



April 4, 2022

Ms. Liane Randolph
Chair, California Air Resources Board
1001 I Street
Sacramento, CA 95814

Submitted electronically

Re: Comments on 2022 Scoping Plan Update – initial modeling results as presented March 15, 2022 and March 24, 2022.

Dear Chair Randolph,

On behalf of Environmental Defense Fund (EDF), we appreciate the opportunity to provide comments on the 2022 Scoping Plan update and specifically the initial modeling results. Recognizing both the challenge of considering varied time horizons as well as the increasing urgency of the climate crisis, EDF commends the California Air Resources Board's (CARB) significant effort in developing this Scoping Plan update.

As we have pointed out previously in the Scoping Plan update process, **this decade is a critical time for California, and the world, to dramatically reduce greenhouse gas emissions.** Avoiding the worst impacts of climate change will require securing as many reductions as possible as early as possible to stay within the carbon dioxide budgets identified by the Intergovernmental Panel on Climate Change (IPCC) to limit global warming to 1.5°C – a grave milestone that the world could reach as early as 2030.¹ Fortunately, due to decades of climate leadership including at CARB, California already has many of the tools and certainly the opportunity to increase ambition, right now, in addressing climate change.

In order to inform forthcoming modeling adjustments as well as the selection of the final Scoping Plan scenario, this set of comments first offers several observations, appreciations and

¹ Intergovernmental Panel on Climate Change (IPCC), 2018, Global warming of 1.5°C: An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty, pp. 6, 17, available at: https://www.ipcc.ch/site/assets/uploads/sites/2/2018/07/SR15_SPM_version_stand_alone_LR.pdf.

recommendations for future analysis or improvements of the four proposed alternative scenarios as presented in the March 15, 2022 Scoping Plan workshop as well as the March 24, 2022 Board meeting. The following sections then discuss thematic considerations around hydrogen production, carbon dioxide removal strategies, carbon capture and sequestration (CCS), and the cap and trade program that apply to all four alternative scenarios.

Section 1: Initial modeling results

EDF appreciates the immense amount of work done by both CARB staff and E3 in developing the four alternative Scoping Plan scenarios, and **we look forward to seeing the underlying data of these initial modeling results.** We also anticipate that additional insight into these scenarios will come through the economic and public health analyses. When this additional detail and analysis is available, EDF may provide further or amended comments.

At the same time, it is somewhat challenging to fully evaluate these alternative scenarios because of the lack of consideration of policy design. While EDF recognizes the Scoping Plan is a planning and not a regulatory document, assumptions about technology deployment and sales figures – which appear to constitute many of the underlying modeling assumptions – do not necessarily translate into the legislative or regulatory action required. For instance, the policies enacted to build out the hydrogen production assumed in each of the four alternative scenarios could vary greatly and in turn impact the type of production, cost of production, extent of transportation, level of leak mitigation, and types of end uses – all of which will impact the actual emission, economic, and public health outcomes of these assumptions.

Despite the inherent challenges in fully assessing these proposed alternative scenarios, EDF does have several observations, appreciations and recommendations to offer.

- We are pleased to see that all four proposed alternative scenarios meet or exceed the 2030 target. It is essential that California maximize emission reductions in the current decade to minimize the cumulative greenhouse gas impact on the climate. **The final Scoping Plan scenario must, at a very minimum, meet the 2030 goal and seek to exceed that goal to the extent feasible.**
- EDF also appreciates the “business-as-usual” (BAU) reference presented alongside each of the four proposed alternatives. We do note that in the E3 slides there is no BAU reference provided for overall emissions, and **we request that the data and assumptions used in developing the BAU reference be made available alongside the data for the four proposed alternative scenarios.**
- **It is notable that Alternative Scenario 4 fails to meet the commitments to emission reductions that California has already made.** It does not achieve 80% emissions reductions below 1990 levels by 2050, nor does it achieve 100% light-duty ZEV sales by 2035. At the most basic level, this makes Alternative Scenario 4 unacceptable as the final Scoping Plan scenario.

