

167 FERC ¶ 61,057
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Neil Chatterjee, Chairman;
Cheryl A. LaFleur, Richard Glick,
and Bernard L. McNamee.

New York Independent System Operator, Inc.

Docket No. EL18-33-000

ORDER ON PAPER HEARING

(Issued April 18, 2019)

1. On December 21, 2017, pursuant to section 206 of the Federal Power Act (FPA),¹ the Commission instituted an investigation to examine New York Independent System Operator, Inc.'s (NYISO) practices regarding the pricing of fast-start resources and whether NYISO should be required to revise its Market Administration and Control Area Services Tariff (Tariff).² In the December 2017 Order, the Commission found that NYISO's fast-start pricing practices may be unjust and unreasonable because the practices do not allow prices to reflect the marginal cost of serving load, and the Commission identified changes to NYISO's Tariff that, upon initial review, would result in rates that are just and reasonable.³ In this order, we direct NYISO to revise its Tariff to implement the changes identified in the December 2017 Order, as discussed further below.

I. Background

2. Fast-start resources are resources that are able to start quickly to meet system needs of a regional transmission organization/independent system operator (RTO/ISO), but are often dispatched to their inflexible economic minimum or maximum operating limits, and thus are not eligible to set prices absent special pricing logic, such as fast-start pricing.⁴ Fast-start pricing allows an RTO's/ISO's software algorithms to incorporate the

¹ 16 U.S.C. § 824e (2012).

² *N.Y. Indep. Sys. Operator, Inc.*, 161 FERC ¶ 61,294 (2017) (December 2017 Order).

³ *Id.* PP 1, 15.

⁴ Many fast-start resources have limited or no dispatch range because their economic minimum operating limits are equal to (or are relatively close to) their

offers of fast-start resources into the market prices for energy and ancillary services, typically by treating fast-start resources as flexible (i.e., fully dispatchable from zero to their economic maximum operating limits) during a pricing run that is performed separately from the dispatch run. Additionally, fast-start pricing allows a fast-start resource to include its commitment costs (i.e., its start-up and no-load costs) in prices, thereby allowing a fast-start resource to recover a portion of its commitment costs through the market rather than through out-of-market uplift payments.

3. The Commission began pursuing reforms related to fast-start pricing as part of its broader price formation initiative.⁵ On December 15, 2016, the Commission issued a notice of proposed rulemaking (NOPR) that preliminarily found that some existing RTO/ISO fast-start pricing practices, or lack of fast-start pricing practices, may not result in rates that are just and reasonable.⁶ As a result, the Commission proposed establishing several requirements regarding the pricing of fast-start resources and sought comment on those proposed requirements and the need for reform discussed in the NOPR.⁷ Based on comments received, the Commission withdrew the NOPR, stating that while it continued to believe that improved fast-start pricing practices have the potential to achieve the goals outlined in the NOPR, it was persuaded to not require a uniform set of fast-start pricing

economic maximum operating limits. A resource that is operating inflexibly at its economic minimum operating limit or economic maximum operating limit is not dispatchable to serve an additional increment or decrement of load, and thus is not eligible to set the locational marginal price (LMP) unless fast-start pricing logic is applied. Although NYISO uses the term Locational Based Marginal Prices (LBMP), in this order we also use the broader term LMP.

⁵ The Commission initiated the price formation proceeding in June 2014 in Docket No. AD14-14-000. *Price Formation in Energy and Ancillary Services Markets Operated by Regional Transmission Organizations and Independent System Operators*, Notice, Docket No. AD14-14-000 (June 19, 2014). During the initial stages of the price formation proceeding, the Commission held a series of public workshops, received comments, and directed the RTOs/ISOs to file reports on several price formation topics, including fast-start pricing. *Price Formation in Energy and Ancillary Services Markets Operated by Regional Transmission Organizations and Independent System Operators*, 153 FERC ¶ 61,221, at P 1 (2015) (Order Directing Reports).

⁶ *Fast-Start Pricing in Markets Operated by Regional Transmission Organizations and Independent System Operators*, 81 Fed. Reg. 96,391 (Dec. 30, 2016), 157 FERC ¶ 61, 213, at PP 3, 36-37 (2016) (NOPR).

⁷ *Id.* PP 3, 44.

requirements that would apply to all RTOs/ISOs.⁸ Instead, the Commission initiated targeted section 206 investigations focusing on specific concerns with the fast-start pricing practices in NYISO, PJM Interconnection, L.L.C., and Southwest Power Pool, Inc.⁹

4. NYISO currently applies fast-start pricing logic to online Fixed Block Units¹⁰ and offline Fixed Block Units that can start in ten minutes. In the first pass of the optimization process, NYISO establishes resources' physical base points (i.e., real-time energy schedules).¹¹ In the second pass, also called the pricing run, NYISO relaxes the economic minimum operating limit of Fixed Block Units in order to allow them to be eligible to set prices.¹² When pricing offline Fixed Block Units, the price can also include a unit's start-up costs.¹³ However, NYISO neither relaxes the economic minimum operating limits of dispatchable resources (i.e., resources that are not block-loaded), nor does it include the start-up costs of these or any online resources for the purpose of setting prices.

II. December 2017 Order

5. In the December 2017 Order, the Commission preliminarily found that the following NYISO practices related to the pricing of fast-start resources are unjust and unreasonable: (A) not allowing the start-up costs of fast-start resources to be reflected in

⁸ *Fast-Start Pricing in Markets Operated by Regional Transmission Organizations and Independent System Operators*, 161 FERC ¶ 61,293 (2017) (withdrawing NOPR).

⁹ December 2017 Order, 161 FERC ¶ 61,294; *PJM Interconnection, L.L.C.*, 161 FERC ¶ 61,295 (2017); *Sw. Power Pool, Inc.*, 161 FERC ¶ 61,296 (2017).

