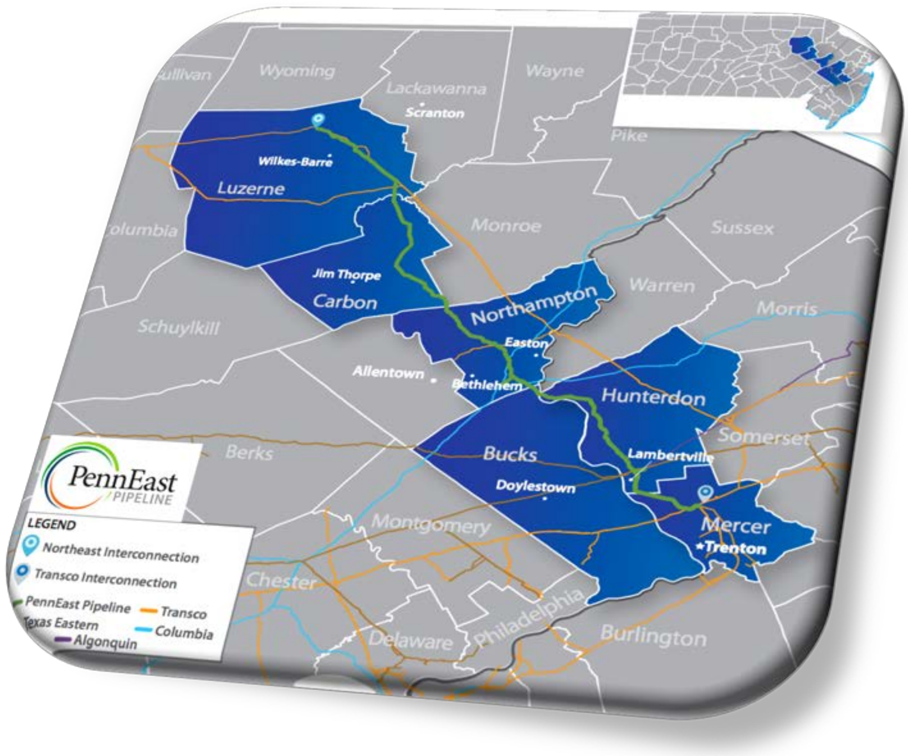
Analysis of Reliability in the Electric and Gas Markets, Cost Savings and Project Need



Author: Greg Lander

For

The New Jersey Conservation Foundation

SkippingStone

www.skippingstone.com

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About Skipping Stone

Skipping Stone is a global energy markets consulting and technology services firm that helps clients navigate market changes, capitalize on opportunities and manage business risks. Our diverse services include market assessment, strategy development, strategy implementation, managed services, talent management and innovation collaboration. Market sector focus areas include natural gas and power markets, renewable energy, demand response, technology services and distributed energy resources. Skipping Stone's model of deploying only energy industry veterans has delivered measurable bottom-line results for over 260 clients globally. Headquartered in Boston, the firm has offices in Atlanta, Houston, Los Angeles, Tokyo and London. For more information, visit www.SkippingStone.com

Skipping Stone operates Capacity Center which is a proprietary technology platform and data center that is the only all-in-one Capacity Release and Operational Notice information source synced with the Interstate pipeline system. Our database not only collects the data as it occurs, it is a storehouse of historical Capacity Release transactions since 1994. We also track shipper entity status and the pipeline receipt and/or delivery points, flows and capacity. Our analysts and consultants have years of experience working in natural gas markets. Capacity Center has worked with over a hundred clients on a wide variety of natural gas market and pipeline related reports and projects.

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Executive Summary

PennEast proponents provided new arguments seeking to justify the proposed pipeline in a letter to FERC dated October 25, 2016, in a response to DEIS comments dated October 12, 2016 and in a Concentric Report dated October 17, 2016.

This report evaluates these new arguments and reaches several conclusions:

1. Recently, pipeline developers predominantly comprised of un-regulated affiliates of state regulated utility shippers have sought to advance projects for new capacity. The PennEast project raises questions about the sole reliance by the FERC on the existence of contracts for the finding of "public convenience and necessity." In cases such as PennEast, it appears these affiliated consortiums have resorted to project justifications based on largely unsubstantiated and ill-defined reasons such as "increased reliability" or "cost-savings."
    - FERC must be the first line of defense against certifying uneconomic projects like PennEast.
2. There is no evidence or justification in the record for assertions that the proposed PennEast pipeline will "increase reliability" in the wholesale electric market.
    - The passing statement by electric grid operator PJM that more pipelines would "improve grid reliability" is meaningless once transplanted to the regulatory context of natural gas pipelines.
    - Reliability determinations and findings in the electric market are the result of well-defined operator and regulator processes.
    - Reliability determinations and findings in the retail local natural gas distribution market are the result of well-defined local gas company and state regulator processes.
    - There is no corollary reliability determination process in the wholesale natural gas market aside from recently introduced "modernization and replacement" efforts between operators, customers and regulators.
    - Reliability assertions in the wholesale natural gas market are no substitute for well-defined processes that, to be valid, must be the result of a determination by appropriately authorized regulators.
    - While PJM states that its market can benefit from expanding pipeline infrastructure, neither it, nor its market participants would bear the costs of such potential benefit which runs counter to both cost causation / cost responsibility and users pay principles.
    - There is no evidence that PennEast capacity would have any meaningful impact on reliability of the electric grid. Only two shippers on PennEast, accounting for 6% of contracted capacity, are self-identified electric generators.
3. There is no evidence or analysis in the record that would allow a determination that the proposed PennEast pipeline will "increase reliability" of the interstate pipeline grid.

