

**UNITED STATES OF AMERICA  
 BEFORE THE  
 FEDERAL ENERGY REGULATORY COMMISSION**

**Fast-Start Pricing in Markets Operated by**            )  
**Regional Transmission Organizations and**          )  
**Independent System Operators**                    )  
**Docket No. RM17-3-000**

**COMMENTS OF THE CALIFORNIA INDEPENDENT  
 SYSTEM OPERATOR CORPORATION**

The California Independent System Operator Corporation (CAISO) submits the following comments on the Federal Energy Regulatory Commission’s (Commission) Notice of Proposed Rulemaking (NOPR)<sup>1</sup> issued in this docket on December 15, 2016.<sup>2</sup> The NOPR would require that each Regional Transmission Organization (RTO) and Independent System Operator (ISO) incorporate proposed market rules applicable to “fast-start” resources.

The CAISO supports the Commission’s efforts to enhance price formation in ISO and RTO energy and ancillary services markets. The CAISO agrees with the Commission that prices in energy and ancillary services markets ideally should reflect the true marginal cost of production, taking into account all physical system constraints. The CAISO also agrees that to the extent possible market prices should fully compensate resources for the marginal cost of providing service and minimize uplift payments.

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<sup>1</sup> *Fast-Start Pricing in Markets Operated by Regional Transmission Organizations and Independent System Operators*, 157 FERC ¶ 61,213 (2016) (“Fast-Start NOPR”).

<sup>2</sup> The CAISO also joins the comments submitted today by the ISO/RTO Council.

However, the CAISO believes that the measures the Commission proposes will not further those goals in the CAISO's markets and, indeed, may adversely affect the CAISO's markets. First, the proposed fast-start pricing requirements will produce market outcomes that could undermine the CAISO's efforts to operate a robust region-wide energy imbalance market and manage a generation fleet that is increasingly comprised of variable energy resources. The CAISO's primary concerns are that under the proposed pricing rules (1) market prices will mask the proper price signal in the numerous intervals in which the CAISO market faces oversupply, and (2) the CAISO will need to rely more extensively on out-of-market actions that increase, rather than minimize, market uplift. The CAISO is also concerned that the proposed rules could undermine the numerous, significant, and tailored market design changes the CAISO has made in recent years to address the challenges raised by the radical transformation of its fleet.

The CAISO is concerned that implementing the proposed market rules will frustrate the CAISO's market design efforts and drain resources that are currently focused on developing needed market design changes to successfully integrate the significant quantities of variable resources expected on the CAISO system. Also, it is not evident to the CAISO that the proposed changes will result in decreased uplift costs on the CAISO system. To the contrary, adopting the proposed pricing rule changes could require the CAISO to increase its manual dispatches or dispatch resources off their submitted bid curves, thus increasing the need for uplift payments. The Commission recognizes in the NOPR that pricing resources in this manner could result in the need to back off other resources. This is already a major problem facing the

CAISO – one that can be overwhelming at times – and is expected to become even more challenging given the steadily increasing number of variable energy resources participating in the CAISO’s markets. It is important that the CAISO and the Commission carefully consider the consequences of the NOPR under these circumstances.

Given the unique and unusual conditions and challenges the CAISO faces, the NOPR potentially could have significant and unintended consequences on the CAISO’s markets. To facilitate a better understanding of these issues, it would be beneficial for the Commission to convene a technical workshop to address the specific impacts of the NOPR on the CAISO’s markets (and any other markets where the NOPR may present market-specific challenges). A technical workshop would allow the CAISO, its stakeholders, and the Commission to consider the specific issues facing the CAISO, evaluate the impact of the NOPR’s proposed changes on the CAISO’s existing markets, and assess how the proposed modifications will affect and interact with other CAISO-planned market enhancements. This will allow the parties to explore and identify options that can effectively balance the Commission’s desire to achieve the NOPR’s intended goals with the need to resolve the difficult challenges the CAISO faces. It is difficult to effectively and comprehensively communicate the CAISO’s concerns in written comments on the NOPR. It would be much more informative and beneficial to engage in a dialogue in a targeted technical workshop.

