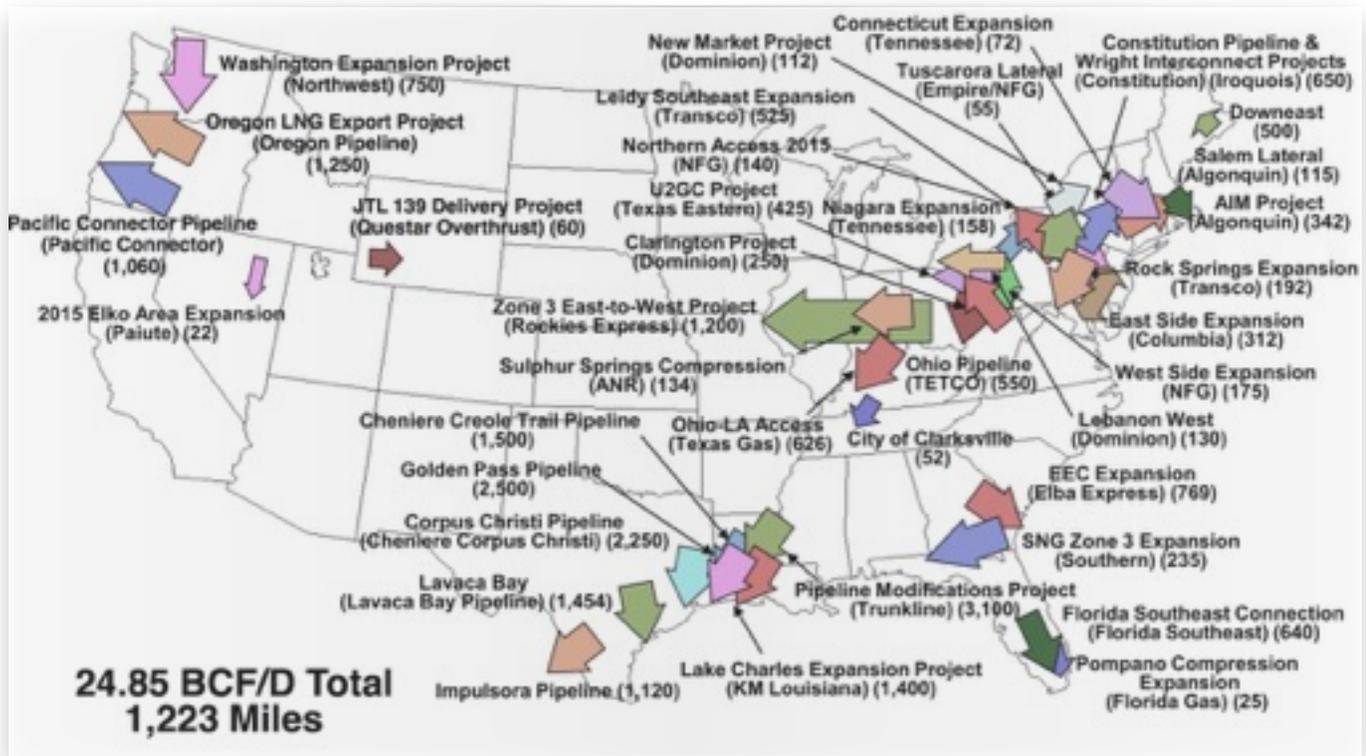

WACAP - ANALYZING PENNEAST PURPOSE AND NEED



Analyzing the PennEast Purpose and Need

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1. EXECUTIVE SUMMARY

The PennEast Pipeline Company, LLC has stated that the predominant purpose of their pipeline is to bring low cost natural gas to consumers and businesses in Pennsylvania and New Jersey. In the media and their web site they have focused solely on PA and NJ consumers, and indicate the natural gas from PennEast will not be used anywhere else. In their FERC application they paint a somewhat broader picture, and talk about supplying gas to “surrounding states”, supply reliability, and price stability. Investors into the individual member companies get yet a third view, one that is focused around the potential for new midstream business for most of the PennEast partner companies. In all cases PennEast asserts that this is a demand-driven project.

