

Submitted By	Company	Date Submitted
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### **General Comments**

From the dialog on the January 6 web conference, NRG better understands the CAISO's intent in pursuing the development of an opportunity cost model. Nevertheless, NRG offers these general comments about this process.

While the development of opportunity costs will help ration and optimize the use of use-limited resources, other important considerations remain. The CAISO should therefore expend as much effort in dealing with other needed market improvements as it has, and will, on pursuing opportunity cost models.

The first needed market improvement is to improve the CAISO's bidding rules so that market participants can reflect their units' true cost to the CAISO in *all* circumstances, especially during dynamic, volatile gas pricing conditions. Having the most well-crafted and accurate opportunity cost adder is of little benefit if market participants cannot accurately reflect all of their units' other costs to the CAISO market optimization.

The second needed market improvement is to price all constraints into the CAISO's market optimization. Again, the most well-fashioned opportunity cost is of little value when units are committed through non-priced minimum on-line capacity constraints or through some other unpriced market constraint. Only when market participants have confidence that nodal prices published by the ISO include the impact of all constraints can opportunity cost adders be accurately and reliably implemented. To do so otherwise provides the illusion of optimization, when in fact a large portion of the cost of energy (and dispatch) to the grid goes unpublished and largely unknown, thus making the deployment of useful opportunity cost adders largely impossible.

Finally – and NRG will reiterate this point later in its comments – the CAISO should remember that scheduling coordinators are in the best position to understand the limitations of their units and to project their expectations of the future conditions that their units will face. If a generating unit is operated past a permit limit, the scheduling coordinator/owner (who has a financial stake in the unit), not the CAISO, will face the consequences. This, and the fact that scheduling coordinators may have a very different risk tolerance around the operation of their unit than the CAISO or some other not fully-vested party may have, argues that the scheduling coordinator must have *the primary role* in establishing the opportunity costs to be used to ration and optimize the use of their generating units. We can debate the mechanics of how opportunity cost adders should be developed, but from NRG's perspective the party who bears the financial implications stemming from how a unit is offered to the market must have the primary role in determining how that unit is offered to the market.

NRG's topic-specific comments follow.

### **Definition of "Use-Limited Resource"**

The proposed definition of “use-limited resource” on page 8 contains a typo:

Capacity with operational limitations or restrictions established by statute, regulation, ordinance, or court order that cannot be optimized by the appropriate ISO commitment process without allowance for opportunity costs.

This typo is replicated on page 15.

**Examples of acceptable use limits**

The CAISO provided this table of examples and asked for feedback as to whether the examples provided sufficient guidance:

Acceptable?	Source	Non-exhaustive list of examples
Yes	Statutes, regulations, ordinances, or court order	<ul style="list-style-type: none"> <li>• Such as from Air Quality Management Districts, California Energy Commission, Local Regulatory Authorities, etc.                             <ul style="list-style-type: none"> <li>○ This limitation is largely environmental and most commonly in the form of an air permit. For example, emissions limitations with an absolute limit (cannot pay to emit more and would incur a penalty), wildlife/natural resource management, noise restrictions, etc.</li> </ul> </li> </ul>
	Operational	<ul style="list-style-type: none"> <li>• Limited due to the actual design of the resource.                             <ul style="list-style-type: none"> <li>○ This limitation is largely applicable to hydro, pumped storage, participating load, and combined heat and power. For example, limited reservoir storage capacity or interruption of host functions for combined heat and power capacity above the regulatory must-take capacity, etc.</li> </ul> </li> </ul>
No	Contractual	<ul style="list-style-type: none"> <li>• Limitations based on a power purchasing or tolling agreements</li> </ul>
	Economic	<ul style="list-style-type: none"> <li>• To reduce wear and tear</li> <li>• Staffing constraints or lack of investment</li> <li>• Avoid purchasing more credits, allowances, etc. to manage emissions (e.g., South Coast Air Quality Management District allows purchase of additional permits rather than a strict limit)</li> <li>• Did not procure fuel (potentially because it was expensive)</li> </ul>
	Fuel limitation	<ul style="list-style-type: none"> <li>• Variable energy resource                             <ul style="list-style-type: none"> <li>○ Such as wind and solar without storage, geothermal</li> </ul> </li> </ul>

