

Stakeholder Comment Template CAISO Integration of Renewable Resources (IRR) October 24, 2008 Stakeholder Meeting	
Organization: <u>Modesto Irrigation District</u>	Date Submitted <u>11-06-08</u>
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Industry Segment: Municipal Utility	
<p>Instructions: The CAISO is requesting written comments on information discussed at the Integration of Renewable Resources Program (IRR) stakeholder meeting held on October 24, 2008. This template is offered as a guide for entities to submit comments.</p> <p>All documents related to the CAISO's IRRP Program Plan are posted on the CAISO Website at the following link: http://www.caiso.com/1c51/1c51c7946a480.html</p> <p>Upon completion of this template please submit (in MS Word) to Jim Blatchford at jblatchford@caiso.com. Submissions are requested by close of business on Friday November 7, 2008.</p>	
<p><i>The IRRP effort is currently divided into two components – 20% RPS and 33% RPS. Each of these components will assess operational and infrastructure needs, which will then drive solutions that will fall with four categories: (1) infrastructure additions, (2) internal operational tools, (3) market products, and (4) regulatory modifications. Many of the tasks identified are consistent with the specific projects included in the IRRP High-Level Plan published in May 2008. Please comment on whether those tasks, as discussed at the stakeholder meeting, are appropriate and whether other projects should be included as part of the IRRP.</i></p> <ul style="list-style-type: none"> ▪ <i>Please indicate whether you believe such tasks should be included for 20% RPS or beyond 20% RPS.</i> ▪ <i>If included in the 20% component, please provide a proposed schedule that would ensure the results of the task could impact meeting the 20% RPS goal by the start of 2012.</i> 	
<p><i>There are many renewable activities occurring in California and various areas across the country. Please list those studies or activities that you believe have merit that may serve as an appropriate model or otherwise assist the CAISO in conducting the IRRP. If ongoing, please indicate how such activities may be coordinated with the IRRP.</i></p>	
<p><i>In response to the IRRP High-Level Plan, the Market Initiatives Roadmap, and the storage White Paper, several parties have indicated a strong interest in market product development to address</i></p>	

aspects of renewable integration. To assist IRRP in prioritizing and coordinating its role in market development, please indicate your perspective on

- **the effect of MRTU market design and planned enhancements (MAP) on renewable integration;**
- **any changes to the Roadmap based on consideration of renewable integration;**
- **which new market products, if any, are needed to stimulate needed capabilities;**
- **market aspects of interdependencies with other market and policy developments (e.g., once through cooling, long-term RA, greenhouse gas regulations); and**
- **market design lessons being learned in other ISOs/RTOs or other countries that are relevant to the California market context.**

In response to comments on the IRRP High-Level Plan, several parties supported the creation of working groups. The CAISO proposes to create the following working groups to act as technical forums to assist the CAISO: Storage, Forecasting and PIRP, Needs Assessment Studies and Research, and Market Products.

- **Please indicate whether you support the creation of such groups and whether your company would be willing to participate.**
- **Are there other working groups that should be created?**
- **Should there be limits on participation to those with appropriate technical backgrounds?**
- **Describe the role the working groups should play in the IRRP.**

Comments from meeting of 10-24-08

Ability for CAISO to project real time output of Solar & Wind.

1. Solar; most control centers have solar index reading, this used in association with a look up table of solar output V. solar index will allow ISO to project real time output of solar units. The look up table should already be populated with pollution index and effect on units due to particulate deposit.
2. Wind; most meteorologist have this data available, the ISO should have a staff to use this data.

Giving hydrogen production, storage, and usage a higher priority in choices to help absorb the variability in energy creation from solar and wind generators.

1. The ability to use hydrogen (H₂) to integrate renewable power into a utility has been studied and confirmed by many people, I refer you as an example to the attached studies and presentations by Glenn Rambach from 1999 & 2000.
2. The advancement in technology to increase the efficiency for the production of H₂ by nano technology can be seen at multiple sources, one being www.qsinano.com.

3. The renewable mandates in California and the markets run by the CAISO provide an opportunity to use the production of H2 and the clean generation output from H2 as an economic and feasible solution to the variability of wind and solar.
4. Existing generation used for shaping and backing down for firming of renewable is a limited resource.
5. Stored H2 can be used to generate and back up loss of real time wind or solar production. This allows existing generators on line to inc their output at a low \$/MWh output, this output is then used to produce H2 through electrolysis. I call this H2 load.
6. This H2 load is dispatchable and would qualify for market payments through the CAISO.
7. This H2 load can replace lost wind, solar or existing online generation loss.
8. H2 load can be increased to absorb loss of system load.
9. In a purely efficient system, on line generation would be run at its most efficient level and load following would occur through adjustments to the H2 load.
10. H2 that was produced through H2 load would be available for peaking, shaping, or base loading, all based on reliability and economics.
11. H2 storage and energy production can be used in partnership with other storage and generation options such as batteries, flywheel, pump storage...

Note: I will produce some charts and simple economics associated with this process.