- EDF is disappointed that none of the four proposed alternative scenarios clearly articulate the assumed role of the cap-and-trade program, an essential policy in California's broad suite of climate strategies. **Overlooking the role and level of the declining emissions cap is a missed opportunity to ensure the state is maximizing its climate ambition**, and we look forward to the forthcoming analysis suggested by CARB leadership. Specific suggestions for this analysis are discussed further in Section 6.
- As discussed below in Section 4, carbon capture technologies have promise in hard-to-abate sectors of the economy. However, **carbon capture technology should not be deployed to expand fossil fuel production or to slow the market transition** away from fossil fuels. To that end, we look forward to reviewing the underlying modeling data to understand the scale of carbon capture deployment on refineries as assumed in Alternative Scenarios 2, 3, and 4.
- Cement is a sector that could benefit significantly from the use of carbon capture technology because of the inherent challenges in fully decarbonizing the production process. Alternative Scenario 1 assumes carbon capture deployment on 100% of cement production by 2035, and Alternative Scenarios 2, 3, and 4 all assume carbon capture deployment on 40% of cement production by 2035 and 100% by 2045. EDF suggests considering an **interim carbon capture deployment assumption so Alternative Scenarios 2, 3, and 4 are not identical and a higher level of abatement in this sector is contemplated**. One possible example would be to have Alternative 3 explore 60% deployment by 2035 and 100% by 2045.
- All four proposed alternative scenarios rely on significant deployment of carbon dioxide removal strategies to achieve net-zero emissions. While these are necessary to address the legacy pollution in the atmosphere, neither nature-based solutions nor **technological carbon removal strategies should be considered an alternative to emission reductions from pollution sources**. Removals should be reserved for the last tranche of emissions that are either impossible or prohibitively expensive to abate. Carbon dioxide removal strategies are discussed below in Section 3.
- Each of the four proposed alternative scenarios require a sizeable buildout of zero-carbon hydrogen. While hydrogen has promise as a decarbonization strategy in certain sectors and applications, **hydrogen production must be scaled in such a way as to prevent leakage of the hydrogen itself as well as other greenhouse gases including methane**. Even moderate amount of hydrogen leakage could undo most of the benefit assumed in these scenarios. EDF suggests that the modeling assumptions specify the level of leak-detection required to ensure climate benefit. This issue is discussed in greater detail in Section 2.
- Approximately 25% of California's greenhouse gas emissions can be attributed to buildings, and **EDF is pleased to see that all four proposed alternative**

scenarios include a rapid shift to electrification of new buildings in the current decade. This is an important step toward maximizing emission reductions in the near-term but will require a mixture of strategies to help ensure that low-income customers are not left behind with either high transition costs or that remaining gas customers still receive affordable and reliable service.

- Electrification of existing buildings is also essential; it appears the modeling assumptions only consider appliance upgrades and **EDF would encourage greater consideration of the emission and health benefits of increased efficiency measures and weatherization in existing buildings.** As policy is developed to make these assumptions a reality, EDF encourages prioritization of buildings in disadvantaged communities and urges CARB to consider the recommendations of the Environmental Justice Advisory Committee (EJAC) regarding measures to support building residents and tenants.² Consideration of a variety of ownership models and building stock types will be required. Adoption of a specific target for emissions reductions from existing buildings will help ensure that all customers will be able to contribute to this transition.
- EDF appreciates CARB’s leadership in decarbonizing heavy-duty vehicles through the Advanced Clean Trucks and Advanced Clean Fleets rules. To that end, we are glad to see that all four proposed alternative scenarios achieve 100% medium- and heavy-duty ZEV sales by 2045 or earlier. **In developing policy to achieve these outcomes, EDF encourages CARB to invest in truck and fleet transitions to speed early retirement to the extent possible.** One example is the suite of innovative financing options created under SB 372 (Leyva, 2021) to support truck owners’ purchase of new ZEV vehicles.
- The initial modeling results as presented by E3 on March 15, 2022 appeared to assume that there would be no increase in the carbon intensity reduction targets under the Low Carbon Fuel Standard across all four proposed alternative scenarios. As CARB has already contemplated such an acceleration pre-2030 and an extension of CI targets post-2030, EDF would encourage increasing the ambition of assumptions in this sector. CARB staff seemed to acknowledge this opportunity in comments at the March 24, 2002 Board meeting, and **EDF supports more ambitious CI targets be assumed in the Scoping Plan modeling.** We also support CARB moving forward with summer 2022 workshops to explore further ambition in the Low Carbon Fuel Standard program.
- Across all four proposed alternative scenarios, the modeling assumes that all energy required for hydrogen production and CDR strategies like direct air capture (DAC) will be powered by off-grid renewable energy. **While this may be the ideal outcome, CARB should consider the reality of assuming**

² <https://ww2.arb.ca.gov/sites/default/files/barcu/board/books/2022/031022/ejacrecs.pdf> “Building Decarbonization”

100% off-grid renewables based on cost projections as well as infrastructure and land use constraints. This is a significant assumption and if not realized could noticeably change the level of emission reductions and public health benefits, as well as the cost of deployment of this technology. EDF requests more detail and data that form the basis and implications of this assumption.

