

Stakeholder Comments Template

Submitted by	Company	Date Submitted
Laura Wisland	Union of Concerned Scientists (UCS), on behalf of UCS, the Environmental Defense Fund (EDF), and the Center for Energy Efficiency and Renewable Technologies (CEERT).	June 22, 2016

Please use this template to provide written comments on the Clean Energy and Pollution Reduction Act Senate Bill 350 (SB350) Study initiative posted on April 25, 2016.

Please submit comments to regionalintegration@caiso.com by close of business
June 22, 2016

Materials related to this study are available on the ISO website at:

<http://www.caiso.com/informed/Pages/RegionalEnergyMarket/BenefitsofaRegionalEnergyMarket.aspx>

Please use the following template to comment on the key topics addressed in the workshop.

1. Are any of the study results presented at the stakeholder workshop unclear, or in need of additional explanation in the study's final report?

Comment:

Please see the attached comments.

2. Please organize comments on the study on the following topic areas:

- a. The 50% renewable portfolios in 2030**
- b. The assumed regional market footprint in 2020 and 2030**
- c. The electricity system (production simulation) modeling**
- d. The reliability benefits and integration of renewable energy resources**
- e. The economic analysis**
- f. The environmental and environmental justice analysis**

Comment:

Our comments address sections "b" and "c" and are grouped together in the attached document.

3. Other

Comment:

Please see the attached comments.

June 22, 2016

Dear Study Manager,

The Union of Concerned Scientists, the Environmental Defense Fund, and the Center for Energy Efficiency and Renewable Technologies (UCS/EDF/CEERT) appreciate the opportunity to provide comments on the Senate Bill 350 Preliminary Results presentations and documents from May 24 and 25. California ISO (CAISO) and its study partners have clearly dedicated a significant amount of time and effort to complete a large amount of analysis in a relatively short time period. We thank the study managers for their efforts and making time to answer questions that were submitted after the workshop.

For several decades, our three organizations have worked to promote the adoption of renewable energy technologies in the West. We recognize that as we strive to make fundamental shifts in the way electricity is produced and consumed, major grid investments will need to be made. Generally speaking, the cost and efficiency of making new grid investments and improving the way we use existing infrastructure will be enhanced as the 38 regional balancing authorities in the western interconnection find ways to coordinate and cooperate. In other areas of the country, the expansion of regional grids has resulted in reductions in fossil fuel use and improvements in renewable energy integration.

UCS/EDF/CEERT acknowledge that the benefits shown in the CAISO/PacifiCorp-only case in 2020 are relatively small for California because in 2020, there has not yet been time to take advantage of consolidated transmission planning and increased renewable energy investment throughout the West. We would expect these benefits to increase in the years following 2020. The study results do make a relatively strong prima facie case for the economic and environmental benefits of an expanded power market that contains many regional partners in 2030. However, UCS/EDF/CEERT remain concerned about some aspects of the analysis that we hope can be addressed. We recognize that creating a more regionalized western grid will put market pressure on coal generation by making it easier to integrate renewables, but a regional market may not be the single most important driver for reducing coal plant emissions and hastening their earliest possible retirements. Nonetheless, as organizations focused on reducing greenhouse gas (GHG) emissions and criteria air pollutants, we think it is very important to have a better understanding of how a regional market may impact generation from incumbent coal plants in the West in the short, medium, and long terms. In addition, while we believe that the successful integration of the CAISO and PacifiCorp's (PAC's) transmission assets will cause additional balancing authorities to join, it is also prudent to understand how the benefits may change if it's just CAISO and PAC in 2030, since this is the proposal that is currently being considered.

The electricity system (production simulation) modeling

Increased coal generation in 2020

The effect of regionalization on the ability to integrate larger amounts of renewable energy and reduce GHG emissions is a paramount concern for UCS/EDF/CEERT. The study results largely support the thesis that regionalizing the power market reduces overall GHG emissions, at least in 2030. But we remain concerned about the apparent increase in coal dispatch and GHG emissions in the 2020 cases. Although we agree that the increase is relatively small, the reason for it has not been fully explored or explained. Absent that, it is difficult to have a complete understanding of how coal generation changes between 2020 and 2030.

