

The California REDD+ Experience

The ongoing political history of California's initiative to include jurisdictional REDD+ offsets within its cap-and-trade system

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Executive Summary

For the last several years, California has considered the idea of recognizing, within its greenhouse gas cap-and-trade program, offsets generated by foreign states and provinces through reduced tropical forest destruction and degradation and related conservation and sustainability efforts, known as REDD+. During their deliberations on the issue, state policymakers have heard arguments from stakeholders in favor of crediting REDD+ offsets, and those against. After years of planning and cooperative efforts undertaken with states in Brazil, Mexico, and elsewhere, California is still determining whether to embrace REDD+ offsets.

The most salient and potentially persuasive arguments in favor stem from the opportunity to influence and reduce international forest-related emissions contributing to climate change, while simultaneously reducing the costs imposed by the state's climate change law. The state is still grappling, however, with serious questions about the effectiveness of REDD+ in addressing climate change, as well as the impacts of REDD+ on other social and environmental objectives. The suitability of the state's cap-and-trade program as a tool for reducing emissions outside the state, given the co-benefits that accrue to local communities from in-state reductions, remains another key area of debate. The outcome of this policy discussion will depend on interrelated questions of program design, future offset supply and demand, and the weight given to the importance of prioritizing in-state emissions reductions and co-benefits.

Introduction

Every ton of carbon dioxide is created equal no matter where or how it enters the atmosphere, says conventional wisdom on climate change. Policy-makers in the climate trenches will often beg to differ.

California is currently deep in this trench as it considers whether to make room in its cap-and-trade program for international offset credits from programs that reduce emissions from deforestation and forest degradation and associated strategies (REDD+). It is substantially cheaper to maintain a ton of carbon stored in a tropical forest than to reduce the same quantity from a California emissions source. But designing a method for implementing REDD+ strategies through a cap-and-trade system presents both technical difficulties and tough policy questions. Largely because of these difficulties, no governing body anywhere in the world has yet recognized REDD+ offsets within a mandatory cap-and-trade program. California is well placed to be the first to do so. As a result, the choices that California makes—both in whether to adopt REDD+ offsets, and, if so, how—will have important consequences for others considering similar efforts.

This paper examines the political history of California's REDD+ offset experience and the current state of discussion in California on this issue. We focus on efforts to include REDD+ offsets generated through government-led, state- and province-wide programs in developing countries—which we and others refer to as “jurisdictional” REDD+ offsets—as compliance mechanisms within California's cap-and-trade program. In developing this history, we have reviewed regulatory documents, reports, comment letters, and other written materials, and conducted interviews with a broad range of stakeholders and decision-makers from government, the private sector, and advocacy groups.¹ Drawing from these sources, the paper traces the key issues, interests, and events that have arisen during California's discussions of REDD+ offsets; describes the regulatory decisions that have been made and that are yet to be made; and dissects the political support and opposition for including REDD+ offsets as a means for compliance with state law on limiting greenhouse gas emissions.

Background to the California REDD+ Initiative

AB 32 and cap-and-trade

In 2006, California enacted the California Global Warming Solutions Act,² commonly referred to by its bill number, AB 32. AB 32, which was passed by the state's primarily democratic legislature without garnering significant organized opposition, requires the state to return to 1990 levels of greenhouse gas (GHG) emissions by the year 2020. The legislature largely delegated to a state agency, the California Air Resources Board (ARB), the job of establishing programs to achieve this emissions reduction goal. In response, ARB identified and began implementing a suite of programs to reduce GHG emissions from a variety of California sources. Among the measures ARB adopted is a cap-and-trade program that imposes a declining cap on 85 percent of statewide GHG emissions.³

Cap-and-trade programs seek to reduce overall emissions while allowing emitters flexibility in whether and how to decrease their individual emissions, by allowing them to trade their emissions rights with other emitters. Very generally, emissions trading works as follows. The regu-

lating body caps overall emissions and allocates allowances to emitters that permit an allowance holder to emit a set amount per allowance (typically a ton of the regulated pollutant), within a particular compliance period (typically one or multiple years). Allowance holders can satisfy their regulatory obligations either by emitting up to the amount they hold in allowances, trading for additional allowances if they need to emit more, or emitting less than their allocated amount and selling or trading the difference. In theory, market forces drive emitters to find the cheapest means to reduce emissions while reducing overall pollution levels.⁴

ARB's cap-and-trade program details are defined in regulations that it has promulgated and periodically updates. The program will run at least through the year 2020. During California's first compliance period, which runs from 2013 through 2014, covered emitters include sources in the electricity industry, including importers of electricity, and large industrial facilities. The scope of the program will expand to include fuel distributors in the second and third compliance periods, which run from 2015-2017 and 2018-2020.⁵ For sources within capped sectors, the regulations set a declining, statewide limit on the emission of carbon dioxide and other GHGs. By 2020, the cap will tighten to about 15 percent below 2012 emission levels.⁶

Businesses and other entities included in the program must obtain and surrender to ARB sufficient allowances or other compliance instruments to cover their GHG emissions, with one allowance equaling an authorization to emit up to 1 metric ton of carbon dioxide (or its warming equivalent in other greenhouse gases).⁷ Allowances are the most commonly used form of recognized compliance instrument, but ARB allows regulated entities to satisfy up to 8 percent of their compliance obligations through offset credits, as an alternative to allowances.⁸ Offset credits, sometimes simply called offsets, are generally defined as credits for certified emissions reductions that occur outside of capped sectors—i.e., reductions made by sources not covered by the cap-and-trade program itself, but used by covered entities to offset their own emissions. Through the use of offsets, regulated entities can fund and take credit for emissions reductions that occur outside of capped sectors, at lower cost than could be achieved in-house. Because they provide access to lower-cost emission reductions, offsets are seen as an important cost containment mechanism within ARB's program. To date, California has approved the use of offsets generated in the United States (not necessarily in California) through forestry practices, livestock biogas control, and destruction of ozone-depleting substances.⁹

This paper concerns California's deliberation over whether to recognize one type of offset, jurisdictional REDD+ offsets. No REDD+ offsets are yet approved for use under ARB's regulations. Those regulations do, however, contain a placeholder that would allow for the recognition and certification of such offsets in the future.¹⁰ Indeed, REDD is the only potential "sector-based" credit system—defined to mean a crediting mechanism implemented by a developing country, or a region or sub-national jurisdiction within a developing country, that covers an entire economic sector¹¹—that is currently identified in the regulations as a potential source of offsets. (See Figure 1 for an overview of relevant offset terminology.)

Figure 1: Offset Terminology

Offset credit (aka offset)	A tradable compliance instrument within AB 32’s cap-and-trade system, which satisfies compliance obligations equal to one emissions allowance. Offset credits are based on certified emissions reductions achieved outside of capped sectors.
Sector-based offset credit	An offset credit issued from a national, regional, or sub-national offset program in a developing country, calculated as an emissions reduction achieved across an entire economic sector within that nation, region, or jurisdiction.
Jurisdictional REDD+ offset	A type of sector-based offset credit, generated through a state or provincial government-led REDD+ program in a developing country, and calculated based on aggregate emissions reductions achieved across the state or province.
Project-based REDD+ offset	An offset credit generated by an individual REDD+ project, calculated based on the emissions reductions achieved by that project.

If jurisdictional REDD+ offsets were to be recognized by ARB, its regulations set a firm ceiling on their use: regulated entities could use sector-based offsets to satisfy no more than 2 percent of their obligations in the first and second compliance periods, and no more than 4 percent in the third compliance period, part of the 8 percent total cap on offsets.¹² Further, any offset crediting program must meet certain stringent regulatory criteria to ensure that credits will produce real and certain emissions reductions.¹³

REDD+

Global forest losses are among the largest contributors to climate change. Land use changes due primarily to deforestation have accounted for about a third of post-industrial anthropogenic CO₂ emissions, and in recent years contribute about 12 percent of anthropogenic GHG emissions.¹⁴ However, many forest GHG emissions can be avoided at relatively low cost. Among the strategies suggested for preventing these emissions, REDD+ has attracted the most international attention. REDD+ is a mechanism for encouraging forest conservation and cultivation in developing countries using funding from the developed world. REDD+ assigns financial value to carbon stored within forest resources, to make local preservation efforts eligible for foreign financing, including voluntary investment and offset credits generated through foreign carbon markets. By making intact forests more valuable than the economic activities that lead to forest destruction, REDD+ aims to promote activities like forest conservation, forest management, and regrowth. The REDD+ terminology and concept originate from a 2005 proposal to the United Nations by the governments of Papua New Guinea and Costa Rica, made in response to the Kyoto Protocol’s lack of mechanisms to reduce deforestation emissions.¹⁵ Since then, REDD+ methodology has been expanded to include strategies to address forest degradation and strategies to grow and develop forests.¹⁶ The “+” in REDD+ indicates this last category of strategies, which includes conservation, sustainable management of forests, and enhancement of forest carbon stocks (see Figure 2).¹⁷

Figure 2: The “REDD+” Acronym

R educed
E missions from
D eforestation, forest
D egradation,
+ conservation, sustainable management of forests, and enhancement of forest carbon stocks

The REDD+ terminology is loose, however. For example, while California has used the term “REDD” in its AB 32 regulations and other planning documents, most of its planning discussions have included reference to carbon stock enhancement strategies, which many policymakers would classify as REDD+. This paper uses “REDD+” by default, and “REDD” or other terms where they appear in source material. However, no significant difference is intended by the distinction except where noted.

Not all REDD+ programs are the same, and they can differ along several dimensions. Some programs include strategies to reduce deforestation, reduce forest degradation, enhance forest stocks, or only some subset of these. They may condition credit eligibility on many other criteria, too. These criteria may address certain difficulties inherent in REDD+ emission reductions, including ensuring that reductions are maintained in the long-term; ensuring that reductions are additional to those that would be achieved without a REDD+ program; and preventing the problem of “leakage,” in which emissions reductions achieved by an offsets program cause increases in another area or sector. A REDD+ crediting program may also require safeguards to protect human rights and environmental health. While it is generally agreed that REDD+ programs require such safeguards, there is debate over how safeguards should be implemented within a REDD+ offsets program. A proposal for a REDD+ program that includes strong safeguards might look very different from one that is only minimally protective. The strength of a program’s safeguards depends on both its design and its enforcement mechanisms: even strong safeguards may not be properly implemented or enforced. Much of the controversy surrounding whether California should proceed is focused on the state’s ability to develop and implement adequate safeguards.