In contrast to PennEast’s claims, the research shows that New Jersey is well-served by natural gas already. The state enjoys some of the lowest prices in the country for residential natural gas. Recent issues with capacity constraints have been largely fixed, and PennEast owners themselves have indicated in their most recent filings that PennEast gas will be used to displace existing supplies, not to supply new demand.

This is a critical point that should be underscored. PennEast is not building this pipeline to meet new demand. No such demand exists. Instead, they are building it so they can avoid paying shipping charges on existing pipelines, and instead pocket those charges for themselves. This is a new revenue stream for the member companies on the order of \$289 million/year.

In addition, the companies can resell the gas they’ve committed to via the precedent agreements to third parties during periods of low consumption. This is a practice that NJR and SJI already do extensively today to help generate their profits, and which they can accelerate once PennEast is operation, and has long been part of PSE&G Power’s overall strategy. This can be to other regions, or to the nascent LNG export industry.

The end result is that rate payers in PA and NJ will pay for this new \$1 billion pipeline, and the member companies will enjoy a guaranteed new revenue stream from those captive rate payers. And existing pipelines that have been in service for decades may in turn become underutilized due to this over expansion of energy infrastructure.

The question to FERC and other agencies is why over-building of infrastructure on this scale should be allowed when the environmental impacts are proven to be so significant, and the cost to land owners in NJ from the threat of eminent domain is so high.

In the end, the true justification for this project would appear to be to allow the PennEast companies to capture a new \$289 million/year revenue stream for themselves. This should not be seen as sufficient justification for a green field pipeline construction project involving federal eminent domain, and as such the “no action” alternative is the right choice for this project.

2. HISTORICAL RESIDENTIAL NATURAL GAS PRICES IN NJ

PennEast has claimed that New Jersey suffers from high energy prices, and that if their pipeline is improved that residential gas customers in the state will finally have relief from high prices. For the purpose of this report I'll be focusing on natural gas and electrical supplies, and somewhat tangentially on renewables as they relate to electric prices.

To investigate this claim relevant to natural gas, I began by researching the historical residential natural gas prices in New Jersey on ¹eia.gov. This spreadsheet indicates monthly average residential prices for each states along with the national average. Figure 1 below is a graph of this data, showing New Jersey's average residential price from 2008 to 2015 and compares it to the national average. The graph also includes the trend lines for each dataset with NJ on the green trend line and the national average in red.

