

December 16, 2016

California Air Resources Board (CARB)  
1001 I Street  
Sacramento, CA 95814

**Re: Discussion Draft: 2030 Target Scoping Plan Update  
(December 2, 2016)**

Dear CARB staff and stakeholders,

Thank you for the opportunity to comment on the recently released CARB Discussion Draft: 2030 Target Scoping Plan Update.<sup>1</sup>

Our comments today build on and supplement those we have previously submitted regarding CARB's proposed amendments to the cap-and-trade regulation<sup>2</sup> and CARB's presentation at the November 7 Public Workshop on the 2030 Target Scoping Plan Workshop.<sup>3</sup> We incorporate these comments by reference and attach our most recent comment letter in the 2030 Scoping Plan process here.

We note that both sets of our previous comments remain largely unaddressed in the Discussion Draft. In our most recent comments, we called for improved transparency in presentation of CARB's analysis, explicit assessment of policy robustness in the face of uncertainty, the use of energy-economic modeling to estimate expected carbon prices consistent with SB 32's 2030 Target, and an explanation of how cap-and-

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<sup>1</sup> CARB, Discussion Draft: 2030 Target Scoping Plan Update (Dec. 2, 2016) (hereinafter "Discussion Draft"), *available at* <https://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>.

<sup>2</sup> Michael Wara and Danny Cullenward, Comment letter to CARB re: post-2020 cap-and-trade proposal (Sept. 19, 2016), *available at* <http://www.ghgpolicy.org/law-policy/>.

<sup>3</sup> Michael Wara and Danny Cullenward, Comments letter to CARB re: Public Workshop on the 2030 Target Scoping Plan (Nov. 21, 2016), *available at* <http://www.ghgpolicy.org/law-policy/>.

trade with unlimited banking will actually produce quantity certainty consistent with SB 32's goals.

Unfortunately, the Discussion Draft does not address any of these issues in sufficient detail. In many instances, it ignores critical scientific issues that should be at the core of an informed decision-making process. Despite this general shortcoming, the Discussion Draft does provide some additional detail regarding the refinery regulation first mentioned in the November 7 Public Workshop. We are grateful for CARB's discussion of this issue in the Discussion Draft, but we are still interested in learning much more about CARB's thinking on this issue in order to evaluate its potential role in the alternatives under consideration in the Discussion Draft.

We write today to reiterate our earlier concerns and to raise new issues with the Discussion Draft. While we remain committed to providing constructive suggestions, we are concerned that the process so far has not focused on generating the information and analysis necessary to chart a successful path to SB 32's 2030 Target. Grounding that important task in the best possible analysis should be CARB's top priority in the 2030 Scoping Plan process, and is a prerequisite to creating a fair comparison of the Draft Scoping Plan Scenario and the Alternative Scenarios for both CARB and stakeholders.

Fundamentally, we believe that additional work is needed to achieve this standard and urge CARB to undertake the necessary efforts to ensure the continued success of this, the most important climate policy system in the United States. If additional time is required to develop a rigorous analysis, we urge CARB to extend the timeline for finalizing the 2030 Scoping Plan.

Here, we highlight six issues in the Discussion Draft:

- **Analysis of current program performance.** The Discussion Draft relies on a superficial assessment of why California's greenhouse gas emissions trajectory is on track to reach the 2020 Target. Rather than rely on optimistic thinking, CARB and stakeholders need to take a hard look at all of the factors that have driven performance to date. While some policies have been very successful, low emissions (and low

carbon market prices) are also partly the result of low economic growth after the great recession. A robust analysis of factors contributing to and detracting from the successful trajectory California now enjoys is critical for planning the next phase of California climate policy.

- **Cumulative vs. annual emissions accounting.** As we have previously commented, CARB appears to approach the 2030 scoping plan process with the goal of achieving cumulative emission reductions between 2021 and 2030, as calculated against a counterfactual baseline scenario. CARB's Draft Scoping Plan Scenario extends cap-and-trade and allows banking of surplus allowances for compliance in future years. This will result in 2030 emissions that are substantially higher than the 2030 Target. As a result, we believe CARB's use of cumulative emissions accounting does not actually address the requirements of SB 32.
- **Post-2020 carbon prices.** As we have previously commented, CARB's models and analytical methods are insufficient to reliably estimate a range of carbon prices necessary to achieve the 2030 Target. Combined with a superficial assessment of program experience to date that takes low carbon prices for granted, the Discussion Draft suggests an unrealistically small role for post-2020 carbon pricing across both the draft 2030 Target Scoping Plan Scenario and Alternative 2 (Carbon Tax). We urge CARB and stakeholders to conduct a robust analysis and take seriously the possibility that the 2030 Target requires significantly higher carbon prices than are present in today's cap-and-trade program.
- **Discussion of existing carbon taxes.** CARB's discussion of existing carbon taxes fundamentally misrepresents the performance of British Columbia's carbon tax policy. It relies not only on websites that aim to discredit British Columbia's efforts, but also one that proudly rejects climate change science. Where CARB does rely on credible analyses of the British Columbia carbon tax, the Discussion Draft nevertheless mischaracterizes the conclusions of the official reports it cites. Whatever CARB's ultimate policy preferences, the Discussion Draft's consideration of carbon taxes falls well short of the standards the

nation's leading climate regulator has met in past rulemakings and should strive for here.

- **Comparison of the draft 2030 Target Scoping Plan Scenario and Alternative 2 (Carbon Tax).** An evenhanded comparison of the two carbon pricing alternatives under consideration is essential for CARB and stakeholders alike. But the presentation of pros and cons is both inaccurate in a number of important respects and strongly biased against the use of a carbon tax to achieve California's 2030 Target. We provide a more balanced set of comparisons based on CARB's own criteria, illustrating how well designed cap-and-trade and carbon tax policies can achieve similar outcomes.
- **A Detailed Proposal for a Carbon Tax.** We believe that part of the reason CARB has failed so far to properly evaluate a carbon tax alternative to its preferred policy of extending cap-and-trade is that it has not actually considered any tax proposal designed to facilitate compliance with a specific annual emissions target. We present a simple policy design that could help achieve the goals laid out in the scoping plan while also creating important opportunities to collaborate with other jurisdictions, most notably Canada under the Trudeau Government.

A full discussion of each point continues below.

**1. CARB should conduct a more rigorous analysis of current program performance.**

The Discussion Draft casually references greenhouse gas emissions trends since 2000, claiming progress because statewide emissions are 35 million metric tons of CO<sub>2</sub> below 2006 levels.<sup>4</sup> In its Preface, CARB observes that “numerous regulatory and incentive programs have been developed and implemented while the economy has continued to grow,”<sup>5</sup> implying here,

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<sup>4</sup> Discussion Draft at 7.

<sup>5</sup> *Id.*

and throughout the document, that these policies have been the primary cause of the observed emission reductions. Yet nowhere in the Discussion Draft does CARB present time series data available in the state greenhouse gas inventory showing which sectors have produced those reductions,<sup>6</sup> nor does CARB analyze the relationship between individual policies and the reported emissions in the sectors they cover.