Any just and reasonable final rule must consider a region’s distinct conditions and operational and market challenges and account for them in a manner that does not undermine the region’s existing and planned market mechanisms to effectively deal with

such challenges. Therefore, the CAISO requests that, before issuing a final rule, the Commission convene a technical workshop to further explore these issues and potential solutions. The CAISO also requests that any final rule not mandate that all ISO/RTOs adopt the pricing rules proposed in the NOPR. Rather, the final rule should allow sufficient flexibility for each ISO and RTO to demonstrate, on compliance, whether the proposed pricing rules are necessary and appropriate in its region.

## I. COMMENTS

### A. **The change in composition of the generation fleet serving CAISO load has resulted in significant changes in the CAISO's operational requirements.**

The generation mix in California is changing rapidly and significantly from primarily conventional resources to variable energy resources as the California-mandated renewable portfolio standard (RPS) increases from 33% to 50%.<sup>3</sup> The change in make-up of the fleet has impacted the CAISO's operational challenges significantly. Not only must the CAISO focus on meeting peak load, but it now must also ensure sufficient ramping capability, both upwards and downwards, is available over relatively short periods to meet the sudden swings caused by variable energy resources. To this end, the CAISO has focused on resource adequacy enhancements to ensure that sufficient flexible resources are procured and offered into its market. This helps to ensure that flexible resources are compensated through capacity payments to provide the operational attributes needed to maintain reliable grid operations with higher levels of renewable resource penetration. The CAISO has also made significant

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<sup>3</sup> See, e.g., [https://www.caiso.com/Documents/FlexibleResourcesHelpRenewables\\_FastFacts.pdf](https://www.caiso.com/Documents/FlexibleResourcesHelpRenewables_FastFacts.pdf) (noting the requirement for serving 50 percent of retail electricity in California from renewable power by 2030).

investments to improve its real-time market to provide accurate price signals for resources to follow five-minute dispatch instructions.

The CAISO's real-time market includes the fifteen-minute short-term unit commitment, real-time unit commitment processes, and five-minute real-time dispatch. Each of these market runs optimizes over a market horizon with multiple time intervals spanning from 4.5 hours for the unit commitment process to 13 five-minute intervals. The CAISO financially settles energy in the real-time market in the fifteen-minute market, based on schedules produced by the second interval of each market run of the real-time unit commitment process and settles the real-time market in the five-minute real-time dispatch, based on dispatches produced by the first interval of each run of the five-minute real-time dispatch. These are referred to as "binding" intervals, while the other intervals of each market run are referred to as "advisory" intervals. The CAISO operates its real-time market to meet "forecasted net load" with dispatchable resources, which is the difference between total system demand and the demand met by non-dispatchable resources.

The CAISO's experience in operating the markets has shown that the fleet of resources committed in the fifteen-minute real-time unit commitment process to provide energy often does not provide sufficient flexible ramping capability in the five-minute real-time dispatch to meet the actual changes in net load that occur over every successive five-minute period. When there is a lack of such resources, the CAISO may have to relax the power balance constraint, dispatch units out of economic sequence, or dispatch units that are not in the market. Such measures impose additional costs on

the system that are borne through uplift, and result in prices that do not reflect such marginal costs.