REDD+ programs also come in very different scales and forms of oversight. A project-based REDD+ program credits individual forest carbon projects, while national and jurisdictional programs credit aggregate emissions reductions achieved across a wider geographical area and certified by some governmental entity. As a result, national and jurisdictional programs are generally able to achieve larger emissions reductions, at lower cost.¹⁸ They are also better able to avoid the problem of leakage; their larger scale and correspondence with administrative boundaries make it less likely that consumptive land uses will be merely relocated to other forested areas. Emissions reductions from individual projects may also be credited under a national or jurisdictional program; the projects are “nested” within the larger system, so that they receive credits for their reductions depending on the overall performance of the larger program.¹⁹

The distinction between national and jurisdictional approaches is part practical, and part political. While national REDD+ programs may often be able to achieve larger total emissions reductions, a jurisdictional program in a heavily-forested region may produce reductions similar to national programs. Some see jurisdictional REDD+ programs as a more politically-manageable alternative to stalled national programs.²⁰ Others say that jurisdictional governments lack the resources and capabilities to design an effective REDD+ program.²¹ California has primarily pursued a jurisdictional approach to REDD+, and these efforts are the focus of this paper.²²

How REDD+ Has Unfolded in California

The idea for a REDD+ offsets program in California was hatched soon after AB 32 was enacted, as it became clear that California would move forward with a cap-and-trade program. In 2007,

Tony Brunello and William Boyd, each of whom would later become key advocates of California REDD+ offsets, began discussing the possibility of California including REDD+ offsets in its budding climate program.²³ Tony Brunello was then at the U.S. Forest Service, and William Boyd was working as an attorney on climate and energy issues for a D.C. law firm and was involved in a coalition to push for REDD+ in United States federal legislation. Both favored a jurisdictional approach. At the time, Boyd recalls, there wasn't a lot of support for the idea. California NGOs and regulators were skeptical of the use of international offsets, and the state was still working out a place for domestic offsets. "They had enough on their plate," Boyd says.²⁴

But the two programs had the potential to be a good match. In form, they are fundamentally complementary: cap-and-trade creates a demand for low-cost emissions credits, and REDD+ offers supply. The timing was also favorable. AB 32 was enacted in 2006, just as the United Nations began seriously articulating its REDD+ strategies. California's close ties to Mexico and other nations with high deforestation were also important; they suggested forest carbon reduction as a ready opportunity for implementing AB 32's international partnership and cooperation goals.

In 2008, Boyd moved to the faculty at the University of Colorado, and Brunello became Deputy Secretary for Climate Change and Energy at California's Natural Resources Agency. Governor Schwarzenegger's administration was deeply invested in advancing climate strategies and was looking for ways to leverage the governor's unique convening power to partner with other states and countries. Brunello and others saw an opportunity to pitch the idea of a California REDD+ program. Renewing conversations with Boyd and NGOs, Brunello and others in the administration agreed that the best way forward would be a memorandum of understanding (MOU) between California and Governors of subnational jurisdictions around the world to cooperate on forest carbon emission reductions.²⁵ In November 2008, the first Governors' Climate Summit was held in Los Angeles, attended by governors from around the world. One result of this meeting was an MOU between California, Illinois, Wisconsin, the Brazilian states of Amazonas, Amapá, Mato Grosso, and Pará, and the Indonesian provinces of Aceh and Papua, which committed these jurisdictions to cooperate on forest and climate issues, including preparation of a Joint Action Plan to outline future efforts.²⁶

Following the signing of the MOU, the idea of an international governor's collaboration began to attract support, including funding. Sustained by grants from the Moore and Packard Foundations and other groups, the states met again in Belém, a city in Pará, in June 2009. Here, the Brazilian state of Acre joined the MOU, and the states formed the Governors' Climate and Forests Task Force (GCF). Two months later, the GCF released the Joint Action Plan called for by the MOU.²⁷ The GCF began meeting regularly to discuss progress on the states' forest and climate initiatives. By late 2010, the GCF had held 3 more meetings, and had grown to 16 members, including states from Nigeria and Mexico.²⁸

This work on the global stage was reflected in California's own regulatory progress on REDD+ at the time. ARB announced in 2009 that it was considering ways to incorporate REDD credits into its preliminary draft regulation on cap-and-trade, and it held a public meeting on this question in July 2010.²⁹ When ARB finalized the state's cap-and-trade regulations the next year, it included language allowing for the consideration of sector-based offsets, calling out REDD (and only REDD) as one source for such potential offsets.³⁰ Although in form the regulations are merely a placeholder for future ARB rulemaking to approve jurisdictional REDD+ offsets, the

regulations strongly signaled that the agency considered REDD+ a possible source of AB 32 emissions reductions.

The Schwarzenegger administration also continued conversations with promising jurisdictional partners. As Schwarzenegger's final term was coming to a close at the end of 2010, the administration narrowed the list of potential jurisdictions with whom the state could advance a more developed REDD+ partnership.³¹ Acre, Brazil soon rose to the top of the list. Technically, Acre was the best positioned to link with California: its jurisdictional REDD+ crediting system was considerably more sophisticated and advanced than those of most of the other GCF states.³² However, due to strong interest by the administration and legislature in furthering cross-border partnerships with Mexico, Brunello and other REDD+ advocates felt that a Mexican partnership was necessary to build and sustain the political will for REDD+ offsets.³³ Chiapas, then one of two Mexican states in the GCF, seemed well-positioned for this role. Chiapas had been heavily engaged in outreach and information-gathering related to forest and climate issues.³⁴ In November 2010, California signed a second MOU with Acre and Chiapas, which created a working group tasked with designing recommendations for ARB to implement a jurisdictional REDD offsets program.³⁵

The working group formed in February 2011. Known as the "ROW" (REDD Offsets Working Group), and comprised of 11 researchers, consultants, state representatives, and others involved in previous REDD+ policy work (including Boyd and Brunello),³⁶ the group met regularly through 2011 and 2012. The ROW released its draft recommendations in January 2013, followed in July by final recommendations that incorporated input from workshop discussions and public comment letters on the draft recommendations.³⁷ The recommendations, summarized in Figure 4 below, attempt to address the major difficulties associated with designing and implementing an effective jurisdictional REDD+ cap-and-trade offsets program. While the ROW drew from the efforts and experiences in California, Acre, and Chiapas, the participants intended their recommendations to be applicable to other jurisdictions involved in the GCF and other planning processes.³⁸

ARB action on sector-based REDD+ offsets was deferred until release of the ROW recommendations.³⁹ However, during development of the ROW recommendations and since, California has also made progress with other forms of forestry offsets. In October 2011, ARB issued a protocol for U.S. forestry offsets, which established an offset crediting system for reforestation, improved forestry management, and avoided conversion projects in the United States.⁴⁰ ARB has since approved offsets from two domestic forestry projects, in California and Michigan.⁴¹ And in October 2013, the Climate Action Reserve, a standard setting organization that was originally developed by the California legislature,⁴² released a draft protocol for project-based forest offsets generated in Mexico.⁴³ In January 2014, California linked its cap-and-trade system with Québec's, making allowances and offsets issued by either jurisdiction interchangeable in either system, thereby potentially expanding the market for jurisdictional REDD+ and other offsets.⁴⁴

Despite this progress, California has not yet acted on the ROW recommendations or otherwise moved to advance a jurisdictional REDD+ offsets program. The 2011 transition from Governor Schwarzenegger to Governor Brown has introduced some uncertainty into the process. Whether California should allow for use of REDD+ offsets continues to be debated in the legislative and executive branches. ARB's most significant recent action on this front came in its 2014 update to the AB 32 scoping plan, which lays out the agency's vision for achieving emissions reductions

through 2050. In that update, the agency says that its “[c]ontinued evaluation of REDD and other sector-based offset programs . . . could result in partnering on other mutually beneficial climate and low emissions development initiatives, particularly those in Mexico.”⁴⁵ In July 2014, Governor Brown signed an MOU with federal environmental officials in Mexico, indicating mutual intent to coordinate efforts on climate change and other environmental issues, including promotion of REDD strategies.⁴⁶ To date, the placeholder language in ARB’s initial cap-and-trade regulations remains the state’s high water mark on jurisdictional REDD+ offsets.

In the legislature, there has been some but not much movement on REDD+ offsets. In February 2013, Senator Ricardo Lara, a Democrat representing California’s 33rd Senate District,⁴⁷ introduced Senate Bill 605 (SB 605), co-authored by Senate President pro Tem Darrell Steinberg. As originally written, this bill would have limited AB 32 offsets to those “originating and achieved within the state,”⁴⁸ therefore eliminating the possibility of REDD+ offsets in California’s cap-and-trade program. However, the bill was substantially modified by the State Assembly in August 2014, and passed with the offsets limitation removed.⁴⁹ The legislature could remain involved on offsets in the future. It seems fair to characterize Senator Lara, and the legislature as a whole, as taking a wait-and-see approach to further action on this issue, as ARB and others in the executive branch consider whether to proceed.

(Figure 3 recaps some of the key events that have occurred in California’s consideration of REDD+ offsets.)

Figure 3: Timeline of Key Events

November 11, 2005: Papua New Guinea and Costa Rica submit proposal calling on United Nations to develop system for international response to deforestation.
September 27, 2006: Governor Schwarzenegger signs AB 32 into law.
December 3-15, 2007: United Nations develops “Bali Action Plan,” calling for action on “issues relating to reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries,” setting the stage for REDD+.
November 18, 2008: California signs MOU with U.S. states of Illinois, Wisconsin, Brazilian states of Amazonas, Amapá, Mato Grosso, and Para, and Indonesian provinces of Aceh and Papua at the Governors’ Climate Change Summit in Los Angeles, California, committing the jurisdictions to cooperate on forest and climate issues, including REDD+ strategies.
December 12, 2008: ARB approves AB 32 scoping plan, setting out design of cap-and-trade program.
June 18-19, 2009: Signatories to 2008 MOU meet in Belém, Para, Brazil, creating the Governors’ Climate and Forests Task Force (GCF), developing a stakeholder involvement process and adding the Brazilian state of Acre to the MOU.
August 2009: Signatories to 2008 MOU release Joint Action Plan, developing recommendations for implementing MOU provisions, and formalizing GCF and stakeholder process created at Belém meeting.
July 30, 2010: ARB holds workshop to discuss its plans for a jurisdictional REDD offsets program.
November 16, 2010: California signs MOU with Brazilian State of Acre and Mexican State of Chiapas, committing to these states to further cooperation on climate and forests, and calling for creation of REDD+ Offsets Working Group (ROW).
January 3, 2011: Governor Jerry Brown takes office.
February 2011: ROW begins meeting to develop recommendations for linking jurisdictional REDD+ offsets to a cap-and-trade program.
October 20, 2011: ARB adopts U.S. forest protocol, approving AB 32 offsets generated through domestic forestry projects.
December 23, 2011: ARB issues cap-and-trade regulations, including “placeholder” for future REDD offsets credits.
January 1, 2013: The first compliance period of AB 32’s cap-and-trade program begins.
February 22, 2013: Senator Lara introduces Senate Bill 605, which proposes to restrict AB 32 offsets to those originating within the state.
July 18, 2013: The ROW releases final draft of its report “Recommendations to Conserve Tropical Rainforests, Protect Local Communities and Reduce State-Wide Greenhouse Gas Emissions,” containing its recommendations for linking cap-and-trade with jurisdictional REDD+ programs.
October 23, 2013: The Climate Action Reserve issues a draft protocol for offsets generated through project-level forest conservation and sustainability efforts in Mexico, setting the stage for ARB adoption of a Mexican (non-jurisdictional) forest protocol.
January 1, 2014: California links its cap-and-trade program with Québec’s, making allowances and offsets fully interchangeable between the two markets.
May 22, 2014: ARB releases updated AB 32 scoping plan, stating ongoing commitment to consider jurisdictional REDD offsets but not including any specific timeframe for moving forward to recognize jurisdictional REDD offset credits.
July 28, 2014: California signs climate and environment MOU with Mexico, including promotion of REDD strategies among prospective cooperative efforts to respond to climate change.

