



July 9, 2021

Ms. Rajinder Sahota
Deputy Executive Officer, Climate Change & Research
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Submitted electronically

Re: EDF Comments on the 2022 Scoping Plan Update

Dear Ms. Sahota,

Environmental Defense Fund appreciates the opportunity to provide comments to inform California's 2022 Climate Change Scoping Plan update, and the California Air Resources Board's consideration of these comments as well as the supporting research and analysis. EDF commends the leadership of CARB through this process and we appreciate CARB and all of the collaborating agencies and commissions for their abundant work preparing for this update.

EDF looks forward to working with CARB throughout the Scoping Plan process and in accompanying rule-makings to achieve swift, direct emission reductions and equitable processes and outcomes for all Californians.

Sincerely,

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Introduction and overarching themes for the 2022 Scoping Plan

The Scoping Plan presents not only an opportunity to critically examine existing climate policies, but also strategically consider new policies and program updates that may be required for the state to achieve its greenhouse gas reduction goals on the timeline science demands and in a way that advances environmental justice. The Scoping Plan is a model of comprehensive climate planning and is required per the Global Warming Solutions Act of 2006 (AB 32) to “achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions”¹ and per the 2016 adoption of SB 32 to “ensure that statewide greenhouse gas emissions are reduced to at least 40 percent below the statewide greenhouse gas emissions limit no later than December 31, 2030.”²

The comments below first address economy-wide emission reduction strategies, subsequently discuss sector-specific strategies, and close with comments on a high-road transition for fossil fuel workers. The comments include recommendations of analysis CARB should undertake to inform the final Scoping Plan scenario as well as recommendations regarding the role of specific policies and level of ambition. EDF’s key recommendations include:

- CARB should conduct an analysis of the cap-and-trade allowance budget, and undertake a rule-making as quickly as possible, to increase the stringency of the program and maximize the cumulative emission reductions before 2030. A more stringent cap-and-trade allowance budget should be included in the final Scoping Plan scenario.
- The Scoping Plan and any subsequent rule-makings should include provisions for preventing an increase in local air pollution from carbon removal or carbon reduction technologies and ensuring strict standards of environmental integrity of carbon storage projects.
- Using California’s progress toward a fully decarbonized electric grid as a platform, the final Scoping Plan scenario should include targets to decarbonize the electricity grid as quickly as possible. The final scenario should also include strategies to incentivize the in-state deployment of clean firm power resources.
- The final Scoping Plan scenario should include a zero-emission baseline for new building construction, as well as strategies to decarbonize existing buildings. The Scoping Plan should also consider how to avoid inequitable outcomes and shareholder risk from stranded assets as it decarbonizes existing buildings.
- The Scoping Plan should employ strategies that swiftly transition the vehicle fleet to zero-emission vehicles.
- CARB should support efforts to enhance forest inventory data, which can then bolster additional research and analysis of the most promising forest resilience, restoration, and growth techniques. The final Scoping Plan scenario should include strategies to protect existing carbon stores and increase forest resilience so California’s forests do not become a net source of greenhouse gas emissions.

¹ Cal. Health & Safety Code § 38561.

² Cal. Health & Safety Code § 38566.

- The Scoping Plan should include principles to support a high road transition for fossil fuel workers and their communities to ensure that the clean energy industry is diverse, provides family-sustaining jobs and strong labor protections, is accessible to all and that ultimately fossil fuel workers and communities have the tools and resources to determine their own futures.

In seeking these and other outcomes discussed further below, the following four goals should underpin every aspect of this Scoping Plan update.

#1. Frontload climate ambition to maximize greenhouse gas emission reductions in the current decade.

This decade is a critical time for California, and the world, to dramatically slash greenhouse gas emissions. Since the last Scoping Plan update in 2017, the Intergovernmental Panel on Climate Change (IPCC) has released a special climate report detailing threatening realities: that human activities have already caused approximately 1.0°C of warming above pre-industrial levels and that **the world could reach 1.5°C warming as early as 2030.**³ Thus, the IPCC calls for “rapid and far-reaching transitions” across all sectors in order to reduce cumulative emissions and limit global warming to 1.5°C, to minimize the risks and harmful impacts of climate change on current and future generations. Here in California, we are already seeing these impacts — historic wildfires, drought, extreme heat, sea level rise, coastal flooding and erosion, and more — each with devastating environmental, health, and economic impacts.⁴ California already has many of the tools and certainly the opportunity to increase ambition, right now, in addressing climate change. **California’s suite of climate policies must — at minimum — be calibrated to achieve emission reductions consistent with a persistent linear trajectory toward the 2030 and 2045 goals, while minimizing the state’s cumulative greenhouse gas emissions to the extent practicable.**

The key metric for evaluating the efficacy of a regulatory framework to tackle climate pollution is the level of cumulative reductions over time: the sooner California cuts emissions, the greater the cumulative reductions — and the easier it becomes to ensure California is on a reduction trajectory consistent with the state’s climate targets.

Acting now to reduce greenhouse gas emissions has both near- and long-term benefits. For example, reducing emissions of short-lived climate pollutants (e.g. methane) – which govern *the rate* of warming – is crucial for slowing the pace of warming and limiting associated damages. On the other hand, reducing emissions of long-lived climate pollutants (e.g. carbon dioxide) – which govern *the maximum extent* of warming – is crucial for limiting the overall amount of warming we experience in the long-term. This is because long-lived climate pollutants can last for centuries in the atmosphere,⁵ thus committing us to

³ 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.

⁴ California Department of Justice Office of the Attorney General, Climate Change Impacts in California, <https://oag.ca.gov/environment/impact>.

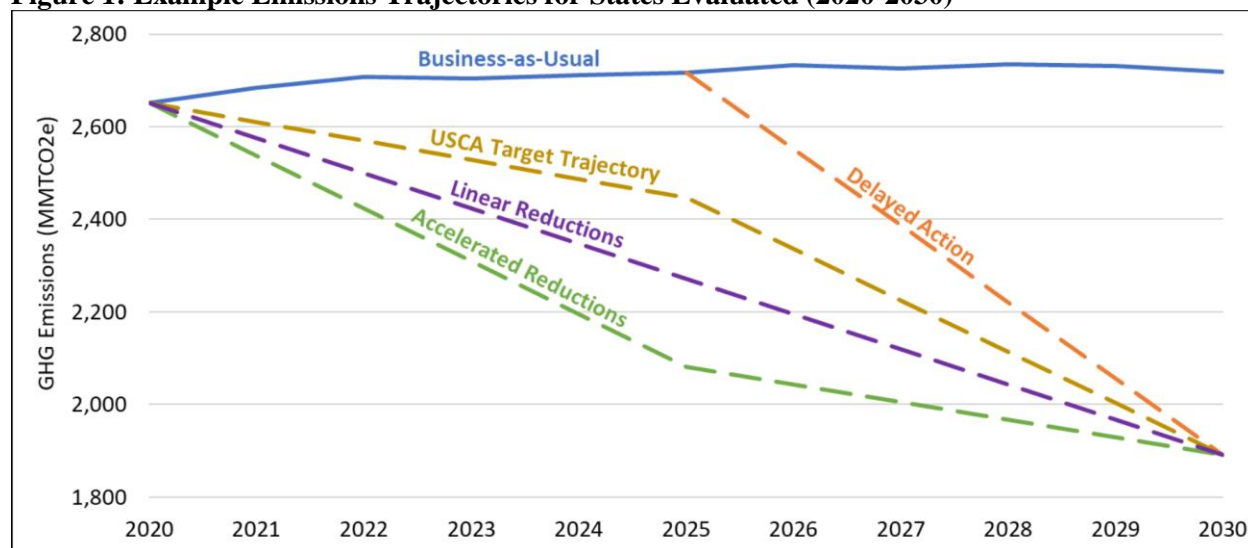
⁵ Myhre, G., D. Shindell, F.-M. Bréon, W. Collins, J. Fuglestad, J. Huang, D. Koch, J.-F. Lamarque, D. Lee, B. Mendoza, T. Nakajima, A. Robock, G. Stephens, T. Takemura and H. Zhang, 2013, Anthropogenic and Natural Radiative Forcing. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the

warming for generations to come. Therefore, as California continues to emit carbon dioxide into the atmosphere over the next decade, and even over the next few years, the warming effect of those gases will only exacerbate the climate devastation already impacting Californians.⁶

