
CALIFORNIA CLIMATE LEGISLATION: CAP-AND-TRADE AND INTERNATIONAL FOREST CARBON OFFSETS

Briefing Paper for October 30 Webcast: *The California Carbon Market and the Role of International Forests: A Primer on Risks and Opportunities for Institutional Investors*

BACKGROUND

In 2006, the State of California passed the most expansive greenhouse gas (GHG) reduction plan in the United States, titled the *Global Warming Solutions Act* (or AB 32) requiring California to reduce economy-wide emissions to 1990 levels by 2020. As the world's ninth largest economy,¹ this is approximately equivalent to the GHG caps currently in the UK and Germany.² The legislation may have a material impact on the valuation of companies with an energy footprint in California. To decrease emissions, California's lead air regulatory agency – the California Air Resources Board (ARB) – has developed a variety of emissions reductions strategies including direct regulations, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms.³ A key strategy is a broad “cap-and-trade” program that limits the amount of GHGs certain entities can emit, while allowing trading of GHG permits that can be used to comply with the cap. AB32 and the cap-and-trade program present risks, as well as opportunities, for institutional investors. Although compliance costs could impact portfolio holdings, new avenues for investment are emerging.

The cap-and-trade regulations may generate between \$2 billion and \$14 billion in revenues from allowance auctions in some years⁴. It will also create investment opportunities for offset generating activities, among these are activities that generate GHG permits by reducing emissions from deforestation and degradation (REDD)⁵ of international forests.

This briefing paper has been prepared for the webcast, “The California Carbon Market and the Role of International Forests: A Primer on Risks and Opportunities for Institutional Investors”. The objective of the webcast is to inform participants about California's forthcoming GHG cap-and-trade program; how the program could impact portfolio holdings; how mitigation of international forest carbon emissions fits into the program; and how institutional investors can find opportunities in these emissions reduction activities. The webcast, to be broadcast October 30, 2012, is sponsored by the U.S. Agency for International Development's Forest Carbon, Markets and Communities (FCMC) Program and is hosted by Institutional Investor Journals. FCMC will also produce a full report on AB 32 that will be available on their website at www.fcmcglobal.org.

KEY MESSAGES

- **The California AB32 legislation is economy wide and may impact investment decisions**
- **The cap-and-trade program is a key element capping 85% of California's emissions**
- **A new multi-billion dollar market in greenhouse gas allowances and offsets will be created**
- **International forestry activities may become eligible, which could generate up to \$2.2 B in offsets and create investment opportunities**

¹ Center for Continuing Study of the California Economy, *Numbers in the News*, Sept. 2012. Accessed Oct. 16, 2012 at <http://www.ccsce.com/PDF/Numbers-Sept-2012-CA-Economy-Rankings-2011.pdf>

² European Commission press release “Emissions trading: 2007 verified emissions from EU ETS businesses,” May 23, 2008. Accessed Oct. 16, 2012 at http://europa.eu/rapid/press-release_IP-08-787_en.htm?locale=en

³ California Air Resources Board for the State of California (December 2008) *Climate Change Scoping Plan: A Framework for Change*. p.32. Available at <http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>.

⁴ For the auction years 2015 – 2016, and 2016 – 2017, Nachbaur J., Roberts T. and Newton M., *Evaluating the Policy Trade-Offs in ARB's Cap-and-Trade Program*, The Legislative Analyst's Office, February 2012 at 13

⁵ The UN climate change negotiations on this topic refer 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”, known as REDD+, with deforestation and degradation accounting for the first two D's and the remaining activities lumped under the “+”. As California is focused on international REDD, this abbreviation will be used throughout this briefing.