Figure 4: The ROW Recommendations

The REDD+ Offsets Working Group, established in 2010, identifies several key elements to be addressed by a jurisdictional REDD+ program linked to California.⁵⁰ These elements are listed below, with a summary of the ROW’s recommendations for each.

Scope of REDD+ (which REDD+ strategies may generate offset credits)	California should credit deforestation and forest degradation, and credit other practices only when agreed upon by the partnering states.
Reference Levels (estimate of emissions that would result without the program, to ensure that reductions are additional to those that would have occurred otherwise)	California should use an historical average of 10 years from between 1995 and 2010, and should require partner jurisdictions to make additional, uncredited reductions (for example, by setting a baseline below reference level).
Crediting Pathways and Nested Crediting (how credits are issued, registered and tracked, and whether credits are issued at a project level “nested” within the jurisdictional system, or only at the jurisdiction level)	California should recognize credits issued by either the partner jurisdiction or a third-party program. Partner jurisdictions should decide whether to credit reductions at a jurisdictional or project level, or both. If a jurisdiction allows nesting, it should integrate project mechanisms at the jurisdictional and project levels, and allocate responsibility for leakage and reversal at each level.
Registry Infrastructure (structure of information database used to ensure compliance with program requirements)	California should work with partner jurisdictions to develop minimum standards and procedures for registries, and each partner jurisdiction should design its own registry to meet these standards (or use a national registry if it meets the standards).
Leakage (net emissions increases outside of a REDD+ jurisdiction as a result of the program)	Partner jurisdictions should develop policies to avoid leakage (for example, minimizing the impacts of intensive land uses or relocating them to already-cleared land), and should implement systems to detect and account for residual leakage. California should recommend that partner jurisdictions demonstrate business-as-usual production of crops and livestock within the jurisdiction.
Reversal (subsequent release of credited carbon into the atmosphere)	California should establish regulatory criteria for monitoring credited reductions and compensating reversals. Partner jurisdictions should report reversals, and adopt mechanisms (such as “buffer credits” or insurance) to compensate for any reversals.
Double Counting (one emission reduction unit receiving multiple credits)	Partner jurisdictions should clarify legal ownership of reductions, coordinate jurisdictional programs with national efforts, and integrate accounting of nested projects.
MMRV (measurement, monitoring, reporting and verification)	California should incentivize accurate measurement by giving less credit to emission reductions that are less certain to occur, and should set an uncertainty threshold above which no credits would be issued. It should also validate each jurisdiction’s MMRV methodology at the program outset and periodically thereafter, and require independent, third-party verification of reductions at intervals of no more than 5 years.
Safeguards (mechanisms to ensure risks related to environmental and social issues are considered and reduced)	Partner jurisdictions should follow best-practice standards for implanting safeguards, develop a transparent public process for developing REDD+ policy measures, institute grievance measures, and respect indigenous peoples’ rights. California should condition the acceptance of REDD+ offsets on a partner jurisdiction’s adoption of best-practice safeguards.

Opportunities and Challenges Driving the Debate about REDD+ Offset Credits in California

In this section, we lay out the big-picture policy drivers behind California’s interest in recognizing REDD+ credits under AB 32 and the central challenges that concern opponents. Those who

favor the recognition of REDD+ offsets in California emphasize both economic and environmental benefits from a successful REDD+ program. Three main arguments in favor of including REDD+ credits have gained prominence and sway in the debate.

First, many advocates are focused on the need to address GHG emissions from the international forestry sector in order to make a dent in global climate change, and they see California's program as a key lever for reducing emissions from global forestry practices. Climate change is an energy problem, but also—and perhaps just as much so—a land use problem. According to the latest Intergovernmental Panel on Climate Change Assessment Report, the agriculture, forestry, and other land uses (AFOLU) sector and the electricity and heat production sector each account for about a quarter of worldwide GHG emissions.⁵¹ Responding to climate change will mean taking on emissions from both of these sectors. California's program provides a good opportunity, some believe, for creating a viable mechanism to encourage the sustainable forestry practices that will be necessary for climate progress.⁵²

Cost containment is a second key factor in the debate. The cost of AB 32 compliance is expected to increase over time. As the state emissions cap tightens and emitters exhaust cheap emission reduction strategies, the prospect of more expensive control measures is anticipated to fuel greater demand for low-cost offsets.⁵³ REDD+ offsets represent a potential source of plentiful and cheap emissions reductions. Under AB 32 regulations, potential demand for sector-based offsets (like jurisdictional REDD+ offsets) may reach as high as 71 million metric tons—the total limit on sector-based offsets that may be used by regulated entities between now and 2020.⁵⁴ REDD+ offsets could potentially meet this demand in full.⁵⁵ REDD+ offsets are also fairly cost-effective. Recent prices for a ton of carbon in voluntary REDD offset markets have ranged from \$2 to \$3 at the low end to \$8 to \$9 at the high end, with an average price of about \$5.⁵⁶ By comparison, California auction allowance prices have recently hovered around \$12 per ton,⁵⁷ and prices will rise in the coming years.⁵⁸ By allowing REDD+ offsets into the market, proponents argue, California can achieve AB 32's emissions reductions while minimizing the financial burden on regulated entities.⁵⁹ Lower compliance expenses could result in reduced costs to consumers and customers, thereby helping achieve climate goals at lower total cost.⁶⁰ Despite the prominence of this cost-containment argument, there is no comprehensive, publicly available analysis of the potential effect of REDD+ offsets on California's overall AB 32 compliance costs.

Third and last, many proponents in California look to non-economic, and even non-climate, environmental benefits as a driving force for the inclusion of REDD+. Many environmental groups and advocates see REDD+ as an opportunity to advance natural resource protection with significant environmental and social co-benefits. Tropical rainforests are home to diverse and rare species, and they provide important environmental benefits like limitation of soil erosion, flood reduction, and maintenance of natural hydrological cycles.⁶¹ However, destructive land uses in rainforests and other sensitive environments have been on the rise for decades. About 13 million hectares of tropical forests are destroyed every year.⁶² Advocates see REDD+ as an opportunity to respond to climate change while also addressing deforestation and forest degradation.⁶³ By demonstrating a workable REDD+ offsets program, advocates say, California may encourage other authorities to adopt similar programs, thereby promoting efforts to reduce climate change—and forest destruction—above what can be achieved through the state's trading program.⁶⁴

All proponents of REDD+ in California hope to create a model that can be replicated elsewhere. AB 32 was meant to promote greenhouse gas emission reduction response efforts by other states, the federal government, and other countries.⁶⁵ Because an effective response to global climate change will require efforts far beyond what California can achieve on its own, the success of AB 32 in addressing climate change will depend primarily on the state’s ability to inspire international efforts.

There are, however, significant technical and legal challenges in adopting an AB 32 REDD+ offsets program. AB 32 sets high standards for all offsets. The law requires that offsets be “real, additional, quantifiable, permanent, verifiable, and enforceable” (see Figure 5).⁶⁶ All parties acknowledge that REDD+ offsets pose potential difficulties under each of these criteria. Forest carbon stores are considerably more difficult to quantify than most other emissions sources, and emission reductions from forests—particularly those far outside California—can be much harder to track, verify and enforce.⁶⁷ Previous REDD-branded projects have come under fire for failing to adequately ensure meaningful emissions reductions.⁶⁸ The ROW report addresses potential solutions to these legal and technical challenges, not all of which are satisfactory to REDD+ critics.⁶⁹

Figure 5: AB 32’s Offsets Criteria

AB 32 regulations require greenhouse gas reductions from sector-based offsets to be “real, additional, quantifiable, permanent, verifiable, and enforceable.”⁷⁰ These terms are defined as follows.⁷¹

Real

“...that GHG reductions or GHG enhancements result from a demonstrable action or set of actions, and are quantified using appropriate, accurate, and conservative methodologies that account for all GHG emissions sources, GHG sinks, and GHG reservoirs within the offset project boundary and account for uncertainty and the potential for activity-shifting leakage and market-shifting leakage.”

Additional

“...greenhouse gas emission reductions or removals that exceed any greenhouse gas reduction or removals otherwise required by law, regulation or legally binding mandate, and that exceed any greenhouse gas reductions or removals that would otherwise occur in a conservative business-as-usual scenario.”

Quantifiable

“...the ability to accurately measure and calculate GHG reductions or GHG removal enhancements relative to a project baseline in a reliable and replicable manner for all GHG emission sources, GHG sinks, or GHG reservoirs included within the offset project boundary, while accounting for uncertainty and activity-shifting leakage and market-shifting leakage.”

Permanent

“...either that GHG reductions and GHG removal enhancements are not reversible, or when GHG reductions and GHG removal enhancements may be reversible, that mechanisms are in place to replace any reversed GHG emission reductions and GHG removal enhancements to ensure that all credited reductions endure for at least 100 years.”

Verifiable

“...that an Offset Project Data Report assertion is well documented and transparent such that it lends itself to an objective review by an accredited verification body.”

Enforceable

“...the authority for ARB to hold a particular party liable and to take appropriate action if any of the provisions of this article are violated.”