While annual emissions of short-lived climate pollutants generally dictate their climate impact, the amount of long-lived climate pollutants emitted in any single year is less important than the overall amount emitted over the upcoming decades. Therefore, we must ensure that total reductions in carbon dioxide over time are consistent with assessments of carbon dioxide budgets that estimate the cumulative amount of carbon dioxide that can be emitted while staying below a particular temperature target.⁷

Importantly, the legislature codified California's targets and timelines to reflect an emissions pathway consistent with carbon dioxide budgets identified by the Intergovernmental Panel on Climate Change (IPCC) to limit global warming to 1.5°C.⁸ To minimize the damages from cumulative emissions, it is not enough to achieve a certain emissions level by 2030 or 2045 if most of the reductions take place in the final few years leading up to the deadline and far greater total quantities of greenhouse gases are emitted as a result. California's 2030 target should be used to establish an immediate and persistent reduction trajectory that delineates the cumulative emissions allowable over the decade. It is critical to create a reduction trajectory consistent with the carbon dioxide budget from which this target was derived.

Figure 1: Example Emissions Trajectories for States Evaluated (2020-2030)



To illustrate how the pace of emission reductions will affect the total pollution emitted in the atmosphere over the next decade, EDF constructed and compared four illustrative emissions trajectories using

Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter08_FINAL.pdf.

⁶ Continuing to emit carbon dioxide will continue to exacerbate damages unless we scale up removal mechanisms.

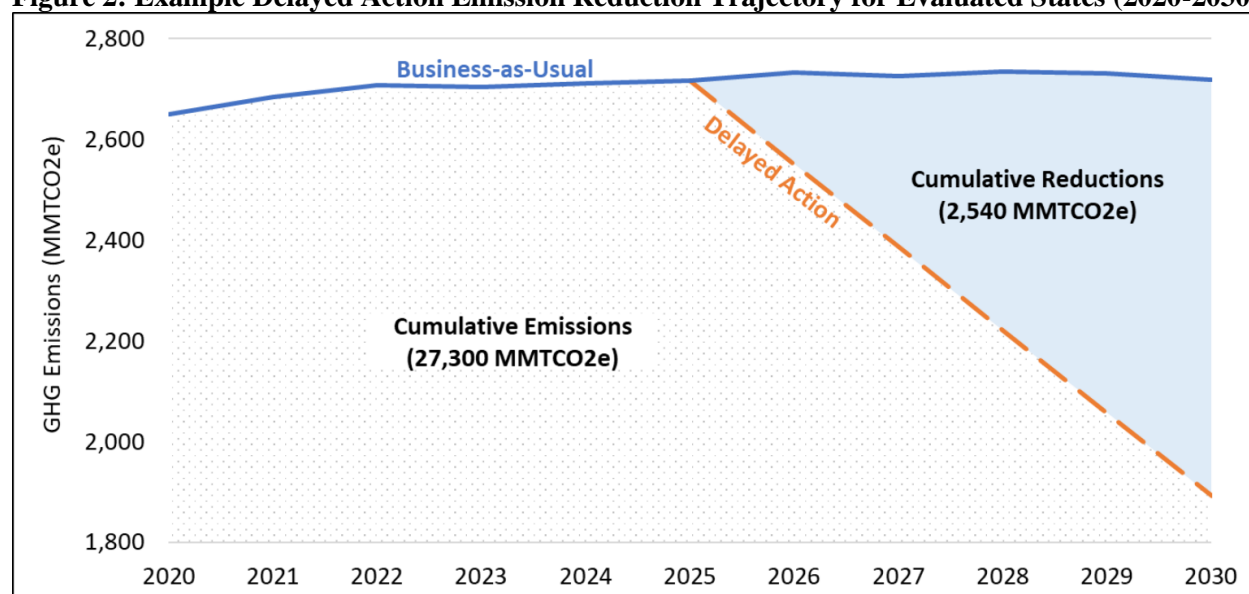
⁷ For more information about carbon dioxide budgets, refer to IPCC, 2018, Global warming of 1.5°C: An IPCC Special Report, https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_High_Res.pdf.

⁸ IPCC, 2018, Global warming of 1.5°C: An IPCC Special Report, https://www.ipcc.ch/site/assets/uploads/sites/2/2018/07/SR15_SPM_version_stand_alone_LR.pdf.

Rhodium Group’s U.S. Climate Service data.⁹ Figure 1 above outlines example trajectories that the states we analyzed¹⁰ could collectively take while achieving the annual emissions target for 2030, derived from the IPCC average pathway for 1.5°C. These trajectories include one that delays action until 2025, one where emissions decline linearly from 2020 to meet the 2025 U.S. Climate Alliance target, one where emissions decline linearly from 2020 to the 2030 target, and one where reductions are accelerated with most of the decline taking place in the first five years. **While all of these pathways result in the same quantity of emissions in 2030, they differ significantly in the amount of pollution actually entering the atmosphere over the decade.**

Figure 2 and Figure 3 below underscore the profound implications for total greenhouse gas pollution. The area in the charts beneath the emission reduction trajectory shows the cumulative quantity of emissions entering the atmosphere from the states, while the area between the reduction trajectory and the BAU trajectory indicates the cumulative quantity of emissions reduced. Both trajectories have the same emissions in 2030, but the **accelerated reduction trajectory prevents twice as much pollution from entering the atmosphere over the course of the decade.** This is an example of how crucial the reduction pathway is toward a point-in-time target (e.g. 40% below 1990 levels in 2030); different reduction trajectories can generate significantly different levels of cumulative emissions and hence dramatically different climate change impacts.

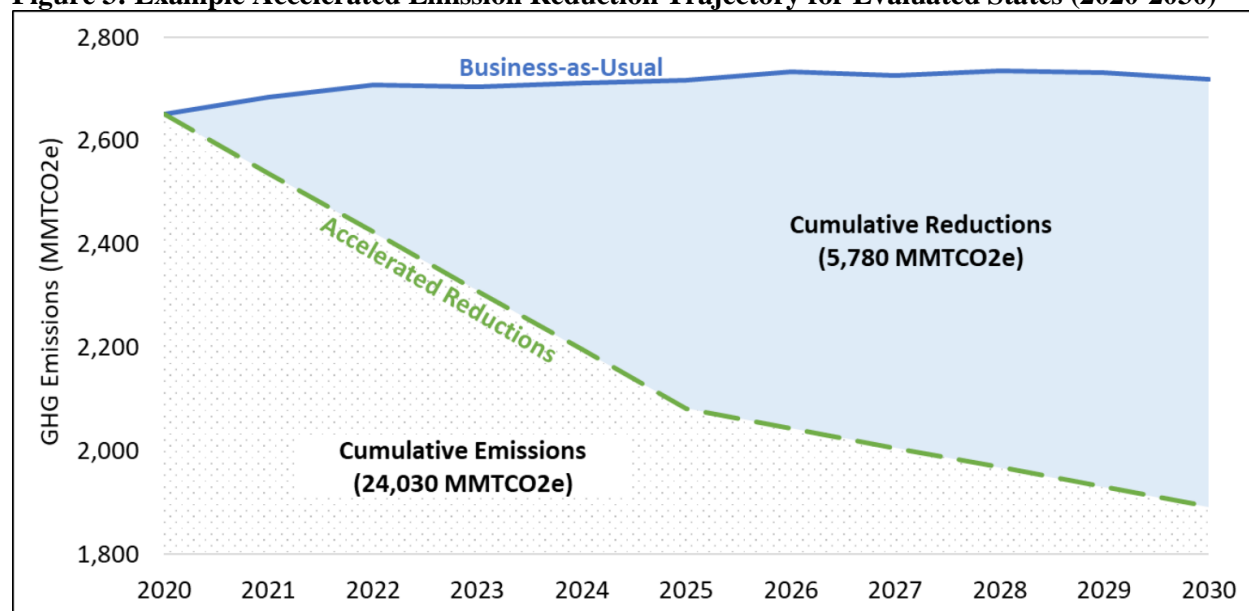
Figure 2: Example Delayed Action Emission Reduction Trajectory for Evaluated States (2020-2030)



⁹ Environmental Defense Fund, 2020, Turning Climate Commitments into Results: Progress on State-led Climate Action, https://www.edf.org/sites/default/files/documents/FINAL_State%20Emission%20Gap%20Analysis.pdf.