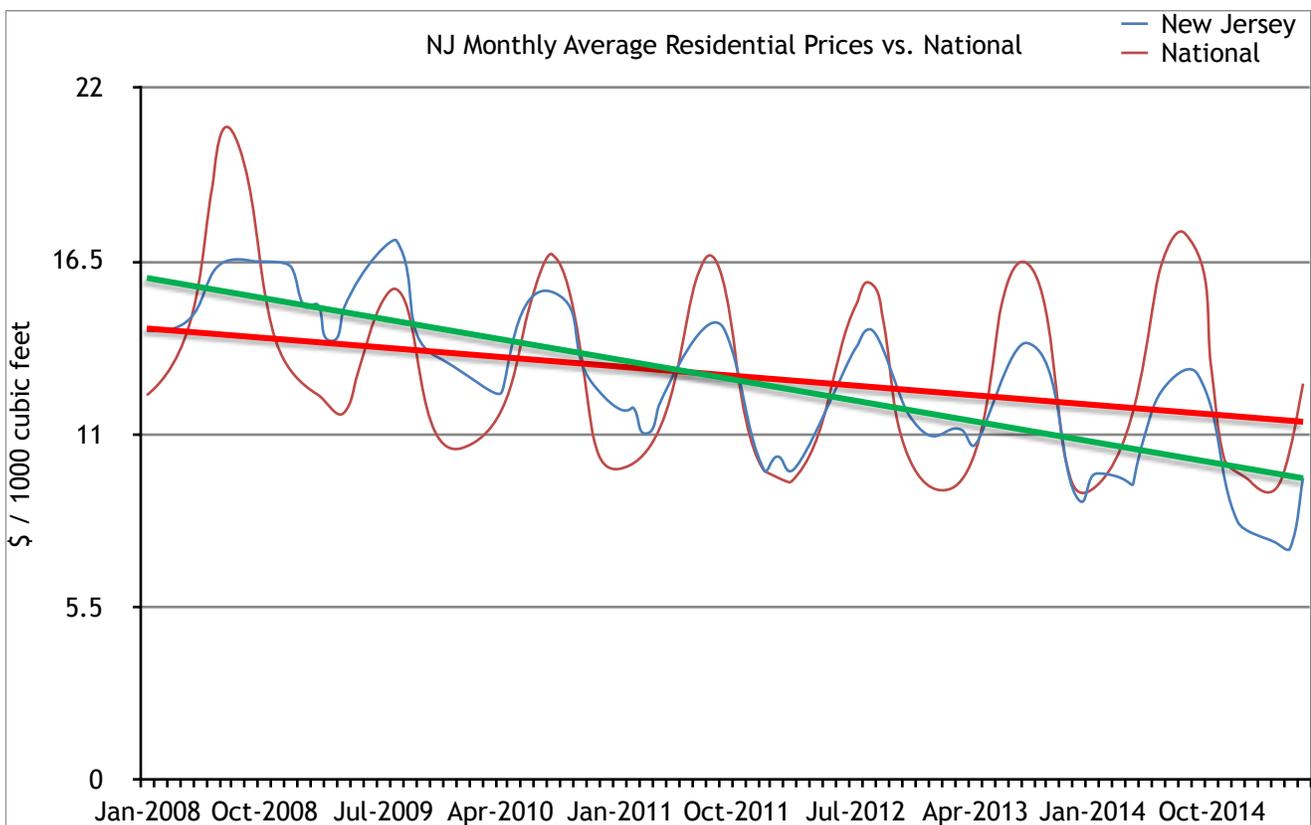


Figure 1 - New Jersey Average Residential Price vs National average

¹ EIA.GOV State Historical Residential Natural Gas Prices: http://www.eia.gov/dnav/ng/xls/NG_PRI_SUM_A_EPG0_PRS_DMCF_M.xls

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The figure shows New Jersey's prices have been dropping dramatically since 2008, and the downward trend is much steeper than that of the national average. Also, New Jersey's graph shows much less price variation than the national average, indicating that we suffer significantly less seasonal price variance than the rest of the nation.

Figure 2 is another visualization of the same underlying data, but shows the ranking of New Jersey vs the other 50 states in terms of lowest residential prices (where 1 would be the lowest prices and 50 would be the highest).

