

Opportunity Cost and Storage Cost Offers

MRC

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Opportunity Cost

- **A mitigated energy offer for a generating resource reflects the short-run marginal cost of production for the resource.**
- **The short-run marginal cost may include opportunity cost associated with producing incremental generation now at the expense of producing incremental generation in more valuable hours.**
 - **Exogenous operational limits can cause opportunity costs**
 - **Exogenous:**
 - External environmental limits
 - **Endogenous limits are not a valid source of marginal opportunity cost (means of exercising market power):**
 - Decision to fill oil tank halfway
 - Decision to not buy gas, limited to oil
 - Discharge unit in offpeak hour



Opportunity Cost

- **If resource owner has control over the limitation or the lost eliminates the opportunity cost.**
 - **Raises questions of market power**
 - **Eligible to set price? Circular result.**
- **Marginal Opportunity Cost in cost offer presumes PJM has dispatch and operational control in optimization period.**
 - **PJM can commit/dispatch uneconomically absent the marginal LOC adder.**
- **Rational for marginal opportunity cost eliminated if PJM cannot dispatch/commit**
 - **PJM cannot commit**
 - **Charge/Discharge/Continuous**
 - **Control over Max and Min**
 - **No outages unless broken**



Opportunity Cost

- **LOC calculations require a good price estimates**
 - **Hourly vs. 5 minute**
 - Hourly difficult
 - If easy virtual bids would never lose money
 - 5 minute reaction with 5 minute settlement,
 - Very short horizon, very small (zero) opportunity cost
 - Hourly offer change is not compatible: No OC
 - State of charge
 - **5 minute price response (peaks and valley) vs hourly price response**
 - Multiple peaks and valleys in day.
 - Offer locked for hour, no OC within the time block.



Opportunity Cost

- **Variable discharge rate complicates/undermines calculation**
 - Discharge/Charge full capability in 1 hour, 4 hours, or 10 hours? Needs to be fixed.



Opportunity Cost

- **State of Charge Information Essential**
 - **Fully charged coming into the operational day**
 - **no charging opportunity without discharge**
 - **No cost (if OC is calculated within an operational day)**
 - If cost based on prior day, then inventory method hinted at generally
 - **Owner control over charge state undermines opportunity cost**



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