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OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Develop an Electricity Integrated Resource Planning Framework and to Coordinate and Refine Long-Term Procurement Planning Requirements.	Rulemaking 16-02-007 (Filed February 11, 2016)

COMMENTS OF THE NATURAL RESOURCES DEFENSE COUNCIL (NRDC) ON 2019-2020 ELECTRIC RESOURCE PORTFOLIOS TO INFORM INTEGRATED RESOURCE PLANS AND TRANSMISSION PLANNING

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I. Introduction

The Natural Resources Defense Council (NRDC) respectfully submits these comments on Administrative Law Judge's proposed decision, filed February 21, 2019-20 Electric Resource Portfolios to Inform Integrated Resource Plans and Transmission Planning ("Proposed Decision"). NRDC is a non-profit membership organization with more than 95,000 California members who have an interest in receiving affordable energy services while reducing the environmental impact of California's energy consumption.

Upon carefully reviewing the Proposed Decision, NRDC recommends that:

- The Proposed Reference System Plan (RSP) is unlikely to reduce enough emissions to comply with California Air Resource Board's Scoping Plan and therefore does not fulfil the intent of Senate Bill 350.
- The Commission should adopt the low emissions, 30 MMT scenario, to comply with CARB's recommendation and put California's load serving entities (LSE) on the best path towards SB100 compliance.
- Staff should adopt the NRDC/ TURN proposal to require resource shuffling specific information from LSEs.
- The Commission should conduct a workshop to solicit stakeholder feedback to make a

more informed decision on resource adequacy imports.

- Negative impacts of criteria pollutants and methane leakage should be internalized within RESOLVE to develop a more robust RSP.

II. Discussion

A. The Proposed Reference System Plan (RSP) Is Unlikely to Reduce Enough Emissions to Comply with California Air Resource Board's Scoping Plan and Therefore Does Not Fulfil the Intent of Senate Bill 350

The proposed Reference System Plan (RSP) is unlikely to reduce California electric sector emissions to the extent necessary to comply with CARB's 2017 Climate Change Scoping Plan Update. Senate Bill 350 ("SB350") requires that integrated resource plans (IRP) aim for electric sector emissions in 2030 in line with CARB's Scoping Plan which recommends electric sector emissions in California be reduced to 30 - 53 MMT by 2030.[1] Developing plans compliant with this emissions range is the very intent of this proceeding.[2]

Although the nomenclature for the RSP: the "46 MMT" scenario suggests that the proposed RSP's 2030 GHG emissions are well within CARB's recommendation, this scenario is unlikely to be compliant with CARB's recommendation. This is because (1) the actual modeled 2030 emissions estimates are 51 MMT (not 46 MMT), only 3% under the upper limit of CARB's range, and (2) the high uncertainty associated with forecasting emissions means that the actual emissions in 2030 from the RSP would likely fall outside CARB's upper limit – 53 MMT. The Commission should select an RSP that leads to emissions well within CARB's recommended range *and* (as explained in Section II.B.) puts California's electric sector on the best path to achieve SB100's 2045 goal of getting to a zero-carbon electric sector.

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[1] California Air Resources Board, , *California's 2017 Climate Change Scoping Plan*, (November 2017), at 31.

[2] California Public Utilities Code, Section 454.52. "(a) (1) Commencing in 2017, and to be updated regularly thereafter, the commission shall adopt a process for each load-serving entity, as defined in Section 380, to file an integrated resource plan, and a schedule for periodic updates to the plan, to ensure that load-serving entities do the following:
(A) Meet the greenhouse gas emissions reduction targets established by the State Air Resources Board, in coordination with the commission and the Energy Commission, for the electricity sector and each load-serving entity that reflect the electricity sector's percentage in achieving the economywide greenhouse gas emissions reductions of 40 percent from 1990 levels by 2030."

To develop this scenario Commission Staff applied RESOLVE, a capacity expansion model, to determine a least cost portfolio to get to CAISO emissions of 37.9 MMT by 2030; 37.9 MMT is CAISO LSE's share of statewide 46 MMT electric sector emissions.[3] However, more granular production cost modeling (through the SERVM model) conducted to determine whether the RSP produces a reliable electric system indicates that the RSP's CAISO wide emissions in 2030 are 41.4 MMT, much higher than RESOLVE's estimate. This 41.4 MMT CAISO emissions estimate translates to a California wide 2030 electric sector GHG emissions estimate of 51 MMT.[4] This more accurate GHG emissions estimate is just under the upper limit of CARB's recommended range (32 – 53 MMT) for electric sector GHG emissions in 2030.

Given the uncertainty in forecasts of electric sector GHG emissions in 2030, it is very unlikely that the proposed RSP will result in a resource mix that will result in emissions within CARB's recommended range, which is the intent of this analysis.

