



October 24, 2022

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

Re: Comments on the draft Environmental Analysis of the draft 2022 Climate Change Scoping Plan

Dear Chair Randolph,

On behalf of Environmental Defense Fund (EDF), we appreciate the opportunity to provide comments on the draft Environmental Analysis for the draft 2022 Climate Change Scoping Plan. EDF recognizes and appreciates the significant time and expertise that has gone into this process and these products by California Air Resources Board (CARB) and partner agency staff, consultants, and the Environmental Justice Advisory Committee (EJAC).

As EDF has pointed out previously in the Scoping Plan 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 2030¹. 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.

However, the current draft of the Environmental Analysis indicates that there are still areas for improvement in CARB's approach to the final Scoping Plan, including opportunities for greater climate ambition. State leaders must ensure that California's suite of climate policies not only meet climate goals, but also guarantee that the state's politics will *maximize cuts in emissions in this decade*. CARB should front-load climate ambition so that California can meet or beat the 2030 goal

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.
https://www.ipcc.ch/site/assets/uploads/sites/2/2018/07/SR15_SPM_version_stand_alone_LR.pdf.

and put the state on track to achieve net-zero emissions no later than 2045, alongside an 85% reduction in greenhouse gas emissions below the 1990 level no later than 2045.

There are many opportunities for increased ambition throughout the draft Scoping Plan, as demonstrated in this updated Environmental Analysis. In order to inform the final draft, this set of comments (1) appreciates the removal of assumptions of new natural gas generation; (2) encourages clearer decarbonization goals for electricity generation; (3) identifies opportunities for greater ambition in medium- and heavy-duty transportation; (4) urges clarity and caution on CARB's plans for hydrogen buildout, particularly regarding the need for greater research and safety precautions around hydrogen blending; (5) re-emphasizes that carbon removal is not a substitute for emission reductions from pollution sources; and (6) discusses the role of a cap-and-trade program and rulemaking in achieving California's emission reduction goals.

Assumptions of new natural gas removed

EDF applauds CARB's Scoping Plan modifications to eliminate consideration of new natural gas capacity, rather than the 10 GW of new gas capacity originally proposed in the draft Scoping Plan. Eliminating the assumption of natural gas buildout is important to ensure that California's path toward achieving its emission reduction goals includes transitioning away from fossil fuels.

Clear decarbonization goals for electricity generation are imperative

EDF appreciates that this revised Environmental Analysis emphasizes a "further transition away from fossil fuel-based electricity generation, and toward increased renewable energy resources." It is encouraging that this draft includes a clear goal of 100% zero carbon for retail sales by 2045, and a procurement goal of zero carbon electricity between 2030 and 2045 with an offshore wind target of 20 GW in 2045. EDF recently published a report² jointly with Clean Air Task Force laying out a clear plan for accelerating the clean energy transition in California, providing a template for ambitious and accelerated action. As stated in the report, **scaling zero-emissions electricity is the crucial first step towards transforming California's economy, but achieving this will require a significant - and rapid - investment in clean energy infrastructure.**

However, the targets laid out in the draft Scoping Plan and Environmental Analysis do not address the overall need for a clearly defined goal of zero emissions from electricity *generation* no later than 2045, with direction for planning agencies to establish interim targets and front-loaded actions to measure that progress. This is not only necessary for California to meet its emission reduction requirements; achieving zero emissions by 2045 can be done both affordably and reliably and sending this signal as soon as possible will help create the right market incentives to decarbonize the grid. To achieve the scale and pace of emissions reductions required, EDF urges CARB to swiftly undertake rulemakings with partner entities to ensure greater ambition in the electricity sector. As

² <https://www.catf.us/resource/growing-grid-plan-accelerate-californias-clean-energy-transition/>

summarized in the joint EDF-CATF report³, “the risks of moving too slow have far eclipsed the risks of moving too fast.”

