

**Comparison of Cap-and-Trade Programs:
California, Ontario, Quebec and Oregon SB 1070***

	California's cap-and-trade program	Ontario's cap-and-trade program	Quebec's Carbon Market	Oregon Senate Bill 1070
Population	38 million	14 million	8 Million	4 million
Gross Regional Product	US \$2.6 trillion	US \$763 billion	US \$380 billion	US \$227 billion
Participating Jurisdictions	California, Quebec & Ontario	California, Quebec & Ontario	California, Quebec & Ontario	Designed to connect with California, Quebec & Ontario
Greenhouse Gases Covered	Carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O), sulfur hexafluoride (SF ₆), perfluorocarbons (PFCs), nitrogen trifluoride (NF ₃), other fluorinated greenhouse gases	Carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride, nitrogen trifluoride and other such contaminants as may be prescribed by regulation	Carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O), sulfur hexafluoride (SF ₆), perfluorocarbons (PFCs), nitrogen trifluoride (NF ₃), other fluorinated greenhouse gases	"Greenhouse gas" includes, but is not limited to, carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride and nitrogen trifluoride
Sectors Covered	Electricity (including imports) and industry in 2013; plus ground transportation and heating fuels in 2015	Electricity (including imports), industry, and certain fuel suppliers and distributors	Electricity (including imports) and industry in 2013; plus ground transportation and heating fuels in 2015	Air contamination source as defined in ORS 468A.005, electricity (including imports), fossil fuels that generate greenhouse gases when combusted, all beginning in 2021
Emissions Threshold	Emitters of at least 25,000 metric tons CO ₂ e annually, except for electricity imports for which the threshold is essentially 0	A facility or natural gas distributor that emits 25,000 tons or more of greenhouse gas emissions per year, or a fuel supplier that sells more than 200 litres of fuel per year	Emitters of at least 25,000 metric tons CO ₂ e annually, except fuel importers for which threshold is much lower to prevent small importers crossing the Western border avoiding the program	25,000 metric tons for all sources (a higher threshold for imported power than CA and a higher threshold for fuel importers than Quebec)
Target	Approximately 40% below 1990 emissions by 2030	37% below 1990 by 2030 Interim targets may be established	37.5% below 1990 levels by 2030	45% below 1990 levels by 2035
Status	First auction on November 14, 2012; compliance obligations began January 1, 2013	Compliance obligation began January 1, 2017. Linkage with Quebec and California is now established to begin in 2018	Compliance obligations began January 1, 2013	n/a
Allocation Method¹	Mixed – some free allocations for industry;	Enabling legislation authorizes Minister to distribute allowances registered participants in	Free allocation for some sectors, auctions for others	Similar to California; mixed – some free allocations for

¹ See information on recent changes to leakage calculations in California on page 3.

* This chart was published in the [California Cap-and-Trade Program Summary](#) by the Center for Climate and Energy Solutions (January, 2014) and has been updated to reflect recent changes in WCI jurisdictions and the provisions of Oregon Senate Bill 1070 by the Oregon Legislative Policy and Research Office staff (October, 2017).

	full auction for fuels, consignment for utilities	accordance with regulations either free of charge or at auction. Requires Minister to describe by 1/1/2021 how free allowances will be phased out.		industry; full auction for fuels, consignment for utilities
Price Floor at Auction	\$10 per metric ton for both 2012 and 2013 before rising 5% per year (plus inflation) starting in 2014	Will need to be identical to CA & QC	\$10 per metric ton price floor starting in 2012 and rising 5% for each year thereafter (plus inflation)	Will need to be identical to CA & QC
Affiliations	Helped establish Western Climate Initiative in 2007	Joined Western Climate Initiative in 2008	Joined Western Climate Initiative in 2008	Joined Western Climate Initiative in 2008
Linkage Status	Linked with Quebec starting in 2014	Linking with California and Quebec in 2018	Linked with California in 2014	Would enable linking with WCI
Offset Limit	Offsets can now account for 8% of a regulated entity's compliance obligation; changing to 4% for 2021-2025, and 6% for 2026-2030. Post-2020, one-half of offsets must come from inside CA.	Can account for 8% of a regulated entity's compliance obligation	Can account for 8% of a regulated entity's compliance obligation	Can account for 8% of a regulated entity's compliance obligation, however this can be reduced for entities in impacted communities
2013 Offset Use Limit - Millions of Offset Credits	13	N/A	2.1	N/A
Types of Offset Categories	<ul style="list-style-type: none"> 1) U.S. forest and urban forest project resources; 2) Livestock projects; 3) Ozone depleting substances projects; 4) Urban forest projects 	<p>Developing 11 new offset protocols tailored to Ontario. Has retained Climate Action Reserve to develop up to 13 protocols; 3 priority projects types: landfill gas capture and destruction, ozone depleting substances capture and destruction, and mine methane capture and destruction. Other protocols to include: afforestation and reforestation, anaerobic digestion (organic waste and manure), conservation cropping, emission reductions from livestock (enteric), forest (avoided conversion and improved forest management), grassland, N₂O reductions from fertilizer management, organic waste management, refrigeration systems, urban forest</p>	<ul style="list-style-type: none"> 1) Covered manure storage facilities – CH₄ destruction; 2) Landfill sites – CH₄ destruction; 3) Destruction of ozone depleting substances (ODS) contained in insulating foam recovered from appliances. Developing 11 new offset protocols tailored to the environmental and economic landscape in Quebec 	Directs Oregon to develop standards in a manner that allows DEQ to explore and encourage opportunities for development in Oregon

Leakage – Recent Changes in California

For background on emissions leakage, see “[Considerations for Designing a Cap-and-Trade Program in Oregon, Department of Environmental Quality, February 14, 2017, pages 38-39.](#)”

The original metrics for determining emissions leakage risk (trade exposure and emission intensity) in California have been modified by recent changes to the regulation, as discussed below. The final regulation order which contains all recent changes made to the cap-and-trade program can be found here: <https://www.arb.ca.gov/regact/2016/capandtrade16/ctfinro.pdf> For a specific discussion of the changes California Air Resources Board staff considered and implemented to industry assistance factors due to the leakage studies conducted, see this attachment: <https://www.arb.ca.gov/regact/2016/capandtrade16/attachb.pdf>

The formula for allocation to prevent leakage is generally summarized as:

$$\text{Allocation} = \text{AF} \times \text{B} \times \text{C} \times \text{O}$$

Where:

- AF is the assistance factor given to a particular level of leakage risk;
- B is the industry benchmark
- C is the cap adjustment factor to reflect the declining overall emissions cap; and
- O is the entity-specific output

The assistance factor declines over time for some industries that are deemed low or medium risk for leakage. Three studies of potential emissions leakage in California were completed in 2016 and staff have made some changes to the metrics used to determine leakage risk for the program post-2020. The primary change appears to be that staff are now calculating assistance factors and leakage risk based on a summation of an international assistance factor to minimize potential international leakage and a domestic assistance factor to minimize potential domestic leakage. Both components range between zero and 100 percent and are summed to yield the total assistance factor for a sector. Determining each part of the new assistance factor formula requires a separate set of calculations which are based, in part, on the studies of emissions leakage that California ARB commissioned.