Climate Hawks and California’s Carbon Offsets
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September 2012

Abstract

Two non-profit organizations composed of climate hawks are presently challenging the legality of the offset portions of California’s greenhouse gas cap-and-trade regulations. They claim that the offset protocols do not guarantee “additionality” as required by AB 32, the Global Warming Solutions Act. In this paper, I look at the general regulatory framework in which California offset projects are to be developed and argue that for the most part climate hawks ought to use the protocols to develop buy-in and disseminate expertise, two “incidental” yet indispensible aspects of successful GHG mitigation policy. The degree to which these two goals can be achieved and the best strategy for achieving them are dependent upon the details of particular protocols, which I consider individually. While working to develop buy-in and expertise, climate hawks should also keep the ultimate goal in mind, which is the closing of the carbon markets once they have fulfilled their mitigation objectives.

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A. Introduction

The Global Warming Solutions Act of 2006 (AB 32) empowered the California Air Resource Board (ARB) to promulgate a wide swath of regulations to mitigate California’s greenhouse gas emissions and to begin climate adaption. The act invited
the ARB to design and implement a cap-and-trade (CAT) regime for greenhouse gas emissions, and ARB accepted the invitation. The CAT scheme became enforceable at the beginning of 2012 and the first allocation of emission credits are to be auctioned in November 2012. Recently, climate hawks have become skeptical of the efficacy of cap-and-trade policy. They worry of the verifiability of emission reductions (it is hard to disaggregate real emission reduction from reduction caused by, e.g., economic downturns). They worry that CATs create a new type of commodity (the emission credit expressed in ton CO$_2$-e) which will come under the dominion of financiers, who have shown themselves to be untrustworthy stewards. And, the subject of this paper, they worry that the required “additionality” of offset protocols are mere illusory legerdemain. The recent challenge by Citizens Climate Lobby and Our Children’s Future Foundation exemplifies this skepticism about additionality.

This article considers the offset provisions of the California CAT and makes recommendations on the best attitudes and political practices climate hawks ought to have to these provisions. Considered only from a theoretical point of view, CATs and their attendant offset protocols tend to appear as either, depending on one’s point of view, an efficient harnessing of “market forces” for the sake of preserving some public good or the self-interested maneuverings of the captains of industry.

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2 The paradigmatic example is the collapse of the Russian economy in the early 1990s, which allowed it to easily meet its Kyoto Protocol obligations. See Andrew Kramer, “In Russia, Pollution is Good for Business” NY Times, December 28, 2005 (http://www.nytimes.com/2005/12/28/business/worldbusiness/28kyoto.html?ei=5090&en=f61ab4e537e9d5b&ex=1293426000&adxnnlx=1347026670-JG8XHeUclxNo15v0YYwRRw) and grist.org “Russian Hot Air” December 29, 2005 (http://grist.org/article/russian-hot-air/).
3 See e.g., Victor B. Flatt “‘Offsetting’ Crisis? – Climate Change Cap-and-Trade Need Not Contribute to Another Financial Meltdown” 39 Pepp. L. Rev. 619 (2012) (arguing that the new carbon commodities and their associated derivatives can be regulated so as not to become toxic and, like the mortgage bubble, implode the economy).
5 Plaintiff’s briefing can be found at http://www.citizensclimatelobby.org/files/images/Files-Stamped%202012%20Brief%20for%20Petitioners%20Final%2B.pdf. Plaintiffs argue that AB 32 prohibited “CARB from counting any greenhouse gas emission decreases that ‘otherwise would occur’ as qualified reduction. Nevertheless, through rules for a category of emission reduction known as ‘offsets,’ CARB has done exactly that.” Id. at p. ii (underlining and highlighting are indigenous). They would, therefore, have the court invalidate all four offset protocols.
however, are never theoretical. They are built into and on top of already existing regulatory regimes. That regulatory structure, along with subsequent modifications to that structure, impacts the working of CAT market, particularly the offset protocols. An evaluation of California’s CAT offset protocols must account for existing regulations and anticipate – indeed work for – further regulations.

It is also important, in evaluating offset protocols to consider that climate change mitigation polices have more than one function.\(^8\) Especially in the context of sub-national governments, which cannot by themselves bring about sufficient emission reductions to prevent catastrophic climate change, climate hawks must be attuned to these other functions and modulate their activism accordingly. In particular, climate change policy must generate buy-in amongst an extensive – indeed, an absolutely through – swath of local, state, and federal governments, along with institutions of education, private industry and civil society. New forms of knowledge and knowing must form and bring forth new technologies. Indeed, if we are to avoid catastrophic climate change, global warming policy must become the dominant form of governmentality. A lot of people in a lot of places will need to be counting carbon for the coming decades, even centuries. The emergence of this new form of governmentality carries with it extreme risks to material prosperity and political liberty,\(^9\) but it has become necessary and the goal of climate hawks should seek to carefully and deliberately shepherd it in.\(^10\) The offset protocols of AB 32, I argue, provide just such an opportunity and that opportunity is presently greater than the risk posed by false additionality.

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\(^9\) In Climate Capitalism (Cambridge, 2010) Peter Newell and Matthew Paterson set forth a chilling future in which climate capitalism (of which AB 32 is a part) fails, further hardening global inequalities and generating an extensive and repressive system of carbon surveillance. “... [G]overnments shift the burden of implementing carbon cuts squarely on individuals. Personal Carbon Allowance schemes proliferate, but end up operating more as surveillance schemes, enabling the state to monitor personal behavior ever more intensively, rather than produce egalitarian outcomes. ... The poor get locked even further into fuel poverty, decarbonising through not consuming, selling surplus allowances for a pittance while experiencing lives that are more and more intrusively monitored.” p. 171.

\(^10\) The contours of this new governmentality seem to me to be presently undertheorized. Suffice it to say, while necessary for success, the dangers to freedom, equality, material prosperity are all put at unprecedented risk by “environmentality” and the material conditions (climate change) which call it forth. See e.g., Timothy W. Luke Environmentality in The Oxford Handbook of Climate Change and Society, pp. 96-109 (“Too often enviornmentality discourse scales up totalizing solution off raw data, which read like the draft diktats of expert ‘environmental governors.’ p. 107). See also Ian Gough and James Meadowcroft Decarbonizing the Welfare State in the same volume, pp. 490-503 (“Unlike most other chapters in this Handbook, there is no systematic academic research, literature, or scholarly network on this particular topic, so we must gather material and build our arguments from what is available.” P. 490).
In what follows, I briefly present case for being a climate hawk before discussing the regulatory framework established by AB 32. I then sketch the outlines of the California CAT system before examining the details of each of the four offset protocols. The details of each protocol reveal the degree, and by what means, climate hawks can use that protocol to establish buy-in and develop expertise among wide range of influential individuals and institutions.

B. The Case for Being a Climate Hawk

At the margin, anthropogenic climate change poses an existential threat to human civilization. Flood and drought (along with attendant migration), food security, additional stress on infrastructure, new and more prominent disease vectors, and increased air pollution (to name just a few of the difficulties) pose deep threats to material prosperity, national and personal security, and free and open societies. The margin, however, is rapidly approaching: atmospheric CO$_2$ concentrations are presently at 395ppm and increasing at roughly 2ppm per year. The rate of increase is itself increasing. Some climate scientists estimate that a Holocene type climate, the stability of which allowed for the development of the sort of complex societies and civilization we now take for granted, can be maintained only if CO$_2$ remain below 350ppm. Not only must greenhouse gas emission be reduced, but there must be a drawdown of 45ppm over the next century. No credible science indicates that we can avoid catastrophic climate change if CO$_2$ concentration exceeds 450ppm. The longer human societies and their governments delay this drawdown, the more aggressive – and more expensive – the mitigation policies will need to be. At some point, probably soon, increased average atmospheric temperature will unlock irreversible “positive feedback” mechanisms.

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12 Hansen et al. FN 6.


