UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Technical Conference on Environmental Regulations and Electric Reliability, Wholesale Electricity Markets, and Energy Infrastructure	Docket No. AD15-4-000

Prepared Statement of

Environmental Defense Fund

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The Environmental Defense Fund ("EDF") appreciates the opportunity to provide comments and participate before the Commission as part of its inquiry into the potential implications of the Environmental Protection Agency's ("EPA's") proposed Clean Power Plan rule for electric reliability, wholesale electric markets and operations, and energy infrastructure in the Eastern region.

We know from experience that when the states and the federal government propose laws to protect public health and welfare by reducing harmful air pollution, to expect a loud cacophony punctuated by claims that new air rules increase costs for customers, and jeopardize reliability. Whether such claims are made by utilities, electric generators or others, long-standing and consistent programmatic results demonstrate that such claims amount to exaggeration, and that no such reliability problems will arise. As stated in the Analysis Group's recent Clean Power Plan reliability report, there is no historical basis in support of an assertion that environmental regulatory implementation will be the cause for a resource adequacy shortfall.[1]

In 2007, the North American Electric Reliability Corporation ("NERC"), in its Long-Term Reliability Assessment 2007- 2016, ("2007 NERC Reliability Assessment")[2], predicted that that: 1) New England will drop below target capacity margin levels required to meet summer peak load in 2009; 2) New York State will drop below target capacity margin levels required to meet summer peak load in 2011; and 3) PJM East and PJM West will drop below target capacity margin levels required to meet summer peak load in 2012. NERC attributed the projected shortfalls to numerous factors, including proposed environmental regulations, and these findings were asserted by power generators in opposition to the RGGI program. We know now that the predicted reliability shortfalls did not come to fruition and RGGI has been extraordinarily successful in helping to reduce power sector GHG emissions while contributing to economic vitality and maintaining reliable electric service in the participating states.

The 2007 NERC Reliability Assessment cited numerous other factors as having significant implications for reliability and to reliability planners. Those included: increased integration of variable renewables and demand response, expanded reliance on natural gas-fired generation, coal plant retirements and higher frequency of extreme weather events, to name a few. In citing the increased incidence of such factors, NERC was largely correct. Yet reliability has been maintained by the ongoing actions of policymakers, regulators, market

[1] *Electric System Reliability and EPA's Clean Power Plan*, Analysis Group (February 2015); http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Electric_System_Reliability_and_EPAs_Clean_Power_Plan.

[2] Accessible at http://www.nerc.com/files/ltra2007.pdf .

participants and system operators. In fact, since 2007, national renewable output (excluding hydroelectric) has increased from 105,238 GWhs to 281,060 GWhs in 2014 and national natural gas output has increased from 896,590 GWhs in 2007 to 1,121,928 GWhs in 2014.

While there have been challenges, the markets have responded effectively to maintain reliability amidst these rapid changes. For example, from 2007 through 2013 approximately 80 bcf/d of pipeline capacity was added in the United States, comprising nearly 30% of total interstate system capacity. In addition, electric reliability planning improved, resource adequacy markets were refined, and market participants on both the gas and electric side increased coordination. This Commission has consistently enabled market rules that (i) promote a market based on voluntary participation, (ii) allow market participants to manage the risks involved in offering and purchasing services, and (iii) compensate at fair value (considering both benefits and risks) any services required for reliability. Market participants, in response to efficient price signals and commercial impetus, were and remain ready to deploy new infrastructure and investment.

In New England, natural gas and renewable generation has all but replaced coal, and reliability concerns have been particularly acute during cold winter months due to limited pipeline capacity. Yet reliability has been maintained. More importantly, the actions of New England Power Pool market participants have demonstrated that fostering flexibility in the market is critical for reliability, and that when given the opportunity, markets will respond. For example, in developing a winter reliability program for 2013/14, ISO-NE expressed concern that including liquefied natural gas ("LNG") in its program ***would obscure*** the price signal for new pipeline infrastructure deployment and thus refused to include LNG in its winter reliability solicitation. This winter 2014/15, when temperatures were colder and natural gas usage was higher than the prior year, natural gas spot market and electric prices were significantly lower, and the basis blowouts of last winter were avoided in significant measure by new LNG supplies. Rather than obscure the price signal for new pipeline builds, LNG and other alternatives ***clarified*** the price signal for new pipeline infrastructure.

