



Chair Mary Nichols and Members of the Board

California Air Resources Board
1001 I Street
Sacramento, CA 95814

April 10th, 2017

Re: 2017 Climate Change Scoping Plan Update—The Proposed Strategy For Achieving California's 2030 Greenhouse Gas Target

Dear Chair Mary Nichols and Members of the Board,

Thank you for the opportunity to provide comments on the 2017 Climate Change Scoping Plan Update (the Update).

It is clear that achieving the 2030 target will be substantially more challenging than achieving the 2020 targets, and the importance and urgency of the targets cannot be overstated. Therefore, 350 Bay Area strongly urges the California Air Resources Board (CARB) to select Alternative 1, direct regulation without cap and trade, rather than the “proposed scenario” as the basis for the Scoping Plan.

- California's most clear-cut successes in emissions reduction to date have come from measures such as the RPS and energy efficiency mandate, which involve direct interventions to reduce emissions.
- The mandate of AB197 for Environmental Justice is most readily fulfilled through the direct, California-based emissions reduction measures in Alternative 1.
- Since Alternative 1 includes direct emission reductions in California, resulting in decreased criteria and toxic air pollutants and decreased diesel emissions in California (compared with cap and trade scenarios)—which then results in reductions in direct health impacts and the huge costs associated with them—this scenario will have far greater economic benefits compared to the other scenarios, benefits which are not fully accounted for in the Update.

I. C. California's Greenhouse Gas Emissions and the 2030 Target:

- 1) New climate data makes eminently clear that *extremely steep, unceasing, year-on-year reductions of GHGs are necessary, beginning immediately*, in order to have any hope of meeting the interim or long-term targets. Industry must be decarbonized, transportation and building heating/cooling must be electrified, and electricity must be 100% renewable wherever possible.

How many MMT of CO₂ must be reduced each year from the State's current position in order to reach, and

then keep pace with, the reductions needed through 2030 and 2050? 2030 is only 13 years away at this point. How do CARB's actions compare with the yearly reductions that are mathematically necessary beginning immediately?

- 2) News and scientific reports are full of the horrific damages caused by fossil fuel combustion for power, heating, and driving on both public health and the climate (and through the climate, public health again). The highest priority of the Update should be to develop and implement the strategies and regulations that are required to protect public health *and* the climate all in one, *by reducing combustion*.

II. A. Proposed Scoping Plan Scenario:

- 3) SB 350:
 - a) Increasing energy efficiency in natural gas and electricity end uses statewide is critical, but *ultimately regulation must be considered that reduces and eliminates the use of fossil fuel-based space and water heating over time*. Given an average product life of 20 years, it's critical to start sending the market signal now for sources like these. Electric space heating technologies are already being installed in new and existing homes. In the context of aiming to 2050 or even 2030, it is not too soon to contemplate the day when the sale of fossil fuel furnaces could be prohibited.
 - b) CARB may consider the 2009 "Mayor's Task Force on Existing Commercial Buildings – Final Report for the City and County of San Francisco" as a model for addressing the reduction of energy use in commercial buildings. It includes recommendations for requiring ENERGY STAR benchmarking beyond the 2007 California Assembly Bill 1103.
 - c) CARB should require the California Energy Commission (CEC) to adopt a plan for implementing the energy efficiency targets in SB 350 that (i)quantifies the expected reduction in energy use associated with particular strategies and (ii)that is incremental to the energy savings anticipated from ratepayer-funded energy efficiency programs and Title 24 on their current trajectories. The "2016 Existing Buildings Energy Efficiency Action Plan" does not quantify the energy savings anticipated from particular strategies, and many of the strategies outlined in the plan (such as increasing access to building energy use data), while necessary to scale investment in building energy efficiency, will not directly result in energy savings.
 - d) CARB should direct the California Public Utilities Commission to address current obstacles that effectively prevent ratepayer-funded energy efficiency programs administered by the utilities from incentivizing "fuel switching" from natural gas to electricity for space and water heating using heat pumps.
 - e) CARB should direct the CEC to develop compliance-based performance mechanisms for Title 24 that account for the carbon reduction benefits of fuel-switching in new construction. The existing "energy cost budget" approach for demonstrating compliance under the performance path puts electric space and water heating with heat pumps at a disadvantage, due to the higher operating cost of electric appliances, in spite of their emissions reduction benefits.

