

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

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

COMMENTS OF THE R STREET INSTITUTE

Pursuant to the Federal Energy Regulatory Commission’s (the “Commission” or “FERC”) Notice of Proposed Rulemaking (“NOPR”) issued on December 15, 2016,¹ the R Street Institute (“RSI”) respectfully submits these comments in response to the Commission’s proposed revisions to require regional transmission organizations (RTOs) and independent system operators (ISOs) to incorporate market rules consistent with certain requirements when pricing fast-start resources.² Specifically, the NOPR proposes to require RTO/ISOs to:

- 1) Apply fast-start pricing to any resource able to start within 10 minutes, has a minimum run time of one hour or less, and submits economic energy offers to the market.
- 2) Incorporate commitment costs (i.e., start-up and no-load costs) of fast-start resources in energy and operating reserve prices during a resource’s minimum run time.
- 3) Relax the economic minimum operating limit of fast-start resources to zero and treat them as dispatchable from zero to the economic maximum operating limit for the purpose of calculating prices.
- 4) Require fast-start offline resources that set prices to be feasible and economic.
- 5) Incorporate fast-start pricing in the real-time and day-ahead markets alike.

I. ABOUT THE R STREET INSTITUTE

The R Street Institute (RSI) is a pragmatic, free market oriented think tank. RSI aligns with such thinkers as Milton Friedman, Friedrich Hayek, Ronald A. Coase, James M. Buchanan and Arthur C. Pigou. RSI favors consumer choice; regulation that is transparent and applied equitably; and systems that rely on price signals rather than central planning.

RSI recognizes market failures – including public goods and externalities – are valid concerns governments must sometimes address. RSI also recognizes the nature of a democratic society often means agreeing on a compromise that may not always represent the first, best solution. RSI sees its role

¹ *Fast-Start Pricing in Markets Operated by Regional Transmission Organizations and Independent System Operators*, Notice of Proposed Rulemaking, 157 FERC ¶ 61,213 (Dec. 15, 2016).

² NOPR at P 1.

as offering research and analysis that advance the goals of a market-oriented society and efficient government, with the full realization that progress often occurs incrementally. In other words, RSI looks for free market victories on the margins.

In 2016, RSI launched an electricity policy program to research and promote consumer choice and economically sound market and rate design. RSI believes competitive electricity markets and consumer choice yield superior economic and environmental results relative to the regulated monopoly model.

II. COMMENTS ON NEED AND APPROACH FOR FAST-START RESOURCE PRICING REFORM

The Commission correctly concludes proper fast-start resource inclusions will produce transparent prices that more accurately reflect the marginal cost to serve load. These enhanced price signals will result in improved efficiency of resource investments and management. This, combined with reduced uplift costs, will reduce costs to load and increase overall economic efficiency. While some RTO/ISOs have made substantial progress, clearly a variety of RTO/ISO practices fail to reflect the marginal cost of fast-start resources. This results in suboptimal unit commitment and dispatch, market-clearing prices and creates avoidable uplift costs.

The benefits of proper market integration of fast-start resources will grow, given projected changes in the generation technology/fuel mix. One principle driver is the increase of variable energy resources that require increased system resource flexibility, including fast-start capability. Fast-start resources, such as energy storage and combustion turbines, are also becoming more pervasive. Natural gas combustion turbine capacity, which can have high commitment costs, is increasing markedly. By virtue of being on the end of the supply curve these units have an outsized price effect when priced incompletely, especially during high price natural gas events that commonly coincident with high electric system stress. Partially or fully excluding commitment costs, including start-up and no-load costs, in price formation will increasingly distort investment and operating decisions and potentially could encourage poor market participant behavior (e.g., reduce incentives to follow commitment and dispatch instructions). In turn, this would likely expand out-of-market RTO/ISO commitments, further undermining price formation.

