



Jim Verburg

Senior Manager, Fuels

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Ms. Rajinder Sahota
California Air Resources Board
1001 I Street,
Sacramento, CA 95814

Submitted electronically to Rajinder.Sahota@arb.ca.gov.

Re: Comments on California Air Resources Board's (CARB) 2022 Scoping Plan Update – Initial Modeling Results Workshop

Dear Ms. Sahota:

Western States Petroleum Association (WSPA) is a trade association that represents energy companies that explore for, produce, refine, transport and market petroleum products, natural gas, and other energy supplies in California and four other western states. Currently 152,000 men and women have careers in the oil and gas industry in California and 366,000 have careers whose jobs depend on the industry. The industry in California contributes \$152 billion every year in economic activity and directly contributes \$21.6 billion in local, state, and federal tax revenue to support schools, roads, public safety, and other vital services.

The way the world and California produces and consumes energy is evolving. Californians drive more than 380 billion miles per year. Today more than roughly 90 percent of the fuel meeting California's mobility needs is petroleum. And while the members of WSPA are on the cutting edge of an energy evolution, investing in and developing the diverse energy sources and technologies of the future, any Scoping Plan scenario that relies on banning the internal combustion engine and phasing out in-state refining capacity and oil & gas production is unnecessarily harmful and inequitable to millions of Californians. Working together, we can rise to the challenge of a changing climate, while providing clean, affordable, safe, and reliable energy for all of California.

We appreciate CARB's acknowledgment of the important role of renewable fuels, hydrogen, and carbon capture and sequestration (CCS) including carbon dioxide removal (CDR) will play in meeting California's greenhouse gas (GHG) targets. In our view, California will be unable to meet its interim and 2045 goals in a feasible or cost-effective manner without a diverse set of technologies at its disposal. WSPA offers these observations and recommendations on the modeling and Scoping Plan development:

- The transportation sector reductions in all four scenarios are heavily reliant on zero emission vehicle (ZEV) mandates. CARB has failed to consider a technology-neutral approach that allows for innovation. To fully comply with the Legislature's direction in Assembly Bill (AB) 32

to prepare the scoping plan to achieve the maximum technologically feasible and cost-effective reductions, CARB should model scenarios without mandates. These scenarios without mandates will help CARB identify alternative pathways to reduce emissions in the transportation sector that are inclusive of renewable fuels, low-carbon fuels, near-zero emission vehicles and market based emission reduction technologies employed across the fuel and vehicle value chain including CCS.

- As noted in our October 2021 comment letter, CARB should include a new alternative (e.g., Alternative 5) that prioritizes “least cost” emission reductions across the economy as opposed to the other 4 alternatives which have technologies specified by CARB staff. By relying more heavily on technology-neutral market-based approaches, such as cap-and-trade, to achieve emission reductions, we believe the State would move towards achieving carbon neutrality in the most cost-effective manner. The legislature was clear in their direction to CARB when they passed AB 398¹ with a two-thirds vote in both the Senate and the Assembly, that achieving carbon reductions should be done in a cost-effective manner.
- The scenarios presented to date do not evaluate the potential of specific policies (cap-and-trade, Low Carbon Fuel Standard [LCFS], Renewable Portfolio Standard [RPS], etc.) to cost-effectively reduce emissions to meet the state’s carbon reduction goals. Without evaluating the potential contribution of existing policies, CARB cannot be certain that it will select the maximum technologically feasible and most cost-effective policies. Simply identifying technology deployment options without reference to necessary policy levers fails to meet the purpose of the scoping plan.
- The modeling is oversimplifying future California refinery operations as “tracking California demand.” While we recognize that use of electric and hydrogen vehicles will increase, refineries will continue to operate at some level, provide petroleum fuels, and increased biofuels (e.g., renewable diesel, Sustainable Aviation Fuel [SAF]) for a variety of transportation needs in California and other markets. The Scoping Plan needs to present this ongoing role for refineries.
- Lastly, we caution that all four presented scenarios assume unprecedented levels of growth in emerging technologies and accompanying infrastructure improvements. This would be a daunting task economically and we specifically want to point out the critical need to streamline project permitting for such rates of development. We also recommend that CARB carefully consider the feasibility of assumed deployment rates and how they are portrayed in the modeling scenarios so that policy makers can understand whether certain pathways are remotely probable (or not).

