CalFACT
Californians
For A Carbon Tax

April 10, 2017
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: 2030 Target Proposed Scoping Plan

Dear CARB and other stakeholders,

Thank you for the opportunity to comment on the CARB 2030 Target Proposed Scoping Plan.[1]

Californians for a Carbon Tax (CalFACT) is a grassroots, citizen-led effort to promote equitable, efficient, and effective carbon pricing in California.

CalFACT supports the efforts of the of the Environmental Justice Advisory Committee and the Environmental Justice community and has signed on to their Declaration in Support of Carbon Pricing Reform in California[2].

We applaud CARB for considering multiple options for carbon pricing in the Proposed Scoping Plan. We think it is critical for all California legislators and stakeholders to have enough information and analysis to adequately compare the available carbon pricing options.

We believe that a steadily rising carbon tax would provide the best carbon pricing mechanism for California to meet its climate reduction goals for 2030 and 2050.

A carbon tax implemented as far upstream as possible can cover emissions from fossil fuels throughout the economy. A predictable, annually-rising carbon price that is embedded in the price of all goods will motivate consumers to reduce costs, which will in turn reduce emissions. Even more, it will motivate investors and businesses to make the short- and long-term investments in infrastructure that will transition our economy towards sustainable clean energy.

We also believe that rebating a significant portion of the revenue from a carbon tax to California households is essential to its success. Not only would a rebate protect low-income and vulnerable populations from price increases, but it would maintain political support for the program even as the carbon price increases to the level needed to reach our emissions reduction targets. Furthermore, such a rebate will both stimulate the economy and create local jobs as people spend their money in their local communities.

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[1] https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf

[2] https://www.arb.ca.gov/cc/ejac/meetings/01182017/20170112ca_ej_declaration_on_carbon_pricing_reform.pdf

Below we offer a supplement to the information you provide on the Carbon Tax Alternative. We hope that you will incorporate these concepts into the next version of the Scoping Plan. First, we provide additional criteria by which we think the scoping plan scenarios should be evaluated. Then we provide an alternative version of Alternative 2: A Carbon Tax, so that it presents a more complete picture of what an effective carbon tax alternative might look like for California.

We also encourage CARB to include greater analysis of the effectiveness of the current cap-and-trade program in California, as well as cap-and-trade in the European Union and in the Northeast, under the Regional Greenhouse Gas Initiative. Recent analysis shows that the primary emission drivers in those areas have not been cap and trade but: (1) the economic recession of 2009 and long-term shifts in economic structure, such as the decline of manufacturing; (2) impact of “complementary” regulatory programs that encourage or even mandate renewables and energy efficiency, which undermine cap and trade; and (3) structural changes in energy economics—the expansion of the production of natural gas, which is displacing coal in the electric generation market, and the ongoing rapid decline in renewable costs.

We provide a detailed analysis on some of the challenges of cap-and-trade in Appendix 1.

We also provide additional information on the effects of British Columbia’s Carbon Tax in Appendix 2.

In the interest of providing the most complete and even-handed analysis to the California legislature and the public as you revise the Scoping Plan, leading to sound public policy, we ask you to consider this input.

Thank you again for this opportunity to engage in this process and for all of your work in helping California meet our climate goals.

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# Policy Analysis of Proposed Scoping Plan Scenario

In Section II-C of the Proposed Scoping Plan, CARB outlines the key criteria that it uses to evaluate potential policies.

We suggest that CARB add these important criteria as it evaluates the potential policies:

1. **Protect low-income and vulnerable households from price increases** - The program should be designed to protect low-income households from unaffordable price increases.

2. **Carbon Price Predictability** - Large fluctuations in carbon prices could be detrimental to the California economy and potentially undermine the support for GHG emissions reductions programs. Price predictability can help businesses, investors, and consumers more confidently commit to low carbon capital investments, which will create incentives for reductions well ahead of actual price increases.

3. **Revenue Predictability** - Revenue from carbon pricing is being used for a wide variety of GHG emissions reductions programs that also provide numerous co-benefits. To the extent such revenue continues to be used for these purposes, having it be predictable from year to year allows for better budget planning and opens the potential for the State to issue low-interest, highly-rated bonds against future revenue.

