USA - California Cap-and-Trade Program

General Information

Summary

Status: ETS in force

Jurisdictions: California

California’s Cap-and-Trade Program began operation in 2012, with the opening of its tracking system for allocation, auction distribution, and trading of compliance instruments. The first compliance obligations started in January 2013. California has been part of the Western Climate Initiative since 2007 and formally linked its system with Québec’s in January 2014.

The California program, which is implemented by the California Air Resources Board (CARB), covers sources responsible for approximately 80% of the state’s GHG emissions. Key amendments to the system took effect in 2021, following the passage of legislation clarifying the role of the program after 2020 (Assembly Bill [AB] 398) and regulatory amendments adopted by CARB. Among the major changes to the system that started in 2021 are the addition of a price ceiling, the inclusion of two allowance price containment reserve tiers below the price ceiling, reductions in the use of offset credits (especially for credits generated from projects which do not provide direct environmental benefits in the state), and a steeper allowance cap decline to 2030.

Year in Review

In January 2020, CARB approved the membership of the Compliance Offsets Protocol Task Force, which is required by AB 398 to advise CARB on approving new protocols for the purpose of increasing offset projects with direct environmental benefits in the state of California while prioritizing disadvantaged communities, Native American or tribal lands, and rural and agricultural regions. AB 398 defines direct environmental benefits in the state as offsets that reduce or avoid emissions in California or pollutants that adversely affect the state’s waterways.

In 2020, CARB released an application form that project sponsors may submit if they wish to seek a determination that these projects provide direct environmental benefits in the state. CARB also began making determinations about the direct environmental benefits of offsets. Starting in 2021, no more than half of the offset credits that an entity surrenders for compliance can come from projects that do not provide direct environmental benefits in the state (see "Offsets and Credits" section for more details).

Overall GHG emissions (excluding LULUCF)

Emissions: 425.3 MtCO$_2$e (2018)

Overall GHG emissions by sector (in MtCO2)

<table>
<thead>
<tr>
<th>Sector Name</th>
<th>MtCO2e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity Generation (in state)</td>
<td>38.6</td>
</tr>
<tr>
<td>Electricity Generation (imports)</td>
<td>24.6</td>
</tr>
<tr>
<td>Transportation</td>
<td>173.8</td>
</tr>
<tr>
<td>Industrial</td>
<td>101.3</td>
</tr>
<tr>
<td>Commercial</td>
<td>23.9</td>
</tr>
<tr>
<td>Residential</td>
<td>30.5</td>
</tr>
<tr>
<td>Agriculture &amp; Forestry</td>
<td>32.6</td>
</tr>
</tbody>
</table>
GHG reduction target

<table>
<thead>
<tr>
<th>Year</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>Return to 1990 GHG levels (AB 32)</td>
</tr>
<tr>
<td>2030</td>
<td>40% reduction from 1990 GHG levels (AB 398)</td>
</tr>
<tr>
<td>2045</td>
<td>Achieve carbon neutrality (Executive Order B-55-18)</td>
</tr>
</tbody>
</table>

Carbon Price

Current Allowance Price (per t/CO2e): USD 17.04 (average auction settlement price in 2020; updated prices available here)

ETS Size

<table>
<thead>
<tr>
<th>Covered emissions</th>
<th>0.75</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHGs covered</td>
<td>CO2, CH4, N2O, SF6, HFCs, PFCs, NF3, and other fluorinated GHGs.</td>
</tr>
</tbody>
</table>

Sectors and thresholds

**FIRST COMPLIANCE PERIOD (2013-2014):** Covered sectors include 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 CO2 suppliers.

**SINCE THE SECOND COMPLIANCE PERIOD:** In addition to the sectors listed above, suppliers of natural gas, suppliers of reformulated blendstock for oxygenate blending (i.e., gasoline blendstock) and distillate fuel oil (i.e., diesel fuel), suppliers of liquid petroleum gas in California, and suppliers of liquefied natural gas.

**INCLUSION THRESHOLDS:** Facilities ≥25,000 tCO2e/data year. Electricity providers that import 25,000 tCO2e per year or more from specified sources of electricity (those with known emissions factors) are considered to be above the threshold. All imported electricity from unspecified sources (those without known emissions factors) is considered to be above the threshold, and a default value is applied as an emissions factor.

