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CARB Board & Executive Leadership
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Revised Scoping Plan Environmental Assessment

Members of the CARB Board and Executive Leadership:

We again write on behalf of our civil rights client, The Two Hundred, with comments on on the revised Scoping Plan (SP) Environmental Assessment (EA). These comments are further informed by CARB's incomplete responses to our Public Records Act (PRA) on the SP, EA, and related documents. We note further that CARB's "rolling response" to these PRA requests is ongoing, with the latest production happening this week, and restate our request that no action be taken on the Scoping Plan until full disclosure of these PRA documents has occurred, and that ample time be provided for public review and informed feedback before CARB takes any action on the proposed 2024 Scoping Plan.

We note first that CARB's responses fail to meaningfully address any of the clearly articulated, reasonable questions raised in our comments and in our PRA requests. To pick just one example, CARB continues to fail to disclose how the SP equipment deployment, energy, and social impact costs were calculated. The responses instead show that the SP, the SP EA, and related published public documents omit and obscure materially important information about the SP costs and physical and social impacts. The responses also raise new questions about the consistency, sufficiency and basis of the SP cost and impact claims.

Representative examples of these issues include the following:

1. Vehicle Miles Travelled. The PRA responses do not provide any of the missing information in the SP and SP published documentation concerning the cost and amount of emission reduction achieved by what was originally misrepresented in the draft SP as only a 23% reduction in per capita VMT by 2045. We note that the revised SP disclosed for the first time that that the VMT reduction target is now 30% reduction in per capita below 2019 by 2045. Although the SP focuses heavily on the need for this VMT reduction to not "miss" the 2045

"target," none of the responses provide any quantification of emission cuts that would be caused by reducing VMT. The responses also fail to document the extent to which the SP 2045 "target" would be exceeded if VMT did not decline or remained on the trendline depicted in the SP.

CARB's failure to disclose this VMT data, coupled with the SP's acknowledgment that all past VMT reduction targets have been missed, per capita VMT actually continues to rise (except during the pandemic lock-down), the California Legislature's repeated refusal to mandate VMT reductions, and the record before CARB in its ACC-II rulemaking which included extensive testimony from rural and urban drivers, essential workers (including union workers), the more than 1,000,000 unauthorized immigrants who have obtained Drivers' Licenses under civil rights legislation enacted less than a decade ago (all of whom include members of communities of color), and the expert conclusion of CARB Board's own nationally-renowned transportation expert, Dr. Sperling, who advised CARB's Board and staff in the May CARB public hearing on the SP that even the 23% VMT reduction target could "never" be achieved, means that there is no substantial evidence that the VMT reduction target is feasible, lawful, or supported by substantial evidence in the record. This is only one of several dozen fatal flaws in the SP, as documented in our prior comment letters.

The VMT reduction mandate (along with GHG) is also, as newly documented in the revised SP, identified as a claimed legal deficiency in two-thirds of the anti-housing lawsuits filed under the California Environmental Quality Act (CEQA). As noted in the academic paper on housing that was apparently commissioned by, and is cited extensively by CARB in the revised SP (inclusive of appendices), California climate policy is implemented through CEQA. This is legal truth - as further explained in our comment letters, our pending lawsuit against the CARB Scoping Plan as also submitted as comments on the new SP, and in the CEQA Guidelines and VMT/GHG guidance documents completed by the Office of Planning & Research - is willfully ignored by CARB's many assertions that the SP is merely aspirational, is not self-implementing, and has no discernable environmental, equity, or economic consequences to California. The SP is not, in fact, merely aspirational: it is self-implementing through CEQA, where CARB's own experts agree its GHG and VMT prescriptions are routinely (in two-thirds of lawsuits!) weaponized to oppose housing projects and plans to address what both the Governor and Legislature have formally identified as a massive (and worsening) housing crisis.

We again restate our request that the 2022 Scoping Plan provisions relating to VMT and housing be deleted in their entirety. To willfully continue to deprive communities of color of housing that is affordable to members of our communities, even to union-led households earning median incomes, is knowing and intentionally racist. We raised these issues in 2017, and our lawsuit against CARB remains pending notwithstanding CARB's unsuccessful argument - in court pleadings and in oral argument - that our lawsuit should be dismissed in in part because CARB is entitled to adopt racist housing policies under the California and Federal Constitution.

This is a shocking, immoral, and illegal defense which should be condemned, not advanced by a purportedly progressive agency led by Democrats.

The remainder of this comment letter dives deeply into just this one issue - VMT, which our many prior comment letters and data have shown is inextricably linked to the feasible construction of the millions of new homes required by state housing laws and state approved Sixth Cycle Housing Elements to be dispersed throughout California's communities where driving is the only practical transportation mode choice for most daily chores, as well as the state's Governor and Legislative leadership.

And to cite simply one egregious example of the numerous fatal flaws in the EA prepared for the SP, only by reviewing CARB's belated and partial production of documents under our PRA did it become clear that the EA never analyzed the environmental consequences of the Scoping Plan in relation to the mandatory "baseline" of the existing California environment. Instead, the "scenario" impact evaluation methodology used in the EA simply compared the 2017 SP to the 2022 - a "plan to plan" analytical methodology that has been rejected for decades as unlawful under CEQA.

More technical comments follow on just this VMT issue, as an example of the legally inadequate EA and related SP documentation.

The responses (e.g., spreadsheet "VMT Offset_101521_App_E_part3"), and a notation in the sheet stating "VMT (LDV only)" indicate that the SP VMT requirement is meant to only apply to light duty vehicles (LDVs). The total (apparently daily) LDV VMT, total state population, per capita daily VMT, and annual VMT based on 365 days per year, and the percent change from 2019 to 2045 disclosed in the responses is shown in Table 1.

	Total VMT	Population	Per Capita VMT	Est. (x365) Annual per capita VMT
2019	977,494,297	39,761,195	24.6	8,973
2045	904,524,625	47,692,488	19.0	6,923
Percent change	-7%	20%	-23%	-23%

This information conflicts with the VMT per capita LDV estimates published for the proposed SP action Alternative 3 (Alt 3) in spreadsheet "2022-draft-sp-PATHWAYS-data-E3," a copy of which was also provided in the responses. As noted in the PRA requests, the E3/PATHWAYS data shows (apparently annual) per capita LDV VMT in at 8,560.893407 for 2019 and 6004.211399 in 2045, a 30% reduction by 2045. The E3/PATHWAYS model results are one of the most important sources of SP planning and impact analysis purposes. Nevertheless, the responses do not address the major inconsistencies between the E3/PATHWAY and the VMT Offset_101521_App_E_part3 2019 and 2045 VMT data and reduction magnitudes.

