



An Overview of Key Program Design Elements for State Cap-and-Invest Programs

Patrick Cummins, Senior Policy Advisor*
Center for the New Energy Economy
Colorado State University

April 8, 2022

*Note: The author relied heavily on the [synopsis of Washington State's 2021 Climate Commitment Act – Senate Bill 5126](#) in drafting this report. Also, a number of my colleagues assisted with this report by providing informal peer review and comment.

Executive Summary

This executive summary highlights six key program design elements for state economy-wide cap-and-invest programs. Additional detail for these and other key program design elements is contained in the remainder of the report starting on page 4.

Cap-and-invest is a market-based approach to reduce climate pollution, comprised of two key components: 1) a limit (cap) on total greenhouse gas (GHG) emissions from covered sources, and 2) tradeable allowances that are mostly sold at auction by the state with auction proceeds invested in communities to advance clean energy, climate resilience, and environmental justice.

This approach offers the state several advantages, including: greater certainty that it will meet ambitious emission reduction targets; flexibility for businesses to most efficiently achieve the required emission reductions; and new revenues for investment in community projects that will accelerate the energy transition, increase climate resilience and support environmental justice priorities. A cap-and-invest program can be implemented after obtaining authorization for key program elements from the legislature, as necessary.

The six program components summarized below should be addressed by the legislation, along with a directive to periodically analyze program outcomes, including costs, emissions reductions and benefits for low-income households and overburdened communities.

Program Cap. A binding, declining limit on total greenhouse gas emissions (the cap) is the most essential part of the cap-and-invest program. It should be set to decline from current emission levels to science-based greenhouse gas reduction targets set by the state. Annual allowance budgets must be issued by the state to ensure the cap declines in line with emission reduction targets for 2030, 2040 and 2050 as established in authorizing legislation. The state must track, verify, and enforce compliance through the use of allowances issued by the state. Most allowances will be distributed through quarterly auctions with auction proceeds invested in communities to advance clean energy, climate resilience, environmental justice, and provide energy assistance to low-income households.

Program Coverage. Inclusion of all major emitting sectors is critical to meet economy-wide GHG reduction targets. Entities in the industrial, transportation, and energy sectors that emit at least 25,000 metric tons of carbon dioxide annually will be covered. Examples of covered entities include industrial manufacturing facilities, in-state electric generating facilities, distributors of electricity imported to the state, oil and gas systems, transportation fuel suppliers, and natural gas suppliers.

Allocation & Auction of Allowances. Legislation should clearly establish the state's authority to auction allowances and raise and expend auction proceeds subject to program rules and appropriation by the state legislature. Establishing rules for allowance auctions, including their frequency, allowance purchase limits, rules to prevent market manipulation, and no-cost

allowance allocation for certain entities are all necessary to ensure a functioning and efficient market that protects consumers.

The state would distribute allowances through (a maximum of) four quarterly auctions each year, at which allowances from the current compliance period would be sold along with allowances for future compliance periods.

The state/legislature may decide that some covered entities should be eligible to receive no-cost allowances, such as: a) energy-intensive, trade-exposed facilities, to avoid potential risk of emissions leakage; b) electric utilities, to mitigate cost burdens for consumers, particularly low-income consumers; and c) natural gas utilities, also to mitigate cost burdens for consumers. Electric and natural gas utilities should be required to consign their no-cost allowances for sale at auction with the auction proceeds dedicated to benefit their customers.

Offset Credits. Allowing a portion of a covered entity's compliance obligation to be met through offset credits increases flexibility and creates opportunities for investment in projects that can benefit communities—such as in natural and working lands. In developing policies for offset credits, the state must ensure all offsets are generated from projects that result in GHG reductions or removals that are real, permanent, quantifiable, verifiable, enforceable, and provide GHG reductions that are additional to those already required by law. The state may decide to prioritize offset credits that are developed by and benefit tribal communities. The state should also establish limits on the number of offset credits covered entities may use to meet their compliance obligations.

