

California

The World's Carbon Markets: A Case Study Guide to Emissions Trading

Last Updated: March 2014

Brief History and Key Dates:

California was the world's ninth largest economy in 2011, and twelfth largest emitter of greenhouse gases.¹ In order to reduce these emissions levels, Assembly Bill 32, also known as the Global Warming Solutions Act of 2006 (AB 32) was introduced and signed into law by Governor Arnold Schwarzenegger on September 27, 2006. The legislative package was followed in 2008 by a Scoping Plan developed by California's Air Resources Board (ARB) outlining the regulatory measures that California would take, including:

- Strengthening energy efficiency initiatives and standards for buildings and appliances
- Adopting a renewable portfolio standard (RPS) with a target of 33% renewable source generation by 2020
- Forwarding unspecified forestry protections
- Adopting transportation related emissions targets and vehicle standards
- Improving goods movement efficiency
- Reducing refrigerant leakage reductions
- Implementing a Low Carbon Fuel Standard (LCFS)
- Adopting a multi-sector cap-and-trade program with links to other Western Climate Initiative (WCI) partners. WCI is a collaboration of independent jurisdictions in Canada and the United States working together to identify, evaluate and implement emissions trading systems at a regional level.

On 1 January 2014, California officially linked its cap-and-trade program to Quebec's. All compliance units are fully fungible for compliance across either jurisdiction. Joint auctions of both California and Quebec allowances are expected to begin in the second half of 2014.

In 2010, a ballot initiative was sponsored which would have suspended the implementation of AB 32 until the unemployment rate in California dropped below 5.5% for four consecutive quarters. The initiative, Proposition 23, was defeated by California voters, with "No" votes amounting to 61.6% of ballots cast.

Also in 2010, a legal challenge was filed against ARB by the Association of Irrigated Residents (AIR), raising numerous causes of action arising under state law. Though the court case did result in additional analysis being performed by ARB as to the alternatives to cap and trade, the lawsuit reached a conclusion in 2012 with the California Court of Appeals ruling in favor of ARB. The AIR case did not result in any significant delays to the AB 32 program.²

On October 20, 2011, the ARB submitted [final rules](#) for California's cap-and-trade program to the California Office of Administrative Law (OAL). With OAL's approval of the rules on December 13th 2011, Article 5: "California Cap on

Greenhouse Gas Emissions and Market-Based Compliance Mechanisms” was formally added to Subchapter 10 of Title 17 of the California Code of Regulations. The relevant section (denoted by §) and page numbers in the Final Regulation Order of California’s cap-and-trade regulation are footnoted throughout.

On March 28, 2012, the Citizens Climate Lobby and Our Children’s Earth filed a lawsuit against ARB, related to the use of offsets in the program and alleging that the ARB violated the text of AB 32 when it approved four offset protocols for use in the program. On January 25, 2013 the San Francisco Superior Court ruled in favor of the program, and ARB had acted reasonably by creating a set of standardized offset protocols, rather than judging on a case-by-case basis. On November 13, 2012, the day before the first auction of AB 32 allowances, the California Chamber of Commerce filed a lawsuit claiming that the use of auctioning exceeds the statutory authority provided by AB32 and constitutes an illegal tax. On April 16, 2013, a coalition of businesses and trade groups represented by the Pacific Legal Foundation filed a lawsuit also claiming that the use of auctioning is against the law of AB32 and constitutes an illegal tax. The California Superior Court for Sacramento County has since issued decisions in favor of ARB in both cases; both are currently on appeal. .

Summary of Key Policy Features:

CAP/TARGET: California’s *economy-wide target* for emissions reductions is to *achieve 1990 level emissions by 2020*, as mandated in AB 32. One of the ways to achieve this target is through the use of a cap-and-trade regulation, which began in 2013.

The cap-and-trade program is composed of *three compliance periods*. The first is two years long—covering 2013 and 2014—and the second and third are three years long, covering 2015-2017 and 2018-2020, respectively. During the *first compliance period*, the program will cover generation emissions from first deliverers of electricity, and the process emissions for a range of large industrial sources, including refiners of petroleum and natural gas.³ Verified emissions related to process emissions, stationary combustion emissions and vented emissions are covered.⁴ The *threshold for facilities* is 25,000 metric tons of carbon dioxide equivalent (CO₂e) or greater.⁵ Additionally, reported emissions from imported electricity will carry a compliance obligation if the source of that electricity emits greater than 25,000 metric tons of CO₂e.⁶ Starting in the *second compliance period*, the program expands to cover suppliers of natural gas, distillate fuel oil and liquefied petroleum gas (or blends that contain any of these fuels) if the full combustion or oxidation of these fuels would result in 25,000 metric tons of CO₂e or more.⁷ Also starting in 2015, reported emissions from all imported electricity carry a compliance obligation.⁸ After 2015, when each of these sources is covered under the program, the cap-and-trade program will cover *85% of California’s GHG emissions*.⁹

Figure 1 shows the *annual allowance budget* for covered sectors from 2013 to 2020. ARB set the initial 2013 allowance budget of 162.8 million metric tons of CO₂e (MMTCO₂e) equal to expected emissions for that year. Between 2013 and 2015, the allowance budget will decrease by approximately 2% annually. Beginning in 2015, when the cap expands to cover additional sectors, the allowance budget will increase by 235 MMTCO₂e, but will decrease by 12 MMTCO₂e/year thereafter. This corresponds to a gradually increasing percentage reduction of 0.1% each year, from 3% in 2016 to 3.5% in 2020.