¹⁰ EDF analysis evaluated 26 states, including California, that have committed to achieving economy-wide GHG emission reductions in line with the U.S. 2025 commitment under the Paris Agreement — 26 to 28% below 2005 levels by 2025. For more detail, see Turning Climate Commitments into Results.

Figure 3: Example Accelerated Emission Reduction Trajectory for Evaluated States (2020-2030)



Avoiding the worst impacts of climate change will require securing as many reductions as possible as early as possible to stay within the estimated carbon budgets. **CARB must act quickly to calibrate California’s suite of policies with a consistent and persistent downward trajectory over the course of this decade that aligns with estimated carbon budgets.**

#2. Ensure greenhouse gas removal strategies are not a substitute for emission reductions.

To achieve economy-wide net-zero greenhouse gas emissions by 2045, California needs to sharply reduce emissions from all sectors. But 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. But these measures are not a substitute for reducing emissions directly from the pollution source.

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 carbon dioxide removal strategies accounting for the remaining 8-20% of emissions to achieve net-zero emissions.¹¹ 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.

¹¹ Refer to: Energy and Environmental Economics, 2020, Achieving Carbon Neutrality in California, pp. 4-5, https://ww2.arb.ca.gov/sites/default/files/2020-10/e3_cn_final_report_oct2020_0.pdf.

#3. Pair certainty in economy-wide emissions outcomes with sectoral policies that promote targeted benefits.

EDF appreciates that the 2017 Scoping Plan clearly established the role of the cap-and-trade program as a backstop to ensure certainty in achieving statewide emission reduction goals, alongside a variety of sectoral policies and technologies projected to reduce greenhouse gas emissions and drive other key priorities. For the 2022 Scoping Plan, EDF urges CARB to build on that precedent and take a holistic approach in considering economy-wide and sectoral measures. Sector-specific policies in particular can be used to help incubate new technologies and methodologies and prepare the broader system for deep decarbonization. Affirming the role of strong economy-wide emission limits through the cap-and-trade program — while mobilizing targeted sectoral policies — is the model approach to a holistic and successful climate policy framework.

In addition to considering economy-wide and sector-specific policies comprehensively, CARB should ensure that the final Scoping Plan scenario includes careful and thoughtful estimates and evaluation of the abatement potential of sector-specific policies, as it did in the 2017 Scoping Plan. First, consideration of sectoral policies should not be limited to those with high near-term abatement potential; long-term abatement must also be valued. Second, the Scoping Plan should clearly differentiate between performance standards (where emissions outcomes can vary) and other sectoral policies where abatement is even harder to estimate on the one hand, and economy-wide, multi-sector, or sector-specific policies that guarantee outcomes by limiting emissions on the other. Third, CARB should be particularly careful to not overestimate the abatement potential of sectoral policies, but also to not undercut sectoral policies that appear to provide lower abatement benefits but might provide valuable benefits toward other critical objectives including reducing local air pollution.

Overall, a properly calibrated economy-wide cap can simultaneously provide much-needed flexibility and certainty to ensure the state's progress toward its climate goals: flexibility, in that the state can explore sectoral strategies for reasons beyond pure abatement potential, and certainty, in that the state can ensure it will meet climate goals even if performance standards and other sectoral policies do not deliver modeled outcomes. For these reasons, a strong economy-wide cap is essential.

#4. Establish equitable processes to support equitable outcomes for disadvantaged communities and communities of color during the transition to a 100% clean economy.

Centering environmental justice in the Scoping Plan update procedurally means, though is not limited to, these recommendations from Environmental Justice Advisory Committee (EJAC) members: meaningful and serious engagement with the EJAC, workshops that are accessible to anyone wishing to participate, valuing communities' lived experience, and ensuring that EJAC expertise is presented at each workshop or hearing. But an equitable process is only the first step; *results* that reduce disproportionate environmental burden are also critical. CARB's health impact assessment of Scoping Plan scenarios, as recommended by the previous EJAC,¹² is an essential step and we commend the agency for taking this on. Additionally, as CARB develops Scoping Plan scenarios, they should also examine how to maximize co-pollutant reductions alongside greenhouse gas emission reductions, as the previous EJAC also

¹² CARB, 2017, 2017 Scoping Plan Appendix A: AB 32 Environmental Justice Advisory Committee (EJAC) Recommendations, https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/2030sp_appa_ejac_final.pdf.

recommended. We also encourage CARB in developing the Scoping Plan scenarios to maximize energy and transportation affordability and accessibility for overburdened communities, especially those with lower incomes or those in rural areas of California.

Achieving economy-wide climate targets.

EDF is pleased that in this Scoping Plan update, CARB is already looking toward the 2045 net-zero goal. To avoid the worst impacts of climate change, we must achieve net-zero greenhouse gas emissions by mid-century at the latest and maintain net-negative emissions thereafter. Setting binding targets is an essential step, as well as ensuring that California's regulations, including a declining limit on greenhouse gas emissions, provide the greatest level of certainty that the state will in fact meet this goal. As discussed above, these direct emission reductions will be supplemented by carbon removal strategies. This is where California's leadership is more important than ever: to pioneer the policy pathway that guarantees net-zero emissions in a way that both encourages economic growth and ensures environmental justice.

Cap and trade.

California's cap-and-trade program is a nation-leading policy; 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. The 2017 Scoping Plan estimated that known commitments from sector-specific abatement would likely account for 385 MMT CO₂e in cumulative emission reductions between 2021 and 2030, or 62% of the needed abatement — leaving the cap to close the remaining gap. The cap-and-trade program would be the primary driver of 236 MMT CO₂e in cumulative reductions from 2021 to 2030 — 38% of the needed economy-wide abatement.

EDF recommends that the Scoping Plan 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, during the Scoping Plan update process, CARB should develop emissions projections for all California emissions sources — including sectors outside the cap — ensuring that the budget being evaluated for 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.

a. Increase stringency of the cap and maximize cumulative emission reductions before 2030.

Calibrating the allowance budget to provide the minimum level of ambition described above, and striving to secure the overall emissions outcomes required even if an increase is projected from uncapped sources, is necessary to keep California on track to delivering on its climate commitment codified in SB 32¹³ and statutory obligations under AB 32 to achieve the maximum cost-effective and technologically feasible reductions.¹⁴ Yet because California successfully achieved its 2020 emission reduction goal ahead of schedule, there is a readily accessible opportunity to increase climate ambition by further increasing the stringency of the cap. The current post-2020 cap was based on a straight-line reduction between 2020 and 2030, rather than a step down to emissions in 2021. CARB should evaluate budget trajectories that take advantage of the additional early reductions achieved in 2020 and 2021, and consider trajectories that at the very minimum decline linearly from 2021 actual emission levels, while also considering an even more significant reduction in pre-2030 annual allowance budgets in order to maximize cumulative emission reductions. CARB should also evaluate an emissions cap that accommodates the potential for growth in emissions from uncapped sectors, to ensure that California is maximizing its cost-effective and technologically feasible greenhouse gas emission reductions and will meet the climate goals.