Those opposed to including REDD+ credits within AB 32 have two further principal concerns. First, some believe that AB 32’s emissions reductions should come entirely or largely from in-state sources, so that the public health and other co-benefits accompanying such reductions accrue to local, California communities. To these opponents, California emitters should not be permitted to pay for emissions reductions outside the state as an alternative to cutting their own

pollution.⁷² Significantly, these opponents believe that AB 32 should be used to produce economic and environmental co-benefits for low income communities in California. AB 32 provides support for this position; the statute says that in designing market-based mechanisms like cap-and-trade, ARB must consider localized impacts to already polluted communities in the state and “[m]aximize additional environmental and economic benefits for California, as appropriate.”⁷³ “California first” is a rallying cry for this group of opponents.⁷⁴ According to these opponents, California’s interests may not be served by the availability of low-cost offsets. Initially, some question whether cost savings will actually be passed on to consumers.⁷⁵ And further, they say, California emitters are more likely to pursue innovative direct emissions reductions without these offsets.⁷⁶

A second rationale of opponents focuses on the international human rights implications of REDD+ programs and emphasizes the risk of adverse social and environmental consequences for local communities. Some previous forest conservation projects have resulted in indigenous residents being excluded or evicted from protected areas, and have prompted outcries over alleged human rights violations.⁷⁷ Following the 2010 MOU between California, Acre, and Chiapas, critics have focused particular attention on Chiapas. That state’s forest carbon projects have faced criticism, including charges that the projects have excluded women and others without formal property rights, that they have obtained resettlement of indigenous communities by withdrawing necessary medical services, and that they have failed to adequately compensate local land users.⁷⁸ Opponents worry that a California REDD+ offsets program would increase demand for new offset projects and thereby exacerbate land disputes between indigenous and non-indigenous populations, potentially leading to forced evictions and disruptions of small-scale forest uses like wood-gathering, hunting and fishing.⁷⁹ Additionally, some fear that a REDD+ offsets program may present a threat to biodiversity and native ecosystems.⁸⁰ The United Nations Convention on Biological Diversity has identified risks that improperly implemented REDD+ efforts can result in conversion of natural forests into plantations or other less sustainable and less biologically diverse ecosystems, particularly through “+” strategies like afforestation and reforestation.⁸¹ Opponents question California’s capacity to design and oversee a system that can avoid harming distant populations and landscapes over which the state has limited control.⁸²

Key Constituencies and Interests in the California REDD+ Offsets Debate

A variety of stakeholders—primarily non-profit organizations, but also others from the private sector—have weighed in on the question of whether California should allow REDD+ offsets (Figure 6 provides a sampling of these interests, drawn from responses to the ROW’s draft recommendations). Among supporters of a California REDD+ offsets program, three major non-profit advocacy organizations—The Nature Conservancy, the Environmental Defense Fund (EDF), and Conservation International—have been the most visible. These groups have been involved in forest and climate issues for many years, and representatives of each have been closely involved in the GCF and the ROW. They have repeatedly weighed in with ARB staff, other executive branch officers, the ROW, and legislators to advance their views on this issue. Some of their advocacy has been quite extensive: in December 2013, EDF arranged for a delegation of legislators to visit Mexico, to promote the forest conservation work and other climate efforts that are underway there and to showcase opportunities for cooperation with California. The

trip included Senator Ricardo Lara (the sponsor of SB 605), as well as Senators Lou Correa and Kevin de León.⁸³

These groups rely on a mix of all three of the central arguments in favor of REDD+ in California discussed above. For them, REDD+ presents an opportunity to pursue both climate and conservation goals, at reasonable cost. According to Michelle Passero, a ROW participant from The Nature Conservancy, the issues of conservation and climate change can't be separated, and conservation efforts are a critical part of the climate change response. "We need to address the root cause in order to address the larger problem," she says.⁸⁴ The groups see the success of REDD+ offsets in California as critical to its broader implementation. California's work is valuable because it can provide a "proof of concept" for other jurisdictional REDD+ programs, Passero says.⁸⁵ California's development of a REDD+ offsets program could catalyze other jurisdictions to adopt similar programs, says ROW participant Toby Janson-Smith of the Verified Carbon Standard,⁸⁶ and formerly of Conservation International. The potential impacts of California's plan mean that the state's decisionmaking matters a good deal to both advocates and opponents. For both sides, Janson-Smith says, California is "a high-stakes battleground."⁸⁷

Another key voice pushing for inclusion of REDD+ offsets has been the Greentech Leadership Group (GTLG), a nonprofit organization overseen by Tony Brunello that connects technology companies and other nonprofits with policymakers. They were instrumental in establishing and coordinating the ROW and in shaping its policy recommendations. GTLG and its partners remain active as the Forests 4 Climate Network, which operates an informational website on REDD+ and California's role in forest and climate issues.⁸⁸

Other non-profits and private sector interests have also supported the inclusion of REDD+ credits. A number of forest carbon management and investment firms and organizations, including the International Emissions Trading Association, Ecosystem Restoration Associates, and Terra Global Capital, have voiced their support for California's adoption of REDD+ offsets.⁸⁹ In August 2010, several major California utilities and private environmental market firms joined with EDF, Conservation International, and The Nature Conservancy to file a letter in response to ARB's July 2010 REDD workshop, highlighting the economic and environmental benefits of California deciding to allow REDD offsets.⁹⁰ In July 2013, following the release of the ROW recommendations, more than two dozen private entities—as well as NGOs and representatives of indigenous populations in Kenya, Brazil, and Colombia—signed a letter to ARB sent by the organization Code REDD.⁹¹ The letter urged the state to adopt REDD+ offsets, citing California's leadership in public-private partnerships on forest conservation issues.⁹² Southern California Edison, PG&E and the Sacramento Municipal Utility District (SMUD) joined the letter, along with the Walt Disney Company⁹³ and a number of private conservation and carbon trading firms. A few business and trade groups, including the California Manufacturers and Technology Association, voiced opposition to SB 605's restriction on international offsets.⁹⁴

Generally, however, those with direct economic interests in REDD+ have played a relatively small role in the public discussion on this issue. Many of the large emitters regulated under California's emissions cap have been notably absent at meetings and in the comment process. While not hostile to REDD+ offsets, regulated entities have seemed to treat offsets as a "secondary issue" to more immediate elements of AB 32 implementation and operation, says William Boyd.⁹⁵ Among the regulated community, electric utilities have probably been the most publicly involved. Southern California Edison and others under the Southern California Public Power Au-

thority have generally indicated cautious approval for REDD+ offsets, so long as they can be made commercially viable within a reasonable time frame.⁹⁶ Other utilities, in particular Pacific Gas & Electric (PG&E), have been more actively supportive of REDD+ offsets.⁹⁷

Figure 6: Representative Stakeholder Positions, from Public Comments to the Draft ROW Recommendations

Environmental Defense Fund	“Allowing credits for reduced deforestation into the California carbon market offers a win-win opportunity for regulated entities to achieve significant emissions reductions that will play a critical role in addressing global climate change—while lowering the overall costs of meeting California’s groundbreaking climate goals. The ROW recommendations show how to accomplish this through a comprehensive, jurisdictional REDD+ program with stringent requirements for scientific rigor, environmental integrity and social responsibility.” ⁹⁸
International Emissions Trading Association	“Recognizing REDD+ credits in a compliance program sets an important precedent for using markets to impact deforestation and promote sustainable practices. The carbon benefits can go a long way to achieving the goals set by California lawmakers under [AB 32], and can reduce the costs to the California economy in the process.” ⁹⁹
The Nature Conservancy	“The report presents a thoughtful and comprehensive set of recommendations to states and stakeholders interested in developing [REDD+ programs]. The recommendations are a good synthesis of the current thinking about REDD+ and, along with the companion set of options, provide good guidance to the governments of California, Acre and Chiapas, and any other state developing a jurisdictional REDD+ program, and fulfill the intent of the MOU establishing the ROW.” ¹⁰⁰
Pacific Gas & Electric	“PG&E generally supports the Draft Recommendations from the [ROW], and commends the ROW for its efforts toward structuring a jurisdictional REDD program linked to the California cap-and-trade program. REDD offsets represent a valuable source of potential offset supply to the California cap-and-trade program, which could help contain the cost of the program, while preserving biologically-important forests outside the state.” ¹⁰¹
The Center for Biological Diversity	“In general, ROW provides a good overview of a number of the key issues and problems associated with the development of a REDD program and a subnational approach. However, the ROW recommendations are less successful at describing useful paths to solving these problems. Also, while ROW provides a very convincing argument in favor of investing in the protection of tropical forests and the carbon stores they contain, the recommendations provide little explanation of why a REDD program is the best option for doing so.” ¹⁰²
Friends of the Earth Latin America and the Caribbean	“[U]sing REDD offset credits to meet California’s emissions reduction targets will weaken your state’s efforts to truly reduce CO2 emissions, will fail to protect tropical forests in ways that meet current best practices, and will lead to serious abuses of human rights and the rights of indigenous peoples. . . . Given the volatile nature of carbon markets and the widespread potential for gaming, corruption, fraud, and perverse incentives that exist in these markets, REDD programs financed primarily or wholly through offsets, such as that proposed for California, will magnify all the problems we have already experienced with REDD.” ¹⁰³
The Indigenous Environmental Network	“[T]he Indigenous Environmental Network recommends that [REDD] not be implemented by the State of California under AB32. The abuses of Indigenous Peoples and other forest dwelling peoples their rights could not be controlled. REDD+ would severely and detrimentally affect their collective identity, cultures and ways of life. There is no safe REDD. All REDD initiatives, current or future, cannot guarantee safeguards to prevent human rights abuses.” ¹⁰⁴
The Union of Concerned Scientists	“[The ROW Recommendations Report] is a comprehensive document that reflects thoughtful recommendations for meeting both international principles for [REDD] and creating an implementable program for California and partner jurisdictions. These constructive ideas should be considered if California decides to try to create and implement a program with partner jurisdictions. [CARB] will need to decide if it needs to determine whether it is appropriate to use REDD offsets for meeting the requirements of AB 32, such as economic and environmental co-benefits, monitoring of emissions levels, and achieving emissions reductions targets.” ¹⁰⁵

On the other side of the debate, the most prominent opponents of REDD+ offsets for California have been a collection of NGOs interested in environmental justice and international human rights. Friends of the Earth and Greenpeace were among the first to object to California's use of REDD+ offsets,¹⁰⁶ and they have led much of the effort against the proposal. These organizations, active in the United States and globally, have focused primarily on the potential for negative social and environmental consequences in partner jurisdictions, discussed above. They point to human rights violations that have resulted from previous forest conservation efforts and question whether California has the capacity to design and implement a program to financially incentivize certain uses of land that does not hurt the politically vulnerable populations who live and depend on those lands. In order to adequately address these issues, these groups argue, a much larger and more developed system of national partnerships will be needed. Jurisdictional partnerships aren't enough, they say, because they suffer the same problems—with verification, leakage, conflicts with local populations, and others—as do project-based offset programs.¹⁰⁷ The Center for Biological Diversity, a prominent national environmental organization, has voiced skepticism over California's plan for this reason. The Center's Roman Czebiniak, formerly a representative for Greenpeace in international climate change negotiations, thinks that California's adoption of a sub-national REDD+ program could be a step backward for global forest conservation efforts. California's approach, he says, could involve the same sort of small-scale sub-national projects that have been largely discredited in global negotiations.¹⁰⁸ "Calling something a jurisdictional approach does not make it such," he says.¹⁰⁹ Czebiniak worries that California's proposal could be counterproductive to ongoing talks on national partnerships and larger scale efforts.¹¹⁰