As the benefits of fast-start resource reforms grow, the Commission should endeavor to avoid overly prescriptive remedies that inhibit the experimentation necessary to identify best practices and tailor reforms to unique regional circumstances (costs and benefits of fast-start resource reforms vary by RTO/ISO). The NOPR correctly identifies challenges and costs involved with implementing reforms. These include substantial software upgrades, RTO/ISO modeling and labor costs and market participant

and monitoring adjustments. The final rule should be mindful of how these costs compare against projected benefits.

An economically sound, principle-based rulemaking will encourage identification and adoption of best practices while avoiding restrictive prescriptions. The lack of industry consensus on best practices in fast-start resource pricing logic underscores this. Forward-looking cost-benefit analyses should guide the substance and timing of reforms. Benefits should account for synergies with other recent or expected market reforms. For example, improving fast-start resource integration should bolster the performance of look-ahead unit commitment and dispatch reforms and ramp products. Other price formation enhancements, such as those to settlement intervals and scarcity pricing, will also have cumulative benefits with improved fast-start resource integration in excess of the sum of individual reforms done in isolation.

III. COMMENTS ON NOPR PROPOSALS

RSI supports the Commission's intention to incorporate commitment costs into energy and ancillary service pricing logic. RSI agrees many existing RTO/ISO practices have flaws but cautions against overly prescriptive remedies. RSI stresses the value of a principles-based rulemaking, especially considering best industry practices have not emerged with respect to pricing fast-start resources.

A. Fast-Start Resource Definitions and Eligibility

The definition of a fast-start resource is relative and may change with the evolving state of technology and transmission system needs. Performance definitions are preferable to those based on specific technology characteristics. The former allows greater flexibility and avoids asymmetric, discriminatory resource treatments between otherwise qualified resource categorizations. The Commission should avoid making performance-based definitions that are *de facto* technology-based definitions and instead focus on the expected costs and benefits of altering resource definitions that account for any differential treatments between resource categories.

Ideally, energy and ancillary services pricing logic would account for the short-run marginal costs of all resources. The definition of a fast-start resource should not leave the Commission, RTO/ISOs or stakeholders complacent about incomplete market integration of any medium- to slow-start resources. Many of these resources face increased cycling demands, yet market processes do not fully reflect their unit commitment costs. For example, many traditional baseload units have start times and minimum run times inconsistent with day-ahead scheduling processes, relying on non-market reliability commitments. Similarly, multi-configuration combined cycle combustion turbines have cost structures that bidding parameters and unit commitment and dispatch engines incompletely account for. As such, the

distinction between defining a fast- and medium-start time resource matters little; the policy objective is to integrate all eligible resources cost-effectively.

Many resources have start-up times greater than 10 minutes but provide valuable operational flexibility not fully accounted in market processes. Simple-cycle combustion turbines alone vary in start times from minutes to hours. Even a resource with a sub-10 minute start time under typical conditions may require more than 10 minutes to start on occasion (e.g., mechanical delays from adverse weather conditions, state of charge for storage resources or limited fuel availability in late-stage unit commitment for natural gas combustion turbines). This could make tailoring rules to resources with transient classifications based on arbitrarily performance parameters somewhat challenging. The Commission could extend a longer start-time definition for fast-start resources to encompass a broader range of flexible resources (e.g., half hour or two hours per some RTO/ISOs practices) or retain the 10-minute definition and expand efforts to fully integrate non-fast start resources.

Imposing a minimum run time requirement could preclude otherwise applicable resources from full market integration and limit the benefits of price formation reform. For example, hydroelectric resources may have sub-10 minute start-times but flow restrictions that disallow full cycling under one hour. A resource may also meet the minimum run time definition most of the time but face periodic exceptions. For example, most natural gas combustion turbines have nominal minimum run times under one hour but, during stressed conditions, pipeline operators may require ratable gas takes to span multiple hours to avoid sudden shifts in pipeline pressure. If the Commission would like to proceed with a minimum run time requirement, RSI suggests making the rationale clearer and using a broader parameter definition to avoid inadvertent resource exclusion.