Additional measures should also be considered to maximize the ambition of the cap-and-trade program. While EDF recognizes that the market is strong and is a model for other jurisdictions to follow, we urge CARB to explore avenues to further enhance the program's ambition, given both the evident opportunity after exceeding 2020 goals and the increasingly severe and accelerating impacts of climate change as detailed above on page 5. In particular, EDF encourages CARB to consider the following options included by the Independent Emissions Market Advisory Committee (IEMAC) in their 2019 and 2020 recommendations:¹⁵

- **Ensure allowance supply is aligned with program ambition:** As the IEMAC has outlined, CARB has an opportunity in this Scoping Plan to “align the future issuance of new allowances with allowance supplies already available in private and public banks. Alignment matters because allowances currently in private and public accounts enable emissions in excess of the annual issuance of new allowances. To achieve the state’s ambitious emission reduction goals, the annual issuance of new allowances could be adjusted to better align the total supply of allowances in circulation (including banked allowances) with the state’s goals.”¹⁶ Possible approaches to adjusting allowance supply include:

¹³ *Cal. Health & Safety Code* § 38566.

¹⁴ *Cal. Health & Safety Code* § 38561.

¹⁵ Independent Emissions Market Advisory Committee (IEMAC), 2020, 2020 Annual Report, https://calepa.ca.gov/wp-content/uploads/sites/6/2021/01/2020-ANNUAL-REPORT-OF-THE-INDEPENDENT-EMISSIONS-MARKET-ADVISORY-COMMITTEE_FINAL_a.pdf; IEMAC, 2019, 2019 Annual Report, https://calepa.ca.gov/wp-content/uploads/sites/6/2020/01/Final_2019_IEMAC_Annual_Report_2019_12_06.a.pdf.

¹⁶ IEMAC, 2020 Annual Report, p. 6, available at: https://calepa.ca.gov/wp-content/uploads/sites/6/2021/01/2020-ANNUAL-REPORT-OF-THE-INDEPENDENT-EMISSIONS-MARKET-ADVISORY-COMMITTEE_FINAL_a.pdf.

- *Reducing the cumulative emissions cap:* CARB could reduce the issuance of new allowances by making a one-time reduction in the cap (shifting the emissions budget downward) and/or increasing the rate at which the cap declines (making the emissions budget steeper). These approaches would enable the cap-and-trade program to drive deeper emission reductions over the current decade. Either way, as noted above on page 10, CARB should ensure that the cap is calibrated to meet the 2030 greenhouse gas reduction goal while accounting for emissions outside of the cap (including potential emissions growth in these sectors) and banked allowances, and to ensure the greatest possible cumulative emission reductions.
- *Establishing an Emissions Containment Reserve:* Like the existing Allowance Price Containment Reserve, an ECR would adjust the supply of allowances available at auction in response to the price. If auction prices remain near the Auction Reserve Price, then fewer allowances are available for purchase, representing a temporary tightening of the emissions cap. The benefit of this approach is that it is predictable based on auction settlement prices, and allowances not offered for sale now represent emissions that are not occurring now, which increases the cumulative emission reductions if those allowances are then permanently retired. Importantly, if allowances are not permanently retired, they may be added to the market to permit additional emissions later in the decade. Thus, to increase the ambition of the cap-and-trade program, an ECR must permanently remove excess allowances .
- *Increasing price-responsiveness:* CARB could add “one or more price steps above the price floor. This would create a price staircase, with varying quantities of allowances sold at different prices in the auction.”¹⁷ Similar to the ECR, additional price steps would represent a temporary tightening of the allowance budget, which would increase cumulative emission reductions if unused allowances are permanently removed from the supply.

b. Undertake a cap-and-trade rule-making as soon as possible, preferably before the adoption of the Scoping Plan.

Given both the imperative and the opportunity for California to accelerate its climate ambition, and the central role of the cap-and-trade program in meeting California’s climate goals and maximizing emission reductions, **we strongly encourage CARB to begin undertaking a cap-and-trade rule-making as soon as possible**, and preferably before the conclusion of the Scoping Plan update process.

The rulemaking should calibrate the cap-and-trade emissions budget based on modeling that will be conducted during the Scoping Plan process, the precise results of which do not need to be finalized at the beginning of the rule-making process. The cap-and-trade program can be recalibrated in parallel with the Scoping Plan modeling even with preliminary data. Furthermore, it is critical for CARB to begin the rule-making process as early as possible, given the time needed to conduct such a rule-making with equitable processes and meaningful involvement of stakeholders including environmental justice community representatives.

¹⁷ IEMAC, 2020 Annual Report, p. 6, available at: https://calepa.ca.gov/wp-content/uploads/sites/6/2021/01/2020-ANNUAL-REPORT-OF-THE-INDEPENDENT-EMISSIONS-MARKET-ADVISORY-COMMITTEE_FINAL_a.pdf.

Furthermore, any delay of cap-and-trade rule-making — particularly a delay until after the adoption of the Scoping Plan in 2022 — is problematic for maximizing cumulative emission reductions as discussed above on page 5-7. Any delay can push greater climate ambition to, or even past, the middle of the decade, which will increasingly threaten the health and livelihood of all Californians, especially people most vulnerable to the impacts of climate change including those with lower incomes, older adults, and residents in disadvantaged communities.¹⁸ Waiting even another year will leave emission reductions on the table today that are low-cost and readily available. By initiating a rule-making before the adoption of the Scoping Plan, CARB can maximize the state’s cumulative emission reductions over the course of this decade. Additionally, as discussed in CARB’s June 2021 workshops and in subsequent sections of these comments, it is clear the state will need to invest significant resources in mitigation and resilience to ensure environmental justice and a high-road transition for fossil fuel workers in communities across California. Accelerating climate ambition can spur early investments to help meet these objectives that will benefit Californians in the near and long term.

c. Incorporate targeted measures to address local air pollution and consider further facility-specific greenhouse gas requirements.

While cap and trade in California was not designed to address local air pollution, only global greenhouse gas emissions, it is increasingly clear that considering conventional air pollutants in program design decisions is not only valuable — due to the ongoing and significant air pollution in California, especially in the most disadvantaged communities — but also possible. California took a first, critical step in 2017 with the adoption of AB 617, the Community Air Protection Program (CAPP) alongside the extension of the cap-and-trade program. The CAPP is an innovative approach to addressing local air pollution by focusing on cumulative pollution burden, and ensuring the process of determining community-specific strategies is led by community members. While local results have been mixed so far¹⁹ ²⁰ and in some cases it is too soon to fully evaluate outcomes, it is clear that other states are keen to learn from California in developing their own efforts to reduce local air pollution alongside global climate pollution.

Washington State’s new climate law, the Climate Commitment Act, incorporates measures to identify and monitor air pollution in overburdened communities, the authority for the regulator to place additional greenhouse gas restrictions on major pollution sources in overburdened communities including further limitations on the use of offsets, a requirement to set community-specific limits on local air pollution and the requirement for the regulator to issue an enforceable order that those targets be met. 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 and CAPP.

¹⁸ California Department of Justice Office of the Attorney General, “Climate Change’s Unequal Impacts”, <https://oag.ca.gov/environment/climate-change/unequal-impacts>.

¹⁹ California Environmental Justice Alliance [Behles, D., N. Mohan, G. Limón, J. May, J. Williams, S. Azamian, P. Torrado], 2021, Lessons From California’s Community Emissions Reductions Plans: AB 617’s flawed implementation must not be repeated, https://caleja.org/wp-content/uploads/2021/05/CEJA_AB617_r4-2.pdf.

²⁰ London, J., 2020, AB 617 Evaluation Study: Preliminary findings, https://ww2.arb.ca.gov/sites/default/files/2020-02/UC%20Davis%20AB%20617%20Evaluation%20Study%20Preliminary%20Findings_Consultation%20Group%20Feb%202020.pdf.

Negative emission and emission reduction technologies.

As detailed above on pages 7, greenhouse gas removal strategies or negative emission technologies will be necessary to secure net greenhouse gas emission reductions and maintain net negative emissions post-2045. However, negative emission technologies should not be a substitute for direct emission reductions from pollution sources. 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.

Part of the consideration of negative emission technologies in the Scoping Plan should include an analysis of any supply chain constraints. For example, the state must consider whether or not by building more renewable energy to power direct air capture technology it is limiting the ability to build additional grid-connected renewables, which would be preferable. Both nature-based and technology-based removal strategies will also require careful and deliberate consideration of environmental integrity and impacts on local communities, water resources, and ecosystems.