¹⁰ NYISO's Tariff defines a Fixed Block Unit as "[a] unit that, due to operational characteristics, can only be dispatched in one of two states: either turned completely off, or turned on and run at a fixed capacity level." NYISO, Market Administration and Control Area Services Tariff, § 2.6 (8.0.0). The Commission has referred to such resources as block-loaded resources in its price formation proceedings. *See, e.g.*, Order Directing Reports, 153 FERC ¶ 61,221 at P 9 n.9.

¹¹ NYISO, Market Administration and Control Area Services Tariff, § 17.1.2.1.2.1 (21.0.0).

¹² *Id.* § 17.1.2.1.2.2.

¹³ *Id.* § 17.1.

prices; and (B) limiting the relaxation of the economic minimum operating limit to only block-loaded resources.¹⁴

6. Additionally, the Commission stated that, upon initial review, it believed that implementing the following changes to NYISO's Tariff would result in rates that are just and reasonable: (A) modifying pricing logic to allow the start-up costs of fast-start resources to be reflected in prices; and (B) relaxing the economic minimum operating limit of all dispatchable fast-start resources by up to 100 percent for the purpose of setting prices.¹⁵ The Commission also proposed that NYISO be required to extend its current offline pricing practices, including the use of commitment costs in setting prices, to any resources that are provided fast-start pricing treatment.¹⁶

7. The Commission explained that it expected the proposed changes would remedy NYISO's current fast-start pricing practices that the Commission preliminarily found lead to unjust and unreasonable rates. For instance, the Commission stated that it expected the changes would: more accurately reflect the marginal cost of serving load in periods when dispatching a fast-start resource is the next action taken to meet load; provide price signals that better inform investment decisions; and provide more accurate and transparent price signals that better reflect the cost of serving load, minimize production costs, and reduce uplift.¹⁷

III. Notice of Paper Hearing and Briefs

8. Notice of the institution of the section 206 proceeding in Docket No. EL18-33-000 was published in the *Federal Register*, 82 Fed. Reg. 61,558 (2017), on December 28, 2017. Pursuant to the December 2017 Order, interventions were due on or before January 18, 2018, initial briefs were due on or before February 12, 2018, and reply briefs were due on or before March 14, 2018.¹⁸

9. Entities listed in the Appendix filed notices of intervention or motions to intervene. Timely initial briefs were filed by Department of Market Monitoring for the

¹⁴ December 2017 Order, 161 FERC ¶ 61,294 at P 5.

¹⁵ *Id.* P 15.

¹⁶ *Id.* P 15 n.40.

¹⁷ *Id.* P 15.

¹⁸ *Id.* P 18.

California Independent System Operator Corporation (CAISO Market Monitor);¹⁹ Electric Power Supply Association and Independent Power Producers of New York (EPSA/IPPNY); Exelon Corporation (Exelon); NYISO; and Potomac Economics, which is the external market monitor for NYISO. Timely reply briefs were filed by New York Transmission Owners (NYTOs);²⁰ Potomac Economics; and Shell Energy North America (US), L.P. (Shell).

IV. Discussion

A. Procedural Issues

10. Pursuant to Rule 214 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214 (2018), the notices of intervention and timely, unopposed motions to intervene serve to make the entities that filed them parties to this proceeding. Pursuant to Rule 214(d) of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214(d) (2018), we grant the late-filed motions to intervene given the entities' interest in the proceeding, the early stage of the proceeding, and the absence of undue prejudice or delay.

B. Substantive Issues

11. Consistent with the preliminary findings in the December 2017 Order, we find that NYISO's fast-start pricing practices are unjust and unreasonable because the practices do not allow prices to reflect the marginal cost of serving load. We direct NYISO to make the following changes to its Tariff, which we find will result in rates that are just and reasonable: (A) modify its pricing logic to allow the start-up costs of fast-start resources to be reflected in prices; and (B) relax the economic minimum operating limit of all fast-start resources, including dispatchable fast-start resources, by up to 100 percent for the purpose of setting prices. We do not require NYISO to make any changes to its offline fast-start pricing or to its rules addressing over-generation at this time.

¹⁹ Entities seeking to become a party to a proceeding must file a motion to intervene. 18 C.F.R. § 385.214(a)(3) (2018). Because the CAISO Market Monitor did not file a timely motion to intervene, it is not a party to this proceeding.

²⁰ NYTOs include: Central Hudson Gas & Electric Corporation; Consolidated Edison Company of New York, Inc.; New York Power Authority; New York State Electric & Gas Corporation; Niagara Mohawk; Orange and Rockland Utilities, Inc.; Power Supply Long Island; Rochester Gas and Electric Corporation.

12. We direct NYISO to submit by December 31, 2019 a compliance filing with proposed tariff changes reflecting the above requirements, and direct NYISO to implement the above requirements by December 31, 2020.

1. Fast-Start Pricing

a. December 2017 Order

13. In the December 2017 Order, the Commission found that NYISO's practices may not reflect the marginal cost of serving load when a fast-start resource is needed to quickly respond to unforeseen system needs, which may result in inaccurate price signals. In turn, the Commission stated that inaccurate price signals then fail to inform investment decisions, including where and when fast-start resources should be built or maintained.²¹

b. General Support

14. Potomac Economics, EPSA/IPPNY, Exelon, NYTOs, and Shell all generally support the Commission's proposed changes in the December 2017 Order.²² Some commenters encourage the Commission to act expeditiously on fast-start pricing in NYISO.²³

c. Initial Briefs

15. NYISO states that making the changes discussed in the December 2017 Order is a valid path forward to compensate resources for the services they provide, transparently reflect the marginal cost of serving load, and value fast-start resources' ability to meet system needs.²⁴

16. Potomac Economics states that including fast-start resources' start-up costs in prices allows prices to reflect the full cost resources incur and helps ensure fast-start resources recover their costs through real-time market revenues rather than uplift payments. Additionally, Potomac Economics agrees with applying fast-start pricing to all dispatchable fast-start resources, stating that there is no economic rationale for

²¹ December 2017 Order, 161 FERC ¶ 61,294 at PP 1, 8, 11, 14.

