

# Storage as a Transmission Asset

## Stakeholder Comment Template

Submitted by	Company	Date Submitted
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Please use this template to provide your comments on the Storage as a Transmission Asset second revised straw proposal that was posted on October 16, 2018.



Submit comments to [InitiativeComments@CAISO.com](mailto:InitiativeComments@CAISO.com)

**Comments are due November 6, 2018 by 5:00pm**

The second revised straw proposal, posted on October 16, 2018, as well as the presentation discussed during the October 23, 2018 stakeholder meeting, may be found on the [Storage as a Transmission Asset](#) webpage.

Please provide your comments on the second revised straw proposal topics listed below, as well as any additional comments you wish to provide using this template.

Environmental Defense Fund (EDF) is pleased to be joining this stakeholder initiative. Overall, EDF is very supportive of this stakeholder process. CAISO Staff has clearly taken a tremendous amount of thought and care in crafting the second revised straw proposal. EDF was monitoring this stakeholder initiative and the development of this proposal in prior versions. EDF is pleased to engage with CAISO and the other stakeholders with this iteration. EDF offers some general observations on the straw proposal before responding to the specific topic areas identified by CAISO Staff.

EDF supports technology agnostic, fair competition for goods and services, as the preferred means to spur innovation and allow least-cost solutions to prevail quickly. This principle applies to storage capabilities competing within California’s energy markets.

EDF supports enabling energy storage having access to cost-based transmission services and receiving market revenues to provide greater flexibility to the grid. EDF encourages CAISO to design these rules so that energy storage will be incented to charge using fossil-free resources and to discharge at times that can displace fossil-based generating assets. If these market rules are correctly established, energy storage has the potential of accelerating the integration of variable renewable assets, thereby advancing California’s codified energy and climate policies.

EDF has been actively monitoring energy storage and their impacts on Greenhouse Gas emissions. EDF contends that CAISO needs to prioritize the optimization of Greenhouse Gas emission reductions as a key priority in this initiative. In general, for energy storage assets to reduce GHG emissions, the marginal emissions rate on the grid must be lower during charging times relative to discharge times. In other words, storage must charge when the grid is “cleaner” and discharge when it is “dirtier” to achieve GHG reductions. Furthermore, because storage technologies are not perfectly efficient, the amount of energy they discharge over any given period is always less than the amount of energy required to charge the system; thus, storage assets increase net energy use and policymakers should account for this in their calculations of GHG impacts. It is also possible that charging storage from existing renewables could increase emissions if that charging is forcing other end uses to utilize fossil fuel or grid electricity instead of those existing renewables. EDF encourages CAISO to view energy storage as a key strategy to integrate intermittent renewable energy<sup>1</sup> that can further decarbonize the electric grid; however, this decarbonization does not happen automatically. In fact, there is a growing body of evidence showing that energy storage has, or could negatively, impact GHG emissions in the United States if it is not deployed and optimized for GHG reductions.<sup>2,3,4,5,6,7</sup> Though not directly participating in its wholesale

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<sup>1</sup> Condon, Revesz, & Unel, 2018 Managing the Future of Energy Storage. Retrieved from [http://policyintegrity.org/files/publications/Managing\\_the\\_Future\\_of\\_Energy\\_Storage.pdf](http://policyintegrity.org/files/publications/Managing_the_Future_of_Energy_Storage.pdf)

<sup>2</sup> Hittinger & Azevedo, 2015 Bulk Energy Storage Increases United States Electricity System Emissions. Environmental Science and Technology, 3203-3210. Retrieved from <https://pubs.acs.org/doi/abs/10.1021/es505027p>

<sup>3</sup> Condon, Revesz, & Unel, 2018

<sup>4</sup> Craig, Jaramillo, & Hodge, 2018 Carbon dioxide emissions effects of grid-scale electricity storage in a decarbonizing power system. Environmental Research Letters. Retrieved from <http://iopscience.iop.org/article/10.1088/1748-9326/aa9a78/pdf>

<sup>5</sup> Arciniegas & Hittinger, 2017 Tradeoffs between revenue and emissions in energy storage operation. Energy. Retrieved from <https://reader.elsevier.com/reader/sd/91544D08E22591D4109F002E2E148A0C32043171627D49DC612192B44664BB586AFBD4F0B86C8FA928F04A09D7B7A952>

