Western States Petroleum Association

October 22, 2021

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

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

Re: WSPA Comments on September 30, 2021 Scoping Plan Workshop – Draft Scenario Inputs

Dear Ms. Sahota:

We appreciate the opportunity to provide comments on the September 30, 2021 Scoping Plan workshop. 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 people 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 produces and consumes energy is evolving. And the members of WSPA are on the cutting edge of that evolution, investing in and developing the diverse energy sources and technologies of the future. WSPA believes that, working together, we can rise to the challenge of a changing climate, while providing clean, affordable, safe, and reliable energy for a vibrant economy in California.

An alternative prioritizing the lowest cost of implementation should be included as part of CARB's modeling

WSPA recognizes that CARB is approaching modeling for the 2022 Scoping Plan differently than in previous Scoping Plan updates, with more focus on modeling specific technologies instead of specific policies. WSPA still strongly believes that CARB should include a new alternative (Alternative 5) that prioritizes "least cost" emissions reductions across the economy, inclusive of certain policy constraints. We believe that the 2017 Scoping Plan "Alternative 3 – All Cap and Trade" scenario could serve as a model on which to base a "least cost" alternative. We urge CARB to model an alternative that relies more heavily on market-based approaches, such as cap and trade, to achieve emission reductions. WSPA believes that this is critical to meet the legislative intent in AB 32, which requires CARB to "adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective greenhouse gas emission reductions from sources or categories of sources." WSPA continues to believe that market-based approaches are the most effective ways of achieving AB 32's

intent and will be critical to helping the state pursue carbon neutrality in the most cost-effective manner.

We recognize that there are certain measures, programs, legislation, and other restrictions which would need to be included in a proposed Alternative 5 (an alternative centered on cap and trade). For example, we recognize that the power sector has a specific goal under SB 100 which will constrain allowable solutions in that sector. We urge CARB to develop an alternative that removes technology mandates to the degree practicable, and to prioritize cost-effective emission reductions without preference for any given technology. Specifically, we believe that this alternative should not include a ban on the internal combustion engine or restrictions on refinery or oil and gas production operations. We believe that CARB should allow market and price signals to drive reductions in these sectors to meet the carbon neutrality goals of the state, while minimizing impacts to the economy and consumers.

Market-based approaches will be critical to pursuing carbon neutrality in the most cost-effective manner.

California has long been a leader in supporting market-based programs like Cap-and-Trade and LCFS. Many other jurisdictions have used California's programs as templates their climate programs. CARB should carefully consider how its programs are likely to influence other jurisdictions at the state, national and international levels. Programs and regulations that can only apply in California – such as bans and mandates – are less likely to be adopted at the global scale. We encourage CARB and the state's policymakers to focus on programs that will complement and allow for integration with the global economy, rather than a framework based on bans and mandates that could contribute to a patchwork of impractical policies across the world. We encourage CARB not to lose this leadership role, and to avoid falling into the mandate trap.

The impact of market mechanisms currently in place is still unclear

It is still unclear what CARB's assumptions are for post-2030 Cap-and-Trade or LCFS programs, and uncertain what role a price on carbon might play. In 2017, the California legislature extended the state's landmark Cap-and-Trade program through 2030 as a key cost-containment tool with bi-partisan support and with a supermajority vote.[1] We agree that a price on carbon will drive solutions and that should be reflected in the modeling work. As presented, however, we do not yet see CARB describing a role for market mechanisms and a price on carbon post-2030.

Market-driven approaches can achieve greenhouse gas reductions across the board at a lower cost to society. Each of the Alternative assumptions that CARB chooses to include in its modeling will be impacted by a price on carbon. Therefore, any modeling that does not include a price on carbon would be incomplete without evaluating the potential impacts of such a market mechanism.

Recommendation – CARB should develop a new Alternative 5 to evaluate the potential roles (and additional benefits) that market mechanisms and a price on carbon could contribute (in place of bans and mandates) to pursuing carbon neutrality. This evaluation would require appropriate modeling approaches, as described above.

[1] AB 398 (2017), Ch. 135

Scenario Assumptions

We generally find CARB's proposed Alternatives 3 and 4 to be more realistic and balanced approaches than Alternatives 1 and 2. WSPA provides the following input on specific sectors.

- **Vehicle Miles Traveled (VMT) –** CARB should evaluate a wider range of alternatives, including a flat (0%) VMT per capita improvement over time as well as a middle value of 10% improvement. If the assumptions for VMT are too optimistic and not achieved in practice, the state will fall short of achieving its goals. WSPA has commented on this in previous Scoping Plan workshop comment letters.