The VMT Offset_101521_App_E_part3 VMT responses assume that state population will grow substantially by 2045. California, however, has in fact been losing population over the last two years at an average rate of 148,818 people per year. The extent of future growth, if any, is

speculative. The state's current population is significantly lower than apparently assumed in the VMT analysis at 39,185,605 people. If the state's population is stabilized at its current level, daily per capita VMT in 2045 would be 23.083. Even if the need to reduce total LDV VMT to 904,524,625 miles per day is required, which the SP and the PRA responses fail to document, existing population trends may significantly reduce or avoid any such reduction.

2. SP Implementation Costs and Impacts from Existing Baseline Conditions, not a "BAU Scenario." The PRA requests sought the documentation used by CARB staff to calculate and evaluate the reasonableness of the full cost and impacts required by SP implementation, including the legally required SB 197 disclosures concerning the cost effectiveness of each SP emission reduction measure. The SP and related published documents obscured this crucial information by only characterizing "incremental" SP costs and physical changes to the environment relative to an insufficiently described BAU Reference Scenario (BAU). The BAU reference scenario is not current conditions, but instead appears to be an unquantified estimate of reasonably foreseeable future conditions if the Scoping Plan is not adopted. None of the documentation provided quantifies "BAU" in relation to the costs and impacts that are not borne by Californians today, and accordingly constitute an unlawful "[BAU] plan to [Scoping] plan" analysis that violates CEQA, which requires an environmental analysis of the "whole of the project" on the existing physical environment - and under SB 197, which requires the same disclosure of costs and disparate impacts in relation to those currently being borne by Californians.

These BAU incremental costs are precisely the cover-up tactic unlawfully used by CARB to hide NOx emissions increases, and cost and other impact consequences, under CARB's notorious POET I and POET II appellate court losses which confirmed the scope and magnitude of CARB's violation of applicable laws including CEQA

SP Implementation Costs and Impacts were further obscured by deflating future spending using undisclosed factors to reflect what were claimed to be "constant" dollars. The responses fail to sufficiently clarify either the magnitude of the SP implementation requirements relative to existing condition, or the estimated spending in current, unadjusted dollars. Instead, the responses deepen concern about the lack of transparency in the SP cost and impact analysis.

The responses suggest, for example, (e.g. spreadsheet "Task 4 Cost Results_20220325") that California can reduce GHG emissions by 2.7 billion tons from 2022 to 2045 at a total cost of just $586 billion (Table 2). However, the cost estimate still reflects the net increase from BAU and uses synthetic, deflated 2021 dollars over time. The responses merely clarify the extent to which these estimates reflect highly aggregated, undocumented estimates that fail to disclose, or provide the legally required analysis of the cost effectiveness of each SP emission reduction measure in each sector. This failure violates the Public Records Act, CEQA, SB 197, and AB/SB 32 itself.

Table 2 : Average Measure Cost, Cost per ton CO2e, and Total Cumulative Incremental Cost for Alt 3 v. BAU, 2022-2045								
	Industry	OGE & PR	Transportation	Buildings	Non-combustion	CDR	Electric Sector	Total
Cost ($ millions)	*$60,165*	*$20,600*	*-$118,368*	*$178,414*	*$23,515*	*$404,335*	*$17,798*	*$586,459*
GHG Cuts (MMT CO2e)	*166*	*540*	*924*	*298*	*234*	*542*	*36*	*2,741*
Cost per Ton C02e	*$361*	*$38*	*-$128*	*$598*	*$100*	*$745*	*$497*	*$214*

As shown in Table 2, the responses suggest that 924 million tons of emissions can be cut from the state's "transportation" sector by reducing spending by -$188 billion from BAU levels over 2022-2045. The values reported for this single sector are aggregated from assumptions, none of which appear to be documented, in multiple spreadsheets that cannot be transparently evaluated. Instead, the documentation provided by CARB simply show that the "transportation" sector is an aggregate of assumed annual equipment stock changes, combustion fuel and electrical demand, the assumed annual costs required to buy new equipment, combustion fuels and electricity, for several subsectors, including buses, heavy duty trucking, freight rail, harborcraft, light duty vehicles, medium duty trucking, ocean going vessels, passenger rail and aviation. Each subsector's stock, fuel and electricity demand must be separately extracted the spreadsheets for both the BAU and Alt 3 to verify the reported results.

The cumulative costs from 2022-2045, in adjusted 2021 constant dollars, are shown for the LDV subsector in the in Table 3.

Table 3: 2022-2045 LDV Costs in 2021 Dollars			
	BAU	Alt 3	Difference from BAU
Fuel	$775,252,184,230	$521,134,952,917	($254,117,231,313)
Diesel	*$651,553,878*	*$649,682,564*	($1,871,314)
Gasoline	*$769,524,696,194*	*$504,519,822,303*	($265,004,873,891)
Hydrogen	*$5,075,934,158*	*$15,965,448,049*	$10,889,513,891
Stock Costs	$1,913,020,885,950	$1,980,224,221,765	$67,203,335,815
Electricity	$76,634,350,403	$107,429,676,612	$30,795,326,209
Total	**$2,764,907,420,583**	**$2,608,788,851,293**	**($156,118,569,290)**

According to these estimates, the constant dollar cost of equipment (stock), fuels, including diesel, gasoline and hydrogen, and electricity required to buy and operate the state's LDV fleet from 2022 to 2045 will be $2.74 trillion in the BAU and $2.6 trillion in Alt 3. Stock costs will be $67 billion higher in Alt 3, only 3.5% more than in the BAU, but combustion fuel costs will be $254 billion lower, a 32.8% reduction from BAU levels. The responses show that fuel and stock costs (but not electricity) are estimated and aggregated for each of the transportation subsectors to calculate a net change from BAU for the transportation sector as a whole (Table 4). The results indicate that new equipment (stock) costs will be $197.8 billion higher than in the BAU, but fuel costs will be $385.66 billion lower.

Table 4: 2022-2045 Net Difference in BAU and Alt 3 Stock and Fuel Costs, All Transportation Subsectors		
	Stock Costs	Fuel Costs
Buses	$0	$179,845,221
Heavy Duty Trucking	$31,498,395,423	-$68,431,966,456
Freight Rail	$14,095,097,732	-$14,008,435,726
Harborcraft	$0	-$7,636,939,486
Light Duty Vehicles	$67,203,335,814	-$254,117,231,313
Medium Duty Trucking	$81,870,047,063	-$61,952,505,568
Ocean Going Vessels	$1,040,651,569	$118,586,546
Passenger Rail	$1,047,843,080	-$1,021,452,415
Aviation	$1,045,613,535	$21,209,243,741
Total	**$197,800,984,216**	**-$385,660,855,456**

The responses show that after the stock and fuel costs have been aggregated from annual estimates for each subsector in the BAU Alt 3, and the difference between Alt 3 costs and the BAU are calculated, the total electricity cost for the transportation sector as a whole is added to the analysis. As shown in Table 5, the responses indicate that total electricity costs for transportation will be $69.49 billion more than the BAU. When added to the fuel and stock cost differences between Alt 3 and BAU, the total Alt 3 implementation "cost" for all transportation sectors combined is $118.36 billion less than the BAU. This value is reported as the sector total in the responses as shown in Table 2 (highlighted column).