15 At the time of writing this, the Arctic sea ice established another new record minimum a full month before the end of the melting season. See the JAXA Arctic Sea-Ice Monitory at http://www.ijis.iarc.uaf.edu/en/home/seaice_extent.htm) The dissolution of summer Arctic sea ice is likely point of no return.
The axiom of this paper, adopted from Hansen et al., is that to achieve carbon dioxide concentrations of 350 ppm by the beginning of the 21st century, human societies must reduce overall emissions by 6% per year starting in the year 2013 and develop a 100 gigaton reforestation project.16 Human societies are nowhere near achieving these reductions and drawdowns. Climate hawks, then, are right to worry about the additionality of offsets; there is no time to allow financiers to comfortably push hot air around the commodities markets, and both sub-national and national governments have good reason to advance mitigation policy irrespective of the co-ordination problem posed by hold-outs and free-riders.

C. Principles of Evaluation

The urgency of stringent greenhouse has mitigation policy ought to be modulated so as to accommodate for the insufficiency of sub-national action. The analysis and recommendations that follow, then, are based upon the following principles.

First, reducing emissions is alone insufficient to drawdown atmospheric concentrations of carbon dioxide to a safe level. To reach this level, say 350 ppm, requires reduced emissions plus a 100 gigaton reforestation program (or some other means of removing carbon dioxide from the atmosphere, such as biochar).17 Since offsets, assuming the veracity of additionality, are a part of reducing emissions but not necessarily atmospheric concentration of carbon dioxide, they are a part of a system of mitigation which is necessary but not sufficient.

Second, California cannot by itself mitigate emissions or reduce concentrations of atmospheric CO₂ to avoid catastrophic climate impacts. That requires, sooner rather than later, policy action at both an international and a nation level. The California program can, however, provide very import “incidental” effects. First, mitigating emissions and adapting to climate change will require expertise and “buy-in” at absolutely every level of governance and society. The California program, including the offset protocols, provides excellent opportunities for developing the requisite expertise and buy-in, the value of which should not be underestimated by climate hawks.

Third, because of its excellent university system, technology firms, and venture capital, California, it seems to me, is in a position to develop a great preponderance of

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16 Hansen et al. briefing. This is the scenario set forth in Hansen et al. “Scientific Case for Avoiding Dangerous Climate Change to Protect Young People and Nature.” P. 10. This briefing also notes that, had the mitigation policy commenced in 2005, a 3.5% emission reduction per year would have been sufficient. Delaying emission reductions until 2020 requires a 15%/year rate of reduction to achieve 350 ppm CO₂ concentrations.

17 For a primer on biochar, see the International Biochar Initiative at http://www.biochar-international.org/.
the low-carbon technology necessary to displace the carboniferous based technologies presently wrecking the atmosphere. Climate hawks should not underestimate the value of these technological developments; they undermine the viability of the status quo and will facilitate the uptake of GHG emissions mitigation policies in other jurisdictions.

Fourth, the California legislation and regulations allow for the “linking” of jurisdictions. In conjunction with other state programs (the Regional Greenhouse Gas Initiative and the dormant Midwest Greenhouse Gas Accord), there seems to be a high likelihood that a national greenhouse gas policy will be stitched together from the ground up. Or, this presently seems to be at least as likely as Congressional action. In any case, the effective existence of these various local and regional initiatives can be used to increases the pressure on Congress to pass effective federal legislation, which climate hawks should welcome. Because of these “incidental” effects of state mitigation policies, climate hawks should take care to insure, then, that they do not undermine these local and region initiatives.

Offsets, then, cannot be opposed carte blanche. What attitude one takes towards a particular offset protocol depends upon the material and policy circumstances of the offset project, the degree to which it does indeed mitigate GHG emissions, and the degree to which it generates and disseminates expertise and buy-in. Some should be opposed, others should be tolerated for the time being, and others should be developed enthusiastically. Climate hawks should be conscious of making offsets scarce and reliable. They should also keep the long game in mind, which a stable climate and the closing of the carbon market altogether. The strategy for accomplishing this depends upon the policy framework in which offset projects are being developed and the details of each offset protocol, subjects to which we now turn.

D. **AB 32: The Global Warming Solutions Act**

AB 32, signed by Governor Schwarzenegger in 2006, empowered the California Air Resource Board (ARB) to develop an extensive sequence of rules and regulations to reduce the state’s greenhouse gas emissions to 1990 levels by 2020. AB 32 also instructs ARB to update these regulations at least every five years so as “to maintain and continue reduction in emissions of greenhouse gases beyond 2020.” Executive Order S-3-05 further sets greenhouse gas emission target of 80% below 1990 levels by 2050, and the ARB “Climate Change Scoping Plan” of 2008 incorporates this standard, noting that this is “the level of greenhouse gas emissions that advanced economies must reach

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18 One can imagine, for instance, a mitigation regime of an extensive linking of state CAT programs accompanied by a federal “border adjustment” designed to protect local industry and put pressure on foreign governments to institute their own pricing on GHG emissions.
19 AB 32, Sec. 38550.
20 AB 32, Sec. 38551 (a).
if the climate is to be stabilized in the latter half of the 21st century.” To meet the 2020 standard, the Scoping Plan calculates that California will have to reduce its greenhouse gas emissions by 15% from 2008 levels and by 30% from the business-as-usual trajectory. Various regulatory elements, discussed below, are well into their implementation phase. The cap-and-trade element, which is the subject of this article, is set to hold its first auction in November 2012.

Because of their resonance with “neoliberal” economic theory, CAT systems are usually touted as the be all and end all of GHG policy. In fact, they are but one part of a complicated and extensive system of regulation and governance. In theory, they are an elegant and simple way to commodify a negative externality. In practice, they require extensive and complicated planning amongst a great variety of stakeholders, all in the context of the material conditions and policy framework already in place in the jurisdiction. Further, since CATs typically “cover” only on a portion of GHG emitting operations, the mitigation of emissions from these “non-covered sources” (typically smaller and dispersed sources) depends upon other regulations and governance structures. To magnify the complexity of the mitigation regime which is slowly emerging (hopefully effectively), the EPA has begun to promulgate the first federal greenhouse gas regulations and they have survived their first legal challenge. As this regulatory framework develops, it will change the policy framework in which California offset projects are funded and built. In the next section, I sketch some of this regulatory framework – that set forth in the “Climate Change Scoping Plan” so as to contextualize the prospective operation of the offset protocols. I then discuss the CAT and the four offset protocols.

E. The Scoping Plan

AB 32 charged ARB, in collaboration with other California regulatory agencies, with developing a “Scoping Plan” that would identify those regulations required for California to meet the AB 32 target GHG emissions. This “Framework for Change” describes the sources of California’s greenhouse gas emissions and a variety of policies (some already in effect before the writing of the Scoping Plan) which will mitigate those emissions and encourage the development of low-carbon technologies.

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21 See Climate Change Scoping Plan, Executive Summary p. 2. By this standard California’s emissions will have to be reduced from 427 million metric tons of CO₂ equivalent (MMTCO₂E) in 1990 to 85 MMTCO₂E in 2050. Because of projected population increases, this would require a 90% reduction in per capita emissions, from 14.3 MT/person/year to 1.4 MT/person/year. Scoping Plan p. 118.


23 Section 3856.

1. Transportation

Thirty-eight percent of California GHG emissions originate in the transportation sector, and Scoping Plan’s mitigation strategy relies heavily upon already existing state fuel and transportation standards. These include the Pavley act (AB 1493, 2002) which authorized the ARB to adopted standards for GHG emissions from mobile sources. The Obama EPA finally authorized a waiver from the CAA preemption rule on July 8, 2009. In an example of both the influence of California and path dependency, the EPA and the DOT are relying upon the experience and expertise of California in developing its greenhouse gas emissions standards for mobile source. Those standards were finalized on August 28, 2012. ARB is also considering the implementation of a “feebate” program which would place a fee on high-emitting vehicles and use the revenues to reduce the cost of low-emitting vehicles. A recent report concludes that, even with the implementation of the Pavley standards, a feebate would result in additional reductions of greenhouse gases from the transportation sector. Since 1990 the ARB has had a Zero-Emission Vehicle standard in place. In the face of various pressures, it has undergone a variety of modifications, the most recent of which is to enlarge its ambit of concern beyond criteria pollutants to include GHGs. ARB calculates that in order to meet its 2050 goal of reducing GHG emissions by 80% from 1990 levels, nearly every single car on the road in California will need to be powered by hydrogen fuel cell or electric battery, while fewer than 15% will remain conventional, hybrid, or plug-in hybrid.