A zero-emission grid by 2045 is necessary to meet climate goals

Reductions from the power sector are not only critical for reaching California’s 2030 and 2045 climate goals, but they also help unlock reductions in other sectors like transportation and buildings by allowing these sectors to increasingly rely on clean electricity. California must achieve a clean grid to achieve any of its climate targets, including in the buildings and transportation sectors, which means zero-emission generation in addition to zero-emission sales as mandated under SB 100. At the same time, **CARB needs to set ambitious interim targets to ensure that the state is maximizing the emission reduction opportunity from the electricity sector in the current decade.** For instance, we encourage CARB to explore a target of reducing power sector emissions to 30MMT CO2 no later than 2030.

Clearly setting a 2045 zero-emission goal coupled with aggressive interim goals is essential as the state seeks to build a significant amount of needed electricity infrastructure in the coming years. In prior Scoping Plans, CARB established an overall target for emission reductions in the electricity sector and then the state’s integrated resource planning (IRP) process determined the right mix of electric generation to achieve that target. The draft 2022 Scoping Plan and accompanying Environmental Analysis draft falls short of setting clear electricity generation goals for the IRP process to follow, which is especially problematic as California needs to be making record-breaking clean energy investments.

It is also timely for CARB to clearly set this 2045 goal alongside interim goals because it takes a significant amount of lead time and extensive planning to build electricity infrastructure. Determining the necessary new transmission capacity, permitting, and land use requirements for new generation can be a lengthy but necessary process. As such, **clearly articulating as soon as possible the need and expectation of achieving zero-carbon electricity generation no later than 2045 will support the necessary long-term planning.** Early investments in additional clean and renewable resources are lower risk and lower cost than investments in additional GHG-emitting resources or even later investments in clean resources. By clearly articulating a 2045 target for decarbonizing electricity generation, the draft Plan will help put California on track to meet its climate goals.

There is opportunity for more ambition from medium- and heavy-duty transportation

The 2022 Scoping Plan is a significant opportunity for California to reassess its methods for reducing climate and air pollution from the transportation sector. To achieve the state’s goal of

³ <https://cdn.catf.us/wp-content/uploads/2022/10/11081420/growing-grid-plan-accelerate-californias-clean-energy-transition.pdf>

100% zero-emission medium- and heavy-duty vehicles on the road by 2045 everywhere feasible^{4,5}, and to chart an equity-focused path toward achieving net-zero greenhouse gas emissions, **the 2022 Scoping Plan must rapidly eliminate emissions from the transportation sector, including by planning for 100% zero-emission medium- and heavy duty (MHD) vehicle sales by 2036, rather than by 2040.** Accelerating the ambition of this goal would generate \$2.7 billion in additional health care savings by 2050⁶, cut 24 million metric tons of climate pollution, and put 133,000 ZEV trucks on the road in 2050.

Accelerating the 100 percent ZEV sales requirement to 2036 instead of 2040 is both achievable and necessary⁷. Doing so will move California closer to achieving the Governor's Executive Order and the Board Resolution requiring all on-road MHDVs to be zero-emission by 2045. This acceleration of the sales requirement would also have significant cumulative net societal benefits, which are projected to jump by \$9.9 billion by 2050 as a result of improved air quality, fleet savings, higher utility net revenue, and reduced greenhouse gases. The accelerated target of 2036 would reduce cumulative emissions through 2050 of GHGs by 24 million metric tons (MT), NOx by over 30,000 MT, and PM2.5 by 1,040 MT⁸.

While enhancing health and climate benefits are critical reasons for strengthening the MHD ZEV provisions in the draft Scoping Plan, ZEV regulations are also good for the economy. CARB has estimated the ACT will yield almost \$6 billion in direct savings for the trucking industry -- these economic benefits were corroborated by Energy Innovation analysis⁹. These direct savings accrue mostly from lower fueling and maintenance costs due to the switch away from fossil fuel-powered engines, with total cost of ownership savings more than compensating for higher upfront vehicle and infrastructure costs.

