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2022 Scoping Plan launch comments

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Energy Innovation greatly appreciates the work of the California Air Resources Board on the 2022 Scoping Plan. The Scoping Plan's economy-wide nature and consideration of a package of interacting policies is particularly complex. We are in the process of updating our California Energy Policy Simulator, initially released last year, and so we are frequently reminded that such work is challenging. Still, the Scoping Plan's role as the only holistic strategy-setting process for California's decarbonization ambition compels an all-out effort.

The June 8 meeting outlined promising plans for modeling public health benefits and directly including them in the macroeconomic modeling. While applauding this important step forward, Energy Innovation offers several recommendations:

1. Give more emphasis to 2030 and near-term policy opportunities.
2. Aim for emission reductions beyond the minimum required.
3. Elevate ambition in buildings and industry.
4. Address unresolved questions vis-à-vis cap-and-trade.
5. Recognize the Scoping Plan as an opportunity for policy package optimization.

We are still learning about the intended methods for the analysis underpinning the 2022 Scoping Plan. Yet, apart from advancements in modeling of public health impacts, the proposed analytical methods appear largely unchanged from the 2017 Scoping Plan. An improved approach to modeling cap-and-trade program effects is essential and possible.

With emissions increasing in the most recent inventory, warning signs are flashing. CARB itself notes that success "will require a much steeper rate of greenhouse gas reductions." Thus, it is only sensible to put the 2022 Scoping Plan to work in service of devising the most advantageous approach to ramping up economy-wide emissions.

1. Give more emphasis to 2030 and near-term policy opportunities

The substance of the kickoff workshops gave more emphasis to the 2045 carbon neutrality goal, set by Executive Order, starting with its inclusion in the intended title of the plan, which gives it unmistakable prominence. However, compliance with the 2030 target should be a higher priority because it is backed by the force of law—Senate Bill 32.

Another reason to emphasize near-term policy opportunities is the inertia built into the systems generating greenhouse gas emissions California's large economy is a bit like a battleship. It is a massive entity with significant momentum, making sharp turns impossible. This will be the last Scoping Plan that makes a difference in whether California's 2030 ambitions are successful.

We recognize that CARB's opening presentation articulates the goal of assessing "progress towards achieving the 2030 target." However, in its annual progress updates, CARB has simply noted the current

level of emissions and how much further there is to go. More thorough policy analysis is necessary. 2030 goal language contrasts with "laying out a path" to 2045 language on the same slide. Emphasis on "identifying end points" and identifying "technology and fuel paths" suggest an engineering analysis with little connection to near-term policy needs is intended.

CARB's opening presentation asserts that "[t]he Final Scoping Plan … Does not go into details in individual program or regulation design… Does not supplant or create new statutes or regulations." What is the rationale for this? Historically, Scoping Plans have included measures not yet established in regulation or statute separate from the broad authority delegated to CARB in Assembly Bill 32 and Senate Bill 32. In some cases, measures first proposed in the Scoping Plan process were later addressed in separate legislation.

The 2008 Scoping Plan offers three examples of recommended policies not yet established in regulation or later addressed by standalone legislation. First, the 2008 Scoping Plan included the 33 percent Renewable Portfolio Standard, which was codified in 2011 in Senate Bill 2 (1X). Second, the 2008 Scoping Plan outlined cap-and-trade program design, building on outputs of the prior Market Advisory Committee and Western Climate Initiative processes. It would be 2010 before CARB began writing the regulatory rules for the current Cap-and-Trade Program. Note Third, the initial draft of the 2008 Scoping Plan included the forerunner to today's sustainable community strategies program before it was codified in law as Senate Bill 375.

The 2008 Scoping Plan also illustrates past efforts to analyze the implications of individual policy design in the context of achieving the most cost-effective package of policies. The 2008 Scoping Plan analysis evaluated different possible cap-and-trade design configurations, for example, analyzing the impacts of including or excluding compliance offsets. Such historical examples differ from direction set out in the 2022 Scoping Plan launch meetings.

Aim for emission reductions beyond the minimum required

The ever-strengthening science on the catastrophic danger of inaction drives the urgency to identify opportunities to go deeper than the 40 percent mandated reduction. Climate impacts are emerging sooner and more intensely than scientists have predicted. At the same time, sociological studies have identified social and psychological factors that lead scientists to underrepresent climate risks in the research literature. In a recent paper, "Accelerating the timeline for climate action in California," UC Berkeley's Dan Kammen leads a team of California scholars who argue that California needs to aim higher: "California is falling behind in its climate leadership and would benefit economically and ecologically and in terms of social justice, by establishing more aggressive goals."

There is promise, not only peril. Years of remarkable innovation have transformed the economics of clean energy and other technologies essential to decarbonization. Renewable power technologies like solar and wind have reached and surpassed cost-competitiveness thresholds. Rapid innovation in electric vehicles and batteries is also occurring. The fast-moving EV industry is powering an expanding clean energy ecosystem in California, and the economic payoff has been significant, generating tens of thousands of good jobs, producing millions in tax revenue for governments, and nurturing an ecosystem supportive of business.

