NRDC

January 29, 2016

Emily Wimberger, Chief Economist
California Air Resources Board
1001 "I" Street
Sacramento, CA 95814

Re: Comments in Response to Public Workshop on the Economic Analysis of the 2030 Target Scoping Plan Update

Dear Ms. Wimberger:

On behalf of the Natural Resources Defense Council, and our more than 72,000 members in California, we appreciate the opportunity to comment on the material and issues presented by the Air Resources Board (ARB) and E3 staff at the January 15, 2016 workshop on the economic analysis of the 2030 Target Scoping Plan Update.

I. Introduction

Executive Order B-30-15—establishing a mid-term GHG reduction target for California of 40 percent below 1990 levels by 2030—represents the most aggressive benchmark enacted by any government in North America to reduce dangerous carbon emissions over the next fifteen years. Along with SB 350, it extends upon the exemplary leadership that California has displayed since adopting AB 32 in 2006 in combating climate change and creating a new clean energy economy. The California Air Resources Board has been pivotal to that success and served as a global model for regulatory efficiency, and we thank you for your tireless and diligent efforts to achieve California's climate goals.

The economic analysis will play a decisive role in the evaluation of potential policies for the 2030 Target Scoping Plan Update, and therefore is critical not only for achieving the target itself but also for determining the most optimal pathways for creating jobs, conserving water, supporting disadvantaged communities, and continuing to support California's long-term transition to a strong clean energy and sustainable economy.

NRDC looks forward to working with staff and stakeholders over the coming months to help ensure that the inputs informing the analyses, measure design, and modeling structure provide the most accurate and robust foundation for developing the policy measures, regulations, planning efforts and investments needed to achieve these goals.

II. Recommendations and Observations

NRDC looks forward to continuing open dialogue with staff and the economic reviewers throughout the development of the Scoping Plan Update's economic analysis. To the

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extent possible, we also ask that staff please post materials online in advance of meetings to allow attendees more time for providing reflective input.

A. **PATHWAYS ANALYSIS**

Reference Scenario

NRDC supports the staff proposal to exclude the requirements of both SB 350 and the State Implementation Plan measures from the Reference Scenario. As staff explained when soliciting feedback on this proposal, we agree that while both are in statute and therefore would normally be incorporated into the Reference Scenario, they also are essentially a codified roadmap of how to achieve the 2030 targets and therefore are more appropriately incorporated into parameters for the Scoping Plan Scenarios.

Doubling Energy Efficiency

In regards to incorporating SB 350, one of the most critical elements will be how the doubling of energy efficiency requirement is modeled within PATHWAYS. SB 350 specifically requires a cumulative doubling over the next fifteen years of statewide energy efficiency savings in electricity and natural gas final end uses of retail customers, based upon the 2014 approved demand forecast for California energy use and the publicly owned utilities' energy-saving targets (updated in their 2015 energy efficiency status report).

NRDC estimates this will yield savings of nearly 89,000 gigawatt-hours of electricity as well as savings of more than 1,300 million therms (MMth) of natural gas (based on the most recent natural gas forecast) over the next 15 years. California's projected electricity demand in 2030 is therefore expected to be 10 percent lower than all of the state's 2014 electricity consumption. Reaching the goal is also expected to meet more than 25 percent of our expected electricity demand and 10 percent of our natural gas demand in 2030 (based on the 2014 demand forecast projections extended out to 2030). While electric vehicle deployment will likely increase electricity demand by at least 14,000 GWh, that is still only about one-seventh of the overall expected electricity savings from SB 350, ensuring that Californians will still receive substantial benefits (like lower bills) that we hope will be distinguished in your analysis.

As you attempt to model SB 350's doubling of energy efficiency goal into PATHWAYS, we encourage the following considerations:

- The PATHWAYS model includes many implicit behavioral assumptions, in particular around activity levels and associated demand. Given that there are costs associated with each of these assumptions and the potential to achieve substantial savings from behavioral changes without much capital investment, it will be important to review these closely and think innovatively about the potentials for shifting cultural norms in regards to energy usage.