Climate Investment Account. State revenue from allowance auctions should be placed in a Climate Investment Account created in the state treasury and subject to appropriation. Rules and decisions regarding the use of these funds should be developed in consultation with residents, businesses, tribes and key interest groups. Use of funds should focus on projects that reduce GHG and co-pollutants, prioritize environmental improvement in overburdened communities; increase climate resiliency, deploy clean energy resources; invest in workforce development; improve energy affordability; and advance natural climate solutions. The state should establish minimum investment requirements for environmental justice communities, with a recommended minimum of 35% of auction revenue designated for projects led by and directly benefitting low-income and overburdened communities, with an additional percentage of auction revenue invested in programs and projects led by and directly benefitting tribal communities.

Environmental Justice Protections. The cap-and-invest program must be designed to deliver reductions in global greenhouse gas emissions and address locally harmful air pollution in overburdened communities. This should include the identification of overburdened communities and the pollution sources impacting their air quality, the deployment of air pollution monitoring networks, and the establishment of policies to limit emissions in overburdened communities.

Key Program Design Elements for a State Cap-and-Invest Program

Cap-and-invest is a market-based approach to reduce climate pollution which is comprised of two key component - (1) a declining limit (cap) on total greenhouse gas (GHG) emissions for covered sources, and (2) tradable allowances that are mostly sold at auction by the state with auction proceeds invested in communities to advance clean energy, climate resilience, and environmental justice.

In the United States, eleven Northeast and Mid-Atlantic states participate in the Regional Greenhouse Gas Initiative (RGGI), a cap-and-invest program for the electric power sector established in 2009. California began operating an economy-wide cap-and-invest program in 2013. California is linked with the Province of Quebec's cap-and-invest program through the Western Climate Initiative (WCI). The European Union Emissions Trading System has been in place since 2005. In 2021, the Washington State Legislature passed cap-and-invest legislation. Washington will launch their economy-wide cap-and-invest program in January 2023.

Greenhouse Gases

The United States Environmental Protection Agency (EPA) identifies carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride as GHGs as a result of their capacity to trap heat in the earth's atmosphere and contribute to climate change.

Cap-and-Invest Program

The state should seek a legislative directive to implement a cap-and-invest program to reduce GHG emissions, including emission reduction targets for 2030, 2040 and 2050. The state must set emissions budgets consistent these goals and track, verify, and enforce compliance through the use of allowances issued by the State. Allowances will mostly be auctioned by the State with auction proceeds invested to advance clean energy, climate resilience, and environmental justice. The authorizing legislation should firmly establish the state's authority to auction allowances and apply the allowance proceeds, subject to appropriation, to achieve the programs objectives.

Greenhouse Gas Reporting and Verification

The state must adopt rules requiring entities to report emissions of GHGs where those emissions from a single facility, or from electricity or fossil fuels sold in the state by a single supplier or local distribution company, meet or exceed 10,000 metric tons of carbon dioxide equivalent annually. Annual reports should include emissions data for the preceding calendar year and be submitted to the state by March 31st of the year in which the report is due. The reporting rules must support implementation of the cap-and-invest program.

The state must establish by rule the methods for verifying the accuracy of emissions reports, including by third-party verifiers certified by the state. Verification requirements apply at a minimum to:

- entities that are required to report GHGs, if those emissions equal or exceed 25,000 metric tons of carbon dioxide equivalent emissions, including carbon dioxide from biomass-derived fuels; or
- entities who have a compliance obligation under the cap-and-invest program in any year of the current compliance period.

The state may adopt rules to accept verification reports from another linked jurisdiction where the state deems the methods or procedures are substantively similar.

When an entity that holds a compliance obligation under the cap-and-invest program fails to submit an emissions data report, or fails to obtain a positive emissions data verification statement, the state may assign an emissions level for that entity.

The state may by rule include additional gases to the definition of GHG if the gas has been included in external GHG emission trading programs where the state has a linkage agreement in effect. The state must update its rules whenever needed to ensure consistency with emissions reporting requirements for linked jurisdictions.

Allowance Budgets and Timeline

Compliance periods will be three (or four) years in length and should extend through 2050. Prior to the start of each compliance period, the state will adopt by rule the annual allowance budgets for that compliance period.