B. Inclusion of Start-up and No-load Costs in Prices

The question of whether to treat short-term fixed costs, in this case commitment costs (start-up and no-load costs specifically), as marginal costs necessarily delves into the temporal definition of marginal cost.³ Locational Marginal Pricing (LMP) encapsulates the incremental cost to serve load, which clearly includes commitment costs if participants incur such costs within the incremental period. The CAISO and PJM criticisms of including commitment costs in LMP have some merit, as commitment costs often exceed LMP intervals. However, failure to represent commitment costs in short-term pricing

³ Indeed, one could argue that the classification of commitment costs as fixed depends on the definition of timeframe. The brief minimum operating period for many block-loaded resources could lead to the classification of commitment costs as marginal variable costs.

constructs leaves physical and operational constraints unrepresented in energy and ancillary service markets.

The time horizon of interest to energy and ancillary service markets depends on the most economical representation of production costs. Minimizing production costs, a core economic function of RTO/ISO operations, is an exercise in part in minimizing commitment costs.⁴ If RTO/ISOs are to send price signals that accurately reflect the costs of short-term operation of the transmission system, then prices must reflect start-up and no-load costs.

A composite metric of short-term marginal cost, such as MISO's Extended LMP, may better represent all short-term costs. Even an imperfect cost representation may prove preferable to none, where problematic uplift charges fill the cost recovery void. The Commission should stick to a principles-based approach (e.g., require incorporation of start-up and no-load costs) rather than prescribing the mechanism(s) (e.g., convex hull pricing) to represent commitment costs. For example, the most economically advantageous formula for amortizing fixed costs over LMP intervals remains unclear and experimentation may provide further insights. The proposed principle to include start-up and no-load costs is reasonable. The Commission does not need to specify the method (e.g., amortization timeframe or economic parameter determinants), which individual RTO/ISOs and their stakeholders may instead determine.

C. Relaxation of Economic Minimum Operating Limit

The NOPR provision to relax the economic minimum operating limit to zero raises concerns. Accurate representation of economic parameters is central to minimizing production costs. Artificially adjusting the economic minimum (e.g., making a non-dispatchable resource appear dispatchable) would inaccurately over-represent a resource as dispatchable beyond its capable dispatch range. The PJM Independent Market Monitor notes this practice subjectively overrides fundamental pricing logic and, despite potential to reduce uplift, may increase total production costs. In short, not all means of enabling block-loaded units to set price result in increased economic efficiency, on balance.

Ideally, no relaxation should be necessary. The relevant policy goal is to ensure all resources capable of following commitment and/or dispatch instructions are eligible to set price when they qualify as the marginal resource, not to artificially expand their representation as marginal. The problem is that inflexible resources cannot set price because pricing software logic does not treat them as able to meet

⁴ Production costs are comprised of commitment costs and incremental energy costs.

the next increment of load. The Commission should instead encourage RTO/ISOs to rectify any modeling constraints that artificially inhibit block-loaded or limited dispatch units from setting price.

D. Offline Fast-Start Resources

Allowing offline resources to set prices can better reflect the marginal cost of providing energy and ancillary services. The NOPR correctly emphasizes that offline resources should only set price if they are economic and feasible (i.e., have the physical capability to provide service). Otherwise, pricing offline resources may depress real-time prices, encourage uneconomic market participant behavior, and undermine price formation.

An industry consensus to pricing offline resources has not emerged. Thus, the Commission should promote principle-based enhancements rather than prescriptive reforms. Some of the proposed threshold requirements for offline fast-start resources to set price seem unnecessary. For example, offline resources should be eligible outside of shortage conditions, as should resources with start-up times exceeding 10 minutes (this ties back to resource definition), assuming consistency with market product definitions (e.g., reserve requirements). RTO/ISOs should pursue amortization periods on their own accord via stakeholder processes. Further Commission guidance, not prescriptions, could prove helpful. As offline resource integration techniques advance, the Commission should revisit means of nudging lagging RTO/ISOs toward best practices (e.g., sunlight regulation).