These larger groups have been joined by a number of smaller organizations. Generally, these smaller organizations represent two distinct constituencies—some indigenous populations in rainforest nations, and California environmental justice communities—that have united to oppose REDD+ offsets. The indigenous constituency has challenged the idea that offsets can reduce emissions in a way that preserves indigenous rights and autonomy.¹¹¹ While not all indigenous groups are opposed to REDD+,¹¹² indigenous people probably stand to lose the most from a poorly implemented REDD+ offsets system, and some indigenous rights groups have been especially critical of REDD+.¹¹³

The California environmental justice constituency has embraced the "California first" vision for AB 32, opposing REDD+ and other international offsets in favor of direct emission reductions within the state, with a goal of reducing disparate environmental impacts to California's disadvantaged communities. By focusing on local emissions sources, the groups say, California can reduce climate change while simultaneously addressing other forms of air pollution coming from these same sources, which have localized impacts to surrounding communities, often communities of color and other at-risk populations.¹¹⁴ These groups cite provisions of AB 32 that call for ARB to address environmental justice issues alongside climate change.¹¹⁵ To environmental justice advocates, this is a critical element of the law. According to Mari Rose Taruc of the Asian Pacific Environmental Network (APEN), a California-based environmental justice NGO focusing on Asian and Pacific Islander communities and an active participant in the California REDD+ offsets discussions, "the promise of AB 32, to us, is about reducing the pollution that we've been fighting for decades."¹¹⁶ Initially, she says, ARB seemed to have overlooked these requirements, and environmental justice advocates feel that they had to push ARB to engage with these issues. Environmental justice opponents to REDD+ offsets aren't necessarily opposed

to California's involvement in international forest conservation efforts, but they don't think AB 32 is the right way to do it. "Once we have those models here in place and working," says Amy Vanderwarker of the California Environmental Justice Alliance, "then we can think about how they are translated to an international context."¹¹⁷

The indigenous human rights groups and environmental justice groups often work together. This partnership was advanced at a meeting in Copenhagen in December 2009, where advocates were gathered for United Nations climate talks. There, says Taruc, she and others in an environmental justice delegation recognized the connections between their interests and those of indigenous rights groups at the convention.¹¹⁸ Since then, the two sets of groups have become close allies. In July 2012 and again in May 2013, a coalition of NGOs from California and abroad—including both Greenpeace and Friends of the Earth, and smaller indigenous rights and environmental justice organizations—sent letters to the Governor and ARB, urging them not to adopt a REDD+ offsets program.¹¹⁹

The voices of these opponent groups have grown stronger on this issue in recent years, and they are garnering more political attention. While early discussions at the GCF and ROW were dominated by NGOs in favor of the proposal, recent discussion has been driven increasingly by the environmental, human rights, and environmental justice organizations that oppose the idea. When ARB held its July 2010 workshop, nearly all the comments that it received in response favored including an AB 32 REDD+ offsets program. Responses to the 2013 ROW draft recommendations were far less favorable, and many were harshly critical of the recommendations.

Lastly, several important stakeholders have adopted a watchful, neutral position on REDD+ in California. The Union of Concerned Scientists (UCS) endorses REDD+ strategies globally, but is less certain that AB 32 is the appropriate vehicle for advancing these programs in California, particularly because of the law's focus on achieving state goals.¹²⁰ UCS has expressed concern that the ROW recommendations fail to address how ARB can achieve the economic and pollution reduction goals of AB 32.¹²¹

It is difficult to tell how much traction either side has made with policymakers. Outwardly at least, those in California government have maintained a mostly neutral stance, acknowledging the merits of both sides of the debate while declining either to move forward on REDD+ offsets or to abandon the idea. The factors likely to influence the state's next steps are discussed in the following section.

Next Steps and Outlook for the Future

The next steps in the decision making process belong to ARB and to the Governor. Because of its work on other regulatory efforts, ARB is not expected to move to approve REDD+ offsets any earlier than 2015.¹²² Most stakeholders believe that regulators have not yet decided whether to prioritize jurisdictional REDD+ offsets, suggesting that any action on REDD+ offsets may come even later. Mary Nichols, Chair of ARB, confirms that the agency is keeping an open mind about REDD+ but has not yet committed to embracing REDD+ offsets as a form of cap-and-trade compliance instrument.¹²³ ARB staff has indicated that REDD+ offsets decisions will likely be made within the context of a broader regulatory update related to the role and supply of offsets in the cap-and-trade program, which will occur sometime in the next few years.¹²⁴

If ARB moves forward, its process would likely start with a series of public hearings on the question of REDD+ credits, raising issues examined in the ROW report and other issues for further discussion. If it chooses to proceed from there, it could contemplate entering into a non-binding MOU or other type of non-binding arrangement between California and its partner jurisdictions regarding the substance of the new program and each party's procedural requirements.¹²⁵ ARB would have to initiate the rulemaking process for regulatory changes to link with a partner jurisdiction and recognize that jurisdiction's REDD offset credits.¹²⁶ These regulatory amendments would trigger a public review process and potentially an analysis under the California Environmental Quality Act, the state's environmental impact assessment law.¹²⁷

Ultimately, the Governor would serve as a gatekeeper to final approval of any jurisdictional REDD+ offset program. A 2012 California law states that any cap-and-trade linkage between the state and another jurisdiction cannot proceed without a series of certifications made personally by the Governor.¹²⁸ This law, which was not drafted explicitly with REDD+ offset linkages in mind, is not a perfect fit for these programs.¹²⁹ Nevertheless, policymakers agree that it would apply to the jurisdictional linkages contemplated here.¹³⁰ It requires the Governor to determine that the linkage partner has adopted a greenhouse gas reduction program that is at least as stringent as AB 32; that the linkage agreement contains certain enforcement measures; and that the linkage will not submit California to significant liability for any failure associated with the linkage.¹³¹ The Governor has considerable discretion concerning whether to make these certifications. The position of Governor Brown and his advisors on the general advisability of REDD+ offsets for California is not yet settled, and may depend on answers to questions about the reliability and enforceability of REDD+ offsets, AB 32 compliance costs, safeguards, and other issues.¹³²

The legislature may also play a critical, even determinative, role going forward. At any time in this process, it may weigh in with legislation to alter or prohibit REDD+ offset crediting, similar to the original provisions of SB 605 (Lara) described above. The legislature today has a very different composition than it did when AB 32 was enacted, observes Michelle Passero, and some of the new members seem especially sympathetic to the environmental justice community's objections to REDD+ offsets.¹³³ It also remains to be seen whether California will extend the cap-and-trade program beyond 2020. If it does not, many observers have noted that this could suppress demand for all types of offsets and create market uncertainty that will destabilize the entirety of the cap-and-trade program.

Factors bearing on the likelihood of California recognizing REDD+ offsets

Two kinds of factors, broadly speaking, will determine the future of REDD+ in California: legal/technical questions about whether California *can* create REDD+ offset credits that meet AB 32's stringent requirements for additionality, verifiability, enforcement, and other indicia of reliability; and policy questions about whether California *should* embrace such credits, given the various interests discussed throughout this paper.

The ROW report deals mainly with legal and technical questions and provides some paths forward, but no complete solutions. California cannot approve a REDD+ offsets program unless ARB staff and leadership are confident that the program will meet AB 32's stringent requirements for offsets, as described above. Key stakeholders continue to question whether it is possi-

ble to craft a REDD+ linkage that satisfies these requirements.¹³⁴ Brian Nowicki of the Center for Biological Diversity says that the ROW recommendations represent a good review of what would need to be done to create a viable REDD+ program, but that they are far from a working plan. He questions whether all the problems identified in the report can be overcome. “There are extremely difficult pieces that would need to be fleshed out and put into operation,” he says. “It’s very likely impossible to do some of those things, or at least impossible to do them right.”¹³⁵ ARB itself has recently grappled with the difficulty of accounting correctly for forestry offsets, in response to allegations that its domestic forestry protocol may not be resulting in its promised emissions reductions.¹³⁶

Nonetheless, legal and technical issues alone are not expected to present the most significant hurdles to California’s creation of a jurisdictional REDD+ offsets program.¹³⁷ Even if the state can design a REDD+ offsets program that produces identifiable, reliable emissions reductions and provides strong safeguards, California policymakers will ultimately have to conclude that the benefits to the state from such a program will warrant the state’s considerable efforts to implement it.

Part of the policy question is economic. Offsets are useful only if they are cost-effective, a function of both supply and demand. Offset supply remains low; to date, the state has issued about 8.3 million offset credits,¹³⁸ out of a possible maximum of over 200 million credits by 2020.¹³⁹ By regulation, sector-based offsets like REDD+ may account for up to about 71 million of these credits.¹⁴⁰ While early forecasts predicted strong demand for offsets based on allowance prices projections of upwards of \$60 by 2020, more recent projections for that year fall around \$15 per allowance, indicating that demand may be lower than expected.¹⁴¹ Demand for offsets will also depend on whether California extends the cap-and-trade program beyond 2020, and, if it does, on the level at which regulators decide to set the cap for future periods.

If California decides to pursue jurisdictional REDD+ offsets, it will inevitably face a tradeoff between demanding higher-quality (i.e., more reliable) offsets and seeking offsets at the lowest price. In this way and others, political factors are not divorced from program design. A program that allows for lower-cost offsets may attract more industry support. Conversely, a program that demands higher quality offsets—those that are more likely, in fact, to reduce emissions as promised and to be enforceable with proper safeguards—will attract less vigorous opposition from some (but not all) opponents. If California can ensure a long-lasting supply of very cheap, and very reliable, offsets from REDD+ projects, it could shore up political support from both the regulated sectors and some current opponents.

The future political strength of opponents is hard to predict. Opponents of REDD+ offsets have gradually become more vocal and involved as the REDD+ offsets debate has progressed. Amy Vanderwarker thinks they are gaining ground. “It is definitely an uphill battle,” she says, “but I think that we are chipping away at this entrenched position that everything about AB 32, including international offsets, is a success.”¹⁴² Supporters of REDD+ offsets agree that these groups have been successful in generating opposition to the REDD+ offsets proposal.¹⁴³ This rising opposition may indicate a broader policy shift against REDD+ offsets.

Similarly hard to predict is the strength of involvement by the regulated community. Toby Jan-son-Smith and William Boyd both believe that more involvement by regulated companies (i.e., emitters) could make a significant difference in whether California goes forward with jurisdic-

tional REDD+ offsets.¹⁴⁴ To Boyd, if the state's REDD+ offsets plan can't get more industry support, "it probably doesn't go forward."¹⁴⁵ Of course, the regulated community is more likely to get involved if allowance prices rise and other offset programs are not able to meet total demand.