- EDF is pleased to see that all four proposed alternative scenarios achieve the SB 100 goal of 100% zero-carbon energy by 2045, a goal that EDF analysis undertaken with Clean Air Task Force demonstrates is feasible and can be done reliably and affordably.³ However, based on this research, **the land-use requirements of the zero-combustion Alternative Scenario 1 are likely quite sizeable and potential trade-offs of the required build-out should be carefully considered.**
- Alternative Scenarios 2, 3, and 4 rely more on clean firm power than Alternative Scenario 1, and likely represent a more cost-effective approach to full electricity sector decarbonization. Even though individual renewable assets such as solar are lower in cost compared to clean firm power resources on a per MWh basis, **the investment in clean firm power lowers total system cost overall** and CARB should not take any clean firm options including zero-carbon hydrogen, geothermal, imported nuclear, and natural gas with carbon capture and sequestration off the table.⁴ EDF looks forward to the economic analysis of these scenarios to assess how it aligns with our research on electricity affordability and the cost of zero-carbon generation. CARB should also consider the amount of new transmission, permitting and land use required for each scenario, as these will likely be hard constraints to identifying the right portfolio mix.
- EDF encourages CARB to accelerate the emission reductions beyond the currently-mandated 38MMT CO₂ target. While Alternative Scenario 1 does achieve zero MMT CO₂ by 2035, there are some questions about cost and trade-offs mentioned above. Alternative Scenarios 2 appears to achieve 30MMT CO₂ by 2030, and Alternative Scenarios 3 and 4 are at approximately 30MMT after 2045. **We suggest exploring an acceleration of the emission reductions in the electricity sector to achieve 30MMT CO₂ closer to 2030, especially in Alternative Scenario 3.**

³ Environmental Defense Fund, Energy and Environmental Economics, Clean Air Task Force, Brookings Institution [Long, J.C.S., E. Baik, J.D. Jenkins, C. Kolster, K. Chawla, A. Olson, A. Cohen, M. Colvin, S.M. Benson, R.B. Jackson, D.G. Victor, S.P. Hamburg], 2021, California Needs Clean Firm Power.

⁴ For a full discussion of this research, see EDF's July 9, 2021 Scoping Plan comments available here: [https://www.arb.ca.gov/lispub/comm2/bccomdisp.php?listname=sp22-kickoff-
ws&comment_num=144&virt_num=103](https://www.arb.ca.gov/lispub/comm2/bccomdisp.php?listname=sp22-kickoff-ws&comment_num=144&virt_num=103)

Section 2: Zero-carbon hydrogen has potential as a climate solution – if leaks can be prevented

All four of the proposed alternative scenarios rely on a significant increase in zero-carbon hydrogen. Scaling up the use of hydrogen to decarbonize the transportation, industrial, and electricity sectors requires careful consideration of hydrogen's environmental and climate impacts, which recent EDF research find have historically been underestimated.⁵ To be a meaningful part of California's decarbonization plan, hydrogen must be implemented with sufficient monitoring and with technology in place to prevent any leakage, using only zero-carbon hydrogen generation, and with a complete understanding of the leakage risk of greenhouse gasses beyond carbon dioxide. To that end, EDF would echo the recommendation of the Environmental Justice Advisory Committee to do a full lifecycle analysis of emissions from, among other strategies, hydrogen production.⁶

EDF's recent research confirms that hydrogen itself is a powerful short-lived indirect greenhouse gas. Specifically, it is 100 times more potent as a greenhouse gas than an equal amount of carbon dioxide emissions over a 10 year period, which is a far higher level than what standard metrics currently show. Hydrogen should be measured using a global warming potential (GWP) 10 and not a GWP 100 basis in order to accurately capture the impact of hydrogen leaks. When viewed on this scale, EDF could not claim much of the assumed climate benefit from hydrogen even with relatively moderate leakage. Therefore, **minimizing or eliminating hydrogen leakage is absolutely critical to the success of hydrogen as part of the solution to climate change.** With high leakage from hydrogen production - even if it is produced by renewable energy as assumed in the initial results of modeling the four alternative scenarios - the fuel could cause almost twice as much warming in the first five years compared to continued fossil fuel use. However, with a low leakage rate, hydrogen can lead to an 80% decrease in warming in the first five years, compared to fossil fuels.