Table 5: 2022-2045 Net Difference in BAU and Alt 3 Stock, Fuel and Electrical and Total Costs, All Transportation Subsectors			
Stock Costs	Fuel Costs	Electricity Cots	Total
$197,800,984,216	-$385,660,855,456	$69,491,375,350	-$118,368,495,890

Emissions reductions over time are separately estimated for the BAU and Alt 3 for what appears to be major types of fossil fuels, of apparently electricity generated from fossil fuels, used in each sector. For the transportation sector, the estimates appear to include compressed pipeline gas, diesel, electricity, gasoline and kerosene-jet fuel, although some fuels are missing from certain years (for example, kerosene-jet fuel emissions in tab "Energy GHGs (units of MMT CO2e)" in sheet "Task 4 Cost Results_20220325" are estimated for 2044 and 2046 but not in 2045 for some reason). Total transportation emissions aggregated from these estimates during 2022-2045 for the BAU (2.71 billion tons) and Alt 3 (1.786 billion tons). Based on these results, the responses indicate that Alt 3 emissions will be 924 million lower tons than in the BAU. As shown in Table 2, the net cost difference, -$118 billion, is divided by the net emissions difference, 924 million to indicate that the cost avoided emissions for implementing the SP transportation measures will be -$128 per ton. If BAU is taken as the appropriate baseline, and the thousands of annual stock, combustion fuel and electricity cost and emission estimates for each subsector are accurate, the SP transportation measures would save the state billions of dollars compared with doing nothing. The SP cost and impact analysis based on changes from BAU, however, is deficient for several reasons:

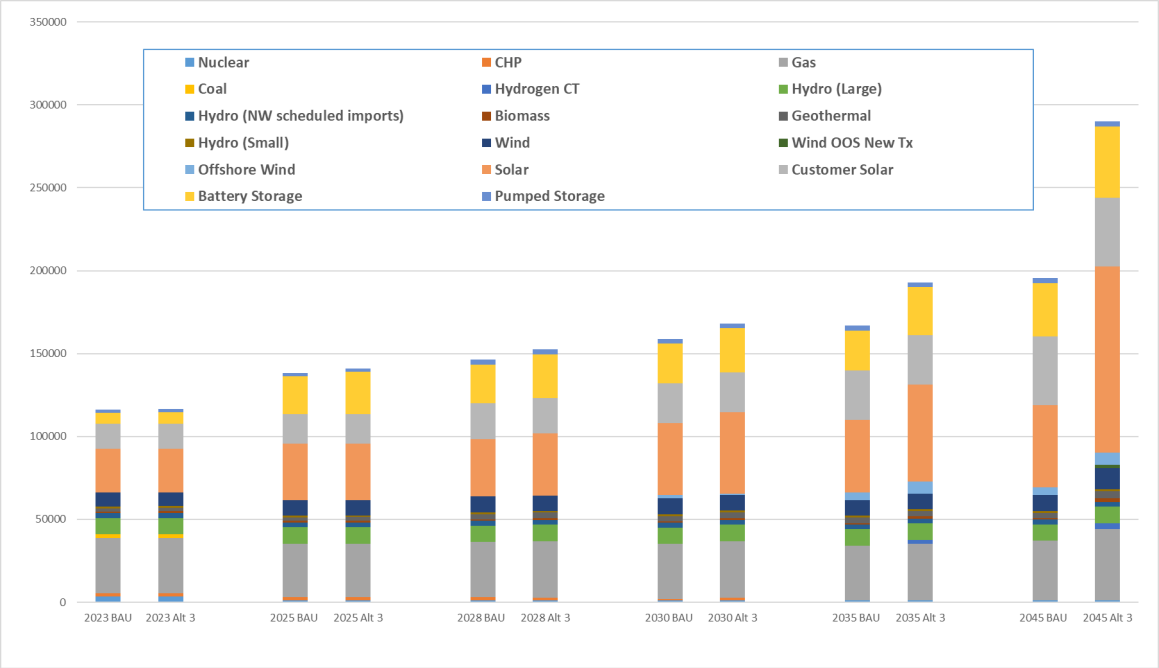
a. *Fundamental elements and related costs of the SP are attributed to BAU even though the 2022 SP modifies, and must disclose the cost of these elements.*

- As shown in response spreadsheet "12 LDV Stocks by Vehicle Type (Millions of Vehicles)," Alt 3 requires that only 5 of 30 million vehicles use fossil fuels in 2045 compared with 18.7 million in the BAU. Nevertheless, possibly due to the use of constant dollar future expense deflation, about 70% of the total LDV electrical costs in Alt 3 ($107.4 billion) is also projected to occur in the BAU ($76.6 billion) (see Table 3). While transportation and other sector electrification is clearly a major focus of the SP, implementation costs are obscured by assuming that a significant amount of SP implementation is part of the BAU baseline and subtracted from Alt 3 costs.

- Hydrogen fuels are discussed with substantially enhanced detail for the first time in 2022 SP, but nearly all of the requisite raw material, distribution, storage and energy equipment, operations and other costs are not quantified in the SP due to future uncertainty. Nevertheless, as shown for LDVs in Table 3 (Alt 3 hydrogen costs of $15 billion are reduced by $5 billion, or one-third, attributed to the BAU). Due to the unique focus in the SP on manufacturing and using hydrogen fuels in California, SP implementation impacts and costs should not be reduced by attributing significant hydrogen development and use to the BAU.

- About half of the total expansion of electricity generation capacity from 120,000 MW in 2022 to 294,000 MW in 2045 would also occur in the BAU. Subtracting the BAU from SP implementation means that at least half of the cost and physical impact, and due to constant dollar deflation of latter year spending, which accelerates after 2035 in Alt 3, almost certainly a greater proportion of costs, is not attributed to the SP (Figure 1). The SP is the planning document that controls California's energy future, and all costs and physical impacts associated with achieving the total 2045 generation and other implementation goals must be attributed to SP implementation.

Figure 1: Total Electrical Generation Capacity (MW), BAU and Alt 3 (from response spreadsheet RESOLVE_summary_060720220)



- Response spreadsheet "2022SP_Scenarios_SC-CO2 and SC-CH4 calc_2021dollars" indicates that the highest estimated social cost of carbon considered in SP planning is $130 per ton. Even when Alt 3 costs are calculated by subtracting assumed BAU expenses for the same required development and spending, and using constant, future cost-delating dollars, the responses show that the cost per avoided ton of emissions for several aggregated sectors, including industry, buildings, the electrical sector and for the SP implementation overall exceeds $130 per ton. To provide a transparent and accurate measure of SP impacts and costs, all measures required to achieve future SP objectives must be included in the analysis.

b. *There is no apparent rationale, or apparent method to evaluate the basis for almost all of the unit stock, energy, electricity or other costs assumed for every sector and subsector in the BAU and Alt 3 datasets in the responses.*

- Response spreadsheet "12 LDV Stocks by Vehicle Type (Millions of Vehicles)," for example, projects that there will be 30 million LDVs in California by 2045. Only 5.1 million will be ICE in Alt 3 compared with 18.7 million in the BAU. Alt 3 requires deployment of 17.9 million EVs by 2045 compared with 6.59 million in the BAU. EVs are substantially more expensive

than ICEs, and predictions that costs will equalize over time have failed to materialize. Nevertheless, as shown in Table 3, the responses assert, without any supporting documentation, that there will less than a 4% difference in LDV stock costs between the scenarios.