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25 Scoping Plan, p. 11.
26 The Clean Air Act preempts states from adopting more stringent emissions standards than those promulgated by the EPA. However, because California already had regulations in place before the passage of the CAA, it can petition the EPA for a waiver of preemption. Once the EPA has granted California a waiver, other states are permitted to adopt the California standards. The Bush EPA originally denied the waiver request, but the Obama EPA granted it on July 8, 2009. CFR Vol. 74, No. 129 at 32744.
30 See e.g., Who Killed the Electric Car? for a dramatized telling of these alterations.
32 See ARB’s Advanced Clean Cars website at http://www.arb.ca.gov/msprog/consumer_info/advanced_clean_cars/consumer_acc_environment.htm
regulations and commenced a public-private collaborative to ensure that the development of hydrogen fueling station and electrical charging stations matches increased use of ZEV.\textsuperscript{33} AB 11 (2007) further establishes a grant fund to be deployed by ARB and the California Energy Commission (CEC) for research on technologies which will transform California’s fuel and vehicle types.\textsuperscript{34}

More efficient vehicles will result in overall reductions in CO\textsubscript{2} emissions only if the total number miles driven remain steady or decreases, and the Scoping Plan is cognizant of already existing policies designed to reduce miles driven. In California, Metropolitan Planning Organizations (MPOs) have authority over the development of regional transportation plans. SB 375 (2008) directs ARB to establish regional greenhouse gas emissions reduction targets. MPOs are then to develop “Sustainable Communities Strategy” which, upon approval by ARB, are incorporated into the region’s “regional transportation plan” (RTP). ARB has established GHG reduction goals for each MPO, developed a methodology for evaluating the effectiveness of Sustainable Communities Strategies in meeting their reduction targets, and begun accepting SCS plans.\textsuperscript{35}

AB 32 also required ARB to develop regulations which would reduce the “carbon intensity” of transportation fuels by 10% by 2020. The ARB accordingly promulgated a Low Carbon Fuels Standard (LCFS) which a few other states have adopted.\textsuperscript{36} Carbon intensity (CI) is expressed in mass of carbon emitted per unit of energy. The energy needed to extract, process, refine, and transport the fuel to its end-use are all included in the CI. Fuels with high CI, such as the Canadian tar sands and corn-derived ethanol, will have a difficult time competing in the California market. Interested industry has challenged the constitutionality of the LCFS, and the district court granted an injunction under the authority of the “dormant” commerce clause.\textsuperscript{37} The ninth circuit has stayed the injunction pending ARB’s appeal and ARB has recommenced reporting requirements.\textsuperscript{38}

\textsuperscript{33} See the California Plug-In Electric Vehicle Collaborative at http://www.evcollaborative.org/home.
\textsuperscript{34} See the California Energy Commission at http://www.energy.ca.gov/drive/index.html.
\textsuperscript{35} http://www.arb.ca.gov/cc/sb375/sb375.htm.
\textsuperscript{37} Rocky Mountain Farmers Union v. Goldstene, 843 F.Supp.2d 1042 (E.D.Cal., 2011).
\textsuperscript{38} ARB press release at http://www.arb.ca.gov/fuels/lcfs/LCFS_Stay_Granted.pdf.
2. Energy Efficiency

California has been a leader in deploying policy instruments which require and encourage the use of energy efficiency technologies and practices.\(^39\) Scaffolding off of this tradition has allowed the California Energy Commission (CEC) to promulgate the nation’s most stringent efficiency codes. By 2020 all new residential construction must be “net zero energy”, as must be all new commercial construction by 2030.\(^40\) The soon to be promulgated 2013 Building Energy Efficiency standards will also reduce water usage (one-fifth of electricity generation and one-third of natural gas are used to transport, heat, and treat water), encourage the use of whole house fans (which cool the house during the night thereby reducing AC load during the day), and require that all new houses have solar readying roofs.\(^41\) It will also require improved insulation on hot water pipes, the installation of more efficient windows, and the verification of efficient AC installation and operation.\(^42\) In line with other analysis, the CEC projects that the standards will increase upfront construction costs by $2,290 and return more than $6,200 over the course of a 30 year mortgage.\(^43\) This will eliminate the projected need of building six new power plants.\(^44\)

The upfront cost involved in financing energy efficiency, along with well-known market failures (split-incentives between property owner and leasee, beneficial externalities, lack of consumer information) make energy efficiency an underutilized market, and part of the Scoping Plan outlined the development of innovative financing mechanisms. For instance, the CEC has developed a low interest loan program (3%) for the financing of energy efficiency projects undertaken by public institutions.\(^45\) The loan is to be paid back from the energy savings accrued over the subsequent 15 years. A Public Utilities Commission report authored by Harcourt Brown & Carey also suggests innovative business models and public policies that might circumvent these market failures.\(^39\) For instance, AB 1037 (Kehoe, Chapter 366, Statutes of 2005) and AB 2012 (Levine, Chapter 734, Statutes of 2006) directed electricity utilities to prioritize meeting their resources needs through energy efficiency and demand response rather than increased generation. California pioneered the policy of “decoupling” utility profits from generation. This removes the incentive for utilities to discourage customers from employing energy efficiency technologies.

\(^39\) For instance, AB 1037 (Kehoe, Chapter 366, Statutes of 2005) and AB 2012 (Levine, Chapter 734, Statutes of 2006) directed electricity utilities to prioritize meeting their resources needs through energy efficiency and demand response rather than increased generation. California pioneered the policy of “decoupling” utility profits from generation. This removes the incentive for utilities to discourage customers from employing energy efficiency technologies.


\(^41\) Id. Press release.

\(^42\) Id.

\(^43\) Id.

\(^44\) Id.

\(^45\) See http://www.energy.ca.gov/efficiency/financing/#eligibility.
failures. Public policy that steers the financial markets towards the development of healthful projects is an indispensible element of a successful climate mitigation and adaptation policy.

Energy efficiency alone will not be sufficient to meet the 2050 greenhouse gas mitigation goals. Between now and then, the generation of electrical power must cease to depend upon the combustion of hydrocarbons. Renewable Portfolio Standards, which require energy generating utilities to generate a percentage of their energy from renewable sources, are presently popular at the state level, and California has the most aggressive standard in the nation. By 2020, 33% of all energy generated is to come from renewables. The incorporation of renewables into the grid will require various modifications to transmission, storage, and coordination of the electrical grid. The intermittency of renewables is not unmanageable, but requires preparation and planning. The CEC’s Renewable Energy Transmission Initiative (RETI) is developing the expertise required to make these modifications.

The Scoping Plan also relies upon the Solar Hot Water and Efficiency Act of 2007 (SHWEA) which provides $250 million in incentives to install solar water heaters (with a goal of 200,000 installations by 2017) and the deployment of Combined Heat and Power (CHP). The Million Solar Roofs Program is an important element of the Scoping Plan’s strategy, as is High Speed Rail between southern and northern California, the more efficient management of waste, and the encouragement of sustainable management practices for the state’s forest and agriculture sectors. The Scoping Plan also identifies several policies to reduce the emissions of high global warming potential (GWP) gases, and ARB has adopted many of these policies as “discrete early” actions.

Realizing that it cannot mitigate GHG emissions on its own, California is also taking the lead in an aggressive program of coordination among sub-national governments. According to the 2010 Climate Action Team Report to the Governor, California is working with sub-national governments to develop policy, exchange information, build capacity and institutions, and undertake joint actions. California, for instance, has also made agreements with Mexico, India, and Jiangsu Province in

47 For an example of how the financial markets shape the environmental impacts of projects undertaken in real markets, see Heather Hughes, Oregon Law Review Vol. 90, No. 2 pp. 359-412 (2011) (discussing mezzanine level loans and urban sprawl).
48 In an example of the complexities of constructing CATS, the California regulations take account of the REC requirements at Section 95852(b).
50 Scoping Plan p. 43-44.
51 See http://www.arb.ca.gov/consprod/regact/ghgcp/ghgcp.htm for a list of ARB’s early action items pertaining to high GWP gases. The regulation of high GWP, of which ozone depleting substances, plays a crucial role in evaluating the Ozone Depleting Substances protocol.
China. It has organized and took the lead with “R20” (Regions of Climate Action), a public-private collaboration designed to develop and implement low-carbon projects through the collaboration of developed and developing sub-national governments. The Western Climate Initiative, the aspiration of which is to include all of the Western states and provinces in the California CAT by means of linkage, is the paradigm example of these inter-state collaborations. Provisions on linkage, not discussed in this article, are critical for the building of a mitigation strategy from the ground up.