- **Light Duty Vehicle (LDV) Fuel Economy Standards –** We assume that vehicle technologies will improve. Our comment below recommends that Alternative 4 assume some continuing sales of combustion (ICE) vehicles to 2045 to accommodate populations for whom EVs may not be practical. To be consistent with this, Alternative 4 should assume continuing fuel economy improvements for internal combustion LDVs to 2035 and then beyond to 2045. WSPA believes that there is potential for efficiency gains above 2% depending on the level of hybridization there is in the fleet.

- **LDV Zero-Emission Vehicle (ZEV) Sales -** WSPA recommends that CARB include at least one alternative that does not evaluate a ban on the internal combustion engine. We recommend that CARB evaluate and make adjustments to other measures in order to identify alternative opportunities to reduce emissions. This could include additional use of CCUS, Direct Air Capture, greater use of renewable fuels, etc. CARB is using the assumptions from the AB 74 Institute for Transportation Studies' report,[2] for Alternative 4. We would instead recommend modeling a more gradual increase in ZEV sales extending to 2045 for three reasons:
  - to better bracket the assumptions in Alternatives 1-3 of full ZEV adoption;
  - to address potential slower consumer and/or political adoption of ZEVs; and
  - to address potential slower ZEV technology development and/or constraints on ZEV manufacturing.

  Alternative 4 should also assume renewable naphtha/gasoline consumption in the LDV ICE fleet consistent with expected annual production capacity of that fuel in CA.

- **Truck ZEV Sales -** CARB is using the assumptions from the AB 74 ITS Report[3], i.e., "100% of MDV/HDV sales are ZEV by 2040" for Alternative 4. We recommend review and use of the

[2] Brown, A. L, Sperling, D., Austin, B., DeShazo, JR, Fulton, L., Lipman, T., et al. (2021). Driving California's Transportation Emissions to Zero. *UC Office of the President: University of California Institute of Transportation Studies*. http://dx.doi.org/10.7922/G2MC8X9X Retrieved from https://escholarship.org/uc/item/3np3p2t0.
[3] *Ibid*.

assumptions in the December 2020 Princeton University "Net Zero in America" study[4] for MDV/HDV ZEV vehicle sales and stock inventory in the "E-" case. Table 21 of that study provides the necessary assumption detail for pace of ZEV implementation. Alternative 4 should also assume renewable diesel consumption in the MDV/HDV ICE fleet consistent with expected annual production capacity of that fuel.

- **Aviation** – We recommend that Alternatives 3 and 4, at a minimum, should assume some use of renewable Sustainable Aviation Fuel (SAF), consistent with expected SAF supply and per CARB's biofuels supply modeling assumptions. This assumption is aligned with the current state of technology for low carbon aviation transportation.

- **Port Operations –** With regard to truck transportation within port operations (e.g., drayage vehicles), we would recommend review and use of the December 2020 Princeton University "Net Zero in America" Study[5] assumptions for ZEV vehicle sales and stock inventory in the "E-" case. Table 21 of that study provides the necessary assumption detail for pace of ZEV implementation for all vehicle classes.

- **Freight/Rail** – Renewable diesel consumption should be modeled in line with expected annual production capacity. Alternative 4 should model a majority of rail service using liquid fuels in 2045 to better bracket the assumptions of full or near-full adoption of electrification technologies in the other Alternatives. CARB should also consider how rail transportation originating outside the state or country is likely to be powered. Alternative 4 should assume consumption of biofuels consistent with expected annual production capacity of those fuels (for which CARB has assumed zero GHG emissions).

- **Oil & Gas Production** - We believe that the way CARB has presented the assumptions for this sector appears to potentially be missing a key factor for modeling emissions in the O&G sector. WSPA strongly believes that there is significant potential to reduce emissions in the O&G sector through the application of technologies and innovative approaches to reduce emissions from production operations over the next 25 years. While we believe this is critical for Alternative 4, we want to urge that this be applied to the other Alternatives as well. Many of these approaches are in use today or within reach during CARB's 2045 modeling timeframe and will significantly reduce scope 1, 2 and 3 emissions. We believe that each of these solutions will contribute to significant emission reductions from the upstream O&G sector and should be accounted for in Alternative 4. Specifically, WSPA believes that CARB should include: 1) improved energy efficiency and electrification in the upstream O&G sector including the pre-combustion capture

[4] E. Larson, C. Greig, J. Jenkins, E. Mayfield, A. Pascale, C. Zhang, J. Drossman, R. Williams, S. Pacala, R. Socolow, EJ Baik, R. Birdsey, R. Duke, R. Jones, B. Haley, E. Leslie, K. Paustian, and A. Swan, Net-Zero America: Potential Pathways, Infrastructure, and Impacts, interim report, Princeton University, Princeton, NJ, December 15, 2020.