²² Potomac Economics and NYTOs do not support the Commission's proposed changes to NYISO's offline fast-start pricing, but otherwise support the proposed changes in the December 2017 Order.

²³ EPSA/IPPNY Initial Brief at 2, 5; Exelon Initial Brief at 3.

²⁴ NYISO Initial Brief at 1-2.

limiting fast-start pricing to block-loaded resources and that NYISO currently has about 1.7 GW of non-block-loaded fast-start resources that are started daily to satisfy demand for energy and ancillary services.²⁵ Exelon and NYTOs state that the Commission's proposed changes will help ensure that prices accurately reflect the marginal cost of serving load.²⁶

17. The CAISO Market Monitor does not support the Commission's proposed changes in the December 2017 Order to NYISO's Tariff. The CAISO Market Monitor argues that prices determined from a market with separate scheduling and pricing runs, or those which include commitment cost in the determination of per unit power prices, would not reflect actual marginal tradeoffs, and these prices would not give producers and consumers the incentive to follow the efficient dispatch. The CAISO Market Monitor further states that deviation penalties or payments to not deviate from the efficient dispatch do not restore incentive compatibility because market participants would have an incentive to submit bids that do not represent their true costs and valuations.²⁷

d. Reply Briefs

18. Potomac Economics argues that the CAISO Market Monitor fails to recognize that the commitment costs of fast-start resources are marginal costs of serving load.²⁸ Potomac Economics argues that, as opposed to fast-start resources, long lead-time resources have some flexibility in real time to increase or decrease production, but such adjustments are unrelated to the resource's commitment costs. Therefore, Potomac Economics asserts that the commitment costs of long lead-time resources should not be considered in the determination of real-time LMPs any more than the cost of building the resource in the first place. Potomac Economics states that offline resources that can start fast enough to participate in the real-time market and be deployed economically incur commitment costs as a result of real-time market conditions. Potomac Economics argues these costs are marginal in real time and, therefore, it is appropriate to consider the commitment costs of fast-start resources in the real-time prices.²⁹

²⁵ Potomac Economics Initial Brief at 6, 9.

²⁶ Exelon Initial Brief at 5; NYTOs Reply Brief at 6.

²⁷ CAISO Market Monitor Initial Brief at 5-7.

²⁸ Potomac Economics Reply Brief at 3.

²⁹ *Id.* at 5.

19. Potomac Economics states that the goal of fast-start pricing is to enable prices to reflect the marginal cost of serving load, which as a result tends to reduce the need for uplift.³⁰ Potomac Economics explains that fast-start pricing reduces the use of make-whole payments, resulting in payments that are more efficient and less discriminatory (i.e., more uniform) than under the CAISO Market Monitor's recommendations.³¹

20. Potomac Economics argues that the CAISO Market Monitor's proposal to confine price-setting eligibility to units with flexible operating ranges at the margin would improperly limit the definition of marginal costs to only short-run marginal *dispatch* costs.³² Potomac Economics argues that the CAISO Market Monitor over-focuses on the marginal tradeoff for these generators because they might have the incentive to not follow dispatch when ramped down to make room when a fast-start resource is brought online and ignores the risk of undermining the fast-start resource's incentive to offer at marginal cost.³³ Potomac Economics contends that while the CAISO Market Monitor describes how deviation penalties and payments present incentive problems under fast-start pricing, the CAISO Market Monitor never explains the extent to which uplift payments present the same problems under its preferred pricing method.³⁴

21. Potomac Economics states that fast-start pricing will improve three features of RTO markets: performance of the day-ahead market; incentives for imports and exports; and incentives for offering competitively and performing reliably. Potomac Economics argues that if real-time markets understate prices they will undermine key actions by market participants in both the short-run and long-run timeframes. Potomac Economics elaborates that if real-time prices fully reflect the efficient cost of satisfying real-time market demand then it will lead the day-ahead market to produce more complete and more efficient energy schedules and associated generator commitments. Potomac Economics argues that understated real-time prices could similarly establish poor incentives to align imports and exports with prices in the RTO's real-time market. With additional imports drawn in by the higher prices reflecting the market demand, the RTO

³⁰ *Id.* at 4.

³¹ *Id.* at 5.

³² *Id.* at 3 (citing CAISO Market Monitor Initial Brief at 3).

³³ *Id.* at 3.

³⁴ *Id.* at 4.

could “stop committing the high-cost peaking resources and/or turn off high-cost peaking resources that are already online.”³⁵

e. **Determination**

22. In the December 2017 Order, the Commission found that NYISO’s existing fast-start pricing practices may fail to reflect the marginal cost of serving load, and that adopting the proposed changes identified in that order would lead to prices that more accurately reflect the marginal cost of serving load. We continue to find that fast-start pricing in NYISO, with the reforms directed herein, will result in prices that more accurately reflect the marginal cost of serving load. We continue to find that, because of their operating characteristics, fast-start resources are uniquely situated to respond to unforeseen or transient real-time system needs that are short-term in nature. When fast-start resources are committed in real-time, it is often at short notice to meet some system condition or market need over a short time period. Specifically, allowing fast-start resources to participate in setting prices and incorporating commitment costs of fast-start resources in prices more accurately represents the marginal cost of serving load, which will better reflect system needs, and help inform investment decisions. For these reasons, we continue to find that commitment costs of fast-start resources should be considered marginal for the purpose of setting prices in NYISO. The Commission made these findings on a preliminary basis in the December 2017 Order, and, as discussed below, we continue to support these findings after careful consideration of commenters’ arguments.

23. In particular, we find that commitment costs for fast-start resources are marginal because they are generally incurred in coordination with the real-time dispatch, as noted by Potomac Economics.³⁶ We agree with Potomac Economics that, in contrast to fast-start resources, long lead-time resources have some flexibility in real time to increase or decrease production, but that such adjustments are unrelated to the resources’ commitment costs and that the commitment costs of long lead-time resources should not be considered in the determination of real-time prices. We find that fast-start resources that are deployed economically incur commitment costs as a result of real-time market conditions, are considered marginal in real-time, and thus, the commitment costs of these resources should be included in real-time prices.