We are confident that many of the policies reviewed in the Discussion Draft are working well. But actual performance across existing policy varies widely in terms of both emission reductions and cost effectiveness.<sup>7</sup> Perhaps most important, we expect that a critical driver of low emissions in the last decade is the great recession, not merely the success of state climate policy. Even a cursory analysis of the overall emissions trend strongly suggests this explanation is an important part of the story.<sup>8</sup>

Developing a robust analysis of past policies' impact on greenhouse gas emissions, economic growth, and co-pollutants should be a foundational step in the overall 2030 planning process. The question of how the economy will evolve between now and 2030, as well as the success of past efforts to regulate emissions in individual sectors, is critical to developing a robust strategy to reach California's 2030 target.

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<sup>6</sup> CARB, California Greenhouse Gas Emission Inventory Program, <https://www.arb.ca.gov/cc/inventory/inventory.htm>.

<sup>7</sup> CARB is obligated to review these issues under AB 197, which requires evaluation of the range of reductions of both greenhouse gas and other air pollution reductions that will occur due to scoping plan measures as well as explicit evaluation of each scoping plan measure's cost effectiveness. Cal. Health & Safety Code § 38562.7.

<sup>8</sup> Note that the significant decrease in emissions over the time period in Figure I-1 is concurrent with the Great Recession. Discussion Draft at 19.

**2. CARB’s use of cumulative emissions accounting in the draft 2030 Target Scoping Plan Scenario does not comply with the requirements of SB 32.**

As we have previously commented, CARB’s use of cumulative emissions accounting in the draft 2030 Target Scoping Plan will result in statewide emissions in 2030 that are significantly above the 2030 Target.<sup>9</sup> This is because the prospect of rising carbon prices through the next decade will spur over-compliance in early years in order to bank allowances for use in later years when caps are more stringent. When those previously banked allowances are used in 2030, they will cause actual, measured emissions in that year to exceed the cap set by CARB in order to achieve the 2030 Target. Thus, the 2030 Target will not be achieved under the Scoping Plan Scenario.

This approach not only fails to meet the requirements of SB 32, but also is prone to serious analytical errors because the cumulative emission reductions are calculated with respect to a single business-as-usual scenario from 2021 to 2030. Yet forecasts on this time horizon are rarely accurate. In basing its preferred scenario on the absolute accuracy of a single scenario without further analysis, CARB does not account for the plausible range of emissions reductions required from either its regulatory programs or the cap-and-trade program.

As we have repeatedly stressed, until CARB discloses the PATHWAYS scenario results and key assumptions behind these projections, it is impossible to explore this issue with the technical rigor it deserves. We urge CARB to share the full data behind its modeling scenarios and key figures in the next release.

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<sup>9</sup> See, e.g., *id.* at 88 (Figure III-2) and 89 (Figure III-3).

**3. CARB should seriously consider the likelihood that carbon prices will need to be higher in the post-2020 period.**

Nowhere in the Discussion Draft does CARB explicitly discuss projected future carbon prices under its draft 2030 Target Scoping Plan Scenario. As we have commented previously with respect to the proposed regulation to extend the cap-and-trade program,<sup>10</sup> however, CARB's public statements on carbon prices consistent with the 2030 Target discount without analysis the notion that carbon prices might need to rise significantly higher than the present floor price trajectory suggests. We view this lack of discussion as a potential symptom of the lack of analysis of the underlying causes of emission reductions achieved to date, as described above.

We urge CARB to explicitly model multiple business-as-usual scenarios and disclose in what sectors its projected cap-and-trade reductions would reduce emissions. At what cost does CARB believe that reductions above and beyond regulatory requirements might occur in these sectors? We believe that if the economy grows quickly—which it hopefully will—and if CARB targets effective regulations at relatively low-cost mitigation options, the remaining potential for further emissions reductions—as would be captured in the contribution of cap-and-trade in the draft 2030 Target Scoping Plan Scenario—likely requires significantly higher carbon prices than are observed today in the cap-and-trade program.

Nowhere in the current draft is there discussion of what carbon prices are likely to occur under the proposed extension of the cap-and-trade program in the draft 2030 Target Scoping Plan Scenario. Reliance on the assumption that the Allowance Price Containment Reserve will limit price increases is just that—an assumption—without evidentiary support showing that for expected market demand for allowances across a range of assumptions, there will be sufficient supply in the reserve to limit price increases. We urge CARB to conduct further analysis using appropriate energy-economic modeling tools before proceeding further with its evaluation of scoping plan alternatives.

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<sup>10</sup> Wara and Cullenward, *supra* note 2

**4. CARB should present an accurate discussion of existing carbon tax initiatives, especially British Columbia’s carbon tax.**

In its discussion of carbon taxes, CARB makes reference to British Columbia’s carbon tax, noting that “recent evidence is emerging regarding the efficacy of the carbon tax policy in British Columbia.” Staff then notes that the policy is not achieving the goals set by British Columbia for 2020.<sup>11</sup> While this is true, it ignores key aspects of the context in which the policy has been implemented in British Columbia. Understood in its proper context, the B.C. carbon tax has been effective.<sup>12</sup> B.C.’s failure to achieve provincial emissions targets reflects the fact that the carbon tax level was increased up to 2012, but held constant thereafter at a level that was not sufficient to produce the desired quantitative outcome.<sup>13</sup>

Indeed, the relationship between B.C.’s carbon price plateau and the lack of continued emission reductions is evident in the very government report that CARB cites but mischaracterizes in its discussion of the program’s performance. We note that B.C.’s carbon tax policy does not include protections for energy intensive trade exposed (EITE) industries—other than an exemption for greenhouse-based agriculture—and therefore differs from California’s program in this critical respect. British Columbia’s decision to hold the rate at \$30/tCO<sub>2</sub> reflects the lack of movement by other jurisdictions on climate change policy and concern on the part of the government that further increases might undermine economic competitiveness, not inattention to the relationship between the carbon price and provincial emissions.

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<sup>11</sup> Discussion Draft at 97.

<sup>12</sup> Climate Leadership Team, Recommendations to Government (Oct. 31, 2015), at 9-10, *available at* [http://engage.gov.bc.ca/climateleadership/files/2015/11/CLT-recommendations-to-government\\_Final.pdf](http://engage.gov.bc.ca/climateleadership/files/2015/11/CLT-recommendations-to-government_Final.pdf).

<sup>13</sup> Province of British Columbia, Carbon Tax Review Topic Box, June Budget Update, 2013/2014 to 2015/2016, at 63-64, *available at* [http://www.fin.gov.bc.ca/tbs/tp/climate/Carbon\\_Tax\\_Review\\_Topic\\_Box.pdf](http://www.fin.gov.bc.ca/tbs/tp/climate/Carbon_Tax_Review_Topic_Box.pdf).

The notion that British Columbia’s carbon tax has failed to achieve its target also ignores the possibility that reforms to its carbon price trajectory might rectify the situation. In fact, the B.C. Climate Leadership Team recently recommend increasing the carbon tax by CAN \$10/tCO<sub>2</sub> per year until the province’s 2050 target is achieved, coupled with implementation of EITE protections and complimentary policy measures.<sup>14</sup> In British Columbia’s view, “a significant body of evidence points to the view that B.C.’s carbon tax is working both economically and environmentally.”<sup>15</sup>

In addition, as Staff must realize, making superficial comparison between British Columbia and California can be highly misleading because of the differences in the two jurisdictions’ energy systems. Because the B.C. electricity sector is dominated by hydro resources, most CO<sub>2</sub> emissions in B.C. come from transportation and from industrial sources. Electricity—the sector most responsive to emissions pricing—accounted for just 1.2% of 2014 greenhouse gas emissions in B.C.<sup>16</sup> In contrast, the electricity sector accounted for 20% of 2014 greenhouse gas emissions in California; it also accounts for the largest share of the total reductions in statewide emissions reported in California since the passage of AB 32.<sup>17</sup>

That a modest carbon tax has failed to substantially shift emissions in B.C.’s transportation and industrial sectors is not a valid argument to establish the impossibility of a higher carbon tax helping California achieve those reductions in the future. Frankly, higher carbon prices will be required to tackle emissions in these sectors—whatever the policy instrument, and whether or not those costs are explicit (as with carbon pricing) or implicit (as in regulations).