Point of regulation

Mixed

Number of entities

~500 entities*

*Approximately 330 registered covered/opt-in entities. These entities represent approximately 500 registered emitting sources/facilities.

Cap

**FIRST COMPLIANCE PERIOD (2013-2014):** The system started in 2013 with a cap of 162.8 MtCO2e, declining to 159.7 MtCO2e in 2014.

**SECOND COMPLIANCE PERIOD (2015-2017):** With the program expanding to include fuel distribution, the cap rose to 394.5 MtCO2e in 2015. The cap decline factor averaged 3.1% per year in the second compliance period (2015-2017), reaching 370.4 MtCO2e.

**THIRD COMPLIANCE PERIOD (2018-2020):** The cap in the third compliance period started at 358.3 MtCO2e and declined at an average annual rate of 3.3% to 334.2 MtCO2e in 2020.

**FOURTH COMPLIANCE PERIOD (2021-2023) AND BEYOND:** During the period 2021-2030, the cap declines by about 13.4 MtCO2e each year, averaging about 4% per year and reaching 200.5 MtCO2e in 2030.

The Cap-and-Trade Regulation sets a formula for declining caps after 2030 through 2050.
Phases & Allocation

Trading periods

The California Cap-and-Trade Program is structured around compliance periods (see “Compliance” section). A cap trajectory has been set through 2030, with a formula for the declining annual caps through 2050 (see “Cap” section).

Allowances are both allocated and auctioned, with each allowance associated with a specific calendar year vintage. Some allowances with a vintage three years in the future are offered at each auction and may be traded, but these future vintage allowances may not be used for compliance until the compliance date for the vintage year.

Allocation

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

FREE ALLOCATION:

Industrial facilities: 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 tiers of “low”, “medium”, and “high” based on levels of emissions intensity and trade exposure. The Cap-and-Trade Regulation as adopted in 2011 set assistance factors of 100% for the first compliance period regardless of leakage risk. 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 compliance period. 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 compliance period. Amendments to the Cap-and-Trade Regulation in 2013 delayed these assistance factor declines by one compliance period, and AB 398 (adopted in 2017) set all assistance factors to 100% for 2021-2030, citing continued vulnerability to carbon leakage. In adjusting these factors pursuant to AB 398, CARB also set all assistance factors in the same manner for the 2018-2020 period.

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, beginning in 2018, waste-to-energy facilities.

CONSIGNMENT:

Electrical distribution utilities and natural gas suppliers: Receive free allocation on behalf of their ratepayers. All natural gas and electrical utilities must use the allowance value for ratepayer benefit and for 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 electrical utilities can choose to consign freely allocated allowances to auction or use them for their own compliance needs.

AUCTIONING: In 2020, about 58% of total California-issued vintage 2020 allowances were made available through auction, which included allowances owned by CARB (about 32%) and allowances consigned to auction by utilities (about 26%).

Unsold allowances in past auctions are removed from circulation and will gradually be released for sale at auction after two consecutive auctions are held in which the sale 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 those provisions.
Flexibility

Banking and borrowing

Banking is allowed but is subject to the general holding limit on allowances to which all entities in the system are held. The holding limit varies based on the year’s cap. Emitting entities may also be eligible for a limited exemption from the holding limit based on their emissions levels to meet annual compliance obligations or obligations at the end of a three-year compliance period.

Borrowing from future vintage allowances is not allowed.

Offsets and credits

**QUANTITATIVE LIMIT:** For compliance obligations related to 2013-2020 emissions, entities are held to a limit of meeting up to 8% of their obligations for a compliance period through offsets. Starting with their 2021 emissions, entities are subject to new limits that were established by AB 398. The share of offsets that can be used to fulfil the compliance obligation will decrease to 4% per year for 2021-2025 emissions and will increase to 6% starting with 2026 emissions.

**QUALITATIVE LIMIT:** Currently, six domestic offset types are accepted as compliance units originating from projects carried out according to six compliance offset protocols:

- US Forest Projects
- Urban Forest Projects
- Livestock Projects (methane management)
- Ozone-Depleting Substances Projects
- Mine Methane Capture Projects
- Rice Cultivation Projects.