24. While the CAISO Market Monitor objects to fast-start pricing in general, arguing that it does not reflect the marginal cost of serving load, we note that the Commission has already determined that fast-start pricing reflects the marginal cost of serving load and

³⁵ *Id.* at 6.

³⁶ *Id.* at 5.

can result in rates that are just and reasonable.³⁷ We also note at the outset that our investigation in this proceeding seeks to remedy certain issues with NYISO's existing implementation of fast-start pricing, and is not proposing that NYISO implement an entirely new pricing concept. NYISO currently uses fast-start pricing in its markets. Further, we disagree with objections from the CAISO Market Monitor that fast-start pricing departs from marginal cost pricing.³⁸ After considering its arguments, we continue to find that the cost of a decision to start a fast-start resource in real time, typically on short notice to meet some unforeseen or transient system need represents a marginal cost that should be reflected in prices.

25. Additionally, we find that the advantages of traditional LMP/uplift pricing, as compared to fast-start pricing, are not as stark in practice as some commenters have argued.³⁹ In particular, while traditional LMP/uplift pricing incentivizes market participants to follow dispatch instructions, other mechanisms can also be employed to incentivize following dispatch. Here, as discussed below, NYISO states that its New York Control Area generation fleet responds well to NYISO-issued basepoints and instructions due to three rules: (1) NYISO does not permit units to self-commit intra-hour to chase prices; (2) generators that self-schedule are not eligible to receive uplift or set price; and (3) a generator producing above its basepoint is only compensated for overproduction that exceeds the basepoint by 3 percent or less of the generator's upper operating limit.

26. The CAISO Market Monitor argues that deviation penalties, as well as payments to not deviate from the scheduling run dispatch, may theoretically create incentives for resources to submit distorted energy offers that do not represent a resource's true marginal cost of production, thereby reducing market efficiency.⁴⁰ However, we find that the risk of such a strategy producing unprofitable results will deter market participants from offering in such a manner. Furthermore, we agree with Potomac Economics that while fast-start pricing requires the use of deviation penalties or payments to provide generators with an efficient incentive to follow instructions, so does traditional

³⁷ *N.Y. Indep. Sys. Operator, Inc.*, 95 FERC ¶ 61,121, at 61,379 (2001); *Midwest Indep. Transmission Sys. Operator, Inc.*, 140 FERC ¶ 61,067, at PP 37-38 (2012).

³⁸ CAISO Market Monitor Initial Brief at 5-7.

³⁹ By "LMP/uplift pricing," we refer to a set of pricing rules that computes energy market prices based only on incremental energy cost offers and instead compensates resources for commitment costs in excess of price-based revenues through direct payments such as uplift payments.

⁴⁰ CAISO Market Monitor Initial Brief at 6.

LMP/uplift pricing.⁴¹ We find that the CAISO Market Monitor's assertions regarding incentive problems associated with deviation penalties and payments are similar to those associated with uplift payments.⁴² As such, we are not persuaded by the CAISO Market Monitor's arguments that fast-start pricing creates greater incentive problems than existing LMP/uplift pricing.

2. Start-Up Costs

a. December 2017 Order

27. In the December 2017 Order, the Commission preliminarily found NYISO's practice of not incorporating start-up costs in the price-setting logic for either online fast-start resources or for certain offline fast-start resources that are not Fixed Block Units may be unjust and unreasonable because it does not accurately represent the marginal cost of serving load. The Commission stated that the costs of commitment decisions for fast-start resources are incurred to serve system needs in a similar way that marginal costs are incurred to serve system needs for a specific time period. The Commission further stated that incorporating the commitment costs of fast-start resources in prices more accurately represents the marginal cost of serving load, which will help inform investment decisions. For these reasons, the Commission preliminarily found that the commitment costs of fast-start resources in NYISO should be considered marginal for the purpose of setting prices in NYISO.⁴³

28. The Commission concluded that, upon initial review, NYISO could remedy this practice that potentially leads to unjust and unreasonable rates by modifying its pricing logic to allow the start-up costs⁴⁴ of fast-start resources to be reflected in prices.⁴⁵

⁴¹ Potomac Economics Reply Brief at 4. We also take note of Potomac Economics' research in the NYISO market with regard to the infrequency of intervals in which dispatchable generators face marginal tradeoffs (i.e., received a physical schedule that was inconsistent with the profit-maximizing level given the clearing price while accounting for ramp rate limitations) that could lead to inefficient incentives. *Id.* at 3, 10.

⁴² *Id.* at 4.

⁴³ December 2017 Order, 161 FERC ¶ 61,294 at PP 9, 11.

⁴⁴ NYISO already includes a resource's no-load costs in the first segment of the resource's operating bid, at minimum load.

⁴⁵ December 2017 Order, 161 FERC ¶ 61,294 at P 15.

b. Initial Briefs

29. In response to the December 2017 Order, NYISO states that it plans to modify its online fast-start pricing logic to include fast-start resources' start-up costs and minimum generation costs in both the day-ahead and real-time market price setting calculations. NYISO plans to include the start-up cost component and minimum generation cost components of a fast-start resource offer as an adjustment to the resource's incremental energy cost curve in the market software's ideal dispatch.⁴⁶ NYISO expects that it would amortize start-up costs in a resource's incremental energy cost curve over the resource's physical minimum run time (therefore, one hour or less) in the day-ahead and real-time market price setting calculations, starting with the period immediately after the resource's scheduled start. NYISO expects amortized minimum generation costs to be included in a resource's incremental energy cost curve over each hour the resource is utilized.⁴⁷