- The interstate pipeline grid is, at a macro level, a highly interconnected, hydraulically integrated and resilient system.
- The current high reliability and strong resiliency of the interstate gas grid that receives and delivers almost 70 billion cubic feet of gas per day is the result of more than 10,000 firm bilateral transportation and/or storage contracts[1].
- It is immensely difficult, if not impossible, to predict those locations where failures of line or compressor station(s) may occur. In a very real sense, preparing for all such eventualities would entail nothing short of nearly 100% duplication of all facilities.

4. The likelihood that cost-savings will be realized after PennEast is in-service is doubtful, for several reasons.
    - While New Jersey regulated gas companies, whose affiliates own 60% of PennEast, have asserted that PennEast will lower gas costs, they are in no way bound by this claim. FERC should be cautious in relying on claims about cost-savings – especially in the absence of contractual or binding regulatory commitments.
5. PennEast entirely fails to address the LNG Alternative to PennEast submitted by Skipping Stone.
    - PennEast constructs an LNG alternative as a strawman that leaves out any analysis of "need" and automatically fails the fallacious alternatives test.
    - To avoid meaningful analysis of alternatives, PennEast asserts that there is a "need" for the project exactly as designed. If project need is defined as synonymous with the project as designed, then any analysis of "alternatives," let alone an analysis of "no action," would be meaningless.
    - The LNG Alternative evaluated by Skipping Stone was based on analysis that showed the extent of possible need unmet by currently existing pipelines out to 2030 to be at most a 10-30 day winter peak need. This need can easily be met by existing LNG facilities.
    - FERC must consider the actual LNG alternative presented in the record, so as not to perpetuate the proponent's faulty analysis.

Introduction

Federal and state agencies charged with regulating energy infrastructure seek to satisfy multiple, sometimes conflicting, goals. One such goal is to ensure that energy infrastructure is reliable, and to balance reliability against consumer cost. Before evaluating whether a given project enhances "reliability," at an acceptable cost, it is necessary to first define reliability.

FERC approval of natural gas pipelines is based on the concept of need, defined in Section 7 as a project that is **required** by the public. The term implies that there is an "obligation" to meet that need. Meeting "need" is more than simply an ancillary benefit from a project, but satisfies a pre-determined extent of a defined need.

[1] The January 2016 Index of Customers filed by each interstate natural gas company with the FERC shows a total of 10,457 individual contracts between 140 large and small pipelines and storage companies and 2,560 distinct shippers.

To determine whether there is a public need for increased system "reliability," and then whether a given project satisfies that need for reliability, reliability must first be defined. Regulators and regulated firms work together to develop the parameters that define "reliability" in the U.S. gas and electric markets. They also decide the goal, or extent of reliability to be sought and planned for. The measures and goals provide an objective basis for deciding whether any given project fills in an existing gap in the previously identified and optimized level of reliability desired.

I. Identification of Reliability in Electric Markets

In the electric markets, reliability means providing continuous, dependable electric service to consumers to the maximum extent practical. At the same time, regulators are charged with providing service at a reasonable cost to consumers. These goals can be in conflict, and can restrain regulators from approving any and all projects that could improve reliability. Regulators must balance these competing factors – reliability versus cost – and determine the optimal level of reliability of system design.

In the U.S. electric markets, there is a well-defined, fact-based articulation of the reliability objective. This definition is accepted by regulators and market operators alike, in both the restructured electric markets and the legacy vertically integrated markets. Generally, in electric markets, that objective is a stated service reliability factor, such as 99% or greater availability of service to electric consumers. Regulators and market operators then assess a set of facts with respect to the present and future "state(s)" of the pertinent electric system and compare it to this pre-determined objective.

Achieving that "reliability factor" requires a combination of generation and transmission facilities sufficient to meet market load, or demand, in identified load locations. First, there must be sufficient supply of generation, including reserves, to meet projections of peak demand. Second, there must be sufficient transmission, or wires, from such generation locations to the identified load(s).

In the electric markets, the reliability objective is well-defined and can be used to assess the need for any particular project. In addition, because a variety of projects can be developed to meet the reliability objective, regulators are required to determine whether a given project provides a low-cost way to meet that reliability level. Proposed projects typically use "least-cost" or "optimum cost" analysis to demonstrate to regulators that the chosen approach is low cost.

In the electric markets, the costs of approved proposals are then "socialized" across the pertinent electrical system by means of regulator-approved rates. The cost is spread across all system users/market participants generally with little, if any, regard to those generators or loads that may specifically benefit from any particular proposal's design.

Thus, to summarize the electric market at a high level, a pre-defined provider obligation to ensure a particular agreed-upon reliability factor identifies the system gaps in meeting that factor, which in turn drives the development of projects to address those gaps in achieving the optimized reliability factor.

II. Reliability in the Gas Markets

Unlike the electric market, the wholesale gas market offers no corollary "reliability" definition, nor an associated well-defined process for evaluating or establishing standards for "reliability." Thus, if a project proponent asserts a gap in reliability that its project is designed to address, this assertion must be contextualized and examined to see what it actually means.