WSPA urges CARB to provide additional opportunities for engagement with the initial modeling results for the 2022 Scoping Plan Update. The importance of public engagement at all stages in the development of the Scoping Plan is reflected in AB 32’s requirement that CARB host “a

¹ AB 328. Available at: [AB 398 - California Assembly \(20172018\) - Open States](#). Accessed: April 2022.

series of public workshops” to solicit public feedback.² This requirement is made hollow, however, if opportunities for public comment at these workshops are not meaningful.

WSPA appreciates the opportunity to participate in CARB’s March 15 Workshop, but it falls short of meeting CARB’s obligations under the Health & Safety Code in two key respects.

- First, CARB deprived members of the public a reasonable opportunity to review the materials in advance of the workshop in order to prepare questions or comments. CARB published meeting materials less than 12 hours before the start of its March 15th Public Workshop after the preceding business day had ended. These materials deal with highly technical, complex modeling results that take time to review and critique with any level of particularity. Without adequate preparation time in advance of the workshop, the March 15th meeting is more accurately described as an informational update rather than a meaningful opportunity for the public to provide feedback on the plan development process. Members of the public repeatedly raised this issue at the workshop and have had to do so in the past as well.
- Second, CARB has not released the assumptions, technical inputs, and economic outputs of the E3 model. Without these, stakeholders lack sufficient information to assess the full range of consequences of proposed actions in the Scoping Plan. With only limited information on the technology choices and timing and environmental assumptions, stakeholders cannot comment on any of the tradeoffs within the modeling choices and are forced to provide comments on technology pathways alone. It is essential for CARB to provide relevant information and solicit feedback earlier. As noted by WSPA and other stakeholders, inadequate data prevents the public from meaningfully engaging in the Scoping Plan development process at a stage where comments are best positioned to influence planning outcomes. CARB has indicated that it will release underlying data and assumptions with its Draft Scoping Plan, but any feedback on assumptions at that stage must contend with the inertia of significant time and resources spent in developing analyses based on existing assumptions. This inertia is even stronger considering that the Draft Scoping Plan is expected to also include a set of policies to put the State on a path to achieve the selected modeling alternative. It would be better for CARB to take comments on the full range of modeling inputs and assumptions for each alternative in order to ensure that the analyses are technically sound before the State selects a “best” alternative. Selecting an alternative without taking comments on key modeling inputs and assumptions prevents the public any meaningful opportunity to have their feedback considered by CARB. CARB has skipped the critical feedback step.

We encourage CARB to ensure, going forward, that they provide the technical data utilized to develop their assumptions, inputs, models, and outcomes and sufficient time to review these materials in advance of future workshops. Our concerns should not be interpreted to imply support for a delayed Scoping Plan adoption process. Our detailed comments on the initial modeling results that were presented during the March 15th workshop are provided below:

² CA Health & Safety Code § 38561(g).

1. CARB’s modeling analysis unreasonably constrains the scope of decarbonization strategies in the transportation sector, to the detriment of the environment and consumers.

CARB’s choice of scenarios is unreasonably narrow. As an example, it fails to evaluate alternatives that incorporate the increased use of renewable liquid and gaseous fuels, or low-NO_x vehicle technologies. These technologies offer substantial opportunities for more cost-effective greenhouse gas emission reductions with corresponding benefits from co-pollutant reductions. Refer to comments 2, 3, and 7 for further details.

CARB’s range of alternatives must be broad enough to encompass feasible, cost-effective measures that further state emissions reduction goals. In developing the Scoping Plan Update, CARB is required to consider emissions reduction strategies that will “achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions in furtherance of achieving the statewide greenhouse gas emissions limit.”³ Similarly, for all rulemakings, CARB is required to consider a reasonable range of alternatives, including “alternatives that are proposed as less burdensome and equally effective in achieving the purposes of the regulation in a manner that ensures full compliance with the authorizing statute or other law being implemented or made specific by the proposed regulation.”⁴ California Environmental Quality Act (CEQA) Guidelines also specify that CARB must consider a reasonable range of alternatives, which “shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects.”⁵

CARB’s analysis unreasonably constrains consideration of near-zero emissions vehicles that could deliver earlier and more cost-effective air quality and greenhouse gas reduction benefits than the ZEV-centric approach that postpones air quality emission reductions for decades. Regardless of vehicle demand projections, the scenarios CARB analyzed seek to maximize electrification in the transportation sector instead of maximizing the most technologically feasible and cost-effective emission reductions. CARB’s modeling scenarios all assume 100% ZEV sales, with variations by mandate date between 2035 and 2045. We recommend that CARB shift from this singular focus on vehicle electrification as it is not realistic and does not represent the range of other options that could meet the State’s objectives for carbon neutrality.