AB 32 CAP-AND-TRADE: OVERVIEW

The cap-and-trade program is a particularly important and innovative part of AB32 that accounts for approximately 22.5% of emissions reductions within California. The program will cover major sources of GHG emissions in California such as refineries, power plants, industrial facilities, and transportation fuels.⁶ It places a cap on approximately 85% of the State's GHG emissions,⁷ and the aggregate emissions cap will decline each year in order to reach the 2020 emissions target of 334 million metric tons carbon dioxide equivalent (MMtCO₂e).^{8,9} Some entities will be covered from the outset of the program in 2013, while others will be phased in at the start of the second compliance period beginning in 2015. Beginning in 2013, the program will cover industrial sources, electricity generators, and electricity imports that produce more than 25,000 MMtCO₂e per year. In the second compliance period, beginning in 2015, the program additionally places compliance obligations on suppliers of transportation fuels (for example, gasoline, diesel and ethanol), distillate fuel oil, and natural gas if the use of these fuels from a given supplier would result in 25,000 MMtCO₂e per year.¹⁰ In addition to reducing GHG emissions, the cap-and-trade program is designed to keep compliance costs low and to promote investment and jobs in green technologies and businesses. Under the cap-and-trade program covered entities can meet their GHG caps by: i) reducing emissions; ii) surrendering GHG "allowances" that are issued by California; or iii) surrendering GHG "offsets" that are generated by certain types of projects that reduce GHG emissions or sequester carbon (e.g. planting trees) not subject to the cap. Both an allowance and an offset credit are equal to one metric ton of GHG emissions. The first auction of allowances will take place in November 2012. Allowance trading, together with use of offsets, provides maximum flexibility for covered entities seeking to cost-effectively meet emissions reductions targets.

Allowances for each industrial sector will be initially set at approximately 90% of total emissions. Between 2013 and 2020, the percent of freely allocated allowances will gradually decrease as more allowances are auctioned off in each successive period. In lieu of reducing emissions on-site or surrendering allowances, covered entities can buy offset credits. The number of offsets is limited to 8% of an entity's compliance obligation in each compliance period.

MATERIALITY OF AB32 TO INSTITUTIONAL INVESTORS

In a cap-and-trade program, allowance allocation, combined with the rules around offset usage, can have a significant effect on subject entities' cash flow and valuations. The program will cover over 600 of the state's largest GHG-emitting stationary sources, consisting of approximately 350 businesses.¹¹ Less emission-intensive industries and companies are at an advantage, while entities with higher emissions will need to optimize increased efficiencies and purchase of allowances and offsets in order to minimize compliance costs. The manner in which emission allowances are allocated to regulated entities under AB32 has significant cost implications. While 90% of allowances will initially be provided for free, the exact amount an individual facility receives will vary, based on trade exposure of the industrial sector and efficiency of a given facility. When industrial facilities receive their allowances, expected in early November 2012, it will be more feasible to quantify the effect AB32 might have on cash flow, valuations and share prices of regulated entities under AB32.¹²

The program contains several cost containment mechanisms in order to ease the compliance burden. One of these is the use of offsets. Protocols for four offset project types have been approved,¹³ but recent analyses by various entities indicate a shortage in supply of offset credits in all three compliance periods if ARB does not

⁶ <http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm>

⁷ California Air Resources Board (December 2008) *Climate Change Scoping Plan: A framework for Change*. p.32. Available at <http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>.

⁸ The cap will be set in 2013 at 2% below the emissions level forecast for 2013. The cap will decline by 2% in 2014, and by 3% annually from 2015-2020.

⁹ California Air Resources Board, *Final Regulation Order, Subchapter 10 Climate Change, Article 5, Sections 95800 to 96023, Title 17, California Code of Regulations*, §95841, p 72. Accessed October 14, 2012 at http://www.arb.ca.gov/cc/capandtrade/september_2012_regulation.pdf.

¹⁰ California Air Resources Board, *Final Regulation Order, Subchapter 10 Climate Change, Article 5, Sections 95800 to 96023, Title 17, California Code of Regulations*, §95811 - 95812, pp 45-48. Accessed October 14, 2012 at http://www.arb.ca.gov/cc/capandtrade/september_2012_regulation.pdf.

¹¹ Available at http://www.arb.ca.gov/cc/capandtrade/september_2012_regulation.pdf.

¹² A full list of covered entities is available at http://www.arb.ca.gov/cc/capandtrade/covered_entities_list.pdf

¹³ Pers. Comm. with Emilie Mazzacurati, Head Carbon Analysis, Thomson Reuters, Point Carbon, August 28, 2012.