Compliance Period	Year	Allowances (MMTCO ² e)
First	2013	162.8
	2014	159.7
	2015	394.5
Second	2016	382.4
	2017	370.4
	2018	358.3
	2019	346.3
Third	2020	334.2

Table 1: Annual Allowance Budgets 2013-2020. Source: §95841 Table 6-1, page 70

AUCTION OVERVIEW: Allowance *vintages* from previous (if unsold), current, and future compliance years are auctioned, with future vintages being auctioned separately at each auction. Auctions are conducted using an **electronic internet-based auction platform**, with bidders submitting their bids in a **single-round, sealed-bid format**. Winning bidders all purchase allowances at either the lowest price at which the entire supply of allowances is exhausted (the settlement price), or the **reserve price**, whichever is reached first.

Auctions are held quarterly. Each quarterly auction is comprised of a “*current auction*” and “*advance auction*”. At current auctions, one quarter of allowances for that year will be offered, as well as the possibility of some unsold allowances from previous years. For sale at advance auctions, future vintage allowances will be withdrawn from the Auction Holding Account (AHA), which holds 10% of all allowances from budget years 2015-2020.¹⁰ At advance auctions, one quarter of the allowances held in AHA for the compliance year three years subsequent to the current compliance year will be offered at auction.¹¹

Auction **purchase limits** prevent any covered entity from purchasing more than 15% of the allowances sold at any auction, while non-covered entities are not allowed to purchase more than 4% of an auction’s allowances. Electricity Distribution Utilities (EDUs) have a purchase limit of 40%. However, limits on advance auctions are less stringent, allowing any entity to purchase up to 25% of future vintage year allowances.¹² Advance auction rules, however, may prevent this 25% limit from being reached if all credits offered for sale are bid on by multiple entities.

ALLOWANCE DISTRIBUTION: In 2013, California **freely allocated** most allowances to two categories of covered entities: vulnerable industries (including refiners) and electricity generators, including investor-owned and publicly-owned utilities (IOUs and POUs, respectively). The utility sector point of regulation is electricity generators, with those generators purchasing allowances at auction. Prior to auction, however, allowances are given to electricity deliverers for free. In turn, deliverers put the allowances into the auction. Why take the extra step to create a “**double auction**”? A major concern pertained to the auction revenues. ARB used this approach to give value to allowances for companies that are compelled to deliver electricity, while preserving an auction for polluters at the point of regulation. A similar approach will be used for providers of natural gas when added to the program in the second compliance period onwards, from 2015. Fuel providers will be the point of regulation in the transportation sector, and all of those allowances will be auctioned.

For the industrial and refining sectors, the system for allocating allowances is designed to reward facilities that are relatively more efficient than their competitors and to ensure that an entity cannot increase their allocation by artificially increasing or decreasing production at strategic times. For the electricity sector, since it is already highly regulated by the state public utilities commission, the need to account for perverse incentives in the allocation process

is minimized. For the operator of an industrial facility, allowance allocations are determined by multiplying total product output or energy consumed by an emissions benchmark, a cap adjustment factor, and an industry assistance factor. While product output or energy consumed is calculated on the facility-level, the remaining variables are determined at the sector-level.

ARB determines **two types of benchmarks**: product and energy based. For a product-based benchmark, ARB calculates an emissions allowance per unit produced. For energy-based benchmarks, ARB calculates an emissions allowance per unit of fuel, electricity, and steam. The cap adjustment factor is a fraction that decreases to reflect a tightening emissions cap.

For a facility using a product-based methodology, ARB uses the facility's annual output from two years prior and the difference in output from two and four years prior to determine annual allowance allocation in a specific year.¹³ For a facility using an energy-based methodology, ARB uses the facility's historical annual arithmetic mean for fuel, electricity and/or steam consumed to determine initial allowance allocation.¹⁴ ARB utilizes facility Mandatory Reporting Rule (MRR) data from 2008-2010 to determine these means. However, if the facility is a member of California Climate Action Registry (CCAR), ARB may also utilize, at its discretion, data from 2002 and 2007.¹⁵

An **industry assistance factor** is a percentage based on an industry's economic leakage risk (i.e. risk that the entities within the industry may leave the state due to competitive disadvantage caused by cap-and-trade). ARB divides the industrial sector into three leakage classifications: High Leakage, which includes oil and gas extraction, paper mills, and chemical and cement manufacturing; Medium Leakage, which includes petroleum refineries and food manufacturing; and Low Leakage, which includes pharmaceutical manufacturing. For the first compliance period, approximately 90% of allowances will be freely allocated to all industry sectors, regardless of leakage classification. For the second compliance period, entities in the Medium or Low Leakage category are freely allocated-75% and 50%, respectively, of their allowances. During the third compliance period, free allocation drops to 50% and 30% for Medium and Low Leakage entities, respectively. Free allocations to High Leakage entities remains at 100% through all compliance periods.¹⁶ Since developing this industry assistance factor, ARB has determined that more assistance is necessary for medium and low leakage entities. ARB has thus proposed that the allocation formulas will be shifted back by one compliance period – meaning that medium and low leakage risk entities will receive free allocation to cover 90% of their anticipated emissions in the second compliance period as well as the first. Medium and low leakage risk entities will then be scheduled to receive free allocation to cover 75% and 50% of their anticipated emissions, respectively, in the third compliance period. This proposed change will be considered for official adoption in Spring 2014.