³ CA Health & Safety Code § 38562(a).

⁴ CA Government Code § 11346.2(b)(4)(A).

⁵ 2022 CEQA Statutes & Guidelines § 15126.6(c). Available at: https://www.califaep.org/docs/2022_CEQA_Statue_and_Guidelines.pdf. Accessed: April 2022.

- 2. The scenarios in the E3 modeling presentation clearly show that an all-electrification option by itself will not reach the State's GHG reduction targets. WSPA maintains its position that CARB should conduct a multi-technology analysis to evaluate how a technology/fuel-neutral market-based approach, could achieve the emission reduction targets and do so faster and with more cost-effectiveness. Such a strategy could also reduce the significant systemic risks inherent to the all-electrification option.**

CARB's modeling shows how difficult and costly the transition to achieve carbon neutrality by 2035 and 2045 would be under the E3 scenarios. For example, the near-zero combustion scenario presented in Alternative 1 presents extreme buildouts of electrical generation and grid capacity that would likely be infeasible and less cost-effective in comparison to other possible options. This highlights the need to employ a variety of technologies to reduce GHG emissions across all sectors of the State's economy as opposed to mandating a single technology.

By developing market-based approaches instead of instituting zero emission technology mandates, CARB would allow for innovation within existing marketplaces to dramatically reduce GHG emissions without the systemic risks associated with the all-electrification option as well as open questions concerning electric infrastructure development, zero emission technology readiness, and cost. Alternatives 2 through 4 present significant continued use of liquid and gaseous fuels in the State's transportation and industrial sectors through at least 2045. The California fuels industry is responding by already producing increasing volumes of renewable fuels. Along with the continued use of liquid and gaseous fuels, Alternative 2 through 4 also assume a phase out of in-state refining and oil & gas production. This acknowledgement of significant ongoing demand for petroleum products while proposing to shut down in-state refining and oil & gas production is irresponsible and threatens to leave millions of Californians without transportation fuel.

- 3. AB 32 requires CARB to "ensure that activities undertaken pursuant to the regulations complement, and do not interfere with, efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminant emissions." The scenarios presented not only interfere with efforts to achieve the federal ozone standard, but actively impede near-term progress toward attainment.**

CARB's narrow reading of the Governor's Executive Order N-79-20 has led to a series of modeling scenarios centered almost entirely around the adoption of ZEVs. The result is a set of scenarios which would obstruct deployment of near-zero emission (NZE) technologies that could help California attain the Federal ozone standards. NZE vehicles and other strategies may be more feasible and cost-effective in achieving the Federal ozone standards while still achieving the necessary GHG reductions.

Ramboll's heavy-heavy-duty truck (HHDT) case study on "Multi-Technology Pathways to Achieve California's Air Quality and Greenhouse Gas Goals" ⁶ highlighted the inconsistencies

⁶ The Ramboll HHDT study is available here: <https://www.arb.ca.gov/lists/com-attach/78-sp22-kickoff-ws-B2oFdgBtUnUAbwAt.pdf>. Accessed: April 2022.

between CARB's mandate to make reasonable progress toward the ozone standard and its proposed all-ZEV strategy. Ramboll's analysis of multi-technology pathways, which included a combination of lower-emission (75% to 100% lower) vehicle technologies and fuel mixes (including lower carbon-intensity liquid and gaseous fuels), demonstrated that there are faster paths to meeting near-term federal air quality requirements, making meaningful progress on State climate goals, and achieving greater emission reductions per dollar spent. The case study concluded that if CARB had implemented policies that encouraged the near-term adoption of zero emission and NZE HHDT, one of the top sources of NO_x emissions in the state, CARB could have reduced NO_x emissions from this sector by 22% by 2023, 63% by 2031, and 80% by 2037, in comparison to the proposed ZEV-only approach, which will only reduce this sectors NO_x emissions <1% by 2023, 42% by 2031, and 71% by 2037.