These challenges will only increase as California progresses toward a 50 percent RPS requirement and beyond. To address these issues, the CAISO has modified and continues to modify both its resource adequacy requirements and its market rules to incentivize investment in enhanced resource dispatch flexibility and not to incentivize resources that are inflexible or, when dispatched, contribute to the need for additional downward dispatch flexibility. In particular, the CAISO developed and the Commission approved the flexible ramping product, which the CAISO implemented on November 1, 2016.<sup>4</sup> The flexible ramping product functionality allows the CAISO to ensure its dispatches and price signals are better aligned with meeting the system flexibility requirements. In accepting the tariff modifications to implement the flexible ramping product, the Commission recognized the importance of encouraging flexible ramping capability in order to “account for forecasted net load movement and forecast uncertainty in all processes of the real-time market.”<sup>5</sup>

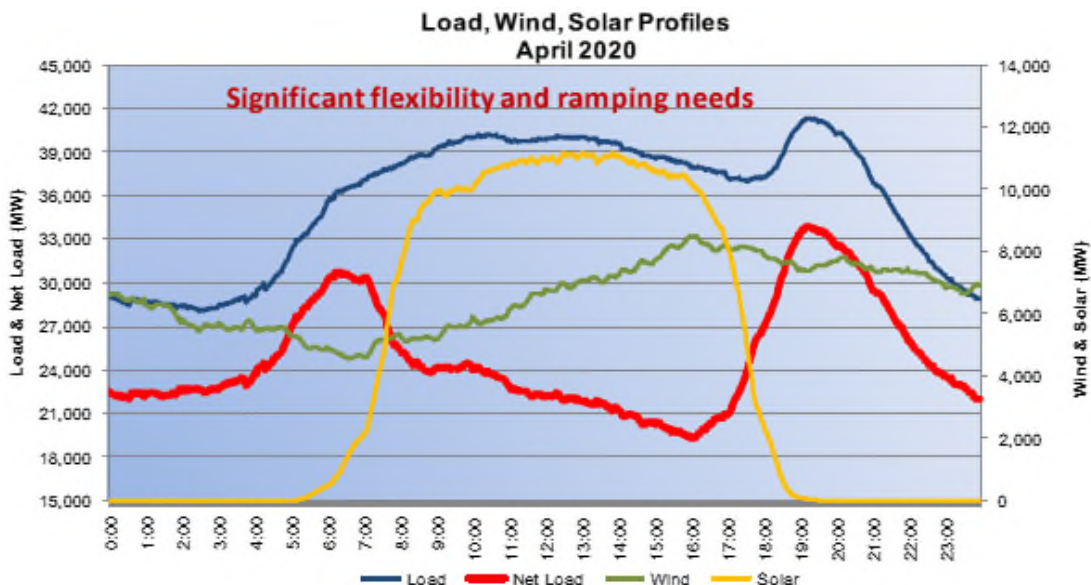
Figure 1 below, which is a figure that the CAISO previously presented in support of the flexible ramping product amendment, remains relevant in the CAISO markets. It depicts the projected load, net load, and energy provided by wind- and solar-powered resources for the CAISO markets in April 2020.

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<sup>4</sup> *California Indep. Sys. Op. Corp.*, 156 FERC ¶ 61,226 (2016).

<sup>5</sup> *Id.* at P 36.

**Figure 1: Projected Load and Renewable Profiles in April 2020**



In Figure 1, the net load (shown as a red line) equals the load (shown as a blue line) minus the variable energy resources' total wind and solar output (shown as a green and a yellow line, respectively). Figure 1 shows that the five minute-to-five-minute net load change may triple in magnitude in the hours ending 18:00 and 19:00, with the variable energy resources' output moving in the opposite direction of the load. The variable energy resources' output may also reverse the direction of load ramping in the hours ending 7:00 and 8:00. These projections demonstrate the need for measures to maintain sufficient flexible ramping capability in both upward and downward directions to address variability and uncertainty in order to ensure reliability. The CAISO is concerned that the Commission's proposed rule may undermine its efforts in developing price signals and market products that incentivize five-minute dispatch ability.