4. **Alignment of Carbon Pricing with Complementary Policies** - The carbon pricing program should support complementary GHG reduction policies and vice versa, by aligning incentives and promoting additional reductions.

We believe that including the above criteria will help CARB and the Legislature better assess the likelihood of the long-term viability of the options outlined in the Scoping Plan.

Below, in the section “Evaluation Based on Criteria,” we provide our analysis of the Plan Alternatives as they relate to these criteria in addition to the ones already included in the Scoping Plan.

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## Alternative 2: Carbon Tax - A Different Take

*In Proposed Scoping Plan section II-D-2, CARB evaluates the potential policy of a carbon tax to replace the current cap-and-trade program, which it refers to as Alternative 2. Below is our discussion of this alternative, which includes both a different policy suggestion and some further analysis of the option.*

The scenario CARB outlines for Alternative 2 includes the known commitments described in Section A of the Scoping Plan, a mandated 20 percent reduction in GHG emissions at refineries, and a carbon tax in lieu of the post-2020 Cap-and-Trade Program.

A cap-and-trade program and a carbon tax are both carbon pricing mechanisms, but there are important differences. A cap-and-trade program sets an emission cap so that the maximum allowable GHG emission level is specified and covered entities will have to reduce GHG emissions.

With a carbon tax, a price is set per ton of GHG emissions that is paid directly to the state. A carbon tax could be assessed either upstream (at the coal mine, oil well, or fracking site), mid-stream (at the power plant or oil refinery), or downstream (at the gas pump or the meter). To be as comprehensive as possible, and for simplicity's sake, a carbon tax should be levied as far upstream as possible. For this analysis, we assume the tax is levied (1) on fossil fuels as they enter the state economy from mines and wells, or when they cross the state border, and (2) on any electricity imported from outside of the state.

With a carbon tax, there is no specific limit to the actual amount of GHG emissions either at a single source or in the aggregate. Instead, the tax functions as an economic incentive, in the same way that the state of California uses taxes to reduce tobacco consumption. The tax could be calibrated to increase predictably so as to meet or exceed the state emissions targets, based on the best economic modeling available. A carbon price that starts low and increases steadily can provide a clear market signal to consumers, businesses, investors, and innovators. Under such a tax, long-term capital investments in emissions reductions technology can be evaluated with confidence.

A chief criticism of the carbon tax approach is that it does not provide the same level of certainty for GHG reductions as does cap-and-trade. For greater emissions certainty, mechanisms could be included such as an ongoing review and adjustment of tax price levels or additional regulations that would automatically go into place if targets are not being met. For example, statewide emissions could be reviewed annually and emissions models adjusted with updated data. If emissions are falling too slowly to reach the targets, ARB could implement a faster rate of increase for the carbon price. This would sacrifice some amount of price predictability but would still be far more predictable than pricing under cap-and-trade.

If emissions were dropping faster than needed to meet the target, there may be no need to adjust prices. Lower emissions are a desired goal of the program, as long as this outcome does not causing damage to the California economy. With a program that returns much of the carbon tax revenue to the public, a higher price does not lead to economic problems; rather, a higher price can stimulate the state's economy through greater consumer spending and by encouraging locally produced clean energy over fossil-fuel-based energy imported from out of state.

A carbon tax would provide compliance flexibility, as it does not mandate specific actions, and it provides a funding source that could be used to fund Greenhouse Gas Reduction Fund (GGRF) programs or other programs. Moreover, this alternative could provide air-quality and public health benefits via direct emissions reductions if the carbon tax is set appropriately to reduce GHGs, since the tax would apply directly and unavoidably to the physical facility emitting the pollutants, with no chance to shift the mitigation to other locations via trading or offsets.