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<sup>14</sup> Climate Leadership Team, *supra* note 12 at 11-12.

<sup>15</sup> Climate Leadership Team, *supra* note 12 at 9.

<sup>16</sup> British Columbia Greenhouse Gas Inventory (2014), *available at* <http://www2.gov.bc.ca/gov/content/environment/climate-change/reports-data/provincial-ghg-inventory>.

<sup>17</sup> CARB, *supra* note 6.

Lastly, we were surprised to find that one of the references CARB relies on to establish its criticism of British Columbia’s carbon tax—a blog called “The American Thinker”—is a reliable source of articles that dispute the scientific consensus on climate change.<sup>18</sup> Recent headlines include “Climate Change: Where is the Science?”<sup>19</sup> and “Trump and the Climate Change Clown Show.”<sup>20</sup> One imagines that the blog’s publishers never expected to be cited favorably in a key California climate policy planning document; certainly we never expected a moment like this.

Frankly, the American Thinker incident does not reflect well on the sincerity of the scoping plan process. We encourage CARB to consider an explicit retraction. We also hope that in the future, CARB will be more selective in the sources on which it relies, particularly when criticizing the policies of other jurisdictions with which it collaborates on climate policy.<sup>21</sup>

##### **5. CARB should provide a balanced and fair-minded comparison of the Draft Scoping Plan Scenario and Alternative 2 (Carbon Tax).**

The Discussion Draft provides an analysis of the extent to which cap-and-trade and a carbon tax can achieve the objectives identified in the scoping plan.<sup>22</sup> We believe that this analysis is deeply flawed both in its description of the degree to which the cap-and-trade system CARB has actually

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<sup>18</sup> Discussion Draft at 97, note 98.

<sup>19</sup> Howard Hyde, Climate Change: Where is the Science?, American Thinker (June 11, 2015), *available at* [http://www.americanthinker.com/articles/2015/06/climate\\_change\\_where\\_is\\_the\\_science.html](http://www.americanthinker.com/articles/2015/06/climate_change_where_is_the_science.html).

<sup>20</sup> Brian C. Joondeth, Trump and the Climate Change Clown Show, American Thinker (Nov. 20, 2016), *available at* [http://www.americanthinker.com/articles/2016/11/trump\\_and\\_the\\_climate\\_change\\_clown\\_show.html](http://www.americanthinker.com/articles/2016/11/trump_and_the_climate_change_clown_show.html).

<sup>21</sup> *See, e.g.*, Pacific Coast Collaborative, West Coast Leaders Climate Change “Resolve is Strong” as COP-22 Concludes, Nov. 18, 2016, *at* <http://pacificcoastcollaborative.org/>.

<sup>22</sup> Discussion Draft at 100-101.

proposed will achieve the 2030 Target and the purported barriers to a well-designed carbon tax matching or exceeding the performance of CARB's preferred cap-and-trade program. The stated reasons for why cap-and-trade is superior to a carbon tax do not withstand scrutiny. If CARB staff have other reasons for favoring cap-and-trade, they should forthrightly present them.

Here, we address the most important shortcomings of the comparison between cap-and-trade and carbon taxes in the Discussion Draft. Along several dimensions, CARB's analysis is flawed and should be significantly revised to reflect better information:

- a. Ability to reduce emissions to meet the 2030 Target.** As we have previously discussed, the cap-and-trade program as proposed by CARB will not achieve the emissions limit set for the year 2030. CARB's assessment that the cap-and-trade will achieve cumulative reductions is not the same as achieving the 2030 Target because banking over-compliance from the present market and expected performance in the early 2020s will lead to under-compliance in the later years of the program. CARB's own figures illustrate this point plainly.<sup>23</sup> In contrast, while a fixed carbon tax cannot guarantee a particular quantity of emissions in a specified year, a trajectory of rising carbon prices can achieve as much or greater emissions certainty as the current cap-and-trade program design—especially if a carbon price trajectory is coupled to a periodic review mechanism that increases the carbon price if emission reductions are not occurring as quickly as expected in *ex ante* projections. Taking into account the detailed program designs that are possible with both cap-and-trade and carbon taxes, the two policy instruments are essentially equivalent in terms of their ability to reach a specified emissions target, contrary to CARB's conclusions in the Discussion Draft.
- b. Ability to protect against emissions leakage.** CARB identifies free allocation as a means of minimizing leakage under cap-and-trade, but

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<sup>23</sup> See, e.g., *id.* at 89 (Figure III-3).

then claims that a carbon tax would allow “fewer options for minimizing leakage,” other than exemption from the tax. But there is no reason to believe that CARB’s current approach to protecting energy-intensive, trade-exposed industries from the risk of leakage couldn’t be replicated with equal efficacy under a carbon tax policy. Under a carbon tax, implementation of this approach would take the form of tax credits granted on the exact same basis as the current schedule of free allowance allocations. Alternatively, CARB could create a border tax adjustment or partially exempt EITs from the tax, resulting in comparable (though distinctly nuanced) economic impacts compared to the current practice of partial free allocation in the cap-and-trade program. Once again, the policies offer essentially equivalent options along this dimension, contrary to CARB’s conclusions in the Discussion Draft.

- c. **Ability to support the development of integrated regional and international programs.** CARB staff state that the ability to cooperate outside of California is greater under cap-and-trade than under a carbon tax. This again misstates the reality. While following its current strategy allows California to maintain a carbon market link with Québec and possibly to establish one in future with Ontario, a carbon tax wouldn’t preclude matching carbon prices in either of these markets—and could better integrate with planned policy developments from the Canadian federal government, which has asked provinces to achieve minimum carbon prices of CAN \$10/tCO<sub>2</sub>e in 2018, ramping to CAN \$50/tCO<sub>2</sub>e in 2022.<sup>24</sup> It is telling that the Canadian coordination policy is established on the basis of price, even though provinces are free to choose a carbon tax or cap-and-trade system that meets the minimum requirement. Following Canada’s lead and coordinating on carbon prices would allow California to cooperate with a much larger jurisdiction and with much lower legal risks than the current system, especially given that President-Elect Trump disfavors

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<sup>24</sup> Government of Canada, Government of Canada Announces Pan-Canadian Pricing on Carbon Pollution (Oct. 3, 2016), *available at* <http://news.gc.ca/web/article-en.do?nid=1132149>.

international action on climate change.<sup>25</sup> Once again, the policies are at least equivalent and a carbon tax may even be superior in terms of its ability to facilitate coordination with other governments, contrary to CARB's conclusions in the Discussion Draft.