Ensuring that the hydrogen generation process is not powered by fossil fuels is also essential. In the March 15, 2022 Scoping Plan workshop, CARB stated that it would only pursue zero-carbon hydrogen produced through renewable energy, or through feedstocks paired with CCS. EDF appreciates the emphasis placed on zero-carbon hydrogen produced through renewable energy, but many issues can persist with the production of hydrogen through feedstocks paired with CCS, which is also contemplated in these initial modeling results. EDF's findings point out that carbon dioxide is not the only important climate pollutant produced through the hydrogen generation process, especially when not produced with renewable energy; methane, ozone, and water vapor are also released at significant levels, contributing to hydrogen's climate warming effects.

Specifically, methane leakage from producing hydrogen using natural gas and CCS technologies is of significant concern; the climate effects of methane leakage are often underestimated in

⁵ Ocko, I. B. and Hamburg, S. P.: Climate consequences of hydrogen leakage, Atmos. Chem. Phys. Discuss. [preprint], <https://doi.org/10.5194/acp-2022-91>, in review, 2022.

⁶ <https://ww2.arb.ca.gov/sites/default/files/barcu/board/books/2022/031022/ejacrecs.pdf>
Recommendation NF39.

hydrogen assessments, and methane is a powerful greenhouse gas with high global warming potential. While EDF appreciates CARB's stance to only use zero-carbon hydrogen, and staff clarification that hydrogen production in California should not rely on fossil gas, it will be absolutely critical to prevent leakage of methane when developing any potential hydrogen production using any feedstocks with CCS. The level of climate harm only increases if there is embedded carbon in the lifecycle analysis of hydrogen. Until such time that hydrogen leakage is more broadly understood and monitoring technologies are more widely available and deployed, EDF suggests that the Scoping Plan only assume zero-carbon hydrogen from renewable energy generation.

Across all methods of hydrogen production, leak monitoring and minimization is of utmost importance and should be of primary concern for any hydrogen buildout in California. Given the risks of a rapid, large-scale buildout of hydrogen production, **hydrogen should be prioritized only for hard-to-decarbonize industrial sectors such as steel and cement manufacturing, or as an alternative fuel for shipping and aviation.** Zero-carbon hydrogen could help be a part of the transition to a clean energy future, but California must ensure that its buildout will not add to the climate crisis by failing to recognize and monitor its role as an indirect greenhouse gas.

As the zero-carbon hydrogen industry is in its infancy, California has an opportunity to ensure that the accelerating investment in hydrogen projects yields the climate benefits being sought in the near-term, and thereby avoid needing to make major retrofits down the road or even abandon large capital investments that do not turn out to be climate solutions. To truly be among the strategies to address climate change, hydrogen production must be approached with robust monitoring and leading technology to catch and prevent any leakage, rely only on zero-carbon generation, and with a stringent measures in place to account for and prevent the leakage risk not only of hydrogen itself, but also any methane from the production process.

Section 3: Ensure greenhouse gas removal strategies are not a substitute for emission reductions

To avoid the worst impacts of climate change, **California must immediately and persistently slash climate pollution – maximizing cumulative emissions cuts this decade – and rapidly draw down greenhouse gas emissions to net-zero by 2045 at the latest.**

To achieve economy-wide net-zero greenhouse gas emissions by 2045, California needs to sharply reduce emissions from all sectors. It is also clear that some emission reductions will be extremely difficult to achieve, such as from agriculture, and it is possible that reductions from certain, limited industrial processes would be extraordinarily expensive. As such, additional measures that are capable of removing carbon dioxide from the atmosphere can play a valuable role in securing the net reductions necessary as quickly as possible. California will need to explore emerging negative emission technologies, while also capitalizing on the significant opportunities for nature-based climate solutions to achieve some of the necessary carbon dioxide removal. However, these **carbon dioxide removal (CDR) measures are not a**

substitute for reducing emissions directly from the pollution source, a theme clearly articulated throughout the EJAC recommendations as well.⁷