AB32 requires CARB to address issues of emissions leakage and trade exposure. To the extent that leakage may occur with a carbon tax, the ideal solution is a border adjustment where emissions intensive imports are assessed a fee equivalent to products produced in state. While there are some concerns about whether this would violate the Commerce Clause, there are solid arguments that such adjustments are possible given California's existing Low-Carbon Fuel Standard.[3]

Absent a border adjustment, another system could be used to address leakage that may occur. As with the cap-and-trade program, any such adjustments would need to consider the role any exempt sector is expected to play in the long run, as supporting high carbon intensive businesses or the fossil fuel industry may not align well with the State's long-term climate goals. Ideally, any such adjustment options would still allow for the carbon price to provide a clear incentive for businesses in these sectors to reduce their emissions. Adjustments could potentially be provided via lower taxes to these sectors (or all sectors)[4] or via a rebate, based on a business's share of employment[5]. This would level the playing field for California businesses competing with businesses outside the state while still providing a strong incentive to reduce emissions.

Linkage with other jurisdictions pursuing carbon pricing, whether cap and trade or carbon tax, can be easily achieved through harmonization of carbon prices. This is being demonstrated in Canada where the various provinces, at their own election, are taking one or the other path, coordinated by a national price target. A carbon tax would better support the goal of creating greenhouse gas reduction programs that can be readily exported to other jurisdictions. Because

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[3] https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2925409
[4] As was proposed in the I-732 ballot initiative in Washington: https://yeson732.org/legal-language/
[5] As is proposed in a bill submitted in Massachusetts: http://climate-xchange.org/massachusetts-campaign/about-the-bill/

carbon taxes are much simpler to design and implement than cap-and-trade programs, and far more transparent, they can be easily emulated by other jurisdictions, including countries that may have a history of susceptibility to corruption because they lack the strong regulatory infrastructure that California enjoys. Eliminating direct, programmatic linkages with other cap-and-trade programs would support the goals of direct GHG emissions reductions as outlined in AB197.

While the Clean Power Plan (CPP) allows a cap-and-trade system, a carbon tax policy is also specifically allowed: "The EPA also notes that the state measures plan type could accommodate imposition by a state of a fee for CO2 emissions from affected EGUs, an approach suggested by a number of Commenters."[6] Some analysts believe that a carbon tax alone can be sufficient to meet EPA standards if sufficient modelling is provided, while others suggest the EPA would require a back-up compliance mechanism. Such a mechanism could be devised if necessary for any emitters covered by the CPP.[7]

The Proposed Scoping Plan refers to the carbon tax in British Columbia (BC) as an example of a carbon tax policy already in place, so it is worth examining in more detail. The tax started in 2008 at a level of $10 CAD per metric ton of CO2 and increased by $5 CAD in each of the next four years, reaching $30 CAD in 2012. The recession in 2008 makes it difficult to accurately evaluate the success of the tax, but studies show an overall 6.1% reduction in emissions in BC compared with a 3.5% overall *rise* in emissions for the rest of Canada. Per capita reductions in emissions in BC were 3.5 times the rate in the rest of Canada.[8]

The carbon tax was frozen at $30 CAD in 2012. Therefore, its impact has been diminished in later years. A progress report issued by the BC government stated, "Some policies lose effectiveness over time if they are not updated. For example, the carbon tax impact effectively diminishes if the rate remains unchanged, as inflation dampens the price signal." Because the tax is capped at $30/MT, BC is not on track to reach its 2020 emissions reduction targets. BC's Climate Action Leadership Team recommends ending the freeze and increasing the tax by $10 CAD annually until 2050 to reach 80% reductions below 2007 levels. Rather than illustrate the ineffectiveness of carbon taxes, BC's experience illustrates the importance of maintaining a steadily increasing rate.

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[6] See Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; Final Rule - Page 176 - https://www.gpo.gov/fdsys/pkg/FR-2015-10-23/pdf/2015-22842.pdf
See also:
http://www.c2es.org/federal/executive/epa/q-a-regulation-greenhouse-gases-existing-power#comply
https://www.brookings.edu/opinions/to-comply-with-the-clean-power-plan-states-should-tax-carbon/
http://www.c2es.org/newsroom/articles/carbon-trading-under-clean-power-plan

[7] https://www.c2es.org/newsroom/articles/carbon-trading-under-clean-power-plan

[8] British Columbia's Carbon Tax: By the Numbers - https://www.carbontax.org/wp-content/uploads/CTC_British_Columbia%27s_Carbon_Tax_By_The_Numbers.pdf To provide a fair comparison, these figures exclude the electricity sector where a carbon tax could have little effect due BC's almost complete reliance on hydroelectricity.