To be clear, UCS/EDF/CEERT accept that there may be competing effects on coal generation. For example, reducing economic barriers (“hurdle rates”) between Rocky Mountain and Pacific Northwest coal generation and California markets could be the cause of the increase in coal generation in the CAISO plus PAC 2020 results. A competing effect might be the reduction of those same barriers for renewable generation driven by the California RPS, which ultimately displaces some coal in the system. It may be that the latter effect is sufficiently large in 2030 due to the build out of renewables that it overcomes the greater market for coal generation found for 2020.

In any case, we do not agree that one can simply conclude that the 2020 coal increase is due to “statistical noise” as some of the study authors have suggested. First, the PSO model is not statistical in nature, following a deterministic set of algorithms that are the direct cause of the results generally. However, there are uncertainties in and sensitivities to the input assumptions that can result in a range of uncertainty in output results. It is possible that the 2020 coal effects fall into that category, but without specific testing,¹ the contention that the results are within the margin of modeling error is simply unfounded.

The study authors have also commented that the treatment of carbon costs in the model overly favors coal generation and that if this assumption could be remedied, coal generation would decrease. This dynamic is plausible, but without quantification it is unclear how significant an effect that is. Perhaps study managers can suggest a reasonable method for quantifying that effect.

If the increased coal dispatch in 2020 is indeed due to a structural issue, it would be very helpful to see at least some results between 2020 and 2030 to better understand how long the region might expect coal

¹ The range of uncertainty in results is normally derived by repeatedly running the studies with small changes in input assumptions that are within the margins of uncertainty for them. The resulting ranges in output results show the range of uncertainty in them. This is a common procedure in weather forecasting models for producing “ensembles” of forecast estimates.

dispatches to increase. In that spirit, UCS/EDF/CEERT urge the study managers to consider performing one or more intermediate year runs between 2020 and 2030 to better understand if coal dispatch is decreasing at a rate proportional to the scale-up of renewable generation, or is simply chance effects as the study authors suggest.

Hurdle rate assumptions and sensitivity

Hurdle rates represent wheeling costs and other transactional barriers to trading across balancing areas. A prime benefit postulated for regionalization is the reduction or elimination of these barriers, resulting in more efficient use of available resources. This places special importance on the assumed hurdle rates. Although wheeling rates are relatively straightforward to compute, some of the hurdles (e.g., those representing institutional friction) are not. The TEPPC Common Case cited by Brattle Group as the source of the hurdle rate data lists three specific components:

1. Tariff rates: trade policy-based charges applied to power transfers between TEPPC regions.
2. Wheeling rates: charges paid to the owner of a transmission line for the right to transport power across the line.
3. Rates per model validation: interregional charges modeled to encourage reasonable interregional transfers. These are set based on stakeholder review of simulation results and their recommendations.

Since hurdle rate assumptions have a significant impact on modeling results and how we quantify the benefits of a regional grid, it would be extremely helpful to have some sensitivity analysis around them. This could also potentially illuminate some of the questions around the 2020 GHG results.

We compared the hurdle rate assumptions in the SB 350 Preliminary Studies to the TEPPC Common Case² and found some significant differences. The Preliminary Studies appeared to rely on a single export hurdle rate charged by balancing area, whereas the TEPPC Common Case had both import and export rates. As a consequence, there is a range of rates for exporting, depending on where the power is exported to. For example, the Preliminary studies used a value³ of \$17.20 per MWh, whereas the TEPPC Common Case exports from the California ISO averaged \$12.67, ranging from \$9.96 to \$16.77 with a

² Release Notes for WECC 2024 Common Case, Version 1.5, WECC, April 9, 2015, Table 2, p. 12.