In E3's 2020 PATHWAYS modeling of carbon neutrality scenarios prepared for CARB, all three scenarios directly reduce greenhouse gas emissions *at least* 80% below 1990 levels by 2045, with CDR strategies accounting for the remaining 8-20% of emissions to achieve net-zero emissions.⁸ The "balanced" scenario, which intends to balance carbon mitigation measures with developing carbon removal technology, achieves an 87% reduction in greenhouse gas emissions, with the remaining 13% of emissions removed from the atmosphere. This modeling demonstrates that direct emission reductions should lead the way to achieving net-zero greenhouse gas emissions, with removal strategies utilized only to balance out the last tranche of emissions that may prove exceedingly expensive to abate—at least on the timeline necessary.

E3's presentation at the March 15 Scoping Plan workshop indicates that the Scoping Plan scenarios largely achieve lower gross emission reduction levels than modeled by E3 in the carbon neutrality report.⁹ While we look forward to reviewing the Scoping Plan modeling results in more detail once the data is available, it appears from E3's presentation slides (slide 8) that Alternative Scenarios 3 and 4 would achieve less than an 80% gross emission reduction towards the 2045 net-zero target, leaving the state reliant on CDR measures to balance out more than 20% of the 1990 baseline emissions level (Alternative Scenario 3 does achieve 80% gross emission reductions by 2050 in line with the target set in Executive Order S-03-05¹⁰). Alternative Scenario 2 appears to directly reduce emissions from the 1990 baseline by just over 80%, while Alternative Scenario 1 appears to achieve just over 90% gross emission reductions. These results therefore indicate that three of the four scenarios under consideration in the Scoping Plan rely on significantly higher levels of CDR to achieve net-zero emissions than modeled by E3 in the "balanced" carbon neutrality scenario. We recommend that CARB carefully review the scenario assumptions to ensure that opportunities to increase gross emission reduction across all four alternative scenarios are maximized.

In addition to the apparent ambition of direct emission reductions modeled for 2045, E3's presentation notes that Alternative Scenario 4 does not meet the minimum 80% gross emission reduction by 2050 targeted by EO S-3-05. We recommend that CARB modify this scenario such that it directly reduces emissions at least 80% below 1990 levels by 2050, consistent with California's goals.

Section 4: Carbon capture and sequestration requires safeguards

If deployed with robust environmental justice protections, environmental integrity, and as part of a full suite of climate strategies, CCS can potentially achieve carbon reductions to support California achieving its net-zero goal, especially in hard to abate sectors such as cement. However, the future efficacy of CCS in California depends on making sure CO₂ is securely, safely

⁷ <https://ww2.arb.ca.gov/sites/default/files/barcu/board/books/2022/031022/ejacrecs.pdf>

⁸ https://ww2.arb.ca.gov/sites/default/files/2020-10/e3_cn_final_report_oct2020_o.pdf

⁹ <https://ww2.arb.ca.gov/sites/default/files/2022-03/SP22-Model-Results-E3-ppt.pdf>

¹⁰ [http://static1.squarespace.com/static/549885d4e4b0ba0bff5dc695/t/54d7f1e0e4bofo798cee3010/1423438304744/California+Executive+Order+S-3-05+\(June+2005\).pdf](http://static1.squarespace.com/static/549885d4e4b0ba0bff5dc695/t/54d7f1e0e4bofo798cee3010/1423438304744/California+Executive+Order+S-3-05+(June+2005).pdf)

and permanently contained, not used for further fossil fuel production, and that any processes and outcomes address equity and community concerns, particularly for communities that bear a disproportionate burden of climate impacts and harmful air pollution.

It will be critical to include methods and strategies in the Scoping Plan to ensure that local air pollution, at a minimum, is not made worse around the installation of reduction technologies such as carbon capture, or around any CDR technologies. Furthermore, wherever possible, California should seek to *improve* local air quality alongside the deployment of carbon capture technology, alongside stringent air quality regulations and public health protections specifically designed to reduce local air pollutants. This may include ensuring that a robust amount of fuel substitution and/or efficiency technologies are deployed at the site to minimize the amount of on-site pollution occurs before deployment of the CCS technology. In the recent modeling workshop, CARB staff noted that capturing carbon from emissions sources has the potential to reduce the emissions of health-harming co-pollutants at the source.¹¹ EDF urges CARB to advance targeted air quality measures such that these benefits are realized wherever possible – particularly in communities that are overburdened by pollution. Given the potential for persistent and continuing harm to these communities, EDF suggests that CARB not support any new CCS project without direct local community engagement.

