

# EAGLE CREST ENERGY COMMENTS ON CAISO DRAFT 2016-7 TPP STUDY PLAN AND REQUEST FOR ECONOMIC PLANNING STUDY

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Eagle Crest Energy (ECE) is developing the 1,300 MW Eagle Mountain Pumped Storage Project (Eagle Mountain or the Project) in Riverside County, California. The Project has already been awarded an operating license by the Federal Energy Regulatory Commission (FERC).

The Project site is at the inactive Eagle Mountain mine and will use two former mine pits as the upper and lower reservoirs. The Project is designed as a closed loop pumped hydro project, i.e., it would not be located on a perennial river or have a surface water connection to other bodies of water. By using the closed-loop process at this brownfield industrial site, the Project can provide California with 22,000 MWh of energy storage capacity, with minimal environmental impacts.

ECE appreciates the opportunity to comment on the CAISO's draft Study Plan for the 2016-2017 Transmission Planning Process (TPP). ECE's comments focus on follow-up work from the last study cycle – specifically, ECE: (1) recommends an enhancement to one of the proposed Special Studies in the Study Plan – the 50% RPS Study; and (2) requests an Economic Planning Study for pumped-storage hydro facilities. ECE's recommendations are summarized below and explained further in the remainder of this document.

## **50% RPS Study**

The CAISO should add to the scope of the 50% RPS Study proposed in this planning cycle a closer examination of export feasibility.

The 50% RPS Study in the last planning cycle examined net-export scenarios between 2,000 and 8,000 MW. This is a very wide range, up to approximately the maximum historical simultaneous export level.

The prior study did not attempt to assess which export level was actually feasible. Narrowing the range of realistic export levels will be key to making policy decisions about potential over-supply mitigation measures – those policy decisions will likely be very different at a 2,000 MW export level than an 8,000 MW export level.

In fact, physical and operational limitations, legacy contracts, and policy/political factors could very well restrict such exports in the study time horizon. The CAISO's ability to export any renewable or other energy over-supply is premised on the ability and willingness of neighboring regions to absorb that excess energy; that ability and willingness will be based on several factors:

- **The physical ability of adjacent / nearby regions to absorb excess energy when it is likely to be available.** Neighboring states have relatively small loads compared to California and their own resource fleets to manage, and many large native resources in those areas lack operating flexibility. This is exemplified by the issues surrounding the current inflexibility of “block” imports, which has actually been exacerbated since implementation of CAISO 15-minute markets.
- **The willingness of other regions to forego the economic and other benefits of developing renewable-energy facilities.** The entire west has abundant renewable resource potential, and native development is an economic driver in many Western states. It's unclear why neighboring states would want to forego the economic development associated with native renewable development in favor of procuring California energy.

On the contrary, many regions considering joining the CAISO EIM and/or an expanded west-wide ISO/RTO are doing so to expand access to California markets, to sell energy from high-potential renewables or other production in their own areas and thus to reap the associated jobs and other economic benefits from such development.

- **Legacy transmission agreements.** Many of these areas have less-flexible, long-term transmission agreements in place that could reduce the use of those assets by others.

If other western regions cannot absorb California's excess energy due to these or other factors, California will be forced to adopt new strategies. In the next planning cycle, the CAISO should attempt to determine which export levels would be realistic – probably not zero, but probably not in the upper ranges assumed either.

### **Storage Study**

The “Bulk Energy Storage Study with 40% RPS in 2024” performed in the last study cycle was a good start. However, that examination was quite limited (focusing on a small subset of potential storage benefits), and additional analytic work is needed to inform CAISO and CPUC policy decisions about procurement and funding of such assets. For the reasons discussed below, ECE believes that this work should be performed under the economic study category, given the ability of bulk energy storage to provide many of the same economic benefits quantified for transmission facilities in the economic study process.

The CAISO's statements in other forums about its need for pumped-storage resources should be supported here with additional analytical follow-up work in the Study Plan. For example, the CAISO stated in its March 26, 2015 comments in CPUC Rulemaking 15-03-011 that, to manage increasing levels of intermittent/renewable energy on the system:

... the CAISO and the CPUC must be prepared to implement solutions that will allow for the reliable operation of a highly dynamic grid. Energy storage, with its unique ability to both consume excess renewable energy and to quickly inject clean energy back onto the grid to meet ramping and peak demand needs, has the potential to be a cornerstone of the new electric network. Pumped energy storage, in particular, can be constructed at large scale, with characteristics that are necessary to meet the grid's over-generation and ramping needs.

CAISO studies demonstrate that additional bulk energy storage with fast-ramping capabilities is essential to balance California's rapid rise toward a 50% renewable grid. Not only would California benefit from additional bulk energy storage resources such as pumped storage, California could be harmed without them. The CAISO therefore urges the CPUC to consider (a) increasing current procurement targets to allow for the capacity of bulk energy storage resources without subsuming the procurement of smaller and newer technologies, and (b) earmarking capacity within those procurement targets specifically for pumped storage.