- d. Ability to support Clean Power Plan compliance.** CARB staff incorrectly state that an economy-wide cap-and-trade program can comply with the CPP while a carbon tax cannot. The truth is that both systems could be approved by EPA as State Measures Compliance Plans, so long as federally enforceable backstop measures are in place that will be triggered if either policy fails to reduce power sector emissions as intended under a state's Emissions Guideline. Once again, the policies are equivalent, contrary to CARB's conclusions in the Discussion Draft.

On all other evaluated dimensions, the Discussion Draft concludes, and we agree, that a carbon tax and cap-and-trade are equivalent policies. We reiterate that a carbon tax and a cap-and-trade can be designed to achieve essentially similar results. This is particularly true when considering hybrid instruments such as a cap-and-trade with banking, price floor, and price ceiling; or a carbon tax with provision for periodic adjustments.

In revising its comparison of alternative carbon pricing instruments, we urge CARB to add two additional dimensions along which the scoping plan scenarios should be compared.

First, we believe it is important to evaluate the stability of revenues generated by carbon pricing policies—especially given recent allowance auction outcomes. Revenue stability is a key outcome for planning purposes for programs designed to mitigate regressive impacts of carbon

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<sup>25</sup> For example, the non-binding documents signed by California and Québec to jointly implement their domestic market regulations may raise greater legal risks under the incoming Trump Administration than was present under the Obama Administration's pro-climate foreign policy. *See* AIA v. Garamendi, 539 U.S. 396 (2003). In contrast, coordination on prices alone requires no formal agreements or legally binding engagements across borders.

pricing. It is also critical for ensuring that investment in environmental justice communities actually occurs.

Second, we urge CARB to take a hard look at how price volatility and regulatory risks impact the ability of a carbon market's indirect price signal to induce investment in low-emitting technologies and infrastructure. We are not aware of any instance in which a firm has used the avoidance of cap-and-trade allowance prices to generate incremental credit or bond financing for low-carbon investments. Likewise, it is our understanding that banks have been unwilling to issue bonds secured against future cash flows to the State from allowance auction revenues (e.g., for high speed rail). We urge CARB to consider the difference between these outcomes and consider how other approaches have performed, such as the federal Investment Tax Credit for solar and the federal Production Tax Credit for wind on investment. In our view, stable, predictable incentives have generated substantially better outcomes, including specifically in terms of the ability to secure standardized project financing arrangements.

**6. CARB's efforts to compare a carbon tax to other alternatives would be improved by consideration of a more sophisticated carbon tax proposal designed to achieve the 2030 Target.**

At times, comparison of a detailed proposal that one knows well with a much less well defined and less familiar concept can lead to the conclusion that the two are quite different simply because one is less well developed and less familiar than the other. We are concerned that this phenomenon may help explain the differences between CARB's thinking on cap-and-trade and a carbon tax as alternative carbon pricing strategies. As a result, we thought it worthwhile to propose a more detailed carbon tax scenario that might inform staff thinking on design of alternative policies.

At the outset, we emphasize that in designing a carbon tax, CARB should focus on setting a trajectory of increasing rates that it believes will achieve the 2030 Target, rather than on imposing a tax equal to the Federal Social Cost of Carbon. The Social Cost of Carbon is a tool designed to aid Federal Agencies in consistently evaluating the full environmental impacts

of major federal actions. It is in no way designed to achieve a particular emissions target. Thus, we agree with staff that it is an inappropriate tool for achieving the 2030 Target.

Instead, we suggest that CARB could pursue a carbon tax with the goal of coordinating with proposed Canadian and British Columbian strategies on long-term carbon pricing. This implies a near-term pricing target of CAN \$50/tCO<sub>2</sub>e in 2022 (about USD \$38/tCO<sub>2</sub>e), followed by annual increases of CAN \$10/ tCO<sub>2</sub>e per year (about USD \$7.50/tCO<sub>2</sub>e), with prices rising until long-term targets are achieved. California could adopt a similar trajectory by transitioning from its cap-and-trade program to a carbon tax instrument with the same coverage of emissions sources. For example, the level of the tax could be initially set at USD \$30/tCO<sub>2</sub>e in 2021 on all currently covered emitters, with the tax increasing by USD \$10/tCO<sub>2</sub>e every year thereafter.

To ensure that the combination of the rising carbon tax and CARB's regulatory program achieve the 2030 and 2050 Targets, CARB could also adopt an adaptive management regime. For example, CARB could set a regular review period—say, every 3 years—at the end of which CARB would apply a formula that adjusts the price as needed to keep California on a quantitative emissions trajectory consistent with achieving its long-term emissions goals. In any given period this might mean increasing the rate at which the tax grows; in other periods, the rate of increase might slow or the tax rate might even be held constant, as conditions warrant.

To better accommodate leakage and competitiveness concerns in a higher carbon price environment, CARB could implement one of several strategies. We suggest CARB evaluate a Border Carbon Adjustment, as staff had considered during 2014<sup>26</sup>; alternatively, CARB could replicate its output-based free allocation for EITEs with a system of output-based tax

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<sup>26</sup> California Air Resources Board, California Cap-And-Trade Program: Potential Border Carbon Adjustment for the Cement Sector (Feb. 5, 2014), at <https://www.arb.ca.gov/cc/capandtrade/meetings/020514/border-carbon-adjustment.pdf>.

rebates, which would be equivalent in economic terms to the current system.

Transitioning from a cap-and-trade program to a carbon tax would not limit California's ability to coordinate with other governments on climate policy. CARB could, in cooperation with the Legislature and Governor, work to extend and harmonize carbon pricing regimes with its neighbors—perhaps through the Pacific Coast Collaborative and directly with other Canadian provinces. Finally, we note that in Washington State, Governor Inslee just proposed a state-level carbon tax<sup>27</sup> that could serve as the basis for continued cooperation and integration in a regional carbon pricing discussion.

Thank you again for the opportunity to comment on the Discussion Draft. As always, we would be happy to discuss these issues in more detail with CARB board members or staff.

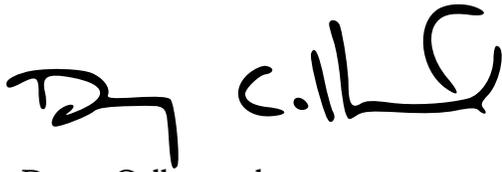
Sincerely,

A handwritten signature in black ink that reads "Michael Wara". The signature is written in a cursive, flowing style.

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<sup>27</sup> Governor Jay Inslee, Policy Brief: Leading the Fight Against Carbon Pollution (Dec. 2016).



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Disclaimer: we are writing in my personal capacities only, not on behalf of our employers, affiliates, or any other organizations.

## **ATTACHMENT**

- Comment letter to CARB (Nov. 21, 2016)

## **ATTACHMENT**

Comment letter to CARB (Nov. 21, 2016)

November 21, 2016

California Air Resources Board (CARB)  
1001 I Street  
Sacramento, CA 95814

**Re: Public Workshop on the 2030 Target Scoping Plan  
(November 7, 2016)**

Dear CARB staff and stakeholders,

Thank you for the opportunity to comment on the recent CARB Workshop presentations concerning the 2030 Target Scoping Plan.<sup>1</sup>

For context, we are longtime academic observers of California's energy and climate policies. Each of us has spent over a decade conducting research on state, federal, and international climate policy with a particular focus on the design and implementation of emissions trading systems and their impact on the electricity sector. We have also worked extensively on legal issues that affect the application of state climate policies to interstate markets for electricity and transportation fuels.

