Comments on the Draft 2022 Scoping Plan Update
submitted by Kenneth Johnson (June 14, 2022)

The meaning of "ambitious" in the context of California's statutory mandates

The 2022 draft Scoping Plan is characterized as "ambitious and aggressive … comprehensive, far reaching, and transformative …". But the true scale of CARB's ambition only becomes apparent when you get to the last sentence of Appendix H:

> "… Achieving carbon neutrality in 2045 under Alternative 3 will cost California households an average of $6 a month in income 2045."

Only $6?? Is the cost of *two coffee cups per month* all that Californian households would be able or willing to spend to avert catastrophic and irreversible climate change?

In macroeconomic terms the projected cost of the proposed plan relative to the reference scenario amounts to a mere 0.1% of Gross State Product. To put that in perspective, if current trends continue, the annual cost of climate change in the U.S. is projected to reach 4% of GDP by 2070 (continuing to increase thereafter), and would reach 1.5% in 2070 even if global GHG emissions are eliminated by 2050.[1] Is California, the world's fifth largest economy and the standard bearer in global climate action, unable to muster a commitment of more than 0.1% of its GSP to forestall the most severe impacts of climate change?

More to the point, would the proposed plan achieve the "maximum technologically feasible and cost-effective greenhouse gas emissions reductions" required by California statute?[2,3] CARB makes no claim that it would.

To give meaning and effect to the statute, CARB would need to make a determination, for each of the evaluated Scoping Plan alternatives, of whether the alternative would be technologically feasible and cost-effective. CARB would then need to select, from the alternatives that are deemed to be feasible and cost-effective, the option that achieves the maximum greenhouse gas emissions reductions. All four alternatives appear to be feasible, and the draft plan discusses their costs in depth. For example, Alternative 1, which exhibits the greatest GHG emissions reductions, is projected to reduce GSP by 0.6% in 2045. That is relative to a growing economy; even with the reduction the GSP is projected to increase from $3.2 trillion in 2021 to $5.07 trillion in 2045, only marginally less than the $5.1 trillion expected in the reference scenario. The difference amounts to $45 per month in household income. (In 2035 the cost would be a little

[1] Deloitte. 2022. *The Turning Point: A New Economic Climate in the United States*. (cited at footnote 52 in the draft Scoping Plan)
https://www2.deloitte.com/content/dam/Deloitte/us/Documents/about-deloitte/us-the-turning-point-a-new-economic-climate-in-the-united-states-january-2022.pdf
[2] Assembly Bill 32 (AB 32) (Núñez and Pavley, Chapter 488, Statutes of 2006)
https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200520060AB32
[3] Senate Bill 32 (SB 32, Pavley, Chapter 249, Statutes of 2016)
https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB32

higher, $79 per month.) Based on those cost projections, would Alternative 1 be cost-effective according to the statutory requirement? CARB doesn't say.

A least-cost policy framework is not "ambitious".

CARB might be reticent to pursuing a more ambitious climate action agenda because the most ambitious plan would also be the most uncertain and most at risk of exceeding limitations of feasibility and cost-effectiveness if a traditional caps-and-standards regulatory approach is used. A primary limitation of Alternative 1 cited in the draft is its "High degree of uncertainty due to highest pace of clean energy and technology deployment and adoption". Add to that the unforeseen impacts of events such as recessions, pandemics, foreign wars, etc., and it becomes near impossible to predict limits of feasibility and cost-effectiveness based on the kind of economic modeling and forecasting that the draft plan relies on. To mitigate the uncertainty, CARB has selected the most cost-conservative rather than the most ambitious plan alternative.

The consequence of CARB's cost conservatism is illustrated by the transportation industry. California's target of 100% ZEV sales by 2035 could be outpaced by current market trends. The Scoping Plan forecasts 110,000 LDV BEV sales in California in 2021[4], but the reported 2021 sales number is actually 184,000[5]. In the U.S. market, EV's currently have a price premium of around 40% relative to ICE vehicles, but EVs have lower lifecycle costs due to their low charging and maintenance costs.[6] Moreover, the EV premium is already down to 10% in China, and will likely cross the price parity threshold within a couple years as new battery technologies enter the market and supply chain bottlenecks open up.[7,8,9] And as EV technology costs decline it might become possible, perhaps with regulatory incentives, to accelerate the phase-out of ICE vehicles via EV conversion kits, which some manufacturers are now offering.[10,11]

---

[4] AB 32 GHG Inventory Sectors Modeling Data Spreadsheet, LDV Sales
https://ww2.arb.ca.gov/sites/default/files/2022-05/2022-draft-sp-PATHWAYS-data-E3.xlsx

[5] *California passes 1M mark for cumulative sales of electric vehicles: BEVs, PHEVs and FCEVs*, Green Car Congress, 26 February 2022
https://www.greencarcongress.com/2022/02/20220226-caliev.html

[6] MOST ELECTRIC VEHICLES ARE CHEAPER TO OWN OFF THE LOT THAN GAS CARS, Energy Innovation, by Robbie Orvis, May 2022
https://energyinnovation.org/wp-content/uploads/2022/05/Most-Electric-Vehicles-Are-Cheaper-Off-The-Lot-Than-Gas-Cars.pdf