F. Cap-and-Trade and Offsets

Builders of Cap and Trade markets face a number of design decisions, the first of which is the identification of an initial “cap” on emissions. ARB has determined 1990 emission to have been 427 million metric tonnes CO₂-equivalent (MMTCO2E). The California CAT covers a mix of “upstream” entities (e.g., providers of natural gas for domestic use) and “downstream” entities (e.g., energy generating units). Only facilities emitting more than 25 MMTCO2E are covered under the initial regulations.

In order to “phase in” the program, ARB has chosen to regulate only electricity generating units and large industrial facilities (e.g., oil refineries and cement) during the first compliance period (2013 and 2014). Total carbon credits worth 162.8 and 159.7 MMTCO2E, respectively, are to be distributed during the first two years. In the second and third compliance period (years 2015-2020) other entities will be incorporated into the CAT scheme at which point the cap resets at 394.5 MMTCO2E and declines to 334.2 for 2020. Based upon historical emissions data each individual firm is then assigned an emissions allowance.

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52 As reported by the Climate Action Team in the ‘Climate Action Team Report to Governor Schwarzenegger and the California Legislature” December 2010 at http://www.energy.ca.gov/2010publications/CAT-1000-2010-005/CAT-1000-2010-005.PDF. The California-Jiangsu Province MOU can be found at http://www.state.gov/r/pa/prs/ps/2009/july/126592.htm.
53 http://regions20.org/
55 A list of covered entities can be found at http://www.arb.ca.gov/cc/capandtrade/covered_entities_list.pdf.
56 See Section 95811 (Covered Entities), Section 95812 (Inclusion Threshold for Covered Entities), Section 95852 (Emission Categories Used to Calculate Compliance Obligations), and especially Section 95891 (Phase-in of Compliance Obligations for Covered Entities). For convenience, the regulations can be found at http://www.arb.ca.gov/cc/capandtrade/covered_entities_list.pdf.
57 Correctly establishing this overall cap and each firm’s emission limits is critical to the functioning of CATs. It seems to be the main reason the European Trading Scheme collapsed during the first compliance program. See Peter Newell and Matthew Paterson, Climate Capitalism p. 101-102 Cambridge (2010).
Although the default procedure for allocating allowances in the California CAT is an auction, the regulations designate a certain portion to facilitate goals besides reduction in GHG emissions. The allocation procedure accommodates the relative ability of some firms to pass the costs through to consumers, recognizes the overlap between upstream/downstream covered entities, and works around other regulations already in place.

Some of the allowances are to be allocated to an Allowance Price Containment Reserve, which, in conjunction with minimum bidding price, places a price “collar” on allowances. Some of the allowances are to be allocated to some covered entities which are considered to be particularly exposed to “leakage” (the fleeing of GHG emitting activities from the jurisdiction or below the 25 MMTCO2E threshold). These free allocations are to be based upon technical benchmark formulas designed to determine a particular facility’s relative efficiency vis-à-vis other similarly situated entities. Some of the allowances are to be allocated free to electrical distribution entities, which are then required to auction these allowances and utilize the proceeds to protect consumers. The hope is that generators and retailers of electrical power will feel the “price signal” and modify their behavior accordingly while the consuming public proceeds unconcernedly with life as usual.

The CAT regulations allow covered entities to trade allowances and to satisfy some of their compliance requirements through the purchase of “offsets.” By means of developing projects which either remove GHG from the atmosphere or prevent the emission of GHG emission which would have been emitted but for the project, firms can earn “offset credits.” Firms may surrender these offset credits to the compliance authority in satisfaction of their allocation requirements.

To make offsets available while presumably avoiding the danger of illusory GHG reduction, California CAT regulations prohibit firms from satisfying their

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59 Auctioning the allowances is necessary to develop a “price signal” for the negative externality of GHG emissions. It also develops an income stream which the government can use to fund various activities.


61 Id. at J-22 - J-23. Each facility type is assigned an Assistance Factors (AF) number, which designates the facilities relative exposure to both leakage and need to “transition assistance.” The AF is then used to compute each facilities allocation of free allowances.

62 Id.

63 Id. at J-17 – J-18. Section

64 Offset Regulations can be found in Subarticle 13, Section 95970 et seq.

65 Carbon colonization is not yet a problem for the California CAT, since it limits the development of offset projects to North America. However, it is something to be cognizant of as California’s program expands. At the minimum, offset protocols should include an element of social justice, discussing the local economy and impacts the project will have on that economy.
compliance requirements with an allowance portfolio comprised of more than 8% offset instruments. Accordingly, during phases I, II, and III of the CAT 25.8, 91.8, and 83.1 million tons, respectively, of potential offset credits may be used by covered entities to satisfy compliance obligations. The price collar constrains the price of carbon between $10 and about $50 per ton, so that the California offset market is potentially worth between $831 million and $4.155 trillion. Some of the California offset protocols explicitly build insurance into the issuance of credits, but the insurance industry has already been developing insurance instruments for the Kyoto offset market. Indeed, the stability and the certainty of this market require an adequate secondary insurance market.

ABR regulation allow for the development of offset projects in the United States or its Territories, Canada, and Mexico. ARB has hitherto approved four offset “protocols”: for ozone depleting substance (i.e., destruction of CFCs); for livestock waste management (combustion of methane); for urban forest projects (i.e., municipal tree management); and for U.S. forest projects (i.e., reforestation, improved management, and avoided deforestation). For comparison, the Clean Development Mechanism recognizes over 204 offset methodologies. The Regional Greenhouse Gas Initiative recognizes five offset protocols and the Climate Action Reserve, from which the ARB has been developing its protocols, has 13 protocols and 1 in progress.

In general, offset protocols require an Offset Project Operator (OPO) or Authorized Project Designee (APD) to establish a hypothetical (but empirically grounded) baseline of GHG emissions which would have occurred but for the completion of the project. APDs are then required to develop the project and measure

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66 Section 95854. Environmentalists counter that while 8% seems like a small portion of the compliance instrument portfolio, it could account for up to 85% of year over year emission reductions. Thus, rather than reducing emissions, firms could satisfy the greater portion of their “reductions” through offsets. Thus, insufficient pressure is placed on emitters to reform their production methods so as to reduce GHG emissions.

67 Section 95983 and the Forest Offset protocol, discussed below at __.

68 Climate Capitalism.

69 Section 95972(c).

70 In contrast, the RGGI operates with five offset protocols – for capture and destruction of methane at landfills, reduced emissions of SF6 from electricity transmission and distribution, afforestation, reduced CO2 emissions from energy efficiency in buildings, avoid methane emissions through agriculture manure management. RGGI Fact Sheet at http://www.rggi.org/docs/RGGI_Offsets_in_Brief.pdf.

71 http://cdmpipeline.org/cdm-methodologies.htm#3

72 The five protocols are for capture and destruction of methane at landfills, reduced emissions of SF6 from electricity transmission and distribution, afforestation, reduced CO2 emissions from energy efficiency in buildings, avoid methane emissions through agriculture manure management. The RGGI restricts offsets projects to participatory jurisdictions, or jurisdiction which have signed an MOU. RGGI Fact Sheet at http://www.rggi.org/docs/RGGI_Offsets_in_Brief.pdf.

73 Climate Action Reserve at http://www.climateactionreserve.org/how/protocols/
either avoided GHG emissions or removed GHGs. The difference between the baseline emissions and the measured reduction are then credited. Those credits can be sold to covered entities which can then use them to satisfy their compliance requirements. Further, all protocols require APDs to quantify and subtract the GHG emissions which result from the offset project itself (i.e., electrical power used to destroy ozone depleting substances) and to account for leakages associated with the project. Because the baseline includes both law and regulations, it is possible to shift the baseline up or down.74

I now consider the offset protocols themselves, so as to identify ways climate hawks might use them to facilitate buy-in, disseminate expertise, insure their reliability, and anticipate the eventual closure of the market.