The scenarios presented on March 15 would depend on current, proposed, and future CARB regulations that would further delay attainment of the federal ozone standard by making it near impossible to invest in existing NZE technologies in favor of a future rollout of ZEVs.

Again, we recommend that CARB utilize a vehicle/fuel performance standard versus adopting ZEV mandates.

4. CARB's scenarios all depend on unprecedented levels of growth within the solar energy and battery storage sectors. Inclusion of natural gas and RNG power plants with CCUS to meet the State's electrical demand and reliability requirements, and can help alleviate the infrastructure redundancy that would be necessary with an all-renewable electric grid.

CARB's scenarios suggest an addition of 5-10 gigawatts (GW) of solar generation and 2-5 GW of battery storage capacity every year throughout the regulatory timeline. These additions represent 2-4 times and 7-17 times the maximum historic development ever achieved in these sectors, respectively. The cumulative growth of the electricity sector would result in an effective tripling to quadrupling of California's nameplate capacity for electric generation by 2045.

The current electrical generation capacity (83 GW) is utilized at 37% to produce the approximately 275 terawatt-hours (TWh) consumed in California in 2020⁷. Under Alternative 1, 250 GW of new capacity will be added by 2035 for a total of 278 GW, assuming that two-thirds of the current electrical grid (gas, nuclear, coal, and "unspecified non-renewable") is phased out.⁸ The resulting electrical grid would utilize only 21% of its full capacity to generate the ~500 TWh of electricity demand projected in 2035,⁹ approximately half the current utilization. The

⁷ Scoping Plan Workshop: Initial Modeling Results E3. Available at: <https://ww2.arb.ca.gov/sites/default/files/2022-03/SP22-Model-Results-E3-ppt.pdf>. Accessed: April 2022.

⁸ Per the California Public Utilities Commission, two-third of in-state electric generation was from non-renewable sources. Available at: <https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2020-total-system-electric-generation>. Accessed: April 2022.

⁹ 278 GW capacity can generate 2,435 TWh (278 GW ÷ 1,000 TW per GW x 8760 hours per year) at full capacity. ~500 TWh generation is around 21% of this full capacity.

inclusion of natural gas power plants with carbon capture, utilization, and storage (CCUS) technology could reduce much of the redundancy and overbuild required to support an all-renewable energy grid, thus avoiding a significant portion of grid upgrade and generation installation costs. Such opportunities have not been considered in the presented scenarios.

Further, an infrastructure buildout of this magnitude would require extensive permitting reform and priority review under the CEQA for such large-scale projects to become operational in time with the presented schedule.

We recommend that CARB include broader use of natural gas with CCUS and renewable natural gas for electricity generation.

5. CARB's scenarios and Scoping Plan should consider all options of hydrogen generation.

The presented scenarios contemplate extensive "off-grid" solar to support hydrogen electrolysis which would be in addition to the solar development required for the California grid. Depending on the E3 scenario, this would range from 31 GW to 47 GW, which represents 37% to 57% of California's current grid capacity. With the significant amount of renewable buildout already required to meet the electricity demands from other sectors shown in the scenarios, CARB should strongly consider allowing more technology options for the production of hydrogen including the use of steam methane reformers (SMR) with CCS. Additionally, these significant investments into hydrogen electrolysis and biomass gasification signaled in the E3 scenarios are inconsistent with modeling scenarios presented by CARB under other proposals, such as the Advanced Clean Cars II (ACC II) and Advanced Clean Fleet (ACF) regulations.

As noted in the previous comment, CARB faces a significant challenge with the needed growth for electrical generation, transmission, distribution, and storage systems to meet the expected demands from its electrification mandates. To propose this additional off-grid demand solely for hydrogen electrolysis is interesting, especially when other low carbon intensity (low-CI) hydrogen production pathways are available in the market.