**B. Relaxing economic minimum operating limits and incorporating commitment costs into prices for fast-start resources will promote the wrong incentives for the CAISO markets and undermine the CAISO's efforts to address the current challenges in its markets.**

The NOPR proposes requiring all RTOs and ISOs, in the pricing run, to relax to zero each fast-start resource's economic minimum operating limit, thereby treating these resources as fully dispatchable for the purpose of calculating prices. Relaxing the economic minimum operating limit of a fast-start resource to zero will permit an inflexible or mostly inflexible fast-start resource to be treated as dispatchable by the RTO/ISO market software during the pricing run.

This proposal is problematic as applied to the CAISO's markets. Allowing inflexible fast-start resources to be dispatched between zero and their PMin will undermine the accuracy of the CAISO's market dispatch. The CAISO is concerned that the market software will produce a dispatch that is physically infeasible because the market is being forced to ignore that the resource is not actually dispatchable in that range. The infeasible dispatch poses a problem because resources will not receive the proper signal and the congestion management from the market optimization will be inaccurate. The CAISO would have to constrain the outcome of the scheduling run and assume in the pricing run that the resources are dispatchable within a range that they are not. Because these resources will be eligible to set the price for subsequent intervals even when they are really only needed for the initial interval of their dispatch, the price signals in those intervals are thwarted. The difference between the market dispatch between 0 MW and Pmin versus the actual dispatch of the resource at Pmin will create a power imbalance that can become significant depending on the number of resources with relaxed dispatches. This will result in the need for the CAISO to carry



additional regulation down, engage in out-of-market actions to remedy oversupply that is created by the market dispatch, and make manual adjustments to the load forecast or transmission constraints to ensure a market result consistent with operational needs. Increased reliance on regulation down to address this issue would expand the CAISO regulating margin, which would increase regulation costs and uplifts. If the CAISO did not increase the regulating margin, it could be faced with a reliability issue.

The Commission proposes to address oversupply issues with products like uninstructed deviation penalties.<sup>6</sup> However, the CAISO is concerned that resources will not be able to respond in accordance with dispatch instructions because the resulting dispatch is not physically feasible, as explained above. Therefore, these types of solutions would not work to address the oversupply issues the CAISO faces and the infeasibilities that the proposed rules could cause.

As discussed above, the main need in the CAISO's markets given the increasing reliance on variable energy resources is for five-minute dispatch-able resources with flexible ramping attributes. An economic signal incentivizing the dispatch of inflexible resources is the wrong price signal based on this need, and indeed, will undermine the CAISO's ability to manage its markets effectively. In particular, this sort of price signal will discourage variable energy resources from submitting economic bids into the CAISO markets because prices would be higher than they otherwise would have been due to the need to treat inflexible fast-start resources as eligible to set the price during intervals in which their output is no longer marginal. This would diminish the incentive for generators to submit economic bids. In other

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<sup>6</sup> Fast-Start NOPR at P 55.

words, based on the operational needs under such circumstances, the market price should be signaling resources to reduce their output in order to offset the minimum load of the fast start unit, rather than remaining positive and thereby signaling resources to continue bidding incremental energy. Over the longer term, these incorrect price signals may result in the over-procurement of inflexible resources, thereby exacerbating rather than helping to address the operational challenges faced by the CAISO in managing a generation fleet that will be increasingly composed of variable resources.

The CAISO has similar concerns regarding appropriate incentives with respect to the NOPR's proposal to incorporate start-up and no-load costs into LMPs for fast-start units, and to amortize those costs over its minimum run time. As variable energy resource penetration increases in the CAISO's market, the CAISO will need to continue to focus primarily on improving 5-minute price signals. The CAISO's advanced 5-minute real time dispatch could be undermined if variable costs were amortized over a period greater than 5 minutes.<sup>7</sup> As with the proposal to relax minimum operating limits, amortizing costs in this manner can lead to incentives inconsistent with operational conditions. This mismatch has two likely impacts: (1) resources not following dispatch instructions, requiring the CAISO to procure additional regulation, thereby further increasing system-wide costs; and (2) incorrect price signals, with the attendant consequences discussed above (e.g., encouraging the procurement of inflexible resources, rather than the flexible resources that the CAISO needs to manage increased amounts of variable resources).

