Clean Energy and Pollution Reduction Act Senate Bill 350 Study
Scope, Assumptions and Methodology – Sierra Club Comments

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 Study initiative posted on February 4, 2016. Please submit comments to regionalintegration@caiso.com by close of business February 19, 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 initiative proposal.

1. Do you think the proposed study framework meets the intent of the studies required by SB350? If no, what additional study areas do you believe need to be included and why?
Comment: No. The studies must analyze the impacts of a PacifiCorp-CAISO integration either in lieu of or in addition to a WECC-wide integration. Sierra Club notes that there is a disconnect between the scope of the proposed study under SB350 and the scope of the development of new governance structures, which is also required under SB350. Specifically, the studies presume that a WECC-wide regional market will emerge, despite the fact that only one entity – PacifiCorp – has put forth any plans to join a regional market. In contrast, CAISO and PacifiCorp are jointly presenting the proposed changes to the governance structure with a framework and on a timeline that would facilitate PacifiCorp's entry into the regional market. The result of this disconnect will be a series of studies that bear little resemblance to the real world, near-term impacts that will occur if and when PacifiCorp and CAISO integrate into a regional market. While a WECC-wide analysis is informative as an academic exercise to illustrate the potential that a WECC-wide market could someday offer to the region, the scope of the study is of limited value to the Legislature as it considers the immediate question of

whether to move forward with the proposal to integrate PacifiCorp and the CAISO.

The studies mandated by SB350 must be tied to the scope of the proposed governance structure. Section 395.5(e)(1) is clear on this point: "The Independent System Operator conducts one or more studies of the impacts of a regional market enabled **by the proposed governance modifications…**" (emphasis added). However, the February 10 presentation on proposed regional governance development makes clear that the intent of the governance modifications is to merge PacifiCorp and the CAISO, at least initially. Slide 11 of that presentation expressly states that the "Timeline [is] designed to allow PacifiCorp to obtain state regulatory approvals before the end of 2017." The studies must reflect the change enabled by the proposed governance change, which means the studies must show the impact of a PacifiCorp-CAISO integration.

The Legislature intended the studies and the governance changes to go together so that it could evaluate the impact on Californians that the proposed governance changes would have **before** those changes occur. As it stands now, the studies proposed by CAISO will not provide the Legislature with the tools to evaluate such a change because the WECC-wide integration of a regional energy market is, at this time, purely hypothetical. The governance changes, on the other hand, are not hypothetical; they are part of a concerted effort by CAISO and PacifiCorp, working together since at least April 2015, to implement changes that will allow PacifiCorp to integrate into the market by January 2019. That proposal – the integration of PacifiCorp and CAISO – will have very different effects in all of the areas targeted by the SB350 study than would a WECC-wide integration. Therefore, CAISO must study the impacts of a PacifiCorp-only integration as part of its compliance with SB350. Sierra Club does not object to also including a WECC-wide analysis, but first and foremost the focus should be on the impacts of integrating PacifiCorp.

The integration of the current CAISO region and PacifiCorp raises a specific and unique set of issues, including the impact on California's energy mix, integration of specific loads and resources, specific proposed and/or potential transmission projects that will impose specific costs on California's ratepayers, and so forth. These are multibillion-dollar issues with long-term impacts that deserve specific, detailed study before irreversible changes are made to the configuration and governance of the ISO. While there is value in studying the impact of wider regional integration, that effort should not come at the expense of thoroughly and pointedly studying the more limited integration now under consideration.

Sierra Club further notes that the study schedule and proposed governance changes appear to be driven specifically by PacifiCorp's proposed schedule for joining the CAISO. Compressing the study timeline into only six months when SB350 allows nearly two years (until December 31, 2017) will produce results that lack the impact of more meaningful engagement and participation from stakeholders.

