To: **Transportation and Climate Initiative Technical Analysis Workgroup**
Christine Kirby and Chris Hoagland, Co-Chairs

Re: **Joint Comments on 8/8 TCI Reference Case Results Webinar and Next Steps**

We applaud the leadership of the TCI states in moving forward aggressively with the rigorous and comprehensive modeling of potential policy scenarios. We strongly support the use of multiple models to comprehensively map the economic, environmental, public health, and other impacts of a potential TCI program. We support the recommendations made in a recent joint comment letter provided by NRDC, including:

- Model a policy horizon through 2035, with cap trajectories that are consistent with achieving state mandated targets for 2030 and 2050 and on the scale needed to address the climate crisis.
- Share data results from each stage of the modeling process, including detailed spreadsheets that contain key assumptions and comprehensive modeling outputs.
- Full consideration of complementary policies working in tandem with market-based mechanisms to achieve ambitious climate goals.

In this supplementary letter, we also submit the following recommendations for TCI leadership to consider including in their model results:

- Compare the induced GHG reductions from the carbon price signal to GHG reductions from investment in each policy scenario.
- Construct a model run with a tight cap trajectory, higher allowance prices, and a revenue return mechanism to consumers.
- To the degree possible, denote the expected GHG reductions for each policy scenario at the state level.
- Include a measure of allowance banking and oversupply in policy scenarios and sensitivity analysis.

1) Compare the GHG reductions from the carbon price signal and investment in each policy scenario

As indicated in a webinar on August 8th, the TCI leadership intends to iteratively combine the output from NEMS with a custom transportation investment model constructed by Cambridge Systematics to accurately portray the comprehensive impacts of the carbon price signal and investment working in tandem. We support this approach and recommend, to the degree possible, that the modeling team publish the expected reductions induced by the carbon price signal in comparison to impacts from investment. This would be especially important for a sensitivity case where national fuel efficiency standards are rolled back, leaving more space for the price signal to affect vehicle choice.

This would allow for a more informed discussion on how to prioritize various aspects of the program's final design, particularly the relationship between use of revenue and market design choices such as cap trajectory and price containment mechanisms.

The modeling exercises can help inform this discussion moving forward. One of the goals of subsequent TCI model runs should be to investigate what is the optimal balance of carbon price signals, investment, and revenue return mechanisms to maximize the program's ambition while maintaining desirable distributional economic benefits.

In addition, releasing the underlying data, assumptions, and resulting spreadsheets from the NEMS module, transportation investment module, and REMI distributional impact module would allow outside groups to investigate this vital research question further.

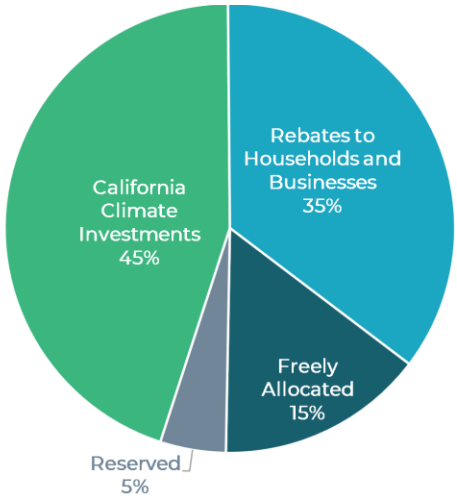
2) **Construct a model run with a tight cap trajectory, higher allowance prices, and a revenue return mechanism to consumers**

There is a concern that tight caps, low enough to meet the carbon reduction mandates/targets of the TCI states, may yield allowance prices that are unacceptably high for consumers. But as the joint comments submitted by a number of organizations have emphasized, given the severity of the climate crisis, it is necessary that the current greenhouse gas mandates of the TCI states be met.

If reaching the appropriate cap trajectory requires allowance prices higher than TCI leadership is comfortable with, then returning a portion of revenue back to consumers can help justify enough program ambition while economically protecting vulnerable constituents.

In California's economy-wide system, approximately half of the allowance budget is returned to households and businesses each year, principally through flat reductions in electric and gas utility bills and free allocation to vulnerable industries.[1] While California uses the allowance money from transportation fuels for investment in low-carbon transportation projects, the state has chosen to balance this with putting a significant portion of revenue into consumer assistance.