Modeled forecasts of GHG emissions deviate from the real world GHG emissions because of three broad reasons. First, models are based on best available inputs and assumptions, such as (but not limited to) an average weather year and electric demand forecasts, which are bound to differ from real world conditions in future years. Second, models simulate an ideally functioning electric system and market; real world occurrences, such as reliability-must-run contracts with thermal power plants, means that the actual electric system and the market always deviate from and are less efficient than the ideal conditions which the model simulates. Third, both models, SERVM and RESOLVE, apply differing levels of spatial aggregation to simplify the complexities of the electric grid. Comparison of RESOLVE emissions estimates with CAISO reported emissions data indicates that RESOLVE significantly underestimates GHG emissions from the electric grid.[5]

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[3] California Public Utilities Commission, Attachment A. 2019-20 IRP: Proposed Reference System Plan, (November 2019), at 18. "For IRP modeling, statewide electric sector GHG targets are translated to CAISO targets based on CARB's proposed Cap and Trade allowance allocation methodology for 2021-2030 (~81% in 2030)."

[4] *See* California Public Utilities Commission, *2019-2020 Electric Resource Portfolios to Inform Integrated Resource Plans and Transmission Planning* (February 21, 2020), at 38. (Calculation: 41.4 MMT / 0.81 = 51.1 MMT, where 0.81 is the ratio of California load in the CAISO.)

[5] E.g. 1: See the comparison of RESOLVE's estimated emissions to CAISO reported emissions developed by Staff and presented through the Modeling Advisory Group.
E.g. 2: CAISO reports ~51 MMT GHG emissions 2019, the RESOLVE model estimates ~45 MMT carbon emissions in 2020 (CPUC, *Attachment A. 2019-20 IRP: Proposed Reference System Plan* (November 2019), at 75.) This 6 MMT difference between CAISO's 2019 reported and RESOLVE's

Given that real world emissions deviate significantly from and are higher than modeled emissions, any RSP must contain enough "headroom" to ensure that California's electric sector is in a position to successfully comply with the 2030 emissions reductions required by CARB's Scoping Plan. This RSP clearly does not have that headroom and should not be relied on to guide electric sector procurement. The Commission should select an RSP with a lower 2030 emissions amount that would provide the best chance of compliance with CARB's Scoping Plan.

B. The Commission Should Adopt the Low Emissions, 30 MMT, Scenario to Comply with CARB's Recommendation and Put California LSEs on the Best Path Towards SB100 Compliance

NRDC has consistently recommended that the Commission select a 2030 greenhouse gas (GHG) reduction target aligned with SB100's longer-term goals. The low emissions scenario accomplishes this while staying within CARB Scoping Plan's 2030 emissions range. As NRDC explained through past comments, Commission's own analysis indicates that the 30 MMT scenario is most aligned with SB100's 2045 goal of a zero-carbon electric sector, and better reflects the intent of SB100.[6] Moreover, Staff's own analysis demonstrates that this low emissions scenario costs only 2.8% more than the proposed RSP.[7]

SB100 requires the Commission to ensure that the electric sector can cost-effectively get to zero-carbon by 2045. This means minimizing the cumulative cost of GHG reductions through 2045. By adopting the 46 MMT scenario, the Commission risks creating a situation where the state's load-serving entities (LSE) under-procure clean energy resources through 2030 and would then need to ramp-up resource procurement to meet our state's 2045 goals after 2030 at an unsustainable rate. Ramping up procurement in this way would put the state's LSEs and the Commission under pressure to procure and integrate clean energy resources. This would either result in non-compliance with SB100's zero carbon mandate, or in inefficient and costly procurement that raise costs for California's utility customers.

2020 modeled emissions is too large to be explained by any new clean energy resources that the model builds in 2020.

[6] Natural Resources Defense Council, *Comments of the Natural Resources Defense Council on Administrative Law Judge's Ruling Seeking Comment on Proposed Reference System Portfolio and Related Policy Actions* (December 2019), at 2.

[7] CPUC, *Attachment A. 2019-20 IRP: Proposed Reference System Plan* (November 2019), at 91. Calculation, levelized total resource cost (TRC) of the 30 MMT case divided by the levelized TRC of the 46 MMT case: 46.7/45.4 = 1.028

This foreseeable scenario also comes with an environmental cost because effective climate change mitigation requires greater cumulative GHG emissions reductions starting today. Consideration of this "cumulative impact" applies similarly to human exposure to criteria pollutants as well.