It will also 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 negative emission technologies or emission reduction technologies such as carbon capture. Communities, air quality, ecosystems, and groundwater around storage sites of captured or removed carbon dioxide must be rigorously protected, and there must be monitoring and verification systems in place to ensure the safe and permanent storage of carbon dioxide. With respect to carbon capture and sequestration specifically, CARB should also revisit aspects of its Carbon Capture and Sequestration Protocol under the Low Carbon Fuel Standard in a near-term rule-making to enhance environmental integrity and facilitate development of projects that meet those strict standards on issues including third party review, the definition of brine, corrosion monitoring, seismic monitoring, corrective action requirements, penetration of the storage complex, and recognition of other state regulatory programs.

Sector-specific strategies: Energy and Electricity

Since the first Scoping Plan process, California has recognized that an affordable, clean and safe energy system is vital to achieving a decarbonized economy. Since the passage of Senate Bill 100, California is now on track to have a zero-carbon electric grid by 2045, which can be the platform to help the state achieve economy-wide net-zero greenhouse gas emissions..

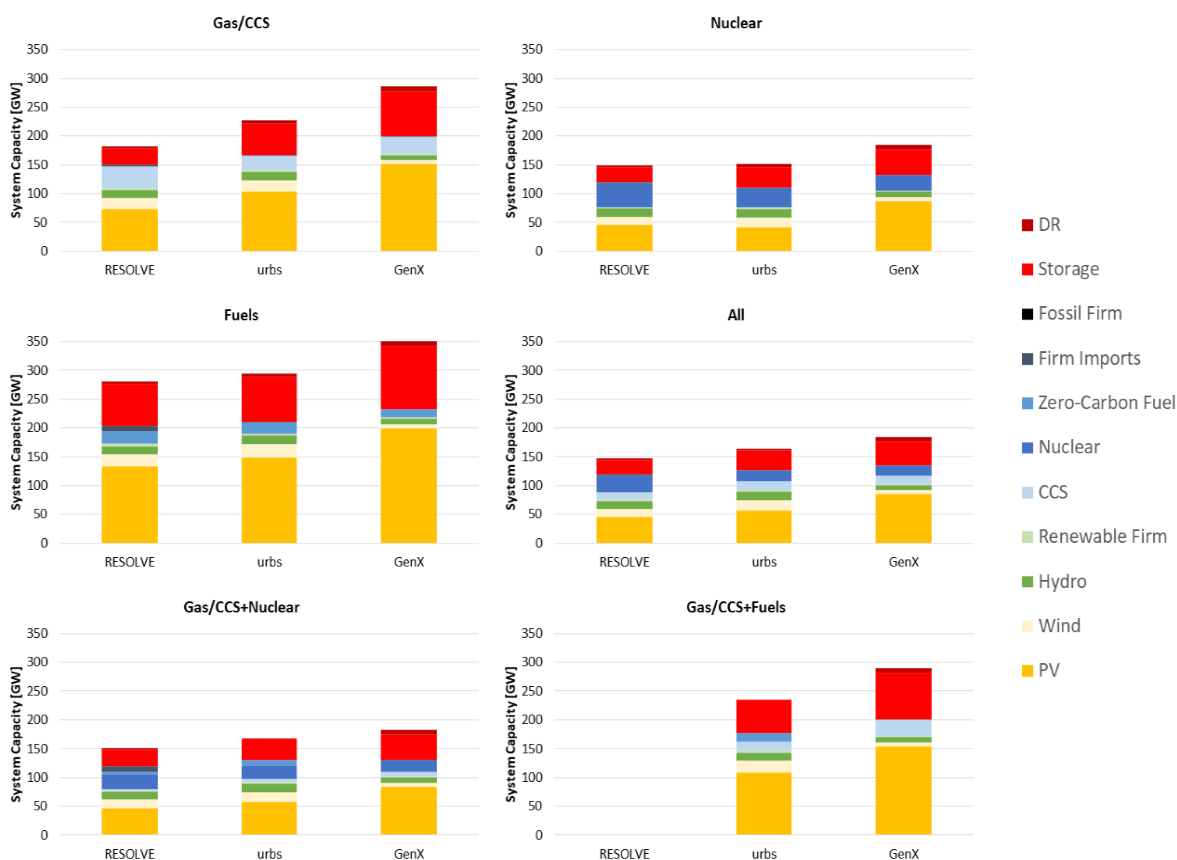
1. Fully decarbonize the electricity system using renewables supplemented by clean firm power; ensure meaningful community engagement.

Recent analysis undertaken by EDF in partnership with Clean Air Task Force engaged three separate electric reliability models to demonstrate how California could fully decarbonize all parts of the electricity system by 2045.²¹ The results fully decarbonize the electric system, not just limiting the

²¹ See attached report: 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, and So Does

generation components to retail sales. The full study is attached to these comments, but we include several key results here.

The results demonstrate that California can fully decarbonize its electric system in an affordable and reliable manner. In addition to a significant build-out of solar and short duration batteries, California will also need to procure approximately 30 gigawatts of what we term “clean firm power” resources. Clean firm power refers to generation assets that are available on demand and for however long the system requires it. While there are many different technologies that fit under the clean firm power category, including geothermal, zero-carbon fuels (such as hydrogen), imported nuclear or expanded use of carbon capture and sequestration technologies, there is no one clear “winner.” Each technology is in the same order of magnitude of price and like all technologies each one has inherent tradeoffs. In the figure below,²² we indicate the modelling results for the amount of clean firm power and total system build required.



the Rest of the World: Three detailed models of the future of California’s power system all show that California needs carbon-free electricity sources that don’t depend on the weather.

²² See attached: 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, p. 8.

Our modelling efforts indicate, however, that any one in this category (or any combination of them) will save energy customers significant funds. Below, one key result indicates the affordability of the overall electric transmission and generation rate increase with and without clean firm power technologies.



As demonstrated by the above figure,²³ any combination of clean firm power technologies acts as a total cost containment mechanism when compared to a pathway of just short duration batteries combined with renewables.

Since clean firm power technologies are relatively nascent, CARB should consider strategies to incentivize their in-state development in the near term for purposes of this Scoping Plan. **This recommendation includes having CARB engage and partner with vulnerable and frontline communities to maximize accessibility and affordability, addressing inherent tradeoffs of decarbonizing the electricity sector.** Our modeling work also indicates that clean firm power resources act as a cost containment mechanism in terms of total system cost. Even though individual renewables 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. The consultation with these community groups should consider overall energy burden and total energy bill affordability.

EDF also recommends that CARB continue to put downward pressure on the amount of allowable emissions from the electricity sector as a whole to ensure that the state is not falsely relying on fossil

²³ See attached: 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, p. 8.

resources to ensure reliability. The modeling work presented in the attached paper indicates that California does not need unabated fossil generation to keep the electric system reliable.

2. Encourage adoption of an all-electric baseline for new building construction.

Approximately 25% of California’s greenhouse gas emissions are attributed to the building sector. Luckily for California, reducing emissions from buildings is not a matter of needing to wait for technology. EDF suggests that there will need to be two separate and distinct strategies to reduce emissions from buildings: one for new buildings and one for existing buildings. The Scoping Plan update presents an opportunity to develop these two strategies and consider their emissions, economic, and equity impacts.

For new buildings, EDF encourages CARB to include in the final Scoping Plan scenario the adoption of an all-electric baseline, with that adoption happening as soon as possible. The California Energy Commission has concluded that building electrification “would need to be a major component of any plan” to meet California’s 2045 decarbonization goals, and that “electrification scenarios ... have the most potential” to achieve needed greenhouse gas reductions from the building sector.²⁴

Developers typically find an all-electric building cheaper to construct since they can avoid a second set of complicated utility infrastructure, and building operators typically find all-electric buildings more cost-effective to operate. All-electric buildings also can integrate distributed energy resources (DERs). Proper integration of DERs has the potential to help lower grid and energy costs, while reducing greenhouse gas emissions, by leveraging existing carbon-free assets more efficiently and driving effective deployment of electrified resources and other DERs. Examples include connected devices that could provide grid services, such as water and space heating appliances that can perform automated demand response with the proper communication protocols and price signals. This transformation will likely increase total electric usage but will also offer the opportunity to manage the newly electrified resources in ways that benefit both the end-use customer of the resource and more broadly all customers on the grid. In California, a 2019 study from E3²⁵ indicates that while total electric usage may go up, overall customer energy bills will decrease, helping to promote the affordability of this electrification push.