[5] *Op. cit*.

of carbon to increase combustion efficiency; 2) expanded application of and use of renewables (renewable power or renewable fuels or hydrogen) in the upstream O&G sector to power operations; and 3) the use of CCUS on upstream combustion sources similar to the manner in which CARB is applying CCUS for the refining industry.

All three of the above-referenced concepts have broad applicability throughout the upstream sector and specifically within California to reduce emissions from operations. In fact, WSPA's member companies are currently working on, or have already achieved, emission reductions associated with these three approaches around the world, and thus we believe they are ripe for CARB to include in their model. Publicly announced examples include:

- Chevron's use of solar power to replace combustion emissions in the Lost Hills field[6];
- Chevron's partnerships to advance carbon capture technology for upstream sources with Svante[7];
- Chevron's partnership with Carbon Clean[8] to evaluate and advance alternative carbon capture technology;
- California Resources Corporation's CCS carbon storage projects, continuing methane emission reductions and solar initiatives[9]; and
- Aera's developing efforts to utilize solar electricity to power oil field operations in Monterey and Kern Counties.

Aside from currently available technology, it should be noted that WSPA believes technology will continue to become more efficient and economical over time as our industry innovates to find lower carbon solutions and drive down costs. New technologies will become available over time to further reduce emissions beyond what the three approaches listed above can accomplish. For example, many of these projects came directly from the industry's investment in low carbon technology companies striving to find innovative solutions to reduce emissions. For example, Chevron has invested significantly in low carbon solutions and has committed $400 million in companies with low carbon technologies covering a broad range of ways to reduce emissions[10]. Additionally, many of our members have publicly announced corporate level emission reduction targets, ambitions and/or sustainability goals in place showing their commitment to a lower carbon future.

Additionally, we request that CARB adjust its approach in Alternative 4 as to the relationship between oil production and fuel demand in the state. WSPA specifically requests that CARB use an in-state oil production decline rate in step with the long term (20+ years) oil production in California from data collected by government agencies such as the US Energy Information Administration (EIA) or the California Energy Commission (CEC). WSPA further requests that imports of crude then be used to make up the difference between refinery demand and in-state

[6] Powering the World Forward with California Sunshine — Chevron.com
[7] Svante and Chevron Technology Ventures launch study for carbon capture pilot unit | Svante (svanteinc.com)
[8] Carbon Clean Solutions attracts $16 million growth capital from a consortium of global investors
[9] www.crc.com\esg
[10] future-energy-fund-overview.pdf (chevron.com)

production. With California's focus on reducing emissions and the uncertainty of actual emissions occurring in regulatory regimes outside of California, WSPA believes that mandating forced reductions in California oil and gas production could result in economic and environmental leakage external to California, with no actual reduction of emissions. We urge CARB to accurately account for any additional emissions and economic leakage associated with substitution of imported crude for California-produced crude. WSPA believes that maintaining production in California preserves jobs and other economic benefits in the state while providing California's O&G production sector the ability to contribute to the state's climate goals by investing in new technologies and reducing emissions from hard-to-decarbonize industries over time.

- **Petroleum Refining** – Similar to the O&G production sector, WSPA believes CARB is underestimating the potential for emission reductions at refineries by only modeling the application of CCS for refinery emission reductions. Just like the O&G production sector, there is potential for continued emission reductions at refineries through improvements in energy efficiency and the use of renewables (renewable electricity and renewable fuel gas). CARB can look to the LCFS program for examples of these improvements in the refining sector. While energy efficiency projects are more straightforward, the use of and/or production of renewable fuels in refineries can be complex. To take these complexities into account, CARB should consider two critical components:
    - First, when processing or co-processing biofuels at a refinery, biomass molecules will be used in a number of refinery processes including into the refinery's fuel gas systems that are used to generate heat and the refinery's hydrogen production processes, both of which emit CO2. When biomass molecules are used in place of fossil molecules, the refinery site emissions of CO2 on a lifecycle basis significantly drop. CARB should account for the lower refinery emissions associated with any processing or co-processing of biofuels.
    - Second, when CCS is combined with biofuels use or production at refineries there is the real potential for negative emissions on a lifecycle basis which other solutions simply cannot offer.

  WSPA is concerned the proposed model assumptions could suggest a policy outcome that would require CCS on large refinery emission sources. WSPA instead recommends that CARB model different rates of implementation CCS over the same time periods in Alternatives 1-4.

  Additionally, WSPA has concerns with CARB's approach to modeling petroleum refining sector operations in line with in-state petroleum demand. WSPA is concerned that this could indicate restricting refinery operations or product exports. We encourage CARB to avoid modeling assumptions that could potentially interfere with in-state refineries' ability to participate in international or interstate commerce. As an alternative, WSPA suggests that CARB use long-term (20+ year) historical trends for refinery operations from data collected by government agencies such as the EIA or the CEC to model what refining capacity would be in the state over the next 25 years. Much like in the upstream O&G sector, California should recognize that the

uptake of climate policy around the world is uncertain. Continued emission reductions from the refining sector in California, combined with continued exports of refined product from California, has the potential to decrease global greenhouse gas emissions (even though those reductions would not be accounted for in California's AB 32 inventory).