Installing electric truck charging infrastructure will also put thousands of people to work in the early years of the rule and support local ZEV manufacturers¹⁰. These direct economic benefits are in addition to indirect economic benefits of nearly \$9 billion in California from 2020 through 2040 related to avoided health impacts, according to CARB staff's analysis¹¹.

⁴ California Air Resources Board, Draft 2022 Scoping Plan Update. <https://www.gov.ca.gov/wp-content/uploads/2020/09/9.23.20-EO-N-79-20-Climate.pdf>

⁵ Office of the Governor, Executive Order N-79-20, September 23 2020. <https://www.gov.ca.gov/wp-content/uploads/2020/09/9.23.20-EO-N-79-20-Climate.pdf>

⁶ https://www.nrdc.org/sites/default/files/media-uploads/california_clean_trucks_program.pdf

⁷ <https://www.catf.us/resource/growing-grid-plan-accelerate-californias-clean-energy-transition/>

⁸ Ibid

⁹ Energy Innovation, "Clean Trucks, Big Bucks" June 2020, page 17. https://energyinnovation.org/wp-content/uploads/2020/06/Clean-Trucks-Big-Bucks_June_17_2020.pdf

¹⁰ Environmental Defense Fund, Medium and Heavy Duty Zero Emissions Vehicle Supply Chain Analysis, June 2021. https://business.edf.org/files/National-Profile-6.29.pdf?_gl=1*1rook2d*_ga*MTg1MDEyMjY0Ni4xNjMxNTY5OTE3*_ga_2B3856Y9QW*MTY1NTI0MzUzMS4zMS4xLjE2NTUyNDM3NDguNTk.*_ga_WE3BPRQKW0*MTY1NTI0MzUzMS45NS4xLjE2NTUyNDM3NDguNTk.*_ga_Q5CTTQBJD8*MTY1NTI0MzUzMS4zMS4xLjE2NTUyNDM3NDguNTk

¹¹ California Air Resources Board, Updated Costs and Benefits Analysis for the Proposed Advanced Clean Trucks Regulation, 2019, page 7. <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2019/act2019/30dayattc.pdf>

EDF appreciates the emphasis in the draft Scoping Plan and Environmental Analysis on transportation -- especially its focus on ZEVs and interagency coordination. California is carving a pathway that is unique, but its success depends on CARB's commitment to clean and cost-saving MHD ZEV trucks and an acceleration of the 100 percent ZEV sales requirement to 2036.

Hydrogen is a potential climate solution in hard-to-decarbonize sectors - but only if leaks are accounted for and prevented and the safety of hydrogen blending is more fully understood

The draft Scoping Plan and this most recent Environmental Analysis show that CARB intends to rely on a significant increase in hydrogen production and deployment, which has the potential to be an important climate strategy. **Scaling up the use of hydrogen to decarbonize heavy-duty transportation, aviation, shipping, or certain industrial applications requires careful consideration of hydrogen's environmental and climate impacts**, which recent EDF research finds have historically been underestimated¹².

There is emerging consensus among the scientific community on **hydrogen's warming impact as a powerful short-lived indirect greenhouse gas, which can leak easily at various stages of the supply chain**. Specifically, it is over 30 times more potent than an equal amount of carbon dioxide emissions over a 20-year period, which is three times higher than its impact over a 100 year period. Hydrogen should be measured, including in modeling underpinning the draft Scoping Plan, using both a global warming potential (GWP) 20 and GWP100 in order to accurately capture the impact of hydrogen emissions (including leakage and venting) in the near- and long-term. When considering near-term climate impacts, EDF research shows that climate benefits from hydrogen usage can be severely diminished for moderate to high leakage rates (around 5 to 10%)¹³. **Minimizing or eliminating hydrogen leakage is absolutely critical to the success of hydrogen as part of the solution to climate change.**

