International Carbon Action Partnership

USA - California Cap-and-Trade Program

General Information

ETS Description

The California Cap-and-Trade Program began operation in 2012 with the opening of its tracking system for allocation, auction distribution, and trading of compliance instruments. Compliance obligations started in January 2013. The program covers ~75% of the state's GHG emissions.

The program covers ~400 facilities and emissions from the power, industrial, transport, and buildings sectors. Covered entities must surrender allowances for all their covered emissions. Allowances are distributed via a combination of auction, free allocation, and free allocation with consignment. The proceeds from auctioning are reinvested in projects that reduce emissions, strengthening the economy, public health, and the environment, especially in disadvantaged communities.

The California Cap-and-Trade Program is implemented under the authority of the California Air Resources Board (CARB). California has been part of the Western Climate Initiative (WCI) since 2007 and formally linked its program with Québec's in January 2014.

ETS Status

in force

Jurisdictions

California

Year in Review

In December 2022, the Board of CARB approved the "2022 Scoping Plan for Achieving Carbon Neutrality". The plan lays out a path of carbon neutrality that includes a 48% reduction of emissions below 1990 levels in 2030, which exceeds California's statutory 40% reduction target. CARB announced it would evaluate all major programs, including the Cap-and-Trade Program, to assess the need to increase the stringency between now and 2030 and a Program through 2045.

A series of informal stakeholder workshops began in June to consider potential amendments to the program. CARB presented three different scenarios for revising future allowance budgets consistent with emission reductions of 40%, 48%, and 55% below 1990 levels. Among other topics considered during public workshops were updates to cost-containment mechanisms, the use of revenues from consigned allowances, and carbon leakage protection measures.

Any amendments to the Cap-and-Trade Regulation are expected to be voted on by the Board of CARB by the end of 2024, with the changes potentially implemented from 2025.

Sectoral coverage

Transport
Buildings
Industry
Power

Revenue usage

Climate mitigation

Low-carbon innovation
Pursuit of other development objectives, such as education and health
Assistance for individuals, households, and businesses

Emissions & Targets

Overall GHG Emissions excl. LULUCF (MtCO2e)

381.3

GHG reduction targets

By 2030: 40% reduction from 1990 GHG levels (SB 32)

By 2045: Carbon neutrality and 85% reduction from 1990 anthropogenic GHG levels (AB 1279)

Current Allowance Price (per t/CO2e)

Updated prices available here

Size & Phases

Covered emissions (2021)

76.00%

Verified ETS Emissions

292.20MtCO_2e

GHGs covered

CO2, CH4, N2O, SF6, HFCs, PFCs, NF3, and other fluorinated GHGs.

Phases

FIRST COMPLIANCE PERIOD: Two years (2013 and 2014)

SECOND COMPLIANCE PERIOD: Three years (2015 to 2017)

THIRD COMPLIANCE PERIOD: Three years (2018 to 2020)

FOURTH COMPLIANCE PERIOD: Three years (2021 to 2023)

FIFTH COMPLIANCE PERIOD: Three years (2024 to 2026)

Cap or total emissions limit

A cap limits the total emissions allowed in the system.

FIRST COMPLIANCE PERIOD: The system started in 2013 with a cap of 162.8 MtCO_2e, declining to 159.7 MtCO_2e in 2014, at a rate of ~2% annually.

SECOND COMPLIANCE PERIOD: With the program expanding to include fuel distribution, the cap rose to 394.5 MtCO_2e in 2015. The cap decline factor averaged 3.1% per year in the second compliance period (2015 to 2017), reaching 370.4 MtCO_2e.

THIRD COMPLIANCE PERIOD: The cap in the third compliance period started at 358.3 MtCO_2e and declined at an average annual rate of 3.3% to 334.2 MtCO_2e in 2020.

FOURTH COMPLIANCE PERIOD AND BEYOND: During the 2021 to 2030 period, the cap declines by about 13.4 MtCO_2e each year, averaging ~4% per year, to reach 200.5 MtCO_2e in 2030.

The “Cap-and-Trade Regulation” sets a formula for declining caps after 2030 through 2050.

Sectors and thresholds

FIRST COMPLIANCE PERIOD: Covered sectors included those that have one or more of the following processes or operations: large industrial facilities (including cement, glass, hydrogen, iron and steel, lead, lime manufacturing, nitric acid, petroleum and natural gas systems, petroleum refining, and pulp and paper manufacturing, including cogeneration facilities co-owned/operated at any of these facilities); electricity generation; electricity imports; other stationary combustion; and CO_2 suppliers.