30. Potomac Economics and Exelon support reflecting the start-up costs of fast-start resources in prices. Potomac Economics states that NYISO's proposed modifications help ensure fast-start resources recover their costs through real-time market revenue rather than out-of-market uplift payments. Potomac Economics asserts that NYISO's proposed fast-start pricing enhancements provide better incentives for investment in all flexible resources that can respond to system needs by reflecting the full cost a resource incurs in real-time energy prices. Exelon states that not including the commitment costs of fast-start resources in prices does not accurately represent marginal cost, distorts prices, and causes uplift payments.⁴⁸

31. Potomac Economics asserts that if a fast-start resource is committed primarily for a transient need during an hour, a larger share of its costs should be allocated to that portion of the hour.⁴⁹ Potomac Economics recommends amortizing commitment costs in proportion to the value of a fast-start resource's energy as forecasted by NYISO's real-time commitment model. Doing so produces advisory prices that reflect the expected marginal cost of resources that will be displaced by the fast-start resource's energy over each 15-minute portion of its commitment period. If this approach is costly or complex,

⁴⁶ NYISO Initial Brief at 5.

⁴⁷ *Id.* at 6.

⁴⁸ Exelon Initial Brief at 4-5.

⁴⁹ Potomac Economics Initial Brief at 6.

Potomac Economics recommends a static front-loaded amortization schedule based on historical real-time commitment results.⁵⁰

c. Reply Briefs

32. NYTOs and Shell Energy support reflecting the start-up costs of fast-start resources in prices, stating that including commitment costs in prices will more accurately represent marginal costs.⁵¹ Shell maintains that failing to account for commitment costs understates the cost and value of fast-start resources and sends the wrong investment signal to the market. Shell states that NYISO's proposed modifications should eliminate the impacts of some out-of-market actions, such as uplift.⁵²

33. NYTOs claim that NYISO's proposed procedure for allocating start-up and no-load costs will lead to improper pricing when applied to the dispatchable segments of units that are online. NYTOs claim that NYISO's procedure for determining the start-up and no-load adders can be gamed by submitting a very low offer for the first incremental block of energy and increasing the minimum generation offer by an offsetting amount. NYTOs propose an alternative procedure which determines the adjusted offer curve used by the real-time dispatch pricing pass with the objective of reducing the adder that is applied to offers above the generator's minimum generation level.⁵³ NYTOs state that they support Potomac Economics' proposed amortization approach, and assert that the stakeholder process is the best method for developing specific implementation procedures to address the aforementioned concerns.⁵⁴

d. Determination

34. Consistent with the December 2017 Order, we find that failing to include commitment costs for fast-start resources in prices would not accurately represent the marginal cost of serving load, and therefore we find NYISO's current practice of not incorporating fast-start resources' start-up costs in its price-setting logic is unjust and reasonable.

⁵⁰ *Id.* at 9.

⁵¹ Shell Reply Brief at 5; NYTOs Reply Brief at 7.

⁵² Shell Reply Brief at 5-6.

⁵³ NYTOs Reply Brief at 9-10.

⁵⁴ *Id.* at 10-11.

35. As noted above, because of their operating characteristics, fast-start resources are uniquely situated to respond to unforeseen or transient real-time system needs. When fast-start resources are committed in real-time, it is often at short notice to meet some unforeseen or transient system condition or market need over a short time period, and, as such, we find that the commitment costs for such a resource should be considered marginal costs. Thus, we find that incorporating start-up costs of fast-start resources in prices more accurately represents the marginal cost of serving load, which will better reflect system needs, and help inform investment decisions, as discussed above in section IV.B.1.e. In addition, if start-up costs are not included, the marginal resource must be compensated through out-of-market uplift payments, which provide a less transparent price signal than compensating resources through market clearing prices that reflect the marginal cost of production. Accordingly, we direct NYISO to modify its pricing logic to allow the start-up costs of fast-start resources to be reflected in prices.

36. With regard to NYISO's proposed amortization methodology, the Commission did not discuss whether NYISO should adopt a specific methodology for amortizing commitment costs in the December 2017 Order. We decline to require NYISO to adopt any particular amortization methodology at this time, and will consider NYISO's proposed methodology upon compliance.

3. Relaxing the Economic Minimum Operating Limit for Fixed Block Units

a. Background and December 2017 Order

37. NYISO's market rules relax the economic minimum operating limit of Fixed Block Units by up to 100 percent for the purpose of setting prices. However, NYISO's relaxation of the economic minimum operating limit is limited to only Fixed Block Units.⁵⁵ In contrast, dispatchable fast-start resources are able to set prices only within their dispatchable range when they are committed.⁵⁶ If a dispatchable fast-start resource is committed such that the quantity needed from the resource to serve load falls in a range above zero but below the dispatchable resource's economic minimum operating limit, that resource may be unable to set price.⁵⁷

38. In the December 2017 Order, the Commission preliminarily found that NYISO's practice of differentiating between dispatchable fast-start resources and Fixed Block

⁵⁵ See NYISO Report at 7; NYISO Initial Brief at 3.

⁵⁶ NYISO Report at 9, 16.

⁵⁷ *Id.*

Units appears to be arbitrary and may result in prices that do not reflect the marginal cost of serving load. The Commission stated that NYISO's practice of allowing only Fixed Block Units to participate in fast-start pricing may also create incentives favoring development of block-loaded resources over dispatchable resources. Furthermore, the Commission stated that this practice may create incentives for dispatchable resources to withhold their flexibility from the market. Consequently, the Commission preliminarily found that this practice may be unjust and unreasonable.⁵⁸

39. The Commission concluded that, upon initial review, NYISO could remedy this practice that potentially leads to unjust and unreasonable rates by relaxing the economic minimum operating limit of all dispatchable fast-start resources by up to 100 percent for the purpose of setting prices.⁵⁹

b. Initial Briefs

40. NYISO states that it will modify the definition and eligibility criteria for which resources are included in online fast-start pricing beyond block-loaded resources to include dispatchable resources that can start, synchronize to the grid, and inject energy in 30 minutes or less. NYISO states that it will revise its online fast-start pricing rules and software to relax the economic minimum operating limits of all dispatchable fast-start resources by 100 percent for determining LBMPs in the day-ahead market and the real-time market.