A. In the Current Gas Market "Reliability" is Related to Modernization

In the last several years, there have been numerous proceedings in which modernization and replacement of existing facilities to improve the reliability of those facilities have been undertaken, generally by settlement between the pipelines, shippers and the FERC. These proceedings resulted in part from a recent FERC policy statement. In these cases, the costs of such modernization have been socialized across all shippers – similar to the electric market model of socializing costs from projects designed to address reliability gaps.

In these modernization proceedings, no capacity increases are permitted absent agreement among all those bearing the costs of the replacements that may increase capacity along any portions of the pipeline systems. This required buy-in provides an additional "check" related to projects that would increase capacity in the course of addressing facility reliability. This procedural check reflects reluctance, if not outright prohibition, to permit capacity increases stemming in large part from two inter-related economic considerations. First, while the costs are socialized, any increase in capacity would benefit future shippers and the pipeline getting that revenue from additional shippers. Second, increases in capacity could reduce the value of current shippers' capacity in the secondary market (i.e., the capacity release market).

Thus today, the only use or recognition of "reliability" as a goal of the interstate gas market is in relation to modernization/replacement of existing facilities.

B. Pre-Restructuring Regulatory View of "Reliability" With Respect to Capacity Expansions

This was not always the case. Before the restructuring of the U.S. interstate natural gas business in the early 1990's, pipelines were merchants and had to make the equivalent of "reliability" showings to the federal regulators (FERC) that they both had the facilities to provide service and the gas supply under contract to meet customer demands. Moreover, prior to getting a finding of "public convenience and necessity" from the FERC for any new market service facility addition to support their merchant sales of gas, the pipelines had to make a showing of sufficient gas supply to serve that market over a forward-looking period of time (generally the period of time that the facility would be depreciated). To the extent they made this showing, they were granted the certificate of public convenience and necessity; and, with respect to the recovery of the costs of increasing capacity to provide increased merchant service, these costs were rolled into rates (i.e., socialized across their systems, to greater or lesser degrees depending on rate design).

Partly, if not wholly, as a result of this historical regulatory regime, there was no evidence of interstate pipeline overbuild during this period prior to restructuring – when the pipelines, as merchants, were subject to this particular form of regulatory oversight.

C. Difficulty of Determining What Constitutes "Reliability" as it Relates to the Interstate Pipeline Grid

Other than requiring that lines of pipe are regularly inspected and replaced when evidence of damage or corrosion are detected and maintaining and occasionally replacing compressor stations that have otherwise reasonably exceeded their useful life, seeking to attain an ill-defined "reliability factor" for the interstate pipeline grid poses deep and nettlesome issues. Unlike in the electric grid context, where an amount of excess generation and transmission constitute a generally accepted "reserve margin," such a "reserve margin" factor has not been established or generally accepted in the wholesale natural gas market.

In addition, the interstate pipeline grid is, at a macro level, a highly interconnected, hydraulically integrated and resilient system. As a practical matter, the interstate gas grid has a high reliability factor given this multi-path structure and highly diverse supply mix feeding its existing delivery systems. While it is true that single point failures can have deleterious effects on a particular path of supply, and from time to time particular markets, it is also true that it is immensely difficult, if not impossible, to predict those locations where failures of line or compressor station(s) may occur. In a very real sense, preparing for all such eventualities, would entail nothing short of nearly 100% duplication of all facilities.

Thus, attempting to make the system totally reliable would entail near total duplication. Assuming this were even possible, such total reliability would not only create significant issues with respect to cost recovery of such facilities, but it would also create an even bigger problem for system operations. This system operations problem would flow from the requirement to maintain the value of capacity to existing contracting entities. And, to maintain that value, such facilities must be kept idle during all but those periods of time when failure of facilities presents itself. To do otherwise would undermine the entire industry's reliance on bi-lateral contracting and risk allocation.

D. Source of Current Level of Resiliency in U.S. Gas Market

The current high reliability and strong resiliency of the interstate gas grid that receives and delivers almost 70 billion cubic feet of gas per day is the result of more than 10,000 firm bilateral transportation and/or storage contracts[2]. In addition to the contracts for capacity service, there are probably more than 100,000 individual bilateral contracts between sellers and buyers of gas that cause these 70 billion cubic feet of gas to get from tens of thousands of wells to the more than 7,000 individual contractual delivery points[3].

[2] The January 2016 Index of Customers filed by each interstate natural gas company with the FERC shows a total of 10,457 individual contracts between 140 large and small pipelines and storage companies and 2,560 distinct shippers.

[3] A contractual delivery point may have dozens of individual meter points. This is because many pipelines aggregate numerous physical delivery points into one contractual point for simplicity of contracting and operation.

E. Regulatory Oversight in Relation to Capacity Expansions Since Restructuring

Since the interstate gas market restructuring some 20 years ago, the FERC has operated on the basis that a finding of "public convenience and necessity," which is the legal standard for approving applications for new construction (over a certain dollar amount), could rely on the existence of contracts for enough of the new capacity (at rates and in durations) sufficient to support their construction, and further provided that no existing customers would subsidize the new construction.[4] This latter provision, the "at risk" provision conditioning new construction, has largely been satisfied by means of stand-alone rates for the newly constructed capacity – also known as incremental rates. "At risk" means at risk for cost recovery (in the case of the pipeline) and economically useful utilization (in the case of the shippers).