Not all hydrogen is green nor a climate solution

It is concerning that in this most recent Environmental Analysis draft, there is an emphasis on "renewable hydrogen" being blended with natural gas in existing pipelines. The lack of clear definition of what is considered "renewable" hydrogen is a critical issue, since the generation of hydrogen - whether by electrolysis, fossil fuels, or other feedstocks - is crucial to its climate benefit or harm. As EDF laid out in our June 2022 comments on the draft Scoping Plan, there is insufficient clarity on what kind of hydrogen production California plans to pursue. This has an enormous impact on the projected environmental impact of hydrogen, and further clarity is essential. **Because the climate impacts of hydrogen generated by fossil power are potentially significant, this type of hydrogen production should not be considered a climate solution in the Scoping Plan.**

¹²Ocko, I. B. and Hamburg, S. P.: Climate consequences of hydrogen emissions, Atmos. Chem. Phys., 22, 9349–9368, <https://doi.org/10.5194/acp-22-9349-2022>, 2022.

¹³ Ibid.

Hydrogen produced through feedstocks, even when paired with CCS, has climate impacts additional to the leakage of hydrogen itself. 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 can also be released at significant levels in addition to hydrogen emissions, contributing to the overall climate warming effects of fossil fuel-based hydrogen.

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 hydrogen assessments, and methane is a powerful greenhouse gas with high global warming potential. As stated in the draft Scoping Plan, "hydrogen can be produced through electrolysis with renewable electricity or through steam methane reformation of renewable or fossil gas. If steam methane reformation is paired with CCS, the hydrogen produced could potentially be zero carbon¹⁴." This language is not sufficiently stringent to ensure that any hydrogen produced is zero carbon, and it does not address the issue of methane leakage which is critical to prevent 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. To that end, **EDF suggests that the final Scoping Plan and Environmental Analysis only assume hydrogen from renewable energy generation.**

Moreover, the Scoping Plan and the accompanying Environmental Analysis should consider upstream emissions associated with renewable electrolysis. For example, an electrolyzer powered by the average U.S. electricity grid mix would register a carbon intensity as high as 20 kgCO₂e/kgH₂ – nearly double the carbon intensity of today's incumbent and unmitigated gas-based hydrogen production pathway.¹⁵ California must ensure that renewable hydrogen truly comes from renewable resources upstream.

This renewable electricity accounting can take different forms, including a direct connection to renewable generation or through bundled RECs. Regardless of method, several principles must be met: the carbon-free electricity claimed by electrolyzer operators should be *additional*, or incremental, to the system as a whole (i.e., to avoid redirecting existing clean energy resources); it should be located in the same region or load balancing authority as the electrolyzer; and it should have an element of temporal matching (i.e., to ensure the level of marginal grid emissions are roughly comparable).

Hydrogen has potential only in hard-to-decarbonize sectors

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**

¹⁴ California Air Resources Board, Draft 2022 Scoping Plan Update, pg 69.
<https://ww2.arb.ca.gov/sites/default/files/2022-05/2022-draft-sp.pdf>

¹⁵ Decarbonized Hydrogen in the US Power and Industrial Sectors: Identifying and Incentivizing Opportunities to Lower Emissions, December 2020,
<https://www.rff.org/publications/reports/decarbonizing-hydrogen-us-power-and-industrial-sectors/>

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.

Unfortunately, the draft Scoping Plan also expects to deploy hydrogen in light-duty passenger vehicles. **Research shows that using green hydrogen in passenger vehicles would require much greater quantities of renewable energy - perhaps as much as 2 to 5 times as much renewable energy - than direct electrification of light duty transportation**¹⁶. This “energy penalty” is even more significant for home heating. It is far more efficient to use renewable energy to electrify vehicles and heat homes than to use renewable energy to produce hydrogen.