[7] IEA Global EV Outlook 2022
https://www.iea.org/reports/global-ev-outlook-2022

[8] *Battery Metals Watch: The end of the beginning*, Goldman Sachs Commodities Research, 29 May 2022
https://www.goldmansachs.com/insights/pages/gs-research/battery-metals-watch-the-end-of-the-beginning/report.pdf

[9] *Gotion High-Tech to Mass Produce 360Wh/kg Semisolid-State Battery in 2022*, Pandaily, May 27, 2022
https://pandaily.com/gotion-high-tech-to-mass-produce-360wh-kg-semisolid-state-battery-in-2022/

[10] *Retrofitting Older Cars with Electric Motors Could Transform Transport*, Discovery, by Robin Fearon, November 01, 2021
https://www.discovery.com/motor/retrofitting-older-cars-with-electric-motors-could-transform-tra

[11] *Converting Your Gas-Powered Car to Electric*, Treehugger, by Justin Thomas, May 22, 2022
https://www.treehugger.com/converting-your-car-to-an-electric-vehicle-4858603

These types of unforeseen opportunities in transportation and other sectors could make it possible to accelerate decarbonization of the California economy well in advance of the 2030 goal. But CARB's target is uninfluenced by such opportunities. Moreover, CARB's cap-and-trade system operates to ensure that statewide emissions in capped sectors are not impacted by unforeseen technology and market breakthroughs, or by complementary policies and actions. Emissions in capped sectors, which account for about 80% of California's total emissions, are determined by the supply of emission allowances. To the extent that the allowance supply is predetermined and controlled by CARB, statewide emissions in capped sectors cannot be reduced below the 2030 target. Efforts to reduce emissions will only free up surplus emission allowances, resulting in increased emissions somewhere else.

The draft plan says "The state can lead by engaging Californians and demonstrating how action at the state, regional, and local levels of government, as well as action at community and individual levels, can contribute to addressing the challenge before us. ..." But the state cannot make any such demonstration as long as cap-and-trade remains the cornerstone of its climate policy, because cap-and-trade operates to nullify the environmental benefit of local and individual climate actions. This perversity of cap-and-trade stems from its fundamental policy objective, which is to achieve a predetermined emissions target at minimal cost. That objective contravenes CARB's statutory mandate to achieve the "maximum technologically feasible and cost-effective greenhouse gas emissions reductions". Regulatory policy can be constructed to either minimize costs or minimize emissions; it can't do both at the same time. The statute requires minimization of emissions. Cap-and-trade operates to channel the benefits of technology advances, market opportunities, and local or individual climate action toward minimizing compliance costs, not toward minimizing statewide emissions.

CARB's interpretation of the statutory "statewide greenhouse gas emissions limit" as a predetermined "target" effectively renders meaningless the qualifier "maximum" as applied to greenhouse gas emissions reductions.[12] The reductions cannot be maximized if they are predetermined.

A variety of adaptive design features – a price floor and ceiling, price containment points, reserve accounts – have been incorporated into California's cap-and-trade system to partially overcome its deficiencies, but these adaptations don't address the fundamental contradiction between cap-and-trade's core policy objective and California's legislative policy. The primary benefit of cap-and-trade, a guaranteed emissions cap, is forfeited by the price ceiling. In any case, the guarantee would be of little value unless the cap is environmentally adequate, in which case there would be no need for a price floor. A price floor is established in recognition of the cap's inadequacy, but if the price ceiling within limits of feasibility and cost-effectiveness then any price floor less than the ceiling will fail to incentivize the maximum feasible and cost-effective emissions reductions.

[12] *Comments on the AB 32 Proposed Scoping Plan*, submitted by Ken Johnson on December 8, 2008 https://grist.org/wp-content/uploads/2009/07/1422-psp_comments2_kenjohnson.pdf

Price-regulated policies could be far more ambitious than CARB's proposed plan.

Assuming that CARB's 2030 statewide emissions target is feasible and cost-effective, a policy directed toward achieving the *maximum* technologically feasible and cost-effective greenhouse gas emissions reductions would automatically achieve, and likely surpass, the target. The problem of predictive uncertainty can be circumvented by employing policies that regulate emission prices or price incentives directly, thereby maintaining price stability in the face of varying and unpredictable market conditions. (Price regulation could supplement, not supplant, CARB's existing standards-based regulations.) Price-constrained policy instruments include carbon taxes and fees, feebates, refunded emission payments, feed-in tariffs, subsidies, financing, and investments.