E. Day-Ahead and Real-Time Market Consistency

Consistent application of fast-start pricing across day-ahead and real-time markets would likely drive price convergence and improve day-ahead price formation. Still, improving real-time pricing alone should drive improvement in day-ahead markets, as virtual transactions will better account for expected discrepancies. Given the limited potential for fast-start resource commitments in the day-ahead, the Commission should grant leeway for RTO/ISOs to pursue day-ahead reforms at a pace and manner consistent with forward cost-benefit analysis.

Existing structural differences may inhibit the ability to apply real-time fast-start resource logic reforms to day-ahead markets. For example, sub-hourly commitment cost amortization in real-time would not reconcile effectively with hourly day-ahead pricing intervals. The Commission could request feedback on any unanticipated structural design changes needed to adopt fast-start pricing efficiently in day-ahead markets and encourage reforms consistent with forward cost-benefit principles.

IV. ADDITIONAL COMMENTS: MARKET POWER AND PHYSICAL PARAMETERS

Enabling fast-start resources to set price also creates new opportunities to exercise market power. Concentration of ownership would elevate the ability to exercise market power only if market

power mitigation practices have shortcomings. As such, the Commission should focus on thoroughly evaluating mitigation techniques.

A newfound ability of fast-start resources to exercise market power calls special attention to the representation of physical parameters. Resource owners may use misrepresentation of fuel availability and cycling capabilities to execute physical withholding strategies. In particular, unnecessary limitations on start capabilities (e.g., start-up times and number up starts over a defined period) could adversely affect transmission system operations and price formation. For example, many fast-start units in CAISO limit their number of available daily starts to one or two, significantly below their physical capabilities. This problem adversely affects market performance as CAISO increasingly relies on flexible resources to integrate variable energy resources.

Although fast-start resources would not become marginal with high frequency, their tendency to be marginal during scarcity periods propels the potential motivation to exercise market power and exacerbates its impact. Physical parameters are often most difficult for a market monitor to verify during stressed system conditions. For example, monitors may find it difficult to validate changes in start-up times that may legitimately result from inclement weather or fuel limitations from natural gas pipeline congestion. This may create leeway for generators to illegitimately change their parameters. Offline resources, in particular, may find gaming opportunities as pricing patterns become recognizable.

The Commission should distinguish between behavior that misrepresents physical parameters to exercise market power from those genuinely motivated to control unrepresented costs. For example, motivation to understate the number of starts may also come to avoid shut-down costs or increased maintenance costs associated with cycling. Some resources may also seek to incorporate opportunity costs (e.g., resources with contractual limits on number of starts, such as demand response, or legal limits, such as environmental requirements on fossil units). The NOPR does not explicitly provide for market representation of such costs, thus participants will have incentive to creatively account for these in offer behavior.

Coordination failure may also lead to inadvertent misrepresentation of physical parameters. In the Northeast, multiple natural gas generators, often with fast-start capabilities, along the same segment of natural gas pipeline cannot simultaneously acquire fuel given pipeline capacity constraints but offer as physically available because a unit accounts for its individual position, not coincident pipeline and electric system conditions. Multiple RTO/ISOs have also observed rapid decreases in natural gas pipeline pressure when multiple fast-start units activate simultaneously. Again, each generator owner will represent their individual unit - offering as physically available - without knowledge of

broader system conditions that may restrict its operation. While these coordination failures often involve fast-start resources, the Commission and/or RTO/ISOs may address such concerns in ongoing natural gas-electric industry coordination and fuel assurance initiatives.

V. CONCLUSION

In response to the NOPR, RSI respectfully requests the Commission consider the comments contained herein.

Respectfully submitted,

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February 28, 2017