For refiners, the method for determining free allocations to an individual facility operator changes after the first compliance period. During the first compliance period, the allocation method varies depending on whether the firm has received an Energy Intensity Index (EII) from participation in the Solomon Energy Review (SER). If a firm does not have an EII, its emissions that qualify for free allocation are the lesser of average baseline emissions and the product of its output and the emissions benchmark for petroleum. This lower value is then multiplied by the cap adjustment and assistance factors to determine allocation to an individual facility operator. If a firm does have an EII, it receives an amount of allowances equal to the product of its baseline average emissions, a distribution factor that awards less energy-intense firms more allowances and a fraction that accounts for total allocation to the refining sector.¹⁷ During the second and third compliance periods, individual refiners receive allocations based on the aforementioned product-based methodology that uses emissions benchmarks for petroleum.

Allocations will be awarded to publicly- and privately-owned EDUs, which include IOUs and POUs. The value of these freely-allocated allowances must be used to protect customers from increased electricity prices caused by the cap-and-trade program.¹⁸ ¹⁹ In 2012, IOUs must offer one-sixth of their freely-allocated allowances at each of the two auctions held that year. After 2012, all IOU-held allowances for current and previous years must be offered at each

auction.²⁰ In contrast, POUs are not required to auction their freely-allocated allowances.²¹ Total allocation to EDUs equals 90% of 2008 emissions from the electricity sector, declining to 85% by 2020.²²

AUCTION PROCEEDS: As the program progresses, the percent of freely allocated allowances will gradually decrease so that **roughly 50 percent of the total allowances issued under the program will be auctioned.**^{23, 24} However, proposed changes to the industry assistance factors (see Allowance Distribution) could alter this percentage of auctioned allowances. Proceeds from auctioned allowances will enter the Air Pollution Control Fund (APCF) and must be used to advance the objectives of AB32.²⁵ The process for directing investments of auction proceeds begins with a three year investment plan developed by the Air Resources Board and the Department of Finance. The first investment plan was released in April 2013. Annual expenditures consistent with the investment plan occur through the California budget process, which begins in January with the Governor's proposal and continues with the Legislature sending the Governor a final proposed budget in June for signature.

Figure 1 shows the anticipated value of allowance allocations broken down by year and allocation type (free allocation to industry, value to IOU/POUs, air pollution control fund, etc.) and also displays estimates of average allowance prices for each year.

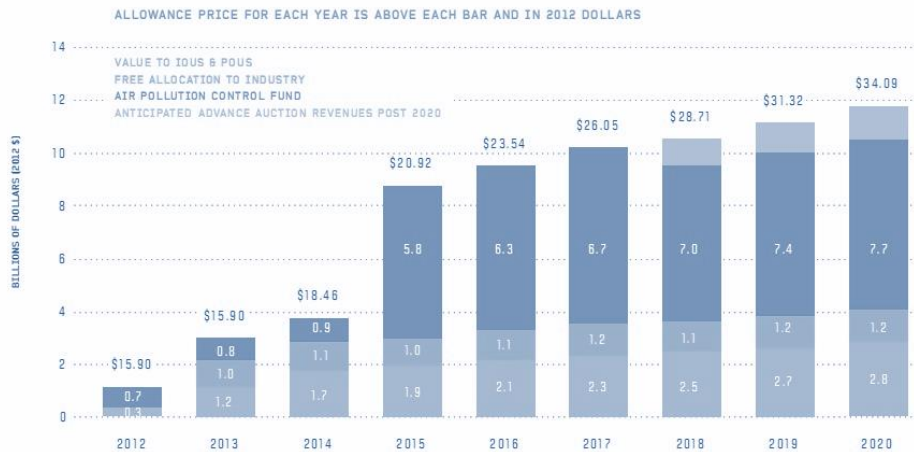


Figure 1: Allowance Revenues Associated with Uses Through 2020. Source: Next10 Report, “Using the Allowance Value from California's Carbon Trading System”

FLEXIBILITY PROVISIONS AND COST CONTAINMENT MECHANISMS: California’s cap-and-trade program contains a suite of flexibility provisions and cost containment mechanisms including a true-up at the end of each multi-year compliance period, banking and borrowing, price collars (including a price floor and an allowance price containment reserve that acts as a soft ceiling) and the use of offsets. Some undoubtedly increase flexibility and contain costs, while others are more controversial.

