COMMENTS OF THE CALIFORNIA WIND ENERGY ASSOCIATION (CALWEA) AND AMERICAN WIND ENERGY ASSOCIATION (AWEA) ON ISO STRAW PROPOSAL FOR 33% RPS IMPACT STUDY
May 27th, 2009

The California Wind Energy Association (CalWEA) offers these comments on: (1) the May 20th document, ***CAISO Analysis of Integration Requirements associated with 33% RPS – Straw Proposal***; and (2) the related discussion at the May 20th meeting of the working group for this study.

As a threshold matter, we ask that the ISO respond specifically to stakeholder comments if it does not incorporate them in the upcoming analysis – a courtesy sometimes lacking in the IRRP stakeholder processes.

Our comments begin with general comments on ISO methodology. The Straw Proposal lacks many details that would explain the ISO's intentions in key areas, so we offer these comments in the hope that they will be reflected in the next version, which will hopefully be more detailed than this one.

We also provide specific comments on elements that were included in the Straw Proposal and then finish with recommendations about the solutions that should be considered to mitigate identified problems. It is not clear to us where solutions will be considered in the proposed analysis process, but our comments would apply regardless of where that might occur.

ISO methodology – general comments: The ISO methodology should:

- ***Clearly define the Base Case:*** As discussed at the May 20th meeting, this could consist of a likely conventional-generation build-out.
- ***Clearly distinguish between needed services***, specifically:
  - **Ramping vs. Regulation needs:** This was a subject of considerable discussion at the May 20th meeting. Ramping needs can be more readily addressed by less-costly and more-effective measures especially with the sophisticated optimization features of the new MRTU markets than procurement of additional Regulation services.
  - **Regulation vs. Spinning Reserve:** The ISO production simulation-based methodology to determine future Regulation needs should be consistent with the methodology for determining Regulation needs that is used in actual operations. Specifically, the penalty prices used to sequence allowed reliability criteria violations in the study optimization should reflect the MRTU optimization order, i.e., meeting Regulation criteria should have a higher value than meeting Spinning Reserve, rather than the opposite relative order as used in ISO studies to date (e.g., Existing Fleet Study).

    This would avoid portraying what would reallybe Spinning Reserve deficiencies in actual operations as Regulation deficiencies in the Study. Spinning Reserve deficits would likely be less of a concern, because the market for the service is generally deeper and more competitive than that for Regulation, and deficiencies would be less costly to remedy.
- ***Consider the vast geography of renewables-intensive areas*** when assessing the potential for rapid variations in intermittent generation output. It is well documented in the literature that spreading wind resources over large areas, such as all wind-resource areas state-wide, will significantly smooth fast variations of individual wind turbine outputs. ISO studies to date have only considered some areas of Tehachapi and Solano, which is inconsistent with the significant development of wind resources throughout California and in neighboring states, including northern Mexico; continuation of such assumptions will produce incorrect results.

- ***Consider controllability of intermittent-resource generation***, especially for the Type 3 and 4 wind turbines that are expected to constitute virtually all future new wind generation. ISO studies to date have assumed that intermittent resources are simply "uncontrollable negative loads," leading to overly conservative results. Future ISO studies should include consideration of output controllability for intermittent generators. Assuming even limited controllability of wind-generator output could have a significant impact on mitigating Regulation capacity needs, particularly for Regulation Down.
- ***Clearly state how many hours in a year significant additional levels of upward and downward Regulation capacity are expected to be needed.*** This information will help determine whether the need for large amounts of Regulation can be better mitigated by simply controlling more intermittent-resource output for those hours.
- ***Fully reflect the complementary nature of wind and solar generation profiles.*** Wind and solar outputs are often complementary – wind generation decreases in the morning as solar output is rising, and wind output rises in the late afternoon as solar generation is waning. Earlier studies have found that the impacts of the combination of intermittent wind and solar generation on load following and regulation requirements generally were modest. Failure to incorporate this relationship fully in the upcoming analysis may overstate the need for additional load-following and Regulation resources.
- ***Reflect realistic resource minimum-generation assumptions.*** CalWEA has repeatedly requested additional information on ISO assumptions for different supply sources in the past, but the ISO has yet to explain its assumptions. Those assumptions should not be duplicated here in yet another study without additional examination, specifically in these areas:
  - **Minimum gas-fired generation levels**, which should reflect ISO Master File entries;
  - **Minimum import levels**;
  - **Minimum QF generation levels**, which should reflect any contract provisions allowing for limited curtailments each year; and
  - **Minimum hydro generation levels**; there should not be any built-in assumption that it is worse to "spill" wind or insolation than water, i.e., minimum generation here should reflect only other factors like physical capabilities, environmental requirements, etc.