- Although the SP provides almost no information concerning hydrogen manufacturing, distribution and water and energy sources and costs, BAU and Alt 3 hydrogen costs for multiple sectors, including the LDV subsector, are estimated to several digits of precision. The responses provide no apparent basis for calculating hydrogen costs given the lack of detail in the SP.

- No basis is provided for the estimated combustion fuel and electricity costs for any BAU and Alt 3 sector or subsector in the responses despite historical and current evidence that these costs, particularly with growing renewable generation capacity, are subject to substantial and rapid volatility.

- No documentation is provided for the estimated emissions for each sector and subsector, including any information concerning emission reduction technology improvements that have occurred in the past and are likely to occur in the future.

c. *The use of constant dollars for future cost projections requires that future inflation and interest rates be predicted, an inherently speculative endeavor subject to high volatility, and none of the factors used to calculate constant dollars are provided in the responses or the SP.*

d. *As documented for the transportation sector and LDV subsector above, the responses aggregate and do not identify specific measure costs, emission reductions, and reduction effectiveness as required by SB 197.*

3. The responses include electrical generation information that nowhere appears in the SP or in the SP CEQA documentation and that raise significant new questions concerning the feasibility and desirability of alternatives energy development scenarios.

The responses (e.g., response spreadsheet "RESOLVE_summary_06072022") show that 3,300 MW to 1,000 MW of nuclear power capacity will be used in California and generate from 26,885 to 8,382 gigawatt hours (GWh) per year through at least 2045. Nuclear power is not identified as a future power source in the SP or analyzed in the SP CEQA documentation.

The fact that nuclear power is not only available but will in fact be utilized to implement the SP raises important new considerations about the state's energy future. The responses show that nuclear generation is by far the most effective and efficient electricity source and will produce 92% of its rated capacity per year. In contrast, the state's projected customer and utility scale solar generation facilities, which will reach a capacity of 153,675 MW by 2045, are

projected to operate at an average of just 24% of rated capacity per year. The state's projected wind generation facilities, which will reach a capacity of 22,302 MW by 2045 are projected to operate at an average of 39% of rated capacity despite the response assumptions that out of state wind will operate at 42% offshore wind at 48% of rated capacity.

The SP and related documents not only failed to disclose that nuclear power will be used to reach the state's emission goals, but also did not consider the feasibility and potential advantages of expanding nuclear capacity for zero emission electrical generation rather than constructing, operating, and more frequently replacing much less reliable wind and solar resources. Alt 3 requires the installation, operation and constant maintenance of 175,000 MW of wind and solar equipment covering hundreds of thousands to millions of acres of open space and requiring hundreds of miles of new transmission. Although this enormous amount of weather dependent and intermittent power is projected to provide about 400,000 GWh of an annual electrical load of 505,000 GWh, Alt 3 requires the installation of approximately 49,000 MW of 8-hour battery storage capacity, equipment presently unavailable at a utility scale, by 2045 in addition to 61,537 GWh of "unspecified" imported electricity.

As conceptually depicted in Figure 2 and Figure 3, if the state elected to develop 40,000 MW of nuclear capacity (about 10 new facilities like the single plant in operation in 2023), it could produce approximately the same amount of electricity as Alt 3 in 2045 with the same solar, wind, hydropower and other generation capacity planned for 2023--that is, no additional build pout of these resources over time. In addition the much greater efficiency and reliability of expanded nuclear generation would avoid all of the "unspecified" imports, and the 39,217 GWh of wasted "curtailed" electrical power that would occur from Alt 3 development by 2045.

Figure 2: Conceptual Deployment of 40,000 MW of Nuclear plus 2023 Capacity relative to 2023 and Alt 3 2045 Capacity (MW) derived from response sheet RESOLVE_summary_06072022