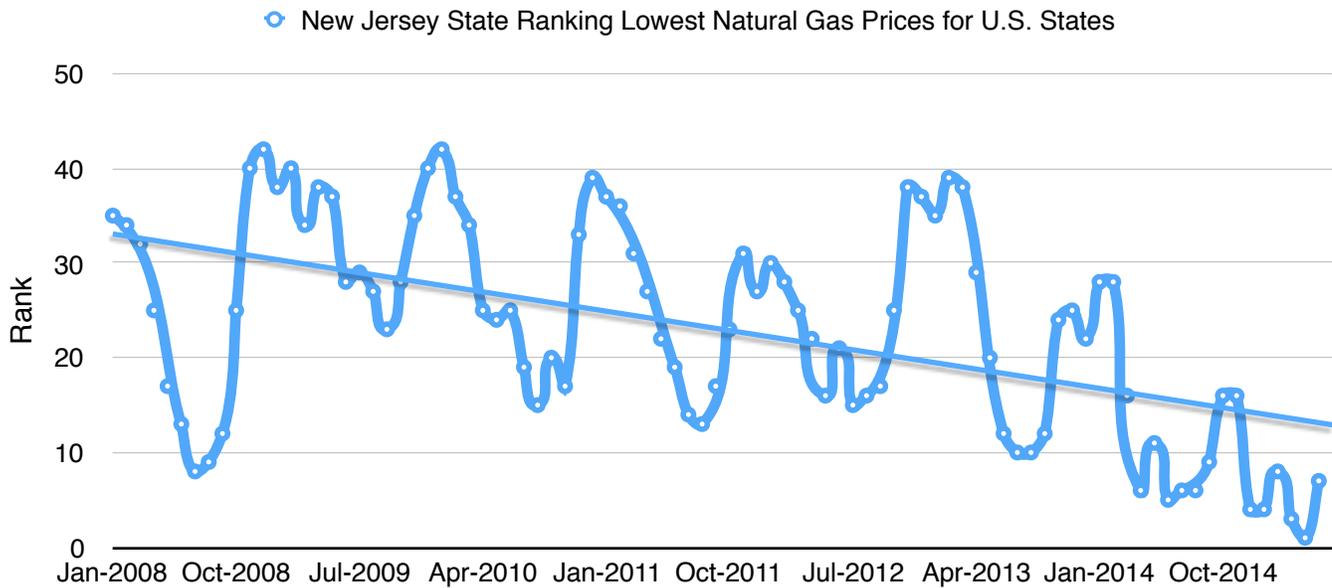


Figure 2 - NJ State Ranking of 50 U.S. states for lowest residential gas prices

As with the pricing graph, trend line here shows another very significant downward trend. In particular in the past 18 months our ranking has gone up very significantly, culminating in the 2014/2015 season. Table 1 details NJ's ranking among U.S. states for that period.

Month	Ranking
December 2014	4th
January 2015	4th
February 2015	8th
March 2015	3rd
April 2015	1st
May 2015	7th

Table 1 - Recent NJ Rankings/Lowest Residential Rates in the Nation

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The table demonstrates that despite a very harsh winter in the 2014/2015 season, residential rates in New Jersey varied between 4th and 8th lowest in the nation, and in the Spring New Jersey actually had the lowest residential gas prices *in the entire country*.

The data shows clearly that NJ does not suffer from high residential natural gas prices. To the contrary, we are leading the nation in a race to the bottom. When looking at commodity wholesale prices vs end user residential prices, you can see that commodity costs are no longer the major contributor to end-user pricing. Local distribution and sale of the gas now costs more than the interstate transportation and commodity pricing of the product.

3. FUTURE GAS PRICES IN NEW JERSEY

There are indications that the historical trend toward lower prices is going to continue in NJ, and that this trend is independent of PennEast. In June 2015 the New Jersey Board of Public Utilities (BPU) received filings from New Jersey's four gas utilities asking to lower residential natural gas rates. The BPU subsequently granted these petitions in September.

An article in NJ Spotlight highlighted the price decreases and have quotes from the utility companies on why they were asking for a decrease². Relevant sections from the utility companies are highlighted below segmented by company. They estimate up to 14.3% savings year over year. PSE&G has indicated that monthly gas bills for their customers have decreased by a whopping 47% since 2009.

New Jersey Natural Gas:

"The price reductions can amount to as much as 14.3 percent in savings in the bill for a typical residential customer of New Jersey Natural Gas.

"Today's filing represent good news for our customers," said Laurence Downes, chairman and CEO of New Jersey Natural Gas. Its rates, like those of the other utilities, have been filed with the New Jersey Board of Public Utilities, which generally approves a company's applications with few, if any, modifications."

PSE&G:

"Public Service Electric & Gas, the state's largest utility, projected its gas rates would decline 5.7 percent this winter, the lowest rate in 15 years. If so, it would lower the annual rate for a typical residential customer by \$52 a year.

Since 2009, the utility has decreased its monthly gas bills by 47 percent."

South Jersey Gas:

South Jersey Gas customers also will benefit from the lower gas prices. The utility said bills could drop by 12.2 percent, or an average \$16.22 on a monthly bill.

Elizabethtown Gas:

Finally, Elizabethtown Gas filed a petition to reduce gas bills for its customers by \$8.42 cents a month. The proposed rate reduction comes in addition to refunds of \$20 million to its customers earlier this year due to lower gas prices.