Offsets: Offsets are subject to an **8% quantitative usage limit**. That is, no more than 8% of a company’s total compliance obligation for each compliance period can be satisfied using any type of approved offset—including approved international sectoral programs, which could potentially include efforts to Reduce Emissions from Deforestation and forest Degradation (i.e., REDD+). This 8% limit also includes early action offsets (EAOs).²⁶ If California’s cap-and-trade program were to link with an external GHG program and a company within California’s cap were to purchase an offset from this external GHG program, that offset would count towards the usage limit as well.²⁷ **International sector-based offsets**, in addition to counting towards the usage limit for total offsets, face additional limitations. Out of the 8% limit on total offset usage, a limited portion can be used for international sector-based offsets; they are limited to 2% of a firm’s total compliance obligation in the first compliance period and 4% of a firm’s total compliance obligation in the second and third compliance periods.²⁸ These restrictions mean that a maximum of 232 million tons of total offsets can be used for compliance through 2020, of which as much as 81 million tons can be from international sector-based programs.²⁹

ARB has currently accepted four **offset protocols**, all of which are from the Climate Action Reserve (CAR). These four protocols are for ozone depleting substance (ODS), livestock, urban forests, and US forest projects that occur within the United States.³⁰ Under the current protocols, no offsets are allowed outside of the US, Canada, and Mexico, although there is room for more offset protocols to be added to the program in the future, subject to ARB approval.³¹ A fifth protocol based on the reduction of methane from mines has been proposed by ARB, and is expected to be approved in Spring 2014. A sixth protocol based on rice cultivation practices may also follow in 2014. Non-sequestration projects are eligible for credits for a period of between 7 and 10 years. Sequestration projects are entitled to longer crediting periods between 10 and 30 years.³²

California has also engaged in international efforts to **reduce emissions from deforestation and forest degradation (REDD+)**. California participates in the Governors’ Climate and Forests Task Force (GCF), which is a multi-jurisdictional collaborative effort among 19 states and provinces from Brazil, Indonesia, Mexico, Nigeria, Peru, Spain, and the United States (Illinois is the only other U.S. state) that was established in 2009. GCF focuses on “developing the technical, legal, and institutional frameworks for comprehensive jurisdiction-wide programs to reduce emissions from deforestation and land use; support strategies for low-emissions rural development; and serve as pathways to and pillars of robust national and international efforts to include forests and land use in climate policy.”³³ In addition, in 2010, California signed a memorandum of understanding (MOU) with the states of Acre, Brazil and Chiapas, Mexico to work towards the establishment of **sectoral offset programs** from REDD. Chiapas is currently developing a statewide REDD+ strategy that could be used as the basis for a link with California.³⁴ The three states have created a REDD Offsets Working Group (ROW) in order to determine: (1) the legal and institutional mechanisms necessary for a sub-national compliance program, such as California’s, to recognize international emission reduction credits from state-level sectoral REDD programs, such as in Chiapas and/or Acre; and (2) the key policy and technical elements that a sectoral REDD program should achieve in order for REDD credits to be recognized in a compliance program.³⁵ On January 25, 2013, the REDD Offsets Working Group (ROWG) released [draft recommendations](#) on how to link REDD+ efforts by Acre and Chiapas to the California cap-and-trade program.

Invalidation: ARB has determined that it is the responsibility of the offset purchaser to replace invalidated offsets within six months.³⁶ Many groups have termed this provision as “buyer liability” and have openly expressed concern over the cost of developing and issuing offsets, and hampering price discovery in the secondary market after offsets are issued.³⁷

The amount of time during which an offset could be invalidated after issuance—the statute of limitations—is currently eight years. However, this statute of limitations can be shortened if an offset project undergoes a second verification by a different verifying body within three years of issuance. In this case, the statute of limitations is shortened to three years for ODS projects, or three reporting periods for livestock, urban, or US forest projects.³⁸

The final regulation clarifies the **grounds for invalidation** and outlines three reasons for invalidation:³⁹

- **Overestimation:** if an Offset Project Data Report (OPDR) contains errors that overstate the amount of GHG reductions or GHG removal enhancements by more than 5%.
- **Illegality:** if project activity and implementation was not in accordance with all local, state or national environmental, health, and safety regulations during the Reporting Period for which the ARB offset credit was issued.
- **Double-Counting:** if ARB finds that offset credits have been issued in other markets for the same project area during the same time period for which the project has received ARB credit.

In the case of overestimation, ARB will withdraw a number of credits according to the equation documented in the regulation:⁴⁰

$$H = |T / I| * O$$

- H is the number of offsets to be withdrawn from holding/compliance accounts from each party that holds credits from the project.
- T is the total number of ARB offset credits from this project currently being held in holding/compliance accounts by each party that holds credits from this project.
- I is the total number of offsets issued for this offset project.
- O is the amount of overstated GHG reductions and GHG removal enhancements by project (determined by ARB).