³ Brattle publicly supplied data in workbook: "HurdleRates-Load-NaturalGas-CO2PriceAssumptions.xlsx".

standard deviation of \$2.05. It would seem reasonable to perform two sensitivities where the hurdle rates are increased or decreased by an amount approximating the standard deviation⁴.

GHG footprint analysis

We understand from study managers that certain GHG effects of grid regionalization were not taken into account. Although carbon emissions of power plant generation were estimated, the impact on GHG emissions of manufacturing more or fewer renewable resources that would be needed in different scenarios (due to differences in energy curtailments) and the construction of new transmission to support Scenario 3 were not separately examined. We recognize that these effects tend to be one-time only (as opposed to ongoing power plant emissions), but they may be significant and deserve to be acknowledged if not specifically quantified. The resulting effect might be expected to show an increased GHG benefit to regionalization generally, but with added GHG burden to Scenario 3.

The assumed regional market footprint in 2020 and 2030

CAISO / PAC-only 2030 sensitivity

UCS/EDF/CEERT recognize that in order to achieve the full range of benefits associated with a larger, more coordinated western grid, we need additional balancing authorities beyond just CAISO and PAC. For this reason, UCS/EDF/CEERT believe it was appropriate for the study authors to model 2030 scenarios with an expanded regional grid that contained more than twenty BAs. However, because the study authors did not also run a 2030 scenario that measures the impacts of a CAISO plus PAC-only expansion, it is difficult to understand how benefits may be different if additional BAs do not join the regional market.

While it is our understanding that a regional market containing CAISO and PAC is the first step in creating a market that would contain many more participants, the opportunity at hand is increased coordination with PAC. Not having 2030 results for a CAISO plus PAC-only run makes it very difficult for stakeholders and policymakers to understand what's at stake if we do not succeed in expanding the market further. For this reason, UCS/EDF/CEERT urge the study authors to conduct at least one 2030 run that only includes CAISO and PAC in the regional market.

⁴ We offer this as one plausible way of establishing the uncertainty in hurdle rates, others may be acceptable. We note that Brattle used a value higher than the maximum hurdle rate in the TEPPC Common Case. It may therefore be reasonable to use a value one standard deviation below the TEPPC value, and one standard deviation above the Brattle figure for sensitivities.

Summary

The work by the study authors takes an important and significant step forward in understanding the effects of a regional market. Nothing in the results has changed UCS/EDF/CEERT's assumption going into this process that a regional market with several participating BAs will improve the efficiency of grid operations, lower overall system costs, and enhance the ability to integrate large amounts of renewable energy. While a regional grid is just one of the several strategies UCS/EDF/CEERT believe must be deployed to help western states accommodate much larger amounts of renewables, enhanced regional coordination is one of the most important evolutions that must occur.

That said, it is imperative to understand the model result showing increased coal production in 2020. It will be important to understand, if possible, how a regional market may impact the generation of individual coal plants that are posing particular problems to air quality and public health and may be considering costly retrofit investments in the near-term. Study managers' assertions that the 2020 increase is within "statistical noise" or "modeling error," or that a more sophisticated methodology with respect to importing coal to California are no more plausible than alternative causal explanations. In short, these assertions need to be tested and substantiated. Finally, UCS/EDF/CEERT urge study managers to run a 2030 CAISO plus PAC-only case to directly address the opportunity at hand and understand the relative importance of adding multiple partners to the market.

UCS/EDF/CEERT appreciate the hard work invested in this analysis and the active stakeholder engagement process. The analysis will only be strengthened by taking the important steps outlined above. While the present study makes a strong but incomplete case for both California and widespread benefits, it is our hope that the California ISO will clarify the concerns expressed here and by other stakeholders regarding the effect on coal generation and greenhouse gasses so that California can move forward on the regionalization with full assurance of its benefits.

Sincerely,

Laura Wisland, Senior Energy Analyst
Union of Concerned Scientists

Ken Dragoon, Consultant for UCS
Flink Energy Consulting

Lauren Navarro, Senior Policy Manager
Environmental Defense Fund

V. John White, Executive Director
Center for Energy Efficiency and Renewable Technologies