Over the time since restructuring, with shippers and pipelines truly "at risk," the market has operated quite well. Moreover, this reliance on arms-length at risk contracts between shippers and pipelines has served the market well. In fact, since restructuring, literally billions of cubic feet of new capacity from supply areas to market hubs, and from market hubs to markets has been constructed and is in operation today.

It appears that over the course of this period of time, FERC's reliance on capacity contracts and the at-risk provision, has proven an effective measure for determining whether projects truly are required by the public convenience and necessity – and FERC's sparse treatment of the other economic metrics has not previously raised serious concerns. The arms-length contracting nature of the vast majority of new capacity projects has enabled the FERC, up to this point, to abstain from critically analyzing, and for the most part even considering, other indicia to measure whether new pipeline capacity projects are required by the public necessity or convenience, such as "need" or "reliability" as justifications for new pipeline capacity.

While historically, the prevalence of arms-length contracts, coupled with at risk conditions, enabled this apparent abstention, more recently pipeline developers comprised of unregulated affiliates of state regulated utility shippers have sought to advance projects for new capacity. These affiliations, and the prospect that these developer-affiliated, regulated shippers' customers (i.e., LDC ratepayers) may be required to subsidize, through pipeline costs passed through to them in local, non-by-passable, LDC rates, raises fundamental questions regarding pure reliance by the FERC on the existence of contracts for the finding of "public convenience and necessity." In cases where this finding appears difficult to make, it appears these affiliated consortiums have resorted to project justifications based on largely unsubstantiated and ill-defined reasons such as "increased reliability."

F. "Reliability" as a Concept in Retail Regulation of LDCs by State-Level Public Utility Commissions

At the retail distribution level, the state PUC-regulated level of the gas market, there is a generally recognized obligation for LDCs to provide "reliable" service to their retail consumers.

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[4] FERC, in its Certificate Policy Statement, specifically noted the problems that could arise from solely relying only on these capacity contracts, and declined to adopt that approach.

At that retail level, the LDCs and their state regulators have varying processes under which they operate to identify current and projected firm market demands in the LDC service areas and then assess what mix of pipeline capacity, supplemental supplies (made up of contracts on pipelines for delivered supply by others with pipeline capacity as well as on-system supply of LNG and/or propane-air), and loads that can be interrupted (so as to not require the LDC to plan for such loads) will make sure the LDC can provide reliable service, in accordance with their defined and optimized reliability factor.

Several states require pre-approval of LDCs' contracting and/or de-contracting for pipeline capacity, as well as pre-approval for construction and operation or de-commissioning/removal of on-system facilities related to the LDCs' provision of reliable service.

Yet other states (New Jersey in particular) have no apparent pre-approval process for LDCs' entering into or de-contracting of pipeline capacity. New Jersey does have processes for pre-approval of construction or de-commissioning/removal of on-system facilities related to reliable service.

As is the case in the PennEast Project, where New Jersey LDCs or their affiliates[5] represent more than 48% of initial subscribed capacity and their affiliated non-regulated pipeline developer/owner participants represent 70% of equity participants in the project, it is extremely troubling that there is no pre-approval process in New Jersey where the extent of need, if any, can be vetted. This means that FERC must be the first line of defense against certifying uneconomic projects like PennEast, which point to no documented or forecast reliability gaps or other indicia of need, to proceed.

III. The Inappropriate Application of the Well-Defined Concept of Electric Market "Reliability" to Consideration of "Need" under the Public Convenience and Necessity Standard for PennEast

The proponents of PennEast have recently introduced, in a filing purporting to respond to comments on the Project's DEIS, a passing statement by an electric market operator, PJM. That statement was made at a FERC Commissioners Meeting in a presentation unrelated to the instant proceeding. Yet the proponents make much about this statement in their recent filing, related to an attenuated suggestion of how PennEast, if built, might contribute to electric reliability in PJM.

By importing that reference to "reliability," which was proffered from the perspective of an electric market operator in a wholly different context, the proponents seek to rely upon it in the natural gas market as a new project justification– despite the fact that it is both unrelated to the statements previously offered by the proponents, and also meaningless once transplanted from one regulatory context into another inapposite one.

Moreover, as discussed above, reliability is far from an economic justification absent context that gives this concept a meaningful definition. In order to have any meaning or to be relied upon to support any

[5] New Jersey Natural Gas, South Jersey Resources, Elizabethtown Gas, and PSEG between them have subscribed for more than 510,000 Dth/d of capacity or 51% of the capacity of PennEast. Unregulated affiliates of these same companies also have 70% ownership in PennEast.

sort of reasoned decision-making, it must be the result of a determination by appropriately authorized regulators in a regulatory proceeding. To continue otherwise is to substitute hearsay for fact-finding.