The annual allowance budgets will be set at the level necessary to achieve the state's 2030, 2040, and 2050 emissions goals. The state may, by rule, adjust the annual allowance budgets as necessary to compensate for the use of offsets as compliance instruments so that offsets do not prevent the state from achieving its 2030, 2040, and 2050 emissions reduction goals.

An allowance distributed under the program does not expire and may be banked consistent with rules established for allowance holding limits (a restriction on the total number of allowances an entity may hold at one time).

One year after the end of the first compliance period, the state should submit to the legislature a report that evaluates the performance of the program, including costs and reductions of GHG emissions. Based on this evaluation, the state will establish allowance budgets for future compliance periods as necessary to achieve the established emission reduction goals. Subsequent evaluations must be completed every four years with allowance budgets established as necessary to achieve the emissions reduction goals for future years.

Covered and Participating Entities

Covered entities are required to register to participate in the program. At the beginning of the first compliance period, and for all subsequent compliance periods, a covered entity is an entity who has emissions equal to or exceeding 25,000 metric tons of carbon dioxide equivalent for:

- facilities;
- oil and gas systems based on aggregated emissions from wells, gathering and processing, and other equipment in a basin under common ownership or common control;
- electricity generated in the state;
- first jurisdictional deliverer importing electricity into the state from specified or unspecified sources;
- natural gas suppliers to non-covered entities; and
- fuel suppliers other than natural gas (e.g., gasoline and diesel fuel).

Emissions associated with fuel products produced in or imported to the state but which have a documented final point of delivery outside of the state, and which are combusted outside of the state, are excluded for purposes of program compliance.

Industrial gas customers who purchase gas from someone other than a covered natural gas company are responsible for those emissions, along with all other emissions from their facilities.

An opt-in entity is a non-covered entity that voluntarily registers for and participates in the program and is responsible for its GHG emissions. An opt-in entity is not eligible to receive no-cost allowances directly distributed to emissions-intensive, trade-exposed (EITE) industries, electric utilities, or natural gas companies under this program.

A general market participant is not a covered or opt-in entity, but may also voluntarily register in the program to purchase, trade, hold, sell, transfer, or retire compliance instruments. Federally recognized tribes and federal agencies may elect to participate in the program as opt-in entities or general market participants. The state must maintain a public roster of all covered entities, opt-in entities, and general market participants on its website.

The state must adopt rules and procedures for entities to register for the program.

Electric Utilities

The state will allocate no-cost allowances to all electric cooperatives (co-ops) and investor-owned utilities (IOUs) to mitigate the cost burden of the program on electricity customers.

In consultation with the PUC, the state will adopt rules for establishing the methods, schedules and procedures for the provision of these no-cost allowances to co-ops and IOUs consistent with their clean energy and emission reduction requirements. These allocations will decline each year consistent with the cap and also consistent with each utility's forecasted demand.

Allowances allocated at no cost to co-ops and IOUs must be consigned for sale at auction with auction proceeds used by the utility for the benefit of ratepayers, prioritizing low-income ratepayers.

Natural Gas Utilities

Natural gas utilities will also be allocated allowances at no cost for the benefit of their ratepayers. The state must set allocation schedules by rule, in consultation with the PUC, to allocate allowances to natural gas utilities, with the allocation declining over time consistent with the cap for each compliance period.

Allowances provided to natural gas utilities at no cost are for the benefit of their ratepayers and must be consigned for sale at auction with the auction proceeds used for the benefit of customers, prioritizing low-income customers. The utility may use the proceeds for actions such as weatherization, de-carbonization, energy conservation and energy efficiency services, and bill assistance. The customer benefits provided from allowances consigned to auction must be in addition to existing requirements in law.

Emissions Intensive, Trade-Exposed (EITE) Industries

Facilities owned or operated by a covered entity may receive an allocation of allowances at no cost if it is classified as an EITE industry. The state must adopt by rule objective criteria to identify EITE manufacturing businesses. The state must also adopt by rule a methodology to distribute allowances to facilities designated as EITEs in order to prevent emissions leakage. The methodology adopted by the state shall reflect the output of a facility, the emissions intensity of its production, the potential risk of leakage, and best practices for energy efficiency and emissions reductions for the industry.