There is an important lesson from New England. When markets provide clear and efficient price signals[3], participants are able to make investment decisions to determine the most cost-effective means to maintain reliability, while complying with public health and safety requirements. This has been the case countless times in the recent past, and there is simply no basis to reasonably assume that market operators, regulators and market participants will

[3] As discussed below and in EDF's comments on the Commission's Notice of Proposed Rulemaking, Coordination of the Scheduling Processes of Interstate Natural Gas Pipelines and Public Utilities, Docket No. RM14-2-000 ("Gas/Electric Coordination NOPR"), the 2014 Polar Vortex events surfaced important issues about the accuracy of price formation in the wholesale gas spot markets.

not continue to do so in the case of the Clean Power Plan --which provides states and plant owners broad flexibility with respect to the manner and timing of achieving emission reductions.

It is also clear that there is ample existing infrastructure to support further reductions in power sector pollution. With regard to the adequacy of pipeline capacity, the United States has a substantial amount of unused capacity. The Department of Energy, in its recent study, determined that nationally, from 1998 through 2013, 46% of existing pipeline capacity went unused, and points out that higher use of existing capacity, where feasible, is more cost-effective than building new pipelines.[4] In many areas of the country, existing unused capacity will accommodate increased natural gas-fired generation.

This surplus of existing gas transmission capacity has even persisted during periods of abnormally high gas demand, such as the 2014 Polar Vortex. For example, on January 22, 2014 in PJM East, as gas prices were exceeding $100/ dekatherm, and power prices $1000 / MWh, there was unused capacity on several pipelines supplying PJM East from production areas in the Marcellus and Utica basins.[5] Analysis of pipeline utilization during the Polar Vortex events also shows that pipelines providing more frequent scheduling cycles were utilized to a far greater extent than those that primarily abide by NAESB minimum standards in their service offerings. More frequent nominating opportunities and scheduling cycles provide electric generators with enhanced flexibility to meet reliability needs so that they can procure gas deliveries when it is actually needed.

PJM's experience during the Polar Vortex highlights opportunities for FERC to ensure that existing gas infrastructure is used as efficiently as possible, not just to facilitate implementation of the Clean Power Plan but also to benefit shippers and protect the public interest in avoiding expensive, long-lived investments in unneeded pipeline infrastructure. The Commission, in its Gas/Electric Coordination NOPR, recognized that refinements such as requiring more frequent scheduling cycles are necessary to better harmonize the interface between the gas and electric markets, regardless of the Clean Power Plan's requirements. Dr. Susan Tierney and others have observed in this proceeding that significant fundamental and ongoing shifts already underway in the gas and electric systems compel market participants to adjust operational and planning practices to accommodate change. In the words of NRG Energy CEO David Crane during its earnings call on February 27,

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[4] *Natural Gas Infrastructure Implications of Increased Demand from the Electric Power Sector*, U.S. DOE (February 2015).

[5] EDF submitted analysis of scheduled and end-of-day deliveries during January 2014 for each interstate pipeline serving generators in PJM East with its comments on the Commission's Gas/Electric Coordination NOPR, Docket No. RM14-2-000.

> Our industry is in the early but unmistakable stage of a technology-driven disruption of historic proportion. This disruption ultimately is going to end in a radically transformed energy industry where the winners are going to be those who offer their customers, whether they be commercial, industrial or individual customers, a seamless energy solution that is safer, cleaner, more reliable, more convenient and increasingly wireless.[6]

The energy delivery system will need to be optimized around lower cost variable renewables, distributed generation, new technologies, and more granular, dynamic and transactive customer prerogatives not because of the proposed Clean Power Plan, but rather because this is what customers are demanding and what innovation is increasingly cost-effectively providing.

