Stakeholder Comments Template

Submitted by	Company	Date Submitted
Edward G. Cazalet	MegaWatt Storage Farms, Inc.	February 19th, 2016

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: How does the framework does address the benefits of local resiliency / reliability with storage paired with local renewable generation including the potential choices of end customers and communities to adopt microgrids that can be islanded in emergencies? A concern is that more dependence on remote resources and long-distance transmission may reduce local resiliency. While the study has significant local solar resources, additional local storage is not selected in the resource portfolios. MegaWatt understands that this is a study of regional market alternatives, but to the extent that issues related to local resiliency and local storage are not properly addressed, remote resource and transmission solutions may be advocated by a west-wide entity that local customers must pay for in addition to paying for any local resiliency solutions. How is this issue addressed in the study?

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:
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: MegaWatt is concerned with the assumptions regarding new storage. New storage is not selected in any of the portfolios other than the 500 MW of pumped storage added for diversity. If diversity is valued why are the benefits of diversity apparently not modeled? At 50% percent renewables for the high solar case previous public studies by e3 for the five CA IOUs have found that the marginal curtailment of solar is about 65%. How is the decision modeled to add local CA storage vs. adding remote resources impacted by marginal solar curtailment at these levels? MegaWatt's understanding is that retirements of fossil generation are limited to the once-through cooling plants. It is also possible that with high renewables the spot prices of energy to existing fossil plants may not cover the fixed costs of maintaining these plants and such plants would need subsidies to stay in operation. Excess subsidized fossil generation capacity may have a depressing impact on spot and ancillary services prices which depresses the spot and ancillary services revenues to storage and renewables. We suggest the study investigate the implications of fossil retirements.
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: The study relies on two battery storage technologies, neither of them proven with many years commercial operation for daily cycling at large scale. We suggest that sodium sulfur storage which is commercially proven at large scale in daily cycling should

replace flow batteries in the storage options and that the cost and performance assumptions for all storage technologies should be vetted and updated as necessary.
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:
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: What are the assumptions regarding other regions development of solar which could limit the market for solar outside of California.?
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: See comments on resiliency in 1.
8. Are the methodology and assumptions to estimate the potential impact on California ratepayers reasonable? If not, please explain.
Comment: Is the de-pancaking of wheeling tariffs effectively a subsidy for remote resources versus more local resources? How does this affect investment decisions in local vs. remote resources? How do the models and analysis address this issue?
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:
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:
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:

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:
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:
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:
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:
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:

17. Other
Comment: What are the RESOLVE modeling assumptions regarding marginal transmission losses on the West-wide grid? The marginal losses over the full distances North to South and reverse and East to West and reverse may be a significant factor. For example, if at full load on a path the loss is say 15% then the marginal loss would be about 30%. Average losses on the same path might only be 5% because of the capacity factor of the renewable resource transported. A with high imports when North East wind is blowing or high exports when California solar is surplus, the marginal losses in a an economic west-wide dispatch may be important. Local storage of course also has marginal losses, but if the regional marginal losses are not properly characterized the role of local storage versus exports and imports may not be properly evaluated. How does the model consider this?