- **Low Carbon Fuels for Transportation –** Biofuels will continue to play a major role in reducing carbon emissions in California's emission inventory. Therefore, they should hold a more prominent role in the scoping plan process. WSPA encourages CARB to include in their modeling assumptions the benefits of biofuels as the availability of these fuels grows, and to highlight the need for and benefits of these fuels in every sector of the PATHWAYS Modelling Assumptions.

  During the scoping plan workshop, CARB discussed the use of a biofuels module to forecast the supply of biofuels in California. The 2017 scoping plan utilized a module developed by CARB that estimated the volume of biofuels available to the state based on LCFS credit values, capital costs to produce the fuels, availability of feedstocks, and competition from other jurisdictions' fuels programs. WSPA supports this approach to the scoping plan and asks CARB to make this information available, adding a biofuels module framework discussion to a scoping plan workshop so that CARB can explain its reasoning and allow for stakeholder input to this important analysis. We urge CARB to:

  - model the amount of biofuels that can be cost-effectively put into the fuel supply system;
  - incorporate biofuels into the baselines of Alternatives 2, 3, and 4; and
  - model varying levels in each alternative, with a maximum in Alternative 4.

  WSPA recommends that CARB update the "Biofuels Module" and use the results to adjust Alternative 4 to model the continued the use of renewable fuels in the transportation sector where supplies of biofuels are available and cost-effective when compared with alternative options.

- **Industrial Use of CCS** – CARB's workshop presentation included a modeling approach that first eliminates combustion, and then conducts a subsequent effort to evaluate remaining emissions. WSPA believes that it is suboptimal for CARB to dictate an order of emission reductions. A better approach would be to evaluate all potential options simultaneously to determine which can provide emissions reductions most efficiently, and with the least economic dislocation.

  CARB's inclusion of CCS in Alternatives 2, 3, and 4 should not be limited to industrial, oil and gas production, and refining applications. Our September 7, 2021 comment letter discussed the Lawrence Livermore National Laboratory finding that CCS projects in California could deliver up to 125 MMt/year of reductions.[11] We recommend that Alternative 4 allow up to 100 MMt/year at $200/tonne.

[11] Sarah E. Baker, Joshuah K. Stolaroff, George Peridas, Simon H. Pang, Hannah M. Goldstein, Felicia R. Lucci, Wenqin Li, Eric W. Slessarev, Jennifer Pett-Ridge, Frederick J. Ryerson, Jeff L. Wagoner, Whitney Kirkendall, Roger

- **Carbon Dioxide Removal (CDR) from Atmosphere** - As recommended above, Alternative 4 should model the findings from the Lawrence Livermore National Laboratories report[12] at 100 MMt/year at $200/tonne. Alternative 4 should further include an assumption for carbon removal from the atmosphere via Direct Air Capture. Finally, if appropriate for the modeling, Alternative 4 should include reasonable assumptions for carbon removal from Natural and Working Lands.

- **Commercial/Residential Buildings –** WSPA recommends that CARB take a different approach to modeling in this sector and suggests the modeling of a non-zero but increasing efficiency standard for sales in this sector in at least one of the modeled alternatives. Efficiency-improvement assumptions should be combined with assumptions about the pace of retrofits of existing appliances to meet the higher efficiency standard. This would allow CARB to analyze whether more efficient natural gas appliances can potentially replace less efficient ones in this sector more cost-effectively than requiring all-electric appliances, which face resistance from some sectors of the public. As in other sectors, WSPA believes that CARB should prioritize the most cost-effective emission reductions and believes that an approach that mandates a specific technology ignores the potential that other technology options can provide. Combined with the use of RNG and hydrogen in the pipelines, we believe that this can lead to a significant amount of emission reductions from this sector over the next 25 years.

Conclusion

Thank you for 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 mnechodom@wspa.org with any questions or concerns.

Sincerely,

Mark Nechodom, PhD
Vice President, Upstream Strategy

D. Aines, Daniel L. Sanchez, Bodie Cabiyo, Joffre Baker, Sean McCoy, Sam Uden, Ron Runnebaum, Jennifer Wilcox, Peter C. Psarras, Hélène Pilorgé, Noah McQueen, Daniel Maynard, Colin McCormick, *Getting to Neutral: Options for Negative Carbon Emissions in California*, January, 2020, Lawrence Livermore National Laboratory, LLNL-TR-796100.

[12] *Ibid.*