41. Potomac Economics and Exelon support the Commission's proposed remedy of relaxing the economic minimum operating limit of all dispatchable fast-start resources by up to 100 percent for the purpose of setting prices.⁶⁰ Potomac Economics states that the economic principles underlying fast-start pricing apply equally to block-loaded and non-block-loaded fast-start resources and that there is no economic rationale for excluding non-block-loaded fast-start resources from fast-start pricing. Potomac Economics notes that NYISO has approximately 1.7 GW of fast-start resources that are not block-loaded that are started daily, and that excluding these resources from fast-start pricing leads to frequent circumstances when real-time prices do not cover the resources' as-bid costs, resulting in uplift payments.⁶¹ Exelon agrees with the Commission that NYISO's current practice of not allowing relaxation of the economic minimum operating limits by up to

⁵⁸ December 2017 Order, 161 FERC ¶ 61,294 at P 14.

⁵⁹ *Id.* P 15.

⁶⁰ Potomac Economics Initial Brief at 9.

⁶¹ *Id.*

100 percent for all fast-start resources results in pricing that does not reflect the marginal cost of serving load. Exelon states that revisions to NYISO's fast-start pricing rules are necessary to eliminate the arbitrary, disparate treatment of block-loaded resources.⁶²

c. Reply Briefs

42. NYTOs and Shell Energy support relaxing the economic minimum operating limit of all dispatchable fast-start resources in NYISO by up to 100 percent for the purpose of setting prices. NYTOs agree with the Commission that this will promote more accurate prices and more accurately represent the marginal cost of serving load.⁶³ Shell states that limiting fast-start pricing to block-loaded resources results in LBMPs that do not reflect the marginal cost of serving load.⁶⁴

d. Determination

43. We find that NYISO's practice of applying fast-start pricing only to block-loaded resources (i.e., Fixed Block Units) is unjust and unreasonable and direct NYISO to apply fast-start pricing to all fast-start resources, including non-block-loaded resources. Non-block-loaded fast-start resources are used by system operators to respond to the same unforeseen and transient system needs as block-loaded ones. Therefore, both types of resources reflect marginal actions taken by system operators and should be priced consistently in the market. Under NYISO's current practice, prices do not reflect the marginal cost of serving load when committing a non-block-loaded resource is the marginal action taken by system operators. Therefore, we find NYISO's current practice to be unjust and unreasonable. We find that expanding fast-start pricing to all fast-start resources will enable prices to reflect the marginal cost of serving load, when non-block-loaded fast-start resources are effectively the marginal resource. As such, we direct NYISO to relax the economic minimum operating limits of all fast-start resources, including dispatchable fast-start resources, by up to 100 percent for the purpose of setting prices.

⁶² Exelon Initial Brief at 5.

⁶³ NYTOs Reply Brief at 6-7.

⁶⁴ Shell Reply Brief at 5-6.

4. Offline Fast-Start Pricing

a. Background and December 2017 Order

44. NYISO currently allows offline block-loaded gas turbine resources to set price in the real-time dispatch to avoid shortage pricing of reserves, regulation, or transmission.⁶⁵ NYISO states that these offline 10-minute resources are included in the real-time dispatch and can be started to resolve real-time needs that arise between real-time commitment runs.⁶⁶ In the December 2017 Order, the Commission proposed that NYISO be required to extend its current offline pricing practices, including the use of commitment costs in setting prices, to any resources that are provided fast-start pricing treatment.⁶⁷

b. Initial Briefs

45. NYISO requests that the Commission not direct any changes to its offline fast-start pricing at this time. NYISO states that it currently has two ongoing projects that are evaluating the effectiveness of its offline pricing.⁶⁸ NYISO states that these projects may obviate the need for NYISO to continue offline pricing for fast-start resources. NYISO states that it expects to continue only allowing offers from offline 10-minute, block-loaded or dispatchable gas turbines, including start-up costs, to be eligible to set the LBMP in the real-time dispatch process.⁶⁹ NYISO states that resources that require 30 minutes to start can be started by the next real-time commitment run and do not belong in the real-time dispatch's offline fast-start pricing. NYISO notes that it is concerned that expanded offline fast-start pricing could create larger divergences in physical dispatch power balance because expanding the types of fast-start resources eligible for offline pricing could lead to more situations when prices are low but there are

⁶⁵ NYISO states that this avoids pricing volatility when there is a resource available to resolve the issue but is not yet online. *See* NYISO, Comments, Docket No. RM17-3-000, at 18 (filed Feb. 28, 2017).

⁶⁶ NYISO Initial Brief at 11.

⁶⁷ December 2017 Order, 161 FERC ¶ 61,294 at n.40.

⁶⁸ NYISO's Integrating Public Policy project is evaluating the impact of increased intermittent resource penetration on the New York power system, market participant behavior, and market outcomes, while its Constraint Specific Demand Curves project is evaluating NYISO's transmission shortage pricing practices. NYISO Initial Brief at 12-13.

⁶⁹ *Id.* at 12.

not enough physical resources online to meet load and reserve requirements. Finally, NYISO states that if changes to offline fast-start pricing are warranted in the future, NYISO would work with stakeholders to develop a section 205 filing.⁷⁰

46. Potomac Economics states that it is concerned about NYISO's current offline fast-start pricing practices and recommends against expanding offline fast-start pricing to include all resources that are eligible for online fast-start pricing, including resources that can start in 30 minutes or less.⁷¹ Potomac Economics states that it has recommended in other Commission proceedings that offline pricing be phased out in NYISO. Potomac Economics argues that NYISO's offline resources frequently cannot actually start quickly enough to address the transitory need, and so current offline fast-start pricing already depresses real-time prices and prevents the real-time market from recognizing some shortage conditions.⁷² Potomac Economics then states that expanding offline fast-start pricing would greatly exacerbate these market inefficiencies.⁷³

c. Reply Briefs

47. In its reply brief, NYTOs oppose the Commission's proposed changes to NYISO's offline fast-start pricing. NYTOs state that the stakeholder process is the most appropriate method for determining whether there is a need for changes to the procedures for offline resources, and how to implement such changes.⁷⁴

d. Determination

48. We will not require NYISO to change its offline fast-start pricing practices. Commenters raise concerns about the inability of offline resources to respond to real-time system needs, which they state may depress real-time prices and can obscure shortage conditions.⁷⁵ We recognize the possibility that these concerns might be exacerbated by any further expansion of offline fast-start pricing. We also recognize the importance of the stakeholder process and its role in NYISO's ongoing offline pricing projects. At present we are satisfied with NYISO's plan to evaluate the effectiveness of its offline

⁷⁰ *Id.* at 11-13.