Section 5: Additional affordability analysis required

As the Independent Emissions Market Advisory Committee recommended in their 2021 report (pg 11), CARB should conduct an analysis of affordability impacts, specifically with respect to the electricity sector and rural, low-income, and historically overburdened communities. As electricity demand increases alongside economy-wide decarbonization, and more transmission infrastructure is needed to deliver that electricity, it will be essential to ensure that the cost burden is not felt disproportionately by communities and households least able to absorb that cost and who have often enjoyed fewer benefits and more burdens from this economic and energy transition.

Unfortunately, doing this analysis in a way that provides meaningful insights will likely be hampered by the lack of specific policy options presented in the proposed alternative scenarios. As IEMAC noted, “technology outcomes alone do not determine the distribution of costs and benefits to Californians; instead, affordability impacts depend on the policy design. To help understand “who pays,” it needs to be clear which policies are being relied upon to get California to its climate goals.”¹²

Traditionally, affordability in this state is measured by either electric rate or electric bill. Both are imperfect options for this situation. EDF recognizes that major new portions of the economy will be electrified as part of our state’s decarbonization transition. By default, that means that energy usage will increase. The better metric to use in the recommended affordability analysis is “energy burden.” Energy burden measures the percentage of household budget allocated to

¹¹ “2022 Scoping Plan Update – Initial Modeling Results Workshop,” March 16, 2022.

<https://www.youtube.com/watch?v=IVCQ-RpTRM>.

¹² <https://calepa.ca.gov/wp-content/uploads/sites/6/2022/01/2021-IEMAC-Annual-Report.a.pdf>, pg 11.

energy products. For example, consider a household that was paying \$100/week to fill up its family vehicle's traditional gas tank. Switching that vehicle, absent the conversion costs, will mean that the same vehicle will spend far less on a weekly basis on the *substitution* of gas for electricity. While this example family's energy bill will increase, there will be more money available in the budget. (EDF also notes that energy burden can also capture non-energy benefits, such as reduced spend on health care costs from less exposure to local air pollution in aggregate). For these reasons, EDF encourages the Board to consider metrics to measure affordability that align with the policy objectives in the other parts of the Scoping Plan. EDF notes that energy burden may require customer segmentation to ensure that the impacts to the state's most vulnerable populations are not obscured by an "average" customer cost shift. However, the state already has the ability to evaluate economic segments of the population.

In addition to the substitution effects outlined above (which can be captured by energy burden), EDF also encourages the Board to consider the bill impacts on both electric and gas customers during the transition. If the state does not engage in some form of targeted geographic electrification, then only prioritizing low-income households will be insufficient. The goal is to lower total customer revenue requirements by treating electrification as a "non-pipeline" alternative. If there is not some form of geographic electrification targeting, then California will require the same amount of total infrastructure but spread out across fewer customers, meaning that their bills will only go up. The state may need to explore innovative sources of funds to help offset this cost shift, including securitization of existing assets or leveraging non-ratepayer funds to keep bills affordable during the transition. EDF outlined many of these strategies in a 2019 white paper entitled *Managing the Transition*.¹³

Section 6: Cap-and-Trade is central to California's suite of climate policies; take the opportunity for greater ambition

California's cap-and-trade program is a nation-leading policy; **CARB must ensure that the declining limit on greenhouse gas emissions, alongside numerous other essential emission regulations, provide the greatest level of certainty that the state will meet its 2030 greenhouse gas reduction goal** and be on an ambitious path to achieve net-zero greenhouse gas emissions no later than 2045.¹⁴

EDF is pleased that CARB has indicated that it intends to more fully explore the role of cap and trade in California's suite of climate policies. In the February 23, 2022 Senate Budget Subcommittee hearing, CalEPA and CARB leadership indicated they intend to analyze the stringency of the emissions cap in 2023 and report back to the Legislature, as well as consider the role of cap and trade alongside other emission reduction measures. The EJAC recommendations point out the need for "thorough analysis of the cap needed to meet 2030

¹³ See *Managing the Transition: Proactive Solutions for Stranded Asset Gas Risk in California* available online at <http://www.edf.org/strandedassets>

¹⁴ A full discussion of ambition in the cap-and-trade program is included in EDF's July 9, 2021 Scoping Plan comments available here: https://www.arb.ca.gov/lispub/comm2/bccomdisp.php?listname=sp22-kickoff-ws&comment_num=144&virt_num=103

goals.”¹⁵ EDF also supports the intention to explore any necessary modifications to California’s cap-and-trade system to ensure that the state realizes as many emission reductions as possible before 2030, and encourages CARB to undertake this work on as swift of a timeline as possible.

