

NAESB Advisory Committee Meeting February 2013



Synchronizing Natural Gas & Power Markets *A Series of Proposed Solutions*



By



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February 2, 2013

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White Paper Process

Author's Rough Draft

Industry Expert Peer Review

- Regulators
- ISOs
- Traders
- Pipelines
- Generators

Author Redraft

Second Peer Review

Published 1-22-2013

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Market Syncing Solutions Paper Reason & Timing

- Natural gas has become the predominate power generation fuel in many markets and the marginal generation in nearly all markets, hence grid reliability is now dependent on gas.
- The market rules for gas and power were developed during different time frames – rules were internal to each market’s operations and didn’t focus on need to sync with each other back then.
- The market syncing topic has moved to the forefront at the federal level, ISOs, NERC and the press as the realization that grid reliability and market risk due to unsynced markets has become problematic.
- To date, various market participants from differing segments have articulated their version of the problem; however, no one has approached it yet from a holistic cross-market viewpoint....We have attempted to do that.
- As Skipping Stone is not a market participant, but does work with a large cross section of gas and power companies, we felt we could provide all sectors of the industry with a starting point on refocusing the discussion toward solving the problem.... Hence our White Paper of proposed solutions.

Potential Market Risks of Not Syncing the Markets

- Do we really want to explain to customers and politicians that the reason for a major blackout is because gas and power markets are not in sync and therefore cannot operationally work together in harmony?
- We have an obligation to provide the public with reliable power; however, the electricity market operators today have no formal process of verifying that their gas generators' power is backed by firm service (i.e., firm delivery capacity).
- Gas generators and pipelines have no formal process of providing that verification nor do their current rules and operating procedures incorporate that capability.
- Currently this mismatch is being addressed as an arbitrage opportunity by the trading community. Do we really want to point the finger for failure at the financial community instead of fixing the underlying physical market problems?
- The gas market has proven to be one of the best stories in decades for providing low cost energy, jobs and the related boost to our economy. It is unlikely the gas industry wants to wear the blame for a power market failure.
- Do we really want to wait until after a crisis to fix this problem?

Definition of “Firm Power” – The Problem

- Today’s definition of “Firm Power” does not address the fuel required to generate the power, only that the generator be connected and available to the grid and have sufficient capacity.
- Much of the “Firm” power bid into the real time and day-ahead market by gas generators isn’t actually backed by the firm gas pipeline capacity necessary to deliver the gas supply to the generator.
 - Today gas generators cannot buy intra day or “day-at-a-time” firm pipeline capacity because the market rules don’t enable pipelines to offer that service.
 - Further, pipeline capacity confirmations occur AFTER power bids are due and most Day Ahead power markets “clear.”
- The current definition of “Firm Power” as it relates to gas-fired generation is not conducive to sending economic signals related to the gas pipeline capacity (FTS) which makes the power “firm.”
- Without a redefinition of “Firm Power,” all other attempts to sync the markets will fall short, as there is nothing to economically link the two markets and incent true reliability. “Twiddling” at the edges will not succeed.