⁷¹ Potomac Economics Initial Brief at 3.

⁷² *Id.* at 10.

⁷³ *Id.* at 10, 16.

⁷⁴ NYTOs Reply Brief at 11.

⁷⁵ Potomac Economics Initial Brief at 9-10.

fast-start pricing and, if changes to offline pricing practices are warranted, to work with stakeholders to develop a section 205 filing.

5. Implementation Schedule

a. December 2017 Order

49. The Commission did not specify a compliance timeline in the December 2017 Order.

b. Initial Briefs

50. NYISO requests that the Commission allow it to submit its compliance filing by the end of 2019 and implement changes by the end of 2020. NYISO states that this proposed timeline for implementation is necessary to allow NYISO to finish its Energy Management System (EMS)/Business Management System (BMS) Upgrade Project, a three-year long effort to upgrade the hardware and software that run NYISO's wholesale energy markets and monitor the reliability of the grid. NYISO states that the EMS/BMS Upgrade Project will provide important benefits⁷⁶ and that upgrades to change its fast-start pricing practices would involve the same personnel.⁷⁷

51. EPSA/IPPNY state that fast-start pricing reforms are overdue and should be implemented expeditiously to address the fundamental concept of reflecting all resources with fast-start capability in energy and operating reserve real-time pricing.⁷⁸ EPSA/IPPNY assert that other market improvements or efforts underway should not delay expeditious implementation of fast-start pricing, which they state is critical to preserving the benefits of wholesale power markets and positively impacting impending investment decisions. EPSA/IPPNY emphasize that price formation improvements are low hanging fruit that have already been successfully implemented across very different regional power markets, and that the Commission has established a clear and extensive record on this topic that warrants immediate action.⁷⁹

⁷⁶ NYISO states that benefits will include less downtime, more reliability, enhanced cyber security, greater training capabilities, an improved user interface, and faster workflows. NYISO Initial Brief at 14-15.

⁷⁷ *Id.* at 13-17.

⁷⁸ EPSA/IPPNY Initial Brief at 2, 5.

⁷⁹ *Id.* at 6-7.

c. Reply Briefs

52. NYTOs support NYISO's proposed implementation schedule. NYTOs share NYISO's concerns regarding the importance of preventing interference with the EMS/BMS Upgrade Project and state that a rushed implementation could yield inefficient rules that are prone to manipulation. NYTOs note that NYISO's proposed schedule would allow NYISO to work through its stakeholder process and craft a proposal that fully accomplishes the Commission's objectives and mitigates adverse impacts. NYTOs further argue that the downside to adopting NYISO's proposed schedule is *de minimis* since they claim that nearly all existing fast-start resources in NYISO are block-loaded.⁸⁰

53. In contrast, Shell is concerned about NYISO's proposed implementation schedule and suggests directing NYISO to implement fast-start pricing rules as expeditiously as circumstances permit, ideally in advance of a peak period. Shell notes that price formation efforts have been under review by the Commission for nearly four years, and further delaying reforms sends the wrong investment signal to the market and arbitrarily excludes dispatchable, non-block-loaded resources from setting price.⁸¹

d. Determination

54. We find that NYISO's proposed implementation schedule is reasonable and direct NYISO to submit its compliance filing by December 31, 2019, and implement changes by December 31, 2020. This implementation schedule will accommodate ongoing work related to NYISO's EMS/BMS Upgrade Project, which is a major hardware and software upgrade that utilizes many of the same personnel who would be developing fast-start pricing changes. Additionally, the fast-start pricing changes directed in this order may require significant modifications to NYISO's software.

55. We also recognize that vetting changes through NYISO's stakeholder process may mitigate adverse consequences, as was emphasized by both NYISO and NYTOs, and allow complex issues such as the appropriate amortization method for commitment costs to be further developed in a thoughtful and collaborative manner.

56. While some commenters support a faster implementation schedule, we believe the above implementation schedule reasonably balances the need for reforms to NYISO's fast-start pricing practices with NYISO's ability to develop and implement changes.

⁸⁰ NYTOs Reply Brief at 7-8.

⁸¹ Shell Reply Brief at 5-7.

6. Over-Generation

a. December 2017 Order

57. In the December 2017 Order, the Commission encouraged NYISO to develop any necessary changes to address potential over-generation concerns that may arise from the identified fast-start pricing modifications.⁸² To ensure that its fast-start pricing logic does not cause over-generation or lead to incentives for resources to not follow NYISO's dispatch instructions, the Commission suggested that NYISO may consider penalizing uninstructed deviations, settling over-generated MWh at only standard location-based marginal price (not at the prices determined through fast-start pricing), or providing lost opportunity cost payments.⁸³

b. Initial Briefs

58. NYISO asserts that its existing rules will provide incentives for generators to avoid over-generation and/or basepoint deviations, and therefore NYISO does not intend to make changes to address potential increases in self-scheduling. NYISO states that its New York Control Area generation fleet responds well to NYISO-issued basepoints and instructions due to three rules: (1) NYISO does not permit units to self-commit intra-hour to chase prices; (2) generators that self-schedule are not eligible to receive uplift or set price; and (3) a generator producing above its basepoint is only compensated for overproduction that exceeds the basepoint by 3 percent or less of the generator's upper operating limit.⁸⁴

59. Potomac Economics suggests that NYISO consider the potential lost opportunity costs to online units that are dispatched below their profit-maximizing level due to fast-start pricing. Potomac Economics states that online units that are frequently ramped down may have incentives to: (1) over-generate to the profit-maximizing output level; (2) reduce their offer price below marginal cost; or (3) self-schedule to avoid being ramped down. Potomac Economics recommends that NYISO perform an analysis to determine if some units are likely to have incentives to over-generate and/or offer below

⁸² Price signals generated by fast-start pricing could provide incentives for some resources to produce energy above their dispatch targets. Specifically, if LBMP is higher than a resource's incremental energy offer, that resource would have an incentive to increase its profits by generating above energy dispatch targets, leading to over-generation.