- f) In addition to recognizing the importance of reducing operating energy, steps should be included to reduce the embodied energy of materials and equipment. As operational energy goes down, the significance of energy embodied in materials increases. Currently, over a building's whole life, embodied energy accounts for roughly 20% of a building's total GHG footprint. However, in the first 20 years of a building's life, this can be 50% or more. In addition, as we approach zero-net operating energy, these numbers increase, eventually reaching 100%.

Low-carbon materials provide net GHG emissions reductions now, when GHG emissions reductions are most effective and are needed most because of the delayed impact of GHGs and the self-reinforcing loops that GHGs trigger. Low-carbon construction can reduce the embodied energy of a building by 30 to 50%, with 20% achieved through simple substitutions.

Rapidly renewable plant materials, wood, earth, and stone are the primary low-carbon construction materials. Use of rapidly renewable plants and wood products can actually sequester atmospheric carbon and could be assembled to create a carbon-negative house. Metal and plastics in general have a very high carbon footprint and should be avoided where possible. Concrete, while lower in embodied energy per pound, is used in such great quantities that its global warming impact tends to dwarf that of other materials used in construction. Where concrete is necessary, materials with a global warming potential 30% or more below standard mixes, as established by the NRMCA, should be specified.

- g) Equally troubling is the high global warming potential of several commonly used insulation materials. Because of the chemicals commonly used to expand the foam, extruded polystyrene and closed cell spray polyurethane often have an extremely high lifetime global warming potential. In a 2010 study by Buildinggreen.com ("Avoiding the Global Warming Impact of Insulation," by Alex Wilson, Environmental Building News, Vol 19.6), the payback from using extruded polystyrene and closed-cell spray polyurethane foam expanded with high global warming potential blowing agents as an additional insulation layer on the outside of a 2 x 6 framed and insulated house was a minimum of 30 years for a house in a very cold climate like Boston. With less than half of the heating and cooling loads of Boston, the payback time in Berkeley for a similar house would be a lot longer. Another study by Passive House researcher Rolf Jacobson shows payback periods of 20+ years from using these high global warming potential insulations to meet Passive House energy efficiency goals. ("Comparing 8 Cold Climate PH Houses," by Mary James, Home Energy Magazine, Oct. 2014)

By limiting the global warming potential of insulation materials to 0.05/sq. ft./R, highly insulated buildings will generally pay back the added carbon footprint of this extra insulation in five years at most. Manufacturers are developing safer alternative methods of expanding the foam.

- h) Finally, while heat pumps are essential to decarbonizing buildings, emphasis should be put on supporting heat pumps that rely on refrigerants with a low global warming potential. The most commonly used refrigerants, R134a and R410a, have a very high global warming potential (GWP) of 1430 and 2100, respectively, over a 100-year time period (IPCC 2007). While it is not known what the rate of leakage is for refrigerants, they can lower the environmental and GHG benefits of specific heat pump models. There are heat pumps, such as the Sanden heat pump water heater, that use CO₂ as a refrigerant, which

is preferable from both a climate and public health perspective.