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<sup>7</sup> The CAISO's market includes both a fifteen and five minute market. The CAISO uses the same bid set for both markets that include start-up and minimum load costs. Therefore, any amortization of the commitment costs for the term of the resource minimum run time will impact both the fifteen and five minute LMPs.

Additionally, the CAISO has been working on further enhancements to its real-time market to recognize the energy opportunity costs that result from positioning flexible resources to meet operational needs. These initiatives compensate resources at the marginal opportunity costs or cost of dispatching high cost resource up out of merit order that results when the CAISO holds a resource out of merit in the financially binding interval. These products include the recently implemented flexible ramping product, contingency modeling enhancements to be implemented in 2018, and generation contingency and remedial action scheme modeling, also planned to be implemented in 2019. These initiatives will reduce real-time uplift payments needed to cover the cost of out of merit dispatches. The CAISO is concerned that the fast-start pricing proposals in the NOPR will undermine the compensation of these enhanced products.<sup>8</sup>

First, the CAISO is uniquely situated among the various ISOs and RTOs in that it is the only ISO/RTO that has fifteen and five minute markets. The CAISO would have to determine whether to incorporate the amortized costs of a fast-start unit in both or only one of these two markets. If it incorporates the costs in both, it would dilute the CAISO five-minute dispatch signal because the prices are being kept artificially high in during the resource minimum run time. This, as explained herein, causes a problem because the CAISO must increasingly rely on five minute dispatch ability. If the CAISO

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<sup>8</sup> The CAISO is uniquely situated among the various ISOs and RTOs in that it is the only ISO/RTO that has fifteen and five minute markets. The CAISO would have to determine whether to incorporate the amortized costs in both or only one of the two markets. If it incorporates the costs in both, it would dilute the CAISO five-minute dispatch signal because the prices are being kept artificially high in during the resource minimum run time. This, as as explained herein, causes a problem because the CAISO must increasingly rely on five minute dispatch ability. If the CAISO were instead to incorporate the amortized costs only in fifteen minute market, this would create a pricing discrepancy between the two markets that would cause uplift in the CAISO markets as those differences are reconciled in the real-time dispatch.

were instead to incorporate the amortized costs only in fifteen minute market, this would create a pricing discrepancy between the two markets that would cause uplift in the CAISO markets as those differences are reconciled in the real-time dispatch

In addition, the CAISO enforces the flexible ramping product requirement in all intervals of the CAISO's multi-interval optimization. This ensures that the CAISO positions resources not just to meet load in the current interval and the ramp to the next 5-minute interval, but also meet uncertainty and variability optimally across the entire horizon. If under this construct, fast start resources set the LMP when dispatched below their PMin, the price between intervals could artificially remain unchanged. This would provide a price signal showing that there is a need for increasing output during the minimum run time of the fast-start unit, when in reality there is a need for less output. In addition, the price signal of meeting variability and uncertainty in net load would be muted because changes in net load that do not result in the fast start resources being dispatched at PMin will not result in LMPs changing between intervals. This would in essence undermine the benefits of the flexible ramping product.

Another operational issue with adopting the pricing proposals from the NOPR in the CAISO markets is that since the 2014, the CAISO pricing run produces both the final schedule and pricing. The scheduling run still conducts the actual commitment or dispatch of the resource. However, the pricing run now takes that schedule as a constraint and produces the final dispatch and prices for the applicable interval. Previously, the CAISO used the scheduling run to determine awards and the pricing run to determine settlement prices. Under certain circumstances, this resulted in a

mismatch between the price submitted in cleared bids awarded and the settlement price in the CAISO's hour ahead scheduling process at aggregated pricing nodes.