We are grateful for the staff presentations made at CARB's November 7, 2016 Scoping Plan Workshop. Our comments today focus on two elements of the public workshop: CARB staff's presentation of the Draft Scoping Plan Policy Scenarios and CARB staff's Preliminary Economic Analyses.

Overall, while we believe that the workshop represents an important step in articulating how CARB's Scoping Plan will achieve the statewide 2030 emissions limit required by SB 32, CARB still lacks critical information necessary for stakeholders—and even CARB—to perform a reasonably informed evaluation and comparison of the Scoping Plan Scenario and its Alternatives.

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<sup>1</sup> CARB, Public Workshop on the 2030 Target Scoping Plan (Nov. 7, 2016) (hereinafter "CARB Presentation"), *available at* <https://www.arb.ca.gov/cc/scopingplan/meetings/meetings.htm>.

Significant new analysis is needed to properly inform California's ambitious climate policy strategy. Moreover, this analysis needs to be performed prior to moving forward to a Draft Scoping Plan.

We describe what we believe is necessary for a full evaluation in our comments below. We highlight five major issues in this letter:

- **Improved Transparency.** In order for stakeholders to evaluate the alternatives presented, CARB should disclose all model inputs, assumptions, and outputs. CARB should also provide additional time for stakeholders to review and evaluate these disclosures.
- **Policy Specificity.** CARB refers to a number of policies that are estimated to have major impacts on simulated emissions, but provides little or no explanation for how these policies would be designed or achieved. For example, CARB states that the refining sector can reduce its emissions 20 to 30% without any discussion as to how these requirements would be imposed or realized. Much more information needs to be provided on how CARB plans to achieve the reductions forecast in order to evaluate the proposed alternatives.
- **Policy robustness.** CARB's initial scoping plan relied on what turned out to be a very inaccurate forecast of key drivers of California GHG emissions—most notably with respect to the trajectory of state economic growth, a notoriously difficult variable to accurately predict. One consequence of the earlier forecast error is the present oversupply in the state's cap-and-trade market and hence, limited revenue for the Greenhouse Gas Reduction Fund (GGRF). At the November workshop, staff once again relied upon a single reference emissions scenario; however, the use of a single reference scenario falls short of best practice in long-term policy analysis. We strongly recommend developing multiple reference scenarios that incorporate both low and high electricity load growth, transportation fuel demand growth, population growth, and overall economic growth. Only an analysis that considers multiple baseline scenarios can ensure that the selected Scoping Plan strategy is capable of achieving California's policy goals.

- **Energy-economic modeling.** CARB’s analysis relies on two models: PATHWAYS, an engineering model that does not take into account interactions between economic sectors, and REMI, an economic model that does not simulate energy or greenhouse gas emissions. As a result, CARB must assume carbon prices, rather than estimate them endogenously. This means that CARB cannot endogenously estimate the macroeconomic impacts of the Draft Scoping Plan Scenario. Similarly, CARB cannot use these models to estimate carbon market prices (Draft Scoping Plan Scenario) or design a carbon tax (Alternative 2) that would achieve the 2030 Target. CARB’s assumptions about carbon pricing under a cap-and-trade program (Draft Scoping Plan Scenario) and under a carbon tax (Alternative 2) are inconsistent and frustrate an even-handed comparison of these two policy mechanisms.
- **Quantity Certainty.** The design of the current cap-and-trade system allows for unlimited banking. Given the ambition of the 2030 Target and the current oversupply in the carbon market, it is very likely that market participants will over-comply in the early 2020s, bank allowances, and under-comply in the second half of the 2020s (using banked allowances to satisfy program requirements in these years). This strategy appears inconsistent with SB 32, however, because the statutory target requires statewide emissions to be at 40% below 1990 levels in 2030—not that the integral of emissions over 2021-2030 equal some fixed quantity. Staff should explain how the Draft Scoping Plan Scenario (cap-and-trade with allowance banking) will comply with the legally mandated 2030 emissions target. An explanation is particularly important given the criticism in the staff presentation regarding lack of an emissions limitation for Alternative 2 (Carbon Tax).

## 1. Improved Transparency

We believe that a transparent and open process will facilitate broad stakeholder agreement on the best path forward for achievement of California’s GHG reduction goals. In turn, this requires CARB to provide more information about the Draft Scoping Plan and Alternative Scenarios,

including the assumptions and modeling data behind each of the measures considered in the staff presentation.

It is clear that staff have undertaken significant modeling efforts using both the PATHWAYS and REMI models in the course of developing the Scoping Plan Scenario and Alternatives 1 and 2. We strongly believe that the inputs and assumptions from these model runs should be made available to interested stakeholders for analysis and evaluation, along with the complete model output files. Absent full disclosure of these technical details, it is impossible to properly evaluate the feasibility and impacts of the strategies articulated in CARB's scenarios.

Disclosure will also help improve the quality of analysis in the final 2030 Scoping Plan. CARB's use of an engineering model that does not include interaction between economic sectors (PATHWAYS) with an economic model that does not incorporate energy or GHG emissions (REMI) means that modeling assumptions (including interactions between assumptions made in PATHWAYS and REMI) are a critical determinant of CARB's Scenarios. A full public review and evaluation of these assumptions is therefore essential for evaluating the plausibility of each scenario, as well as for comparing the attributes of the policies proposed in the Draft Scoping Plan Scenario and its Alternatives. Without providing these data, CARB is asking the stakeholder community to take the agency's word.

We note that for major complex EPA air pollution related rulemakings, all Integrated Planning Model baseline and scenario results are released for external review as common practice.<sup>2</sup> EPA maintains this practice for politically controversial rulemakings, such as the Clean Power Plan.<sup>3</sup> We think this approach represents the best practice in public policy analysis, and believe CARB staff can and should achieve this standard in its 2030 Scoping Plan process. In addition to being the right way to pursue public

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<sup>2</sup> EPA, Clean Air Markets, Power Sector Modeling, *available at* <https://www.epa.gov/airmarkets/clean-air-markets-power-sector-modeling>.

<sup>3</sup> EPA, Analysis of the Clean Power Plan, *available at* <https://www.epa.gov/airmarkets/analysis-clean-power-plan>.

policy, transparent disclosure will also benefit CARB by increasing confidence and stakeholder buy-in with respect to the analysis that underlies staff proposals and the final 2030 Scoping Plan.

## 2. Policy Specificity

A number of the policy measures outlined in the CARB Presentation lack specificity. The two most striking examples of this are the proposed “refinery measure” and the “industrial sector measures.” Both have significant impacts on statewide GHG emissions, not to mention potential impacts to in-state GDP, fuel costs, and industrial productivity. We address each in turn.

The CARB Presentation explains only that the “Refinery Measure” will result in either a 20 or 30 percent reduction in energy demand by 2030 from the refinery sector, with associated emissions reductions.<sup>4</sup> One is left to wonder whether emissions reductions will be achieved by reduction in energy intensity or by reduction in output. CARB does not present sufficient information to distinguish between these two alternatives, but their consequences are significant for stakeholders and public policy goals alike: if it is not possible to reduce the energy intensity of refining in line with CARB’s proposed targets, will production merely shift to refineries in unregulated jurisdictions and cause CO<sub>2</sub> emissions to leak?<sup>5</sup> Given that the Refinery Measure was simulated in PATHWAYS, one might assume that CARB has greater specificity regarding its approach and expected consequences.