Specifically, EDF recommends that the Scoping Plan and subsequent analysis evaluate the role that the cap-and-trade program can play to fully close the gap between expected abatement from sectoral policies and the emission cuts necessary to achieve cumulative reductions over the next decade consistent with the state goals. In order to function effectively as the backstop, the budget from 2021 to 2030 must be calibrated to ensure that cumulative emissions in California, at a minimum, do not exceed emissions allowed under a linear trajectory from 2020 to 2030 targets, factoring in any previously “banked” allowances that may be retired for compliance in the upcoming years. Moreover, CARB should use the emissions projections developed for all California emissions sources — including sectors outside the cap — to ensure that the allowance budget in the cap-and-trade program is stringent enough to accommodate any potential growth in emissions from uncapped sectors and still secure the cumulative reductions necessary. In other words, if an increase is projected in uncapped sectors even given any existing or likely future complementary policies, the budget should be reduced in order to ensure the capped sectors overperform and reduce additional emissions to accommodate any projected increase in uncapped sectors.

When well-designed, a firm, declining cap on emissions provides the greatest possible certainty of meeting greenhouse gas reduction targets, and this pollution limit, set by the emissions budget for covered sources, is the most essential feature of the cap-and-trade program. The relative role of the cap-and-trade program compared to sector-based policies as the “primary driver” for emission reductions is less important than the role the cap plays in ensuring that emissions do not exceed the allotted budget, and the stringency of the budget itself. The cap should act as the backstop to keep California on track to its climate goals. If other programs help achieve greater reductions than expected then there is less pressure on the cap; but if other programs deliver fewer reductions, the cap remains the state’s “insurance policy” to make sure emissions continue to decline at the pace required.

In line with the recommendations of the Independent Emissions Market Advisory Committee in their 2021 report¹⁶, **EDF encourages CARB to move forward swiftly with a robust analysis of the cap-and-trade program’s role in achieving economy-wide greenhouse gas reduction goals and any necessary design adjustments to provide the greatest possible certainty of achieving those goals.**

Lastly, while a more detailed discussion of cap calibration and design features to enhance program ambition is available in EDF’s July 9, 2021 Scoping Plan comments¹⁷, we do want to highlight the recommendation from the EJAC to explore “no trade zones” as a strategy to reduce

¹⁵ <https://ww2.arb.ca.gov/sites/default/files/barcu/board/books/2022/031022/ejacrecs.pdf> “Cap and Trade”

¹⁶ <https://calepa.ca.gov/wp-content/uploads/sites/6/2022/01/2021-IEMAC-Annual-Report.a.pdf>, pg 7-11.

¹⁷ https://www.arb.ca.gov/lispub/comm2/bccomdisp.php?listname=sp22-kickoff-ws&comment_num=144&virt_num=103

conventional air pollution in overburdened communities alongside the reduction in global climate pollution. In 2021, EDF filed a regulatory petition with the Colorado Air Quality Control Commission which included inflexible, source-specific greenhouse gas pollution limits for facilities that directly contribute to disproportionate pollution burdens.¹⁸ For those sources, the program was designed to limit compliance flexibility such that pollution reductions and health benefits accrue directly in the communities where environmental injustices are most acute. EDF encourages CARB to study these provisions and **consider how further greenhouse gas requirements for specific sources may further improve pollution outcomes from locally harmful pollutants**, including how such provisions could be adapted for the California context and incorporated into the cap-and-trade program.

Thank you for your ongoing work to develop the 2022 Scoping Plan update, and for your consideration of these comments. EDF looks forward to working with your staff through the balance of the Scoping Plan process and additional workshops and rule-makings on these topics.

Sincerely,

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¹⁸https://www.edf.org/sites/default/files/documents/Proposed%20Amendments%20to%20Regulation%202022%20Text%20and%20SBAP_o.pdf