G. Ozone Depleting Substances

Ozone depleting substances (ODS) are artificial chemical compounds used as refrigerants, as foam blowing agents, solvents, and fire suppressants. Because they do not naturally occur in the atmosphere, they have very high global warming potentials – anywhere between several hundred and several thousand times that of CO₂.75 Under the right circumstances, the California protocol allows for the generation of offset credits for the destruction of ODS.

The protocol requires that the destruction of ODS occur at facilities certified under a variety of federal provisions (e.g., RCRA, the CAA, and HESHAP) and distinguishes between those ODS found in refrigerants76 and those found in foams.77 In accordance with the Montreal Protocol, U.S. domestic law has phased out the production of ODS material, and the protocol is applicable only to ODS produced before the phase-out. Although the regulations allow for the development of projects in both Canada and Mexico, the ODS offset protocol requires that all destroyed ODS be sourced from the US and destroyed in a US facility.78 The protocol considers the destruction of ODS by the U.S. government to be “business-as-usual” and therefore not eligible for crediting.79 It also “estimates baseline emissions according to the assumption that refrigerant ODS would be entirely recovered and resold.”80 All collection and

74 Section 95973(a)(2)(A).
75 GWP is usually defined in comparison with the global warming potential of CO₂. Because GWP is partially a function of the degree to which any particular GHG has saturated the spectrum . . .
76 The protocol allows for credits from the destruction of the following “ODS species” used as refrigerants: CFC-11, CFC-12, CFC-13, CFC-113, CFC-114, and CFC-115. ODS Protocol, Table 5.1, p. 17.
77 The protocol allows for credits from the destruction of the following ODS found in foam: CFC-11, CFC-12, HCFC-22, and HCFC-141b. Id. Table 5.3, p. 19.
78 Id. at Section 3.1, p. 7.
79 Id. at Section 3.4, p. 7.
80 Id. at Section 5.1.1, p. 16.
destruction of ODS must be in accordance with any federal, state, or municipal requirements. With respect to the destruction of refrigerants, the protocol establishes a baseline of 10-year “fugitive” emissions, not the complete venting of the refrigerant. Those emissions include leaking and emissions from servicing. The 10 year baseline emission rate is calculated from the date of destruction. Table 5.2 identifies the 10 year fugitive emissions for the six ODS species, which ranges between 61% (CFC-115 and -13) and 95% (CFC-12).

The baseline for foam destruction, either from insulation recovered from appliances or from building demolition, is that the foam will be landfilled. As with refrigerants, the baseline does not assume that the entire ODS content of the landfilled foam will be emitted, but calculates a 10-year emission rate. For appliance foam this is between 44% (CFC-11) and 75% (HCFC-141b). For building foam the 10-year emissions rate is between 20% (CFC-11) and 65% (HCFC-22).

Project emissions under this protocol include GHG emissions from non-ODS substitutes, GHG emissions from removing ODS containing blowing agent, GHG emissions from the transportation of ODS, and GHG emissions from the destruction of ODS. APDs are required to calculate the GHG potential of non-ODS species refrigerants that would be used to replace the destroyed ODS. Some ODS from blowing agents will be emitted during its extraction at the time of building demolition, and the protocol requires ADPs to calculate this amount based upon the total amount of ODS recovered multiplied by a “recovery efficiency” scalar. The transportation and destruction of the ODS will also emit GHG and the protocol conservatively allows for default emissions of 7.5 metric tons CO₂e per metric ton of ODS when that ODS had been used as either a refrigerant or entrained in blowing agents. The default emissions are 75 metric ton CO₂e per metric ton of intact building foam projects. ADPs may also

81 Id. at Section 3.5, p. 8.
82 Fugitive emissions is my term, it includes leaking and emissions from servicing. Id. at Section 5.1.1.
83 Id.
84 Id.
85 Id. at p. 17.
86 Id. at Section 5.1.2, Table 5.3, p. 19.
87 Id. at Section 5.1.2, Table 5.3, p. 19.
88 Id. at Section 5.2 and equation 5.5, p. 19.
89 Id. at table 5.4, p.21. The protocol displays the global warming potential of the replacement but gives no intimation of what those replacements actually are.
90 Id. at section 5.2.2, p. 21. The recovery efficiency is calculated on a per project basis in accordance with a sampling methodology set forth in Appendix A. In the absence of the application of the methodology ADPs may assume a recovery efficiency of 14.9%. Appendix A.
91 Id. at section 5.2.3, p. 22.
calculate transportation and destruction emissions on a project by project basis.\textsuperscript{92} Finally, the protocol includes monitoring, reporting, and verifying requirements used to determine and record the amount of ODS actually destroyed by a particular project.\textsuperscript{93}

\textbf{1. Recommendations on ODS Protocol}

Some things about the California ODS offset protocol should not raise concerns amongst climate hawks. First, one of the most controversial offset methodologies from the CDM is for the destruction of HFC-23, which is a by-product of the manufacturing of HCFC-22.\textsuperscript{94} In some instances, the value of the offset credits exceeds the value of the product, which creates the perverse incentive to develop HCFC-22 just for the offset credits. The ARB intentionally excluded HFC-23 from the list of ODS species eligible for offset credits.\textsuperscript{95} Climate hawks, then, cannot oppose the ODS offset protocol for this reason, but should monitor it to ensure that HFC-23 is not added to the ODS-species list.

Second, the EPA already regulates the disposal of many appliances. For refrigerators, the EPA already requires that the refrigerant be collected, but the blowing agent is not.\textsuperscript{96} With the recent affirmation of the EPA’s power to regulate greenhouse gases, it apparently now has the authority to regulate blowing agents as well, and climate hawks should encourage such regulations. Many states also regulate the collection and disposal of refrigerators. Wisconsin, for instance, prohibits the release of ozone depleting substances to the environment, including HFCs.\textsuperscript{97} California has a similar requirement.\textsuperscript{98} In this cases, climate hawks, rather than challenging the offset protocol, should monitor and challenge ODS offset projects to make sure that the state in which they are taking place does not already require the destruction of the refrigerant. Similarly, for purposes of reducing load, utilities have an incentive to purchase old and inefficient refrigerators.\textsuperscript{99} Purchasing refrigerators specifically for the purpose of generating offset credits is a permissible practice under the CAT, but climate hawks should consider and monitory whether such purchases might be a double incentive in some jurisdictions and challenge and remove such possible double incentives.

\textsuperscript{92} \textit{Id.} at sections 5.2.4 and 5.2.5, p. 24-26.
\textsuperscript{93} Section 6 (quantification), Section 7 (reporting), and Section 8 (verification).
\textsuperscript{94} \textit{NY Times}, December 28, 2005, FN 2.
\textsuperscript{96} See EPA Fact Sheet at http://www.epa.gov/ozone/partnerships/rad/raddisposal_factsheet.html.
\textsuperscript{97} NR 488.02.
\textsuperscript{98} AB 2277.
\textsuperscript{99} Southern Californian Edison has such a program. See http://www.sce.com/residential/rebates-savings/appliance/fridge-freezer-recycling.htm?from=pickup
There are, however, a couple of things for climate hawks to be concerned about. First, the production of ODS is being phased out under the Kyoto Protocol. However, non-ODS replacement compounds (still necessary for refrigeration) are also greenhouse gases with high global warming potential. CFC’s have been replaced with HCFCs and HFCs. HCFC have lower ozone depleting potential than CFC and HFCs do not destroy ozone at all. Both, however, are greenhouse gases.\textsuperscript{100} The ODS protocol does not presently incentivize the destruction of those GHGs, and yet these must be prevented from entering the atmosphere. Since the Montreal Protocol does not allow for the regulation of these compounds, they must be suppressed by other means, some of which California has under taken and which climate hawks should pursue in other jurisdictions.\textsuperscript{101}

Otherwise, the market for ODS offset credits is potential short lived and will produce buy-in amongst both offset producers and covered entities who are interested in the purchase of offsets. Climate hawks should consider advancing regulatory actions that will further shorten the life span of the ODS offset credit market. To ensure the scarcity and reliability of this type of offset credit, climate hawks might even consider building and supporting non-profits engaged in ODS offset projects. Because they have no shareholders, they could potential develop offset projects more aggressively and more cheaply than for-profit entities. This would help ensure the integrity of these offset credits and also hasten the closing of this market.