Forestry reversals do not trigger invalidation. If reversal is unintentional but lowers a project’s actual carbon stocks below its baseline, the project will be terminated. If reversal is unintentional and does not drop the project below its baseline, ARB will retire credits from the **Forest Buffer account**—which collects a predetermined portion of offsets before they are issued—in an equal amount. If reversal is intentional, the forest owner must replace the credits.⁴¹

Early Action Offsets: ARB will also accept offsets from other programs that are approved using the criteria listed in Figure 3. The offset project operator or the holder of an early action project can register with ARB to be eligible to gain credits for their EAOs. However, a clear provision for approval of additional EAO protocols is not readily apparent.

Criteria for Early Action Offsets
A. Occurred between January 1 2005 and December 31 2014
B. Meets verification standards ¹
C. EAO program registered with ARB prior to January 1 2014
D. Located in the United States

Table 2: Criteria For Early Action Offsets. Source: California Air Resources Board

Auction Price Controls: Auctions have a **floor price** starting at USD \$10 for 2012 auctions. The floor price will rise annually by 5% plus the rate of inflation, which is calculated by the Consumer Price Index (CPI).⁴² Additionally, an Allowance Price Containment Reserve (APCR) will collect a portion of allowances from auction each year and release them if certain predetermined **trigger prices** are reached (see below). The percent of allowances withheld from auction to fill the APCR will be as follows: 1% for years 2013-2014, 4% for years 2015-2017, and 7% for years 2018-2020.⁴³ Allowances from the APCR are divided into three equal-sized tiers. In 2013, one of these tiers will become available at each of the following prices: \$40, \$45 and \$50. After 2013, the offering price of reserve allowances increases by 5% annually plus inflation.⁴⁴ Thus far, no allowances have been purchased from the APCR, as market prices for allowances remain far below the set price tiers of the APCR.

In response to stakeholder concerns of allowance supply shortages to the extent that the APCR is exhausted, ARB has proposed amendments that would make additional allowances available. This proposal would offer a temporary solution by taking 10% of future years' allowances budgets and offering them for sale once per year at the highest price tier of the APCR (beginning in 2015). With this proposal, future vintage allowances are borrowed to satisfy short-term supply shortages. The proposal does not address longer-term structural supply shortages. The Board is expected to rule on this proposal in Spring 2014.

Linkage to Foreign Jurisdictions: ARB linked its cap-and-trade program with Quebec's cap-and-trade program on 1 January 2014, with a first joint auction expected to be held in the second half of 2014 once the joint-auction platform has been tested. Under the linked system, compliance instruments (allowances, offsets, and early action offsets) will be recognized as mutually and equivalently acceptable in either jurisdiction.

Credit holding accounts and compliance periods: Covered entities are allowed two accounts – compliance accounts and holding accounts. Compliance accounts serve as a clearinghouse where allowances are transferred to ARB for retirement. Allowances in compliance accounts cannot be sold, traded, or transferred to another account or entity. Once an allowance enters a compliance account, it can only be submitted directly to ARB for compliance.⁴⁵ Holding accounts are to be used whenever an entity is interested or potentially interested in trading allowances. Allowances in holding accounts can be freely bought, sold, or traded.⁴⁶

The annual compliance obligation for a covered entity is at least 30% of its emissions from the previous year.⁴⁷ One year after the end of each compliance period, a “true-up” occurs where a covered entity must retire an allowance for each ton of CO₂e it emitted during the previous compliance period but did not already retire.⁴⁸ This partial annual compliance obligation offers a form of flexibility, which is elaborated upon in the banking and borrowing section. If an entity is found to be non-compliant, it must forfeit four allowances for each allowance it did not retire.⁴⁹

Holding accounts are subject to **two holding limits**: one for allowances eligible for compliance use in current years, and another for allowances eligible for compliance use in future years.⁵⁰ Holding limits are intended to prevent individual entities (or small groups of entities) from manipulating the market by gaining too large a market share of allowances. Holding limits are controversial, however, because the limit disproportionately hampers large emitters whose compliance obligation may be close to, or even greater, than the holding limit itself – thus forcing large emitters to keep a greater number of compliance units in their compliance accounts (where the holding limit does not apply, but where compliance units cannot be traded).

The holding limit for allowances eligible for compliance *use in the current year* is equal to the equation below, where the “Base” equals 25 MMT CO₂e and the “Annual Allowance Budget” is equal to the number of allowances issued for the current budget year. Included in this holding limit are allowances that were issued for previous compliance years, purchased from the APCR (any vintage) or those that were purchased at an advance auction but are now eligible for compliance during the current compliance year.⁵¹

$$HL_{(\text{current year})} = 0.1 * \text{Base} + 0.025 * (\text{Annual Allowance Budget} - \text{Base})^{52}$$

The holding limit for *use in future years* is calculated separately for each future vintage year and is equal to the equation below where the “Base” equals 25 MMT CO₂e and the “Annual Allowance Budget” is the number of allowances issued for the current budget year. It is the sum of the compliance budgets of California and all ETS programs to which California has linked for the current budget year.

$$HL_{(\text{future year})} = 0.1 * \text{Base} + 0.025 * (\text{Annual Allowance Budget} - \text{Base})^{53}$$