Further research is needed on hydrogen blending with natural gas

This Environmental Analysis also indicates that renewable hydrogen will be blended in natural gas pipelines at a level of 7% energy (20% by volume), a level set to increase between 2030 and 2040. This raises concerns about infrastructural safety, end-use efficiency, and overall climate benefit. Research has shown that the climate benefit of pursuing a hydrogen-natural gas blend of this ratio is marginal (<10%) even if the leakage rate is low (1%). A leak rate higher than this level would further undercut the climate benefit, with blue hydrogen blending (generated by fossil fuels, including natural gas) adding hardly any climate benefit at all. In fact, **blending blue hydrogen with natural gas will end up using a higher total amount of natural gas, since energy is lost to produce the hydrogen in the first place.**

There are at least three major reports which address the issue of safety in blending hydrogen with natural gas, considering pipeline and infrastructure integrity and compatibility with end-use technology. An NREL study (2013) claimed 20% is a safe threshold (which is most commonly accepted), a UC Riverside study (2022) says only 5% is safe for system-wide blending, and a report by Fraunhofer Institute (2022) says there is no established limit value for hydrogen when blending, and that it depends on a case-by-case basis. There are concerns that hydrogen can cause or accelerate embrittlement in steel pipelines and compromise the integrity of polymeric materials. Compatibility with end-use appliances like cooktop burners and heating furnaces are also of concern at higher percentage blends. **Much more research is needed into the health and climate risks of blending hydrogen and natural gas, including into the viability of using existing natural gas pipelines to contain a molecule as small and ‘slippery’ as hydrogen.**

As the 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

¹⁶Morris, James: Why Are We Still Talking About Hydrogen? Forbes, 2021:
<https://www.forbes.com/sites/jamesmorris/2021/02/06/why-are-we-still-talking-about-hydrogen/?sh=63c3c8e37f04>

leading technology to catch and prevent any leakage, rely only on renewable generation, be applied only for hard-to-decarbonize end uses, and with stringent measures in place to account for and prevent the leakage risk not only of hydrogen itself.

Greenhouse gas removal strategies are not a substitute for emission reductions

To achieve economy-wide net-zero greenhouse gas emissions by 2045 alongside 85% emission reductions below the 1990 level, 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. 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 carbon dioxide removal technologies, while also capitalizing on the potentially significant opportunities for nature-based climate solutions to achieve some of the necessary carbon dioxide removal. CARB recognizes this reality in the incorporation of new goals for carbon removal of 20 MMT in 2030 and 100 MMT in 2045, while prioritizing the role of natural and working lands to achieve these goals.¹⁷

Critically, the carbon dioxide removal (CDR) measures used to achieve these goals should not be a substitute for reducing emissions directly from the pollution source. In September, Governor Newsom signed the California Climate Crisis Act (AB 1279, Muratsuchi) into law – codifying the state’s goal to reach net-zero greenhouse gas emissions by 2045, while committing to cut emissions from pollution sources at least 85% below the 1990 level by 2045. These ambitious targets demonstrate that emission reductions from pollution sources 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. **Within the timeframe allowed, we encourage CARB in the final Scoping Plan to chart a pathway to achieving the state’s new goal of reducing emissions 85% by 2045.**

Carbon capture and sequestration is likely necessary, but requires robust 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 carbon dioxide is securely, safely 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.

With the passage of SB 905 (Caballero and Skinner), California has established a framework to enable the deployment of carbon capture technology to reduce emissions from stationary sources,