Supporting the 30 MMT scenario in this cycle will also give the LSEs, especially newer Community Choice Aggregators, adequate time to transition to a zero-carbon grid by 2045 in a smooth and cost-efficient manner. Starting down the path to a zero-carbon grid now will ensure that longer lead-time resources, such as offshore wind and long duration storage, are developed in a timely manner to be able to meet SB100's 2045 requirements.

C. Staff Should Adopt the NRDC/ TURN Proposal to Require Resource Shuffling Specific Information from LSEs

NRDC recommends that the Commission adopt the NRDC/ TURN proposal[8] to require LSEs to file information regarding resource shuffling, because without this easy to obtain information, the Commission will not be able to make any progress towards understanding the extent of this issue. The Proposed Decision states that it carefully considered NRDC and TURN's proposal to require LSEs to file information specific to resource shuffling, but that "further analysis is needed regarding what data may be needed in addition to information from LSEs" to "assess the impact of LSEs' procurement of zero-GHG imports that would otherwise be serving out-of-state loads."[9]

Although additional data and analysis will be needed to quantitatively determine the extent to which LSE procurement plans could cause resource shuffling, NRDC disagrees with this Commission rationale, a paucity of perfect information, to not adopt this proposal. The filing requirements in the NRDC/ TURN proposal represent the minimum information necessary for the Commission to investigate whether and to what extent LSE procurement plans could cause resource shuffling; the NRDC/ TURN proposal will also help staff identify what additional information is needed to thoroughly understand this phenomenon. Moreover, LSEs can provide these essential data through minimal effort. Not requiring this essential and easy to provide data

[8] NRDC, *Comments of Natural Resources Defense Council on Administrative Law Judge's Ruling Seeking Comment on Filing Requirements for 2020 Integrated Resource Plans* (October 2019), at 3, 4.
[9] Proposed Decision at 54.

will only serve to delay any progress the Commission could make towards better understanding this issue and ensure compliance with SB100.[10]

Staff could estimate the *net* WECC-wide GHG impact of the 2019-2020 Preferred System Plan (PSP) by simply taking the difference in GHG emissions between WECC-wide production cost model runs "with" and "without" the new resources in the 2019-20 PSP. Such simulations could reveal the 2019-2020 PSP's impact on GHG emissions WECC-wide, within California and outside of California.

However, NRDC cautions against applying this type of analysis to determine specific instances of resource shuffling. Production cost models tend to model the economic dispatch of resources and not contractual overlays that may specify which entities receive which sources of energy. Determining resource shuffling through such modeling and attributing responsibility to specific contracts or to specific LSE IRPs is therefore a very complex analytic exercise. The NRDC/ TURN proposal gives the Commission the information it needs to begin to understand the extent of resource shuffling that may occur even without conducting this complex modeling.

To summarize, the Commission should adopt the NRDC/ TURN proposal which requires LSEs to file resource shuffling specific information because this readily available and/ or easy to gather information is necessary to understand whether and to what extent LSE procurement plans could cause an increase in out of state emissions. There is no downside to requesting this additional information.

D. The Commission Should Conduct a Workshop to Solicit Stakeholder Feedback to Make a More Informed Decision on Resource Adequacy Import

The impact of the constraint on import for resource adequacy imports is significant and well-illustrated by the Proposed Decision[11] and Staff's own analysis presented in Figure 1. Figure 1 illustrates that the shadow price for capacity procurement, which is incremental to the shadow price for GHG abatement, is as high as $1,000/kW-year in 2021.

[10] Senate Bill 100, Sec. 5., 454.53(a) "The bill would require that the achievement of this policy for California not increase carbon emissions elsewhere in the western grid and that the achievement not allow resource shuffling."

[11] Proposed Decision at 32. "the additional constraint on imports during summer evenings implemented in SERVM is a strong driver of decreased reliability in SERVM results."