A. Reliability in Regulated Markets Must Be Defined and Determined by Regulators Not Simply Asserted by Project Proponents

Notably, New Jersey has made no finding that New Jersey-regulated shippers and their subscriptions to PennEast will contribute to some amorphous natural gas use of the electric grid concept of "reliability." Of these shippers, only Elizabethtown has an interconnection with PennEast, near the Gilbert generating plant, to serve what appears to be an otherwise small service territory now served by Columbia Gas Transmission in Northwest New Jersey. None of the other New Jersey regulated shippers will have direct connections to PennEast. All gas to be received by these other NJ LDCs must travel through at least one other pipeline for the gas to reach their service territories.

Moreover, as also discussed above, as PennEast may relate to "electric reliability," there are but two subscribing shippers on PennEast that are self-identified electric generators; NRG REMA and Talen. For Talen, its 5% level of PennEast subscription is for a mere five years in duration and Talen's gas from PennEast must also traverse at least one other pipeline. This means that even in the case of some unforeseen pipeline rupture, building PennEast could not increase pathway reliability. In the case of NRG, the subscribed quantity is less than 1% of PennEast proposed capacity. Using that 1% of the proposed PennEast Project to justify building the whole Project would be like building an entire city with fire department, police department, school, sewer and water systems because one person wants a home next to one they already have in a different town[6].

B. If Electric Reliability Is to Be Relied Upon by Regulators – On What Basis Do They Make a Finding of "Public Convenience and Necessity?"

Given these facts, and the assertions by subscribers and proponents that "no new markets are to be served by PennEast," what then, should reviewers and regulators make of the assertions that the "need" PennEast is purported to serve is now to be a contribution to reliability in an unrelated market? If captive ratepayers of LDCs are going to be made to bear the responsibility for "reliability" in wholesale electric markets, the regulators should make that finding an explicit one; but only after analyzing and quantifying:

1) an appropriate and quantifiable definition of "reliability"
2) what measurable contribution to electric reliability there might be
3) what assurances demonstrate that such contribution will occur
4) what the duration, in hours or days per year, of such contribution will be
5) what the total cost of such contribution might be, and what factors must be accounted for in totaling the cost

[6] The Gilbert plant is already connected to an Elizabethtown line that runs from Columbia Gas Transmission to the plant.

6) what the "returns" (i.e., benefits) such captive LDC ratepayers might receive as a result of their bearing the cost of providing such contribution to a market unrelated to their demands as gas consumers
7) what guarantee of benefits will consumers have, or will regulators assure occur

IV. Warning of Reliance on LDC Ratepayer Cost-Savings as the "Need" to Be Met by PennEast

Proponents and subscribing shippers have made the argument that there will be cost-savings to the ratepayers of the subscribing regulated LDC shippers as a result of placing PennEast in service. An analysis as to the likelihood that such savings will be realizable after placing PennEast in-service is essential to any reasoned decision making that would rely on such a justification for assessing the public benefit from the proposed project.

Over time, many observers have taken note that historically, new pipelines, and/or pipeline expansions once placed in service, cause the reduction, if not total elimination of the "basis" that gave rise to their justification for being constructed in the first place. Simply stated, "basis" is the difference in price between two locations. It can be stated as a positive amount (i.e., the lower priced location absolute price is subtracted from the higher priced location) or as a negative amount (i.e., the price at the higher priced location is subtracted from the price at the lower priced location). In this analysis, we choose the latter formulation, that is, presenting basis as the negative differential, i.e., how much lower the price realizable by producers in the under-served production area is than in the destination market served by the pipeline seeking to relieve the excess supply situation.

As the data shows, in the examples discussed below, getting access to the higher priced, destination market is the objective of so-called producer push pipeline projects. That said, nevertheless, the phenomenon of new pipelines crushing the basis they seek to exploit in order to attract subscribers is the same whether the subscribing shippers are pushing (i.e., producers) or pulling (i.e., market-side participants) the gas the line is intended to carry.

It is important to note that often, in the case of producer-push pipeline projects, while basis has largely evaporated once new facilities have been placed in-service (i.e., those facilities relieving constrained production and associated price depression), the producers do benefit because the basis evaporation was the result of supply prices (in the relieved supply area) increasing. In short, the producers benefited from higher prices.

A. Examples of Basis Evaporation after New Pipelines Are Placed In-Service

Two recent examples of this frequent phenomenon are presented below. Close analysis of these examples undermines PennEast's assertions that purported "cost-savings" on gas will outweigh costs of accessing currently trapped gas (Marcellus gas), which are sought out by PennEast shippers and used by them as "justification," i.e., used to bolster both the "need" to be satisfied and purported "benefits" from the proposed PennEast Project.

These two recent examples are: (1) the entrance into the market of the Cheyenne Plains Pipeline in January 2005; and (2) the entrance to the market of the Rockies Express Pipeline (REX) Zone 3 facilities into OH in two phases, the first in mid July 2009 and the final in November 2009.

1. Cheyenne Plains Discussion

Cheyenne Plains was sponsored and built by El Paso Energy (now owned by Kinder Morgan). It came into service in January 2005. Because generally pipelines take on the order of two years from initial application to commencement of service, looking at gas prices and basis one year in advance of filing indicates in part, if not in whole, the price differential between two locations that the pipeline proponents sought to exploit in order to obtain long-term subscribers to such new line. In this period, production in the Rockies surged greatly. This production surge quickly out-paced both the ability of local markets to absorb this production and the then existing pipelines to carry that gas away to more distant markets. This surge in supply led to ever lower net-backs at production points as producers competed with one another to be selected by shippers with capacity to be moved to those more distant markets.