- We recommend coordinating with the California Energy Commission to inform your estimates of the cost-effectiveness of possible/future appliance standards that will compose a significant portion of the doubled energy efficiency savings from SB 350. For example, there is significant potential to cost-effectively increase energy savings from accelerating progress on new and updated appliance standards (Title 20) that address non-preempted appliances and electronics, and the proliferation of miscellaneous plug-in equipment, which is one of the primary drivers of the growth in residential energy use. Another priority is to continue strengthening the building energy code (Title 24), for both residential and non-residential buildings.

- We also recommend coordinating with the CPUC to help identify areas of cost-effective potential in voluntary programs that could provide valuable insight into how ARB incorporates the doubling energy efficiency goal. However, we do not recommend adopting the significant limitations of the CPUC's potential study (*Energy Efficiency Potential and Goals Study for 2015 and Beyond Stage 1 Final Report*), which excluded wide swaths of savings opportunities and which has structural limitations that reduce future saving opportunities based on past achievements. Because of this limitation, it would be useful to consider the results of the high economic potential scenario—which is not adjusted in that manner—to gain a general understanding of where end-uses or building types new program savings might occur. There are also several opportunities for efficiency savings specifically referenced in both SB 350 and AB 802—including savings from operational, behavioral and retro commissioning activities—which should be reviewed and incorporated as sources of energy savings.

- We further recommend accounting for the economic and climate benefits of cleaner-fuel-substitution opportunities, as SB 350 allows those carbon savings to count in achieving the total energy savings goal defined in SB 350. We believe the methodology used by Energy Commission to account for upstream energy savings from cleaner heating fuels in the residential and commercial sector (contained in the CEC's AB 758 *Existing Buildings Energy Efficiency Action Plan*) would serve as a helpful starting point for assessing these opportunities economy-wide, as directed in SB 350.

Vehicle-Miles Traveled

NRDC encourages ARB to more closely consider the importance of smart growth and other policies that reduce vehicle-miles traveled (VMT) in the Scoping Plan Scenarios. At the January 15th workshop, staff stated that the PATHWAYS modeling would rely upon VMT projections from EMFAC 2014 for the Reference Case and upon the Mobile

Source Strategy's Scenario 2 ('*Cleaner Technologies and Fuels'*) for measure testing. However, the latter scenario only aspires to achieve a modest VMT reduction of 15% below the Vision 2.0 2050 baseline. Moreover, that goal itself is in some ways simply a placeholder while ARB proceeds with a schedule of evaluating VMT reduction measures between 2016-2023, and then quantifies and selects measures from 2023-2027.

As E3 noted in their presentation at the workshop, housing stock turns over very slowly, and urban planning can take decades to restructure. Therefore early adoption of smart growth and other strategies that reduce VMT are important, especially with 6 million new residents moving to California by 2030. Stronger policies to reduce VMT will not only will help meet state climate and air quality goals but also offer a host of co-benefits such as reduced infrastructure costs, water conversation, and improved public health.

NRDC recommends that ARB refer to *Moving California Forward*—a recent report by Energy Innovation and Calthrope Analytics, leading experts in urban development—in order to inform Scoping Plan Measures for how to reduce VMT in California. The report utilizes the most spatially advanced analysis to date to design urban planning scenarios that help achieve California's 2030 climate target while also providing substantial economic and environmental co-benefits, including billions of dollars in public health cost savings. For example, the report's 'Infill' scenario outlines achievable smart growth policies that could reduce California's VMT per capita by 13.43% by 2030, compared to the modest 6.36% reduction—less than half—achieved by Scenario 2 of the Mobile Source Strategy. CALTRAN's recent *The California Transportation Plan 2040* report also includes a scenario with an even lower VMT forecasts; while NRDC does not consider its target as practically attainable as the scenarios outlined in *Moving California Forward*, it outlines an array of VMT reduction strategies outside of land-use planning that would be useful for ARB to considered incorporating into its analysis.

B. **MODELING ANALYSIS STRUCTURE**

NRDC supports the new proposed changes to the economic analysis modeling structure, specifically *(i)* the iterative loop of the REMI outputs back into the PATHWAYS model and *(ii)* the incorporation of both cap-and-trade allowance prices and "Other Monetized Costs/Savings" into the REMI model. These additions will greatly enhance the ability of the economic analysis to more fully account for the savings benefits of climate policies.