\section*{H. Livestock Projects}

The “Livestock Projects” protocol (really a manure protocol) allows for the production of offsets for the mitigation of GHG biogas emissions (mostly methane, CH4) associated with the installation of “manure capture and destruction technologies.”\textsuperscript{102} It presently applies only to dairy cattle and swine farms.\textsuperscript{103} The crediting period is ten years.\textsuperscript{104}

The protocol distinguishes between two types of baselines. The first is for already existing livestock operations, in which case the ADP must “demonstrate that the depth of the anaerobic lagoons or ponds prior to the offset project’s implementation were sufficient to prevent algal oxygen production and create an oxygen-free bottom layer;

\begin{thebibliography}{10}
\bibitem{101} California has attempted to reduce emission from mobile air conditioning. See http://www.arb.ca.gov/cc/hfc-mac/hfc-mac.htm
\bibitem{102} Compliance Offset Protocol Livestock Projects, p. 4.
\bibitem{103} \textit{Id.}
\bibitem{104} \textit{Id.} at Section 3.3, p. 6.
\end{thebibliography}
which means at least 1 meter in depth.” For new livestock operations, the project developer must show that “uncontrolled anaerobic storage and/or treatment is common practice in the industry and geographic region where the offset project is located.”

In both cases, “project baseline emissions must be calculated according to the manure management system in place prior to installing the BCS.” Further, “project baseline emissions must be calculated each year of the offset project.” The baseline emissions are calculated by summing the emissions from all anaerobic storage and treatment and all non-anaerobic storage and treatment. The formulas for doing this take into account, non-comprehensively: the species, mass, and number of livestock in the project boundaries; the rate at which those livestock produce manure (adjusting for such things as difference in rate of manure production between e.g. lactating and non-lactating cows); and the “proportion of volatile solids that are biologically available for conversion to methane based on the monthly temperature of the system.”

Actual GHG emissions are calculated by summing the annual emissions of methane from the BCS, the methane emissions from the BCS effluent pond, and the annual methane emissions from other possible sources in the system. The equations for calculating these values account for the volume of methane collected, the efficiency of the destruction devices, accidental and intentional venting events, and the amount of additional anthropogenic CO₂ emitted to the atmosphere because of the manure project. Sources of anthropogenic CO₂ include the emissions associated with the generation of electricity used by pumps and equipment, fossil fuel generators used to destroy biogas or power pumping systems or milking parlor equipment, flares, tractors, on-site and off-site vehicles used to haul manure. Emissions from the combustion of methane (i.e., CO₂) are considered biogenic rather than anthropogenic and therefore not included in the project boundary.

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105 Id. at Section 3.4.1, p. 6.
106 Id. at Section 3.4.1, p. 6.
107 Id. at Section 5.1, p. 12.
108 Id. at Section 5.1, p. 12.
111 See Equation 5.5, p. 19.
112 Id. at Section 5.4, p. 24 et seq.
113 Id. at Section 5.4 and Equations 5.11, p. 24-25.
114 Id. at Section 5.4, p. 25.
1. Recommendations for Livestock Protocol

With respect to additionality, climate hawks worry that the biogas offset protocol allows firms to profit off of GHG emissions which would have occurred anyhow. This is especially so for the construction of new facilities, the baseline for which is computed by reference to the customary standard in the area. The capture and destruction of GHG emissions from manure lagoons, they argue, ought to be required in the first place. Allowing emitters to profit from doing what they should be doing already is both insufficiently aggressive and disingenuous.

If one is worried only about additionality, then this argument is pretty convincing. If one is concerned also about buy-in and the development of expertise, this attitude must be modulated. First, the customary standard for new facilities incentivizes the construction of BCS projects in areas where there is no custom of developing such projects. Initially, this will incentivize a race to the top. Other facilities in the area will be at a competitive disadvantage vis-à-vis the newer BCS facility and will have incentives to also install BCS equipment. At some point, presumably determined by a common law court, the inclusion of BCS equipment will become customary, at which point new facilities will no longer have an incentive to include BCS projects. One worry, then, is that eventually the customary standard when applied new projects increases the entrance cost for new “sustainable” agriculture projects. This is an undesirable result. Climate hawks need to tend carefully to the federal, state, and local laws impacting the competitiveness of local, sustainable, and organic agriculture. It is helpful that this offset protocol is limited to dairy cattle and swine farms.

With respect to already existing facilities, the question is whether transferring money from emitters in California to pay for emission reductions at another facility is superior to state mandated BCS installation, probably supported with government subsidies. The goal ought to be to use markets to eliminate emissions, produce buy-in and expertise, and then close off the market. The livestock offset protocol allows for a ten year crediting period for projects, after which a project must seek re-accreditation. One tactic climate hawks might take, then, is to challenge re-accreditation, arguing that since the BCS is already in place, the baseline for the project has changed to include that infrastructure. Rather than oppose the offset protocol, then, climate hawks should also work to do what they should be doing anyhow – advancing state and federal regulations that require the capture and destruction of biogases.

Another worry with the biogas offset protocol is that it does not sufficiently account for the financial and economic incentives for the development of these projects that are already in place in some jurisdictions. Because BCS provide a multitude of environmental benefits, including to water quality, some states already subsidize the
construction of these projects. In many cases, it is financially feasible to combust the collected methane and generate steam or electric power, which can then be used or sold, and in some jurisdictions the generation of this power can count towards a utility’s satisfaction of the local renewable energy portfolio. The offset protocol ought to account for these and other policy incentives to make sure that GHG mitigation projects do not double count.

The CA Biogas Protocol, then, provides considerable opportunities to generate buy-in and expertise. It also contains mechanisms which, if correctly used, would allow for the closing of the market. Rather than oppose this protocol, climate hawks ought to promote the development of technical expertise and work for the closure of the market through the promulgation of regulation.

I. Urban Forests

The California CAT includes two offset protocols designed to encourage the sequestration of carbon through the growing – or avoided destruction – of trees. One is for “urban” forest projects undertaken by municipalities, educational campuses, and utilities. This protocol applies to tree sites which contain “one tree at a time” and anticipates the sort of tree-by-tree planning and maintenance done along sidewalks and in parks. The crediting period is 25 years and projects must be verified at least every six years.

For municipalities and campuses, the “business-as-usual threshold” is annual net tree gain (NTG). The ADP measures the “business-as-usual threshold” NTG by determining the average annual difference between plantings and removals over the five years previous to the commencement of the offset project. Any offset project must then exceed a “threshold” of zero (also over a five year average), which signifies a “stable urban forest population.” The protocol allows for using short averages to

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116 Id.

117 Urban Offset Protocol, Section 2.1, p. 3.

118 “An offset project is defined by a specific number of project tree sites, determined a priori, that will be planted and maintained within one of the above types of entities over the offset project life.” For municipalities: “along streets, in parks, city golf courses, cemeteries, near city buildings, greenbelts, city parking lots, and other public open spaces, or on private property in municipalities.” Id. at Section 4, p. 7. For Campuses: “along streets, near classrooms, dorms, office building near recreational fields and other facilities, in parking lots, arboretums, and other opens spaces on education campuses.” Id.

119 Id. at Section 1, p. 2.

120 Id. at Section 3.4.1, p. 5.

121 Id. at Section 3.4.1, p. 5.
compute NTG for projects younger than five years old. When NTG is positive, the project has sequestered carbon and is eligible to receive offset credits.

For utilities, the protocol simply defines additionality: “Trees planted that replace those removed during line clearance operations or are planted for energy conservation are eligible for offset credits.” Rather than requiring utilities to prove a baseline (or “threshold”), as is required of municipalities and campuses, the protocol asserts that “these types of projects are not common practice and not required by regulation.” Section 4 designates which trees count: “in parks, streets, parking lots, private property, and opens spaces by utilities.”

To be eligible for offset credits, any of the three entities must quantify their CO₂ reductions by identifying and calculating the amount of carbon sequestered by any additional trees and then subtracting any carbon emissions caused by the management of these additional trees. Carbon sequestration is to be calculated by directly measuring either the entire tree population (census) or by sampling. The measurements are then inputted into allometric equations which return values for tree volume, biomass, and carbon stock. Emissions are to be measured by determining the volume of fuel consumed and multiplying by each fuel’s emission factor. For some equipment (e.g., backhoes and chain saws), CO₂ emissions can be determined by recording the hours used, the typical load factor for that type of equipment, the horse power, and the emissions factor.