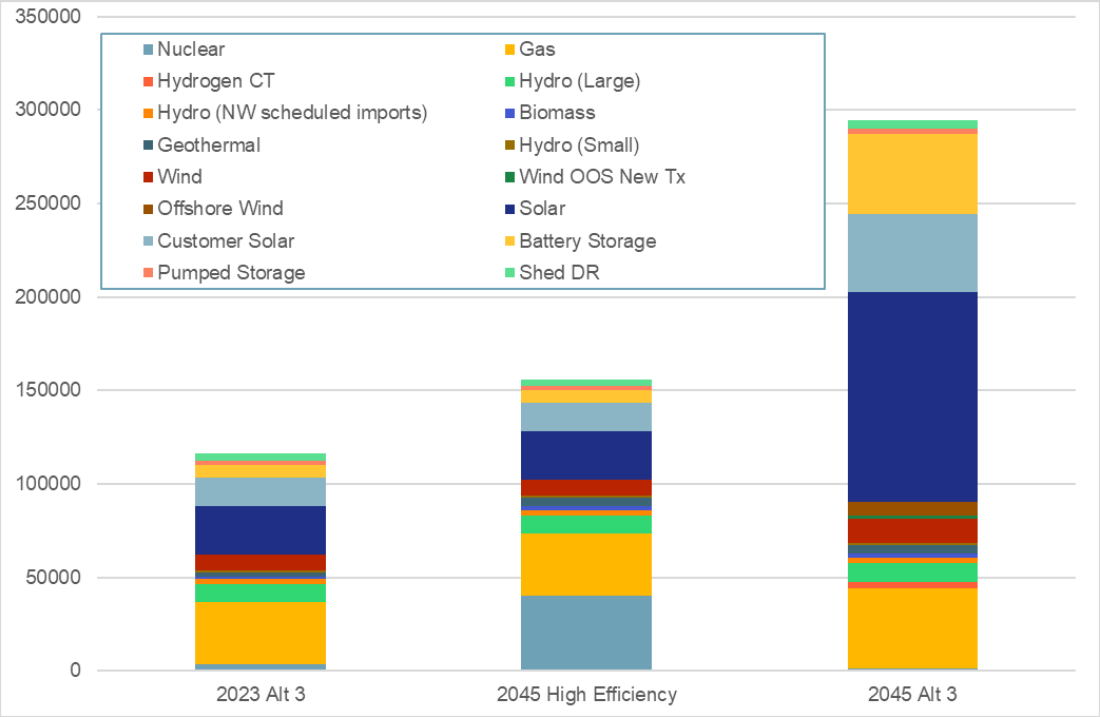
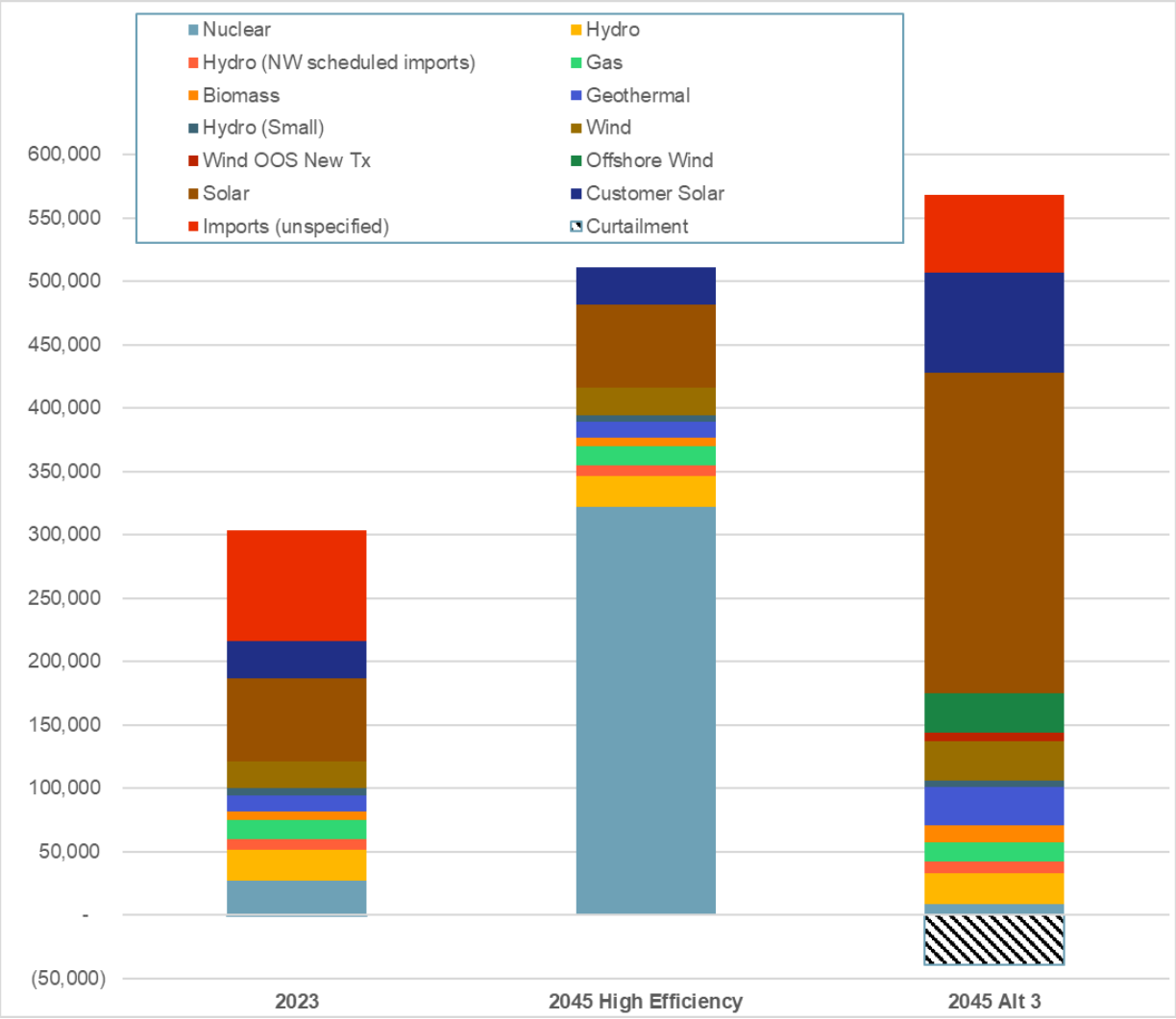


Figure 3: Conceptual Annual Generation from 40,000 MW of Nuclear plus 2023 Capacity relative to 2023 and Alt 3 2045 Generation (GWh) derived from response sheet RESOLVE_summary_06072022 (note negative curtailment volume and size of imports in Alt 3)



The SP, SP CEQA analysis and supporting documentation must be revised to consider the potential reliability, cost, and avoided environmental harm that could be achieved by developing additional nuclear generation capacity in lieu of intermittent wind and solar capacity to meet California's emissions goals.

The responses further document that SP implementation will require the creation of 2,975 MW of 12 hour capacity pumped storage, including approximately 1,000 MW of entirely new

capacity by 2028. The SP, the SP CEQA analysis and related documents do not disclose this planned development, including the locations and extent of existing pumped storage retrofitting and improvement, and new water impoundment, pumping and transmission that will be required to provide the projected 2,975 MW pf 12 hour storage capacity in Alt 3.

The responses show that by 2045 California will own and operate 1,970.17 MW of out-of-state wind requiring new transmission and 7,355.28 MW of offshore wind. Neither of these resources are discussed in detail in the SP or SP CEQA analysis although they are explicitly included in the capacity and generation tables provided for Alt 3 in the PRA responses. As with nuclear and pumped storage, the locations and potential impacts associated with out of state and offshore resources, including new transmission must be identified and discussed with far more clarity in the SP documentation.