¹⁷ See Recirculated Draft Environmental Analysis, pg. 11. <https://ww2.arb.ca.gov/sites/default/files/2022-09/2022-draft-sp-appendix-b-draft-ea-recirc.pdf>

with the inclusion of essential community protections and environmental integrity provisions. As such, **it is critical for the Scoping Plan to propose concrete steps to realize potential benefits and ensure communities will not experience persistent or worsened air pollution as a result of CCS deployment.** The draft Scoping Plan notes that capturing carbon from emissions sources has the potential to reduce the emissions of health-harming co-pollutants.¹⁸ At the same time, the draft recognizes the need to understand and address potential air quality impacts resulting from carbon capture deployment. **We appreciate that “the public safety evaluation has been reassessed and expanded for carbon dioxide pipelines associated with potential atmospheric mechanical carbon dioxide removal projects and carbon capture and storage projects.”**¹⁹ In addition to this evaluation, **CARB should advance targeted air quality measures that ensure CCS does not worsen local air pollution and that air quality improvements are realized wherever possible – particularly in communities that are overburdened by pollution.** 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 occurring before deployment of the CCS technology. Given the potential for persistent and continuing harm to these communities, EDF suggests that CARB not support any new CCS project without meaningful local community engagement.

While CCS has potential to mitigate carbon emissions in hard-to-abate sectors of the economy, it should not be deployed to expand fossil fuel production or to slow the market transition away from fossil fuels. 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. The draft Plan assumes carbon capture deployment on 40% of cement production by 2035 and 100% by 2045. However, **the modeled role of CCS at petroleum refineries—which the Recirculated Draft Environmental Analysis appears to continue assuming²⁰—raises significant concerns that surrounding communities will experience persistent local air pollution burdens for decades to come. CCS should not be a tool to prolong fossil fuel production in California.** To that end, the Scoping Plan should not assume CCS deployment at refineries. Finally, we request that CARB make clear the assumed carbon capture rate in the draft Plan to enable a full evaluation of the proposed role of CCS.

Cap-and-trade can close the emissions gap - if calibrated correctly to ensure climate ambition

EDF is very pleased that CARB intends to undertake a comprehensive rulemaking on California’s cap-and-trade program in 2023. **EDF urges CARB to initiate this rulemaking quickly – ideally Q1 2023 – and to ensure that the ambition of the program matches the necessary increase in ambition required to meet California’s net zero and emissions reductions goals.**

¹⁸ California Air Resources Board, Draft 2022 Scoping Plan Update, pg. 70. <https://ww2.arb.ca.gov/sites/default/files/2022-05/2022-draft-sp.pdf>

¹⁹ Recirculated Draft Environmental Analysis, pg. 1. <https://ww2.arb.ca.gov/sites/default/files/2022-09/2022-draft-sp-appendix-b-draft-ea-recirc.pdf>

²⁰ Recirculated Draft Environmental Analysis, pg. 17. <https://ww2.arb.ca.gov/sites/default/files/2022-09/2022-draft-sp-appendix-b-draft-ea-recirc.pdf>

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 and 85% emission reductions below the 1990 level no later than 2045²¹. As CARB undertakes the rulemaking process, there are several key areas that EDF recommends focusing on.

Using cap and trade to close the emissions gap

In previous comments, EDF recommended that the Scoping Plan and subsequent analyses 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's goals²². The draft Scoping Plan begins to address this issue by anticipating that the cap-and-trade program will "likely play a reduced role" in meeting California's climate goals because of the adoption of additional policies reducing those same greenhouse gas emissions. Specifically, CARB estimates an "approximate 27 percent reduction in the role of the Cap-and-Trade Program in 2030 compared to what was included in the 2017 Scoping Plan update without any consideration of the uncertainty factor²³."