SECOND COMPLIANCE PERIOD AND BEYOND: In addition to the sectors listed above, suppliers of natural gas, suppliers of reformulated blendstock for oxygenateblending (i.e., gasoline blendstock) and distillate fuel oil (i.e., diesel fuel), suppliers of liquefied petroleum gas in California, and suppliers of liquefied natural gas are covered by the program.

INCLUSION THRESHOLDS: Facilities emitting ≥25,000 tCO_2e per year. All electricity imported from specified sources connected to a specific generator with emissions >25,000 tCO_2e per year is covered. Emissions associated with imported electricity from unspecified sources have a zero threshold, and all imported electricity emissions are covered using a default emissions factor.

OPT-IN COVERED ENTITIES: A facility in one of the covered sectors that emits <25,000 tCO_2e annually can voluntarily participate in the Program. Opt-in entities are subject to all registration, reporting, verification, compliance obligations, and enforcement applicable to covered entities.

Point of regulation

Upstream (buildings and transport); point source (industry, in-state power generation); imported electricity at the point of first delivery onto California's electricity grid.

Type of entities

Installations, fuel distributors, electricity importers

Number of entities

~400 facilities

Allowance Allocation & Revenue

Allowance allocation

Allowances are distributed via free allocation, free allocation with consignment, and auction.

FREE ALLOCATION: Industrial facilities receive free allowances to minimize carbon leakage. For nearly all industrial facilities, the amount is determined by product-specific benchmarks, recent production volumes, a cap adjustment factor, and an assistance factor based on assessment of leakage risk.

Leakage risk is divided into "low", "medium", and "high" risk tiers based on levels of emissions intensity and trade exposure for each specific industrial sector.

FIRST COMPLIANCE PERIOD: The Cap-and-Trade Regulation as adopted in 2011 set assistance factors of 100% for the first compliance period, regardless of leakage risk.

SECOND COMPLIANCE PERIOD AND BEYOND: For facilities with medium leakage risk, the original regulation included an assistance factor decline to 75% for the second compliance period and to 50% for the third. For facilities with low leakage risk, it included an assistance factor decline to 50% for the second compliance period and to 30% for the third. However, amendments to the Cap-and-Trade Regulation made in 2013 delayed these assistance factor declines by one compliance period. Pursuant to AB 398 adopted in 2017, all assistance factors were changed to 100% through 2030, citing continued vulnerability to carbon leakage. There is no cap on the total amount of industrial allocation, but the formula for allocation includes a declining cap adjustment factor to gradually reduce allocation in line with the overall cap trajectory.

Free allocation is also provided for transition assistance to public wholesale water entities, legacy contract generators, universities, public service facilities, and, during the period 2018-2024, waste-to-energy facilities.

FREE ALLOCATION WITH CONSIGNMENT: Electrical distribution utilities and natural gas suppliers receive free allocation on behalf of their ratepayers. Natural gas and electric utilities must use the allowance value for ratepayer benefit and for GHG emissions reductions. All allowances allocated to investor-owned electric utilities and an annually increasing percentage of allowances allocated to natural gas suppliers must be consigned for sale at the state's regular quarterly auctions. Publicly owned electric utilities can choose to consign freely allocated allowances to auction or use them for their own compliance needs.

AUCTIONING:
- Auction share: ~70% of total California-issued vintage 2023 allowances made available through auction in 2023, which included allowances owned by CARB (~41%) and allowances consigned to auction by utilities (~29%).
- Auction volume: 197,368,635 (2023 vintage) 25,400,000 for advance auction (2026 vintage).

Unsold allowances in past auctions are gradually released for sale at auction after two consecutive auctions are held in which the clearing price is higher than the minimum price. However, if any of these allowances remain unsold after 24 months, they will be placed into CARB's price ceiling reserve or into the two lower reserve tiers (see 'Market Stability Provisions' section). To date, 37 million allowances originally designated for auction have been placed in reserves through these provisions.