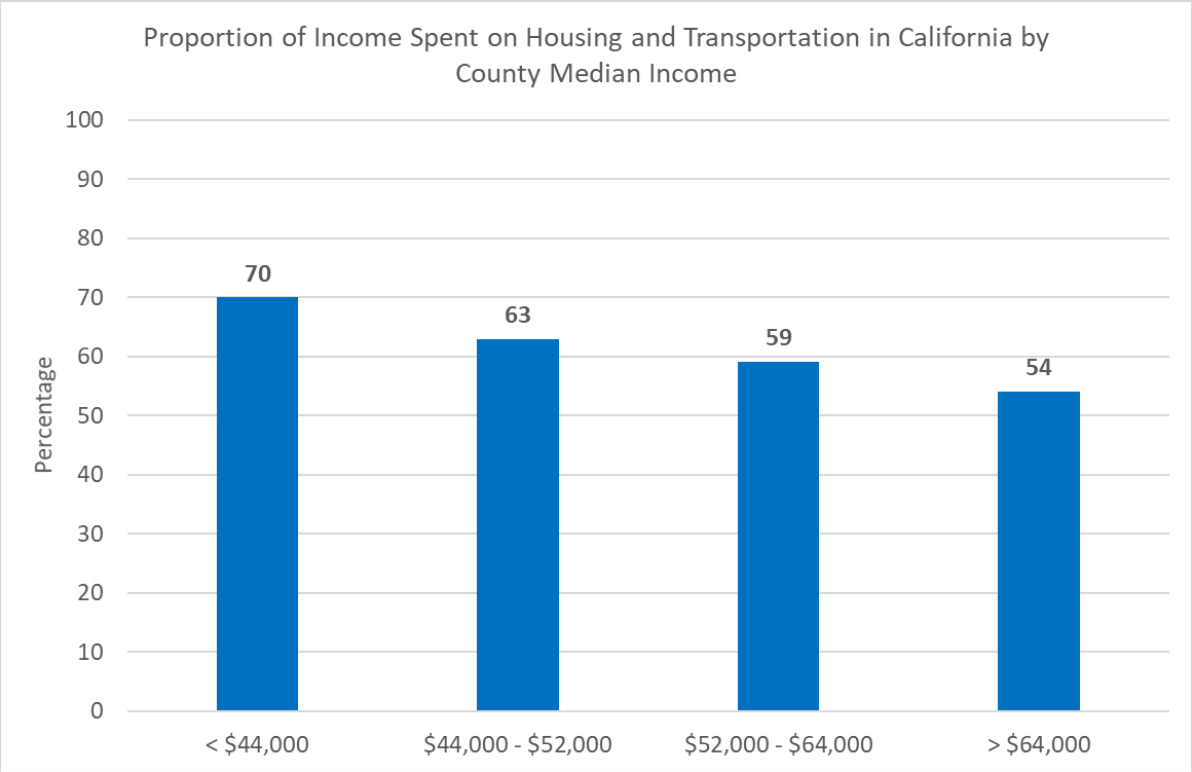
The responses indicate, apparently for the first time, that California is expected to increase storage from just under 3,000 MW of capacity at present to 23,000-25,000 MW of four hour-duration batteries by 2025 in both the BAU and Alt 3 projections. This would require the purchase and installation of utility scale batteries approximately equal to about 20,000 Tesla 4-hour megapacks in only two years, which would cost about $33 billion at the currently most favorable installed price for 1,000-unit bulk orders assuming they can be purchased at all due to existing raw material and supply chain constraints. The massive increase in battery capacity by 2025 also means that the state may need to replace all or a substantial amount of this storage prior to 2045 due to normal degradation and wear. Replacement of this magnitude does not appear to be scheduled in the response spreadsheets.

The responses further indicate that battery storage capacity will need to expand to increase to 42,877.78 MW with an 8 hour duration in Alt 3 by 2045. There do not appear to be any such utility-scale batteries available at present. The responses do not appear to provide any documentation concerning the sources, costs and durability of the projected utility-scale 8-hour batteries.

4. Cost to consumers and social equity.

The PRA requests sought all information concerning the analysis of household and family impacts by income and race. None of this information appears to be included in any of the responses. Response spreadsheet "Countyhandt_Scoping_Plan_graph_070822" includes a reference to a third-party nonprofit that has developed a "housing and transportation" (H+T) affordability analysis tool. According to H+T analysis, housing and living costs are unaffordable if housing plus transportation expenses exceed 45% of household income. The responses include a table and chart for California showing the percentage of household income spent on housing and transportation by income quartile based on 2015 data. The chart shows that housing and transportation costs exceed household incomes for all quartiles in the state, and ranged from 70% of income for the least affluent to 54% for the most affluent quartile (Figure 4).

Figure 4: Chart included in Response Spreadsheet Countyhandt_Scoping_Plan_graph_070822



The failure of the responses to show that SP implementation household impacts were apparently not considered in any significant detail is of particularly concerning because the responses also disclose, apparently for the first time, that residential electricity costs are projected to dramatically increase starting in 2023. While the responses, like the SP, claims that electricity costs will average from 18 to 20 cents per kilowatt hour (KWh) in all scenarios and the BAU, the responses appear to show that residential costs will spike from an average of 26 cents per KWh over January to August 2022, the most recent reporting period covered by federal energy data, to 43 cents in 2023, and reach 50 cents per KWh in 2045. As shown in Table 5, the responses calculate that monthly bills for 500 to 600 KWh will range from $213 to $255 in 2023 and $249 to $299 in 2045 as a result of SP implementation. At present, consumption of this magnitude would cost $132 to $159, and the apparent imposition of a $1,000 electrical bill increase starting next year would likely further erode the affordability measures summarized in the responses and shown in Figure 4.

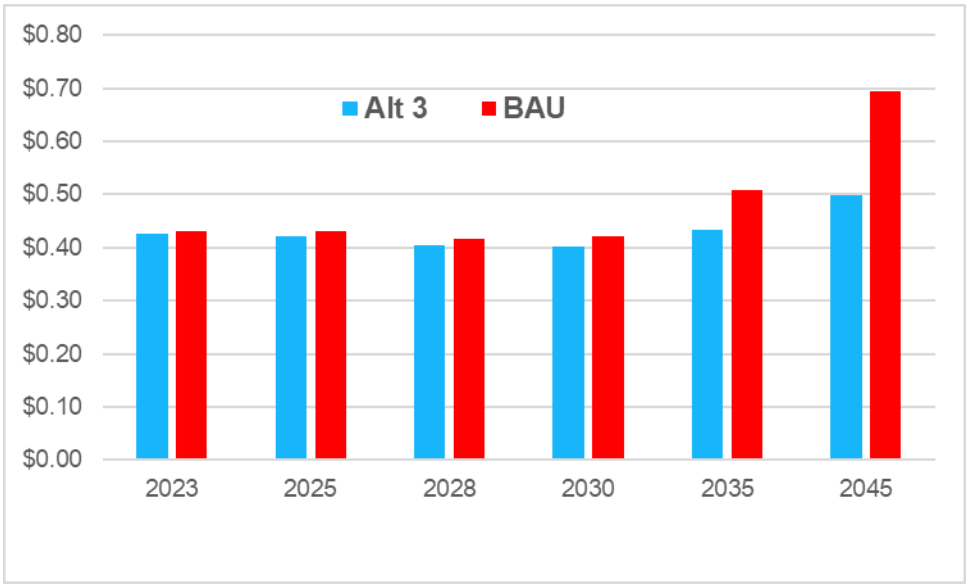
Table 5: Residential Electrical Prices and 500-600 KWh monthly Costs for Alt 3 2023 and 2045 (RESOLVE_summary_06072022) and 2022 (U.S. EIA, October 2022)

	2022 YTD	Alt 3 2023	Alt 3 2045
Residential Rate per KWh	$0.26	$0.43	$0.50
Residential Monthly Bill at 500 kWh/mo	$132	$213	$249
Residential Monthly Bill at 600 kWh/mo	$159	$255	$299
Residential Monthly Bill at 800 kWh/mo		$341	$399
Residential Monthly Bill at 1000 kWh/mo		$426	$498

Federal energy data indicates that California households current use between 550-600 KWh per month. Under all SP scenarios, including the BAU, household electrical demand will increase due to the use of electric and plug-in vehicles and electrical appliances. It is reasonable to assume that energy use could increase to as much as 800 to 1000 KWh per month. As shown in Table 5, the combination of the projected residential electricity cost increase plus increased household electrical use would significantly increase monthly and annual energy costs and potentially erode what the responses already show is widespread cost of living unaffordability (see Figure 4). The responses do not appear to evaluate these households impacts in any systematic manner, including by income group or race.