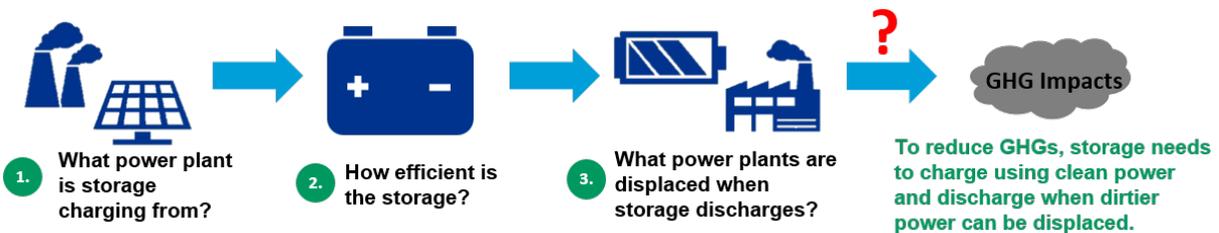
<sup>6</sup> Goteti, Hittinger, & Williams, 2017 How much wind and solar are needed to realize emissions benefits from storage? Energy Systems. Retrieved from <https://link.springer.com/article/10.1007/s12667-017-0266-4>

<sup>7</sup> Hittinger & Azevedo, 2017 Estimating the Quantity of Wind and Solar Required To Displace Storage-Induced Emissions. Environmental Science & Technology. Retrieved from <https://pubs.acs.org/doi/abs/10.1021/acs.est.7b03286>

markets, California’s Self Generation Incentive Program (SGIP) conducted an impact evaluation for its behind-the-meter storage assets (~49 MW) and found that even with California’s high penetration of renewables, the non-residential energy storage projects increased system GHG emissions by 726 MT CO<sub>2</sub>.<sup>8</sup>

It is critically important, therefore, for CAISO to consider as part of this stakeholder process that energy storage is actually charging from clean energy generation assets, discharging to displace dirtier generation assets, and ultimately driving decarbonization in the power sector. As demonstrated in the graphic below, EDF encourages CAISO to consider the source of power for charge, efficiency of the storage technology and time of discharge as part of this initiative.

### 3 factors determine GHG impacts from storage



As discussed in further detail below, the cost recovery mechanism, contract term length and other areas identified by CAISO all have implicit GHG emissions considerations. EDF encourages CAISO to consider this framework as it pursues next steps. Studies have also highlighted that “negative environmental effects of storage operation can be reduced or eliminated at low cost through voluntary or regulatory shifts in operational patterns, particularly in grids with larger flexibility in electricity prices and emissions rates,”<sup>9</sup> and EDF offers its suggestions in this spirit. If electric storage were properly incented, it could be a key strategy to reduce “wind and solar curtailment.”<sup>10</sup>

### Cost Recovery Mechanism

The ISO has proposed three alternative cost recovery mechanisms in the straw proposal:

1. Full cost-of-service based cost recovery with energy market crediting
2. Partial cost-of-service based cost recovery with no energy market crediting
3. Full cost-of-service based cost recovery with partial market revenue sharing between owner and ratepayer

Additionally, the ISO envisions two potential scenarios for option 1: Direct assigned SATA projects and 2) when the project sponsor bids into TPP phase 3 competitive solicitation process, selecting this option. The ISO has proposed the rules governing SATA bidding and cost recovery eligibility would differ slightly

<sup>8</sup> ITRON, 2017 2016 SGIP Advanced Energy Storage Impact Evaluation. Retrieved from <http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442454964>

<sup>9</sup> Arciniegas & Hittinger, 2017

<sup>10</sup> Craig, Jaramillo, & Hodge, 2018

between these two scenarios. Please provide comments on these three options, including the two scenarios under option 1 and any other options the ISO has not identified.

**Comments:**

EDF supports both variants of the first option presented by CAISO. The energy market crediting component of this option is the strongest signal available to charge/discharge at identified times. If the storage asset had to make up additional revenue through market arbitrage, it could lead to displacement of clean assets with the unintended consequence of increasing greenhouse gas emissions. Both Options 2&3 create uncertainty about the overall impact on greenhouse gas emissions. While EDF understands the potential economic merits associated with Options 2&3, we believe that the potential to increase greenhouse gas emissions and further curtail clean generation outweighs the potential economic gains from these options. If CAISO were to proceed with either Option 2 or Option 3, we encourage additional ratepayer protections on dispatch of the asset so that ratepayers are not made worse off on a net GHG basis.

**Options in the event of insufficient qualified project sponsors**

The ISO proposal would require all SATA projects sponsors to also submit a full cost-of-service bid as described in option 1, above. This bid would to be used in instances when there is fewer than three qualified project sponsors.

Please state your organization’s position as described in the Second Revised Straw Proposal (support, support with caveats or oppose). If you support with caveat or oppose, please further explain your position and include examples.

**Comments:**

EDF supports this approach.

