

result in both construction- and operational-related impacts out-of-state; however, these changes would again generally be expected to occur within existing industrial areas. Consequently, public services impacts resulting from compliance responses to a carbon fee or tax would be less than significant.

Recreation impacts of Alternative 4 would be less than significant, because compliance responses to the fee or tax would occur at existing facility sites. The carbon fee or tax, including the expected compliance responses, would not result in increased demand for or adverse impacts to recreation resources. The affected entity compliance responses consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities in the state. Leakage issues could result in both construction- and operational-related impacts out-of-state; however, these changes would again generally be expected to occur within existing industrial areas. Consequently, recreation impacts resulting from compliance responses to a carbon fee or tax would be less than significant.

Adverse transportation impacts could occur from Alternative 4, because of the potential for substantial leakage of operations to other states for sectors subject to the fee or tax, resulting in the potential need for additional transportation of affected products. Under this alternative, compliance responses by covered entities could include fee or tax payment, but also upgrading equipment, switching to lower intensity carbon fuels, curtailing operations because of increased cost, and implementing maintenance and process changes at existing facilities. Implementation of this Alternative would not be anticipated to result in adverse transportation or traffic impacts because no major traffic-generating construction- or operational-related activities would likely occur. If such were to transpire, any increases due to construction traffic would be temporary and mitigated through ingress and egress controls, traffic controls, and reduced speed zones to ensure safety; and operational traffic levels would be similar to existing conditions. Thus, these impacts would be considered less than significant. However, under this alternative, leakage issues could result in both construction- and operational-related impacts out-of-state due to the generation of traffic. Unless administrative mechanisms are in place to minimize the potential for leakage, implementation of this Alternative could result in adverse transportation impacts out-of-state associated with construction- (e.g., use of heavy-duty equipment) and operational-related (e.g., relocated facilities). However, with such mechanisms in the design of the alternative, impacts to transportation would be reduced to a level of insignificance.

Utility and service system impacts of Alternative 4 would be less than significant, because compliance responses to the fee or tax would occur at existing facility sites where utility systems are already provided. Under this alternative, compliance responses to the fee or tax by affected entities could include the fee or tax payment, but also upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities. These projects would not increase the level of utilities beyond that already provided to existing facilities. The availability and extension of utilities is subject to approval of the local utility provider, and readily implemented in a manner that would be less than significant. Leakage

issues could result in both construction- and operational-related impacts out-of-state; however, these changes would again generally be expected to occur within existing industrial areas. Consequently, utility and service system impacts resulting from compliance responses to a carbon fee or tax would be less than significant.

2.7 Alternative 5: Adopt a Variation of the Combined Strategies or Measures

Goal of Alternative 5

The goal of Alternative 5 is to describe a reasonable variation of the components of the Proposed Scoping Plan reduction measures. It is intended to help decision-makers consider whether modifying the mix of reduction strategies would reduce or otherwise substantially change potential effects on the environment.

Role of Alternative 5 in the Range of Alternatives

The role of Alternative 5 in the range of alternatives is to assess whether the number and magnitude of environmental effects would be sensitive to varying the mix of reduction measures. Instead of adopting all the reduction measures in the Proposed Scoping Plan or a set of measures oriented to a specific, primary strategy (e.g., Cap-and-Trade, source-specific regulation, or carbon fee or tax, as described in other action alternatives), ARB could adopt some of the measures or a different mix of them. Numerous variations could be implemented when considering different subsets and/or combinations of the measures identified in the Proposed Scoping Plan. It is not feasible or meaningful to examine the numerous potential Alternative combinations in detail; too many different permutations exist. However, identifying a reasonable, Alternative combination of measures would illustrate whether the number and magnitude of environmental effects would be influenced substantially by altering the combination of measures.

Precedents or Examples of the Approach in Alternative 5

British Columbia

British Columbia has prepared a Climate Plan and is developing a multi-faceted climate program that includes comprehensive strategies and initiatives that will substantially reduce GHG emissions by 33 percent by 2020. The Climate Plan program includes some measures that are in the Proposed Scoping Plan, but differs in other substantial ways. British Columbia's Climate Plan includes a carbon tax, which has been in place since 2008, and a proposed cap-and-trade program that will be voted on in the near future. Incentive programs for energy efficiency are already being implemented. The carbon tax is applied to all fuels, except for bunker, aviation and marine vessel fuels. The cap-and-trade program would cover industrial sources and electricity. In-province electricity is generated largely from hydro and biomass facilities. Similar to California's proposed Cap-and-Trade Regulation, biomass emissions are exempted.