The responses also appear to disclose for the first time that residential energy costs will rise to an even greater extent in the BAU and reach 70 cents per KWh by 2045 (Figure 5). The reason for this increase is not clear, but appears to be related to the growing imbalance in the BAU projections between "required" electrical generation revenue and a falling amount of electrical sales to households. Since the volume of residential electrical demand falls in the BAU from 2035 to 2045, the only way the "required revenue" can be secured is by raising unit prices per KWh. This imbalance may be one reason why state policymakers are actively working to reduce household fossil fuel demand; growing electrical demand is necessary to pay for the build out of "green" energy capacity without pushing household costs even higher than projected in Alt 3.

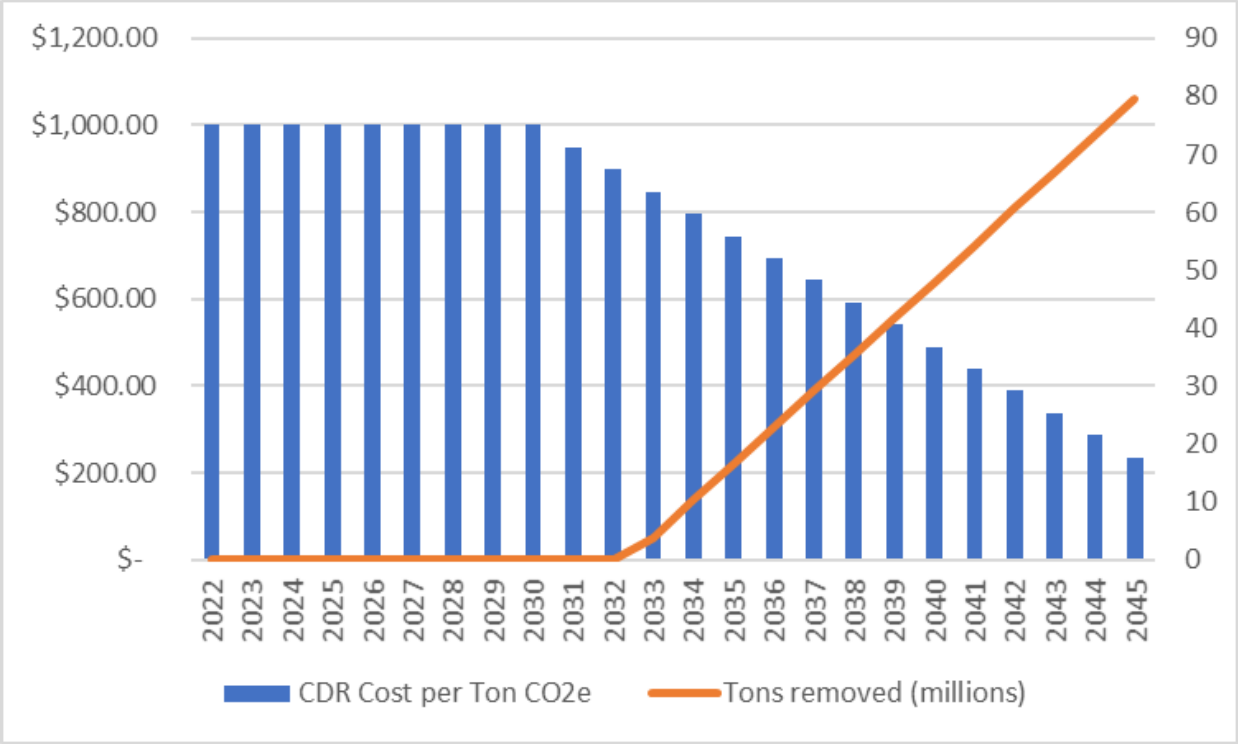
Figure 5: Residential Electrical Prices 2023-245, Alt 3 and BAU, cents/KWh (RESOLVE_summary_06072022)



5. Carbon Direct Removal (CDR) Volumes and Cost

The responses appear to characterize, without documentation, the cost and volume of emissions that will be removed from the atmosphere by using as-yet to be developed CDR technologies. As shown in Figure 6, the responses (response spreadsheets "CDR" and " Task 4 Cost Results_20220325") indicate that from 2031 to 2045, CDR will remove 542 million tons of CO2e emissions at a total cost of $321 billion. In addition, the responses show that CDR removal costs will fall from $847.2 per ton in 2031 when first used in Alt 3 to $236 per ton by 2045. The average cost of removal (incorrectly shown as $745 per ton in the responses apparently based on averaging annual cost from 2022 although no removal occurs until 2033) is $434 per ton. The total amount removed in 2045 is 79.54 million tons, significantly less than the 94.54 million tons of CDR removal for Alt 3 in 2045 shown in the SP and response spreadsheet "02 Total Emissions (MMT)".

Figure 6: Alt 3 Annual CDR Emissions Removal Volumes and Cost per Ton 2031-2045
(response spreadsheets CDR and Task 4 Cost Results_20220325)



If accurate, the CDR cost estimates in the response spreadsheets indicate that the technology will be significantly less costly ($236/ton) than the SP Alt 3 implementation costs for several major sectors, including industry ($361/ton), buildings ($598/ton), the electric sector ($497/ton) and close to the overall calculated cost of the Alt 3 as a whole ($214/ton)(see Table 2). As discussed above, the calculated costs in the SP and the response spreadsheets reflect only the difference from BAU, and the BAU includes a substantial share of physical improvements and costs required to achieve Alt 3. It is possible, if not likely, that the 2045 CDR cost would be lower than the emissions abatement costs for most or all Alt 3 sectors, and for the scenario as a whole, implementation if all of the relevant costs are appropriately considered.