Similarly, the “Industrial Sector Measures” proposed under Alternative 1 are supposed to achieve a 25% reduction in industrial energy demand by 2030, with an equivalent reduction in emissions.<sup>6</sup> Given the much greater

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<sup>4</sup> CARB Presentation at slide 24.

<sup>5</sup> *See* Cal. Health & Safety Code §§ 38562(b), (b)(8) (requiring CARB to minimize leakage “to the extent feasible” in the design of its climate regulations).

<sup>6</sup> CARB Presentation at slide 24.

diversity of firms and technologies covered by the oil and gas and industrial sectors in California, this description is even less informative than the proposed “Refinery Measure.” Which industries does CARB expect will reduce emissions? How does CARB propose to handle trade exposure for these industries? How will industrial output be affected in California due to the measures? How do these expectations change across reference scenarios that incorporate different views of future economic growth? Once again, given the detail of the PATHWAYS model, it is reasonable to assume that there is more policy specificity to be had here, including assumptions about what is common practice in various industries in California and how energy efficiency might be improved upon.

Policy specificity for these new measures is important because it also concerns the balance of CARB’s reliance on so-called complementary measures and carbon pricing policies. CARB has indicated a strong preference for using complementary measures as the dominant tool to reduce emissions.<sup>7</sup> If there isn’t sufficient detail yet to be confident that these large reductions are achievable, then this uncertainty should be forthrightly indicated in CARB staff’s estimates of reductions provided by these new complimentary policies.

By implication, any such uncertainty could potentially increase the role that a carbon pricing mechanism plays in achieving the 2030 Target—assuming post-2020 carbon pricing is implemented. All of this information should be shared with stakeholders so that all parties can have confidence in the degree of effort expected of different aspects of the program and of different economic sectors. If for some reason it does not yet exist—perhaps because CARB staff are still developing their thinking on these

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<sup>7</sup> See generally CARB, 2030 Target Scoping Plan Update Concept Paper (June 17, 2016); CARB, Public Hearing to Consider the Proposed Amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms, Staff Report: Initial Statement of Reasons (Aug. 2, 2016)313 (citing the PATHWAYS modeling results projecting cumulative emission reduction requirements over 2021 to 2030 of ~900 mmtCO<sub>2</sub>e—700 to 800 mmtCO<sub>2</sub>e of which are discussed as coming from complementary policies, leaving 100 to 200 mmtCO<sub>2</sub>e from the cap-and-trade program); Staff Presentation at slide 24.

measures—then CARB staff should be much more circumspect about these new measures’ ability to achieve the reductions with which they are credited.

### 3. Policy Robustness

A policy is robust if it can be expected to perform well under a range of future conditions. The best way to design robust carbon policy is to test its performance and effects against a wide range of possible future scenarios. In contrast, the worst way to design robust carbon policy is to test its performance and effects against a single baseline scenarios because this information cannot speak to how the policy portfolio will operate as future conditions depart from the policymaker’s point forecast. These risks are especially significant when trying to forecast the trajectory of an entire economy over a period of more than ten years.<sup>8</sup>

In contrast to best practice in public policy analysis, CARB’s Presentation compares the Draft Scoping Plan Scenario and the Alternatives against a single reference scenario. Until CARB (or outside stakeholders) analyze the performance of these scenarios against a range of plausible futures, it is impossible to form a reasoned judgment of any Scoping Plan Scenario’s robustness to future conditions.

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<sup>8</sup> Vaclav Smil, Perils of Long Range Forecasting: Reflections on Looking Far Ahead, *Technological Forecasting & Social Change* 65: 251-64 (2000); Michael Wara, Instrument Choice, Carbon Emissions, and Information, *Michigan Environmental and Energy Law Review* 4(2): 261-301 (2015); Michael Wara, Danny Cullenward, and Rachel Teitelbaum, Peak Electricity and the Clean Power Plan, *The Electricity Journal* 28(4): 18-27 (2015); Lesley K. McAllister, The Overallocation Problem in Cap and Trade: Moving Towards Stringency, *Columbia Journal of Environmental Law* 43: 426-442 (2009); Severin Borenstein, James Bushnell, Frank Wolak, and Matthew Zaragoza-Watkins, Report of the Market Simulation Group on Competitive Supply/Demand Balance in the California Allowance Market and the Potential for Market Manipulation, Energy Institute at Haas Working Paper #251 (July 2014); Severin Borenstein, James Bushnell, Frank Wolak, and Matthew Zaragoza-Watkins, Expecting the Unexpected: Emissions Uncertainty and Environmental Market Design, Energy Institute at Haas Working Paper #274 (August 2016).

We note that the first scoping plan also relied on a single reference case scenario. This scenario turned out to be incorrect in a number of respects that have had important consequences for the performance of California's climate policies. In particular, the reference case scenario assumed average electricity load growth, liquid fuel demand growth, and economic growth for the period to 2020 based on estimates developed in 2007.<sup>9</sup> Of course, as we all know, the Great Recession and subsequent recovery undermined most of these assumptions to a substantial degree. So did more-rapid-than-anticipated deployment of various energy efficiency technologies that acted to reduce load growth. As a consequence of the combination of these unforeseen outcomes, achieving the 2020 target has turned out to be easier than initially forecast by CARB staff. As a result, there has been low demand for allowances within the cap-and-trade program; demand has been so low that allowance auctions have fallen far short of revenue projections, resulting in reduced GGRF program funding.

The point here is not that CARB staff should somehow have anticipated all of these changes in a single reference scenario. How could they, or anyone else? Rather, the point is that policy planning should assume a wide range of values for key variables precisely because they are inherently difficult to predict. Evaluating major economic regulations against a single baseline scenario is the surest way to make incorrect analytical assumptions.

We urge CARB staff to consider developing low and high electricity load, liquid fuel demand, and economic growth baseline scenarios for the state. These baseline scenarios can then be used to estimate the range of potential outcomes attributable to the Scoping Plan Scenario and Alternatives 1 and 2. By doing this, CARB and stakeholders will be better able to compare the range of reasonably likely outcomes that may occur under the three alternatives. As UCLA Professor Donald Shoup has

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<sup>9</sup> CARB, Climate Change Scoping Plan and Appendices, Volume II, Analysis and Documentation, *at* G-11 (December 2008).

argued in another model-based forecasting context, it is better to be “roughly right than precisely wrong.”<sup>10</sup>

#### **4. Energy-Economic Modeling**

The staff presentation makes clear that the current CARB modeling approach is similar to the one taken for the original scoping plan in 2008. That is, it relies on an engineering model (PATHWAYS) to estimate the possible size of GHG reductions and a macroeconomic model (REMI) to estimate the size of the California economy and changes to various related economic indicators if the changes produced by the engineering model take place.

As was identified in 2008 in the original Scoping Plan, however, this approach has a serious weakness: it cannot evaluate the cost or impact of the “unplanned” reductions produced by market based emission reduction programs.<sup>11</sup> For the pre-2020 period, this was perhaps not such a serious defect. After all, the market-based programs were not intended to do very much work in meeting the AB 32 target for 2020. Further, because of unforeseen circumstances, the state’s climate goals have been even easier to achieve than anticipated, resulting in reduced role for the cap-and-trade program in ensuring the state meets its 2020 target.