  More generally, minimum generating capability assumptions for all generators should be examined. As the incentives for lowering minimum generation levels becomes greater, both existing and new plants are likely to find ways to lower those minimum levels.
- ***Reflect realistic A/S import assumptions:*** Unless the amount of imported A/S is only de minimis (information that has not been provided), it makes no sense to assess A/S resource sufficiency under different scenarios without considering imports.
- ***Reflect likely ISO forecasting improvements:*** The ISO is currently conducting a vendor assessment process to improve ISO intermittent-generation forecasting ability, which should allow the ISO to reduce the need to commit or dispatch unnecessarily additional ramping and Regulation capacity and to reduce or avoid potential over-generation conditions by addressing them in the Day Ahead and/or HASP timeframe. It's not clear that the Straw Proposal assumes any forecasting at all, which would clearly overstate reserve requirements.
- ***Assume likely replacement of inflexible Department of Water Resources (DWR) contracts with more responsive generation***, as the contracts expire in the coming years.

ISO methodology – specific comments on the Straw Proposal

- ***Generic vs. specific terminology:*** We agree with the comments of Resero Consulting and others at the May 20th meeting that:
  - The problems should be stated in terms of managing the combined variability of intermittent generation and loads; and
  - The solutions should be stated as increased need for different kinds of system capability (e.g., the "integration services" term used at the meeting), instead of references to "generation fleet characteristics," to emphasize the variety of different methods that could be used to meet those needs (e.g., including storage or demand-side options.

- ***Base case definitions:*** We cannot comment on them at this time, as the specific information (e.g., CPUC base cases and Nexant report) has not been provided. The next study plan version should include all assumptions the ISO plans to use, instead of vague references to other studies, with an appropriate additional stakeholder comment opportunity at that time.

- ***Additional cases/sensitivities (p.3 of Straw Proposal):*** At a minimum, additional storage and demand-side resource scenarios should be considered. We believe that the "additional wind feathering and solar de-focusing" scenario probably should be added as well, though the ISO should provide its precise definition of those terms.

- ***Integration costs:*** CalWEA supports including an estimation of integration services costs as a study output but, as noted above, we believe that impacts and costs should be assessed by at least considering the geographic and technology diversity that is actually likely to occur, especially the complementary profiles of wind and solar technologies.

  CalWEA is particularly concerned about the ISO proposal to estimate separate wind, solar PV, and solar CSP impacts using separate simulations for each, absent an aggregate estimate of all resources combined (Straw Proposal, top of p.6, and reference to use of such data in the 2010 TPP around the middle of p.4).

  This type of analysis would be unrealistic and exaggerate the true impacts of the complete portfolio of new renewables expected to be operational over the study time horizon – specifically, it will overstate intermittent renewables' impacts on morning and evening ramps, intra-hour load following, and Regulation requirements, as well as the resulting costs.

- ***GHG dispatch adder:*** CalWEA supports the use of GHG adders in assessing the cost-effectiveness of renewable generation, but the ISO should explain its proposal (Straw Proposal, bottom of p.5) to use this adder in the dispatch simulations.

- ***Export assumptions:*** The ISO should explain its cryptic statement about halfway down p.8 that exports would be based on historical data but "not allowed during over-generation in base assumptions." The historical reference is clear, but why would use of those data not be "allowed" in over-generation periods when such exports will likely increase during those times?

  Instead, the ISO should not only use historic exports in its analysis, but it should use historic exports during over-generation periods when the simulations indicate that over-generation is occurring. In other words, the ISO should reflect the likely actual market response to zero or negative ISO market prices by assuming the high levels of exports that this would likely trigger.

- ***Resource case assumption summaries:*** The charts at the bottom of p.8/top of p.9 of the Straw Proposal should be explained – they are impossible to understand in their current form.

Solutions considered: The solutions assessed in the Study should include the following, in addition to increased Regulation purchases:

- ***Likely transmission and generation additions that could mitigate over-generation and increase ISO ability to manage intermittent resources***, e.g.:
  - **The proposed Central California Clean Energy Transmission Project** (C3ETP), which should allow better use of off-peak generation to increase availability of the Helms units in on-peak hours; and
  - **Other large pumped storage plants** in the ISO generator interconnection queue.
- ***More frequent import/export scheduling on the interties***, including intra-hour scheduling and dispatch of flexible resources outside the ISO area that could help ISO manage intermittent resources on its system.
- ***New storage technologies and off-peak loads***, e.g., flywheels, compressed-air storage, plug-in hybrid vehicles, and off-peak cooling.
- ***New demand-side technologies***, like Plug-in Hybrid Electric Vehicles (PHEVs) and Demand Response resources (e.g., building pre-cooling), which can play a major role in increasing off-peak demand.
- ***ISO market changes that could allow intermittent resources to help resolve problems***, e.g., lowering the decremental-energy bid floor below the -$30 level. A lower bid floor would allow price-responsive bids low enough to compensate for both foregone contract energy payments and loss of tax credits for the resulting reduced output. (This would have to be accompanied by PPA modifications allowing for payment for foregone production, rather than the MWh-based payments in most current intermittent-resource contracts.)

  These changes would also encourage investments to increase operating flexibility by both new existing generation, e.g., to lower minimum-load set points and increase start-up and shut-down frequency.