- 4) Low Carbon Fuel Standard: As you know, the LCFS exempts all emissions associated with refined fuels that are exported for use outside the state from its allowance purchase requirements—and Bay Area refineries, for example, already increase exports when statewide demand for fuels declines, a trend which the Bay Area Air Quality Management District expects to increase over time. The LCFS pollution trading market does not ensure local reductions of PM, GHGs, and TACs, shirking CARB’s core mission to protect public health—and perpetuating the refining industry’s own shirking, the externalization of its costs as damages to public health and climate borne by all of us.
- 5) SB 1383:
 - a) While we concur with the importance of reducing Short-Lived Climate Pollutants whenever and wherever possible, it is this Scoping Plan Update—coming just three years before the State’s first climate goal, only 13 years before the 2030 goal—that must do a meaningful amount to develop and implement effective policies to reduce CO₂ emissions over the long term. The real work of reducing combustion cannot be pushed further into the future.
 - b) Eliminating a unit of combustion not only prevents criteria pollutants and GHGs from being released, but also protects residents from dozens or hundreds of combustion co-pollutants, most of which government will never have the time, resources, or personnel to characterize, let alone to monitor or control. Reductions in fine PM, TACs, GHGs, and other co-pollutants will result in economic benefits worth hundreds of millions or billions of dollars per year by reducing health care costs, improving productivity, reducing lost work and school days, and reducing necessary future expenditures on climate adaptation and disaster response.
 - c) Likewise, eliminating dependence on fossil combustion as quickly as possible is a direct and permanent method of reducing methane emissions. Investments in cleaning up fossil fuel infrastructure now will create additional stranded assets that need to be abandoned sooner rather than later. This expense should be minimized in favor of spending resources on permanent solutions.
- 6) 20% Refinery Sector Measure: We ask that CARB consider where California refining will need to be in 2030 and 2050 for the State to meet its climate targets. Does this measure ensure that those emissions are being reduced in a commensurate fashion through 2030? If not, how does California plan to achieve those reductions?

III. C. Economic Analyses:

- 7) We urge CARB to be more specific in identifying direct health impacts of Scoping Plan measures. If California is serious about the importance of promoting and protecting public health, then the costs and benefits of these direct health impacts should be incorporated into the economic analyses. Specifically:

- a) We urge CARB to improve the accuracy of the cost figures by including direct health benefits of avoided criteria and toxic air pollutants throughout the document, especially in the Pathways analysis, which is critical for comparing feasibility and cost of different measures to achieve GHG reductions (e.g., with respect to Scoping Plan Table III-3, page 65, the cost of implementing refinery controls and the RPS standard would be substantially lower if the cost savings for decreased hospitalization and medical care costs were included).
 - b) We urge CARB to include in the economic analysis cost savings from avoided cardiovascular diseases, breast cancer, diabetes, depression, and premature mortality that arise due to increased physical activity from effective active transportation solutions. This step will more accurately value active transportation solutions.
 - c) CARB's cost analysis of different measures and scenarios should include the savings from avoided cancer cases due to decreased diesel particulates.
- 8) We agree that the EPA Social Cost of Carbon is an appropriate starting point for considerations of GHG impacts, including health, and strongly support the Update's statement on page 61 that "The State will continue to monitor and engage in discussions related to any updates to U.S. EPA's SC-CO2 methods and values and initiate its own work to refine a SC-CO2 method and values for California." Furthermore:
- a) Eliminating combustion in a feasible and responsible manner will take many tiered actions over an extended period of time. CARB action *must* push that process along in parallel with quick action on SLCPs. The longer the glide path for business as usual, the less private and social economic disruption will be expected to occur. The State is not doing industry any favors with respect to their business planning by delaying meaningful action on combustion (including regulatory actions with future effective dates).
 - b) The Scoping Plan Update neglects to make explicit that if we do *not* make the emission reductions described, our standard of living is all but guaranteed to evaporate. This point needs to be made very clear. The choice to take climate action is taken not *instead of* maintaining our society's standard of living, but rather in an explicit attempt to preserve it.

III. D. Public Health:

- 9) Promoting and improving public health is the very first charge in the Air Resources Board's Mission. Public data and modeling indicates that PM_{2.5} and GHGs are responsible for almost all of the health and social costs from our air pollution and that there are *huge* public health benefits to reducing combustion of fossil fuels, even ignoring the climate protection benefits entirely.