EDF recommends that in the Scoping Plan, CARB prioritize additional emission reductions from new construction, including special incentives for all-electric buildings targeted for deployment in disadvantaged communities.

²⁴ Cal. Energy Comm’n, 2021, Draft Staff Report: California Building Decarbonization Assessment, pp. 11, 51, 211, 234, <https://www.energy.ca.gov/data-reports/reports/building-decarbonization-assessment>.

²⁵ Energy and Environmental Economics [Mahone, A., C. Li, Z. Subin, M. Sontag, G. Mantegna, A. Karolides, A. German, P. Morris], 2019, Residential Building Electrification in California: Consumer economics, greenhouse gases and grid impacts, https://www.ethree.com/wp-content/uploads/2019/04/E3_Residential_Building_Electrification_in_California_April_2019.pdf.

3. *Prioritize funding the electrification of existing buildings in vulnerable communities to minimize stranded asset risks and ensure equitable processes and outcomes.*

Decarbonizing existing buildings is a more complex endeavor, but it is still achievable and necessary. As discussed extensively in a 2019 EDF report “Managing the Transition” (see attached),²⁶ it is quite possible that the push to electrify existing buildings could leave Californians with a large stranded asset problem of existing gas infrastructure. This transition has significant equity concerns; Californians who have lower incomes and/or who are renters are less likely to be able to afford to electrify (or would not be able to electrify because of agreements with landlords, for example). Without a specific policy approach, there could be a significant decline in the gas utility customer base with the same amount of fixed infrastructure, leaving lower-income and other vulnerable customers left “holding the bag.”

EDF encourages CARB, in partnership with the Energy Commission and the Public Utilities Commission, to use the Scoping Plan to explore strategies to target building electrification to minimize the stranded gas asset risk. Allocation of Greenhouse Gas Reduction Funds to help deploy electrification strategies to California’s most vulnerable populations will be a key equity consideration. To ensure a just and managed transition, EDF urges CARB to continue dialogue about the affordability of electric equipment and installation, stranded assets, and cost-shift.

4. *Develop long-term planning strategies to align gas regulatory policies with state climate goals.*

EDF recognizes that there are several portions of the economy that will not be able to electrify on the timeline required to meet the state’s science-based climate goals. Examples include heavy industry that uses high quality thermal output and there is no electric option to generate that heat. While EDF does not think that the entire gas system will be eliminated through electrification, there *are* several strategies that the final Scoping Plan scenario can employ to further reduce emissions, including strategies to help align gas regulatory policy with the state’s emission reduction and net-zero targets. Attached to these comments is a January 2021 white paper authored by EDF²⁷ that identifies various regulatory steps that can be taken to help further decarbonize the natural gas system.

In particular, EDF encourages CARB to consider how the Scoping Plan can help leverage new long-term planning with a date certain of achieving greenhouse gas emission reductions. Elements of this long term plan can include:

- Having utilities submit long-range plans with detailed demand projections and corresponding planned resources
- Gathering utilities’ historic and forecasted demand curves and resource stacks (including fixed and variable costs, projected load factor utilization, Non-Pipeline Alternatives considered and not considered)
- Conducting an annual open cost reconciliation proceeding
- Integrating Non-Pipeline Alternatives into planning
- Establishing a gas priority investment order

²⁶ See attached: Environmental Defense Fund [Bilich, A., M. Colvin, T. O’Connor], 2019, Managing the Transition: Proactive solutions for stranded gas asset risk in California.

²⁷ See attached: Environmental Defense Fund [Karas, N., M. Colvin, T. Kelly, E. Murphy, T. O’Connor], 2021, Aligning Gas Regulation and Climate Goals: A road map for state regulators.

- Evaluating resources using the all-in cost metric
- Requiring robust life-cycle greenhouse gas emissions analyses to compare all supply options

As further outlined in the 2021 white paper, EDF suggests that CARB coordinate with the relevant energy agencies to establish a set of pilots to help decarbonize the hard-to-electrify parts of the economy. These pilots should include four key principles:

1. **Accountability:** Require regular and detailed reporting to allow regulators and the public to track the pilot's progression.
2. **Scalability:** Ensure that pilots could generate useful information and results that inform larger-scale application of technologies and programs.
3. **Equity:** Not only treat all communities fairly, but also remedy past harms and ensure expanded access for disadvantaged communities through proactive outreach.
4. **Reduction of greenhouse gas emissions:** Estimate, quantify, and report greenhouse gas emissions before, throughout, and after the pilot.

Sector-specific strategies: Transportation

Freight trucks and other medium- and heavy-duty trucks contribute a significant part of our greenhouse gas emissions and air pollution along highways and near fleet depots. Mobile sources and the fossil fuels that power them are the largest contributors to the formation of ozone, greenhouse gas emissions, fine particulate matter (PM_{2.5}), and toxic diesel particulate matter in California. Medium- and heavy-duty vehicles make up a significant proportion of harmful air pollution in California, despite making up just 7% of vehicles on the road. With this Scoping Plan, CARB has the unique opportunity to simultaneously address two pressing issues during an important time: to reduce both air and climate pollution.

1. Build on the emission reductions benefits of the Advanced Clean Trucks and Fleets Rules.

At this point, CARB already has planned for unprecedented approaches to transforming trucking in California through the Advanced Clean Trucks Rule (finalized), and its companion the Advanced Clean Fleets Rule (still in process). The Advanced Clean Trucks Rule has already been found to have a huge reduction in greenhouse gas emissions – 17.3 MMT CO₂e through 2040, with total benefits from reduced greenhouse gases adding from “\$398 million to nearly \$1.7 billion through 2040” (depending on the discount rate used).²⁸

These two recent examples demonstrate CARB's extensive leadership in policies to convert our medium- and heavy-duty vehicles to zero emission vehicles. The final Scoping Plan scenario should rely on these rules, cementing the ACT Rule's nearly 20% in NO_x and 11% in PM_{2.5} emission reductions in 2040 from Class 4-8 vehicles, with significant reductions from other vehicle classes.²⁹ EDF analysis with Energy Innovation corroborated these findings.³⁰

²⁸ CARB, 2020, Updated Costs and Benefits Analysis for the Proposed Advanced Clean Trucks Regulation, pp. 8-9, <https://ww3.arb.ca.gov/regact/2019/act2019/30dayattc.pdf>.

²⁹ Calculated from CARB, 2019, Emissions Inventory Methods and Results for the Proposed Advanced Clean Trucks Regulation Proposed Modifications, pp. 15-16, <https://ww3.arb.ca.gov/regact/2019/act2019/30dayattd.pdf>.

³⁰ Energy Innovation and Environmental Defense Fund [C. Busch, J. Fine, A. Myers], 2020, Clean Trucks, Big Bucks, https://energyinnovation.org/wp-content/uploads/2020/06/Clean-Trucks-Big-Bucks_June_17_2020.pdf.

EDF encourages CARB to create targets for ZEV-based emission reductions in the Scoping Plan along four key strategies:

- 1) Availability of the vehicles through the Advanced Clean Truck Rule
- 2) Ability of the fleets to purchase the vehicles through the pending Advanced Clean Fleet rule
- 3) Proper rates for zero emission charging or fueling to help keep total cost of ownership favorable
- 4) Availability of zero emission charging and/or refueling infrastructure

2. Prioritize deployment of ZEV charging infrastructure in high-pollution zones.

Recognizing that medium- and heavy-duty vehicles have different operational profiles than traditional light-duty vehicles, EDF encourages CARB to identify zones where air pollution is high along transit corridors to help target public charging and private conversions at warehouses. Access to charging remains a significant barrier to ZEV uptake and providing infrastructure in these areas will allow fleets to enter the ZEV market. In turn, the deployment of ZEV charging infrastructure will have a substantial impact on the public health of those communities since they will reduce reliance on polluting diesel vehicles. The emission reductions from transitioning fleets to ZEV will reduce diesel particulate matter and overall greenhouse gas emissions. CARB should prioritize closing the identified ZEV infrastructure gap³¹ and place the missing chargers within health constrained areas to maximize health benefits especially to disadvantaged communities.