The fact that California has enacted more sectoral policies to cut climate pollution is a promising sign of further action on climate change. At the same time, the draft Scoping Plan notes that estimated abatement from non-cap-and-trade policies is subject to uncertainty factors (such as the rate of deployment of clean technologies and fuels) that may impact their ability to achieve anticipated greenhouse gas emission reductions, and references a forthcoming analysis to quantify such factors. **This uncertainty is exactly what makes the emissions cap so critical to the success of California's climate goals; the best way to mitigate uncertainty is with a firm, declining cap on emissions which is in line with the state's emissions targets.**

Emissions cap must be aligned with 2030 emission reduction goal

It is not inherently a problem if the cap-and-trade program plays a smaller role in achieving greenhouse gas reduction goals. The more important question is whether or not the cap, the most important part of the cap-and-trade program, is calibrated correctly to achieve the goal. When well-designed, a firm, declining cap on emissions provides the greatest possible certainty of meeting greenhouse gas reduction targets. **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

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

²² 3 Environmental Defense Fund, April 4, 2022 Scoping Plan modeling results comments. <https://www.arb.ca.gov/lists/com-attach/47-sp22-modelresults-ws-B3RdOFc5BCdSPQhm.pdf>

²³ California Air Resources Board, Draft 2022 Scoping Plan Update, pg 91. <https://ww2.arb.ca.gov/sites/default/files/2022-05/2022-draft-sp.pdf>

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.

To function effectively as the backstop, the budget for this decade 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 emissions from uncapped sectors (including potential growth in emissions) and still secure the cumulative reductions necessary. In other words, if uncapped sectors are not projected to “proportionally” reduce emissions in line with the cap under current business-as-usual assumptions, the cap-and-trade program budget should be reduced in order to ensure the capped sectors overperform sufficient for statewide emissions to meet targets.

Consider opportunities to update cap-and-trade program design

Both the Independent Emissions Market Advisory Committee²⁴ and the Environmental Justice Advisory Committee²⁵ have made numerous recommendations on the design of the cap-and-trade program. EDF appreciates these recommendations and engagement with CARB staff, and **urges consideration of these recommendations and other potential updates in the forthcoming rule-making.**

Specifically, EDF encourages CARB to explore and consider the emission, environmental justice, and market impacts of 1) the establishment of an emissions containment reserve to ensure the supply of allowances is more responsive to the demand for allowances as the existing price tiers already are; 2) creation of facility-level emission caps on stationary sources in the most overburdened communities to ensure that local air pollution benefits are realized alongside climate benefits; and 3) additional steps or program adjustments – if any – that may be beneficial to facilitate potential future linkage with Washington State’s nascent cap-and-invest program and expansion of California’s climate leadership. While these are key priorities, EDF will submit further, comprehensive comments on the cap-and-trade rulemaking at the first germane opportunity.

Rulemaking is necessary to ensure sufficient ambition in cap and trade

While EDF recognizes that the Scoping Plan is not the venue for actually making adjustments to the emissions cap, the draft Plan should clearly articulate an intention to examine the stringency of the

²⁴ 2021 Independent Emissions Market Advisory Committee Annual Report: <https://calepa.ca.gov/2021-iemac-annual-report/>

²⁵ Environmental Justice Advisory Committee 2022 Scoping Plan Recommendations <https://ww2.arb.ca.gov/sites/default/files/barcu/board/books/2022/090122/finalejacrecs.pdf>

emissions cap in a formal rulemaking proceeding as soon as possible. EDF recommends that this rule-making process commence no later than Q1 2023 with any regulatory changes to be implemented by January 1, 2024. Any delay makes it more challenging to change course - in policy or compliance - as needed before 2030.

EDF again commends the staff of CARB and partner agencies on the significant amount of work that has gone into the Scoping Plan process, including this Environmental Analysis, over the past year. This process, and the final product, will be an example of California's climate leadership, and EDF strongly encourages CARB to increase the ambition of the final product to match the leadership this climate moment requires. EDF also recognizes that a significant amount of regulatory work is yet to come - both at CARB and at partner agencies. **Given the urgency of accelerating climate change, and this detailed pathway toward climate goals, CARB and its partners should move diligently through rule-making processes to ensure the climate, health, and economic benefits illustrated in this Scoping Plan are quickly realized.** EDF looks forward to continued engagement with CARB staff through these many upcoming processes.

Sincerely,

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Katelyn Roedner Sutter
California State Director