Increasingly favorable economics, rising global demand, and world-leading regulations have driven California's electric vehicle industry to become the state's most valuable exporter in 2020, while delivering manufacturing jobs. The state's motor vehicle manufacturing workforce grew to a record 18,900 jobs in 2018, double historical levels. Altogether, according to a 2018 study, the electric vehicle supply chain

supports 275,000 jobs in California, including 120,000 in Southern California, with an average wage of $91,000.

Finally, it is important to consider the text of Assembly Bill 32, and by extension Senate Bill 32, which implies that deeper reductions should be considered in Section 38561.(b): "The [Scoping Plan] plan shall identify and make recommendations on direct emission reduction measures, alternative compliance mechanisms, market-based compliance mechanisms, and potential monetary and nonmonetary incentives for sources and categories of sources that the state board finds are necessary or desirable to facilitate the achievement of the ***maximum feasible and cost-effective reductions of greenhouse gas emissions (emphasis added)***."

Another reason to aim for emission reductions beyond the minimum 40 percent below 1990 by 2030 is that doing so is consistent with Executive Order B-55-18. It sets the goal of carbon neutrality, "as soon as possible, and no later than 2045." Achieving deeper reductions in 2030 will put California in a better position to achieve carbon neutrality before 2045.

3. Elevate ambition in buildings and industry

Thanks in large part to CARB's work, last year California put in place two landmark zero-emission policies, one for cars and the second for trucks and other medium- and heavy-duty vehicles. In accompanying remarks, albeit not the slides themselves, the CPUC presentation at the kickoff meeting indicated plans to increase ambition in the power sector in line with the 38 million metric tons target under consideration in Integrated Resource Planning, consistent with a 70 percent Renewable Portfolio Standard by 2030 (per prior IRP modeling, e.g., slide 70).

We recognize that CARB and the 2022 Scoping Plan will address the building and industry sectors. We urge specific recommendations for stronger policies. In light of the goal of economy-wide carbon neutrality, as well as the need to begin now replacing long-lived equipment, climate policy and the 2022 Scoping Plan can leave no sector behind.

The building and industry sectors also deserve heightened attention because they are experiencing the same rapid innovation that has amped up expectations for power and transportation. In buildings, heat pumps for air and space heat are accelerating ambition. Electrification with heat pumps is already cost effective for some processes in California's important food and beverage industry. California companies are also making progress toward cost-effective use at industrial scale for advanced solar thermal and renewable hydrogen technologies. Such technological advances combined with industry decarbonization funding in the administration's budget proposal—$250 million for industry in addition to $125 million targeted to agricultural and $110 million targeted to green hydrogen—offer a springboard for transformational progress in industry.

4. Address unresolved questions vis-à-vis cap-and-trade

The 2017 Scoping Plan elevated cap-and-trade in importance, as a share of expected emission reductions, compared to the first 2008 Scoping Plan. The underlying 2017 Scoping Plan analysis portrayed the cap-and-trade program as the single-most productive policy in the entire strategy considering emission reductions caused, driving about 40 percent of overall expected reduction.[i] That is roughly double the 20 percent from cap-and-trade expected in the 2008 Scoping Plan.

At the time, Energy Innovation, as well as legislators, the California Legislative Analyst's Office, and the nonprofit Near Zero, raised concerns about the disconnect between the increasing importance of the cap-and-trade program in the state's climate strategy and market fundamentals, pointing to growing oversupply. The Independent Emission Market Advisory Committee, chaired by an executive branch

appointee, has also pointed to similar concerns. Excess supply – more tradeable permits to emit than there are emissions needing to be covered, puts downward pressure on carbon prices—the mechanism by which the cap-and-trade program drives emission reductions. Nevertheless, CARB has rejected these concerns.

The private bank of unused tradable permits has continued to grow since the completion of the 2017 Scoping Plan, reaching levels like those predicted in our prior research. Energy Innovation's 2018 report projected oversupply—defined as the number privately-held permits beyond the quantity needed for compliance—would reach 290 million permits for California and Quebec combined by the end of 2020. The carbon market consultancy ClearBlue Markets more recently found oversupply likely reached 260 to 290 million in 2020.

At the urging of Ex-Officio Board Member Assemblyman Eduardo Garcia, CARB adopted Board Resolution 18-51 in conjunction with the 2017 Scoping Plan. This resolution directed staff to consider whether a growing public bank puts achievement of future decarbonization targets in jeopardy. The resolution, "directs the Executive Officer to quantify and report back to the Board, by no later than December 31, 2021, the volume of unused allowances from 2013 through 2020, including volumes held in private accounts, and the potential for unused allowances to hinder the ability of the program to help achieve the SB 32 target. The Executive Officer shall hold a public workshop in 2019 to discuss potential methodologies to evaluate this topic."

In the resulting workshop, the core of the argument presented involves "Design Features to Support Steadily Increasing Allowance Price." are answer questions raised in the context of the 2017 Scoping Plan. Even with an increasing carbon price, California Energy Policy Simulator analysis found the climate strategy outlined in the 2017 Scoping Plan resulted in 2030 emission exceeding the SB 32 limit. The nonprofit Near Zero offered some of the most trenchant commentary and strongest calls for for analytical improvements, in both the Scoping Plan process and cap-and-trade program regulatory proceedings.