In 2013, the CAISO proposed, and the Commission accepted, a tariff amendment to establish both awards and settlement prices in the pricing run.<sup>9</sup> This change has provided significant benefits to CAISO market dispatches and prices, particularly in reducing inconsistency between schedules and prices between the scheduling and pricing runs. In order to implement the pricing modifications proposed in the NOPR, the CAISO must carefully evaluate whether the goals of the prior changes would be undermined by the need to incorporate the Commission's proposed changes, which could be costly or problematic if left unaddressed. The CAISO has not been able to fully investigate and evaluate the magnitude of these consequences, but is concerned that implementing the NOPR's pricing proposals without better understanding the potential consequences thereof could have serious negative ramifications for the design and operation of the CAISO's markets. For this reason, the CAISO requests that the Commission establish a technical workshop in order to further develop the record on these issues, particularly with respect to the potential consequences that the NOPR proposals might have in specific regional markets.

**C. The fast-start pricing requirements in the NOPR will exacerbate overgeneration conditions in the CAISO and lead to increased system costs to address these conditions.**

In the NOPR, the Commission recognizes the overgeneration challenges associated with treating fast-start resources as fully dispatchable for price calculation purposes, and requests comments on such challenges. The CAISO anticipates that

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<sup>9</sup> Tariff Amendment to Enhance Price Consistency, Docket No. ER13-957-000 (February 19, 2013).

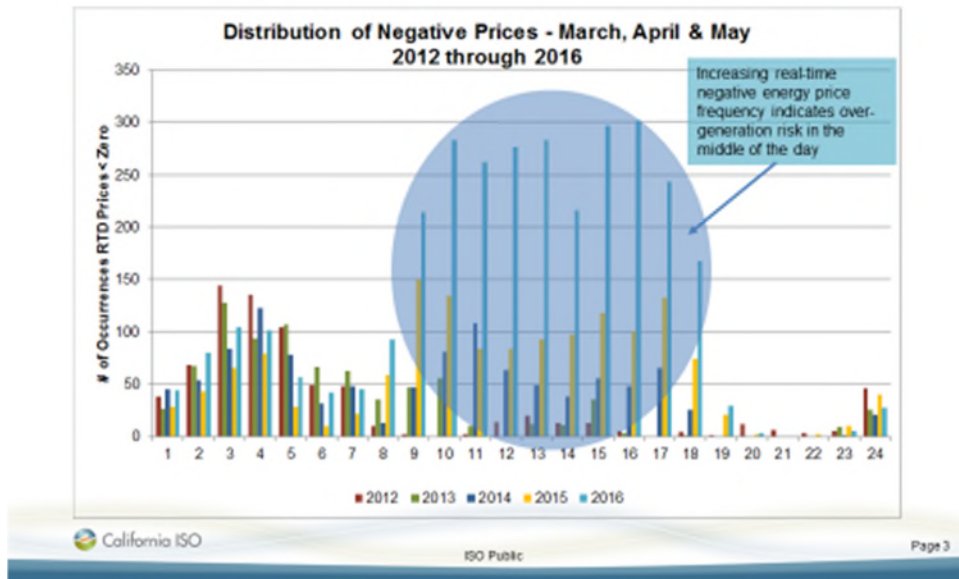
challenges related to overgeneration will increase along with the increase of variable resources on its system. This is an issue of particular importance to the CAISO because forcing the CAISO to manage the overgeneration on its system by manual dispatches would result in a significant strain on the CAISO operations and would undermine the efficacy of the CAISO's price signals given that a greater volume of dispatches would be obtained through actions outside of the CAISO centralized dispatch. Indeed, the CAISO has endeavored to reduce its out-of-market actions to ensure its market dispatches and prices reflect the marginal costs of committing and dispatching its system resources. Forcing the CAISO to increase its out of market actions would run contrary to the Commission's prior orders aimed at reducing such actions.<sup>10</sup> For this reason, the CAISO, has modified and continues to modify its market rules to reduce oversupply through market mechanisms and incentives.