While a full analysis and modelling would need to be done to design the proper carbon tax, tools are available from REMI to provide sufficient modelling[9]. CalFACT suggests that a carbon tax starting in 2020 at $30 and initially increasing at $10/year, with future increases adjusted by CARB if needed, would allow California to reach its 2030 emissions targets. Revenue from such a tax in 2020 is estimated at $12 billion, and would increase in each successive year.

Use of the revenue is critical to any carbon pricing program and must be prioritized for protecting all low-income households from the impacts of higher prices. Also, the revenue should support the California economy and protect energy-intensive-trade-exposed businesses. We assume that, under a carbon tax alternative, funding the GGRF at levels similar to cap-and-trade would be continued. Revenue use could be as follows:

1. **Greenhouse Gas Reductions Fund** - $2 billion to the GGRF in 2021, growing at 5% per year thereafter.

2. **Dividends to low income households** - equal monthly or quarterly dividends provided to all California residents with incomes in the bottom 60% of income earners, in sufficient quantities to protect the vast majority of those residents from any price increases resulting from the carbon tax. Net costs for higher-income households would amount to a small percentage of their income and are unlikely to present an economic hardship.[10]

3. **Emissions Leakage Prevention** - A small portion (10-15%) of the revenue could be returned to emissions-intensive-trade-exposed businesses (criteria used would be similar to those used to determine free allowances under cap-and-trade). Revenue might be returned as a rebate per employee, a lowering of taxes, and/or a per-product allocation.

Such a tax-and-rebate program should provide an economic stimulus and create additional jobs in the state. Thus, the carbon price can rise to a sufficient level to motivate the necessary emissions reductions while protecting households and businesses as well as maintaining

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[9] REMI has done numerous state level carbon tax studies using the Carbon Tax Analysis Model (or CTAM), an open-source, Microsoft Excel-based model of state-level carbon emission and tax revenues derived from the National Energy Modeling System (NEMS) of the U.S. Energy Information Administration (EIA) and a national carbon tax study using their Carbon Analysis Tool (CAT), which draws its assumptions from the Annual Energy Outlook (AEO) produced by theEIA. Both tools can be used in conjunction with REMI's PI+ to estimate the carbon tax level needed to deliver a specified level of reductions. See links to state and national studies in the footnote below.

[10] In a study of a nationwide fully-rebate carbon tax, the majority of households in upper quintiles showed an average cost increase of less than 0.2% of household income for a $15/ton carbon tax. https://citizensclimatelobby.org/household-impact-study/

political support for the program.[11]

The cost per metric ton of abatement under such a program would depend on the level that the carbon tax rose to during between now and 2030, which could be estimated based on modelling. Abatement measures are assumed to be undertaken as soon as their cost is less than the current or predicted price.

## Evaluation Based on Criteria

Below we provide our evaluation of Cap-and-Trade and a Carbon Tax based on the criteria outlined in Section II-C of the Scoping Plan, as well as the additional criteria we suggest above. We note that a Carbon Tax can perform as well as, or better than, cap-and-trade for each of these criteria.

| **Criteria** | **Cap-and-Trade** | **Carbon Tax** |
|---|---|---|
| Ensure the State achieves the 2030 target | Yes, within the definitions of the program which allow for offsets, trading, and banking of allowances. | Yes, if designed and adjusted properly. |
| Provide air quality co-benefits | Less likely, due to provisions that allow for the fungibility of reductions and for up to 8% of reductions to occur via out-of-state offsets | More likely, since each and every GHG-emitting entity would be included under the tax |
| Prioritize Rules and Regulations for Direct GHG Reductions | No | Yes, without trading and offsets there is equal incentive to reduce emissions at every facility, though there are no specific site by site limits. |
| Provide potential to protect against emissions leakage | Yes, through free allowances for exposed industries | Yes, through offsetting tax reductions for exposed industries. |