Redefining Firm Power – The Proposed Solution

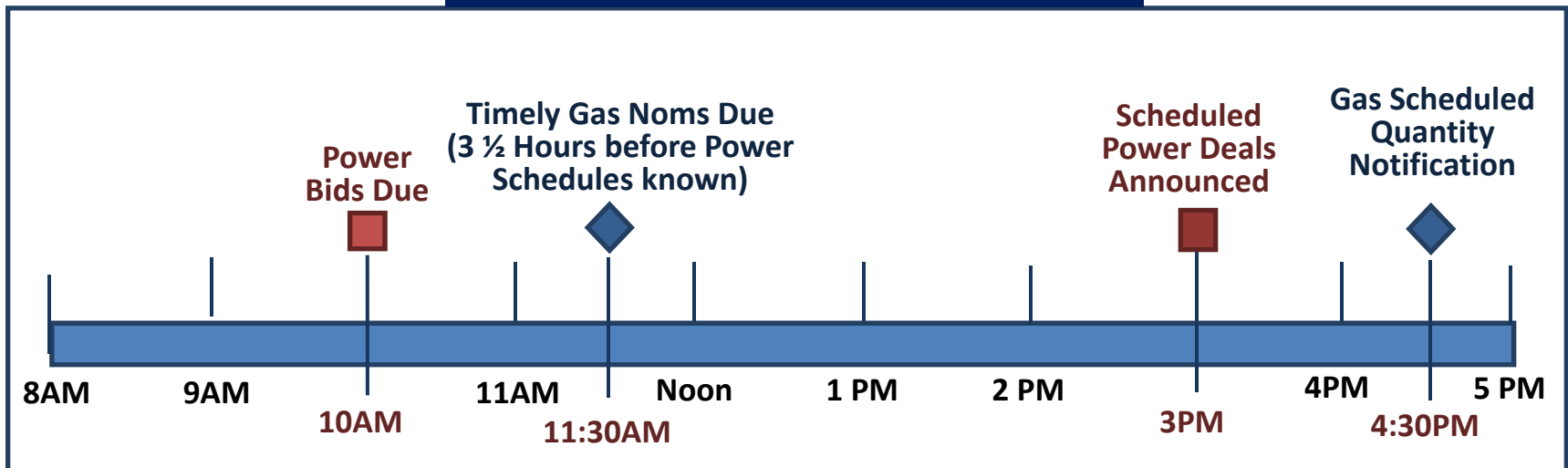
For the Day-Ahead Power Market - Redefine “firm power” on a “fuel neutral” basis.

- A coal generator would need to verify inventory on site, such as the coal pile size and generating capacity in terms of hours.
- Oil generators would verify tankage, inventory and related generation capacity and hours.
- For hydro, verification of stored water and generation capacity and hours.
- Gas fired generators would need to provide verification (with third party confirmation) of the necessary firm pipeline capacity and related generation capacity and hours.
- For gas generators behind city gates, the confirmation would come from the Local Distribution Company (LDC) contracts for either firm LDC transportation or firm sales service or both.
- Renewable generators would provide verification of either gas fired or demand response assets, with capacity and hours backing their bids.

Market Operations Timing – The Problem

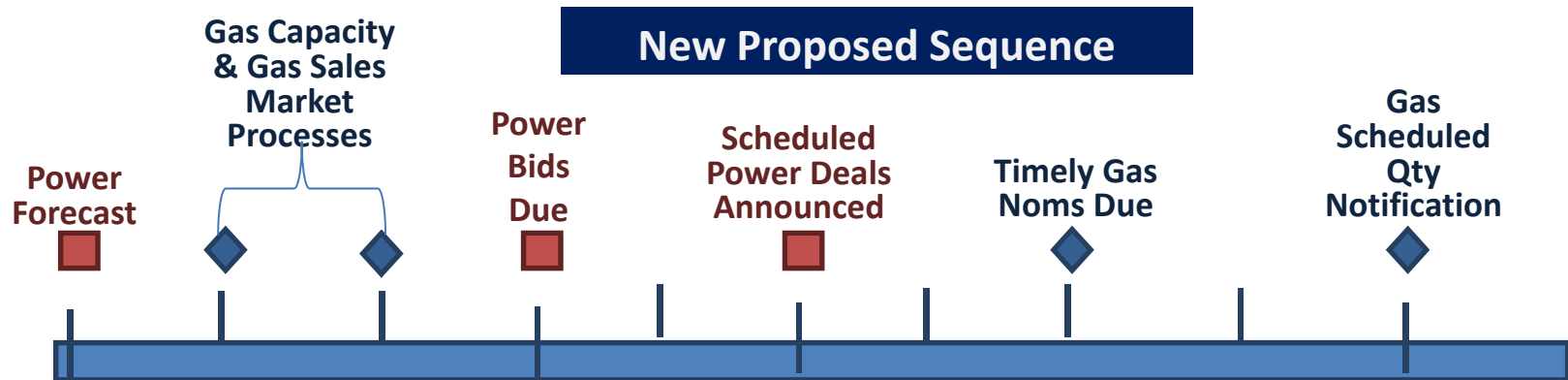
Today, the gas market's standardized schedule for purchasing, scheduling and confirmation of short term primary or secondary firm pipeline capacity to deliver the required gas supplies generally operates after power bids are due.