² "LOWER PRICES MEAN GOOD NEWS FOR NATURAL-GAS CUSTOMERS IN NJ THIS WINTER (<http://www.njspotlight.com/stories/15/06/01/er-natural-gas-prices-mean-good-news-for-customers-when-temperature-drops/>)

4. ELECTRICAL PRICES IN NJ

Electrical prices in NJ are higher than the national average. PennEast seems to indicate their pipeline will somehow alleviate this, but it's unclear exactly how this will happen. As mentioned in prior section on natural gas use, the whole sale price of natural gas is racing to the bottom, and is becoming less and less relevant to final end-user delivered costs.

The real reason electrical prices are higher than the national average in New Jersey is because of New Jersey's lack of large scale renewable energy sources, most notably hydro power. States with large hydro power plants are generating electricity essentially for free, which skews the national average considerably. Low natural gas prices in gas-fired generating plants simply cannot compete with free. In fact this is why major tech companies such as Microsoft, Facebook, and Google are co-locating their energy-intensive data centers in areas of the country with large scale renewable power.

5. PIPELINE OVERCAPACITY PROJECTIONS

FERC issues a yearly “State of the Markets” report which reviews the prior year’s energy markets. The report for 2014/2015 touches on a number of points relevant to considering the PennEast pipeline³. For reference, the yearly report, in the words of the authors:

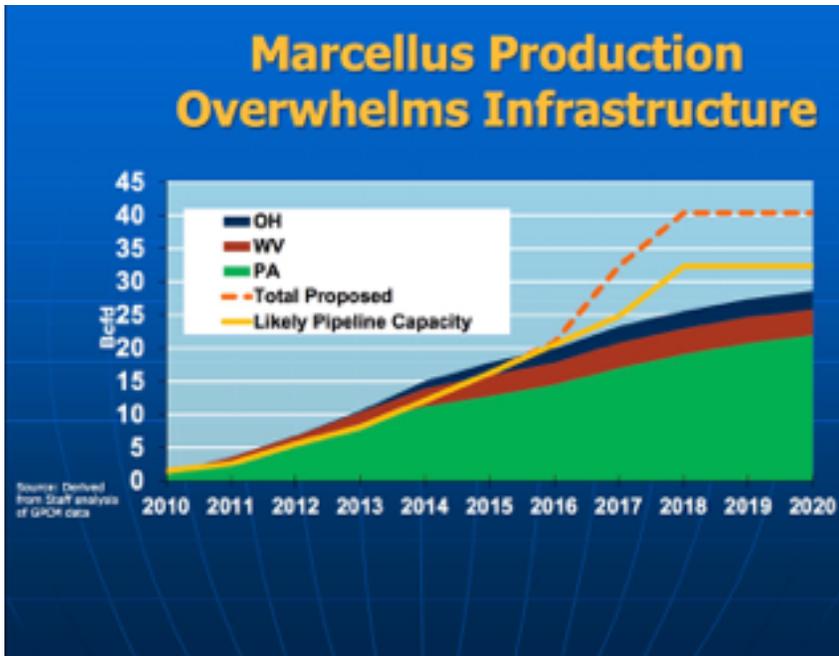


Figure 3 - Natural gas production in shale regions vs. proposed and likely pipeline capacity (source: FERC)

The graph shows pipeline capacity almost, but not quite, keeping pace with shale gas production numbers, with both increasing dramatically from near zero in 2010 to over 15 billion cubic feet/day (bcfd) in 2015. By 2016, pipeline capacity in the region is projected to have caught up to production and stay that way.

At that point the chart changes dramatically. “Likely” pipeline capacity will grow moderately out to 2017, and then have a sharp inflection upwards until 2018, when pipeline capacity is projected to be up to 32 bcf/d. Meanwhile the *proposed* capacity from industry starts its upward inflection in 2016 and peaks in 2018 at a level of 40 bcf/d.

What this chart is showing is that FERC is expecting to approve pipeline infrastructure out to 2018 that will have a built in 28% over-capacity for the region. And meanwhile the **industry is proposing to build in 60% over capacity for the region**. PennEast is clearly part of the overcapacity being planned by industry.