[11] This result has been shown in numerous studies from REMI including:
California REMI Study on a Carbon Tax:
http://citizensclimatelobby.org/wp-content/uploads/2014/03/REMI-CA-Carbon-Tax.pdf
National REMI Study on Carbon Fee and Dividend:
http://citizensclimatelobby.org/wp-content/uploads/2014/06/REMI-carbon-tax-report-62141.pdf
Massachusetts REMI Study:
http://climate-xchange.org/regional-economic-models-inc-study-carbon-tax-massachusetts/

| | | |
|---|---|---|
| Develop greenhouse gas reduction programs that can be readily exported to other jurisdictions | Somewhat, can provide linkages only with jurisdictions with well developed regulatory and anti-corruption infrastructure. | Yes, carbon taxes are a simple, transparent model for other states and countries to implement. |
| Invest in disadvantaged and low-income communities, and low-income households | Yes, through GGRF | Yes, through direct rebates and funding of the GGRF. |
| Avoid or minimize the impacts of climate change on public health by continuing reductions in GHGs | Yes | Yes |
| Provide compliance flexibility | Yes | Yes |
| Support the Clean Power Plan and other federal climate programs | Yes | Yes, with the potential need for additional mechanism. |
| Protect low-income and vulnerable households from price increases | Unlikely, even if revenue is returned to low-income households, as volatile price/revenue would make that challenging. | Yes, if sufficient money is returned to low-income households. Stable revenue stream provides steady and adequate funding. |
| Carbon Price Predictability | No, price is volatile and can change at any time. | Yes, with a potential need for occasional adjustments in rate of increase. |
| Revenue Predictability | No, auction price is unpredictable and all allowances may not be sold. | Yes, with a predictable price revenue levels can be predicted more accurately. |
| Alignment of Carbon Pricing with Complementary Policies | No, GHG reductions from mandatory reduction policies (now legally preferred by AB 197) create less need for covered entities to reduce emissions to meet cap-and-trade limits. This combination can allow some sectors or facilities to continue to pollute, while not providing additional emissions reduction. | Yes, carbon prices reinforce other policies, and other policies do not reduce the effectiveness of the carbon tax. Price continues to motivate GHG reductions across all sectors, while complimentary policies motivate additional reductions. |

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# Appendix1

## CALIFORNIA CAP AND TRADE DESIGN AND PERFORMANCE

The ARB Scoping Plan does not provide adequate analysis of the design of or the experience to date with the cap and trade program. The absence of an adequate analytical basis for continuation of the cap and trade policy provides little evidence for policy makers and legislators to go forward.

Over a decade of experience with cap and trade in the European Union Emissions Trading System (EU ETS) and the US Northeast's Regional Greenhouse Gas Initiative (RGGI) shows minimal causality between cap and trade and declining emissions. These findings are relevant for the California scheme. The primary emissions reduction drivers have not been cap and trade but: (1) economic factors—recession and long-term shifts in economic structure; (2) impact of "complementary" programs, e.g., renewables and energy efficiency, that undermine cap and trade; and (3) energy changes—the expansion of natural gas production and rapidly declining renewable costs.

The result of these external factors has been a chronic surplus of allowances, long-term low carbon allowance prices ($3/ton/CO2 in RGGI and $5-6/ton in EU ETS) and no incentive for major long-term clean energy investments.

These same factors are at work in California. Four recent analyses confirm the weak link between cap and trade design and causality regarding emissions reduction.

The first analysis of emissions from covered industries (Cushing, Wander et al, 2016)[12] was done in the context of impacts on vulnerable communities. It indicates there has been essentially no reduction in emissions by covered industries under cap and trade over four years. Contributing to this was the use of offsets that allow covered industries to continue business as usual, including local pollution (SOx, NOx, Particulates) in vulnerable communities.