It important that the 2022 Scoping Plan conduct a deeper investigation of the likely contribution from the cap-and-trade program as currently designed. The state of the art in policy analysis calls for use of a computable general equilibrium model, with energy as a variable input to production. The REMI macroeconomic model CARB has relied upon in the last two Scoping Plan analyses is inadequate for cap-and-trade analysis.[ii]

It would be relatively straightforward for the 2022 Scoping Plan process to bound likely emission reductions expected from cap-and-trade by examining the excepted effects at the floor and ceiling prices. Another essential improvement we hope to see in the 2022 Scoping Plan Analysis is clarity on assumptions vis-à-vis carbon price effects, detailing their provenance in the literature. Dr. Roland-Holst and the Berkeley Energy and Resource (BEAR) model were important contributors to the 2008 Scoping Plan process. David Roland-Holst and colleagues have continuously updated their CGE model and understand California policy.

5. Recognize the Scoping Plan as an opportunity for policy package optimization

The 2022 Scoping Plan is the ideal proceeding to investigate the best mix of policy instruments going forward. It is a natural fit for integrated analysis. There is no other candidate process. In conjunction with a deeper analysis of the cap-and-trade program, the 2022 Scoping Plan analysis is a chance to compare the effectiveness and economic implications of different policy packages, each representing possible decarbonization strategies.

CARB's opening presentation seems to imply that policy analysis should be handled separately, apart from the Scoping Plan, during analysis carried out in individual regulatory proceedings: "Each [regulatory proceeding] has their own detailed public process and more detailed health, economic, and environmental

analyses." Yet these separate proceedings are not linked with the Scoping Plan analysis; they are siloed. Better-integrated policy evaluation is necessary to capture system dynamics of interacting policies.

Recent efforts in the European Union (EU) have set a new standard for state of the art in economy-wide policy analysis. Here is an example of their 2030 target analysis (which contains detailed explanation of the Reference Scenario). The Scoping Plan is a future planning exercise, but retrospective evaluation informs future expectations. A California-specific study in the same vein as these official U.S. and EU government examples of retrospective evaluation of causal factors determining emissions would also be a useful input to climate policy planning.

In conclusion

Now is the right time to comprehensively evaluate whether the sum of California's policy commitments yield a strong chance of success and, if not, what are the most promising avenues for emission reductions. World class policy is at risk without the insights of world class analysis.

Thankfully, it is early in the process. Perhaps plans for policy analysis are more extensive than we understand, and, if not, there is still time to adjust. Energy Innovation stands ready assist. In the first Scoping Plan, CARB staff actively worked with independent modelers. We would welcome a revival of this approach. Our California Energy Policy Simulator offers unique insights into cross-sector policy optimization. And greater cooperation can only make easier the challenging but important task of policy analysis for deep decarbonization.

Thank you for your consideration of these comments and questions.

Sincerely,

Chris Busch, Ph.D.

Director, California Climate Policy Program, Energy Innovation

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[i] To estimate the effects of cap-and-trade, the 2017 Scoping Plan analysis estimated the emission reductions expected from the program purely as a function of the level of cap in any given year. Put differently, the 2017 Scoping Plan analysis assumed emissions would fall in line with annual caps. (In years in which other policies were expected to drive emissions covered by the cap-and-trade program below cap levels, such as the early 2020s, the 2017 Scoping Plan analysis, treated the program as non-binding, having no effect.) So, CARB assumed emission reductions from the cap-and-trade program in 2030 as a direct function of the cap level in that year. The problem with this approach is it ignores the intertemporal flexibility the program offers. Such a "static" approach to modeling cap-and-trade program emission impacts has grown ever more untenable with the accumulating private bank of allowances.

The 2017 Scoping Plan analysis did include a separate "uncertainty analysis," but it suffered from doubtful representation of the carbon price effects. The uncertainty analysis lacked any indication of references used in representing carbon price effectiveness and produced results at odds with research by Borenstein, Bushnell, and Wolak on emission responsiveness to carbon price. Figure 4 in this Near Zero comment submitted in the 2018 cap-and-trade regulatory proceeding boils down the contradictions between the Scoping Plan analysis and work by Borenstein, Bushnell, and Wolak. The contradiction is significant because CARB has regularly pointed to these professors as key validators. Of three economists invited to the 2019 workshop discussing oversupply concerns, two of the three panelists CARB invited were drawn from among the authors of Borenstein, Bushnell, and Wolak.

[ii] In brief, if we understand correctly, the 2022 Scoping Plan analysis intends to run the Policy Insight version of the REMI model. CARB used this macroeconomic model in the 2017 Scoping Plan analysis. It is ill-suited to the task of carbon price policy analysis because it treats energy as a fixed input to production. As such, it is unable to capture key changes in producer behavior, such as switching to cleaner energy sources or investing in energy efficiency.