Public Health Impacts

In particular, NRDC strongly supports the proposal to incorporate the Public Health Analysis into the modeling structure via the "Other Monetized Costs/Savings" input. This will offset a key gap in the PATHWAYS model (which does not include public health benefits) and also is a substantial improvement over the first Scoping Plan, which only included a separate analysis of health benefits and therefore may not have been given adequate attention by policymakers, the media, and the public.

It is critical to integrate the health-related costs of climate impacts, and the benefits of policies that help avoid those costs, directly into the modeling analysis in order to ascertain the most optimal Scoping Plan measures. A 2011 paper in *Health Affairs* (Knowlton et al. 2011)[1] describes one such approach to climate-related health cost valuation of climate-related mortality and morbidity; estimates suggested $14-40 billion in health costs for just 6 climate-related events, several of which were in California. This paper is consistent with other research that finds that the public health benefits of climate policies are usually much larger than simply the direct costs and savings related to energy production and use. In terms of overall societal benefits, public health benefits from climate policies, such as avoided mortality, again are generally at least several times larger than the direct climate benefits. Therefore we underscore our support for including public health impacts in the analysis and encourage careful consideration of how to best incorporate the full range of such effects, as they reflect real-world costs in both dollars and human suffering that would otherwise be borne by Californians.

Climate Benefit Impacts

While public health benefits are the most important component of societal cost impacts to consider, NRDC would encourage ARB to also consider how to incorporate the climate benefits of GHG mitigation into the economic analysis. These are neither included in the PATHWAYS model nor currently proposed to be incorporated into the economic analysis via the "Other Monetized Costs/Savings" input in REMI. While we recognize that quantifying such impacts in a localized manner limited to California is inevitably difficult and prone to high uncertainty, NRDC would encourage ARB to consider simply including a social cost of carbon or explore other innovative ways to include these costs.

Other Modeling Considerations

More broadly, NRDC encourages ARB to closely consider how to incorporate the potential impacts of technological innovation, technological learning, technology forcing, and path dependence into the Scoping Plan Update's economic analysis. The real-world impacts of these factors are often ignored or under appreciated by demand models and economists in general. ARB should instead utilize a range of scenario analyses to obtain a more robust assessment of possible future outcomes. For example, consider the dramatic decline of past technologies such as personal computers, or the more recent steep declines of renewable energy technologies such as solar and wind. Only past forecasts that tried to incorporate the potential of learning curve impacts could have predicted such declines.

Also if the Scoping Plan Update economic modeling relies too heavily on options that have the lowest marginal cost for near-term reductions at that time, they may not identify the best pathways for achieving California's long-term climate targets and may be overly skewed towards current technologies. If ARB sets clear long-term targets, then we can

[1] http://content.healthaffairs.org/content/30/11/2167.full.html

expect most businesses will to some extent make investment plans based upon the most cost-effective pathway over the long-term, rather than simply seeking to minimize costs within any given year.

Inversely, NRDC recommends ARB consider policies that will help lower the long-term cost of emissions-reducing technology within its set of goals. One of the benefits of California being a global leader in climate policy is that the businesses in our state get to 'cherry-pick' the best opportunities for reducing emissions before the rest of the world catches up, and cost-minimization models will indeed generally reflect this. Thus, given California's pivotal role as a global flagship, ARB should aim to consider to some extent pathways that include technology-forcing policies which offer the greatest long-term benefit in reducing GHG emissions and costs not only on a state level but also on a global scale. In other words, there needs to be a balance between simply finding pathways that meet the next compliance period's goals at the lowest cost, and identifying pathways that achieve the greatest reductions in emissions and costs long-term.

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Thank you for considering these ideas and recommendations. We look forward to providing more detailed analysis on these issues in the months ahead and engaging with staff and stakeholders to develop an economic analysis for the 2030 Scoping Plan Update that provides a firm foundation on which to continue California's exemplary climate and clean energy leadership.

Sincerely,

David Puzey
Policy Advisor, California Climate Project