With regards to contractual limitations, the CAISO’s position is that the CAISO tariff currently disallows “contractual” use limits and the CAISO is not proposing to change that disallowance at this time. It may be that the CAISO does not permit the use of contractual use limits because there is a concern that unless the use limit originally stems from some other fundamental source, such as an environmental permit or regulation, contract counterparties may have some ulterior motive for putting a use limit in a power purchase agreement that would unnecessarily or wrongfully deprive the CAISO of service. However, the reality is that contract counterparties have natural incentives to negotiate to maximize their own interests and to reach a mutually acceptable balance of burden and benefits. It seems unlikely, then, that load-serving entity counterparties would agree to a contractual use limit that would wrongfully deprive them (and, by extension, the CAISO) of service they were entitled to. Further, it does not seem reasonable that regulators would approve contracts with needless or wrongful use limitations. For all of these reasons, the CAISO should not continue to reflexively exclude contractual use limitations but should consider if and what kinds of contractual limits might be acceptable use limits.

**Scheduling Coordinators submitting their own opportunity costs**

*Some stakeholders have suggested that scheduling coordinators should be allowed to submit their own opportunity costs subject to verification. While the ISO does not object to this in principle, the ISO also does not currently have a model or methodology in place to verify, modify, or cap these costs. (Revised Straw Proposal at 17)*

NRG strongly believes that scheduling coordinators must have the primary role in establishing opportunity costs for their own resources. NRG notes that the CAISO has proposed to allow Scheduling Coordinators to submit their own negotiated opportunity costs where the use limits are sophisticated and complex:

*Based on conversations with scheduling coordinators, many hydro, participating load, and pumped storage resources develop costs based on sophisticated models that synthesize the impact of current and projected hydrology data, including snowpack levels, watershed topology and size, and various fish and wildlife restrictions. The ISO will not be able to replicate such a model. Instead, the ISO expects the scheduling coordinator to provide documentation of the modeling methodology for calculating opportunity costs. The resource will then use negotiated opportunity cost adders as approved by the ISO based on the submitted methodology, as depicted by the yellow box. The ISO expects that thermal host needs for combined heat and power and more complicated environmental permits (e.g., Delta Dispatch), as well as [multi]-stage generators with use limitations, may also require negotiated opportunity cost adders. Lastly, there may be some resources for which the ISO can model some limitations but not others. The ISO proposes to consider these resources under the negotiated option where the final opportunity cost is a combination of ISO calculated and scheduling coordinator provided data. (Revised Straw Proposal at 17)*

Scheduling Coordinators should be able to submit their own opportunity costs independent of the perceived complexity of the use limitation. A generating resource's opportunity costs are informed primarily by expectations regarding future events and opportunities and the unique characteristics and conditions that apply to individual generating resources. The CAISO's expectation regarding future events and conditions and the scheduling coordinator's expectation regarding future events and conditions (i.e., future gas prices and market conditions) may or may not be similar. Furthermore, the scheduling coordinator may have an entirely different risk tolerance regarding its own generating resources than the CAISO's risk tolerance for the same resources. Ultimately, however, it is the scheduling coordinator, not the CAISO, who bears the financial, environmental, or legal consequences of the resource's operation. While NRG does not object to the CAISO developing an opportunity cost model to inform the CAISO's own expectations with regards to a resource's opportunity cost, NRG does not support the CAISO using the model to substitute its own judgment and risk tolerance with regards to that resource's opportunity cost for the judgment and risk tolerance of the resource's scheduling coordinator. For instance, how does the CAISO intend to fold in the risks and

implications of out-of-merit dispatches into a unit's opportunity cost? Scheduling coordinators must be allowed to establish their own opportunity costs in negotiation with the independent market entity if need be in all cases, not just in situations that are complex or sophisticated.