But any comfort one takes in the relative ease of achieving California’s 2020 climate goals is a dangerous sentiment to carry over into the 2030 planning period. True, it now appears that the state’s broader portfolio of complementary policies appear capable of achieving the 2020 target without much of a role for the backstop cap-and-trade program. But the same cannot be said about the relative roles of complimentary and market-based mechanisms in achieving the 2030 target.

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<sup>10</sup> Donald Shoup, *Roughly Right or Precisely Wrong*, Access No. 20, at 20 (Spring 2002), at <http://shoup.bol.ucla.edu/RoughlyRightOrPreciselyWrong.pdf>.

<sup>11</sup> CARB, *Climate Change Scoping Plan and Appendices, Volume II, Analysis and Documentation*, at G-4 – G-7 (December 2008).

We note that CARB appears poised to make the same policy choice—relying on regulations above market-based instruments—despite the very different challenge the agency now faces with a much deeper target for 2030 reductions. Under CARB’s Scoping Plan Scenario, a post-2020 cap-and-trade program is expected to achieve 88 to 98 MMtCO<sub>2</sub>e out of 671 MMtCO<sub>2</sub>e in cumulative reductions during the 2021 to 2030 period—about 13 to 15% of total effort.<sup>12</sup> Yet absent the use of carbon pricing, the staff presentation indicates difficulty in reaching the 2030 Target.<sup>13</sup>

In our view, this policy strategy amplifies the risks CARB (and California) avoided because of recession and unforeseeable changes in clean energy costs in the pre-2020 period. We think the chance of having similar luck is much smaller in the post-2020 period, if for no other reason than the much larger climate policy ambition in the 2030 target relative to the 2020 target.

We also note that CARB’s calculations once again highlight the problem of using a single reference scenario to describe the future. Planning towards a cumulative reduction of 671 MMtCO<sub>2</sub>e from 2021 to 2030 requires CARB to precisely estimate (1) the business-as-usual reference scenario for the state economy over this time period against which reductions are measured, (2) the specific drivers of economic activity and GHG emissions in each regulated sector, and (3) the expected emission reductions from state policy in each regulated sector. In practice no one has a crystal ball this clear—not even for a single one of these forecasting applications, let alone the complex interactions between all three.<sup>14</sup>

Again, the level of estimated reductions from complementary policies depends on the difference between the reference scenario and the target. If the actual baseline emissions turn out higher than the reference scenario—

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<sup>12</sup> Compare CARB Presentation slide 16 *with* CARB Presentation slide 25.

<sup>13</sup> *Id.* at slides 28, 33 (showing a 39% reduction below 1990 GHG emissions in 2030 for Alternative 1).

<sup>14</sup> See references and discussion in note 8.

which, assuming an unbiased forecast, has a 50% likelihood—then the required reductions will be even greater.

Our point is that the magnitude of any error introduced by the lack of appropriate modeling increases with the scale of the reductions required to meet the 2030 target. These errors error directly affect the balance of complementary policies and carbon pricing required to reach the 2030 Target. As a result, the risk of forecast error in determining the appropriate use of complementary policies and carbon pricing is much higher in the 2030 planning period relative to the 2020 target.

We urge CARB to take these risks more seriously, as they are fundamental to choosing a robust climate policy strategy. The good news is that there are solutions to this problem. Several tools are available that can adequately simulate market based environmental policies. They are widely used to evaluate cap-and-trade programs for pollutants or the imposition of emissions taxes. They range from relatively simple models that can explicitly represent reference case uncertainty<sup>15</sup> to more complex partial equilibrium macroeconomic models with significant detail in the energy sectors of the economy that can represent uncertainty using high and low growth scenarios.<sup>16</sup>

In order to estimate the economic costs and environmental benefits of market-based environmental policies in the Scoping Plan Scenario and Alternative 2, CARB needs to contract with one or more experts in the energy modeling community to actually estimate the impacts of these market based environmental policies. CARB's current approach may have been appropriate for the first Scoping Plan, when these policies did very little work in achieving mandated targets. But given the importance of market-based policies for achieving the 2030 target, the current analytical framework is unlikely to produce trustworthy results. We strongly urge

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<sup>15</sup> See Borenstein et al. (2014), *supra* note 8; see also Borenstein et al. (2016), *supra* note 8.

<sup>16</sup> See, e.g., NERA Economic Consulting, NewERA Model, at <http://www.nera.com/practice-areas/environmental-economics/newera-model.html>.

CARB to deploy better analytics, including by contracting with outside experts if necessary. This should not be delayed until further into the Scoping Plan process—it should be part and parcel of developing the alternatives under consideration to achieve the 2030 Target.

## 5. Quantity Certainty

The proposed regulatory amendments to the cap-and-trade program leave unchanged the rules providing for banking of allowances. This enables regulated firms to over-comply with the cap during the pre-2020 period and bank allowances for future use. These banked allowances can then be used such that regulated firms under-comply in later years when they surrender banked allowances. CARB needs to acknowledge that this has the impact of injecting quantity uncertainty into a cap-and-trade system for any given year. In other words, CARB should acknowledge the cap in a cap-and-trade system that allows for banking is really the sum of the allowed emissions for all years of the program plus offsets—and not a strict limit on reported emissions in any one year.

Inter-temporal flexibility on emissions is a feature of cap-and-trade systems, not a bug. In a well-designed system, it allows regulated parties to minimize compliance costs while achieving an overall programmatic goal. In an oversupplied market, however, the risk is not that companies allow their emissions to fluctuate from year to year while remaining consistent with an overall trajectory. Rather, the risk is that oversupplied allowances with unlimited banking will put the cap-and-trade system on a fundamentally higher emissions trajectory that is inconsistent with the goals of SB 32. Indeed, this is exactly what CARB's presentation shows.<sup>17</sup>

We note that CARB has expressed concern about quantity uncertainty in criticizing carbon taxes under Alternative 2.<sup>18</sup> Our point is that this concern applies equally to CARB's preferred Draft Scoping Plan Scenario,

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<sup>17</sup> CARB Presentation at slide 25 (showing 2030 emissions significantly higher than the 2030 target for the Draft Scoping Plan and Alternative 2 scenarios).

<sup>18</sup> *Id.* at slide 37.

which assumes that regulated firms in the cap-and-trade over-comply with program requirements in the early years of the program, resulting in significantly higher emissions in 2030.<sup>19</sup> As a result of banking in an oversupplied market, CARB's Draft Scoping Plan Scenario creates a similar risk that the state will be unable to achieve its 2030 target—just as would be the case for a comparable carbon tax as modeled under Alternative 2.

As we have previously noted, CARB's proposal to extend the cap-and-trade system while retaining unlimited banking is designed to create a buffer of oversupplied allowances to keep prices low.<sup>20</sup> Indeed, the specific proposal to place allowances that remain unsold at auction into the Allowance Price Containment Reserve (APCR) while simultaneously raising the APCR Reserve Price to \$60/tCO<sub>2</sub> above the minimum auction floor price is designed to encourage firms to purchase allowances that are not needed in the pre-2020 compliance phase for banked use in the post-2020 compliance phase.<sup>21</sup> These incentives are consistent with CARB's projection that a post-2020 cap-and-trade program would likely lead to early over-compliance and later under-compliance with the formal cap levels, leading to higher-than-scheduled emissions in 2030.