⁸³ December 2017 Order, 161 FERC ¶ 61,294 at P 16.

⁸⁴ NYISO Initial Brief at 10.

cost, the extent to which these are addressed by current settlement rules, and whether changes are necessary for units to recover opportunity costs.⁸⁵

c. Reply Briefs

60. Shell expresses concern that deferring consideration of over-generation issues may result in unnecessary uplift being incurred. Shell requests that the Commission direct NYISO to provide quarterly reports to its stakeholders on over-generation after implementing fast-start pricing changes.⁸⁶

d. Determination

61. Given NYISO's representations, we believe that NYISO's existing practices adequately address potential concerns related to over-generation, and that it is not necessary for the Commission to require further changes to address potential over-generation at this time. We disagree with Potomac Economics' arguments that the Commission should require NYISO to pay opportunity costs. As noted above, the Commission indicated in the December 2017 Order that penalizing uninstructed deviations would be an appropriate method of mitigating price chasing behavior. NYISO has demonstrated that its practice of only compensating for overproduction by up to 3 percent above the basepoint of the generator's upper operating limit is consistent with this approach and we do not require any changes or responses from NYISO.

7. Other Issues

a. Initial Briefs

62. NYISO states that it does not interpret the establishment of a refund effective date in the December 2017 Order as signifying that NYISO will be expected to retroactively change market prices established between December 28, 2017 and the date that NYISO ultimately implements the tariff changes discussed in this filing. NYISO contends that such an interpretation would conflict with established Commission policies favoring the preservation of settled market expectations and disfavoring retroactive changes to market auction results.⁸⁷

63. Potomac Economics recommends that NYISO and the Commission consider allowing Coordinated Transaction Scheduling (CTS) transactions to set the LBMP. Potomac Economics explains that CTS transactions are external transactions that are

⁸⁵ Potomac Economics Initial Brief at 17-18.

⁸⁶ Shell Reply Brief at 7.

⁸⁷ NYISO Initial Brief at 17-18.

evaluated and scheduled in economic merit order every 15 minutes by real-time commitment in the same evaluation that determines whether to schedule fast-start resources. Potomac Economics states that CTS transactions have a 15-minute scheduling lead time, which is comparable to a fast-start resource's start-up notification time of 15 minutes, and no minimum run time. Potomac Economics explains that CTS transactions are treated as fixed injections and withdrawals in the five-minute dispatch of real-time dispatch, so they currently do not set price. Thus, Potomac Economics asserts, CTS transactions have the essential characteristics of fast-start resources, and there are some circumstances where CTS transactions are the marginal source of supply (or demand) in real-time commitment, particularly in locations without much dispatchable generation. Potomac Economics recommends NYISO evaluate the potential effects of allowing certain CTS transactions to set LBMP in the five-minute dispatch.⁸⁸

b. Determination

64. We clarify that the refund effective date set forth in the December 2017 Order did not establish a requirement that NYISO change market prices established between the refund effective date and the effective date for the fast-start pricing changes directed in this order. Additionally, we find that Potomac Economics' recommendations regarding allowing CTS transactions to set LBMP are outside the scope of this proceeding.

The Commission orders:

(A) The Commission finds that NYISO's existing fast-start pricing practices are unjust and unreasonable, as discussed in the body of this order.

(B) NYISO is hereby directed to make a compliance filing by December 31, 2019, as discussed in the body of this order.

By the Commission.

(S E A L)

Nathaniel J. Davis, Sr.,
Deputy Secretary.

⁸⁸ Potomac Economics Initial Brief at 18.

APPENDIX: List of Intervenors

Notice of Intervention

New York State Public Service Commission

Motions to Intervene

American Petroleum Institute

American Public Power Association

American Wind Energy Association

Calpine Corporation

Cogentrix Energy Power Management, LLC

Consolidated Edison Company of New York, Inc. and Orange and Rockland Utilities, Inc.

Direct Energy, Direct Energy Business, LLC, and Direct Energy Business Marketing, LLC

EDF Renewable Energy, Inc.

Edison Electric Institute

EDP Renewables North America LLC

Electric Power Supply Association

E.ON Climate & Renewables North America, LLC

Exelon Corporation

Independent Power Producers of New York, Inc.

Invenergy LLC

LS Power Associates, L.P.

National Rural Electric Cooperative Association

New York Power Authority

NextEra Energy Resources, LLC

NRG Power Marketing LLC and GenOn Energy Management, LLC

Public Citizen, Inc.

Retail Energy Supply Association

Shell Energy North America (US), L.P.

Southern Company Services, Inc. (on behalf of Alabama Power Company, Georgia Power Company, Gulf Power Company, Mississippi Power Company and Southern Power Company)

Southern Power Company

Out-of-Time Motions to Intervene

New York Transmission Owners (Central Hudson Gas & Electric Corporation; Consolidated Edison Company of New York, Inc.; New York Power Authority; New York State Electric & Gas Corporation; Niagara Mohawk; Orange and Rockland Utilities, Inc.; Power Supply Long Island; Rochester Gas and Electric Corporation)

Potomac Economics

Vitol, Inc.