Current Market Operations Timeline



Market Operations Timing – The Proposed Solution

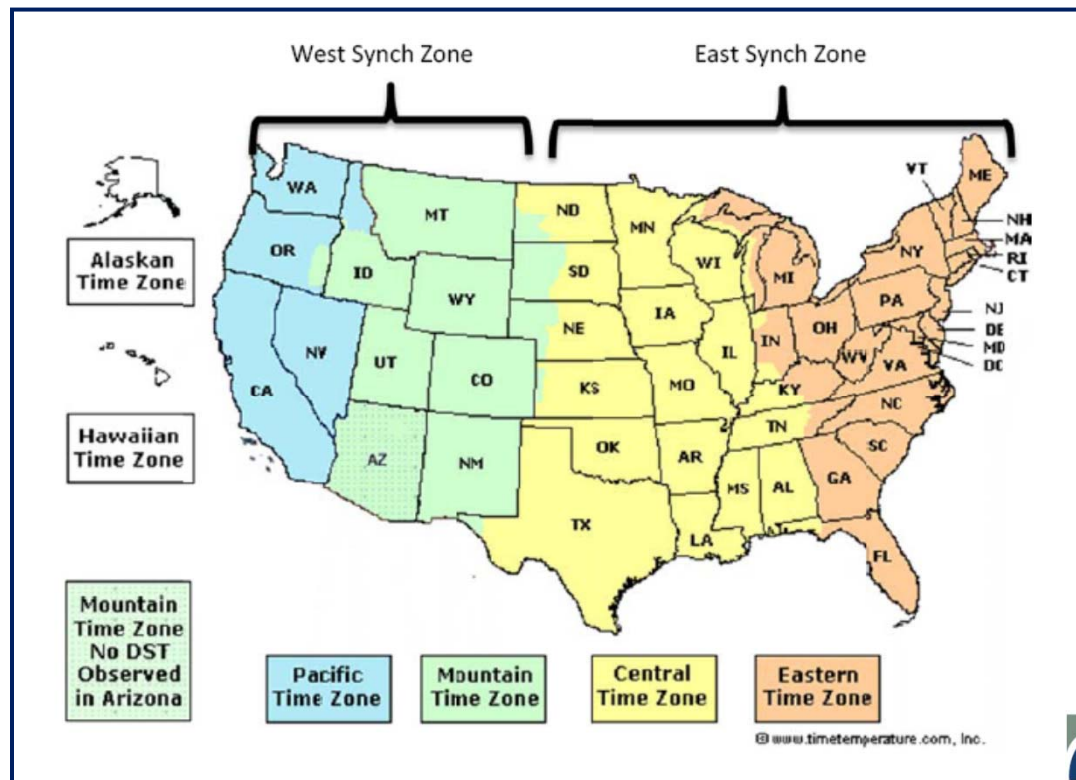
- Change the sequence to Gas before Power



- More Pipeline Nomination Cycles
 - Increasing the number of standardized gas scheduling cycles would allow gas generators to tweak schedules and get confirmations more often based on power market requirements.
- Raise the Priority of Secondary Firm Above Interruptible
 - Moving secondary firm ahead of IT in the pecking order would enhance capacity release assets for both buyers and sellers and provide gas generators the opportunity to not need to rely on IT.

Market Operations Timing – Solutions continued

- Create Two North American Energy Sync Zones
 - Today there are at least 4 “Electric Days” and a different “Gas Day” in North America.
 - Instead of multiple definitions of a “day,” having one “Eastern Energy Sync Zone” and one “Western Energy Sync Zone” would eliminate overlap and establish the foundation for fully synchronizing the two markets.