Cheyenne Plains was proposed as a relatively short line. It was designed to leave Colorado and travel to the south to Oklahoma, where it could gain access to pipelines that had capacity to move gas to Chicago, the Midwest and the Upper Midwest.

Cheyenne Plains Supply and Market Areas

Cheyenne Plains runs from the Cheyenne Hub in Colorado down to a Western Oklahoma Hub, where supplies can enter pipelines bound for Chicago, Midwest, and upper Midwest markets. Given these two locations, Skipping Stone analyzed the daily series of spot prices from April 2002 through end of September 2013 as reported to and published by Natural Gas Intelligence (NGI) at the following locations:

For the supply area of Cheyenne Plains:
1) Cheyenne Hub
2) CIG (located approximate to the Cheyenne Hub)

and for the market area of Cheyenne Plains:
1) ANR Pipeline - SW (OK)
2) Natural Gas Pipe Line - Amarillo Mainline (OK)
3) Panhandle Eastern Pipe Line (OK)
4) Southern Star Central Gas Pipeline (formerly Williams Central) (OK)

During the April 2002 through December 2004 period leading up to the January 2005 in-service of Cheyenne Plains, the supply area prices average nearly $0.90 ($0.88) below those over the same period on average in the SW OK destination market for Cheyenne Plains. In other words, the basis was negative $0.88 on average and Rockies producers saw prices lower than OK prices by nearly $1.00.

From January 2005 through March 2006 this differential shrunk to $0.23 on average, a reduction of 75% in the price differential. The basis between this supply area and this pipeline's market area then expanded to an average negative basis of $1.15 in the two-plus year period leading up to the in-service of REX (which serves the same supply area); and in the 7 years since the in-service of REX, the basis has on average been in the negative $0.07 range, which is a reduction in the value of that transportation link (basis) of greater than 90%. Basis in this range (the negative $0.07 range) is basically considered "flat" or non-existent, especially against transportation rates to connect those two locations through Cheyenne Plains in the $0.30 to $0.34 range[7]. This provides a clear example of data showing the disappearing price differential resulting from placing the pipeline in-service.

2. Rockies Express Discussion

Following the in-service of Cheyenne Plains, production in the Rockies continued to surge upwards. Given that Cheyenne Plains satisfied much of the demand that existed (at least as measured by basis differential) in nearby destination locations in OK, REX was directed to Illinois, Indiana, OH and East Coast markets. The demand that REX sought to serve was that perceived to be formerly served by declining Gulf Coast supplies. In fact, during this same period, it seemed that the U.S. would be requiring imported LNG to meet demand, and a number of LNG Import terminals were being proposed and built along the U.S. Gulf Coast.

REX Supply and Market Areas

REX runs from the Cheyenne Hub (the same supply area as accessed by Cheyenne Plains) in Colorado eastward in a nearly straight line to Clarington, OH. Along the way it interconnects with numerous pipelines that run north-south from OK and Gulf Coast Supply areas to the markets cited above. The biggest of those markets that REX was targeting were those served by pipelines running to the Northeast from the REX terminus at Clarington, OH. Given these two locations, Skipping Stone analyzed the daily series of spot prices from the January 2005 in-service date of Cheyenne Plains through end of September 2013, as reported to and published by Natural Gas Intelligence (NGI) at the following locations:

For the supply area of Cheyenne Plains:
1) Cheyenne Hub
2) CIG (located approximate to the Cheyenne Hub)

and for the primary market area of REX:
1) Dominion (DTI) - South Point,
2) Texas Eastern Transmission Company (TETCO) – Zone 2; and,
3) Tennessee Gas Pipeline (TGP) – Zone 4 Clarington

During the January 2005 through March 2006 period, following the in-service date of Cheyenne Plains and leading up to the May 2006 filing for the certificate to build the REX system, the

[7] This is the typical rate paid by the initial, negotiated rate, Shippers. The Maximum Recourse rate is $0.3525 at 100% load factor.

supply area prices averaged nearly $2.00 ($1.89) below those over the same period, on average, into the primary destination market for REX (i.e., the East Coast feeding pipelines identified above). In other words, the basis was negative $1.89 on average and Rockies producers saw prices lower than their target markets' prices by nearly $2.00. From the point in time when the filing was made for REX, and leading up to its partial in-service date to the Eastern markets, the negative basis blew-out to nearly $3.00 on average ($2.89).

From the partial in-service date of mid-July 2009 up to the full in-service date of November, 2009 basis plummeted by 84% to less than $0.50 ($0.47) on average. Following the November 2009 full in-service date through October 2013 this differential shrunk to $0.40 on average, a reduction of 86% in the price differential.

Then, starting in 2013 and continuing up through 2015 Marcellus and Utica production in SW PA grew to such a level that REX has now reversed flow from OH to Illinois. This reversal has not only caused REX transported supply to move north to the Upper Midwest markets but also caused the reversal of other pipelines such as ANR, NGPL, and Texas Gas with the REX transported gas moving to the Gulf Coast to serve those markets, as well as the former LNG Import Terminals that have also reversed to become LNG Export Terminals.

Thus, the basis from Cheyenne Hub to the original target market – the East Coast serving pipelines - has not only gone flat (i.e., evaporated), but it has actually reversed as now prices in the Rockies are higher than those where REX intended its gas to flow.