¹³ Forestry, destruction of ozone depleting substances, livestock, and urban forestry.

approve additional protocols^{14,15}. If the market is significantly short from the beginning, compliance costs to regulated entities are expected to be very high. REDD offsets could aid in keeping the compliance costs of affected industries within a workable range.

AB 32 CAP-AND-TRADE - FOREST AND LAND-USE OFFSETS

In recognition of “the forest sector’s unique capacity to sequester, store, and emit carbon dioxide and to facilitate the positive role that forests can play to address climate change,” ARB has already developed protocols supporting the creation of offsets in U.S. forests and urban environments, and is interested in expanding this program beyond the U.S. borders.¹⁶

As a precursor to ARB’s final cap-and-trade regulation adopted in 2011, ARB’s 2008 Climate Change Scoping Plan articulated California’s commitment to working at the international level to reduce global GHG emissions. Affirming “the importance of establishing mechanisms that will facilitate global partnerships and sustainable financing mechanisms to support eligible forest carbon activities in the developing world,” the Scoping Plan embraces the opportunity to “provide incentives to developing countries to help cut emissions by preserving standing forests, and to sequester additional carbon through the restoration and reforestation of degraded lands and forests and improved forest management practices.”¹⁷ The final cap-and-trade regulation under AB32 specifically recognizes REDD as a “sector-based” offset credit. Contingent on developing the necessary rules and mechanisms, up to 25% of all offsets submitted for compliance may be sector-based through 2017, with the limit rising to 50% thereafter.¹⁸

Two organizations – The Governors’ Forests and Climate Task Force (GCF) and the REDD Offset Working Group (ROW) – have been working as partners with ARB to develop a framework for the inclusion of an international REDD offset program. The ROW was created by a Memorandum of Understanding signed in November 2010 by then-Governor Schwarzenegger and the governors of Acre, Brazil and Chiapas, Mexico to explore ways to design and implement an international REDD offset program.

The ROW is currently nearing completion of a set of recommendations regarding i) legal and institutional mechanisms required to enable California to recognize international REDD-based emission offsets for compliance purposes; and ii) the key policy and technical elements a sectoral REDD program should achieve in order for REDD-based offsets to be recognized in a compliance program.

In order for states like California, Chiapas, and Acre, or other REDD states or provinces, to link under the AB32 cap-and-trade program, a number of issues need to be addressed collectively and independently. Each state must deal with its own domestic political forces regarding international agreements, sharing financial benefits, demonstrating environmental integrity in emission reduction measurement, and a host of other potential issues. Robust measurement, reporting, and verification (MRV) requirements for REDD are important for ensuring accurate accounting of emissions and reductions — the backbone of any cap-and-trade program. Environmental and social safeguards have moved in recent years to the center of the debate on REDD, and both Chiapas and Acre are addressing social and environmental safeguards as a core component of their development of statewide REDD programs and activities that may be subsequently recognized in California.

The state of **Acre** is located on the far west of Brazil within the Amazon Basin and 88% of its territory is covered with tropical forest. Although the state saw 254,000 km² of forest destroyed in 2008, this reflected a 70% drop in the rate of deforestation since 2003. Government leaders view the California carbon offset market as a valuable source of revenue for a sustainable forest economy. **Chiapas** is an extremely bio-diverse state in southern Mexico and an epicenter of international forest conservation efforts. Leaders in Chiapas have taken a number of important steps towards the protection of forests and are eager to advance these efforts by connecting with the AB32 via a future REDD market.

¹⁴ American Carbon Registry, Offset Supply Forecast for California’s Cap-and-Trade Program (2013-2020).

¹⁵ Point Carbon Thomson Reuters, The WCI in numbers: Quebec & California. Slide presentation, Olga Chistyakova, June 4, 2012.

¹⁶ California Air Resources Board (October 2011). *Compliance Offset Protocol U.S. Forest Projects*. p.8 Available at <http://www.arb.ca.gov/regact/2010/capandtrade10/copusforest.pdf>.

¹⁷ California Air Resources Board (December 2008) *Climate Change Scoping Plan: A Framework for Change*. p.115. Available at <http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>.

