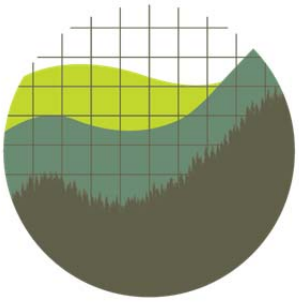

Institute *for*
Policy Integrity
NEW YORK UNIVERSITY SCHOOL OF LAW

April 10, 2017

California Air Resources Board
VIA ELECTRONIC SUBMISSION

Subject: Comments on 2017 Climate Change Scoping Plan Update (Jan. 20, 2017)

The Institute for Policy Integrity at New York University School of Law ("Policy Integrity") respectfully submits the following comments on the California Air Resource Board's ("ARB") 2017 Climate Change Scoping Plan Update. Policy Integrity is a nonpartisan think tank dedicated to improving the quality of government decisionmaking through advocacy and scholarship in the fields of administrative law, economics, and public policy. Policy Integrity regularly conducts economic and legal analysis on the appropriate use of the social cost of carbon, among other environmental and economic topics.

These comments build on Policy Integrity's December 16, 2016 comments[1] on the Discussion Draft of the Scoping Plan, make recommendations on how to improve the plan's economic analysis to best achieve the goals laid out in ARB's statutory mandate, and address some core concerns raised by environmental justice advocates.

Overall, the 2017 Climate Change Scoping Plan Update[2] is an improvement on the Discussion Draft because it uses the best available estimate for the social cost of carbon ("SC-CO_2") and lays the foundation for a strong economic analysis. In order to more completely and accurately account for the social costs of greenhouse gas emissions and the co-benefits of reducing these emissions, ARB should:

- Use the interagency working group's ("IWG") social cost of methane ("SC-CH_4");[3]
- Monetize the co-benefits in the process of comparing the net benefits of each proposed policy scenario; and
- Commit to ensuring that the social cost of greenhouse gases it uses continues to be based on the best available science and economics as they develop over time.

[1] Policy Integrity Comments on the Discussion Draft, 2030 Target Scoping Plan Update (Dec. 16, 2016) [hereinafter "Policy Integrity Comments"] (attached as Appendix A).
[2] Cal. Air Res. Bd., The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target (Jan. 20, 2017) [hereinafter "Proposed Scoping Plan"].
[3] More information on the formation and methodology of the Interagency Working Group is available in Section I of the attached comments (Appendix A). The IWG's technical support documents can be found at https://obamawhitehouse.archives.gov/omb/oira/social-cost-of-carbon.

These recommendations will help ensure ARB's policy recommendations are grounded in sound economic analysis and aid the public in understanding ARB's policy decisions.

I. ARB Thoughtfully Conducts Many Aspects of Its Draft Economic Analysis

ARB's economic analysis is thorough and thoughtful in a number of ways, especially in its use of the IWG's estimate of the SC-CO_2 and its use of sensitivity analysis and consideration of multiple alternative scenarios.

a. ARB uses the best available estimate for the social cost of carbon

ARB uses the best available estimate of the SC-CO_2 in its economic analysis, and the Scoping Plan includes important language about how California will update that number going forward. ARB appropriately uses the "central" estimate of the IWG's SC-CO_2 in Appendix E to the Plan.[4] As we noted in our previous comments, the IWG's SC-CO_2 reflects the best available science and economics and was developed through an academically rigorous, peer-reviewed process.[5] Additionally, ARB's commitment to monitoring ongoing developments with the federal SC-CO_2 estimates is critical to California continuing to use the best available value for carbon dioxide.[6]

Though President Trump's Executive Order 13,783[7] has withdrawn the IWG's technical support documents, these documents remain the best available estimate of the social costs of greenhouse gases.[8] The National Academies of Sciences has recommended certain updates to the models in the long run,[9] but the IWG's values remain a reasonable starting point for ARB's estimates.[10] As economic conditions change and the science develops, states using the SC-CO_2 and other social costs of greenhouse gases should ensure that they continue to use estimates that are grounded in sound science and economics. We commend ARB for its commitment to continue monitoring the potential need to update the SC-CO_2 in