California Distribution of Allowances, 2015-2018[2]

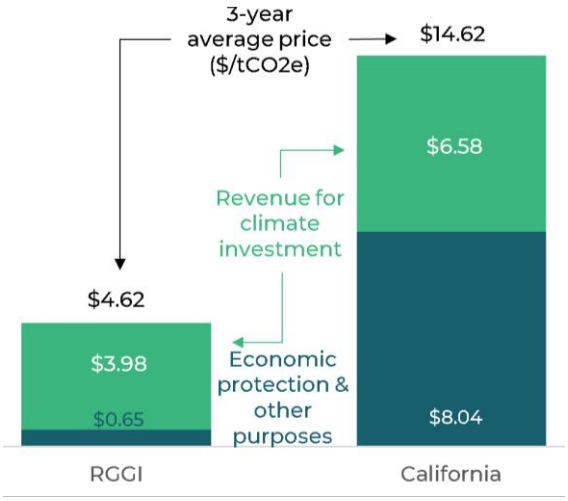


[1] The flat rebates are known as "consignment" to utilities. A portion of the funds are also used for energy efficiency programs and other purposes.

[2] *Regional Cap and Trade: Lessons from the Regional Greenhouse Gas Initiative and Western Climate Initiative* (2018), Jonah Kurman-Faber and Marc Breslow, Climate XChange, 2018, page 18, https://climate-xchange.org/wp-content/uploads/2018/08/Cap-and-Trade-Report-10.03.2018-compressed.pdf.

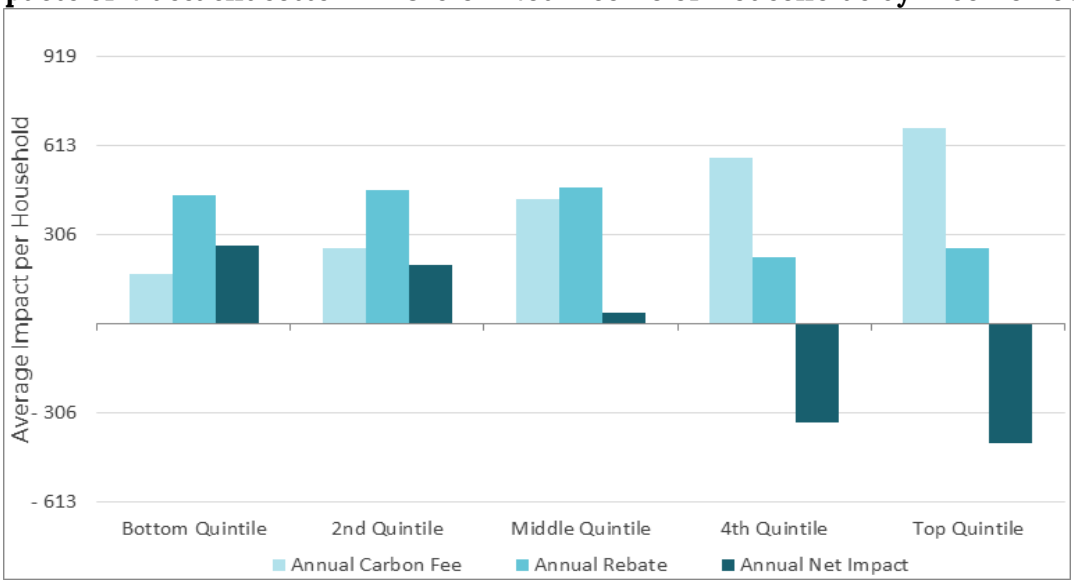
If making a choice to return revenue to consumers helps justify a more ambitious program (such as a tighter cap trajectory and higher price floor), it can lead to greater total investment revenue as well. For example, despite dedicating approximately half of the allowance budget to other purposes, California is raising significantly more investment revenue per covered metric ton of carbon dioxide equivalent (tCO^2e) than the Regional Greenhouse Gas Initiative (RGGI), due to a significantly higher allowance price.