Projects must submit a tree maintenance plan (TMP) that provides details about the number, location, size, species of trees planted each year, the different care provided to different ages, species, and cohorts of trees, and budget. TMPs are also required to account for the possible leakage which might be caused by shifting funding to the maintenance of project trees and from non-project trees, which population might then regress in their carbon sequestration potential.


The management of individual trees and relatively small collection of trees is not an effective means of mitigating GHG emissions. However, the Urban Forest offset protocol promises to generate a great deal of buy-in and expertise, so climate hawks ought embrace this offset protocol and work to make it as user friendly as possible. The

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122 Id. at Section 3.4.1, p. 6.
123 Id. at Section 3.4.1, p. 6.
124 Id. at Section 4, p. 7.
125 Id. at Section 4, p. 7.
126 Id. at Section 5.2 and Table 5.2, pp. 11-12.
127 Id. at Section 5.3 and Table 5.3, pp. 12-13.
128 Id. at Section 7, pp. 16-18.
129 Id. at Section 7.1, p. 18.
development of urban offset protocols occurs amongst a broad and influential segment of institutions – local governments and institutions of higher education. Climate hawks, then, ought to encourage their local communities to build the counting of carbon into their already existing public works plans. The municipality or campus will earn a little money for selling their offsets while the local leaders on the councils will incorporate climate thinking into their governance routines. University administrators, professors, and students will all have an opportunity to gain expertise in this area of GHG mitigation.

The first obstacle to achieving this is the language of the protocol itself, which departs from the standard technical nomenclature of the other protocols. Instead of using the terminology of “baseline” for instance, it relies upon the concept of “threshold.” It is not clear if these are in fact the same concept, but from the point of view of governance and expertise, a consistent vocabulary is essential. Along the same lines, the protocol uses the phrase “a priori” in a non-standard way. This phrase is typically taken to mean “before empirical observation” but here means something like “before the project begins.” As with “threshold” this phrase is unique to the Urban offset protocol and ought to be standardized.

Second, climate hawks ought to work to decrease the transaction costs associated with the development of Urban Forest projects. The offset protocol requires the use of various sorts of expertise which might very well be lacking at the level of municipal governance, especially given the novelty of the protocol. For instance, the protocol requires the use of sampling techniques, statistical confidence intervals, and detailed knowledge of tree species. NGOs should think of providing this expertise and helping local governments build this sort of knowledge into their governance practices.

The protocol’s inclusion of tree plantings undertaken by utilities seems to be an entirely ad hoc throw away to the utilities. Again, the amount of carbon offset from these projects seems to be minimal. But since this aspect of the protocol might facilitate buy-in and the development of expertise within utilities themselves, climate hawks should tolerate this element of the protocol while remaining vigilantly against its expansion. Rather than fighting the protocol, they might also work to alter the regulations so as to require the sort of plantings incentivized by the protocol.

130 For instance, Duke University’s Duke Carbon Offset Initiative develops offset projects. See http://sustainability.duke.edu/carbon_offsets/index.php. Campus can sign the Chancellor’s and Presidents Climate Commitment which pledges the campus to become carbon neutral by some date of their choosing. There are presently 468 signatories. See http://www.presidentsclimatecommitment.org/.
J.  U.S. Forests

As compared to the urban forest protocol, which targets the management of individual trees, the U.S. Forest Protocol aims at “quantifying the net climate benefits of activities that sequester carbon on forestland.”\(^\text{131}\) The protocol allows for project activities which either remove CO\(_2\) from the atmosphere or avoid such emissions. Reforestation, improved forest management, and avoided conversions might all qualify for offset credits.

1. Reforestation.

The goal of the reforestation component of the Forest protocol is to return previously forested land to “optimal stocking levels.”\(^\text{132}\) The protocol attempts to distinguish between reforestation projects whose origination might be attributable to the offset project itself and reforestation which would have occurred irrespective of the incentive to procure offsets. A reforestation project is only eligible, then, if the project takes place on land which has had less than 10 percent tree canopy cover for a minimum of 10 years or has been subject to a Significant Disturbance (defined in Appendix E) that has removed at least 20 percent of land’s above-ground live biomass in trees. ADPs of reforestation projects cannot engage in commercial harvesting for 30 years after the commencement of the project (with some exceptions) and there cannot have been any commercial harvesting on the land during the 10 years previous to the commencement of the project.\(^\text{133}\)

2. Improved Forest Management.

Already existing forests are also eligible for offset credits when improved management techniques increase the amount of carbon sequestered in the forest land. Such projects must take place on land which has more than 10 percent canopy cover and deploys natural forest management practices (defined elsewhere in the protocol).\(^\text{134}\) Improved management techniques include: increasing the overall age of the forest by increasing rotation ages; increasing the forest productivity by thinning diseased and suppressed trees, managing competing brush and short-lived forest species, increasing the stock of trees on understocked areas, and maintaining stocks at high level.\(^\text{135}\)

3. Avoided Conversions.

By means of an “avoid conversion” a project operator prevents the destruction of forested land by either placing a Qualified Conservation Easement on the land or transferring it to public ownership. Project operators must demonstrate “that there is a

\(^{131}\) U.S. Forest Protocol, Section 1, p. 7.
\(^{132}\) Id. at Section 2.1.1, p. 9.
\(^{133}\) Id. at Section 2.1.1, p. 9.
\(^{134}\) Id. at Section 2.1.2, p. 9.
\(^{135}\) Id. at Section 2.1.2, p. 10.
significant threat of conversion of project land to non-forested use.”\textsuperscript{136} Section 6.3 (discussed below) details the requirements for determining whether there is a significant threat. Only land privately owned before the commencement of the project are eligible for avoided conversion offset credits. Avoided conversions must also show that the “avoided” project is compatible with local zoning plans, that the Forest Owners have obtained all necessary approvals for the “avoided” non-forest use (including, e.g., subdivision approvals), and evidence that similarly situated land within the projects Assessment Area have recently been able to obtain all required local permits and approvals.\textsuperscript{137} Avoided conversion projects require discounting dependent upon the “uncertainty of conversion probability.”\textsuperscript{138}

All three components of the protocol include restrictions on the use of broadcast fertilization and require that the land had not previously been managed as an offset project. In all cases, projects eligible for accreditation must not be legally required, where legality includes federal, state, and local ordinances, court orders, management plans (Timber Harvest Plans), and conservation easements.\textsuperscript{139} The protocol also requires that Forest Owner have a real, as opposed to personal, property interest in the land.\textsuperscript{140}

All three projects must also satisfy a “performance test.”\textsuperscript{141} Improved management projects and reforestation projects, except those commenced after a Significant Disturbance, automatically satisfy the performance test. If the reforestation follows a Significant Disturbance, the project operator must show that the reforestation would not have otherwise occurred but for incentive provided by the offsets.\textsuperscript{142}

Avoided conversion projects satisfy the performance test by submitting an appraisal of the property which indicates that the project area is suitable for conversion and that the conversion use has a higher market value than leaving the project area as forestland.\textsuperscript{143} The protocol designates several events which mark the commencement of each type of project,\textsuperscript{144} and establishes a 25 year crediting period.\textsuperscript{145} A forest project’s “life” is 100 years, and project operators must monitor, verify, and report project data

\textsuperscript{136} Id. at Section 2.1.3, p. 10.
\textsuperscript{137} Id. at Section 3.1.1.3, p. 13.
\textsuperscript{138} Id. at Section 6.3.1, p. 54-56.
\textsuperscript{139} Id. at Section 3.1.1.3, p. 13.
\textsuperscript{140} Id. at Section 2.2, p. 11.
\textsuperscript{141} Id. at Section 3.1.2, p. 13 et seq.
\textsuperscript{142} Id. at Appendix E, Table E.1, p. 108-109.
\textsuperscript{143} Id. at Section 3.1.2.3, p. 13-14.
\textsuperscript{144} Id. at Section 3.2, p. 14-15.
\textsuperscript{145} Id. at Section 3.3, p. 15.
for that length of time, unless the project is “terminated” (in which case project operators must surrender offset credits in accordance with a compensation rate table).\textsuperscript{146}