If the actual emissions of an EITE facility exceed the facility's no cost allowances assigned in a compliance period, the EITE facility must purchase additional allowances for compliance. The state may limit offset credit use by an EITE facility if the no cost allowances plus offset credits exceed one hundred percent of total compliance.

A curtailed EITE facility can retain, but not trade, sell, or transfer, no cost allowances except to transfer those allowances to a new operator of the facility operating under the same industrial classification. All unused allowances must be transferred to the emissions containment reserve if an EITE facility becomes a closed facility.

Rules adopted by the state for allocation of allowances at no cost to EITE facilities must include protocols for allocating allowances from under the cap to an eligible facility built after the effective date of the program. These protocols must include consideration of pollutants produced by the facility, as well as local environmental and health impacts associated with the facility, with particular attention given to facilities located in overburdened communities. The protocols for allocating allowances to a new covered EITE facility built on tribal lands or determined to impact tribal lands or resources must be developed in consultation with affected tribal nations.

Auctions

The state should distribute allowances through four quarterly auctions annually. The auction may include allowances from the current year allowance budgets, future compliance periods, and allowances yet to be distributed from prior compliance periods. The state should engage a qualified, independent contractor to run the auctions. Additionally, the state must engage a qualified financial services administrator to hold and evaluate bid guarantees and to inform the state of the value of the bid guarantees when the bids are accepted.

Registered entities in good standing may participate in auctions. A registered entity must submit an application to participate and is only eligible to participate in an auction after receiving approval by the state. The state will require a bid guarantee in an amount greater than or equal to the sum of the maximum value of bids that will be submitted by the registered entity.

The state will establish auction purchase limits for registered entities and their direct corporate associations and will also specify holding limits that determine the maximum number of allowances that can be held for use or trade by a registered entity and their direct corporate associations at any one time.

The state must adopt rules to guard against bidder collusion and minimize the potential for market manipulation, including by engaging a qualified market monitor.

Allowance Trading and Tracking Compliance Instruments

The state must use a secure online electronic tracking system to register entities, issue compliance instruments, track ownership and transfers of compliance instruments, facilitate program compliance and support market oversight.

Compliance and Enforcement

All covered entities shall be required to transfer to a compliance account one allowance for every ton of greenhouse gas pollution, expressed as carbon dioxide equivalent, emitted during each compliance period. Compliance deadlines for each compliance period shall be established by rule and may include a requirement for annual transfers of allowances to cover a portion of emissions prior to the end of the compliance period.

All covered and opt-in entities must comply with the requirements for monitoring, reporting, holding, and transferring emission allowances and other provisions of the law. If a covered entity or opt-in entity fails to submit sufficient compliance instruments to cover its emissions, it must, within six months, submit a penalty of four allowances for every one allowance that is missing.

If a covered entity or opt-in entity fails to submit penalty allowances, the state must issue a civil penalty for each penalty allowance that is not submitted per day. The state should also issue a penalty per violation for failure to comply with program rules, and may issue higher penalties in cases of market manipulation. Such penalties shall be established by rule.

All monies from penalties should be deposited into the Climate Investment Account. Appeals of orders and penalties must be to the state's environmental enforcement authority. An electric utility or natural gas utility must notify its retail customers within three months of paying a monetary penalty for failure to comply with the requirements of the program.

Price Floor and Price Ceiling

To support a stable program, the state should adopt by rule an auction floor price for each year of the program. The auction floor price shall increase by a predetermined amount every year as established by rule. The state may not sell allowances at bids lower than the established auction floor price for any given year.

To help minimize price volatility and limit the potential for extraordinary prices, the state should adopt by rule an auction ceiling price for each year of the program. The price ceiling shall increase by a predetermined amount every year as established by rule to provide cost protection for facilities obligated to comply with the program. The state must issue price ceiling units for sale at the established price if no allowances remain in the allowance price containment reserve. Funds raised in connection with the sale of price ceiling units must be expended to achieve emission reductions to help preserve the environmental integrity of the emissions cap.