CARB's action needs to reflect that reality. Is the State going after all the biggest gains and synergies in public health and climate protection? Is CARB doing everything in its power and authority to reduce and eliminate quantifiable health and social costs from wood burning, diesel and gasoline engines, natural gas combustion,

and petroleum refining in our communities' airsheds?

- 10) It is worth noting that wood burning, diesel engines, gasoline engines, burning natural gas, commercial cooking, mobile sources, landfills, livestock, wastewater treatment, refineries, and ships are all sources of both fine PM, which causes a majority of pollution-related health costs, *and* GHGs, which endanger a stable and healthy future for the State. *Thus, binding regulations to reduce emissions—including with future effective dates—must be utilized on these sources as soon as possible, wherever possible, to protect public health and the climate.*

Reduce combustion and you improve PM, GHG, TAC, and ozone all at once. *That* is a true multi-pollutant approach. Is CARB doing everything technically feasible to get us to the state's 2030 and 2050 GHG targets?

- 11) Health-related costs of air pollution are generally valued based on cancer risk, however public data makes clear that neurological damage, hormone disruption, developmental defects, and other permanent injuries may also result from TAC exposure, for example. How are these additional negative health impacts/costs valued? If they are not fully integrated into cost models, are the TAC risk estimates not severely underrepresenting the potential harm from exposure, and thus are the health benefits of reducing them not even higher?

To assign a cancer death that can be attributed to benzene emission a monetary value in your health burden and cost/benefit accounting while excluding, for example, the monetary cost of a child born with birth defects because of the same benzene exposure seems arbitrary. Doing so also clearly understates the economic cost of the pollution and inaccurately weights cost/benefit analyses against pollution control.

IV. A. Low Carbon Energy:

- 12) The fossil fuel industry will attempt to transition to other, lower-carbon fuels and to maintain that market as long as possible, despite the necessity and feasibility of electrification and extensive decarbonization. We are also wary of overly incentivizing the combustion of biomass—thus incentivizing the preservation, rather than reduction, of biomass sources—when we could be reducing waste over time through efficiency, biomimicry, and technological improvement, and instead be using renewable electricity for those applications. Bioenergy should in general be used only where logistically necessary (i.e., for applications that cannot yet be electrified) where it can be utilized on-site to offset energy load, or as created by ongoing operations of other processes.

IV. B. Industry:

- 13) The State's Oil and Gas Rule needs to be very robust. Local Air Districts are counting on CARB action. We ask that you consider what status oil and natural gas production, processing, and storage operations in the State will need to have in 2030 and 2050 to meet its climate targets. Does CARB's impending Oil and Gas Rule ensure that those emissions are being reduced in a commensurate fashion through 2030? If not, what is CARB's plan to achieve those reductions in the State?