Banking is allowed. That is, in any year, allowances from any prior year may be used for compliance or sold.⁵⁴ Banked allowances never expire.⁵⁵ The quantity of banked allowances, however, is subject to holding limits.⁵⁶

Borrowing allowances from future periods, for compliance in the current period, is only allowed to satisfy an excess emissions obligation.^{57, 58} However, the provision for partial annual compliance may be viewed as a form of intra-period borrowing, in that when the true-up occurs at the end of a compliance period, allowances from later vintage years in the period can be submitted to comply for emissions that occurred in the earlier years of the compliance period. For example, a firm that chooses to comply with 30% of its annual emissions in 2015—effectively leaving the remaining 70% for later compliance—can use 2016 allowances to comply with its remaining 2015 emissions during the true-up period in 2018. Table 3 demonstrates a hypothetical compliance pathway illustrating these nuances.

Hypothetical potential compliance pathway associated with intra-period borrowing: Table 3 (below) represents a potential compliance pathway for a hypothetical covered entity that emits 100 tons of CO₂e each year and achieves the minimum annual compliance, effectively leaving as much compliance as possible for the “true-up” period. Notice that all previous vintage year allowances are eligible for compliance use in the current year. Note that this compliance pathway could be altered if the current ARB proposal to eliminate the 30% annual surrender obligation is approved by the Board in Spring 2014.

Compliance Period	Year	Annual Emissions (tons CO ₂ e)	Compliance Obligation	*Annual Compliance Obligation (allowances to be surrendered)	Cumulative Compliance Obligation (allowances)	**Eligible Allowance Vintages
1st	2013	100	None	0	0	n/a
	2014	100	30% 2013 emissions	30	30	2013
2nd	2015	100	Remaining 2013/2014 emissions	170	200	2013, 2014
	2016	100	30% 2015 emissions	30	230	2013, 2014, 2015

	2017	100	30% 2016 emissions	30	260	2013-2016
3rd	2018	100	Remaining 2015-2017 emissions	240	500	2013-2017
	2019	100	30% 2018 emissions	30	530	2013-2018
	2020	100	30% 2019 emissions	30	560	2013-2019
	2021	100	Remaining 2018-2020 emissions	240	800	2013-2020

Table 3: Hypothetical potential compliance pathway associated with intra-period borrowing. Source: § 95855, page 90; and IETA calculations.

* This column presents a hypothetical firm's annual requirements for surrendering allowances. Note that surrender obligations only apply to emissions compliance obligations for the compliance period associated with the prior year's emissions.

** Allowances purchased from the Allowance Price Containment Reserve may be used at any time.

MARKET OVERSIGHT: ARB has assembled a Market Surveillance Committee composed of academics with expertise in market development and oversight.⁵⁹

Emissions Reporting: The Mandatory Reporting Rule (MRR) under AB 32 obliges California facilities, including some non-covered entities, to report and verify their in-state emissions to ARB. Generally, applicability **thresholds** for reporting are lower than those for compliance. For example, the reporting threshold for fuel suppliers is 10,000 metric tons of CO₂e, lower than the 25,000 metric tons of CO₂e compliance threshold.⁶⁰ Additionally, the **scope** for reporting and compliance thresholds differs. For example, producers of bio-ethanol do not have a compliance obligation for production emissions, yet are required to report these emissions to ARB. The final MRR regulation can be viewed [here](#).

ARB has the authority to reverse transfers of compliance instruments in the event a company exceeds its holding limit. Originally ARB had used language suggesting that they would have the same authority in futures markets, but following stakeholder concern expressed by many organizations regarding the impact of this provision on market liquidity, ARB removed the provision. The oversight authority is shared between the Commodities Futures Trading Commission (CFTC) of the Federal Government under the Dodd-Frank Act, which covers swaps and futures markets, and ARB, which will oversee spot and forward trading markets.

COMPLEMENTARY AND SUPPLEMENTARY MEASURES: AB 32 requires California to reduce emissions to 1990 levels by 2020. In 2008, ARB, the agency responsible for implementing AB 32, created the AB 32 Scoping Plan. The Scoping Plan outlined a number of emissions reducing policies, including a renewable portfolio standard, a low carbon fuels standard, a cap and trade program, and over a dozen other measures. The cap-and-trade portion is estimated to account for approximately 22.5%, or 18 MMTCO₂e, of the necessary emissions reductions under AB32.

Taken together, the remaining policies are estimated to account for 77.5%, or 63 MMTCO₂e, of the necessary emission reduction goals under AB32. However, cap-and-trade is the only economy-wide provision in the scoping

plan and thereby serves as the back-stop that guarantees California’s reaches its emissions reduction target. Figure 2 shows the business-as-usual 2020 emissions forecast for California, the 1990 emissions target and the expected reductions from cap-and-trade and each complementary measure.