In addition to setting new quantitative limits on the use of offsets, AB 398 set new limits on the types of units that can fulfil compliance obligations. Starting with 2021 compliance obligations, no more than one half of any entity’s offset usage limit can come from offsets that do not provide direct environmental benefits in the state of California (DEBS). Projects located within California are 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 waters flowing through California. Recent regulatory amendments specify the criteria that will be used for determining DEBS.

Offset credits issued by jurisdictions linked with California (e.g., Québec) are eligible to be used to satisfy a California entity’s compliance obligation, subject to the quantitative usage limit.

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

Market Stability Provisions

**AUCTION RESERVE PRICE:** USD 17.71 per allowance in 2021. The auction reserve price, the minimum price at which allowances are available at auction, increases annually by 5% plus inflation, as measured by the Consumer Price Index.

**RESERVE:** Allowances from each annual cap were placed in an Allowance Price Containment Reserve (APCR) (1% from the 2013-2014 compliance period; 4% from the 2015-2017 compliance period; and 7% from the 2018-2020 compliance period). Until the end of 2020, these allowances populated three price tiers in equal quantities. AB 398 replaced the three tiers with a new structure of two tiers and a price ceiling starting in 2021. AB 398 also directed where remaining allowances from the earlier APCR would be distributed. Specifically, two-thirds of those allowances are spread evenly across the two new price tiers. The remaining one-third (which had been spread evenly across the original three price tiers), plus unsold allowances that have been transferred into the APCR (about 37 million to date), are placed in the price ceiling reserve. In addition, the Cap-and-Trade Regulation also sets aside portions of annual allowance caps for the two lower price tiers from 2021-2030.
Although no reserve sale has been held to date, CARB will offer a reserve sale when auction settlement prices from the preceding quarter are at least 60% of the lowest price tier. CARB will also offer a reserve sale just before the compliance obligation deadline, if requested by at least one covered entity.

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 metric tonne for metric tonne basis. Sales at the price ceiling will only be conducted if no allowances remain at the two lower tiers.

In 2021, the two cost containment reserve tiers and the price ceiling are set at USD 41.40, USD 53.20, and USD 65.00, respectively. Tier prices increase by 5% plus inflation (as measured by the Consumer Price Index).

Compliance

**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 1 November (or the first business day thereafter). Compliance instruments equal to all remaining emissions must be surrendered by 1 November (or the first business day thereafter) of the year following the last year of a compliance period.

**FIRST COMPLIANCE PERIOD:** 2013-2014

**SUBSEQUENT COMPLIANCE PERIODS:** Three calendar years (2015-2017, 2018-2020, and so forth)

**Monitoring, Reporting, Verification (MRV)**

**REPORTING FREQUENCY:** Annually

**VERIFICATION:** Emission data reports and their underlying data require independent third-party verification annually for all entities covered by the program.

**FRAMEWORK:** Reporting is required for most emitters at or above 10,000 tCO2e per year. They must implement internal audits, quality assurance, and control systems for the reporting program and the data reported.

**Enforcement**

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

Failure to meet the untimely surrender obligation as described above 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- or non-reporting under the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions.

Linking

**Links with other systems**

California linked with Québec’s ETS on 1 January 2014. The two extended their joint market by linking with Ontario on 1 January 2018 until the termination of Ontario’s system in mid-2018.
### Other Information

<table>
<thead>
<tr>
<th>Institutions involved</th>
<th>California Air Resources Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation / ETS review</td>
<td>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 different programs in the state’s portfolio approach to climate mitigation.</td>
</tr>
</tbody>
</table>

### Revenue

- **SINCE BEGINNING OF PROGRAM:** USD 14.24 billion
- **COLLECTED IN 2020:** USD 1.70 billion*

*Does not include revenue from auctioning of consigned allowances.

- **REVENUE FROM AUCTION OF CALIFORNIA-OWNED ALLOWANCES:** Most of California’s revenue goes to the Greenhouse Gas Reduction Fund, of which at least 35% must benefit disadvantaged and low-income communities. The fund also invests the proceeds in projects that reduce GHG emissions.

- **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 emissions reductions

### Implementing Legislation

- 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](https://www.cahb.ca.gov)
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