¹⁸ California Air Resources Board, *Final Regulation Order, Subchapter 10 Climate Change, Article 5, Sections 95800 to 96023, Title 17, California Code of Regulations*, §95854(c), p 91 and §95993(a), p 264. Accessed October 14, 2012 at http://www.arb.ca.gov/cc/capandtrade/september_2012_regulation.pdf.

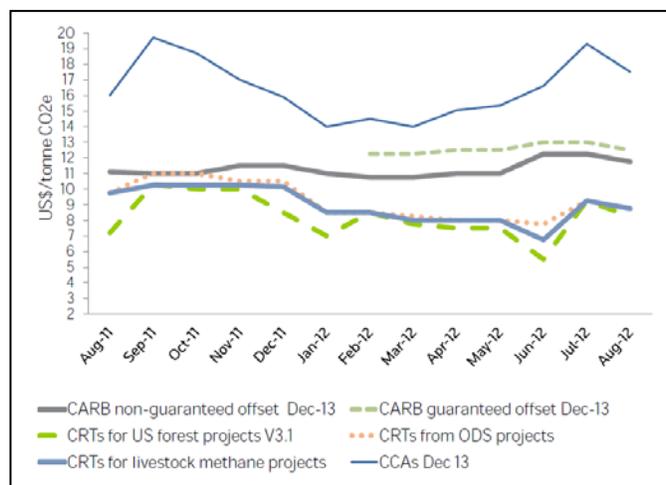
The initial ROW recommendations are expected to be released for comment in the coming months, and after incorporating stakeholder input into the report the final version is to be issued by early 2013 for ARB's consideration. If ARB develops regulations to allow international REDD offsets into California, it is expected to be initially limited to REDD offsets from Chiapas and Acre, with some potential to expand sources of supply in future years.

REDD MARKET ANALYSIS

Carbon markets can be divided into “voluntary” markets, in which demand relies on voluntary corporate initiatives to purchase offsets, and “compliance” markets where demand is created through legislation. As regulatory constructs, compliance markets inherently see policy interventions influence supply and demand. When more established, they also trade on fundamentals such as economic activity, fuel and power prices, and weather. The market for REDD compliance carbon offsets is too immature to react to these fundamental factors. As the rules to allow REDD offsets into California have not yet passed (to create a functioning regulated market) the pre-compliance market is at a very early stage, still dependent on policy signals and therefore subject to a high level of “regulatory noise.”

California market

ARB rules will greatly influence the available supply of REDD offsets. Modeling by the Environmental Defense Fund indicates that the supply of REDD offset credits from the state of Acre alone could fill the demand for REDD credits under AB32. However, the potential development of an internal carbon market in Brazil, as well as other demand drivers such as a potential compliance market for REDD in Australia, might counteract oversupply issues.¹⁹ Based on the current rulemaking under AB32, the maximum demand for sector-based credits, such as those from REDD activities, is limited to 25% of the 8% limit on all offsets, or around 71 MMtCO₂e between 2013 and 2020, out of a total offset limit of about 200 MMtCO₂e. As a comparison, the offset limit in the European Union Emissions Trading Scheme is approximately 1.7 billion MtCO₂e between 2005 and 2020, or an average limit of 106 MMtCO₂e per year.²⁰ If REDD is admitted as a sector-based offset, this could create a primary market for REDD offsets valued at up to \$900 million – \$1.65 billion through to 2020,²¹ with a larger total market value with the secondary market.



California Carbon Allowances (CCAs) are government-issued and their value will vary with market conditions, but they don't face the prospect of being deemed illegitimate and, consequently, being invalidated. The different types of compliance-eligible offset credits, on the other hand, carry several risks, and thus are of relatively lower value to a buyer who wants to use them. Chief among these is the real or perceived risk that an offset from a given project type could be invalidated by ARB.²² The only offset contracts trading are for yet to be issued California Carbon Offsets (or, CCOs, which will be issued by the ARB) and for offset credits called Climate Reserve Tonnes (CRTs), issued by the California-based Climate Action Reserve (CAR). CRTs and CCOs trade at different discounts to

Figure 1 Price fluctuations of Californian units

¹⁹ Pedro Piris-Cabezas and Ruben Lubowski, Environmental Defense Fund (EDF), September 27, 2012. Potential supply to California of sectoral credits from REDD+ from the state of Acre, Brazil.