International opinion on REDD+ will matter, too. Because California has pursued REDD+ offsets in part to encourage other jurisdictions to do so as well, the state's willingness to adopt a REDD+ program may depend on continued interest by other jurisdictions in following suit. If it appears that other governments are not interested, then, asks Kip Lipper, advisor on energy and environmental issues in the California State Senate, "how much of the state staff time and resource and money and effort should be going into establishing templates for use by other regions or other countries, and how much of it should be going into really boring down and dealing with what we know are still significant in-state pollution problems and in-state impacts that need to be addressed?"¹⁴⁶ On the other hand, if other states or countries show interest in following California's lead, the state may decide that it is worthwhile to pursue the idea. California's recent linkage with Québec's cap-and-trade system has expanded the market for offsets approved by either program, and future market linkages could grow demand for California REDD+ offsets. Both California and Québec hope to attract additional linkages with other partners.¹⁴⁷ Future linkage partners might themselves decide to issue REDD+ offsets, which would make these offsets available to California emitters.¹⁴⁸ Additionally, other jurisdictions might pursue REDD+ offsets independently, based on the California model. According to Cliff Rechtschaffen, Senior Advisor to Governor Brown, the best reason for California to adopt REDD+ offsets is to create a workable model that others can follow and build on.¹⁴⁹

Some see continued support for REDD+ partly as a function of time. Foundations and NGOs support ideas that are likely to be successful, says Tony Brunello, and if an initially promising concept doesn't show results within a certain time period—he puts it at about five years—it tends to get left behind.¹⁵⁰ William Boyd echoes this idea: "there are windows of opportunity that don't stay open forever."¹⁵¹ Brunello worries that REDD+ may already be tarnishing. He doesn't see politicians as willing to push the issue much.¹⁵² It may be worth waiting, says Brunello. In the years ahead, he says, advances in data, tracking, and program design may bring renewed interest to REDD+ strategies, and make it technically and politically easier for California to implement a REDD+ offsets program.¹⁵³ At the same time, the concept of REDD+ is evolving. Michelle Passero describes a "paradigm shift" in REDD+, to include things like land use planning and changes in laws and zoning.¹⁵⁴ Similarly, William Boyd sees recent discussions of REDD+ strategies focusing on low-emission rural development.¹⁵⁵ California might choose to implement a program that reflects this expanded notion of REDD+.

If California decides not to adopt a jurisdictional REDD+ offsets program within the AB 32 context, the state may get involved in international forest carbon efforts in other ways. Mary Nichols says the state has been considering other forestry initiatives beside REDD+ offsets: "Even while we've been discussing in detail REDD, we've also looked at other ideas that people have for things that we could do in this general area, that would not necessarily involve the cap-and-trade program or offsets."¹⁵⁶ One idea, she says, would be direct engagement with forested jurisdictions, to develop guidance for voluntary REDD+ investments.¹⁵⁷ The Climate Action Reserve's project-based Mexican forest protocol could be another way. Ultimately, according to Mary Nichols, the question ARB faces is not "REDD or not REDD." "The question is, 'What

role, if any, should California play in improving forest management practices, or helping to come up with better ways to preserve forest carbon than would happen without us?”¹⁵⁸

Conclusion

Several years into California’s discussion of jurisdictional REDD+ offsets within its cap-and-trade system, it remains to be seen whether the state will ultimately choose to pursue these offsets. Questions remain regarding the state’s ability to ensure reliable emissions reductions while providing adequate safeguards against negative social and environmental consequences. Political support for the idea is divided, and there is some indication that earlier enthusiasm has dwindled in recent years. But many influential regulators and advocates continue to see California as having the opportunity to play a key role in improving international forestry practices, while reducing the costs of controlling greenhouse gas emissions. California’s decision whether or not to approve jurisdictional REDD+ offsets will likely depend on economic demand for such offsets, as well as regulators’ confidence in being able to design an effective and politically supported program. This decision will likely have implications for other authorities’ interest in pursuing their own jurisdictional offsets programs.

Appendix A: List of Interviews

- Adrienne Alvord, California and Western States Director, Union of Concerned Scientists (Apr. 25, 2014)
- William Boyd, Associate Professor, University of Colorado Law School (Apr. 18, 2014)
- Tony Brunello, Executive Director, Greentech Leadership Group; Principal, California Strategies, LLC (Apr. 24, 2014)
- Xantha Brusco, Principal, Long-Term Energy Policy, Pacific Gas & Electric Company (May 9, 2014)
- Roman Czebiniak, Conservation Director, Center for Biological Diversity (June 2, 2014)*
- Sean Donovan, Air Pollution Specialist, California Air Resources Board (Apr. 21, 2014)†
- Gary Gero, President, Climate Action Reserve (May 8, 2014)
- Jason Gray, Manager, Climate Change Program Monitoring Section, California Air Resources Board (Apr. 21, 2014)†
- Toby Janson-Smith, Director, Agriculture, Forestry & Other Land Use (AFOLU) Program, Verified Carbon Standard (May 6, 2014)
- Kip Lipper, Advisor to the Senate Pro Tempore on Energy and Environmental Issues, California State Senate (May 13, 2014)
- Christina McCain, Senior Manager, Latin American Climate Initiative, Environmental Defense Fund (May 12, 2014)‡
- Erica Morehouse, Attorney, Environmental Defense Fund (May 12, 2014)‡
- Mary Nichols, Chair, California Air Resources Board (May 15, 2014)
- Brian Nowicki, California Climate Policy Director, Center for Biological Diversity (June 2, 2014)*
- Michelle Passero, Senior Climate Policy Advisor, The Nature Conservancy (Apr. 17, 2014)
- Cliff Rechtschaffen, Senior Advisor to Governor Jerry Brown; Professor, Golden Gate University Law (Apr. 30, 2014)
- Earl Saxon, Principal Consultant, ForestInform Partners (May 15, 2014)
- Mari Rose Taruc, State Organizing Director, Asian Pacific Environmental Network (Apr. 29, 2014)
- Cameron Valderrama, Rules Committee Consultant, Office of Senator Ricardo Lara (May 21, 2014)
- Amy Vanderwarker, Co-Coordinator, California Environmental Justice Alliance (May 9, 2014)
- Derek Walker, Associate Vice President, U.S. Climate and Energy Program, Environmental Defense Fund (May 12, 2014)‡

* Interviews conducted together.

† Interviews conducted together.

‡ Interviews conducted together.

Notes

1. We conducted 17 interviews of 21 major stakeholders and decision-makers in April, May, and June of 2014. A full list of those interviewed for this paper, and their titles, is available at Appendix A.
2. Cal. Health & Safety Code § 38500 et seq. (passed Sept. 27, 2006).
3. California Air Resources Board (ARB), *Climate Change Scoping Plan: A Framework for Change*, (2008) 31, http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf.
4. Cutter, W. Bowman, III, et al., *Rules of the Game: Examining Market Manipulation, Gaming and Enforcement in California's Cap-and-Trade Program* (UCLA Emmett Center on Climate Change and the Environment, Aug. 2011), 5, <http://ssrn.com/abstract=2089626>.
5. ARB, *Scoping Plan*, 31.
6. ARB, *Emissions Trading Program Overview*, revised Oct. 27, 2010, <http://www.arb.ca.gov/newsrel/2010/capandtrade.pdf>.
7. Cal. Code Regs. tit. 17, § 95802(a)(8).
8. *Ibid.*, § 95854(b).
9. *Ibid.*, § 95975(e). See protocols at: <http://www.arb.ca.gov/regact/2010/capandtrade10/copusforest.pdf> (U.S. Forest Projects); <http://www.arb.ca.gov/regact/2010/capandtrade10/copurbanforestfin.pdf>; (Urban Forest Projects); <http://www.arb.ca.gov/regact/2010/capandtrade10/coplivestockfin.pdf>; (Livestock projects); <http://www.arb.ca.gov/regact/2010/capandtrade10/copodsfin.pdf>. (Ozone Depleting Substances Projects).
10. Cal. Code Regs. tit. 17, § 95993.
11. *Ibid.*, § 95802(257). A “sector” is defined as “a group or subgroup of an economic activity, or a group or cross-section of a group of economic activities, within a jurisdiction.” *Ibid.*, § 95802(256).
12. *Ibid.*, § 95854. ARB has explained its rationale for limiting sector-based offsets thus: “In addition to limiting the use of sector-based offset credits because these programs are new and evolving, the limit on sector-based offset credits will ensure that California’s policy objectives to have offset projects implemented in the State of California will be met.” ARB, *California's Cap-and-Trade Program: Final Statement of Reasons* (Oct. 2011), 813-14.
13. See Cal. Code Regs. tit. 17, § 95994(a)(3): sector-based offsets must be “real, additional, quantifiable, permanent, verifiable, and enforceable.”
14. Intergovernmental Panel on Climate Change, “Agriculture, Forestry, and Other Land Use (AFOLU),” chap. 11 in *Climate Change 2014: Mitigation of Climate Change; Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, ed. O. Edenhofer et al. (Cambridge and New York: Cambridge University Press, 2014), 16.
15. United Nations Framework Convention on Climate Change, Conference of the Parties, Eleventh Session, Montreal, Can., Nov. 28-Dec. 9, 2005, *Reducing Emissions from Deforestation in Developing Countries: Approaches to Stimulate Action; Submissions from Parties*, U.N. Doc. FCCC/CP/2005/MISC.1, <http://unfccc.int/resource/docs/2005/cop11/eng/misc01.pdf>.
16. United Nations Framework Convention on Climate Change, Conference of the Parties, Thirteenth Session, Bali, Indon., Dec. 3-5, 2007, *Addendum; Part Two: Action Taken by the Conference of the Parties at its Thirteenth Session*, U.N. Doc., FCCC/CP/2007/6/Add.1, <http://unfccc.int/resource/docs/2007/cop13/eng/06a01.pdf>.
17. UN REDD Programme, *Frequently Asked Questions*, accessed June 25, 2014, http://www.unredd.net/index.php?option=com_docman&task=doc_download&gid=12119&Itemid=53.
18. REDD Offsets Working Group, California, Acre and Chiapas: Partnering to Reduce Emissions from Tropical Deforestation; Recommendations to Conserve Tropical Rainforests, Protect Local Communities and Reduce State-Wide Greenhouse Gas Emissions, ed. Evan Johnson (July 2013), 2, <http://greentechleadership.org/documents/2013/07/row-final-recommendations-2.pdf>.
19. *ROW Recommendations*, 28.
20. *ROW Recommendations*, 2.
21. Greenpeace, *Outsourcing Hot Air: The Push for Sub-National REDD Offsets in California's Carbon Market from Mexico and Beyond* (Amsterdam: Greenpeace International, 2012), <http://www.greenpeace.org/international/Global/international/publications/forests/2012/REDD/OutsourcingHotAir.pdf>.
22. However, as discussed below, the state is also considering a project-based program with Mexico.
23. William Boyd, e-mail message to Cara Horowitz and Jesse Lueders, July 2, 2014.