[4] Proposed Scoping Plan, *supra* note 2, app. E at 16.
[5] Policy Integrity Comments, *supra* note 1, at 2-5.
[6] Proposed Scoping Plan, *supra* note 2, at 61.
[7] Exec. Order No. 13,783, 82 Fed. Reg. 16,093 at § 5 (Mar. 28, 2017).
[8] Richard G. Newell et al., *Carbon Market Lessons and Global Policy Outlook*, 343 SCIENCE 1316 (2014); Bonnie L. Keeler et al., *The Social Costs of Nitrogen*, 2 SCIENCE ADVANCES e1600219 (2016); Richard L. Revesz et al., *Global Warming: Improve Economic Models of Climate Change*, 508 NATURE 173 (2014) (co-authored with Nobel Laureate Kenneth Arrow, among others). *See also* NAT'L ACAD. OF SCI., ENG'G, & MED., ASSESSMENT OF APPROACHES TO UPDATING THE SOCIAL COST OF CARBON: PHASE 1 REPORT ON A NEAR-TERM UPDATE (2016) [hereinafter "NAS 2016"] (explaining that the integrated assessment models used in developing the IWG's social cost estimates are the most cited models in the peer-reviewed literature); Michael Greenstone et al., *Developing a Social Cost of Carbon for US Regulatory Analysis: A Methodology and Interpretation*, 7 REV. OF ENVTL. ECON. & POL'Y 23 (2013) (same).
[9] NAT'L ACAD. OF SCI., ENG'G, & MED., VALUING CLIMATE DAMAGES: UPDATING ESTIMATION OF THE SOCIAL COST OF CARBON DIOXIDE (2017)[hereinafter "NAS 2017"]
[10] *See* NAS 2016, *supra* note 8, at 1.

the future.[11] We discuss factors that ARB should consider in these efforts in Section I of our December 2016 comments.[12]

b. ARB's Cost-Effectiveness Analysis Appropriately Considers a Range of Policy Alternatives and Economic Conditions

Beyond using the SC-CO_2, the current Scoping Plan's economic analysis appropriately includes a robust cost-effectiveness analysis[13] and considers multiple scenarios, including two alternative scenarios to the Plan proposal.[14] Though already thorough, the analysis could be made even more robust by including additional scenarios, particularly a cap-and-trade-only scenario. Including additional scenarios would allow a comparison between the selected approach and what may be even more cost-effective approaches to reducing greenhouse gas emissions.

Additionally, ARB uses transparent, well-documented,[15] and publicly available[16] models to conduct its analysis. The models contain sufficient detail to accurately assess the cost-effectiveness of the alternatives. ARB conducts a sensitivity analysis, focusing particularly on alternative (low and high) oil and natural gas price paths, which allows ARB to address these elements of uncertainty in assessing the alternatives.[17] ARB provides the social costs of greenhouse gas emissions and breaks down costs by sector, rather than just providing aggregate costs of each proposal. Finally, ARB also does an excellent job of describing this analysis.

II. ARB Should Conduct Additional Analysis to Ensure that it Satisfies its Statutory Mandates and Better Understands How the Different Policy Options Will Affect All of California's Residents

Conducting additional economic analyses in the process of preparing the final plan will aid ARB in satisfying its statutory mandates, which dictate that ARB must consider the social costs of the proposed greenhouse gas emissions reduction measures, as well as the range of projected reductions of other air pollutants expected to result from each proposed measure. Conducting additional economic analyses will allow ARB to maximize the net benefits of the program to California residents and reduce the risk of successful legal challenges to the final Scoping Plan and subsequent regulations.

a. To fully assess the public impacts of the possible approaches, ARB should monetize the co-benefits of each alternative

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[11] Proposed Scoping Plan, *supra* note 2, at 61.
[12] See Policy Integrity Comments, *supra* note 1 (& app. A), at 2-14, for an in-depth discussion of the SC-CO_2.
[13] Proposed Scoping Plan, supra note 2, at 54.
[14] *Id.* at 49.
[15] *See id.* at app. D for more information on PATHWAYS; documentation by REMI of its Policy Insight Plus model is available at http://www.remi.com/resources/documentation.
[16] E3 Energy + Environmental Economics, Summary of the California State Agencies' PATHWAYS Project: Long-Term GHG Reduction, *available at* https://www.ethree.com/public_proceedings/summary-california-state-agencies-pathways-project-long-term-greenhouse-gas-reduction-scenarios.
[17] Proposed Scoping Plan, *supra* note 2, at 70.

ARB should monetize the co-benefits associated with each regulatory alternative, in order to assess the public health and economic impacts associated with each possible approach. At present, the draft proposal does not monetize these co-benefits in assessing alternative regulatory approaches, nor does it indicate that these co-benefits will be monetized in assessments of future regulations promulgated under the Scoping Plan. Without understanding the full range of benefits and costs, it will be difficult for ARB to appropriately consider overall societal benefits and to maximize net benefits to California from proposed policies. An economic analysis that quantifies and monetizes, to the extent feasible, the health benefits associated with co-benefit reductions under different combinations of emission reduction measures will help decisionmakers and communities understand the full scope of the effects of pollution that can be avoided under each reduction approach.