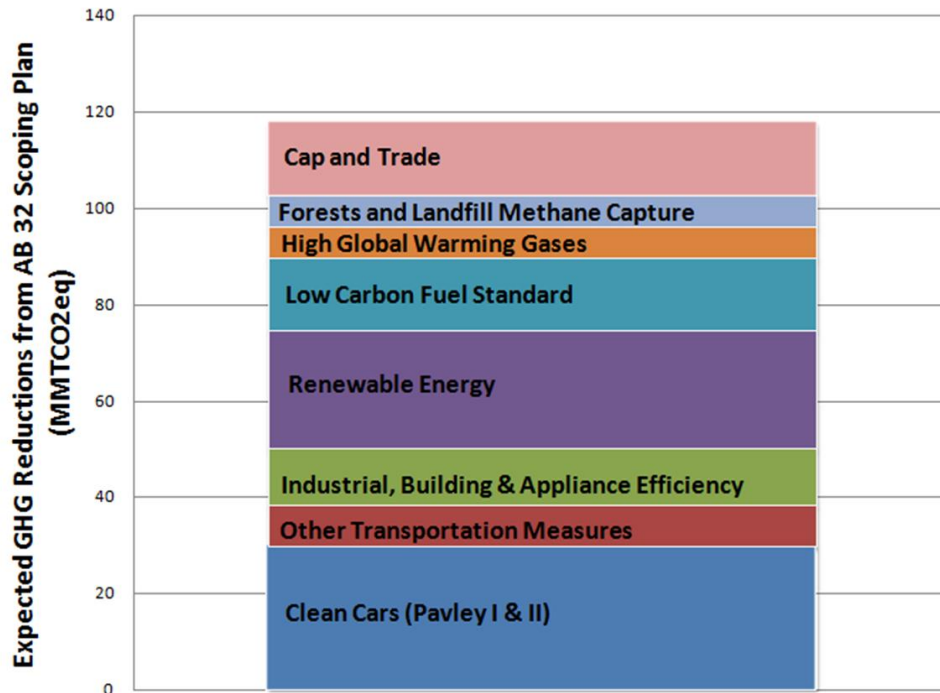


Figure 2: Expected GHG Reductions in 2020 from California Policies. Source: California Air Resources Board (ARB)

What Distinguishes this Policy?

UNIQUE ASPECTS:

1. California’s Mandatory Reporting Rule has required businesses to report the GHG emissions since 2008, meaning that the **cap was set based on real emissions data** rather than estimates. This should reduce the likelihood of the over-allocation that has occurred in some other programs.
2. ARB has taken a rigorous approach to the environmental integrity of **offsets** that will be eligible to enter California’s program. ARB is responsible for adopting protocols that set guidelines that individual projects must meet and that make accounting and other practices consistent across like projects. ARB has approved four protocols so far: ODS, livestock digesters, urban forests, and US forest projects.
3. The cap-and-trade program in California and Quebec will **expand its scope** from 2015 onwards to include emissions from transportation fuels. It will be the first carbon market to cover these emissions.
4. The ability for ARB to approve **sectoral crediting** provides opportunities for experimenting with compliance credits for scaled-up mechanisms such as jurisdictional accounting for REDD+, which is an innovation for compliance markets.

CHALLENGES:

1. The text of AB 32 requires California to account for the emissions associated with the power that is imported into the state. The cap-and-trade program therefore regulates electricity that the state imports from its neighbors

(approximately a quarter of electricity used in California is generated elsewhere). As a result, the regulations address the issue of **resource shuffling**, where clean energy is filtered to California and dirtier energy is sent to states without cap-and-trade in place.

2. California continues to consider the issue of how many allowances industries should receive for free and how many should be auctioned. This decision is ultimately a balancing act between the need to protect businesses from out of state competition and the need to transition to a polluter pays model where Californians see tangible benefits to their health, economy, and the environment as the state makes wise investment of auction revenue.
3. There are market functionality issues, such as holding limits, know-your-customer requirements, and buyer liability for offsets provisions, where a balance is needed between providing adequate protection without compromising the liquidity of the market. ARB has also committed to monitoring the system for signs of gaming or fraudulent activity.
4. California has **linked** its program with Quebec. Since both jurisdictions participate in the Western Climate Initiative, the two programs are substantially similar. Moving forward, California and Quebec will need to consider how to continue to share information and evaluate enforcement and any programmatic changes.
5. California must use its **auction** revenues in the most effective way, and with competing interests for how to allocate that funding.

LESSONS:

1. Instituting cap-and-trade regulations often requires significant political support from a wide range of environmental and business groups. California has seen a number of political and legal challenges emerge from a wide variety of groups on the left discontented by the use of market mechanisms, and offsets in particular, for compliance.
2. In the absence of overarching national legislation, which would be preferable on efficiency and leakage grounds, it remains possible to progress with action on pricing carbon and demonstrate the ability of markets to uncover emissions reductions. It is hoped by many that California will act as a test-case for cap and trade in the United States.

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Disclaimer: The authors encourage readers to please contact the EDF and IETA contacts with any corrections, additions, revisions, or any other comments, including any relevant citations. This will be invaluable in strengthening and updating the case studies and ensuring they are as correct and informative as possible.

