

Stakeholder Comments Template

Submitted by	Company	Date Submitted
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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?

General Comments:

1. Are the benefits presented in the presentations net benefits? If so, please provide the detail on both the benefits and costs identified in the study. If not, please provide the detailed costs identified in the study.
2. It was not clear from the presentations how the statewide benefits of regionalization (\$1B in Scenario 2 and \$1.5B in Scenario 3) were allocated to sub regions and balancing authorities for the purposes of the Berkeley Macroeconomic study. Please describe how these allocations were performed. Also, please provide a table showing the net benefits by balancing authority showing the detailed calculations to determine the net benefits.
3. The presentations do not show the detailed calculations of the capital cost benefits of regionalization particularly:
 - a) The calculation details for how the avoided capital cost of renewables changes from Scenario 1 to Scenario 2 to Scenario 3.
 - b) The calculation details for any other components of the capital cost impacts such as pumped storage hydro or transmission costs should be explained.
4. The presentations did not provide any detail on the calculations for each of the utility zones in California regarding how regionalization impacts their renewable procurement and renewable procurement capital costs. Please describe the basis for the calculations for each of the utility zones.
5. Slide 123 of the May 24th presentation states that coordinated operator training will exceed NERC requirements. Please discuss in more detail how this result is achieved.
6. Slide 29 of the May 25th presentation indicates that up to 1,200 jobs could be created in the greater Los Angeles Area. However, slides 88 and 89 do not indicate that there would be any development of renewables in this Area. How does the development of resources outside of an Area facilitate the creation of jobs within the Area? Please explain.
7. Slide 78 in the May 25th presentation shows that Palm Springs incremental solar development drops to 0 in Regional Scenario 3. While we understand that Scenario 3 assumes high levels of out-of-state development, it is not clear why Palm Springs would not continue to be developed. Please describe the method and rationale for determining the California Solar Portfolio distribution for each of the scenarios.
8. Slide 78 in the May 25th presentation details specific CREZ (California Renewable Energy

Zone) development levels for the different scenarios. It is not clear how these different development levels were determined. Please describe the factors that will impact the congestion patterns and, as a result, the economic results. Please describe how these development levels were determined and discuss how they were modeled in the analysis.

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

Comments on 50% Renewable Portfolios

1. Slide 126 of the May 24th presentation states that 5,000 MWs of wind distributed in WY and NM are “conservative”. It is not clear that this is a conservative assumption, especially with respect to WY. Slide 175 shows that most central US development is in the south central US and the ability to tap this supply is easiest in the south, via Texas into New Mexico. We recommend that additional analysis be performed on the geographic distribution of the out of state wind.
2. Slide 80 in the May 25th presentation shows that incremental Oregon wind drops by 1244 MWs in Scenario 3. It appears to be replaced by incremental Wyoming wind, which increases by 1995 MWs. Please describe why such a change in wind development is a valid assumptions between the scenarios.

Comments on Assumed Regional Market Footprint

1. Slide 89 in the May 24th presentation states that a regional market “reduces the number of unit starts” and provides a chart showing the estimated number. However, this has not always been the experience of other markets (e.g., MISO) due to the need for CTs to provide daily regulation that had been previously provided by older coal plants. We also note that this slide does not show the number of starts for out of state units. Underestimating starts could result under-estimation of Variable O&M and start-up costs. Please provide an explanation of this impact.
2. Slide 104 in the May 24th presentation states that savings of up to \$800M are dependent on accessing low cost development in New Mexico and Wyoming. This value represents over 50% of the benefits identified in Scenario 3. Please provide additional discussion on why New Mexico and Wyoming development assumptions is appropriate for this analysis.