3. Pursue short- and long-term ZEV infrastructure planning and deployment.

An additional concern is that the focus on near-term investments to meet 2025 goals does not adequately address the gaps for future infrastructure targets. Increased investment alongside community input can help keep ZEV infrastructure deployment on track for 100% ZEV sales by 2035.

Attached to these comments is a recent EDF report entitled “Charging Forward” focusing on ZEV charging and key policy recommendations.³² These recommendations include the following:

- 1) Encourage and reward the use of managed charging and the deployment of clean, on-site distributed energy resources
- 2) Explore policies, programs or market-based tools that reduce the up-front infrastructure costs of electrifying heavy-duty truck fleets
- 3) Accelerate research and development to improve battery performance and optimize en route charging infrastructure design.

4. Consider dedicated rate design, needs of small businesses, and the role of private capital in funding the transition to zero-emission medium- and heavy-duty vehicles.

Dedicated rate design is vital for the success of transportation electrification, and should be reflected in the 2022 Scoping Plan. Businesses looking to electrify must be met with rates that adhere to their varying needs. If fuel-cost savings are not materialized for different types of fleets, then electrification rates will

³¹ 2022 Scoping Plan Update Workshop: Zero-Emission Vehicle Infrastructure (ca.gov) Slide 7.

³² See attached: Environmental Defense Fund [MacDougall, P., T. O'Connor], 2021, Charging Forward: Recommendations for reducing charging infrastructure costs for heavy-duty trucks.

lag. To ensure California meets its ZEV sales targets and to ensure equity, CARB should work with the PUC to design rates for businesses seeking to electrify their fleets.

EDF appreciates that the state has dedicated funds toward moving fleets to ZEV in disadvantaged communities. EDF further encourages that the definition of equity considers the needs of small businesses, rather than just large fleets. Small businesses may need additional and varied approaches in transitioning their fleets to ZEV. The upfront cost of vehicles and infrastructure may be more burdensome for smaller, less capital-rich businesses. Multiple strategies for financing should be made available and small businesses based within transit corridors should receive additional support. At the same time, CARB should consider steps towards ameliorating issues around misclassification of workers.

Long term, ZEV trucks will generate significant cost savings; in the short term, CARB should use tools to align economic incentives as the ZEV truck market grows to help address upfront costs. CARB's analysis, along with the Energy Innovations analysis, indicated extreme cost savings from transitioning to ZEV trucks, in the order of billions of dollars. While most of these cost savings land on the balance sheet of fleets, in the form of fuel cost savings and reduced maintenance costs, they do not experience all of these cost savings concurrently with the truck purchases. Because of the urgency of this transition, EDF urges CARB to include in the Scoping Plan the spending of medium- and heavy-duty grant money in a way that leverages private capital.

The limited state money focused on vouchers cannot make this transition – CARB can develop the tools necessary to bring more private capital into the market. An EDF Report, *Financing the Transition: Unlocking Capital to Electrify Truck and Bus Fleets*,³³ interviewing leading experts in transportation and finance, indicates that many more options are required and available to be updated to address the wide range of needs and risks facing these fleet owners. By providing the diverse tools needed by owners and operators of fleets of various sizes and types, the state can enable private capital to enter a more stable market. For example, some fleet owners may have the purchase power but lack the expertise, while some may need more direct support. By providing the appropriate training and expertise, the state can make space for private capital and support a more broadly affordable and accessible transition.

5. Ensure that by 2035, all new passenger cars sold in California are zero-emission vehicles.

Achieving 100% ZEV sales would be a historic and important step in responding to the dual crises of climate change and air pollution, and the Scoping Plan is an important tool to plan for this transition. California suffers from some of the worst air quality in the nation. A recent study by researchers at George Washington University and EDF found that, in the Bay Area alone, more than 2,500 lives are lost, and 5,200 children develop asthma every year due to traffic-related air pollution exposure.³⁴ Moreover, the pollution from these highway vehicles disproportionately harms communities of color and low-

³³ See attached: Environmental Defense Fund, M.J. Bradley & Associates, Vivid Economics [Rojas, V., J. Hiller, P.J. Moynihan, J. Culkin, N. Kingsmill], 2020, *Financing the Transition: Unlocking Capital to Electrify Truck and Bus Fleets*, <https://www.edf.org/energy/financing-transition-electric-truck-and-bus-fleets>.

³⁴ Southerland, V.A., S.C. Anenberg, M. Harris, J. Apte, P. Hystad, A. Van Donkelaar, R.V. Martin, M. Beyers, A. Roy 2021, Assessing the Distribution of Air Pollution Health Risks within Cities: A Neighborhood-Scale Analysis Leveraging High-Resolution Data Sets in the Bay Area, California, *Env. Health Persp.* 129 (3), <https://ehp.niehs.nih.gov/doi/10.1289/EHP7679>.

income communities, as a result of housing discrimination and other unjust policies.³⁵ A recent report by the Moving Forward Network found that, on average, Asian and Black Americans bear a PM2.5 pollution burden from cars, trucks and buses that is 56% and 44% higher, respectively, than white Americans.³⁶ The EDF analysis of the Bay Area study data referenced above found that neighborhoods with higher percentages of residents of color experienced double the rate of asthma from NO2 – a pollutant used as a marker for transportation-related pollution.³⁷

EDF agrees with CARB that deep reductions from the light-duty fleet are required to address these serious health harms from vehicles operating in communities across California. EDF also agrees that the path to achieving the needed long-term reductions in climate and air pollution is a full transition to ZEVs. A recent EDF analysis found that if all new cars, SUVs, and passenger trucks sold in California are zero-emitting starting by 2035, the state could:³⁸

- Prevent up to 7,406 premature deaths in total by 2050
- Eliminate more than 1.2 billion tons of climate pollution by 2050
- Significantly reduce the smog-forming and particulate pollution that disproportionately burdens communities of color and low-income communities
- Save Californians who buy a new ZEV in 2035 more than \$13,000 over the life of the vehicle, compared to a gas-powered car
- Save the state of California \$194 billion cumulatively by 2050 in health and economic benefits

This report further substantiates the need for an urgent transition to zero-emitting passenger vehicles, to promote environmental justice and the health of all Californians. The Scoping Plan should reflect the urgency of this transition.

6. Ensure equitable and inclusive processes and outcomes in the transition to ZEV fleets.

As highlighted by members of the EJAC, equity must be centered throughout this transition, considering issues including but not limited to: procedural justice, upfront transition costs, accessibility of vehicles and charging infrastructure, and transportation-related air pollution. EDF appreciates that CARB is paying special attention to disproportionately impacted communities, including those near freeways, in reducing pollution, making charging accessible and affordable, and reducing total miles traveled. We urge CARB to continue working closely with the EJAC and disadvantaged communities throughout the process of transitioning the state to a zero-emitting light-duty fleet.

³⁵ Sinnamon, H., 2020, Accelerating to 100% Clean: Zero emitting vehicles save lives, advance justice, create jobs, Environmental Defense Fund, <https://www.edf.org/sites/default/files/documents/TransportationWhitePaper.pdf>; G.M. Rowangould, 2013, A Census of the US Near-Roadway Population: Public health and environmental justice considerations, Transportation Research Part D 25, 59–67, <https://www.sciencedirect.com/science/article/pii/S1361920913001107>.

³⁶ O’dea, J., 2020, Zero-Emissions Technology for Freight: Heavy-Duty Trucks, Tools to Advocate for Zero-Emissions Technology, Moving Forward Network, http://www.movingforwardnetwork.com/wp-content/uploads/2020/10/MFN_ZeroEmissionToolkit-1.pdf.