¹ GDP: <http://www.cscse.com/PDF/Numbers-Sept-2012-CA-Economy-Rankings-2011.pdf>, Data US Department of Commerce (Calif.), World Bank (Intl.); GHG Emissions: Perry, F. Noel, Sarah Henry, and Marcia E. Perry. *Using the Allowance Value from California's Carbon Trading System*. Rep. Web. <http://www.next10.org/sites/next10.huang.radicaldesigns.org/files/12-NXT-008_Cap-Trade_r2.pdf>.

² Superior Court of California, Case No. CPF-09-509562 Statement of Decision, County of San Francisco. Available: <http://cdn.law.ucla.edu/SiteCollectionDocuments/Environmental%20Law/Court%27s%20Final%20Order%203%2017%2011.pdf>

³ §95811

⁴ §95852 (a)(1)

⁵ CO₂e is carbon-dioxide equivalents. See section §95812(c)(1), page 47.

⁶ §95812(c)(2)(B), page 47.

⁷ §95812(d)(1), page 48.

⁸ §95812(d)(2), page 49.

⁹ *Supra*, Note 1.

¹⁰ §95870(b), page 97.

¹¹ Generally, see §95910, page 126.

¹² Generally, for this paragraph, see §95911(c), page 129.

¹³ §95891 (b)(1), page 104.

¹⁴ §95891 (c), page 111.

¹⁵ §95891(c)(1) page 111.

¹⁶ §95870 Table 8-1, page 97, provides the full list of leakage risk classifications

¹⁷ §95891 (d) provides the complete set of equations. See page 112

¹⁸ See Pg 5 of ARB's [Appendix A: Staff Proposal for Allocating Allowances to the Electric Sector](#)

¹⁹ See §95892(d)(3-5), page 119-120

²⁰ §95892(c), page 119

²¹ *Supra*, Note 1.

²² See Pg 1 of ARB's [Appendix A: Staff Proposal for Allocating Allowances to the Electric Sector](#)

²³ California's recent budget proposes a framework for investing the revenue from auctioned allowances, which is expected to reach \$1 billion in 2013 alone, into measures that further reduce greenhouse gases consistent with AB32. See page 98 of [California's Summary Budget for Environmental Protection](#)

²⁴ Taylor, Mac. *Evaluating the Policy Trade-Offs in ARB's Cap-and-Trade Program*. Rep. Legislative Analyst's Office. Web. <<http://www.lao.ca.gov/reports/2012/rsrc/cap-and-trade/cap-and-trade-020912.pdf>>.

²⁵ *Supra*, Note 1.

²⁶ Sector-based offsets are offsets awarded according to a sector's, instead of an individual project's, emissions baselines and emissions reductions.

²⁷ §95942, page 152.

²⁸ Generally, for this paragraph, see §95854, page 89.

²⁹ Electric Power Research Institute (EPRI) (April 2011). "Overview of the California Greenhouse Gas Offsets Program." Available at http://globalclimate.epri.com/doc/EPRI_Offsets_W10_Background%20Paper_CA%20Offsets_040711_Final2.pdf

³⁰ §95973(a)(2)(C), page 156.

³¹ §95971, page 154.

³² §95972(b), page 155.

³³ Governors' Climate and Forest Task Force (GCF) (2012). "About GCF." Available at <http://www.gcftaskforce.org/about>

³⁴ Diamant, Adam (October 2012). "Linking Offsets from Mexico into California's Greenhouse Gas Cap and Trade Program." Electric Power Research Institute (EPRI). Available at http://globalclimate.epri.com/doc/adiamant_mexico.pdf

³⁵ Brunello, Tony (September 2011). "REDD Offsets Working Group." Available at <http://stateredd.org/wp-content/uploads/2011/10/ROW-101-OCT-Mexico-Workshop.pdf>

³⁶ See §95985(h)(1)(B) and (h)(2)(A), pages 217 and 218.

³⁷ See for example, IETA comments to ARB on AB 32 Program Rules During Second Commenting Period, September 27 2011. Available: https://ieta.memberclicks.net/assets/PressReleases/ieta_letter_-_arb_15-day_comments_27_sept_2011_final.pdf

³⁸ §95985(b), page 209.

³⁹ Generally, see §95985(c), page 210, for more details.

⁴⁰ §95985(g), page 214.

⁴¹ §95985(i), page 219.

⁴² §95911 (b)(6), page 129.

⁴³ §95870 (a), page 97.

⁴⁴ §95913, page 135.

⁴⁵ §95831(a)(4), page 56.

⁴⁶ §95831(a)(2), page 56.

⁴⁷ §95855(a)(2), page 90.

⁴⁸ §95853, page 88.

⁴⁹ *Supra*, Note 31.

⁵⁰ §95920(c), page 143.

⁵¹ §95920(c)(1), page 143.

⁵² §95920(d)(1), page 144.

⁵³ §95920 (e), page 166 of amended regulations.

⁵⁴ §95922(a), page 151.

⁵⁵ §95922(c), page 151.

⁵⁶ §95920(c), page 143.

⁵⁷ Another exception is if an allowance is purchased from the Allowance Price Containment Reserve.

⁵⁸ §95856(b)(A) and (b)(B), page 91.

⁵⁹ *Supra*, Note 31.

⁶⁰ See §95101(a)(C), page 3 of MRR regulation.