The current gas market, however, is less responsive than it can and should be to efficiently serve electric generation load. Particularly in the organized electric markets, natural gas service offerings do not reflect the variation in services and pricing seen in the electric markets. This is expressed in pipeline requirements for ratable flow even when it would be possible for shippers to vary receipts and deliveries such that they are in balance hourly, but are nonetheless non-ratable. Even in vertically integrated markets, the ratable flow requirement frustrates sub-day scheduling of gas to meet sub-day demand for gas-fired electric generation.

As a result, there is no partial-day non-ratable “take” market for gas. Therefore, there are not tailored price signals to inform what combination of natural gas facilities and services are required to meet the variable demands of natural gas-fired generation –demands that will increase as the grid integrates more renewables and relies more heavily on natural gas generation. Moreover, potentially available partial day pipeline capacity goes unutilized and demand that could be served by renewable and/or low carbon generation goes unserved.

Because short notice, non-ratable natural gas service is largely unavailable at any price, there is no targeted market response to provide such services and by which market-based price formation could develop. Better price signals derived from shorter duration gas-for-electric-generation services will improve price signals to renewable resources and also demand response and energy storage (both gas and electric) which can be alternatives to balancing services by natural gas.

[6] The complete transcript of the NRG Energy February 27, 2015 earnings call can be accessed at http://www.thestreet.com/story/13062094/2/nrg-energy-nrg-earnings-report-q4-2014-conference-call-transcript.html .

EDF, along with our colleagues at Skipping Stone and numerous other stakeholders, provided extensive recommendations to the Commission in several recent dockets to increase liquidity, gas market responsiveness and gas/electric coordination not as a result of the proposed Clean Power Plan, but rather to send efficient and effective price signals to utilities and other market participants, in order to cost-effectively meet innovation-driven customer needs. Attached to these comments is a list of recommendations originally presented by EDF and Skipping Stone on September 18, 2014 during Commissioner Philip D. Moeller's Inquiry into the Trading of Natural Gas, Docket No. AD14-19-000.

The Commission, in the Gas/Electric Coordination NOPR, has begun the process of refining the gas market design to be more compatible with the contemporaneous and evolving direction of the energy sector. To efficiently optimize the gas and electric sectors, far more needs to be done. We urge the Commission to take the next step as outlined in our prior comments.

The ongoing economically and technologically-driven shifts already underway in the electric system compel refinement to market designs, service offerings and planning processes irrespective of whether EPA had proposed its regulation to reduce carbon pollution. The Clean Power Plan is but one critical point within an ongoing trend line to a cleaner, safer, more reliable and dynamic energy system. The markets and market participants are ready willing and able, and have more than adequate time to respond to market signals, including as clarified by the final EPA rule. This Commission can help by continuing and expanding its efforts to refine markets to achieve better coordination and price formation between the gas and electric sectors.

FERC September 18, 2014 Technical Conference

Presentation by

Greg Lander, Skipping Stone

and

N. Jonathan Peress, Environmental Defense Fund (as of September 29, 2014)

Problem 1 (Gas Market is Less Responsive than Needed):

Particularly in Organized Electric Markets, natural gas services do not reflect the variation in services and pricing seen in the wholesale electric markets. This expresses itself in pipeline requirements for ratable flow even when it would be possible for shippers to vary receipts and deliveries such that they are in balance hourly, but are nonetheless non-ratable. Even in vertically integrated markets, the ratable flow requirement frustrates sub-day scheduling of gas to meet sub-day demand for gas-fired electric generation.

Problem 2 (Illiquidity of Gas Markets):

In particular, in the natural gas market, for the most part, gas is traded and scheduled Monday through Thursday for ratable daily delivery Tuesday thru Friday and on Friday for ratable delivery Saturday through Monday (or Tuesdays over long weekends). This leads to periods of illiquidity on weekends and especially on long weekend holidays. This is in stark contrast with the electric market in which quantities of fuel needed for generation and the prices of that generated energy vary on an hourly and sub-hourly basis 24/7/365.