The discussions on hydrogen infrastructure during the recent ACF working group meetings made it clear that access to hydrogen and other low carbon combustion fueling sources would be pivotal to transitioning the heavy-duty vehicle fleet. Our industry offers great opportunities to support this transition and minimize carbon emissions in the long term. CARB should instead consider other options for the production of hydrogen necessary for use within California. SMRs with CCS provide a low-carbon option for hydrogen production. Once the SMR is equipped with CCS the raw materials and natural gas from combustion can be substituted with renewables to further reduce the carbon intensity of the hydrogen produced.

It is also concerning that CARB allowed other sectors to maintain some residual emissions (e.g., the electricity sector appears to have about 30 million metric tonnes of CO₂ per year in most alternative scenarios) whereas the hydrogen sector was forced to not only meet a zero-emission standard in 2045 but for all years leading up to 2045.

More generally, the hydrogen opportunity is difficult to follow in the modeling results. We recommend that the modeling output and Scoping Plan present a broader story for hydrogen that reflect all options for hydrogen production and hydrogen end-use.

6. Trillions of dollars would be required for the electric infrastructure upgrades needed to sustain the all-sector transition to electrification contemplated in CARB’s scenarios. Adopting technology-neutral, market-based approaches for GHG emissions reductions could be more cost-effective.

The State is required under AB 32 to “evaluate the total potential costs and total potential economic and noneconomic benefits of the plan for reducing greenhouse gases to California’s economy, environment, and public health” and “update its plan for achieving the maximum technologically feasible and cost-effective reductions of greenhouse gas emissions”.¹⁰

Based on our communication with CARB staff, it is our understanding the E3 economic forecasts and cost data will be released during an April workshop (date to be determined). We look forward to reviewing this information once it is released and encourage CARB to do so well in advance of the workshop to allow for meaningful review and comment. In the meantime, we would like to point CARB to Ramboll’s study on “Transportation Electrification Infrastructure Costs in California”.¹¹ This study concluded that the cumulative infrastructure costs (i.e., generation, transmission, distribution, maintenance, and electric vehicle chargers) from 2020 to 2050 to achieve a statewide on-road ZEV fleet could be at least \$2.1 to \$3.3 trillion. This is equivalent to 12%-18% of the 2019 gross domestic product of the United States of America. These costs could be even higher for CARB’s Scoping Plan Scenarios (Alternatives 1 through 4) which contemplate off-grid electric generation for hydrogen production and would therefore pose a significant barrier to the implementation of these Alternatives.

7. CARB’s transportation energy demand projections for the E3 scenarios appear to assume vehicle miles traveled (VMT) reductions ranging from 10% by 2030 for Alternative 4 to 30% by 2035 in Alternative 1 as compared to the 2020 VMT baseline. This is despite the State’s previous failure to achieve VMT reductions under Senate Bill (SB) 375. The increased use of low carbon-intensity fuels could provide GHG reductions with much greater certainty than VMT reduction assumptions.

Even with complete electrification of the automotive fleet, CARB’s scenarios are unable to achieve the State’s GHG emission reduction targets without assuming VMT reductions from the remaining vehicles. The proposed VMT reductions under all four alternatives are highly optimistic given historical increases in VMT and previous failures to reduce VMT. Under SB

¹⁰ Division 25.5. California Global Warming Solutions Act of 2006, Chapter 2 Section 38561(d) and 38561(h). Available at: https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=200520060AB32. Accessed: April 2022.

¹¹ Ramboll case study can be found as Attachment A in the WSPA comment letter on the August AB 32 Scoping Plan Workshop. Available at: <https://www.arb.ca.gov/lists/com-attach/80-sp22-concepts-ws-AmNWJVA2VFgEM1Bn.pdf>. Accessed: April 2022.

375, metropolitan planning organizations were directed to meet GHG emissions reduction targets by incorporating a sustainable communities strategy (SCS) as part of the long-range regional transportation plans. As noted in the CARB's 2018 Progress Report,¹² the anticipated performance of the SCS was a 10% reduction in VMT per capita by 2020 as compared to 2000. However, by 2016 the VMT per capita had increased by ~3%. As noted in the progress report, there are numerous challenges associated with social engineering VMT reductions which are dependent on factors outside CARB's purview such as employment rates, fuel prices, job and housing balances, and availability of affordable housing.