RGGI and California
Average Carbon Price and Use of Revenue[3]



The impacts of returning this revenue can be incorporated into the distributional economic model run by REMI. Research on House Bill 2810 in Massachusetts, for example, finds that the revenue return mechanisms create net economic benefits for low and moderate-income households before accounting for additional co-benefits from decarbonization.[4] This design choice was a key measure in justifying a more effective carbon price.[5]

Impacts of Massachusetts HB 2810 on Net Income of Households by Income Level



[3] From forthcoming Climate XChange report. 3-year average prices are derived from public auction data accessed July, 2019. Methodology available upon request.
[4] *Impacts of Carbon Pollution Pricing on Massachusetts Households at Different Income Levels*, Marc Breslow, Climate XChange, 2019, page 3, https://tinyurl.com/y4gquccy
[5] For further analysis, see: *A Short-Run Distributional Analysis of a Carbon Tax in the United States*, Anders Fremstad and Mark Paul, May 03, 2017, Political Economy Research Institute, U. Mass.-Amherst, https://tinyurl.com/yctnh563; *An Analysis of Impacts on Households at Different Income Levels from Carbon Pollution Pricing in Maryland*, Marc Breslow and Chynna Pickens, Climate XChange, May 2018, https://tinyurl.com/yxlv9nvz

3) <u>Denote GHG reductions for each policy scenario at the state level</u>

It is important to track how TCI will affect emissions relative to each state's climate goals. Modeling should reveal to the best degree possible what contribution each policy scenario will make to each state's reduction mandates. Alternatively, the appropriate data results should be shared to allow outside groups to analyze the expected contribution of TCI to each state's climate goals. The table below shows the targets used by each TCI state that has set them.

Legally Mandated Climate Goals by State in TCI Region

State	Short-term GHG target	Long-term GHG target
Connecticut	45% below 2001 by 2030	80% below 1990 by 2050
Delaware	33% below 2008 by 2030	-----
District of Columbia	50% below 2017 by 2032	100% below 2017 by 2050
Maine	10% below 1990 by 2020	75-80% below 2003 long term
Maryland	40% below 2006 by 2030	80-95% below 2006 long term
Massachusetts	25% below 1990 by 2020	80% below 1990 by 2050
New Hampshire	20% below 1990 by 2025	80% below 1990 by 2050
New Jersey	1990 level by 2020	80% below 2006 by 2050
New York	40% below 1990 by 2030	85% below 1990 by 2050
Pennsylvania	26% below 2005 by 2025	80% below 2005 by 2050
Rhode Island	45% below 1990 by 2035	80% below 1990 by 2050
Vermont	40% below 1990 by 2030	80-90% below 1990 by 2050

We understand that the NEMS module is constructed to divide the TCI region into multi-state subregions. If the model is unable to calculate emissions reductions at the state level, then we recommend publishing the appropriate underlying data and output spreadsheets to enable outside groups to perform a reasonable calculation of what emissions reductions to expect in their respective states.

4) Include a measure of banking and allowance supply in policy scenarios and sensitivity analysis

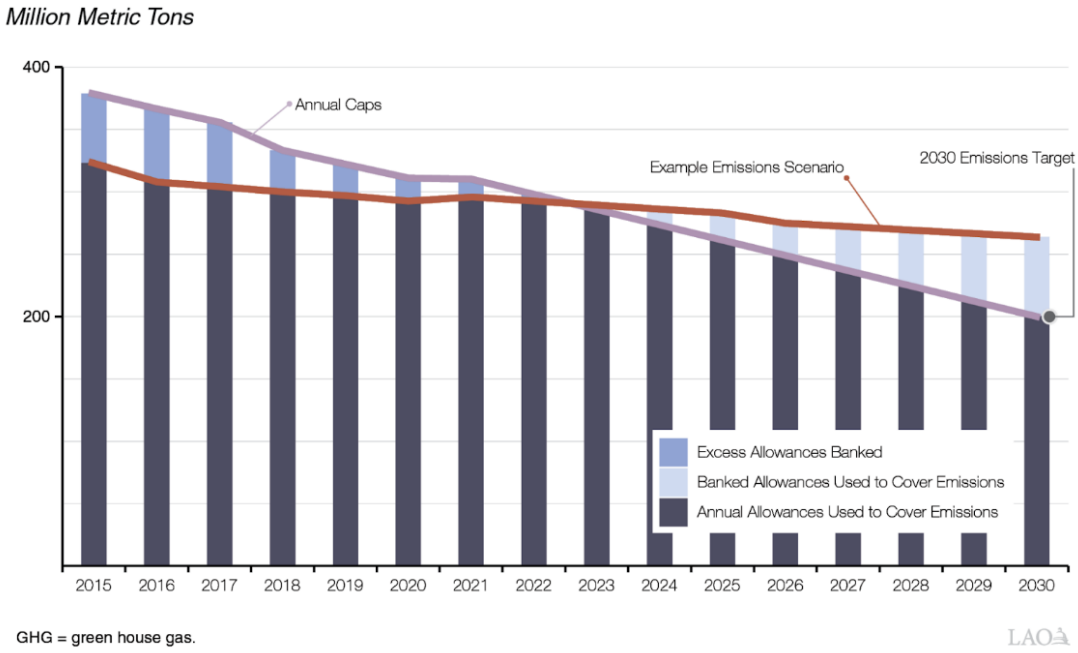
The TCI modeling exercises should also carefully consider the market dynamics demonstrated by previous emissions trading systems, particularly the tendency to bank excess allowances. This has significant implications for what market design decisions, such as banking rules, allowance reserves, and review periods, will best prepare the program for a wide variety of emissions outcomes.