In its economic analysis, ARB should take into account the significant indirect benefits, also known as ancillary or co-benefits, of regulating greenhouse gas emissions. Co-benefits of greenhouse gas regulation include reductions of other pollutants that occur together with greenhouse gases, including criteria pollutants, like particulate matter, and air toxics. Reducing these co-pollutants, concurrently with a reduction in greenhouse gases, can lessen some of the adverse public health consequences of air pollution.

Consideration of ancillary consequences of ARB's rulemaking is consistent with the statutory mandate set out in AB 32, which tasks ARB with designing greenhouse gas emissions reduction measures that maximize "additional environmental and economic co-benefits for California, and complements the state's efforts to improve air quality."[18] Consideration of co-benefits is also consistent with AB 197, which requires ARB to identify both the "range of projected greenhouse gas emissions reductions that result from the measure" and the "range of projected air pollution reductions that result from the measure."[19] Cost-benefit analysis is the most effective way for ARB to fulfill its mandate to "[d]esign the regulations . . . in a manner that . . . seeks to minimize costs and maximize the total benefits to California"[20] and also to "[c]onsider overall societal benefits, including reductions in other air pollutants, diversification of energy sources, and other benefits to the economy, environment, and public health."[21] Without understanding the full range of benefits and costs, it will be difficult, if not impossible, for ARB to appropriately consider overall societal benefits and to maximize benefits (minus costs) to California.

Furthermore, a cost-benefit analysis that quantifies and monetizes, to the extent feasible, the health benefits associated with co-benefit reductions associated with different combinations of emission reduction measures will help decisionmakers and communities to understand the full scope of the effects of pollution that can be avoided under different reduction approaches. In order to "consider the social costs of the emissions of greenhouse gases" and to "prioritize . . . [e]mission reduction rules and regulations that result in direct

[18] Cal Health & Safety Code § 38501(h).
[19] Cal Health & Safety Code § 38562.7.
[20] Cal. Health & Safety Code § 38562(b)(1).
[21] Cal Health & Safety Code § 38562(b)(6).

reductions,"[22] it will be necessary to understand the true extent and impact of those direct reductions. Without quantifying and monetizing these co-benefits in a comprehensive cost-benefit analysis, there is a risk that these co-benefits might be undervalued relative to the greenhouse gas reductions, especially if a dollar value is put on the greenhouse gas reductions through the requirement to consider the social costs of the greenhouse gas emissions.

ARB has indicated that the final Scoping Plan will also include a regional analysis, which will provide further insights into where targeted reductions are most needed.[23] In addition to an overall analysis of co-benefits, ARB should also conduct an analysis of co-benefits in conjunction with this regional analysis. Because sources of greenhouse gas emissions can be concentrated in specific communities, the reduction of those emissions may have greater health co-benefits when calculated on a regional level.

Environmental justice advocates have expressed particular concerns regarding emissions reductions from stationary sources. A regional economic analysis that quantifies and monetizes, to the extent feasible, the health benefits associated with co-benefit reductions from different combinations of emission reduction measures will help decisionmakers and communities to understand the full scope of the effects of pollution that can be avoided under different reduction approaches.

Policymakers and communities benefit when policy decisions are made based on transparent information and analysis. Monetization of co-benefits of emissions reductions, if possible at both an overall and a regional level, can help ARB select the best policy tools to meet California's 2030 greenhouse gas targets while also producing an outcome that most benefits the public and best satisfies ARB's statutory requirements. Monetizing these co-benefits will also reduce the risk of successful legal challenges to the final Scoping Plan and implementing regulations.

A more thorough discussion of the importance of monetizing co-benefits, and references to examples of straightforward methods for doing so, can be found in Section II.B of Policy Integrity's December 16, 2016 comments.[24]

b. ARB should use the social cost of methane

The Scoping Plan should monetize the social cost of methane emissions, in addition to carbon dioxide emissions. The Scoping Plan currently does not monetize costs from short-lived greenhouse gases.[25] To do this, ARB should use the IWG's social cost of methane ("SC-CH_4").