CARB should consider the implementation of technology-neutral vehicle/fuel pathways that could achieve the GHG reductions contemplated within these Scoping Plan scenarios. The increased use of low and negative carbon-intensity drop-in fuels along with the penetration of fuel-efficient vehicle technologies such hybrid electric vehicles and plug in hybrid electric vehicles could provide GHG reductions with much greater certainty than the VMT reductions assumed in the E3 scenarios.

8. CARB is obligated under AB 32 to minimize the “leakage” potential of any of their regulatory activities. The presented scenarios appear to set an emissions inventory boundary that fails to account for California GHG emissions that would be caused outside the California border. Such emissions leakage would likely be a direct result of certain CARB policy concepts presented in these scenarios. CARB must estimate the emissions increases outside of California which result from leakage and policy-driven demand.

CARB has a responsibility to minimize the “leakage” potential of any regulatory activities,¹³ which includes activities under Scoping Plan emissions reduction scenarios. As part of this responsibility, CARB must analyze the potential for emissions reduction activities in the state to be offset by an equivalent or greater increase in emissions of greenhouse gases outside the state. This analysis necessarily requires estimating emissions impacts outside the state, which CARB has yet failed to do.

Here, however, the presented scenarios have an inappropriate boundary that fails to account for GHG emissions that would be “outsourced” beyond the California border. For example, the modeling to reduce or cease in-state oil and gas extraction and reduce petroleum refining to track in-state petroleum demand fails to account for the out of state petroleum refining increases that would likely occur to counter the lack of exports from California. It also fails to account for potential new import of crude oil or additional infrastructure requirements at marine ports to accommodate these imports needed to support demand. California has strong environmental programs and a robust GHG emissions program designed to reduce the carbon-

¹² 2018 Progress Report: California's Sustainable Communities and Climate Protection Act. Available at: https://ww2.arb.ca.gov/sites/default/files/2018-11/Final2018Report_SB150_112618_02_Report.pdf. Accessed: April 2022.

¹³ CA Health & Safety Code § 38562(b)(8).

intensity of California economy, including oil production, over time and CARB should consider this when setting policy and give preference to in-state demand over imports.

CARB's scenarios include unprecedented levels of growth within the solar panel and battery production to upgrade the electric infrastructure (5-7 GW solar generation and 2-5 GW battery storage capacity every year throughout the regulatory timeline), increase hydrogen generation (31-47 GW solar generation), and increase penetration of battery electric vehicles, which in turn would lead to the development of growth of solar panel and battery production facilities both within and outside the State. GHG emissions associated with these out of State activities that are driven primarily by the energy transition within California should be included in the analyses. It is also important to note that mineral resources critical to the production of solar panels and batteries are primarily found outside the State. So, GHG emissions associated with mining and processing these minerals that occur outside the State boundary should be included in CARB's analyses.

CARB's failure to estimate emissions increases outside of California is also inconsistent with its Scoping Plan obligations. In developing a Scoping Plan, AB 32 requires CARB to include for each emissions reduction measure a projection of greenhouse gas emissions reductions resulting from the measure.¹⁴ This requirement is not limited to in-state analysis. Rather, other Scoping Plan provisions indicate that the legislature expected CARB to take a broader perspective in developing its Scoping Plan, requiring CARB to consider "all relevant information pertaining to greenhouse gas emissions reduction programs in other states, localities, and nations, including the northeastern states of the United States, Canada, and the European Union."¹⁵

This broader analysis is also mandated under CEQA, which requires CARB to identify each "significant effect on the environment," including indirect and cumulative effects.¹⁶ CEQA Guidelines require CARB "to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project," focusing on "the reasonably foreseeable incremental contribution of the project's emissions to the effects of climate change."¹⁷ Emissions related to leakage potential are reasonably foreseeable—in fact, CARB has a specific duty to minimize these emissions under AB 32. It is impossible for CARB to assess any cumulative or incremental contributions to climate change stemming from emissions reduction measures contemplated in the Scoping Plan without assessing emissions outside California. The effects of climate change do not stop at California's border.

¹⁴ CA Health & Safety Code § 38562.7.

¹⁵ CA Health & Safety Code § 38561(c).

¹⁶ 14 C.C.R. §§ 15064(a), 15126.4.