The second analysis (Cullenwald and Coghlan, 2016)[13] indicates further flaws that raise basic questions about cap and trade. The widespread "resource shuffling" allowed in California's cap and trade program involves covered industries swapping their out-of-state fossil-fuel based

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[12] "A Preliminary Environmental Equity Assessment of California's Cap and Trade Program", Cushing, Wander, et al., USC, UC Berkeley, SFSU, Occidental, September 2016; Figure 5. http://dornsife.usc.edu/assets/sites/242/docs/Climate_Equity_Brief_CA_Cap_and_Trade_Sept2016_FINAL2.pdf

[13] "Structural Oversupply and Credibility in California's Carbon Market", Cullenwald and Coghlan, The Electricity Journal, 2016 - http://www.sciencedirect.com/science/article/pii/S1040619016300707

electricity contracts with third parties for those parties' in-state non-fossil contracts. In this way, covered industries get credit for reducing emissions while overall actual emissions remain constant--except in California's cap and trade accounting. This "leakage" subverts the basic purpose of the cap and trade scheme.

In addition, both offsets and resource shuffling contribute to the accumulation of surplus allowances, which drive prices down to their regulatory floors and cause allowance auction sales volumes to be less than 100 percent of offerings, sometimes dramatically less.

The third analysis (Borenstein, Bushnell, Wolak, et al, 2016)[14] documents the 90%+ probability of cap and trade allowance prices either settling near the floor or spiking. The prices of the ARB's allowances have hovered around the floor for several years, confirming the analysis. These chronically weak allowance prices raise fundamental questions about cap and trade that need to be thoroughly addressed in the Scoping Plan.

This analysis, conducted by the former members of the ARB Emissions Market Assessment Committee, concluded that the most likely market outcome of continuing with cap and trade would be an on-going oversupply of allowances and offset credits that would exceed market demand. The consequence is clear: prices hugging the floor, which will minimize both revenue to the state and incremental emissions reductions.

Neither the Draft Scoping Plan nor the three analyses indicate causality to date between California's cap and trade program and declining emissions. As in Europe and New England, California's cap and trade program is not having any impact of consequence because of dominant economic factors such as the recession and the subsequent slow recovery, "complementary" AB 32 programs that undermine cap and trade effectiveness, and energy trends. In addition, the analyses identify design shortcomings contributing to leakage, surplus allowances, chronic pricing near the floor, and auction shortfalls.

The absence of causality calls for the ARB to obtain independent analysis to document the performance and relative cost-effectiveness ($/ton of CO2 reduced or avoided) of each of California's GHG reduction programs, including the renewable portfolio standard, low carbon fuel standard, and vehicle emissions standards. Without this analysis, there is little basis for the ARB and policy makers to make the effective decisions necessary to accelerate emissions reductions post-2020.

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[14] "Expecting the Unexpected: Emissions Uncertainty and Environmental Market Design" Borenstein, Bushnell, Wolak, Zaragoza-Watkins, Energy Institute At Haas, UC Berkeley, August 2016 http://ei.haas.berkeley.edu/research/papers/WP274.pdf

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**Lessons Learned From a Decade of Cap and Trade in Europe and New England**

Contrary to the common narrative, California's cap and trade has not made adjustments that will avoid the same ineffective outcomes now experienced in Europe and New England.

1. **Cap and trade has shown very limited causality in reducing emissions in Europe (EU ETS) and the US Northeast (RGGI).**

   Caps have not provided "environmental certainty." The caps have been chasing emissions which, as noted above, fell faster due to (i) economic forces; (ii) "complementary" programs that undermine cap and trade; and (iii) energy changes.

2. **Cap and trade has perverse incentives leading to high business-as-usual forecasts and consequently high caps.**

   Industry and regulators have an incentive to overestimate the baseline emissions levels that caps are based upon. This characteristic is addressed in program design theory and experienced in various programs around the world.

3. **Surplus allowances are chronic and result in low allowance prices.**

   The EU ETS scheme has had prices under $10/ton for years (currently around $6/ton) as has the RGGI program (recent auction at $3/ton/CO2). Allowance surpluses are forecast throughout the rest of the decade and beyond.

4. **"Complementary" clean energy programs undermine cap and trade.**

   Renewable energy and efficiency programs have reduced emissions and created more space under the cap for covered industry and utility emitters, rendering the purported economic incentive of allowance pricing ineffectual.

5. **Offsets from the Clean Development Mechanism (CDM) have undermined the EU ETS.**

   Offset credits (CERs—Certified Emission Reductions) awarded to developing country clean energy projects and purchased by European industries and utilities contributed to the EU ETS allowance surplus and allowed industries to avoid direct emission reductions. The international offset program has experienced widespread abuse and gradual reduction or banning offsets from cap and trade programs. The current price for an offset is U.S. 19 cents/ton/CO2.