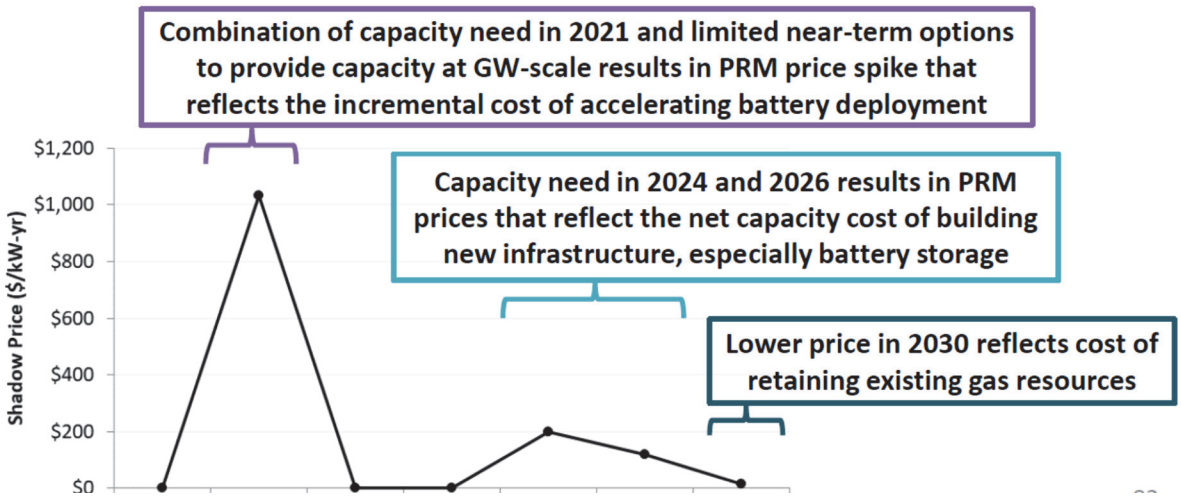

Figure 1: Spending on Capacity Procurement Incremental to Procurement to Reduce GHG Emissions[1]

RESOLVE includes a resource adequacy ("RA") import constraint of 5 GW, which Staff recognize as conservative. In order to correct for this conservative assumption, Staff relaxed this import limit to 6.5 GW when testing the RSP for reliability in SERVM.[12] However, as procurement analysis is conducted in RESOLVE, the amount of resources in the RSP that are procured for capacity are still dictated by the 5 GW constraint.

Commission Staff have chosen this conservative approach to import constraint based on historical data. As demand for imports to address system resource adequacy needs increases, LSEs may be willing to pay more for resource adequacy, which may result in an increase in total amount of resource adequacy imports.

On the other hand, some parties have made a compelling argument[13] that because SERVM simulates the entire WECC, there is no need to impose additional import constraints within SERVM. In fact, provided that SERVM applies best available data to simulate the WECC, SERVM can help determine the amount of imports CAISO LSEs can rely on for system

[12] Proposed Decision at 33. "Given the conservativeness of setting the constraint at 5 GW and the many parties cautioning that it could lead to over-procurement and/or unnecessary ratepayer costs, Commission staff ultimately chose to relax the constraint by 1.5 GW, effectively setting the import limit at 6.5 GW during late summer evenings. Although the 6.5 GW figure now differs from RESOLVE's 5 GW resource adequacy import limit, the two models are by design different in how they assess reliability; constraining imports somewhat differently in each model is reasonable."

[13] Union of Concerned Scientists, *Reply Comments of the Union of Concerned Scientists on the Ruling Seeking Comment on Proposed Reference System Portfolio and Related Policy Actions* (January 2020), at 3.

resource adequacy. This SERVM output can then be used to set the RESOLVE resource adequacy limit.

There is no way to determine whether historical data or SERVM estimates are a better indicator of how much CAISO LSEs can depend on imports for resource adequacy going forward. Because of the significant impact this uncertain assumption has on the levels of procurement within the RSP, this topic requires further investigation. NRDC recommends that Staff conduct a workshop or a modeling advisory group (MAG) webinar to solicit feedback on this critical assumption. The workshop or MAG meeting should include a discussion of (1) the amount of imports that SERVM relies on during critical load hours, and (2) historical data on imports during these hours, and (3) how these different import constraints impact resource procurement in the RSP to determine a reasonable import constraint going forward.

E. Negative Impacts of Criteria Pollutants and Methane Leakage Should be Internalized Within RESOLVE to Develop a More Robust RSP

To fully understand the costs of existing thermal generation, Staff should account for the externalities of ongoing thermal generation. The two most significant of are the health impacts of criteria pollutants and the environmental impact of methane leakage. Commission Staff have already conducted analysis to quantify these impacts through the Integrated Distributed Energy Resources (IDER) proceeding,[14] This analysis should provide Staff with an adequate starting point to internalize some of these externalities within RESOLVE. Accounting for the health impact of criteria pollutants within RESOLVE will meaningfully connect resource procurement analysis with ensuring that clean energy procurement improves air quality in disadvantaged communities where much of the existing thermal fleet is located.

III. Conclusion

NRDC commends Staff for continuing to constructively manage this complex proceeding and appreciates the opportunity to provide these comments.

[14] CPUC, *Staff Proposal: Distributed Energy Resources Cost Effectiveness Evaluation: Societal Cost Test, Greenhouse Gas Adder, and Greenhouse Gas Co-Benefits*, (February 2017)
CPUC, *Distributed Energy Resource Cost-Effectiveness Evaluation: Further Recommendations on the Societal Cost Test An Energy Division Staff Proposal Addendum #2*, (March 2018)

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