Allowance Price Containment Reserve

An Allowance Price Containment Reserve should be established as a mechanism to contain compliance costs in the event of unanticipated high costs for compliance instruments. Only covered and opt-in entities may participate in the auction of allowances from the Allowance Price Containment Reserve. The auction proceeds must be deposited in the Climate Investment Account.

The state must adopt rules to:

- hold auctions of allowances from the Allowance Price Containment Reserve when the settlement prices in the preceding auction approach the auction ceiling price;
- set the reserve auction floor price before the reserve auction and may establish multiple price tiers;
- establish the requirements and schedule for reserve auctions; and
- establish the amount of allowances to be placed in the reserve after the first compliance period ends.

Offset Credits

A portion of a covered or opt-in entity's compliance obligation may be met through offset credits from projects that result in GHG reductions or removals that are real, permanent, quantifiable, verifiable, and enforceable. Offset projects must be in addition to GHG reductions or removals otherwise required by law, regulation, or legally binding mandate, and that exceed any GHG reductions that would otherwise occur in a conservative business-as-usual scenario. Offset credits must be certified by a recognized registry authorized by the state.

The state must establish limits on use of offset credits by covered or opt-in entities to meet compliance obligations prior to the start of the program and must update offset credit limits before subsequent compliance periods. The state may establish separate limits on use of offset credits for projects on federally recognized tribal land, which shall not count toward other established offset credit limits.

The offset credit limits may be modified by rule to ensure statewide emissions limits are achieved and to align with linked jurisdictions. The offset credit limits may also be reduced for a specific entity if the state determines the covered entity has substantively contributed to, or is likely to substantively contribute to, the cumulative air pollution burden in an overburdened community.

The state must develop protocols for offset projects. The state must take into consideration the standards, rules, and protocols for offset projects and credits established by other jurisdictions with comparable programs. The state should also encourage opportunities for the development of offset projects in the state by adopting offset protocols that reduce transaction costs and make use of aggregation or other mechanisms to increase the development of offsets and carbon removal projects by landowners, including small forest and agricultural landowners.

The state must adopt a process for monitoring offset credits and invalidating offset credits that do not achieve actual emission reductions. If an offset credit is invalidated, the covered or opt-in entity must transfer replacement credits or allowances within six months. A covered or opt-in entity is subject to penalties established by rule if it fails to transfer replacement credits or allowances.

Offset credits used may not be in addition to or allow for an increase in established allowance budgets. Offset credits must be registered and tracked as a compliance instrument.

Assistance Program for Offsets on Federally Recognized Tribal Lands

To ensure a sufficient number of high-quality offset projects are available, the state may establish an assistance program for offset projects on federally recognized tribal lands. The assistance may include funding or consultation to assess a project's technical feasibility, investment requirements, development, and operation costs, expected returns, administrative and legal hurdles, and project risks and pitfalls. The state may provide funding or assistance upon request by a federally recognized tribe.

Linkage with Other Jurisdictions

The state should seek to enter linkage agreements with other jurisdictions with established allowance-based GHG reduction programs in order to broaden GHG emission reduction opportunities, reduce costs of compliance, enable unified tracking for compliance instruments, enhance market security, and reduce program administrative costs.

Linkage agreements must include provisions relating to auctions, floor and ceiling prices, purchase limits, holding limits, GHG reporting and verification, offset protocols, enforcement, penalties, program registry, compliance instruments, coordinated administrative and technical support, public notice and participation, and processes to withdraw from the agreement.

Before entering into a linkage agreement, the state must evaluate and make a finding whether the aggregate number of unused allowances in a linked program would reduce the stringency of the state's program and the state's ability to meet its emissions limits. The state must find that the linkage agreement meets certain criteria, conduct a public comment process to obtain input and review of the linkage agreement, and consider the input prior to finalizing a linkage agreement. The criteria must include:

- the linking jurisdiction has provisions to ensure distribution of benefits from the program to vulnerable populations and overburdened communities;
- a determination by the state that the agreement will not yield net adverse impacts to either jurisdiction's overburdened communities, relative to the baseline level of emissions; and
- linkage will not adversely impact the state's ability to achieve statewide emissions goals.