In its cap-and-trade regulatory amendments package, CARB projects that emissions from capped sectors in 2020 will be below the cap for that year.<sup>22</sup> We note that this is a common pattern observed in cap-and-trade programs implemented to date: emissions in early years are frequently less than the cap while emissions in later years are in excess of it.<sup>23</sup> Because this

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<sup>19</sup> *Id.* at slide 25.

<sup>20</sup> *See generally*, Michael Wara and Danny Cullenward, Comment letter to CARB re: post-2020 cap-and-trade proposal (Sept. 20, 2016), *available at* <http://www.ghgpolicy.org/law-and-policy/2016/9/20/carbs-post-2020-cap-and-trade-proposal-policy-comment>.

<sup>21</sup> CARB ISOR, *supra* note 7 at 16-17.

<sup>22</sup> *Id.* at 12-13.

<sup>23</sup> This compliance behavior was observed in both the Acid Rain Trading Program and is currently underway in the Low Carbon Fuel Standard market. Juha Siikamai, Dallas Burtraw, Joseph Maher, and Clayton Munnings, The

pattern is common with past emissions trading programs, consistent with the economic incentives CARB has proposed for the post-2020 period, and reflected in CARB's workshop presentation, we believe that under-compliance in the cap-and-trade program should be analyzed in light of the overall goal of reaching the 2030 target in 2030.

On a related point, we believe that uncertainty about reaching the 2030 target under a cap-and-trade program with banking and expected under-compliance in the later years should be more fairly compared to the emissions uncertainty for the same year under a carbon tax regime. Thus far CARB has unfairly framed the comparison, suggesting that a carbon tax “does not include an explicit emissions restraint mechanism” and that “if reductions aren't realized, additional measures need to be implemented quickly to make up unrealized reductions.”<sup>24</sup> These effects are real, but in our view apply equally well to the proposed cap-and-trade program considered in the Draft Scoping Plan scenario as they do to the carbon tax considered in Alternative 2.

Furthermore, we suggest that an appropriately designed carbon tax with an automatic price escalator—*i.e.*, one with a price that escalates at a rate tied to observed progress on emissions reductions with the goal of achieving the desired level of emissions in 2030—should provide a similar if not superior level of emissions certainty to cap-and-trade than is implied by the CARB presentation. If CARB believes otherwise, we respectfully ask for an explanation.

Overall, we call for a more balanced discussion of the pros- and cons- of both market-based mechanisms in the context that they are expected encounter. It may well be that a cap-and-trade was and is the best approach for CARB to achieve the 2030 Target. It might also be that a mechanism that was appropriate for the more modest 2020 Target may be less desirable for achieving the deeper reductions required for 2030. Absent an

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U.S. Environmental Protection Agency's Acid Rain Program, Resources for the Future Backgrounder, 4-5 (Nov. 2012).

<sup>24</sup> CARB Presentation at slide 37.

even-handed comparison of the instruments as they would actually be implemented, the choice of one over the other cannot be justified.

## 6. Additional Comments

Here we provide additional comments, presented in the order in which they appear in the CARB Presentation Slides.

- **Slide 20.** What is the basis for believing that refineries can maintain output while cutting energy demand and emissions by 20 to 30%? Is CCS assumed in the model and if so at what cost? Alternatively, does this assume that refinery output declines by roughly the same percentage as fuel use declines? If so, what assumptions in other sectors would have to be true for this to occur—for example in electric vehicle deployment, heavy duty vehicle biodiesel consumption, aircraft fuel demand, and marine fuel demand?
- **Slide 21.** What assumptions about gas pipeline infrastructure are being made in CARB’s consideration of a renewable gas standard? Can existing infrastructure take a 5% H<sub>2</sub> blend without retrofit?
- **Slide 22.** Why include the proposed refinery measure in addition to a carbon tax or cap-and-trade? An appropriate cap-and-trade program, cap-and-trade with a hard price ceiling, or price trajectory for a carbon tax will have the same incentives to reduce emissions in covered sectors that this measure will. We recommend that CARB remove the refinery measure from all alternatives that contain a carbon price sufficient to achieve the 2030 target.
- **Slide 24.** What is the basis for assuming that 18 to 28 GW of new rooftop solar is possible on the California grid given current deployed utility-scale and distributed solar capacity as well as utility-scale solar capacity in the interconnection queue? What curtailment assumptions underlie CARB’s assessment? Does the rooftop solar deployment assume CAISO regionalization, and how does the question of CAISO regionalization affect rooftop solar deployment? What energy storage assumptions are required for these aggressive targets?

- **Slide 27.** Please provide additional documentation including PATHWAYS Modeling assumptions, inputs, and outputs for this figure. Please estimate uncertainties in performance of the programs detailed in this figure. One simple approach to doing this would be to look retrospectively at forecasts made in first scoping plan in order to estimate forecast error.
- **Slide 29.** Please provide some justification for the 30% uncertainty factor here. What is the basis for this uncertainty factor? Is it regulatory performance? Is it economic or population growth? Is it technology risk? More explanation would be helpful.
- **Slide 29.** Please explain how this analysis is or is not consistent with the cap-setting done for the post-2020 cap-and-trade regulatory amendments package. In particular, is the PATHWAYS modeling here consistent with the assumption in the proposed cap-and-trade regulation that emissions in uncapped sectors fall by the same percentage (40%) as in capped sectors?<sup>25</sup> Is the assumption here that agricultural sector emissions fall by 1% consistent with the way the cap was set in the regulatory amendments package? Or does this require lowering the cap further in order to achieve the 2030 Target?
- **Slide 34.** Consider using a Border Tax Adjustment rather than free allocation in light of the *Rocky Mountain Farmers Union* case.<sup>26</sup> Please explain how the recent Presidential election result does or does not change linkage considerations, particularly with subnational jurisdictions in other countries. Is there increased preemption risk due to Foreign Affairs Power issues?<sup>27</sup> In general, please explain your thinking about the continued relevance of the Clean Power Plan at this point.

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<sup>25</sup> ISOR *at* 12-13.

<sup>26</sup> *Rocky Mountain Farmers Union v. Corey*, 730 F.3d 1070 (9th Cir. 2013), *cert denied* 134 S. Ct. 2875 (2014).

<sup>27</sup> *See, e.g., American Insurance Ass'n v. Garamendi*, 539 U.S. 396 (2003).

- **Slide 38.** We disagree with staff’s pessimistic assessment of the potential to coordinate climate policy with other jurisdictions under a carbon tax. In particular, direct cooperation would still be possible with Canadian provinces (British Columbia and Alberta) as well as with national governments in Canada and Mexico by coordinating future carbon prices. This is much simpler to do in practice than linking cap-and-trade systems, as there is no requirement for coordinated auction, mutual recognition of allowances, and other procedural requirements under SB 1018. Perhaps most important in light of the incoming Trump Administration, coordination via carbon price harmonization has lower legal risks under the Foreign Affairs doctrine.<sup>28</sup> Finally, we note that EPA has made clear that States may use a carbon tax as an element of a State Measures Plan to comply with its Clean Power Plan obligations.<sup>29</sup>

Thank you again for the opportunity to comment on the staff presentations at the November 2016 scoping plan workshop. We would be happy to discuss any of our comments with CARB Staff or Board Members and look forward to the next iteration of the 2030 scoping plan process.

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<sup>28</sup> *Id.*

<sup>29</sup> EPA, Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Generating Units, 80 FR 64,661, 64,835-64,837 (Oct. 23, 2015).

Sincerely,

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