[Note: This experience is highly relevant to California's plans to link with other countries and sub-national entities.]

6. **Cap and trade programs are inflexible and slow to start and respond to changed circumstances.**

   The EU ETS and RGGI took about 3 years to start and as long or longer to modify. The British Columbia carbon tax was approved in February 2008 and took effect in July 2008. The implications for timely exportability to other countries is obvious: a carbon tax can be implemented quickly; a cap and trade program cannot.

7. **Windfall profits have occurred in the EU ETS from the start and continue ten years later.**

   Free allowances and other features have allowed the accumulation of over $25 billion in windfall profits for utilities and major industrial sectors.

8. **Cap and trade programs are more regressive than carbon taxes.**

   The EU countries predominantly keep the revenues from allowance auctions for general budget purposes, with energy price increases disproportionately affecting lower-income households. RGGI's use of revenues for energy efficiency and other programs likely leaves major segments of the lower-income households worse off financially.

9. **Cap and trade is not "market-based" but an administered market**

   The experience indicates that the governments administering cap and trade act as sole suppliers through setting the terms of the transactions and managing the allowance distribution. Buying and selling by covered industries is a response to much more than the marginal cost of emission reduction opportunities.

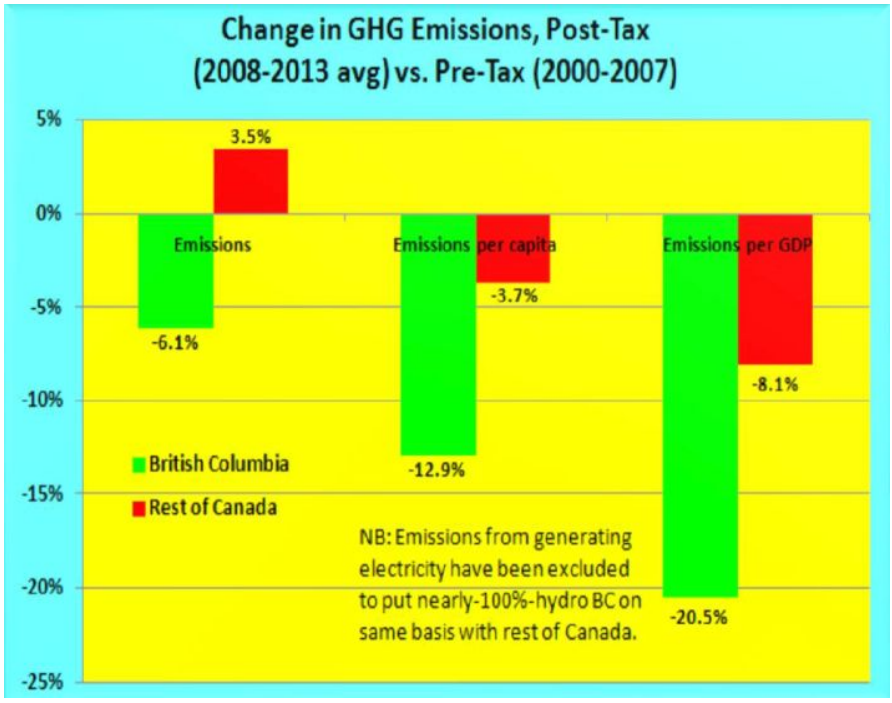
# Appendix 2

## Analysis of British Columbia's Carbon Tax

We believe that the Scoping Plan's assessments of the British Columbia Carbon Tax were incomplete and offer further analysis below.

The most complete analysis of the BC Carbon Tax is provided by the Carbon Tax Center's "British Columbia's Carbon Tax: By the Numbers."[15] They note that the most appropriate way to gauge the effectiveness of the tax is to compare emissions in BC with the rest of Canada for the pre-tax and post-tax periods. In this analysis, they exclude the electricity sector because only a small fraction of BC's emissions come from electricity due to its reliance on hydroelectricity. They note that "electricity generation from burning fossil fuels, accounted for just 2 percent of total emissions from fossil-fuel combustion in British Columbia in 2013, but for nearly 20 percent — almost an order of magnitude more — in the rest of Canada."