- 14) Where will the natural gas distribution system in the State need to be in 2030 and 2050 for the State to meet its climate targets? Does CARB's Oil and Gas Rule ensure those emissions are being reduced in a commensurate fashion through 2030? If not, what is the State's plan to achieve those reductions?
- 15) The technologies for electrifying the buildings and transportation sectors are already being deployed; the primary obstacle to get on track maximizing GHG reductions from these sectors is a lack of political will. It is generally understood that decarbonizing industry will take longer, however. This isn't merely a matter of finding add-on controls, as has been much of the focus of air pollution control for decades, nor is it solely a matter of finding clean replacement technologies. In many instances, it will require re-engineering efforts and the rebuilding of portions of our industrial infrastructure. Your implementation actions should include education and collaboration components focused on different operational and source-type sectors. We encourage CARB to hold community forums for operators, researchers, and interested members of the public to inform all parties about the CARB's deep de-carbonization goals and encourage working partnerships to find solutions, including incentive funding, assistance from our educational institutions, and increasing regulatory action. All stakeholders need to be involved in this effort.
- 16) Increasing combustion efficiency is critical; however, given the advanced nature of the climate crisis and the gulf separating our society from its climate targets, we need to be thinking about how we are going to phase out most sources of combustion in the next 30 years. Where will fossil fuel combustion in the State need to be in 2030 and 2050 for the State to meet its climate targets? Does the Scoping Plan Update ensure those emissions are being reduced in a commensurate fashion through 2030? If not, what is California's plan to achieve those reductions?
- 17) What will need to be happening with diesel backup generators in 2030 and 2050 to ensure the State meets its climate targets? These devices will need to be phased out.
- 18) Decarbonization needs to be the goal in this sector. The use of combustion for heat and power must be eliminated wherever possible. Improving efficiency will not necessarily reduce PM and GHG emissions if it is not an explicit goal.
- Meanwhile, there are ample opportunities to decarbonize operations at facilities in the State—indeed, the brewing and server farm sectors have already taken significant steps. In the foreseeable future, energy storage capacity will obviate the need for back-up generators in many locations.
- Reducing fossil fuel combustion—by more means than just efficiency improvements—is already a feasible means of reducing ozone precursors at many stationary sources, as well as PM, TAC and GHG emissions, and this should be included as a core of the Scoping Plan Update.
- 19) Most scenarios under consideration include 20 to 30% reductions in refinery emissions, consistent with the legislative direction of AB197. We strongly support including specific targets for decreased refinery emissions, no matter which scenario is selected, both for certainty in decreasing GHG emissions and also for the Environmental Justice objectives of the Scoping Plan, since disadvantaged communities located close to refineries have disproportionately borne the burden of health hazards from toxic air pollutants. Our recommendations in this area include:

- a) The refinery reductions should be based **on reductions from a baseline of actual current facility-wide refinery emissions**, not for example from permitted capacity. The measurements of refinery emissions should also be based on **independent measurements**, and when calculations are required (e.g., per barrel), **calculations used should be transparent and readily verifiable** by independent sources.
- b) Also consistent with AB197, economic analyses of the scenarios should incorporate accurate measurements of the **direct costs of fossil fuel combustion, including the health impact of criteria and other toxic air pollutants**, in addition to an appropriate range of values for the social cost of carbon, reflecting GHG damages.

IV. C. Transportation Sustainability:

- 20) Robust local and regional transit is critical to reducing GHG emissions from transportation. Some local jurisdictions have already moved to require employers to either provide public transit subsidies or transit services directly to their employees. In the case of subsidies, this provides direct investment into public transit systems and provides a usage signal to transit agencies that they must expand service. We urge CARB to find avenues to expand employer mandates to support transit alternatives to single- and small-occupancy vehicles for commuting.
- 21) The rapid growth of employer-provided transit for commuting is a positive development. To maximize GHG emission reduction benefits from both these services and public transit agencies, rulemaking is necessary to require conversion to zero-emission buses. Electric buses are already in use and becoming cost-effective. Providing a clear pathway to mandate them is critical.
- 22) CARB should advocate for increased funding for the vehicle buyback program and “Plus Up” program and for incentives towards purchase of zero-emission vehicles. State clean air funds should exclusively go towards zero-emission vehicles. Funding a transition technology like plug-in hybrid vehicles that still combust fossil fuels and emit GHGs, PM, and other pollutants does not make sense when zero-emission technology exists.
- 24) CARB should advocate for increased funding for installing charging stations in workplaces, public on-street stalls and parking lots, apartment buildings, and low-income single family units, using grants or a revolving fund.
- 25) The CARB Scoping Plan is more aggressive than the California Transportation Plan regarding walking, calling for quadrupling that mode; and for biking, where the plan calls for a nine-fold increase. We fully support an aggressive acceleration of active transportation strategies, such as safe infrastructure for biking and walking commuting, to decrease emissions as well as improve health through physical activity.
- 26) CARB should incentivize MPOs, cities, and counties to support transit-oriented development.

Thank you again for offering the opportunity to comment on the 2017 Climate Change Scoping Plan Update—The Proposed Strategy For Achieving California's 2030 Greenhouse Gas Target.

Sincere regards, on behalf of over 12,000 350 Bay Area members,

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