### **Opportunity cost calculation**

#### **Natural gas prices**

NRG supports moving to the use of natural gas futures prices from historical gas prices to calculate opportunity cost.

#### **Use of 15-minute prices to establish opportunity cost**

*The ISO proposes to use forecasted 15-minute real-time prices in the model because unit commitment and de-commitment decisions are made based on that price. (Revised Straw Proposal at 20).*

While 15-minute prices affect unit commitment and de-commitment decisions for some units, those decisions are also strongly affected by day-ahead prices. NRG does not agree that 15-minute prices are the best prices to use in the opportunity cost model for all resources, especially resources that do not start or shut down quickly. NRG requests that the CAISO provide some analytical evidence that 15-minute prices are the better prices to use.

### **Updating opportunity cost calculations**

The CAISO has proposed to update the calculation of resource-specific opportunity costs quarterly, with more frequent updates possible in these situations:

- Significant system or network changes that tend to increase congestion or prices
- Natural gas prices increase appreciably
- Significant Master File or use limit plan changes

(Revised Straw Proposal at 29-30.)

This framework would be more reasonable if the CAISO added an explicit provision that allowed for the recalculation of opportunity costs upon either (1) the reasonable request of the scheduling coordinator (which could be due to some unforeseen circumstance not laid out in the three rules above) or (2) mutual agreement between the CAISO and the scheduling coordinator.

Again, in NRG's view, it is difficult to assess whether these provisions are reasonable until it is known whether opportunity costs will be established by the scheduling coordinator, subject to check by the CAISO or negotiation with the independent entity, or established unilaterally by the CAISO. In NRG's eyes, forward price volatility and the implications of that volatility is such that the concept of quarterly-only updates is likely unrealistic and unworkable.

### **Opportunity cost and the Availability Incentive Mechanism**

The CAISO has proposed the following rules:

- *If the resource has an ISO calculable opportunity cost in their minimum load, start-up, or default energy bid costs, the ISO will allow the resource to be exempted from the availability incentive mechanism once its use-limitation is reached in that month and the resource has put in the appropriate outage card. The ISO will not allow resources with a calculable opportunity cost to submit outages to manage their resource limitations.*
- *If the ISO determines the resource has non-calculable “negotiated” opportunity cost, then a resource will be allowed to manage its use limitation with outage cards and be exempted for the availability incentive mechanism during these outage periods.*

*(Revised Straw Proposal at 34)*

The reasonability of any rule that prohibits market participants from using certain tools at their disposal (such as outage cards) to manage their legal and financial risk associated with their generating units only using opportunity cost adders obviously will depend on the levels of the opportunity cost adders. Market participants must be allowed to exercise control over the level of opportunity cost adders.

### **Three-year review of default Variable Operations and Maintenance adders**

The CAISO observes that, while the three-year date for reviewing the default O&M adders (April 1, 2015) is approaching, only one stakeholder has asked for these adders to be reviewed.

*We would appreciate stakeholder feedback on whether conducting the three year review will be valuable or necessary given that the ISO is not aware of any concerns regarding the current values and the proposed proxy cost option will have an increased head room up to 125 percent on all costs, not just natural gas. (Revised Straw Proposal at 41.)*

NRG does not feel the need to review the current default O&M adders at this time, and believes that the CAISO’s (and market participants’) time is better spent on other initiatives.

### **Default Major Maintenance Adders**

*The ISO is contemplating ways to reduce the administrative burden on ISO and stakeholder resources by proposing to establish default values for major maintenance adders. (Revised Straw Proposal at 41)*

NRG supports the concept of using default major maintenance adders as a way to possibly reduce the significant burden involved in establishing major maintenance adders. NRG supports exploring this option. NRG’s ultimate support for default adders will depend on the structure of the adders (e.g., how adders will be differentiated by such things as technology and vintage) and level of the adders.