Auctioning share

50%

Total Revenue

USD 26.97 billion since beginning of program
USD 4.72 billion in 2023

2023

Use of Revenues

REVENUE FROM AUCTION OF CALIFORNIA-OWNED ALLOWANCES: Most of California's auction revenue goes to the Greenhouse Gas Reduction Fund, of which at least 35% must benefit disadvantaged and low-income communities. The funds are then distributed as California Climate Investments, which support projects that deliver significant environmental, economic, and public health benefits across the state. As of May 2023, USD 9.8 billion (of the total USD 27.0 billion revenue raised) has been invested in 569,477 projects, with expected GHG reductions of 98 MtCO2e. Over USD 7.2 billion has reached disadvantaged and low-income communities.

REVENUE FROM AUCTION OF UTILITY-OWNED ALLOWANCES: Investor-owned electric utilities and natural gas suppliers are allocated allowances, a portion of which must be consigned to auction. Auction proceeds must be used for ratepayer benefit and for GHG emissions reductions.

Flexibility & Linking

Offset credits

The use of compliance offset credits is allowed. Such credits, issued by CARB or by the authority of a linked cap-and-trade system, are compliance instruments under the California Cap-and-Trade Program.

QUALITATIVE LIMIT: Currently, offset credits originating from projects carried out according to one of six compliance offset protocols are accepted as compliance instruments:
- US. forest projects;
- Urban forest projects;
- Livestock projects (methane management);
- Ozone-depleting substances projects;
- Mine methane capture projects; and
- Rice cultivation projects.

Compliance offset credits issued by jurisdictions linked with California (i.e., Québec) are eligible to be used to satisfy a California entity's compliance obligation, subject to the quantitative limits described below.

To ensure environmental integrity, California's compliance offset program has incorporated the principle of buyer liability. The state may invalidate an offset credit that is later determined not to have met the requirements of its compliance offset protocol due to double counting, over-issuance, or regulatory non-conformance. The entity that surrendered the offset credit for compliance must then substitute a valid compliance instrument for the invalidated offset credit.

QUANTITATIVE LIMIT: For 2013 to 2020 emissions, entities could meet up to 8% of their obligations using offset credits. For emissions after 2020, entities are subject to lower limits on the use of offset credits established by AB 398. The share of offsets that can be used to fulfil the compliance obligation is 4% per year for 2021 to 2025 emissions, and 6% for 2026 to 2030 emissions.

In addition to setting new quantitative limits on the use of offset credits, AB 398 set new limits on the types of offset credits that can be used to fulfil compliance obligations. Starting with compliance obligations for 2021 emissions, no more than 50% of any entity's offset usage limit can come from offset projects that do not provide direct environmental benefits to the state (DEBS).

Projects located within California are automatically considered to provide DEBS. Offset projects implemented outside of California may still result in DEBS, based on scientific evidence and project data provided. For example, a forest project outside California has been determined to provide benefits within California by improving the quality of water flowing through the state. Recent regulatory amendments specify the criteria used to determine DEBS.

Banking and borrowing

Banking is allowed, but is subject to a holding limit on allowances to which all entities in the system are held. The holding limit is based on the year's cap and decreases annually. Entities may also be eligible for a limited exemption from the holding limit based on their emissions levels to support meeting annual compliance obligations or obligations at the end of a three-year compliance period.

Borrowing is not allowed.

Links with other Systems

California's program linked with Québec's in January 2014. The two expanded their joint market by linking with Ontario in January 2018 until the termination of Ontario's system in mid-2018.

Compliance

Compliance mechanism

Each covered entity must surrender one compliance instrument for each tCO_2e of its covered emissions.

Compliance Period

Except for the year following the last year of a compliance period, compliance instruments equal to 30% of the previous year's verified emissions must be surrendered annually, by the start of November. Compliance instruments equal to all remaining emissions must be surrendered by the start of November of the year following the last year of a compliance period.

Monitoring, Reporting, Verification (MRV)

REPORTING FREQUENCY: Annually

VERIFICATION: Emissions data reports and their underlying data require annual verification by an independent third-party for all entities covered by the Program.

FRAMEWORK: Reporting is required for most emitters at or above 10,000 tCO_2e per year. They must implement internal audits, quality assurance, and control systems for the reporting program and the reported data.

Enforcement

A covered entity that fails to surrender sufficient compliance instruments to cover its verified GHG emissions on either an annual surrender deadline or a compliance period surrender deadline is automatically assessed an untimely surrender obligation. It is required to surrender the missing compliance instruments as well as three additional compliance instruments for each compliance instrument it failed to surrender.

Failure to meet this untimely surrender obligation would subject the entity to substantial financial penalties for its noncompliance, pursuant to "California Health and Safety Code Section 38580".