Sync Zone Concept Explained

- It is proposed that the Central and Eastern Time Zones have one Energy Day; 6:00 AM to 6:00 AM local clock time for the Eastern Time zone, and 5:00 AM to 5:00 AM local clock time for the Central Time Zone.
 - In this way, all Eastern Sync Zone Gas and Electric infrastructure would be on the same instantaneous schedule.
- The Pacific and Mountain Time Zones will have another Energy Day; for the Mountain Time Zone, 6:00 AM to 6:00 AM local clock time, and for Pacific 5:00 AM to 5:00 AM local clock time.
 - Like the Eastern Sync Zone, all Western Sync Zone Gas and Electric infrastructure would be on the same instantaneous schedule.

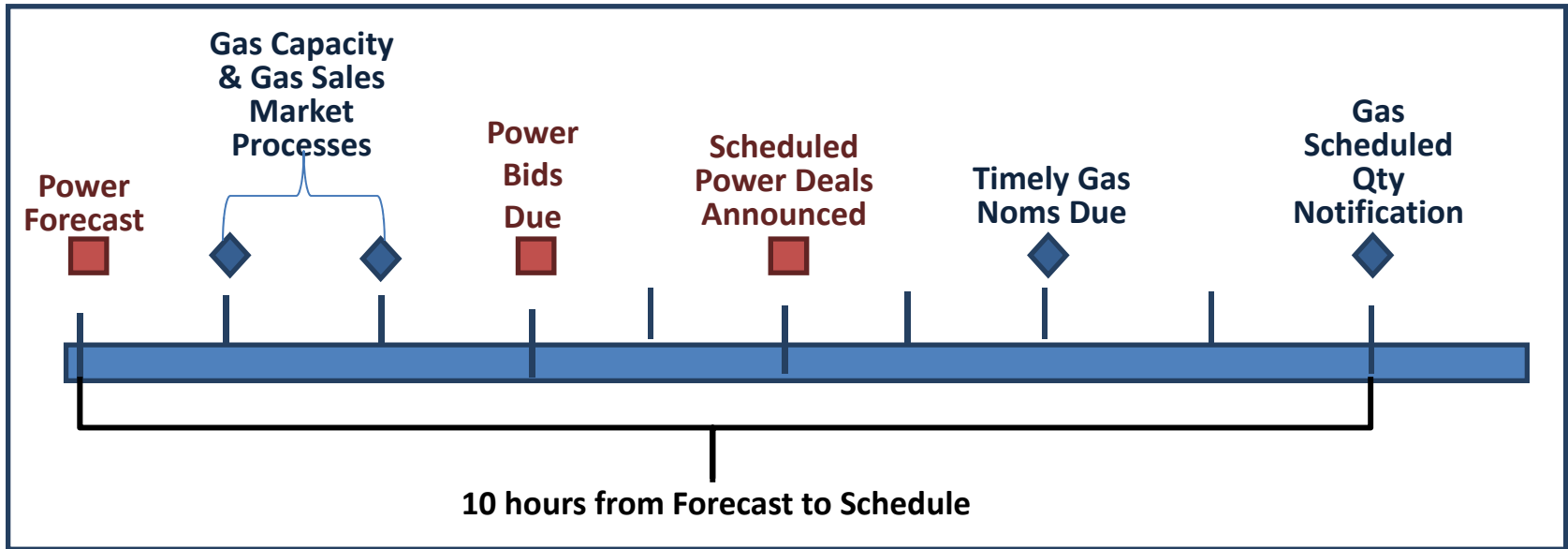
Economic Syncing – The Problem

- Gas shippers using the Timely scheduling sequence, once scheduled, are not at risk of being bumped when using primary or secondary firm capacity rights.
- By the time the Day Ahead power markets are “cleared,” the Timely Day Ahead Gas market sequence is already finished.
- While there are other nomination opportunities later in the day, not all of them afford to secondary firm capacity nominations the same bumping rights over interruptible transportation (IT) that are afforded in the Timely cycle.
- Thus, today, a within-day “late nomination” of secondary cannot bump previously scheduled IT.
- The gas that generators need may not flow because the capacity has already been assigned to someone else, leaving grid reliability in question