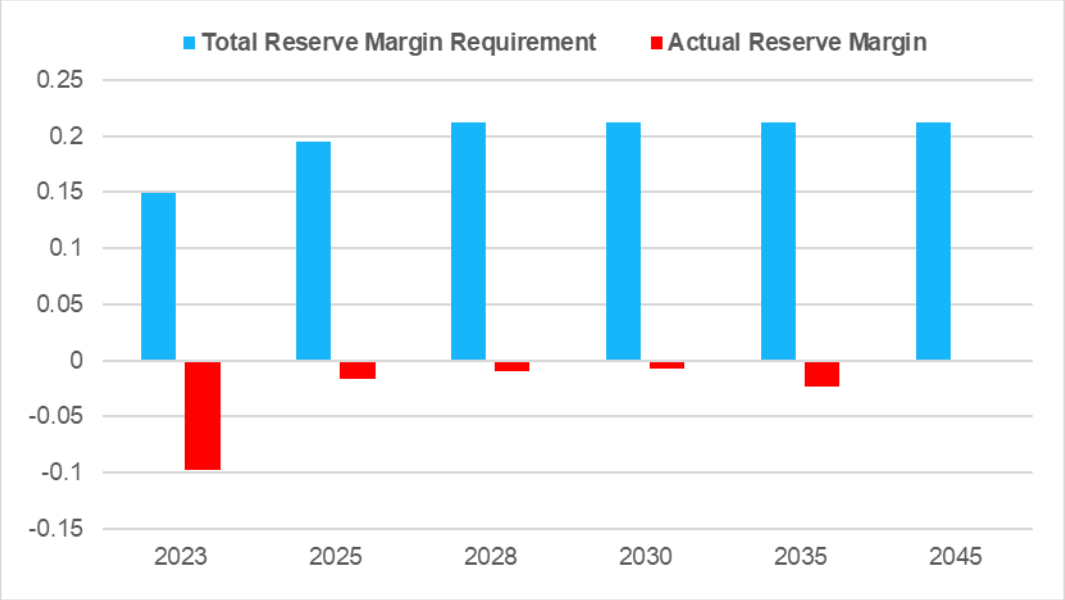
Consequently, the SP should analyze the feasibility of expanding CDR use to avoid other emission reduction measures that are already projected to be much more expensive and to other measures that may also be more costly when adequately characterized. For example, due to the ongoing lack of effective measures for achieving the Alt 3 VMT 2045 "target," and the adverse effects on state housing costs alone, CDR may be a more appropriate, far less damaging approach for achieving the reductions that the VMT "target" is supposed to achieve.

6. Reliability.

The PRA requests sought all information demonstrating how SP Alt 3 reliability was evaluated. As discussed above (see Figure 3), by 2045 the responses (response spreadsheet RESOLVE_summary_06072022) indicate that total annual state electricity load will increase from about 292,698 GWh in 2023 to 505,644 GWh in 2045. Intermittent, weather dependent wind and solar generation will produce approximately 400,517, or 79.2% of the state's annual load, and "unspecified" imports, which also likely include a substantial amount of wind and solar generation, will account for 61,537 GWh, or 12% of the total load. Since more than 90% of the state's projected electrical load in 2045 would be supplied by intermittent, weather dependent or imported sources, the PRA requests anticipated that the responses would include detailed analyses of how demand would be supplied during multiple cloudy, foggy and/or windless days or at times when potential import sources were being used to supple domestic or competing demands.

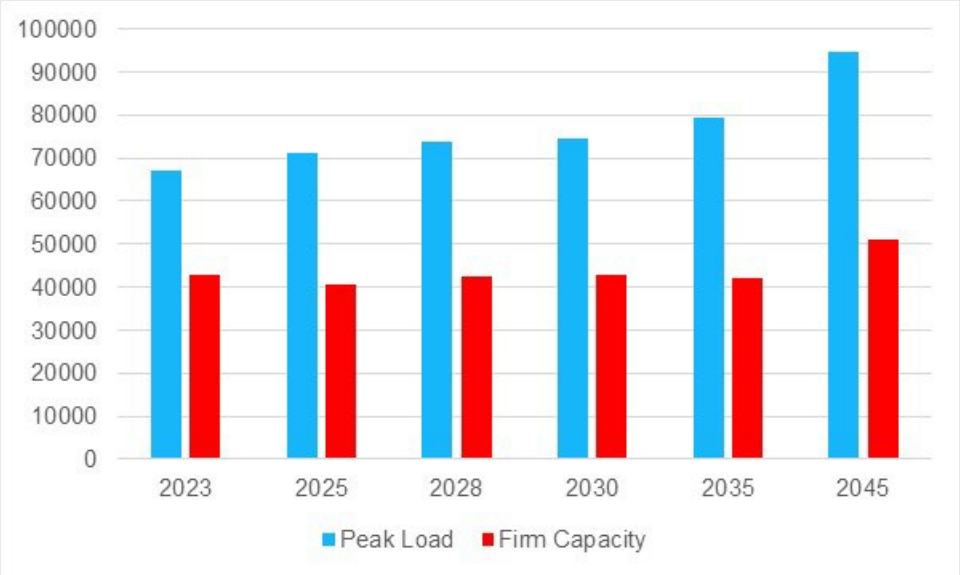
Instead, the only apparent analysis of electrical reliability appears to be a "Planning Reserve Margin Summary" comparing available resources to peak, instantaneous demand that could occur in selected years. In 2045, Alt 3 peak instantaneous demand is projected to be 94,653 GW and the response sheet indicates that reserve margin requirement should be 21% greater than the peak. As shown in Figure 7, however, the responses indicate that the actual reserve is far less than the identified requirement, and that available supplies are insufficient to meet peak demand until 2045, when they are just 0.027% greater than demand.

Figure 7: Alt 3 Reserve Margin Requirement and Actual Reserve Margin 2023-2045 (%) (response spreadsheet RESOLVE_summary_06072022)



In addition, the responses appear to show that, over time, the ratio of firm electrical supply to peak instantaneous demand falls from over 60% in 2023 to about 50% in 2045. The responses indicate that "firm capacity" consists of nuclear, gas CCGT, peaker, large and small hydropower, geothermal, and biomass generation, plus contracts that require power users to cut demand at peak period ("shed demand response" or "shed DR"). In 2045, these sources of "firm capacity" are projected to be able to supply only 50,936 GW of a 94,653 GW peak instantaneous load (Figure 8).

Figure 8: Alt 3 Peak Load and Firm Capacity 2023-2045 (GW)
(response spreadsheet RESOLVE_summary_06072022)



As a result, the responses do not appear to demonstrate that SP implementation will be able to reliably meet peak demand over time and that at no time will the identified "adequate reserve margin" be achieved (Figure 7). None of the responses appear to analyze in any manner the ability of the projected Alt 3 generation capacity to meet demand when intermittent wind and solar capacity, as well as imports, are not available over extended periods of time, potentially including several days. The identified battery and pumped storage requirements, for example, should be calculated to meet foreseeable intermittent power disruptions of this nature. No such documentation has as yet been provided as requested.

Conclusion

The SP and EA, as originally proposed and later revised, fail to comply with applicable legal requirements, as detailed in our earlier comment letters and attachments. We urge CARB to implement California's commitment to global climate leadership in compliance with law, without causing disparate harms to California's poor and middle income communities - the

majority of whom, as the revised Scoping Plan makes clear on pages 125-126, are members of communities of color. Equity isn't a slogan, it's a moral imperative and it's the law. CARB needs to comply with the law.

Sincerely yours,

HOLLAND & KNIGHT LLP

Jennifer L. Hernandez

Cc: Robert Apodaca

JLH:mlm