If the state determines a full linkage agreement is unlikely to meet the above criteria, it may enter into a linkage agreement with limitations.

The state retains all legal and policymaking authority over its program design and enforcement.

The state should request supplemental legislation if it finds any provision of the program prevents linking the state's program with another jurisdiction.

The Climate Investment Account

State revenue from allowance auctions will be placed in a Climate Investment Account created in the state treasury and subject to appropriation. Projects, activities, and programs eligible for funding from the account must be physically located in the state and may include the following:

1. reduce and mitigate GHG and co-pollutants in overburdened communities, including strengthening the air quality monitoring network to measure, track, and better understand air pollution levels and trends to inform analysis, monitoring, and pollution reduction measures;
2. reduce emissions from the transportation sector;
3. deploy renewable energy resources, distributed generation, energy storage, demand-side technologies and strategies, and other grid modernization projects;

4. increase energy efficiency or reduce GHG emissions of industrial facilities;
5. achieve energy efficiency or emission reduction in the agricultural sector, including grants, loans or financial incentives;
6. increase energy efficiency in new and existing buildings or promote low-carbon architecture;
7. promote electrification and decarbonization of new and existing buildings;
8. improve energy efficiency, including high-efficiency electric appliances and equipment for space and water heating;
9. assist with clean energy transition and assist affected workers or people with lower incomes during the transition to a clean energy economy;
10. grow and expand clean manufacturing capacity;
11. improve energy affordability and reduce energy costs for people with lower incomes and rural residents with a higher transportation fuel burden;
12. direct investment in workforce development;
13. allow the diversion of organic materials from landfills and waste to energy facilities or methane capture;
14. deploy carbon dioxide removal;
15. natural climate solutions that increase the state's water, land, and ecosystems resilience and their capacity for GHG emission reduction capacity through sequestration and storage; and
16. support efforts to mitigate and adapt to the effects of climate change.

A minimum of 35% of auction revenue should be invested in programs and projects that directly benefit low-income and overburdened communities in the state. In addition, an additional percentage of auction revenue should be invested in programs and projects that are led by and directly benefit tribal communities in the state.

Projects or activities funded from the account must meet high labor standards, such as paying family sustaining wages, providing benefits including health care and employer-contributed retirement plans, offering career development opportunities, and maximizing access to economic benefits from such projects for local workers and diverse businesses.

Program Evaluations

By (December 1, 2027), the state must issue a report based on an analysis of the first three years of the cap-and-invest program (assumes Jan 1, 2024 start date). This analysis must include the costs and benefits of the program, the total statewide costs of the program per ton of GHG emission reductions achieved, and an evaluation of the benefits of the program on low-income households and overburdened communities. The report must also identify all distributions from all accounts, including recipients of funding, amounts, purpose, end use, whether projects produce reductions in GHGs, and what percentage of auction revenue is invested in overburdened communities

The state must update the report on its website no less than once every three years.

Rules

The state must adopt rules to implement the program and may adopt emergency rules for initial implementation of the program and to ensure that reporting and other program requirements are determined early for the purpose of program design and early notice to registered entities with a program compliance obligation.

Environmental Justice Review

The state must conduct an environmental justice review every three years, with the first review completed by no later than one year after the end of the first compliance period to determine whether the cap-and-invest program has achieved reductions in GHG emissions and locally harmful air pollutant emissions in overburdened communities highly impacted by air pollution. The state shall identify the stationary and mobile sources that are the greatest contributors of emissions in overburdened communities and determine whether emissions have increased, decreased, or remained the same. The state must deploy an air monitoring network in high priority overburdened communities to collect sufficient air quality data for the review and subsequent reviews.

Additional Requirements for Sources Adversely Affecting Overburdened Communities

The state may require a facility to meet a mass-based, facility-level cap on greenhouse gas emissions if the facility is determined to be contributing substantively to the cumulative air pollution burden in an overburdened community. Facility-level caps apply to individual facilities. Emission levels from these facilities must be below the cap to be in compliance with the program. Facilities with facility-level caps shall be prohibited from using offset credits to meet any part of an annual compliance obligation or compliance period obligation.