**Contractual Arrangement**

The ISO proposes to establish defined three contract durations: 10, 20, and 40 years. Additionally, the ISO has eliminated its previously proposed TRR capital credit in favor of contractual requirements for maintenance of the resources.

Please provide comments on these two modifications to the ISO’s proposal, stating your organization’s position as described in the Second Revised Straw Proposal (support, support with caveats or oppose). If you support with caveat or oppose, please further explain your position and include examples.

**Comments:**

EDF supports the elimination of the TRR capital credit in favor of the contractual requirements as outlined in the straw proposal. The contractual requirements will reduce transaction costs and the updated pro-forma will allow for more certainty that the TRR proposal.

EDF supports the contract duration of 10 and 20 years; EDF opposes a 40 year length contract duration. EDF recognizes that a longer contract term length may be required for project certainty of certain energy storage assets, such as pumped hydro. However, the passage of Senate Bill 100 has altered the energy policy landscape in two key ways. First, there is an increase in the state’s Renewable Portfolio Standard to 60% and second there is a target of 100% emissions free electricity grid by 2045. The 2045 mandates a certain amount of flexibility and employing a “no regrets” strategy. CAISO cannot guarantee that any new storage asset brought online will not be in violation of the 2045 date or that there will not be a long term GHG emissions negative impact; while there are some storage technologies that would benefit from this proposed longer time horizon, EDF believes that preserving future flexibility and optionality is more important than the cost differential. Simply put, the potential near term ratepayer savings of amortizing costs over a 40 year term contract are not as valuable as the ability to meet the 2045 target with as much flexibility as possible. If CAISO were to establish some of EDF’s recommendations optimizing the charge/discharge and dispatch of electric energy storage for GHG emissions then EDF would be willing to reconsider its position on the 40 year length contract term.

### **Market Participation**

The ISO has proposed that a SATA resource will be provided notification regarding its ability to participate in the market prior to real-time market runs, but after the day-ahead market closes. The ISO will conduct a Load based SATA notification test to determine a SATA resource’s eligibility to participate in the real-time market.

Please state your organization’s position as described in the Second Revised Straw Proposal (support, support with caveats or oppose), including any alternative proposals. If you support with caveat or oppose, please further explain your position and include examples (please note that any alternative proposals should be specific and detailed).

#### **Comments:**

As stated above, EDF is primarily concerned with preventing the curtailment of renewable resources, encouraging that the charging of storage assets comes from these non-carbon emitting resources and that the discharge occur when the net effect is to reduce overall GHG emissions. EDF supports the notice and market participation as proposed, but encourages the information provided also include relevant grid GHG emissions intensity so that charge/discharge can be optimized.

### **Consistent with FERC Policy Statement**

The ISO believes the revised straw proposal is consistent with the FERC Policy Statement. Specifically, that the straw proposal does not inappropriately suppress market prices, impact ISO independence, nor result in double recovery of costs.

Please state your organization’s position as described in the Second Revised Straw Proposal (support, support with caveats or oppose). If you support with caveat or oppose, please further explain your

position and include examples. If you oppose, please clarify why and how the ISO might address this issue.

**Comments:**

EDF believes that the proposal is consistent with the FERC policy statement. EDF encourages CAISO staff to also make revisions as discussed above to ensure consistency with SB 100.

**Draft final proposal meeting or phone call**

The stakeholder meeting for the second revised straw lasted approximately 2.5 hours. As a result, the ISO requests stakeholder feedback regarding whether an in-person meeting is necessary for draft final proposal or if a stakeholder phone call will allow the ISO to adequately address the remaining issues in the draft final proposal.

Please state your organization's position as described in the Second Revised Straw Proposal (support, support with caveats or oppose). If you support with caveat or oppose, please further explain your position and include examples.

**Comments:**

EDF recognizes that it joined this particular stakeholder initiative after other interested parties have done tremendous work. If parties would like to discuss the issues raised by EDF, we welcome having some time set aside on the agenda to collaborate effectively. EDF is indifferent if the final meeting should occur in person or via video conference.

**Other**

Please provide any comments not addressed above, including any comments on process or scope of the Storage as a Transmission Asset initiative, here.

**Comments:**

If CAISO were able to adopt EDF's recommendations on this initiative, it will send a market signal to energy storage assets to increase their capacity factors and to optimize this new revenue stream to be GHG neutral; if CAISO can establish the right market signals, then EDF contends that this initiative will be a key strategy to reduce the amount of renewable curtailment seen on our system. Presently, between 9am and 5pm, the average daily curtailment of solar and wind assets is approximately 100 MWh. There is a system and economic need to address this curtailment, and we encourage CAISO to use displaced curtailments as a metric of success of this initiative. EDF also encourages having CAISO monitor GHG emissions reductions from this initiative as a metric of success.