The Climate Plan positions British Columbia to benefit from growth in demand for high technology and clean energy products and services while addressing climate action in four key areas:

- Entrenching GHG reduction targets in law.
- Taking targeted action in all sectors of British Columbia's economy.
- Taking steps to help British Columbians adapt to the realities of climate change.
- Educating and engaging British Columbians on climate action.

The Plan highlights the revenue-neutral tax on pollution as a significant piece of climate action legislation which requires industry and individuals alike to pay the same rate on the purchase and use of fossil fuels. As a result of the Carbon Tax, individual British Columbians will see their personal income taxes reduced by two percent in 2008, rising to five percent in 2009 on taxable income up to \$70,000. This will mean British Columbians pay the lowest provincial income tax on earnings up to \$111,000. Every dollar raised by the revenue-neutral carbon tax will be returned to individuals and businesses through tax reductions. Failure to do so will result in a financial penalty for the Minister of Finance.

The Plan describes the three-year, \$60 million LiveSmart BC Efficiency Incentive Program, and lays out strategies specific to seven sectors:

- Transportation – Improved vehicle efficiency, vehicle scrapping, less tax on efficient vehicles, cleaner buses and trucks, reduced fuel carbon and expanded transit and cycling.
- Buildings – A Green Building Code, Energy Efficient Buildings Strategy, encouraging compact, green communities, and solar roofs on 100,000 BC buildings.
- Waste – Turning waste into energy, cleaning up landfills, increased composting, and making manufacturers more responsible for waste created by their products.
- Agriculture – Digesters to capture methane from manure, improved fertilizer application, community biomass projects, research on biomass fuels and green city farms.
- Industry – A carbon emissions cap-and-trade system to provide an incentive for large emitters to reduce their emissions, often by implementing made-in-BC solutions.

- Energy – PowerSmart incentives, a First Nations and remote community clean energy, Alternative energy development, solar energy, smart meters, BC Bioenergy Strategy.
- Forestry –Forests for Tomorrow, Trees for Tomorrow, accelerated forest growth and net-zero deforestation, bio-mass energy and cellulosic ethanol production (British Columbia 2008).

Stakeholder Contributions

During the Proposed Scoping Plan development, several committees and stakeholder groups offered recommendations for different approaches, including a “three-faceted approach”, which involved a combination of regulations and standards, incentives, and a price on carbon (i.e., a carbon fee or tax). Also proposed was a mix of approaches that includes performance standards, a price on carbon, and targeted incentives. Although the attributes of Alternative 5 are not the same as the committees’ recommendations, they serve as an example of a variation in the mix of strategies to consider when defining the reasonable set of measures included in Alternative 5.

Attributes of Alternative 5

Alternative 5 represents a suite of strategies rather than a single alternative. Instead of adopting all the measures identified in the Proposed Scoping Plan, ARB could adopt some of them or a different mix of them. Numerous alternatives exist to adopt various subsets and mixes of the measures identified in the Proposed Scoping Plan, and for the purposes of this analysis, ARB considered taking a three-faceted approach to reducing GHGs: a cap-and-trade system, a combination of regulation and standards, and putting a price on carbon via a carbon fee or tax. Further, for purposes of comparison, ARB examined a mix of traditional regulations, such as a direct regulation for light duty vehicles; a Cap-and-Trade Program for large sources that covers large stationary sources, electricity, refineries, and cement; and a fee on emissions from fuels not under Cap-and-Trade that includes transportation fuels and commercial and residential combustion.

Attributes of each component of this Alternative are individually described in Alternatives 2, 3, and 4.

Alternative 5 builds upon the No-Project Alternative (Alternative 1) by adding:

- a direct regulation that has been defined as technologically feasible and is expected to be cost-effective;
- a cap-and-trade approach for large industrial sources and electricity generation; and
- carbon fees on the transportation, commercial, and residential fuel sectors.