¹⁷ 2022 CEQA Statutes & Guidelines § 15064.4. Available at: https://www.califaep.org/docs/2022_CEQA_Statue_and_Guidelines.pdf. Accessed: April 2022.

9. WSPA agrees that carbon removal technologies including CCS critical tool for industries to choose to invest in and will be pivotal to the overall success of the Scoping Plan to achieve carbon neutrality by 2045. Each of the scenarios considered by E3 would require CCS technologies and/or carbon dioxide removal (CDR) to reach carbon neutrality. CARB may be compromising the viability for these technologies by undercutting the very market tools on which they would depend, specifically the LCFS.

All modeled pathways necessarily include CCS and will need to rely on CDR to achieve carbon neutrality. CDRs, including bioenergy with carbon capture and sequestration (BECCS) and direct air capture (DAC), will be important enablers to decarbonization globally, and California has the opportunity to demonstrate global leadership with policies to nurture their early adoption at scale.

WSPA supports full consideration of CCS and looks forward to the earliest opportunity to review the detailed model, inclusive of its inputs and forced constraints, to better understand and comment about the outcomes. There are opportunities across the supply chain to decarbonize existing fuel supply, from the well to the pump. Achieving the State's emission reduction targets while meeting the transportation needs for all Californians will require the use of proven CCS technologies. Unfortunately, it appears that the modeling work conducted to date does not even consider the potential for deployment of CCS on upstream industrial process, or DAC in close proximity to upstream activities, where this technology can be further developed with critical early market support through programs like the LCFS. California has the optimal blend of existing industry for demonstration and deployment, the technology process to enable CDRs such as CCS and DAC and the passion to showcase this art of the possible to the world. Provision of low/zero-CI feedstock can make these fuels competitive with every other potential energy carrier and modeling should not preclude this potential pathway.

As suggested by the high-level E3 modeling results that were shared, further decarbonization of existing fuels can continue by deployment of CCS in the refining sector. Again, the LCFS and cap-and-trade programs can provide the market support to promote this implementation. It is imperative that the Scoping Plan not inadvertently strand investments in such technology. To presume deployment of CCS on refining operations, while then forcing reductions on the refining sector when it can supply lower carbon fuels not only to California but to other jurisdictions who would otherwise have to utilize higher CI fuels from elsewhere, is inconsistent with the overarching goal to reduce CO₂ levels globally.

As CARB is aware, refining is a complex series of processes, and the modeling scenarios may be missing important granularity if it does not differentiate production of hydrogen as a distinct activity versus the thermal processing steps in a refinery. When CCS is installed on refineries it is very likely that this will include CCS on SMRs which produce hydrogen. It is critical that CARB consider this low-carbon hydrogen resource when planning for the future of hydrogen in the state. For the most robust outcomes, WSPA suggests that these should be modeled separately.


We therefore recommend that the modeling and Scoping Plan reflect a future with California refineries producing CARB compliant petroleum fuels, renewable fuels, and hydrogen, and equipped with CCS where feasible. And, that these refineries in continuing to operate in this way, providing fuels to California, other states and perhaps globally can avoid leakage of refining capacity to higher-carbon non-California operations.

Conclusion

CARB's modeling work should ultimately be constructed with an eye towards supporting and fostering technological innovation. Doing so could create a foundational framework that would attract more investment into the market which would help the state achieve its long-term climate goals. WSPA strongly recommends that CARB evaluate a new alternative (e.g., Alternative 5) that prioritizes "least cost" emission reductions across the economy, by relying more heavily on technology-neutral market-based approaches, such as cap-and-trade, to achieve emission reductions. As noted in our October 2021 comment letter, we believe that such market-based approaches will be critical to helping the State achieve carbon neutrality in the most cost-effective manner. WSPA is prepared to work collaboratively with CARB to help ensure the range of modeled scenarios is expanded given the full vetting and transparency that is necessary.

Thank you for the consideration of our comments. WSPA would welcome the opportunity to discuss these comments and recommendations in more detail with you. We look forward to continuing to work with you as you further develop the alternatives for the Scoping Plan. Please feel free to contact me at jverburg@wspa.org with any questions or concerns.

Sincerely,



James Verburg
Sr. Manager, Fuels