In comparing BC's emissions to the rest of Canada, they find that BC performed better in terms of total emissions, per capita emissions, and emissions per unit of GDP.




15 https://www.carbontax.org/wp-content/uploads/CTC_British_Columbia%27s_Carbon_Tax_By_The_Numbers.pdf

They note that, based on their models, a price at the level of BC's tax ($30 CAD) would not be expected to induce more than a 6% drop in non-electric emissions, which is what was observed in BC. As mentioned in the Scoping Plan, BC emissions have increased slightly once the Carbon Tax was frozen at $30 CAD. Thus, the real-dollar value of the tax has declined slightly over the past few years with inflation. The implication is that the slight increase is attributable to the leveling off of the price at $30 CAD, not the tax itself. Note that emissions per capita have remained steady, and emissions per unit of GDP have continued to fall.[16]

Therefore we draw the following conclusions:

1. **A carbon tax must continue to increase to be an effective price signal**

   A carbon tax is an economic disincentive for an undesirable behavior. It follows that a decline in the undesired behavior occurs as the tax increases and, in turn, the undesired behavior increases as the tax decreases. While the Climate Action Leadership Team formed to help BC reach its GHG emissions targets stated that, in its current state, it would fail to meet its 2020 goals, it also suggested not only to keep the carbon tax but to raise it by $10/tonne/year starting in July 2018 and to expand the program to non-combustible GHG sources.

   The Climate Leadership Team's report states:

   > "Based on this evidence and the economic modelling from Navius, the Climate Leadership Team is recommending that B.C. continue to use our strongest tool to reduce emissions, and recommence the annual increases in the carbon tax starting in 2018, when the carbon tax freeze ends. The Climate Leadership Team further recommends that the annual increases in the carbon tax are reviewed in five years, however, the modelling indicates that increases in the range of $10 per tonne per year will be required through to 2050 in order to achieve B.C.'s 2050 targets. We also recommend expanding the carbon tax to include non-combustion sources of carbon pollution that can be accurately measured. Expanding the coverage will allow B.C. to meet its climate targets as cost-effectively as possible as the carbon tax currently covers only the combustion emissions that account for about 70 per cent of B.C.'s emissions."[17]

   In addition, the Canadian Minister of Environment and Climate Change, Catherine McKenna, stated, "With carbon pricing, it has to increase over time or it just doesn't have

[16] http://www.env.gov.bc.ca/soe/indicators/sustainability/ghg-emissions.html

[17] http://engage.gov.bc.ca/app/uploads/sites/116/2015/11/CLT-recommendations-to-government_Final.pdf

the effect that is needed. It just doesn't create the incentive."[18]

2. **Reductions in emissions and fuel consumption were achieved**

   According to the report from the Carbon Tax Center, from 2008 to 2013 emissions in BC decreased by 12.9% per capita compared to 2000 to 2007, whereas for the comparable periods for the rest of Canada, emissions decreased only 3.7% per capita .[19]

   In addition, fuel usage in BC dropped by 16% per capita while it rose three percent per capita in the rest of Canada.[20]

3. **There are key differences between California and British Columbia**

   Electricity is the most responsive to emissions pricing -- BC's electricity sector accounts for under 2%[21] of its GHG emissions whereas in CA electricity accounts for 20%.[22] It is expected that an equivalent carbon tax in California would have a much more significant effect on emissions reductions, simply because there are more electric emissions to reduce.

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[18] http://www.cbc.ca/news/canada/british-columbia/federal-environment-bc-reaction-1.3732272

[19] https://www.carbontax.org/wp-content/uploads/CTC_British_Columbia%27s_Carbon_Tax_By_The_Numbers.pdf

[20] http://www.energyindependentvt.org/wp-content/uploads/2014/11/BC_Carbon-Tax-success-story.pdf

[21] http://www2.gov.bc.ca/gov/content/environment/climate-change/reports-data/provincial-ghg-inventory

[22] https://www.arb.ca.gov/cc/inventory/data/data.htm