The federal SC-CH_4 estimates are more accurate than an approach that relies on conversion to carbon dioxide equivalents because the SC-CH_4 directly accounts for unique

[22] Cal. Health & Safety Code § 38562.5.
[23] Proposed Scoping Plan, supra note 2, at 75.
[24] *See* Policy Integrity Comments, *supra* note 1 (& app. A), Section II.B, for a more detailed discussion of the valuation of co-benefits, at 15-20 & n.108.
[25] *See, e.g.*, Proposed Scoping Plan, *supra* note 2, at 65 tbl. III-3.

characteristics of methane. In particular, the SC-CH_4 accounts for the quicker time horizon of methane's effects compared to carbon dioxide, include the indirect effects of methane on radiative forcing, and reflect the complex, nonlinear linkages along the pathway from methane emissions to monetized damages.[26]

As noted in Section I of Policy Integrity's previous comments,[27] AB 197 requires ARB to "consider the social costs of the emissions of greenhouse gases" when it is "adopting rules and regulations" to reduce greenhouse gases below 1990 levels.[28] Because the language in ARB's mandate is not limited to CO_2, but rather refers to greenhouse gases generally, the statute prescribes that ARB must monetize the effects of methane emissions in its final Scoping Plan, preferably using the SC-CH_4.

Other state agencies, like the California Public Utilities Commission, frequently work to ensure their policies are consistent with those of ARB, especially with respect to greenhouse gas reductions.[29] Therefore, ARB has a leading role to play in shaping the state's climate change policies across a range of sectors. Ultimately, using the SC-CH_4 streamlines decisionmaking and reduces confusion across policies and agencies because, coupled with the SC-CO_2, it translates carbon dioxide and methane effects into a common metric of dollars that are consistent over time. Furthermore, using the SC-CH_4, as it is a single number, requires less work on the part of a decisionmaker than alternative methodologies.

c. The Scoping Plan Should Commit to Update the SC-CO_2 as Needed Over Time So That it Continues to Reflect the Best Available Science and Economics

The SC-CO_2 estimates will need to be updated over time to reflect the best-available science and changing economic conditions. ARB properly anticipates this possibility in the Scoping Plan, noting, "The State will continue to monitor and engage in discussions related to any updates to U.S. EPA's SC-CO_2 methods and values and initiate its own work to refine a SC-CO_2 method and values for California."[30] Executive Order 13,783 withdraws the IWG reports and disbands the IWG.[31] Thus, California and other states will not necessarily be able to rely on the federal government for consistent guidance going forward.

The IWG's reports on the SC-CO_2, SC-CH_4, and social cost of nitrous oxide remain the best available estimate of the cost of a ton of greenhouse gas emissions at the present time.[32] As

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[26] See Section I.F of the attached comments (app. A) for an in-depth discussion of the social cost of methane.
[27] *See* Policy Integrity Comments, *supra* note 1 (& app. A), at 2.
[28] Cal. Health & Safety Code § 38562.5.
[29] *See, e.g.,* California Public Utilities Commission, Distributed Energy Resources Cost Effectiveness Evaluation: Societal Cost Test, Greenhouse Gas Adder, and Greenhouse Gas Co-Benefits: An Energy Division Staff Proposal**,** at 19 (Jan. 12, 2017).
[30] Proposed Scoping Plan, *supra* note 2, at 61.
[31] Exec. Order No. 13,783, 82 Fed. Reg. 16,093 at § 5 (Mar. 28, 2017).
[32] Richard G. Newell et al., *Carbon Market Lessons and Global Policy Outlook*, 343 SCIENCE 1316 (2014); Bonnie L. Keeler et al., *The Social Costs of Nitrogen*, 2 SCIENCE ADVANCES e1600219 (2016); Richard L. Revesz et al., *Global Warming: Improve Economic Models of Climate Change*, 508 NATURE 173 (2014) (co-authored with Nobel Laureate Kenneth Arrow, among others). *See also* NAS 2016, *supra* note 8 (explaining that the integrated assessment models used in developing the IWG's social cost estimates are the most cited models in

such, these IWG SC-CO_2 values remain a sensible starting point for California's analyses. However, in the future, as the science and economics of climate change continue to develop, an effort should be undertaken to improve the models over time. A recent report from the National Academies of Sciences lists several improvements that could be made to further refine the SC-CO_2 in the future.[33] California is well positioned to participate in, or even lead, efforts to further develop the SC-CO_2 models as science continues to advance. The factors that California should consider in such an effort include the appropriate discount rate, the extent of omitted damages, and the global nature of the damages associated with climate change. These factors are discussed in more detail in sections I.B-C of Policy Integrity's Dec. 16, 2016 comments.

Conclusion

Overall, the January 2017 Scoping Plan contains a number of strong elements. ARB would better fulfill its mandate if the Plan also monetized co-benefits of the alternative measures and used the social cost of methane.

Respectfully submitted,

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the peer-reviewed literature); Michael Greenstone et al., *Developing a Social Cost of Carbon for US Regulatory Analysis: A Methodology and Interpretation*, 7 REV. OF ENVTL. ECON. & POL'Y 23 (2013) (same).
[33] NAS 2017, *supra* note 9.