24. William Boyd (Associate Professor, University of Colorado Law School), interviewed by Cara Horowitz and Jesse Lueders, Apr. 18, 2014.
25. Tony Brunello (Executive Director, Greentech Leadership Group, Principal, California Strategies, LLC), interviewed by Cara Horowitz and Jesse Lueders, Apr. 24, 2014.
26. The MOU was signed individually by each foreign state and province. See, e.g., *Memorandum of Understanding on Environmental Cooperation Between the Province of Aceh of the Republic of Indonesia, and the States of California, Illinois, and Wisconsin of the United States of America* (Nov. 2008), http://www.gcftaskforce.org/documents/2008_summit_mou/MOU.Aceh-Indonesia_Signed_111808.pdf. Although Wisconsin was one of the original members of the GCF, it withdrew in 2011, see “Membership,” Governors’ Climate and Forests Task Force, accessed Jun 25, 2014, <http://www.gcftaskforce.org/about/membership>.
27. Governors’ Climate and Forests Task Force, *Joint Action Plan (2009-2010)* (Aug. 2009), <http://www.gcftaskforce.org/documents/GCTF-1000-2009-031.pdf>.
28. “Events,” Governors’ Climate and Forests Task Force, accessed Jun 25, 2014, <http://www.gcftaskforce.org/events>. As of August 2014, GCF membership has increased to 26 states. Governors’ Climate and Forests Task Force, press release, Aug. 12, 2014, http://www.gcftaskforce.org/documents/2014_annual_meeting/press_release_1.pdf.
29. “Public Meetings,” ARB, last updated June 20, 2014, <http://www.arb.ca.gov/cc/capandtrade/meetings/meetings.htm>.
30. Cal. Code Regs. tit. 17, § 95993.
31. Brunello, interview.
32. *Ibid.* In 2010, Acre enacted Law 2.308/2010, which the ROW describes as “an innovative, jurisdiction-wide approach to low-carbon rural development.” *ROW Recommendations*, 18.
33. Brunello, interview.
34. *Ibid.*
35. See *Memorandum of Understanding on Environmental Cooperation Between the State of Acre of the Federative Republic of Brazil, the State of Chiapas of the United Mexican States, and the State of California of the United States of America* (Nov. 2010), http://www.socioambiental.org/banco_imagens/pdfs/Memorando_Acre_Chiapas_California_REDD_Nov_2010.pdf.
36. The ROW participants were all initially supportive of the idea of AB 32 REDD+ offsets. For this reason, some have criticized the ROW for failing to include others who were skeptical of or opposed to AB 32 REDD+ offsets. See Letter from Brian Nowicki, Center for Biological Diversity, to the ROW (May 7, 2013), <http://greentechleadership.org/wp-content/uploads/2013/07/brian-nowicki-center-for-biological-diversity.pdf>.
37. *ROW Recommendations*.
38. *Ibid.*, 3.
39. See ARB, *Final Statement of Reasons*, 968: “ARB is awaiting the recommendations from the REDD Offset Working Group to better understand the legal and technical landscape for REDD credits.”
40. ARB, *Compliance Offset Protocol: U.S. Forests Projects* (Oct. 20, 2011), <http://www.arb.ca.gov/regact/2010/capandtrade10/copusforest.pdf>.
41. See ARB, *ARB Offset Credits Issued*, last updated June 11, 2014, http://www.arb.ca.gov/cc/capandtrade/offsets/issuance/arb_offset_credit_issuance_table.pdf.
42. 2000 Cal. Legis. Serv. Ch. 1018 (S.B. 1771).
43. Climate Action Reserve, *Mexican Forest Protocol* (Oct. 23, 2013), http://www.climateactionreserve.org/wp-content/uploads/2013/10/Mexico_Forest_Protocol_V1.0_English.pdf. The Mexican forest protocol, not yet approved by ARB, exhibits features of the ROW’s REDD+ program, with a couple of key limitations. It focuses only on the “+” elements of REDD+—that is, it credits forest carbon enhancement projects, but not avoided deforestation or forest degradation. Further, under the protocol, individual projects—not jurisdictions—would generate offsets, in contrast to the ROW’s jurisdictional approach.
44. Cal. Code Regs. tit. 17, § 95943; ARB, *Linkage Readiness Report* (Nov. 1, 2013), http://www.arb.ca.gov/cc/capandtrade/linkage/arb_linkage_readiness_report.pdf.
45. ARB, *First Update to the Climate Change Scoping Plan: Building on the Framework* (2014), http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf.
46. *Memorandum of Understanding to Enhance Cooperation on Climate Change and the Environment Between the State Of California of the United States Of America and the Ministry of Environment and Natural Re-*

- sources and the National Forestry Commission of the United Mexican States* (July 2014), http://gov.ca.gov/docs/7.28_Climate_MOU_Eng.pdf.
47. District 33 includes industry-heavy regions in south Los Angeles County.
 48. S.B. 605, 2013-2014 Leg., Reg. Sess. (Cal. 2013) (as introduced in Senate, Feb. 22, 2013).
 49. S.B. 605, 2013-2014 Leg., Reg. Sess. (Cal. 2013) (enacted). As amended, SB 605 calls for ARB to create a plan to address “short-lived climate pollutants”—GHGs with a short atmospheric lifespan, but high warming potential.
 50. *ROW Recommendations*, 19-53.
 51. Intergovernmental Panel on Climate Change, “Summary for Policymakers,” in *Climate Change 2014, Mitigation of Climate Change, Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* ed. O. Edenhofer et al. (Cambridge and New York: Cambridge University Press, 2014), 8.
 52. Michelle Passero (Senior Climate Policy Advisor, The Nature Conservancy), interviewed by Cara Horowitz and Jesse Lueders, Apr. 17, 2014.
 53. Xantha Bruso (Principal, Long-Term Energy Policy, Pacific Gas & Electric Company), interviewed by Cara Horowitz and Jesse Lueders, May 9, 2014.
 54. AB 32 regulations allow up to 8 percent of each emitter’s yearly compliance obligations to be met through offsets. Sector-based offsets, once approved, may account for up to 2 percent of an emitter’s total obligations in the first and second compliance periods, and up to 4 percent in the third compliance period (California Code of Regulations § 95854). REDD is currently the only sector-based credit system identified in the regulations, though no REDD jurisdiction has yet been approved for credit generation (*ibid.*, § 95993).
 55. Stevenson, Sam, Belinda Morris, Nick Martin, and Mary Grady, *Compliance Offset Supply Forecast for California’s Cap-and-Trade Program (2013-2020)* (American Carbon Registry, 2012), <http://americancarbonregistry.org/acr-compliance-offset-supply-forecast-for-the-ca-cap-and-trade-program>.
 56. Maria Kolos and Ashley Lawson, *What determines the fair price for REDD credits?* (Point Carbon, 2014).
 57. “California Carbon Dashboard,” accessed June 25, 2014, <http://calcarbodash.org>.
 58. Recent data predict California offset prices to stay near the regulatory price floor through 2020, up to about \$15/metric ton. Earlier reports predicted much higher levels, however, to over \$60/metric ton in 2020. Point Carbon, *New California Emissions Model and Revised WCI Price Forecast* (Point Carbon, 2013).
 59. Christina McCain (Senior Manager, Latin American Climate Initiative, Environmental Defense Fund), interviewed by Cara Horowitz and Jesse Lueders, May 12, 2014; Bruso, interview.
 60. Bruso, interview.
 61. Laurence, William F., “Can Carbon Trading Save Vanishing Forests?” *BioScience* 58, no. 4 (Apr. 2008): 286, doi:10.1641/B580402.
 62. *Ibid.*
 63. Passero, interview.
 64. Derek Walker (Associate Vice President, U.S. Climate and Energy Program, Environmental Defense Fund), interviewed by Cara Horowitz and Jesse Lueders, May 12, 2014.
 65. See Cal. Health & Safety Code § 38501(d): “National and international actions are necessary to fully address the issue of global warming. However, action taken by California to reduce emissions of greenhouse gases will have far-reaching effects by encouraging other states, the federal government, and other countries to act.”
 66. Cal. Code Regs. tit. 17, § 95970. Most other cap-and-trade programs set similar conditions.
 67. Even the state’s domestic forestry protocol—theoretically far less problematic than an international protocol—has been criticized for failing to create its intended emissions reductions, by encouraging destruction of old-growth forests, which may hold much higher carbon levels than younger forests. See Letter from Juliette Beck, Sierra Club, et al. to Mary Nichols and Linda Adams (Apr. 1, 2014), http://libcloud.s3.amazonaws.com/93/e0/3/4627/sierra_club_foe_CARB_letter_final_4-1.pdf.
 68. Greenpeace, *Carbon Scam: Noel Kempff Climate Action Project and the Push for Sub-national Forest Offsets*, (Amsterdam: Greenpeace International, 2009),
 69. See “Public Comments,” Greentech Leadership Group, accessed June 25, 2014, <http://greentechleadership.org/programs/redd-offset-working-group/public-comments>.
 70. Cal. Code Regs. tit. 17, § 95994(a)(3).
 71. *Ibid.*, § 95802.