Separate and substantial penalties apply to mis-reporting or non-reporting under the "Regulation for the Mandatory Reporting of Greenhouse Gas Emissions".

Market Regulation

Market Stability Provisions

Auction Reserve Price: USD 24.04 per allowance in 2024. The auction reserve price increases annually by 5% plus inflation, as measured by the Consumer Price Index.

Reserve: Some allowances from each annual cap are placed in an Allowance Price Containment Reserve (APCR). Prior to amendments mandated by AB 398, these allowances were spread across three reserve tiers in an earlier APCR. Pursuant to AB 398, from 2021 onward, these allowances have been placed into two price tiers and a price ceiling.

Specifically, AB 398 directed where allowances from the earlier APCR would be distributed. Two-thirds of those allowances were spread evenly across the two APCR price tiers. The remaining one-third (which had previously been spread evenly across the original three price tiers), plus unsold allowances that had been transferred into the APCR (about 37 million to date), have been placed into the price ceiling. In addition, the Cap-and-Trade Regulation also set aside portions of annual 2021-2030 allowance caps for the two APCR price tiers.

Although no reserve sale has been held to date, CARB will offer one if auction settlement prices from the preceding quarter are greater than or equal to 60% of the lowest APCR price tier. CARB also always offers the third quarter APCR sale before the November compliance obligation deadline.

At the price ceiling, a covered entity can purchase allowances (or, if no allowances remain, “price ceiling units”) up to the amount of its current unfulfilled emissions obligation. The revenues from the sale of price ceiling units will be used to purchase real, permanent, quantifiable, verifiable, enforceable, and additional emissions reductions on at least a tonne for tonne basis. Sales at the price ceiling will only be conducted if no allowances remain at the two lower APCR tiers and a covered entity has demonstrated that it does not have sufficient compliance instruments in its accounts for that year’s compliance event.

In 2024, the two APCR tiers and the price ceiling are set at USD 56.20, USD 72.21, and USD 88.20, respectively. Tier prices and the price ceiling increase by 5% plus inflation (as measured by the Consumer Price Index).

Market Design

MARKET PARTICIPATION: Covered entities, opt-in covered entities, and voluntarily associated entities can participate in the program. Voluntarily associated entities are approved individuals or entities that intend to:

- purchase, hold, sell, or retire compliance instruments but are not covered under the program;
- operate a compliance offset project registered with CARB; or
- provide clearing services and derivative clearing services as qualified entities.

Voluntarily associated entities must be in the United States and have an approved account in the system registry, the Compliance Instrument Tracking System Service (CITSS). Additional eligibility criteria apply, including for individual market participants.

MARKET TYPES:

Primary: Allowances are made available through sealed-bid auctions. State-owned and consigned allowances are offered through quarterly allowance auctions organized jointly with Québec. Auctions are administered by WCI, Inc.

Secondary: Allowances, offset credits, and financial derivatives are traded in the secondary market on the Intercontinental Exchange (ICE), CME group, and Nodal Exchange platforms. Any company qualified to access these platforms can trade directly or through a future commission merchant. Companies can also trade directly over the counter but must have a CITSS account to take delivery of compliance instruments.

LEGAL STATUS OF ALLOWANCES: Allowances are defined as limited tradable authorizations to emit up to one tCO_2e. According to the “California Code of Regulations”, an allowance does not constitute property or bestow property rights and cannot limit the authority of the regulator to terminate or limit such authorization to emit.

Other Information

Institutions involved

California Air Resources Board: Responsible for the design and implementation of the Cap-and-Trade Program.

Western Climate Initiative, Inc.: Non-profit organization that provides cost-effective administrative and technical solutions for supporting the coordinated development and implementation of participating jurisdictions' GHG emissions trading programs, such as administering auctions and maintaining the system registry (CITSS).

Regulatory Framework

Global Warming Solutions Act of 2006 (AB 32)

AB 398

2018 amendments to the 2021-2030 period

Current regulation can be found on the CARB website

Evaluation / ETS review

Pursuant to requirements in existing legislation (AB 32, AB 197, and AB 398), CARB must update the "California Climate Change Scoping Plan" at least every five years and must provide annual reports to various committees of the Legislature and the Board. The Scoping Plan provides updates on progress toward climate targets and lays out strategies to achieve them, including the role and level of effort accorded to different programs in the state's portfolio approach to climate mitigation. The latest update to the Scoping Plan was adopted in December 2022.

Disclaimer

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