Cheyenne Hub to Henry Hub Basis

In addition, looking again at the Cheyenne Hub, not only has the basis to the intended markets of OK and the East Coast serving pipelines evaporated, so too has the basis between the Cheyenne Hub and the Henry Hub. While the basis to the Henry Hub for the 8 years of April 1994 through March 2002 averaged a negative $0.56 (i.e., Rockies prices were $0.56 below Henry Hub prices), in the 8 years since REX went into service, the Rockies basis to the Henry Hub has averaged only $0.17 below the national Henry Hub pricing point, a reduction of 70% from pre-expansion historic levels and a reduction of 93% from peak differential levels.

B. The Lessons to be Drawn from the Effect on Basis of New Pipelines that Un-Constrain the Excess Supply that Caused Depressed Prices

One of the lessons to be drawn from the history of price effects from new pipelines is: don't bank on the current basis persisting once the constraint (that led to the basis in the first place) is relieved. That lesson appears to be evidenced in the case of PennEast as well, given that:

1) not only is less than 10% subscribed by producers seeking east coast outlets for their gas, but also
2) there remains another 100,000 Dth per day as yet unsubscribed. If NE PA Marcellus producers saw valuable market accessible by PennEast, that unsubscribed capacity would not be left available.

Another lesson to be drawn from the price effects data is that statements that there will be "cost savings" not otherwise accessible to the ratepayers of the regulated LDC shippers must be deeply analyzed, and their likelihood and veracity tested. While there may be some level of peak period cost savings, owing to additional pipeline capacity available during such periods, that short-lived savings must be balanced against year-round fixed costs, and fixed costs that will persist for 15 years following in-service.

C. The Additional Risk to Cost-Savings from PennEast Posed by Other Pipeline Projects Seeking to Un-Constrain Supply

PennEast is by far not the only proposed project seeking to un-constrain supply areas currently facing depressed prices. According to recent reports, as much as 8 Bcf/d of projects seek to bring supplies to markets in the south and the Gulf Coast, including to Mexico and including for export as LNG. Many, if not all, of these projects involve reversal and repurposing of existing facilities and thus face decidedly less headwind than those involving substantial "greenfields" development. While many of these projects are subscribed to by producers (i.e., push projects) and others are subscribed to by LNG exporters (i.e., pull projects), both types of subscribers intend to use their capacity at high year-round load factors. The in-service of such projects will undoubtedly have a large impact on un-constraining those supplies that contribute to the depressed prices seen today, and apparently relied upon today by those citing cost savings as a benefit of PennEast.

In addition, assuming the projected level of flow to the southerly markets from PA and WV occurs, this flow will greatly reduce the overall Northeastern supply versus demand balance and result in less competition for access to the Northeastern market and higher relative supply and market prices. Assuming further that supplies remain in excess in NE PA, then it would be very likely that pipelines currently moving those supplies solely to the East Coast, will themselves, at the bidding of producers seeking outlets, seek to reverse and move westward and in turn southward.

In short, history tells us and current market behavior informs us, that it is highly unlikely that the pre-existing basis differentials being cited today as indicators of future gas cost savings will, in fact, survive post in-service of any proposed pipeline. This history and current market behavior are factors that by themselves indicate the high likelihood that there will be a post in-service erosion in value; and this historical effect is independent from, and likely further impacted by, all the likely reversals occurring prior to and/or contemporaneous with the proposed in-service of PennEast.

V. Assertions of Cost-Savings Are Not a Substitute For, Nor Do They Constitute, an "At-Risk" Position

Presently, LDCs neither profit (nor face losses) from the purchase and sale of gas for their on-system customers. Gas costs and attendant capacity contracts for transportation and storage are pass-through costs for LDCs. The fundamental effect of this current reality is that assertions of cost-savings for ratepayers are just that, assertions. There are no at-risk conditions that Skipping Stone is aware of that would make such assertions an obligation on those making the assertions.

Unlike the position of pipelines and end-users, or pipelines and producers, where each is truly at-risk of gain or loss from entering into long-term contracts for capacity to support new projects, there is no corollary risk of loss for LDCs absent a binding commitment to net savings[8] for their ratepayers.

The significance of this is that the FERC cannot, nor should it, take such assertions as evidence to support a "need," which in turn would support any sort of "obligation" to meet that "need." Moreover, unlike arms-length capacity contracts between parties that are truly at-risk, where the Commission has historically been able to rely on such at-risk positions as evidence of need, here there appears to be both a lack of arms-length contracting and an absence of symmetrical at-risk positions among the LDCs and the pipeline whose equity holders are comprised in large part by the same LDCs' unregulated affiliates.

VI. Identified and Defined "Need" Should Drive "Purpose" – Not the Other Way Around

In PennEast's Resource Report 10, in its section on Alternatives, PennEast asserts *a priori* that any alternative must "meet the Project needs." PennEast's definition of "need," is actually the Project "purpose" of the proponents (i.e., to build a pipeline with the specific receipts and delivery points in the quantities and for the durations contracted for by the sponsor/shippers). This is merely purpose or objectives cloaked as "need." Given this mischaracterization of need, PennEast then analyzes all alternatives as to whether these alternatives meet the proponents' objective, that is, the purpose of the Project. The DEIS, in turn, adopts this PennEast mistake. A rational application of the Commission's "need" and "purpose" policy analysis should not rely on tautological formulations such as those proffered by PennEast. Rather, Project "purpose" should be set forth and identified separate from need, and then FERC should specifically identify any existing needs with an analysis of whether there is a nexus between the two. Not the other way around, and certainly not an analysis where need equals purpose and purpose equals need. Such a formulation, if accepted, would make any requirement for analyzing a "no action" alternative purely meaningless.