72. Mari Rose Taruc (State Organizing Director, Asian Pacific Environmental Network), interviewed by Cara Horowitz and Jesse Lueders, Apr. 29, 2014; Amy Vanderwarker (Co-Coordinator, California Environmental Justice Alliance), interviewed by Jesse Lueders, May 9, 2014.
73. Cal. Health & Safety Code § 38570(b).
74. Taruc, interview.
75. Ibid.
76. Ibid.
77. Hallie Boas, ed., *No REDD Papers Volume One* (Portland: Charles Overbeck/Eberhardt Press, 2011), 45-47, http://www.redd-monitor.org/wordpress/wp-content/uploads/2011/11/noreddpapers_download.pdf; Janis Bristol Alcorn and Antoinette G. Royo, “Conservation’s Engagement with Human Rights—Traction, Slippage, or Avoidance?” *IUCN Policy Matters* 15 (July 2007): 123, <http://cmsdata.iucn.org/downloads/pm15.pdf>.
78. Anthony Hall, *Forests and Climate Change: The Social Dimensions of REDD in Latin America* (Gloucestershire: Edward Elgar Publishing, 2012), 79; Jeff Conant, *Do Trees Grow on Money?* *Earth Island Journal* 26, no. 3. (Aug. 2011): 26-30, http://www.earthisland.org/journal/index.php/eij/article/do_trees_grow_on_money; Greenpeace, *Outsourcing Hot Air*, 15-22.
79. “Open Letter to the Government of California” (letter from Brazilian organizations and individuals to Jerry Brown and the ROW) (Apr. 2013), http://libcloud.s3.amazonaws.com/93/18/e/2888/Open_Letter_Acre_english_portugese_spanish.pdf.
80. Letter from Kate Horner, Friends of the Earth and Rolf Skar, Greenpeace, to Kevin Kennedy (Aug. 20, 2010), http://libcloud.s3.amazonaws.com/93/e6/d/708/FOE_and_GP_Comments_to_CA_ARB_on_Sectoral_REDD_Credits_FINAL.pdf.
81. Secretariat of the Convention on Biological Diversity, *CBD Technical Series No. 59: REDD-plus and Biodiversity* (Montreal: Secretariat of the Convention on Biological Diversity, 2011), 22, <http://www.cbd.int/doc/publications/cbd-ts-59-en.pdf>.
82. Greenpeace, *Outsourcing Hot Air*.
83. McCain, interview.
84. Passero, interview.
85. Ibid.
86. Verified Carbon Standard, or VCS, certifies credits for GHG reduction projects.
87. Toby Janson-Smith (Director, Agriculture, Forestry & Other Land Use (AFOLU) Program, Verified Carbon Standard), interviewed by Cara Horowitz and Jesse Lueders, May 6, 2014.
88. See “Forests for Climate Network,” accessed June 27, 2014, <http://forests4climate.org>.
89. See “Public Comments,” Greentech Leadership Group.
90. Letter from Blumberg, Louis, et al. to Barbara Bamberger (Aug. 19, 2010), http://www.arb.ca.gov/lists/sector-based-ws/14-envirocoalition_letterfinal.pdf.
91. Code REDD partners with private sector and non-profit partners to push for REDD+ adoption. According to its website, “Code REDD is a nonprofit organization whose mission is to support and scale the REDD+ mechanism to realize its full potential to empower people, preserve forests, protect wildlife, and reduce emissions.” See “About Code REDD,” Code REDD, (accessed June 24, 2014), <http://www.coderedd.org/about-code-redd>.
92. Letter from Code REDD to Mary Nichols and Jerry Brown (July 18, 2013), <http://www.coderedd.org/wp-content/uploads/2013/07/Letter-of-REDD+-Support.pdf>.
93. Although Disney is not subject to California’s emissions cap, it has made voluntary investments in forest carbon emissions reductions.
94. See letters at “Legwatch 2013-14,” California Manufacturers and Technology Association, accessed June 27, 2014, <http://www.cmta.net/page/legwatch.php?g=energy> (letters hyperlinked under “California Global Warming Solutions Act of 2006: Greenhouse Gas Reduction Fund and scoping plan”).
95. Boyd, interview.
96. Letter from Michael D. Montoya, Cathy A. Karlstad, and Nancy Chung Allred (attorneys for Southern California Edison), to ARB (Aug. 20, 2010), http://www.arb.ca.gov/lists/sector-based-ws/10-sce_comments_to_carb_on_redd.pdf; letter from Norman A. Pedersen (attorney for Southern California Public Power Authority) to ARB (Aug. 20, 2010), http://www.arb.ca.gov/lists/sector-based-ws/11-300226001lmm08201001_redd_workshop.pdf.

97. Letter from Xantha Bruso, Pacific Gas and Electric Company to the ROW (May 7, 2013), <http://greentechleadership.org/wp-content/uploads/2013/07/xantha-bruso-pacific-gas-electric.pdf>.
98. Letter from Nathaniel Keohane, Environmental Defense Fund to the ROW (May 7, 2013), <http://greentechleadership.org/wp-content/uploads/2013/07/nathaniel-keohane-environmental-defense-fund.pdf>.
99. Letter from Anthony Mansell, International Emissions Trading Association to the ROW (Apr. 30, 2013), <http://greentechleadership.org/wp-content/uploads/2013/07/anthony-mansell-ieta.pdf>.
100. Letter from Louis Blumberg, The Nature Conservancy to the ROW (May 7, 2013), <http://greentechleadership.org/documents/2013/05/louis-blumberg-the-nature-conservancy.pdf>.
101. Bruso, letter.
102. Nowicki, letter.
103. Letter from Friends of the Earth Latin America and the Caribbean to Jerry Brown and Mary Nichols (Apr. 28, 2013), <http://greentechleadership.org/wp-content/uploads/2013/07/isaac-simon-foe-latin-america-caribbean.pdf>.
104. Letter from Tom BK Goldtooth, Indigenous Environmental Network to the ROW (May 7, 2013), <http://greentechleadership.org/wp-content/uploads/2013/07/bj-mcmanama-indigenous-environmental-network.pdf>.
105. Letter from Doug Boucher, Union for Concerned Scientists to the ROW (May 7, 2013), <http://greentechleadership.org/wp-content/uploads/2013/07/pipa-elias-union-of-concerned-scientists.pdf>.
106. Horner and Skar, letter.
107. *Ibid.*
108. Roman Czebiniak (Conservation Director, Center for Biological Diversity), interviewed by Cara Horowitz and Jesse Lueders, June 2, 2014.
109. Roman Czebiniak, e-mail message to Cara Horowitz and Jesse Lueders, June 24, 2014.
110. Czebiniak, interview.
111. Goldtooth, letter.
112. For example, in February 2012, indigenous leaders from 11 organizations in Acre responded to an anti-REDD letter sent by a Catholic organization on behalf of indigenous populations, contesting the organization's standing to represent them, saying they were reserving judgment on whether REDD would be beneficial for their communities. Kelli Barrett and Selene Castillo, *NGOs Square Off Over REDD in California* (Ecosystem Marketplace, Oct. 18, 2012), http://www.ecosystemmarketplace.com/pages/dynamic/article.page.php?page_id=9375; see letter from indigenous leaders to Missionary Indigenous Council (CIMI) (Feb. 17, 2012), http://www.edf.org/sites/default/files/Acre_indigenous_leaders_statement_REDD_021712.pdf: "To say that the Indigenous Peoples of Acre are being manipulated and induced to accept a project imposed by third parties is, at a minimum, to doubt our capacity to interact with government agencies and civil society and to formulate plans that can consolidate our territorial rights, the management of our territories, and the economic self-sufficiency and the well-being of our communities."
113. See letter from Coordinating Committee of the Global Alliance of Indigenous Peoples and Local Communities on Climate Change against REDD+ and for Life to the ROW, et al. (May 7, 2013), <http://greentechleadership.org/wp-content/uploads/2013/07/tom-bk-goldtooth-global-alliance-of-indigenous-peoples-and-local-communities-on-climate-change.pdf>.
114. Taruc, interview; Vanderwarker, interview.
115. For example, AB 32's "Findings and Declarations" state that "It is the intent of the Legislature that the State Air Resources Board . . . consult with the environmental justice community . . . in implementing this division" (Cal. Health & Safety Code § 38501(f)). Elsewhere, the statute requires that ARB "ensure" that its implementation measures "where applicable and to the extent feasible, direct public and private investment toward the most disadvantaged communities in California. . . ." (Cal. Health & Safety Code § 38565), and state that in designing market-based mechanisms like cap-and-trade, "to the extent feasible and in furtherance of achieving the statewide greenhouse gas emissions limit," ARB "[c]onsider the potential for direct, indirect, and cumulative emission impacts from these mechanisms, including localized impacts in communities that are already adversely impacted by air pollution" (Cal. Health & Safety Code § 38570(b)).
116. Taruc, interview.
117. Vanderwarker, interview.
118. Taruc, interview.

119. Letter from Michelle Chan, Friends of the Earth, et al, to Jerry Brown and Mary Nichols (July 10, 2012), http://libcloud.s3.amazonaws.com/93/ca/b/2271/Letter_to_Governor_and_ARB_re_CA_REDD_final.pdf; letter from Jeff Conant, Friends of the Earth, et al, to Jerry Brown and Mary Nichols (May 3, 2013), http://libcloud.s3.amazonaws.com/93/79/d/2915/California_REDD_petition_letter.May2013.pdf.
120. Adrienne Alvord (California and Western States Director, Union of Concerned Scientists), interviewed by Cara Horowitz and Jesse Lueders, Apr. 25, 2014.
121. Boucher, letter.
122. Olga Chistyakova and Emil Dimantchev, *REDD In Acre: An Offset Supply Forecast Update* (Point Carbon, 2013).
123. Mary Nichols (Chair, ARB), interviewed by Cara Horowitz and Jesse Lueders, May 15, 2014.
124. Jason Gray (Manager, Climate Change Program Monitoring Section, ARB), interviewed by Cara Horowitz and Jesse Lueders, Apr. 21, 2014.
125. *ROW Recommendations*, 55.
126. Gray, interview.
127. *Final Statement of Reasons*, 801.
128. S.B. 1018, 2011-2012 Leg., Reg. Sess. (Cal. 2012) (codified at Cal. Gov't. Code § 12894).
129. Cliff Rechtschaffen (Senior Advisor to Governor Jerry Brown; Professor, Golden Gate University Law), interviewed by Cara Horowitz and Jesse Lueders, Apr. 30, 2014.
130. *Ibid.*; Gray, interview; Nichols, interview..
131. Cal. Gov't. Code § 12894(f).
132. Rechtschaffen, interview.
133. Passero, interview.
134. Brian Nowicki (California Climate Policy Director, Center for Biological Diversity), interviewed by Cara Horowitz and Jesse Lueders, June 2, 2014; Alvord, interview; Rechtschaffen, interview; Taruc, interview.
135. Nowicki, interview.
136. Nichols, interview.
137. *ROW Recommendations*, 54; Boyd, interview.
138. ARB, *Offset Credits Issued*.
139. Cal. Code Regs. tit. 17, §§ 95841, 95854.
140. *Ibid.*, § 95854.
141. Point Carbon, *New California Emissions Model*.
142. Vanderwarker, interview.
143. Boyd, interview; Brunello, interview; Passero, interview.
144. Boyd, interview; Janson-Smith, interview.
145. Boyd, interview.
146. Kip Lipper (Advisor to the Senate Pro Tempore on Energy and Environmental Issues, California State Senate), interviewed by Cara Horowitz and Jesse Lueders, May 13, 2014.
147. ARB “Air Resources Board Announces Release of Draft Regulations for Cap-and-Trade Linkage with Québec,” press release, May 9, 2012, <http://www.arb.ca.gov/newsrel/newsrelease.php?id=300>.
148. See Cal. Code Regs. tit. 17, § 95942(e): “Once a linkage is approved, a compliance instrument issued by the linked jurisdiction may be used to meet a compliance obligation in California.”
149. Rechtschaffen, interview.
150. Brunello, interview.
151. Boyd, interview.
152. Brunello, interview.
153. *Ibid.*
154. Passero, interview.
155. Boyd, interview.
156. Nichols, interview.
157. *Ibid.*
158. Nichols, interview.