³⁷ Environmental Defense Fund, 2021, Air pollution’s unequal impacts in the Bay Area, <https://www.edf.org/airqualitymaps/oakland/health-disparities>.

³⁸ See attached: Environmental Defense Fund, 2021, California: 100% new zero-emission vehicles sales by 2035 will deliver extensive health, environmental and economic benefits.

Sector-specific strategies: Natural and Working Lands - Forests

California forests – globally distinctive because of their biodiversity, productivity, and beauty – are threatened like never before. Increasing incidence of catastrophic wildfire and insect mortality threaten to bend the carbon storage curve from positive to negative. Since the passage of AB32, the Global Warming Solutions Act of 2006, the dominant narrative in forest climate discussions in California has been about the value of forests in absorbing some portion of the state’s emissions. But the conversation must now shift to protecting existing carbon stores and building resilience so that California forests do not become an annual source of net greenhouse gas emissions.

Toward that end, EDF makes the following recommendations for the 2022 Scoping Plan:

1. Bolster research investments and community and tribal partnerships to inform practical, cost-effective forest management strategies for resilience, restoration, and growth.

Much is known about how to manage California forests for resilience and climate benefit. But more knowledge will help to better calibrate and target investments. A starting point for all discussions about the role of forests is a detailed, reliable and accurate inventory. The US Forest Service Forest Inventory and Analysis program is the gold standard in this regard. California should, like states in the US Southeast, contribute funding to reduce the average sampling interval. This enhanced data, combined with advances in remote sensing, is a no-regret investment by the state that can help guide additional research. Toward that end, the state should invest in research to identify the most promising, practical, and cost-effective resilience, restoration and forest growth techniques. EDF applauds the state’s investment in the Joint Institute on Wood Products Innovation and recommends doubling down on research to identify sustainable uses for thinning residue.

California has done much to increase investment in forest resilience treatments over the last several years. Yet more needs to be done. The goal should be to restore natural fire regimes to California’s fire adapted forests and wildlands. CARB and other agencies should look to engage and partner with local tribes and respect the expertise and traditional knowledge of indigenous communities throughout the process. Additionally, the process will require that residents of California become comfortable with prescribed and managed fire and that will only be the case if communities feel safe in the presence of regular fire. This requires increased investment in community wildfire protection including home and neighborhood hardening, strategic fire breaks, defensible space, and targeted fuel reduction in high risk forest and wildland areas. The priority for fuel reduction outside of the wildlife urban interface (WUI) should be on application of prescribed fire which will require significant policy and legal innovation in the coming years. And, in many cases, mechanical treatments are necessary in advance of prescribed fire to reduce fuel loads to acceptable levels. Many of these same treatments, when carefully applied, can help mitigate forest threats from native insects and disease. Far greater attention needs to be paid to emerging exotic invasive pest and disease threats.

While the top priority for the state should be on building resilience in forests, strategic opportunities exist to stimulate forest recovery and growth. The state should enhance landowner assistance programs operated by CalFire and UC Extension designed to stimulate regeneration of forests that have experienced

catastrophic fire and to expedite growth of high-quality timberlands that might currently be suppressed for various reasons. The state should play a more prominent role in demonstrating promising, practical, and cost-effective resilience, restoration and forest growth techniques on state forests and in collaboration with the federal government on federal lands.

2. Collaborate with federal agencies to manage California's highest-risk forests on federal land.

Many of the highest risk, most acutely unhealthy forests in California are on federal land; the federal government manages about half of the state's forests. Accordingly, EDF encourages the federal government to make the same changes, enhancements, and recommendations stated above. The state must continue to press the federal government to do more and make every effort to collaborate with the Forest Service, Park Service, Bureau of Land Management, and other agencies to meet the pressing needs of California forests.

High Road Transition

EDF applauds California's effort, through the AB398 report, Putting California on the High Road,³⁹ and forthcoming Just Transition Roadmap, to ensure a "high-road transition" for workers and communities dependent on fossil fuels and that the clean energy industry is diverse, accessible to all, and provides family-sustaining jobs and strong labor protections. We appreciate that a high road transition is a priority in the 2022 Scoping Plan. In a recent report,⁴⁰ EDF identified several key design principles drawn from our review of 100+ federal, state, and international programs that could be relevant in ensuring fairness for workers and communities. While the research focuses on lessons at the federal level, we urge CARB to apply the following principles in developing the state's just transition programs and in the Scoping Plan update.

1. Incorporate multiple policy types in the state's transition strategy with coordination across agencies and levels of government, including the federal level.

These range from programs to protect communities currently dependent on fossil fuels and to ensure that the clean energy economy provides equitable access to jobs, particularly among environmental justice communities that have historically borne the burden of the fossil economy. Essential policy types include environmental remediation,⁴¹ workforce development and labor standards,⁴² and economic development.⁴³ Additionally, because the timing and variety of impacts is uncertain, California should strengthen its

³⁹ Zabin, C., 2020, Putting California on the High Road, <https://laborcenter.berkeley.edu/putting-california-on-the-high-road-a-jobs-and-climate-action-plan-for-2030/>.

⁴⁰ See attached: Resources for the Future and Environmental Defense Fund [Look, W., D. Raimi, M. Robertson, J. Higdon, D. Propp], 2021, Enabling Fairness for Energy Workers and Communities in Transition.

⁴¹ Environmental Defense Fund, 2020, Environmental and Infrastructure Policies to Support Communities in Transition, <https://www.edf.org/environmental-and-infrastructure-policies-support-communities-transition>.

⁴² Environmental Defense Fund, 2021, Labor Policies for Communities in Transition, <https://www.edf.org/labor-policies-communities-transition>.

⁴³ Environmental Defense Fund, 2020, Economic Development for Communities in Transition, <https://www.edf.org/economic-development-communities-transition>.

social safety net – which we refer to as “public benefits”⁴⁴ in our federal research – to support workers and communities. Throughout the process, California communities should determine their own futures, and policies must empower them to help guide the investment of state and federal funding and resources.

2. Implement policies early in anticipation of economic change.

Early policy implementation can improve the efficacy and mitigate costs of economic transition programs and potentially avoid initial job losses. California should enable local stakeholders to proactively plan ahead of potential closures; ensure workers receive pensions; provide advance notice of closures; implement programs to shore up local tax revenues; and help displaced workers into new, quality jobs before plants or mines shut down.

3. Ensure just transition policymaking is equitable and inclusive.

California lawmakers can address a legacy of underinvestment and environmental injustice in low-income communities and communities of color by prioritizing investments in infrastructure, environmental remediation, and workforce development programs in these communities. Policymakers should address underlying disparities in access to high-quality jobs by investing in community capacity, planning, and research as they develop roadmaps for the transition; they should transparently engage affected workers and community members throughout both the design and implementation of these roadmaps.

4. Strengthen local government revenue to keep essential services running.

For communities reliant on revenues from fossil fuel production for services, such as education and clean water, state lawmakers may need to provide a lifeline of funding support. These funds could come from investments in additional local tax base opportunities, transfers from general funds, or state revenue sources, such as California’s Greenhouse Gas Reduction Fund. California can also help fossil fuel-dependent communities be more proactive in transition planning by giving them the tools and autonomy to manage their finances effectively.

Attachments

Environmental Defense Fund. (2021). California: 100% new zero-emission vehicles sales by 2035 will deliver extensive health, environmental and economic benefits.

Environmental Defense Fund [Bilich, A., M. Colvin, T. O’Connor]. (2019). Managing the Transition: Proactive solutions for stranded gas asset risk in California.

Environmental Defense Fund [Karas, N., M. Colvin, T. Kelly, E. Murphy, T. O’Connor]. (2021). Aligning Gas Regulation and Climate Goals: A road map for state regulators.

Environmental Defense Fund [MacDougall, P., T. O’Connor]. (2021). Charging Forward: Recommendations for reducing charging infrastructure costs for heavy-duty trucks.

⁴⁴ Environmental Defense Fund, 2020, Public Benefits Programs to Protect Communities in Transition, <https://www.edf.org/public-benefits-programs-protect-communities-transition>.

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