PennEast first introduces the non-sequitur strawman at the outset of its discussion of Alternatives by introducing a discussion of "[p]otential alternative energy sources..." It does so without first stating, but implying, that the alternative energy sources are for electric generation. It then goes on to dispatch its strawman.

In the Resource Report 10's section on Alternatives, PennEast assembles the electric generation and its "fuel" or motive power sources as the strawman. It makes note of renewables, nuclear, coal, and oil and cites to what it considers as negative or problematic attributes of each such motive power source.

While these negative attributes to alternative fuel sources may be present, they are irrelevant because only 6% of PennEast's subscribed capacity is subscribed by electric generators.

[8] Here net-savings means the savings on gas purchased into PennEast and transported to the LDC and actually sold to ratepayers minus the all-in annual cost of the pipeline over the 15 year subscription period.

As discussed below in greater detail, if serving electric generation were the "need" that gives rise to the "purpose/objectives" two questions that must be addressed.

1) Why are there subscriptions for only 6% of subscribed capacity by electric generators?
2) Why are state regulated companies whose primary purpose is to sell gas as retail (i.e., Local Distribution Companies) the subscribers for more than 48%[9] of PennEast's initial proposed capacity, rising to 58% by year 10?

VII. Response to Proponents Supposed Consideration of the "LNG Alternative"

In proponents' Resource Report 10 at 10.1.2, "Energy Alternatives," the proponents state:

> "The alternative energy sources discussed in this section would not ***meet the Project needs*** and, therefore, would not be preferable to the proposed action." [emphasis added]

Simply put, the proponents have defined the Project "needs" to be the 1.1 Bcf/d from the Project's receipt point, along the path selected by the proponents to the delivery points selected by the proponents and in the individual subscription amounts selected by the proponents' affiliated shippers. By equating need with the Project purpose, then by definition any alternative that did not meet each and every one of proponents self-defined "needs" would "not be preferable to the proposed action."

Once the proponents set this as the "standard" of comparison, it is no wonder that the proponents conclude that there are no "preferable alternatives." From the proponents' point of view unless an alternative meets every one of the proponents' constructions of "need" it is not an "alternative."

That point of view, however, cannot be dispositive. To find or reason such would be tantamount to making any analysis of "alternatives," let alone an analysis of "no action," moot as a matter of first impression.

Thus, once the proponents construct the artifice of Project purpose as identical to Project need, they then dispatch with alacrity an LNG alternative by stating;

> "LNG is a developing energy alternative in the northeast. Several LNG facilities are being proposed as a means of addressing some of the energy needs in New England, New Jersey, and New York. However, many of these projects are still in the developmental stages, and the timing of these projects in regard to their schedules for securing approvals and construction do not address the current purpose and need of the Project. ***An LNG system alternative would not only require the construction of a liquefaction and vaporization facility,*** but also transportation of the necessary volume of LNG to the delivery point by truck or train using existing road and railways. Given the requirement for the construction of two new facilities as well as the number of truck and train trips that ***would be required on a continuous basis***, we concluded that the transportation of the required amount of natural gas is not preferable to the proposed Project." [emphasis added]

Embedded in this quick dispatching of the LNG alternative is the fallacy of the highlighted language.

First, PennEast entirely fails to address the LNG alternative submitted into this record by Skipping Stone, along with critical analysis thereof of multifaceted need factors, and a demonstration of how that alternative satisfies discretely identified needs. With its latest filing, the proponent continues to ignore

[9] New Jersey Natural, South Jersey Gas, Elizabethtown Gas, and Consolidated Edison constitute 48.5% of initial subscribed capacity. PSEG Power, which is owned by PSE&G (an LDC in NJ) has said that it will potentially use supply from PennEast for both its gas customers and to support electric generation. It has not however, stated what amount of capacity would be used for either purpose.

the fact that there are existing facilities that could easily meet the peak period requirements, which are the only objective "need" that may exist. Thus, proponents first define the "need" as a "continuous" one without analysis or justification; then conclude that this need would require both a liquefaction and vaporization facility, because, the "alternative" has to be able to operate on "a continuous basis" at the 1.1 Bcf/d level. Finally, they posit trucks and trains to get liquid LNG to various locations to meet the defined need constructed by the proponents.

In short, as the proponents conceive of alternatives, the LNG alternative they have constructed as their strawman fails their fallacious test. However, left out of this summary disposition by the proponents is any analysis of real "need." In our earlier report, we analyzed the extent of possible need unmet by currently existing pipelines out to 2030, and identified at most a 10-30 day winter peak need. This need can easily be met by existing LNG facilities; as opposed to a 365 day need which "need" is only a "need" in so far as it is the same "need" alleged by the proponents. FERC must consider the actual LNG alternative presented in the record, so as not to perpetuate the proponent's faulty analysis.