Comments on Production Simulation Modeling/Economic Analysis

1. Slide 88 in the May 24th presentation states that “results are conservatively low because of simplified simulations”. In our experience, simplified analysis often results in higher estimates of benefits and lower estimates of costs. Please describe in more detail how these simplifications result in conservatively low net benefit estimates, and describe in detail the cost estimates that were considered.
2. Slide 90 in the May 24th presentation states that simulations do not fully capture under-utilization of the existing grid. However, production cost analysis usually includes thermal limitations but ignores voltage and frequency instability limits. Please provide some additional support for this statement.
3. Slide 92 in the May 24th presentation lists a series of simplification assumptions that introduce possibility of wide variations of the economic benefits (e.g., item 1 – “normal weather”). We are concerned that these assumptions may result in an undue bias in the analysis. We recommend that CAISO perform additional sensitivity analysis around these assumptions which will help stakeholders better assess the potential variations in benefits.
4. Slide 98 in the May 24th presentation describes the methodology for load diversity savings, yet it does not discuss how transmission constraints are considered. On slide 100, CAISO states that additional benefits can be captured with additional transmission upgrades, but there is no detail provided. Please describe how this methodology captures the transmission constraints and also explain the impact on calculating the load diversity savings.

Comments on Reliability Benefits

1. Slides 121 through 130 in the May 24th presentation discuss reliability issues. However, the costs of integration are not quantified and the benefits cited are general. While we agree that some of these benefits would come with expansion of the market, many of these benefits appear to be available to California and the stakeholders via other formats. Please provide clarification on the following items:
 - a) Slide 123 - Improved Real-time awareness since, for example, it could be improved by expanded use of synchro-phasors).
 - b) Slide 123 – Enhanced system and software for monitoring stability since systems are available today which could be implemented outside of the SB350 scenarios. .
 - c) Slides 123 and 130 – More unified system planning since regional planning can be expanded today if stakeholders feel it would benefit the region.
 - d) Slide 130 – Fewer planning coordination challenges and more consistent and unified regional planning tools which could also be provided today if stakeholders requested.

Comments on Environmental Analysis

1. Slide 118 in the May 24th presentation shows that CA in-state CO₂ emissions actually increase unless WECC wide renewable development exceeds the RPS target by 5000 MWs. Please provide additional support for the assumption that 5000 MW of renewable development above the RPS target is a likely development under Scenario 3.
2. Slide 98 in the May 25th presentation does not provide sufficient detail to critically review the land use analysis. More detail should be provided.
3. Slide 109 of the May 25th presentation indicates that the Westlands Area is in a “critically overdrafted basin” from a water supply perspective. However, slide 88 indicates that there are over 440,000 acres of land in the Westlands Area that could be suitable for solar development. Since slide 115 indicates water is required for PV development, please discuss how these issues were considered in determining the distribution of California Solar Portfolio.

3. Other**Transmission Related Comments:**

1. As stated in the May 24th presentation, Scenarios 1 and 2 do not include any new out of state transmission additions. Since there are many transmission projects currently being evaluated, additional analysis for these scenarios should be performed to factor in the impact of the possibility of new transmission coming in either through the south or the north. We recommend that a sensitivity study be performed that includes some additional transmission being added in Scenarios 1 and 2 in the south and in the north. However, before the sensitivity runs are performed, the nature of these transmission additions should be vetted through a stakeholder process. If such analysis is not performed, we are concerned that the results will tend to bias toward Scenario 3.
2. Slide 80 in the May 24th presentation presents information on the “available” transmission capacity that could be used to deliver additional energy only capacity from a number of California Renewable Energy Zones (CREZ) and the incremental cost for new transmission facilities that would be required once the “available” capacity has been utilized. The slide also notes that the information was based on a “special” study that the CAISO did as part of its 2015-2016 Transmission Plan. Have these values been discussed with/agreed to by “non-Participating Transmission Owners” i.e. entities that own transmission facilities that are not under the operational control of the CAISO but are operated in parallel with facilities that are under the operational control of the CAISO?

3. Slide 81 in the May 24th presentation presents information for out of state transmission cost assumptions. What is the basis for these costs? Are they based on individual utilities transmission requirements and OATT rates? Were they escalated in future years and, if so, what was the assumed escalation rate?
4. Slide 81 in the May 24th presentation states that Scenario 2 assumes no wheeling costs out of state. Why is this a legitimate assumption since (if we understand correctly) Scenario 2 does not include external states in a wider OATT?
5. Slide 81 in the May 24th presentation describes estimated costs if 1,500 MW of new transmission capacity was developed to deliver NM wind to Four Corners. Do these estimated costs also include the transmission-related costs for wheeling the generation from Four Corners to the system in California?