An exemplary historical example of price-constrained policy is Germany's feed-in tariff (FIT) program, which catalyzed rapid capacity expansion and cost reductions in renewable energy to the point where unsubsidized wind and PV have now become the least costly utility power sources. At its outset in the early 2000's, the FIT program subsidized renewable energy at a rate of 45¢/kWh, equivalent to a carbon price of about $450/MTCO2e based on substitution for coal. (A carbon price of $450/MTCO2e would have had the same impact on the relative price disparity between renewables and coal power.) However, the program was financed by a relatively modest surcharge on consumer electricity bills initially amounting to only 0.56¢/kWh, which is roughly equivalent to a $5.60/MTCO2e carbon price. (The surcharge was about 3% of household electricity costs.) That was possible because renewables initially comprised only a small fraction of Germany's energy market, the financing costs were distributed over a large ratepayer base, and the surcharge revenue was allocated solely toward financing renewable energy.[13] As renewables gained market share the surcharge increased (even as renewables' energy price plummeted) to the point where it has now reached 3.7¢/kWh (comparable to a $37/MTCO2e carbon price). The surcharge is being terminated as of July 1, 2022 to eliminate the disincentive for electrification of Germany's economy (and also to alleviate high energy prices resulting from Russia's invasion of Ukraine).[14]

Similar price incentive policies could be applied to accelerate nascent low-carbon technologies such as green cement, green steel, sustainable aviation fuel, etc., which are now at the stage where renewable energy was ten or twenty years ago. But price competitiveness is not a limitation for mature technologies that have already reached price parity with fossil fuels, such as wind and PV power, electric vehicles, and high-efficiency electric home appliances. Other obstacles, such as financing, regulatory burdens, grid infrastructure, supply chains, labor shortages, consumer education, etc. need to be overcome to unlock the market potential of such technologies.

---

[13] Feed-in tariffs in Germany, Wikipedia
https://en.wikipedia.org/wiki/Feed-in_tariffs_in_Germany

[14] *Germany drops renewables surcharge, household bills to fall by €300*, RenewEconomy, by Kerstine Appunn, 1 May 2022
https://reneweconomy.com.au/germany-drops-renewables-surcharge-household-bills-to-fall-by-e300/

To achieve the most ambitious climate goals, consumers will need to become investors.

A truly transformative climate policy, one that would be replicable on a national and global scale, would leverage the investment potential of clean energy[15] (unlike traditional carbon pricing policies that capitalize on the economic value of carbon emissions). State and local governments could offer individuals and businesses investment opportunities, e.g. via bond auctions to finance home electrification, or utility Green Power options that return dividends, etc., enabling citizens of California to collectively control the scale and pace of the state's decarbonization efforts (beyond minimal statutory requirements) through their investments. Engaging consumers as investors could increase the supply of capital for the clean energy transition, it would help mitigate wealth concentration and inequality, and it would enable municipal governments to recycle dividends back into local economies via locally-financed community investments. On the national level, the limitations of consensus politics and partisan polarization could be circumvented by the collective actions of individuals advancing national decarbonization goals through their investments and personal actions.

An ambitious and adaptable climate policy should empower complementary climate action.

An effective Scoping Plan would constitute a business plan for decarbonization of California, which is sufficiently flexible to accommodate and take advantage of unforeseen technology advances and market conditions, and which empowers individuals, businesses, communities, and municipalities to influence the scale and pace of decarbonization through their collective actions and investment choices.

Questions for CARB

The following questions pertain to CARB's implementation of Sections 38566 and 38562(b)(1) of the Health and Safety Code through its existing and proposed regulations including those proposed in the Draft 2022 Scoping Plan and the Draft Environmental Analysis.

Section 38566 provides that "In adopting rules and regulations to achieve the maximum technologically feasible and cost-effective greenhouse gas emissions reductions authorized by this division, the state board shall 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." (This provision is paraphrased in the first Project Objective stated in the Draft Environmental Analysis.)

Question 1: According to CARB's interpretation of HSC-38566, does the qualifier "maximum" apply to statewide greenhouse gas reductions, and does the qualifier have actionable meaning?

[15] *Climate Infrastructure Investing: Risks and Opportunities for Unlisted Renewables*, IEA, March 2022. (Also see the two earlier companion reports.)
https://www.iea.org/reports/climate-infrastructure-investing-risks-and-opportunities-for-unlisted-renewables

Question 2: Does CARB recognize any statutory requirement to attain GHG emissions reductions significantly more than 40 percent below the HSC-38566 statewide limit by 2030, to the extent that such further reductions are technologically feasible and cost-effective?

Question 3: Has CARB made any determination of whether GHG emissions reductions significantly more than 40 percent below the HSC-38566 statewide limit by 2030 could potentially be feasible and cost-effective, and if so, what was the result of such determination?

Question 4: Has CARB enacted or proposed any specific regulatory measures to incentivize feasible and cost-effective emissions reductions significantly more than 40 percent below the HSC-38566 statewide limit by 2030?

Section 38562(b)(1) provides that the state board shall "Design the regulations, including distribution of emissions allowances where appropriate, in a manner that is equitable, seeks to minimize costs and maximize the total benefits to California, and encourages early action to reduce greenhouse gas emissions." (This provision is not expressly reflected in the stated Project Objectives of the Draft Environmental Analysis.)

Question 5: Has CARB enacted or proposed any specific regulatory measures or taken actions to encourage and support early action directed toward achieving feasible and cost-effective emissions reductions significantly more than 40 percent below the HSC-38566 statewide limit by 2030?