Conservation easements are an important aspect of all types of potential forest projects. They are required for avoided conversion projects, reduce the insurance requirements for reforestation and improved management projects, and, if filed appropriately, can mark the commencement of a forest project. They must, therefore, expressly acknowledge ARB as a third party beneficiary of the conservation easement with rights to litigate.\textsuperscript{147}

Project owners must harvest “sustainably” and use natural forest management practices. The protocol requires project operators to have their harvesting practices certified by a licensed third party.\textsuperscript{148} Project operators must also “maintain a diversity of native species and utilize management practices that promote and maintain forests comprised of multiple ages and mixed native species . . . and at multiple landscape levels.”\textsuperscript{149} Native forests are defined in terms of pre-European contact and ARB provides a Forest Offset Protocol Resources on its webpage which identifies different native forest zones.\textsuperscript{150} Plantings of non-native species is allowed only if it is a strategy for adapting to climate change. When so, such planting must be done in accordance with an official federal, state, or local approved adaptation plan.\textsuperscript{151} Since forests promote a variety of other environmental benefits besides carbon sequestration, the management of the project may not, on average, reduce the standing live carbon stock within the Project Area, and the protocol supplies various exceptions and modes of calculating year over year standing live carbon stock.\textsuperscript{152} Similarly, project operators must balance age and habitat classes.\textsuperscript{153}

In computing carbon sequestration, project operators must take into account both “primary” and “secondary” GHG sources, sinks, and reservoirs.\textsuperscript{154} For instance, primary sinks and reservoirs include, \textit{inter alia}, standing live carbon sinks, herbaceous understory carbon, and litter and duff carbon.\textsuperscript{155} Secondary effects include emissions

\textsuperscript{146} \textit{Id.} at Section 3.4, p. 15 and Table 3.1, p. 16.

\textsuperscript{147} \textit{Id.} at Section 3.5, pp. 16-17.

\textsuperscript{148} \textit{Id.} at Section 3.8.1, p. 18.

\textsuperscript{149} \textit{Id.} at Section 3.8.2, p. 19.

\textsuperscript{150} \textit{Id.} at Section 3.8.2, p. 19. Native forest zones are identified at http://www.arb.ca.gov/cc/capandtrade/protocols/usforestprojects.htm.

\textsuperscript{151} \textit{Id.} at Section 3.8.2, p. 19.

\textsuperscript{152} \textit{Id.} at Section 3.8.3, p. 22 – 23. For instance, it is permissible that harvesting reduce the standing live carbon stock between years one and two so long as over the life of the project the standing live carbon stock increases.

\textsuperscript{153} \textit{Id.} at Section 3.8.4, p. 24.

\textsuperscript{154} \textit{Id.} at Section 5, pp. 26 \textit{et seq}.

\textsuperscript{155} \textit{Id.} at Table 5.1, pp. 26-27.
from site preparation and maintenance, as well as any leakages (i.e., increased harvest on another forest displaced by the project).\textsuperscript{156} Section 6 provides equations and methodologies for estimating or measuring these sources, sinks, and reservoirs. These include: baseline onsite carbon stocks, baseline carbon in harvest wood products, actual onsite carbon stocks, actual carbon in harvested wood products, and secondary emissions from the three different project types.\textsuperscript{157}

Section 6 also includes formulas for determining carbon stocks in “the same logical management unit as the Project Area,” which are required for determining the baseline for improved management practices projects.\textsuperscript{158} To ensure the permanence of GHG reductions and GHG removal enhancements, Section 7 requires project operators to monitor and report reversals, submit a certain portion of their offset credits to a “Forest Buffer Account” (i.e. insurance), and compensate for intentional and unintentional reversals. Sections 8, 9, and 10 require project monitoring, reporting, and verification, respectively.

In accordance with AB 32 and the regulations, Sections 6.2.1.2 and 6.2.1.3 require project operators to factor legal and financial constraints into their baseline calculations, and this is an important hook that climate hawks should use to ensure the reliability and scarcity of forest offset credits.


Of all of the protocols, this is the most difficult to evaluate: the reconstitution of the forests is a necessary element of successful GHG mitigation, but it also insufficient. Also, unlike the other protocols, it is difficult to image the closing of the market for this sort of offsets.

First, even assuming that these removals and avoided additions are in fact additional, they do not contribute to the necessary drawdown of atmospheric CO\textsubscript{2}. They contribute only to decreasing the rate of emission. Returning concentrations of CO\textsubscript{2} to 350 ppm or less will still require a 100 gigaton reforestation project and this reforestation project (or some other means of removing carbon from the atmosphere, such as biochar\textsuperscript{159}) must be pursued by a separate program. Cap-and-trade and the commodification of carbon cannot achieve this drawdown.

Second, of the tree types of forest programs, climate hawks should be the most leery of “avoided conversion.” First, in this instance seems appropriate to confront the protocol directly, as Citizens Climate Lobby and Our Children’s Future Foundation have done. Second, California will be linking its program to other state programs:

\textsuperscript{156} Id. at Table 5.1, pp. 27-28 and Figure 6.3, p. 42.
\textsuperscript{157} Id. at Section 6.1 et seq.
\textsuperscript{158} Id. at Section 6.2.1.1, pp. 48 -51.s
\textsuperscript{159} See e.g., the International Biochar Initiative. FN 17.
attempt to remove this type of project from the linking instruments. (This is a potential universally employable strategy). For instance, the RGGI afforestation offset protocol does not allow for the distribution of offset credits for avoid conversions. In any linkage between these two CATs, the RGGI protocols ought to win out. Third, advocate for stringent appraisal requirements, either at the state-level or within the professional associations. This will increase both the transaction costs and the discount rate for avoid conversion projects. Fourth, the baseline for avoid conversion projects include local zoning ordinances and land planning documents. At the county and municipal level, continue to advocate for the preservation of forested space, green belts, and conservation easements. Avoided conversation projects must demonstrate that they have acquired all the necessary local zoning permits for the conversion project (e.g., for the golf course) and that permits for similarly situated projects have recently been granted in the area. Institutions of municipal governance, then, are in a position to exert pressure on avoided conversion projects. Climate hawks should get their hands on these levers.

Climate hawks should be less hostile to reforestation and improved management projects, but should still work to alter the legal baseline so as to make offset credits increasingly scarce. Carbon counting will need to percolate into every aspect of management and governance, and climate hawks should see the U.S. Forest offset protocol as a mechanism for disseminating the techniques and methodologies to accomplish this, just as with the Urban Forest offset protocol. At the same time, they should be sure to distinguish between offsets (which reduce emissions) and the sort of reforestation which will drawdown carbon dioxide concentrations to a safe level. This line cannot be lost or blurred or there will be no drawdown. This is especially true because market mechanisms, even the hyper-artificial ones created by cap-and-trade, seem highly unlikely to produce such a program (the cap would have to eventually become negative). Indeed, the institution of a 100 gigaton reforestation project will, more than likely, require the closure of the market for reforestation projects.

There seems to be at least one more strategy for using and closing off the offset market. Under the California regulations, only 8% of a covered entities compliance instruments can be offset credits. Climate hawks should be vigilant against any increase in that number and should work to turn that percentage into a mandatory declining rate. Just as the cap on emissions reduces every year, covered entities should be able to satisfy a smaller and smaller percentage of their compliance requirements with offset reductions.
K. Conclusion

Successfully tackling climate change requires the developing of an entirely new form of governmentality, one dedicated to the counting of carbon at every level of governance. Offset projects provide an opportunity for the development of environmental citizenship at every level of government. The California offset provisions provide climate hawks an excellent opportunity for intentionally and carefully easing in this new governmentality. Climate hawks should use the offsets to develop buy-in from influential individuals, institutions, and economic sectors. They should use them to develop the sort of expertise needed for the counting and managing of carbon. They should keep the end game insight: the movement away from this form of governmentality - and its attendant markets - by drawing down greenhouse gas to safe levels in a world of low or zero-carbon energy sources. Achieving these goals requires the mobilization of a wide swath of civil society, which must be deliberate, patience, and persistence – just those citizenship qualities already needed to achieve the required mitigation goals. Finally, it should also be remembered that CATs and their associated offsets are only one piece of the GHG mitigation puzzle. Climate hawks need to continue to work on all the other pieces, and in working on them, alter the policy framework in which offset projects take place.