The figure below shows that in the months of March, April and May, the increased frequency with which the system experienced real-time negative prices indicates the increasing risk of over generation in the middle of the day. This issue will be further exacerbated in years like 2017, where the CAISO anticipates a high volume of hydro generation on its system.

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<sup>10</sup> See, e.g., *California Indep. Sys. Op. Corp.*, 128 FERC ¶ 61,218 (2009) at PP 50-51 (noting the goal of reducing reliance on exceptional dispatches by the CAISO).

## Negative energy prices indicating over-generation risk start to appear in the middle of the day



These realities make it critical that the CAISO not be forced to adopt market and pricing rules that would send the wrong incentive with respect to encouraging non-flexible resources and potentially result in the increased dispatch of resources that will contribute to its over-supply challenges, particularly during peak periods.

Also, one of the Commission's expressed goals in the NOPR is minimizing uplift costs. However, the fast-start pricing requirements proposed in the NOPR could have the opposite effect of exacerbating uplift costs in the CAISO's markets. Overgeneration caused by dispatching fast-start resources under the current market design can result in negative prices when variable energy resources are curtailed. However, significant additional uplift costs will result from resources that will have to buy-back at prices higher than their bids because the price is set at the amortized cost of the fast start units.

**D. The concerns underlying the NOPR are not pressing in the CAISO's markets, relative to the concerns discussed above.**

The CAISO recognizes that there may be other markets in the country where the operational and economic needs of the system require the pricing constructs proposed in the NOPR. But this is not the case in the CAISO markets. As discussed above, the operational circumstances facing the CAISO markets indicate that the fast start pricing as proposed in the NOPR would send the wrong price signals and thereby undermine the CAISO's efforts to address those circumstances effectively. Moreover, the concerns articulated by the Commission as underlying the NOPR proposals -- ensuring that prices reflect the value of fast-start resources and avoiding unnecessary uplift payments -- are not especially problematic in the CAISO markets. Moreover, the CAISO addressed the type of market design features that caused additional uplift in the CAISO market with the design and implementation of the flexible ramping product.

As discussed above, the CAISO's main need in effectively managing its system in real-time is for resources with flexible dispatch attributes. The primary tool for compensating flexible resources is through the CAISO's flexible resource adequacy requirements, which fast-start-type resources can qualify for and thereby obtain capacity payments that appropriately recognize their contribution to the system based on their ramping capabilities.<sup>11</sup> The CAISO is currently conducting a stakeholder process to enhance its flexible resource adequacy requirements to ensure that needed resource operational attributes are procured through forward markets and available for five minute dispatch.

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<sup>11</sup> See CAISO Tariff, Section 40.10.



In its most recent stakeholder initiatives catalog, the CAISO ranked exploring the development of “Extended Pricing Mechanism” consisting of “extended pricing mechanisms to either incorporate non-priced constraints into energy prices or to reduce uplifts” as “discretionary,” as opposed to twenty-three initiatives currently underway or planned.<sup>12</sup> Also, in the CAISO’s scoring of discretionary initiatives, taking into account such factors as stakeholder desire, expected improvements to overall market efficiency, and the amount of time and resources that would be required in order to implement the initiative, the Extended Pricing Mechanisms initiative had a total score lower than thirty other initiatives.<sup>13</sup>

This leads to another important point: the CAISO and its stakeholders have limited resources. Devoting resources to implement the modifications as proposed in the NOPR will necessarily mean that the CAISO and its stakeholders will have to de-prioritize or delay other initiatives. For instance, the CAISO is working towards changes to its market to improve market performance as well as compensation mechanisms for generators, as well as to integrate additional entities into its region-wide Energy Imbalance Markets.<sup>14</sup> Given the concerns expressed herein and the relative lack of need for the reforms proposed in the NOPR in its markets, the CAISO is concerned that

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<sup>12</sup> See California ISO 2017 Stakeholder Initiatives Catalog, available at [https://www.caiso.com/Documents/Final\\_2017StakeholderInitiativesCatalog.pdf](https://www.caiso.com/Documents/Final_2017StakeholderInitiativesCatalog.pdf). As indicated, this proposed initiative is not limited to fast-start units, but rather would involve a more generic examination of incorporating commitment costs into market prices.