Similarly, the draft 2015-6 Transmission Plan states that “consideration should also be given to how the storage resource would be compensated for the benefits it brings to the system.” (p. 258)

The CAISO must recognize that neither the CPUC nor the CAISO itself can reasonably make the policy decisions needed to support the pumped-storage procurement it recommends, or the means by which storage would be funded or compensated, without the analytic support that will form the basis for such decisions. This analytic support must be provided by the CAISO.

Moreover, those critical policy decisions cannot be postponed indefinitely if the CAISO expects to have these facilities available when needed, e.g., by 2024 when RPS levels may reach or exceed 40%. Like transmission facilities, pumped storage facilities take many years to plan, develop, and construct. Thus, the CAISO should perform the more complete studies now to preserve those options and enable those procurement, funding, and development decisions to be made by California policymakers in the next 1-2 years.

For example, the Eagle Mountain Project is already FERC-licensed; however, even for a facility at this advanced stage, procurement decisions are needed soon to meet a 2024 commercial-operation date. Other pumped-storage facilities that are not as far along will take even longer to develop.

Therefore, ECE requests that the CAISO undertake an in-depth Economic Planning Study for pumped storage hydro facilities to provide a comprehensive assessment of the system, local, and societal benefits of such facilities. The justification for large storage facilities will likely rely on all of these different benefits, so this study should be broad enough to encompass them and avoid isolated, “silo-based” analysis that has hampered storage development to date. Specifically, the study should consider, and quantify where possible, the following benefits:

- **System benefits:** Renewables and other energy curtailment avoidance (e.g., through reduced renewable generation “overbuild” needs to meet RPS requirements), frequency response, ramping, flexible capacity requirement reductions, avoided transmission, etc.
- **Locational benefits:** As the 50% RPS Study in the last planning cycle illustrated, there may be localized congestion or other negative grid impacts that could be addressed by bulk storage facilities. For example, additional renewables development in high-potential renewables areas such as East Riverside, or imports from other areas (which may become part of an expanded west-wide ISO/RTO by joining with the CAISO), could be accommodated through locating bulk storage facilities in that area.

ECE understands the CAISO’s general reluctance to study specific facilities in the TPP, but in reality there are only a small number of known feasible pumped-storage locations in California. In this cycle, the CAISO should examine the curtailment-avoidance, voltage support, and other locational benefits that could accrue from pumped-storage additions in these locations.

- **Societal benefits:** The storage study in the last cycle gave a price per ton of emissions (source not explained) and a reduction in millions of metric tons. However, given the state’s ambitious carbon-reduction goals, the CAISO should consider potential future increases in carbon-emissions values over time, as well as any other emissions-related or other societal benefits.

This study should reflect these key assumptions:

- **RPS level:** The study should include a 50% RPS level. The RPS will reach 50% just a few years after a 2024 COD, and it will be at or above 50% for the vast majority of the asset’s life.
- **Project size:** The storage study in the CAISO’s draft 2015-6 Transmission Plan noted:  
...the effectiveness of the new pumped storage resource is limited by its maximum capacity in relative to the volume of potential renewable generation curtailment. In this study the new pumped storage resource has 600 MW maximum pumping capacity that converts to 500 MW maximum generation, with an efficiency factor of 83%. When the curtailment...is greater than 600 MW, the pumped storage

resource...cannot store all the energy and use it in later hours. The portion of energy exceeding 600 MW is still curtailed...(p.253)

That document further states that curtailments of renewable energy were "...greater than 600 MW in many of the hours." Far higher levels of renewables curtailments (>13,000 MW) were seen in the 50% RPS Study in that last planning cycle. Mitigating larger amounts of renewables and other energy curtailment can reduce "overbuild" need, better optimize generation and transmission assets, and improve system reliability.

Therefore, the economic planning study should consider whether increasing the hypothetical bulk storage facility size (e.g., to 1,500MW or more) would provide a commensurate increase in benefits. Several feasible facilities under development in and around California could provide far more pumped storage capacity (individually or in total) than 500/600 MW.

### **Conclusion**

ECE recognizes the challenges of analyzing pumped-storage facilities, since the far-reaching and long-lived benefits are difficult to capture in a narrow analysis. The results of the study requested by ECE should be factored into broader thinking about the public policy benefits of maximizing the use of renewable resources consumers have paid for, and achieving state carbon-reduction goals without assuming unrealistic "overbuild" situations where incremental resources would have to be curtailed by 50% or more. ECE is confident that pumped storage will prevail under economic scrutiny if coordinated and comprehensive analysis considers the value of these assets in achieving the State's clean energy objectives.