2. Five separate 50% renewable portfolios are being proposed for 2030 as plausible scenarios for the purpose of assessing the potential benefits of a regional market. Are these portfolios reasonable for that purpose, and if no, why?
Comment: The Legislature requires and would be best served by a study that focuses on the specific ISO expansion scenario currently under consideration. The current portfolios do not meet that test. Sierra Club therefore recommends that the analysis include both a realistic BAU scenario and a scenario that compares integration with PacifiCorp only. With respect to the proposed portfolios, the consultant has proposed comparing a BAU case (Scenario 1) that includes rate pancaking and balkanized operations (along with three somewhat arbitrary simultaneous export limits) with a regional operations case (Scenario 2) that eliminates all regionalization in the study area in favor of simultaneous optimization. Scenario 1 is too pessimistic in that it assumes no common-sense improvements in operations even when such changes are already occurring and are clearly in all parties' interests. For example, this "do-nothing" scenario neglects any benefits of the recent and forthcoming expansions of the energy imbalance market, which should clearly result in improved ability for neighboring regions to absorb excess generation from each other. California has other options as well for managing over-generation such as storage, Demand Response, electric vehicle charging, retail rate design and improvements to the CAISO's energy market. None of these alternatives appear to be reflected in the BAU scenario. Sierra Club recommends that scenario 1 reflect the likely potential of these other efforts. At the same time, by modeling optimization throughout the region, Scenario 2 will far overstate the benefits that would accrue from incorporating PacifiCorp alone. While the proposed expansion may result in decreased friction for energy transactions with part of the non-California WECC, it will not eliminate all inefficiencies among non-participating balancing areas in a PacifiCorp-only scenario. Further, Scenario 2 (and 3) is designed, in part, to model the ISO's increased access to "latent flexible capacity across a broad, diverse region." (E3 Presentation at slide 3.) While increased access to latent flexible capacity may produce a benefit in parts of the non-California WECC, it is a poor characterization of the PacifiCorp region, which includes a generation mix comprised primarily of older and inflexible coal plants. The overly-pessimistic assumptions underlying Scenario 1 means that any comparison using this scenario as a baseline is likely to overstate the benefits of *any* regional integration; the overly-expansive assumption of optimization throughout the WECC in Scenario 2 means that comparing these two scenarios will provide very little insight

into the benefits of integrating PacifiCorp into the California ISO.

Scenario 3 is similarly poorly targeted to the issue at hand, because it relies largely on increasing amounts of wind from New Mexico, which is not part of the PacifiCorp footprint.

At a minimum, it is crucial that the consultant model a scenario in which wheeling charges are eliminated only between the ISO and PacifiCorp, and where a realistic scenario for reserve sharing between these balancing areas is implemented without changing the transactional environment for the rest of the WECC. If the modeling shows benefits derived from increased use of "latent flexible capacity," it would be imperative to identify the source of this capacity. This scenario should be compared to a base-case scenario in which the benefits of the expanded EIM are represented. This approach will provide the most realistic and useful analysis of benefits for consideration by the Legislature.

3. **To develop the five renewable portfolios the RESOLVE model makes a number of assumptions resulting in a mix of renewable and integration resources for the scenario analysis (rooftop solar, storage, retirements, out of state resources etc.) Do you think the assumptions associated with developing the renewable portfolios are plausible? If no, why not?**

Comment:
No comment.

4. **The renewable portfolio analysis assumes certain costs and locations for the various renewable technologies. Do you think the assumptions are reasonable? If no, why not?**

Comment:
No comment.

5. **The renewable portfolio analysis makes assumptions about the availability and quantity of out-of-state renewable energy credits ("RECs") to California. Do you think the assumptions are plausible? If no, why not?**

Comment:
The expansion of the ISO will affect the definitions used by the legislature in setting portfolio content categories under the state's RPS. Any *de facto* or explicit redefinition in this area will affect both the economic and environmental impacts of the RPS. The study should be clear in stating its assumptions on how the RPS "buckets" will work under an expanded ISO scenario.

6. The renewable portfolio analysis makes assumptions about the ability to export surplus generation out of California (i.e., net-export assumptions). Do you think these assumptions are reasonable? If no, why not?