Economic Syncing – The Proposed Solution

- To sync the economics in line with Sync Zones for the power markets, it is proposed that there be an “On-Peak Market” standardized to be 16 hours/day Mon-Fri (excluding holidays).
- Once the Day-ahead Firm gas transportation capacity market clears, the Electric Day-Ahead On-Peak Market Opens, Closes and Reports – followed by the clearing of the gas market.
- With these two complimentary and interdependent markets cleared, the gas market proceeds with Day-ahead Nominations being made, followed by Confirmations and then Scheduling (Reporting).
- In the Gas Market, the deadline for submitting nominations to the pipelines signals the end of the gas trading time interval, as all deals for the commodity must be completed prior to such deadline so that the counterparties can submit nominations and conduct confirmations through the pipelines’ electronic systems.

Simplified View of Economic Sync Sequencing



Market Syncing Communication – The Problem

- Currently, no formal method of data transfer process exists to verify firm pipeline capacity between the pipeline, gas generators and power market operators and compliance organizations, such as NERC or FERC.
- There are several communication issues to consider regarding information transfer.
 - Generators or pipelines will voice concerns regarding the extent and proprietary nature of the information that they might be required to disclose.
 - Pipeline capacity may change hands in the release market and may not be directly linkable to the generator. For example, a generator may have their “firm pipeline capacity” bundled with the gas supply by gas trading companies holding the firm pipeline capacity.
 - Many generators, especially those located behind the city gate, have options as to which pipeline can serve the LDC serving their facility and may switch the pipelines on which they acquire capacity back and forth based on economic factors or capacity constraints.
 - For gas generators that rely on LDCs for delivery of gas supply and/or firm capacity, some LDCs may not have segregated those transactions from the rest of their system when setting overall dispatch.

Market Syncing Communication – The Proposed Solution

- Utilize the gas and power market information that already exists in each sector.
 - Pipelines are required to make quarterly Index of Customers (IOC) reports.
 - Pipelines are required to post, prior to gas flow, their sales of Firm Capacity through FT reports
 - Capacity release transactions in the secondary market are also made publicly available.
- Share information regarding pipeline capacity and nominations with market operators on the same cycle as confirmations omitting proprietary details such as economic terms of bundled sales
 - Without the ability to verify firm capacity and match that information to generation bids, market operators cannot properly manage reliability risk.
- The LDC information posting corollary would be similar to the pipelines' IOC postings and FT Reports, and, where an LDC accommodates on-system capacity release, a corollary similar to that of SoCal Gas' Firm Access Rights (FAR) trading postings.

Pipeline Capacity Availability

- The combination of the redefinition of firm power, market timing and economic syncing will cause true pipeline capacity price signals to create a value for peak and emergency capacity.
- Pipelines would be authorized to provide “Day-at-a Time” – secondary market – Firm services in addition to existing and future primary market firm services (i.e., day-at-a-time hourly services, firm linepack services, P&L, and others to be developed).
- Pipeline owners have long demonstrated a willingness to respond to market price signals and to both build infrastructure and fashion new primary market services to capture those price signals’ economic value.
- The demand side of the power grid has already demonstrated it can respond to peak needs, which in combination with tighter coordination with pipelines will strengthen grid reliability and generate true price signals for such reliability.

Implementation Considerations

1. The regulatory process, beginning with FERC and including NARUC, needs to fully vet these and other solutions.
 - FERC NOI followed by a NOPR
 - NERC and NAESB
2. Market synchronization rules need to be adopted by ISOs, RTOs, utilities, generators and pipelines, and retail and wholesale market participants.
 - Software and Transaction Process Modifications
 - Adoption of Required Reporting Parameters
3. Other related issues to address:
 - The necessity for the electric grid, in times of distress, to “share information” to keep power flowing to those segments of the fuel supply chain that require power to run the pumps, meters and compressors that ensure fuel gets to the generators
 - The possibility that these changes may necessitate the gas grid subscribing for firm electric services to the extent that is not the case today
 - Training of the work force to adapt to the new operating rules
 - Eventual introduction of rules into forward capacity markets and Integrated Resource Planning processes

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