²⁰ Alexandre Kossoy and Pierre Guigon, State and Trends of the Carbon Market 2012. A report by The World Bank. Accessed Oct. 16, 2012 at http://siteresources.worldbank.org/INTCARBONFINANCE/Resources/State_and_Trends_2012_Web_Optimized_19035_Cvr&Txt_LR.pdf

²¹ This estimate contains a number of uncertainties and assumptions. It assumes no REDD offsets are used in the first compliance period and 75% of the allowable REDD offsets are recognized and used for the second and third compliance periods, and the price of credits is discounted by either 40% or 60% against Barclay's predicted allowance prices of \$40 and \$73 for the second and third compliance period respectively. If 100% of the allowable number of REDD credits are used, the range is \$1.1 - \$2.2 billion.

²² California Air Resources Board, Final Regulation Order, Subchapter 10 Climate Change, Article 5, Sections 95800 to 96023, Title 17, California Code of Regulations, Section 95985. Accessed August 27, 2012 at <http://www.arb.ca.gov/regact/2010/capandtrade10/finalrevfro.pdf>

CCAs (see figure 1).²³ Note that, at this time, no international sector-based offset credits, such as from REDD activities, exist. They will likely be discounted against a CCA, but given the rules are yet to be determined, the discount factor is hard to predict.

Voluntary market

While compliance markets bring larger volumes and more reliable demand to carbon and other environmental markets, the voluntary markets provide a testing ground for new methodologies, protocols, and market infrastructure. The volumes in voluntary markets are steadily growing and in 2011 REDD represented 7.3 MMtCO₂e out of the total voluntary market volume of 95MMtCO₂e. Voluntary REDD credits transacted at a price of \$12/tCO₂e on average in 2011 with a total market value of \$87 million.²⁴

INVESTMENT OPPORTUNITIES

The development of a new tradable asset type and environmental market offers opportunity for early entrant investors that have developed an understanding of fundamental drivers as the market forms. There are different ways to gain exposure for investors looking to engage in the emerging REDD market: i) direct investment into offset project development, with financing structured as equity, debt or advance payment for credits; ii) direct purchase of offsets from a project developer either via long-term forward purchase agreements or spot transactions, or lending against long term purchase contracts; iii) investment through a fund managed by specialist investment managers investing in a well-diversified portfolio of projects; iv) secondary market trading (directly or via a hedge fund), which will in time offer trading opportunities as market liquidity and fundamental price drivers develop; and vi) structured products such as a REDD bond, which are new and yet-to-be-issued instruments. Since the start of emissions trading under the UN system almost 10 years ago exchange trading has developed within the EU cap-and-trade system, and specialist hedge funds have raised capital and earned returns with little correlation to the market (as best proven through the financial crisis of 2008). However, the secondary market for REDD emissions trading remains highly illiquid and is likely beyond the risk mandate of many institutional investors.

AB32 alters the business landscape in California. Capping GHG emissions may impact the value of regulated entities as a function of their energy consumption mix, response to emission reduction options (including offsetting), and the actual price of carbon that develops. New opportunities will emerge from the development of international forest carbon offset projects that have a high sustainable development impact, and have been developed by experienced project developers under appropriate market standards. Such projects may provide opportunity for long-term institutional investors, particularly frontier investors with appetite for new asset class risk, investors already familiar with the forestry sector through timber portfolios, and investors motivated by sustainable development impact and socially responsible investing.

In summary, AB32 is a significant development for California and Californian investors. The regulations as they currently stand will influence investment decisions and create a new market for tradeable allowances and offsets. An additional market for REDD offsets valued at up to \$1.65 billion²⁵ may also be created, opening up further investment opportunities that will support forest protection and sustainable development in developing countries.

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²³ Source: Thomson Reuters Point Carbon

²⁴ Molly Peters-Stanley and Katherine Hamilton, *Developing Dimensions: State of the Voluntary Carbon Markets 2012*. A report by Ecosystem Marketplace and Bloomberg New Energy Finance. Accessed August 15, 2012, at http://www.forest-trends.org/documents/files/doc_3164.pdf

²⁵ Primary market only. Secondary market would add additional total value. See note 21 above for assumptions.