The application of a set of regulations, fees, and a Cap-and-Trade Program to other combinations of source categories is possible. The approach was selected based on the following reasoning:

- Direct regulations are preferred in cases where there is a high likelihood that cost-effective emission reduction technologies can be applied in a relatively uniform manner across the spectrum of sources affected.
- A cap-and-trade approach is most appropriate for those sources that are not good candidates for direct regulation, but can exercise a substantial degree of control over their emissions and/or usage in response to a cap-and-trade system. Under this approach facility operators have the flexibility to weigh the cost of reductions versus the cost of obtaining emission allocations and chose the less costly compliance option.
- A carbon fee approach is most appropriate for the remaining fuel combustion-related categories. In these categories, the regulated entity, such as a supplier of transportation fuels, has limited influence over the amount of fuel consumed. Under these conditions the principal impact of a cap-and-trade approach would be to gain reductions because as fuel prices increase to reflect the cost of carbon allowances. As described in Alternative 4, a fee approach would incentivize reductions in GHG levels, but the level of that reduction is less than certain than a cap.

Because most of the sources that could be best governed by direct regulations and meet the criteria described above are already included in Alternative 1, the new direct regulation element of Alternative 5 is limited to one major regulation, the ARB's advanced clean cars program. This program consists of strengthening clean cars standards for new vehicles produced between 2017 to 2020 to achieve an additional 3.8 MMTCO₂E of reductions by 2020.

The second element of Alternative 5 would be the application of a cap on the large source emission sector which consists of larger industrial sources and electricity generation facilities. (See Alternative 2 for more detail on the cap-and-trade approach) Collectively these sources are projected to emit about 192 MMTCO₂E in 2020 in ARB's most recent baseline forecast (ARB 2010e). Measures included in Alternative 1 are estimated to reduce emissions in 2020 to about 172 MMTCO₂E. The cap for the sources covered by the second element would be set at about 157 MMTCO₂E in order to meet the 2020 emissions limit (427 MMTCO₂E) established pursuant to AB 32. The derivation of the level of the cap is predicated on obtaining 7.2 MMTs from other elements of Alternative 5 (see Table 2.7-1 for more detail).

The final element of Alternative 5 would be the application of an emissions fee on transportation fuels, residential and commercial fuels and on fuels used by smaller industrial sources not subject to the cap. (See Alternative 4 for more detail on the emission fee approach.) Collectively, these sources are projected to emit about

229 MMTCO₂E in 2020 in ARB's most recent baseline forecast. Measures included in Alternative 1 and from an advanced clean cars program are estimated to reduce emissions in 2020 to about 204 MMTCO₂E. Under these elements, an emissions fee of \$50 per MT would be assumed, and is estimated to produce reductions on the order of 1.7 percent – about 3.4 MMTCO₂E in 2020. Table F-12 in Appendix F of the Cap-and-Trade Regulation statement of reasons estimated that a \$60 per MT allowance price would produce a 2 percent decrease in gasoline use (ARB 2010a). Based on this information, an estimated reduction of 1.7 percent was made for a \$50 per MT fee. A similar percent reduction was assumed for all transportation fuels and for natural gas usage, as well.

The emission reductions and remaining emissions estimated from implementing Alternative 5 are shown below in Table 2.7-1.

Table 2.7-1 Summary of Emission Effects from Alternative 5

Strategy Category	2020 Emissions MMTs(1)	Emission Reductions MMTs - 2020	Remaining Emissions in 2020
Direct Regulation (Advanced Clean Cars)		3.8	N/A
Sources in Cap & Trade	182	15	167
Fuels Subject to Fees	204	3.4	197(2)
Remaining Sources(3)	63	None	63
Totals	449	22.2	427

Notes:

¹ After measures included in Alternative 1 are accounted for and rounded to no more than three significant figures.

² Includes reductions from direct regulations, Advanced Clean Car Program.

³ Includes high GWP gases, Agriculture and Forestry.

Collectively, the elements in Alternative 5 are designed to achieve the 2020 emission target set by AB 32.

Alternative 5 Impact Discussion

Objectives

Alternative 5 would be expected to be able to meet the fundamental objective of reaching the 2020 emissions reduction target. The Proposed Scoping Plan Cap-and-Trade Program was designed to reduce GHG emissions by 18 MMTCO₂E, so achieving a contribution of 15 MMTCO₂E in this Alternative would also be feasible. The advanced clean car program has received initial evaluation by ARB sufficient to support the feasibility of a 3.8 MMTCO₂E contribution. The application of a carbon fee to transportation fuels is estimated to secure a 3.4 MMTCO₂E contribution, which is only 1.5 percent of the current emissions from that sector. It would be reasonable to expect that this combination of measures could achieve the 2020 GHG reduction target.

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