Comment:
No. By looking only at a WECC-wide integration, the study fails to account for the large amount of inflexible coal generation that is the bulk of PacifiCorp's system. Approximately two-thirds of PacifiCorp's energy mix is generated from coal plants. That inflexible system may severely reduce the ability of California to export surplus generation to PacifiCorp, which in turn would diminish the benefits of the proposed regional market.

As described by the consultant, the ability to export surplus generation out of California depends, in part, on the availability of "latent flexible capacity across a broad, diverse region." While this may reasonably describe parts of the non-California WECC, it is a poor characterization of the PacifiCorp region, with a generation mix comprised primarily of older and inflexible coal plants.

With reference to the figures on Slide 11 of E3's presentation, PacifiCorp's coal units do not have the capacity to provide upward and downward reserves to the extent that more flexible gas-fired units can. If the modeling is to provide adequate insight into the currently-proposed integration, it will be crucial to realistically represent this lack of flexibility to avoid exaggerating the potential benefits of exporting surplus generation from California.

This limitation of PacifiCorp's coal-heavy system is a prime example of why a PacifiCorp-CAISO study must be conducted instead of only a WECC-wide study. The preponderance of coal generation across the WECC is much less intense than in PacifiCorp, where nearly two-thirds of the energy is derived from coal. Therefore, the potential constraints on the ability of California to export to PacifiCorp's BA's will be more restrictive than on a WECC-wide basis, and therefore the benefits that flow from the ability to export generation are reduced in a PacifiCorp-only scenario.

California energy planners and operators are well aware of the benefits of flexible capacity in facilitating the integration of renewable energy, including the capability to export surplus renewable energy out of state. Integration of a resource mix that provides this benefit will be more valuable to California ratepayers than integration of one that does not. The study should therefore focus on the specific unit dispatch constraints of PacifiCorp's inflexible coal capacity to determine the extent to which PacifiCorp's coal fleet limits the benefits of a regional market.

7. Does Brattle's approach for analysis of potential impact on California ratepayers omit any category of potential impact that should be included? If so, what else should be included?
Comment: Brattle's analysis of ratepayer impacts evaluates operating and investment cost savings. However, California ratepayers have additional policy concerns as well. For example, SB1368 imposes an emission performance standard on new investments and long-term financial commitments from California utilities. This law implements Californians' policy preference to reduce and eventually eliminate high GHG resources, particularly coal generation. In an integrated market with PacifiCorp, California ratepayers may be impacted by inadvertently supporting coal generation dispatch into the region. This impact is contrary to California's policy goals and should be addressed as an impact in the study. The results of the production cost modeling and the overall study should be reported in a manner that allows stakeholders to understand the unit-by-unit impacts (or at least by unit fuel type) that will be projected by the modeling. This will allow stakeholders to evaluate whether any cost savings come at the expense of other impacts such as increased thermal generation or the need to build (or avoid) new thermal generating units. Brattle should also consider the impacts of transmission cost allocation in an expanded ISO system. PacifiCorp in particular has plans for large transmission expenditures. Whether and how the cost of these expenditures would redound on California ratepayers should be addressed.
8. Are the methodology and assumptions to estimate the potential impact on California ratepayers reasonable? If not, please explain.
Comment: No comment.
9. The regional market benefits will be assessed based assuming a regional market footprint comprised of the U.S. portion of the Western Interconnection. Do you believe this is a reasonable assumption for the purpose of this study? If not, please explain.
Comment: See Sierra Club's comments on question 1. The study should analyze the impact of a PacifiCorp-CAISO integration in lieu of or in addition to a WECC-wide footprint. It is not reasonable to only look at a WECC-wide impact because such a market is at this point