<sup>13</sup> 2017 Discretionary Policy Initiatives Ranking, available at: <https://www.caiso.com/Documents/2017DiscretionaryPolicyInitiativesRanking.pdf>

<sup>14</sup> These initiatives include Phase 3 of the commitment cost enhancement process, in which the CAISO is developing an opportunity cost compensation mechanism, and real-time market redesign to five-minute granularity.

de-prioritizing existing items in favor of the NOPR proposals is not in the best interest of its market participants or ratepayers.<sup>15</sup> The CAISO believes it necessary for the CAISO and the Commission to consider carefully the implications this rule may have on the CAISO's markets in light of the need to de-scope other enhancements to accommodate the Commission's proposed rule. The CAISO is happy to consider these hard questions more carefully with the Commission at a technical workshop, as proposed herein.

#### **E. Additional Implementation Concerns**

The CAISO is also concerned with the manner in which the NOPR would interact with other recent Commission initiatives. For instance, the instant NOPR seems to conflict with the Commission's recent NOPR on settlement intervals in organized markets.<sup>16</sup> Therein, the Commission determined that the use of hourly integrated prices for real-time settlement may have the unintended effect of distorting price signals, and, in certain instances, contributing to market participants' failing to respond appropriately to operating needs. Specifically, the Commission stated that hourly integrated prices for real-time settlement may: (1) not accurately reflect the value a resource provides to the system; (2) discourage resources from following dispatch instructions; and (3) cause increased uplift payments. Therefore, the Commission determined that ISOs and RTOs should settle energy transactions at the same time interval as it dispatches energy. This seems at odds with the proposal in the instant NOPR to treat fast-start resources

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<sup>15</sup> The NOPR estimates the cost of complying with a Final Rule at \$291,042 per respondent. As described above, the implementation of the proposed process would require the changes to the market design and structure that would be problematic from a design perspective and cost perspective. FERC's estimate does not reflect the cost of the redesign needed in the CAISO market structure nor the cost of the fixes the CAISO would have to adopt in order to address the inefficiencies caused by the changes proposed by the Commission.

<sup>16</sup> *Settlement Intervals and Shortage Pricing in Markets Operated by Regional Transmission Organizations and Independent System Operators*, 155 FERC ¶ 61,276 (2016).

as dispatch-able by the RTO/ISO market software during the pricing run below their economic minimum operating limit, because such resources would be able to set the price for their entire minimum run time, even though they may only needed to be dispatched at their Pmin for a subset of the intervals in their minimum run time.

## **II. CONCLUSION**

The CAISO believes that the concerns expressed herein speak to the need to develop the record further on the issues addressed in the NOPR. In particular, further investigation and discussion is needed in terms of the need for the modifications proposed in the NOPR in different regional markets, and how these modifications will interact with the current and future designs of those markets. Therefore, the CAISO respectfully requests that the Commission, before issuing a final rule, establish a technical workshop for the purpose of further developing the record on these issues. However, if the Commission does proceed directly to issuing a final rule, the CAISO requests that the Commission not mandate that all ISO/RTOs adopt the pricing rules proposed in the NOPR. Rather, the CAISO requests that the Commission's final rule provide for sufficient flexibility so that each ISO and RTO has the opportunity to demonstrate, on compliance, whether or not the pricing mechanisms proposed in the NOPR are necessary and appropriate in its markets, and to provide adequate justification for not pursuing such changes should it conclude that the proposed pricing methodology would not be beneficial given its individual market structure.

Respectfully submitted,

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