Current Negative Implications of Problems 1 & 2:

For the most part, there is no partial-day non-ratable take “market” for gas; therefore there are no price signals to inform exactly what combination of natural gas facilities and services are required to meet the variable demands of natural gas-fired generation – demands that will only increase as the electric grid integrates more renewables and relies more heavily on natural gas generation to meet electricity demand.

Potentially, available part-day pipeline capacity goes unutilized and demand that could be served by renewable and/or lower-carbon generation goes unserved.

Because short-notice, non-ratable natural gas delivery service is largely unavailable at any price, there is no targeted gas market response to provide such service(s) and by which market-based price formation could develop.

Incremental Ways to Address Problems 1 & 2:

- To the extent of available pipeline capacity, require pipelines to schedule non-ratable flows for durations as short as one hour provided that supply and demand agree to match their non-ratable quantities, and providing such flow variance(s) can be verified.
- Permit pipelines to charge "overrun" rates to compensate them for facilitating and providing non-ratable capacity that exceeds a shipper's ratable contracted capacity. One formula for setting a maximum rate for such service would be to allow the pipeline to set the hourly rate as no greater than the 100% load factor of the highest recourse rate currently in effect of the system. For instance this could be the overrun rate of a recourse rate associated with an incrementally priced expansion.
- Permit sub-day capacity releases to compete with pipeline "overrun" service on non-ratable flows.
- Remove any tariff provisions which would inhibit the projection of No-Notice Service from one pipeline onto another.
- Remove any tariff provision which would inhibit third-party storage or other facility operators from offering No-Notice Service onto a connected facility to the extent of available capacity and flow rate verification by means of electronic flow measurement.
- Require pipelines to only accept one-day-at-a-time nominations during periods in which the pipeline has declared an Operational Flow Order (OFO).

Market and Policy Benefits Flowing From Incremental Market Improvements - "Promoting Liquidity through Permitting and Promoting Non-Ratable Services":

- To the extent transaction durations can better facilitate shorter periods of time, then pricing of such shorter duration transactions will better reflect least cost combination of assets, products and services to meet those demands. Such price signals will not only increase liquidity but will cause the introduction and proliferation of tailored products and services around the provision of just the sort of non-ratable services and products that are needed to meet the challenges associated with firming intermittent generation.
- Pipelines can generate additional revenue with existing facilities.
- Better price transparency will call forth the right mixture of assets, products and services to serve demands within the gas / electric market interface.

- Better price signals coming from shorter duration gas-for-electric-generation services will improve price signals to Renewables, Demand Response and Energy Storage (both Gas and Electric) products.
- Better price signals coming from shorter duration gas-for-electric-generation services will call forth competitive offerings in shorter term capacity release, third-party and pipeline no-notice services, and incremental pipeline expansions (e.g., looping and compression) which will institutionalize such sub-day services.
- Day at a time transacting during OFO periods combined with short duration non-ratable transactions will result in more transactions and thereby increasing liquidity in the gas market during periods otherwise tending to be illiquid.

About Skipping Stone

Skipping Stone is a privately held professional services company focused solely on energy markets. For almost two decades, we have assisted clients achieve their goals by helping navigate energy market changes, capitalize on growth opportunities and solving business problems. We exclusively utilize energy industry veterans on engagements, producing definable results. Skipping Stone serves clients globally through offices in Atlanta, Boston, Los Angeles, Houston and Tokyo. For more information, visit www.SkippingStone.com .

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About Environmental Defense Fund

Environmental Defense Fund's mission is to preserve the natural systems on which all life depends. Guided by science and economics, we find practical and lasting solutions to the most serious environmental problems. We work to solve the most critical environmental problems facing the planet. This has drawn us to areas that span the biosphere: climate, oceans, ecosystems and health. Since these topics are intertwined, our solutions take a multidisciplinary approach. We work in concert with other organizations — as well as with business, government and communities — and avoid duplicating work already being done effectively by others. For more information, visit http://www.edf.org/.

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