still a hypothetical. It will take many years to develop and implement a WECC-wide market. While it is a laudable goal, the immediate question presented by SB350 is in direct response to the proposal to integrate PacifiCorp and the CAISO, and the study schedule has been dramatically compressed to meet PacifiCorp's aggressive timeline. The study must therefore at a minimum assess the market benefits of PacifiCorp-only integration with CAISO. There are other potential footprints that could merit further study, such as an evaluation of BA's that currently operate in the EIM, or the WECC-wide study that has been proposed. However, the first priority should be an analysis of a PacifiCorp-only expansion scenario.
10. For the purpose of the production cost simulations, Brattle proposes to use CEC carbon price forecasts for California and TEPPC policy cases to reflect carbon policy implementation in rest of WECC. Is this a reasonable approach? If not, please explain.
Comment: The consultant should assume that carbon emissions from the electric sector will be constrained by the compliance-period limits established in the Federal Clean Power Plan. Because the specific implementation of this program for each state is unknown at this time, it is reasonable to set an aggregate limit for the study area equal to the sum of the mass limit for each state. If the consultant is able to replicate this level of emissions by imposing a fixed carbon price on the dispatch cost, that would be an indication that the price is reasonable for the study period.
11. BEAR will be using existing economic data, and generation and transmission data from E3, the CAISO, and Brattle. These data are currently being developed. Are there specific topics that you want to be sure to be addressed regarding these data?
Comment: No comment.

12. The economic analysis will focus on the electricity, transportation, and technology sectors to develop the economic estimates of employment, gross state product, personal income, enterprise income, and state tax revenue. These results will be further disaggregated by sector, occupation, and household income decile. Do you think these sectors are the appropriate ones on which to focus the job and economic impact analysis? If no, why?
Comment: No comment.
13. Under the proposed study framework, both economic and environmental impacts of disadvantaged communities will be studied. Based on the study overview do you think this satisfies the requirements of SB350?
Comment: No comment.
14. The BEAR model will evaluate direct, indirect, and induced impacts to income and jobs, including those in disadvantaged communities. Do you think additional economic analysis is required? If yes, what additional analysis is needed and why?
Comment: No comment.
15. The environmental analysis will evaluate impacts to California and the west in five areas – air quality, GHG, land, biological, and water supply. Do you think additional environmental analysis is required? If yes, what additional analysis is needed and why?
Comment: Sierra Club recommends that the environmental analysis evaluate the potential impact to biological resources outside of California. While there is still a high level of uncertainty as to the location of build-out that would occur outside of California to achieve the level of wind resources and transmission assumed by the study, the plans for such development are sufficiently complete to understand the impact to sensitive biological resources. For the GHG analysis, the baseline or BAU case should assume that (1) California achieves the 50% RPS and (2) the region meets the goal of the Federal Clean Power Plan. The study should then consider any GHG impacts incremental to those two assumptions that could be provided by regional integration.

In particular, Sierra Club recommends that the study first focus on the GHG impacts of integrating PacifiCorp into the CAISO. According to its 2015 IRP, PacifiCorp is facing a series of expensive capital additions to its coal plants over the next 10 years. The study should consider whether those expenses are more or less likely to occur under regional integration, and what the regional GHG impacts will be from keeping those units online or retiring those units.

16. The environmental analysis presentation identified a number of potential indicators for the various impacts. Are the indicators sufficient? If no, what additional indicators would you suggest?

Comment:
Slide 12 of the Aspen presentation notes an indicator of "Changing MWh production towards coal or natural gas in mapped disadvantaged communities." This is an important indicator and should remain. In addition, the study should consider ALL changes in MWh production towards coal or natural gas on a unit by unit basis, regardless of whether that change occurs in a mapped disadvantaged community.

17. Other

Comment:
Timing: Sierra Club notes that the timeframe for completing these studies is very fast. The timeline contemplates a final report by June or July 2016. Yet SB350 requires a report by December 31, 2017. Sierra Club recommends that CAISO revise the study to fully use the time allotted by the Legislature so that a more thorough and accurate study will result.

Access to Data and Assumptions: Sierra Club requests that CAISO provide to stakeholders detailed input and output and post-processing files in machine-readable format (i.e., Excel with formulas intact) used to prepare the production cost simulations. This data will allow Sierra Club's experts, as well as other stakeholders, to review the data and provide more meaningful comments and suggestions regarding Brattle's analysis. CAISO and/or Brattle should provide this data as soon as possible so that stakeholders can conduct a meaningful analysis and provide input prior to the final results.