As the Regional Greenhouse Gas Initiative (RGGI) and Western Climate Initiative (WCI) have demonstrated, compliance entities tend to purchase excess allowances and "bank" them for the future. Some level of temporal flexibility is vital to create a smooth, stable

carbon market, but overallocation combined with unlimited banking can also threaten the environmental integrity of the program.

Our analysis finds that in the WCI carbon market, there are approximately 226 million excess allowances from 2013-2018 currently held in private accounts, which nearly equals the 236 million metric tons of reduced CO_2 that the program is expected to induce in California between 2021 and 2030.[6] California's scoping plans in 2008 and 2017 both fail to account for oversupply dynamics in their modeling exercises, providing insufficient evidence that the cap will remain binding through 2030. In subsequent program reviews, California Air Resources Board (CARB) has resisted transparently investigating the issue in accordance with the chorus of academics and policy experts who have quantitatively analyzed the issue of oversupply.[7,8]

Potential Impact of Oversupply in California[9]



As there is significant uncertainty in what future emissions in the TCI region will be, the model results should include a simple measure of allowance supply, particularly in sensitivity analysis.[10] This measure could significantly impact the ultimate policy design by informing what technical design decisions can best prepare TCI for the possibility of

[6] Analysis from forthcoming Climate XChange report. Methodology available upon request.
[7] *Holding limits Don't Constrain Banking in California's Cap-and-Trade Program*, Mason Inman, Near Zero, 2018, https://tinyurl.com/y2f83m3g;
[8] *Recalibrating California's Cap-and-Trade Program to Account for Oversupply*, Chris Busch, 2017, https://tinyurl.com/yxcv63uj
[9] Image from *Cap-and-Trade Extension: Issues for Legislative Oversight.* Ross Brown, Legislative Analyst's Office, Dec 2017.
[10] See: *An Open-Source Model of Supply and Demand in the Western Climate Initiative Cap-and-Trade Program*, Near Zero, 2018, https://tinyurl.com/yxhhmen8

overallocation, such as appropriate price floors and ceilings, allowance reserves, banking restrictions and holding limits, and review period protocols.

In conclusion, we reiterate the following recommendations from this letter as a supplement to the joint comment recently submitted by NRDC:

- Denote the expected GHG reductions from the carbon price signal in comparison to the GHG reductions from investment in each policy scenario.
- Construct a model run with a tight cap trajectory, higher allowance prices, and a revenue return mechanism to consumers.
- To the degree possible, break down the expected GHG reductions for each policy scenario at the state level.
- Include a measure of allowance banking and oversupply in policy scenarios and sensitivity analysis.

We deeply appreciate the thorough and expedient modeling process that the TCI Technical Analysis Workgroup is facilitating, and look forward to their investigation of what various policy scenarios can achieve in the TCI region. Thank you for the opportunity to provide input into this process.

Sincerely,

Climate XChange
Health Care Without Harm