 MOU, shows promise but has not yet developed mechanisms to generate transparency in signatories' pledges or meaningful collaboration between participants. Ultimately, the state's most important foreign climate policy is the model it pursues at home and promotes abroad. That model is in tension as state climate policymakers plan on implementing a predominantly regulatory approach while emphasizing cap-and-trade market links abroad.

Second, state leaders need to increase cooperation between the legislative and executive branches of government in order to maintain a strong policy trajectory in the years ahead. Because California is pursuing a globally ambitious target, close coordination will be especially important as program costs rise.

Third, California also needs to take seriously the legal risks of its climate agenda under a federal government that is fundamentally at odds with the state's foreign policy goals. These risks currently counsel de-emphasizing the primacy of international carbon market links and focusing more on transparency and capacity-building exercises with partner governments that want to pursue similar policy instruments. A change in focus would parallel the facts on the ground: CARB already plans to use regulatory instruments to accomplish the significant majority of emission reductions through 2030, leaving only a minor role for the state's carbon market.

California has decades of environmental policy leadership, one of the strongest recent records on climate policy, and the political will to begin the task of deep de-carbonization. In reaching for a globally ambitious climate target, the state is running a series of policy experiments. Its greatest potential lies not in promoting its past successes, but in transparently evaluating its own experience, sharing lessons learned with potential allies, and iterating on strategies as new evidence emerges.

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