³ FERC 2014 State of the Markets Report (hereafter FERC Market Report): <http://www.ferc.gov/market-oversight/reports-analyses/st-mkt-ovr/2014-som.pdf>

6. CRITICISM OF THE PENNEAST CONCENTRIC STUDY

Part of PennEast's justification for their pipeline project is based on a study they commissioned on the so called "polar vortex" winter of 2013/2014. That winter was characterized in the natural gas markets by severe wholesale constraints, extreme price volatility, and prices topping out at \$123/thousand regional city gates, all due to extreme weather conditions in the Northern states. PennEast's study concluded that if the pipeline were in existence at that time that it would have saved consumers \$890 million in a single year⁴.

This study was flawed in a number of ways, which are enumerated below in detail. Fundamentally, the study made a number of simplifying assumptions that inaccurately model the real markets. In addition, a theoretical point-in-time study focused on the past cannot, by definition, take into account changes in markets since that point in time. In the case of the region covered by the study, changes in the market since the polar vortex winter have been extensive, and further serve to invalidate the study's final message.

Over 20% of the shipping capacity is documented going out of state.

The Concentric study was based on 1bcfd being used in PA and NJ, but PennEast has made it clear in their official FERC filing that a significant percentage of the gas will be going away from those two states. PennEast has indicated in FERC Resource report 1 that 0.225 bcfd of the gas will flow directly out of state via the Texas Eastern line and to Consolidated Edison. So the benefit Concentric attributed to PA and NY was over-estimated by nearly 25% on its face, or \$222.5 million ⁵.

New pipeline construction erodes much of the study's findings

The Concentric study was concentrated on a fixed point in time in the past, which means that the study was always a theoretical exercise without much applicability to the real world. In reality the Concentric study posits a theoretical scenario where if we could invent a time machine, go back several years, get FERC approval for PennEast and get it online by the time of the polar vortex winter, then these would be the theoretical benefits. An obvious flaw of this approach is that it ignore factors that have changed since that point in time.

One such factor is newly approved and constructed pipeline projects that have come online since 2014. The addition of capacity such as from the Transco Leidy Southeast expansion, and pipeline reversals serve to significantly erode the thesis of Concentric's study.

System efficiency improvements are not considered

The Concentric study assumes that price spikes from the polar vortex winter were solely the result of capacity constraints in the system. FERC studies since then have invalidated that assumption. In fact FERC found that gas

⁴ Concentric PennEast study: <http://ceadvisors.com/publications/reportsandpublications/PennEast%20Energy%20Market%20Savings%20Report.pdf>

⁵ Page 18 <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13946534>

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allocations for electrical generation in the PJM region were highly inefficient and were a significant factor in causing shortages and price volatility⁶. Since that time FERC has drafted new rules which injected significant efficiencies into the existing pipeline infrastructure network. Those regulatory changes were a success. In their 2014/2015 State of the Markets report FERC reported that the PJM rule changes contributed to substantially lowering price volatility, and this was part of the reason gas and electrical markets performed “remarkably well” in that time period despite the weather being nearly as severe and cold as the polar vortex winter.

So while Concentric characterizes the Eastern PA and New Jersey regions as “constrained”, in reality the existing infrastructure was simply used inefficiently. We weren’t using the pipelines we already have very well.

The split between PA and NJ is not correctly attributed

The report estimates that PA would have saved \$515 million per year, and NJ \$378.4 million if an extra billion cubic feet were available in the region. However, PennEast has indicated in their formal September application to FERC in Resource Report 1 that PA will only receive a maximum of 15% of the total share of PennEast gas. So the gas will not be uniformly available, but instead the bulk of it is subscribed in NJ.

How can PA be realizing a 36% *higher* cost savings while only receiving 15% of the end product? This shows severe errors and deficiencies in the Concentric model. It is clear that they were calculating a benefit based on far more consumers in PA than would ever be reached in practice. To be clear - Pennsylvania will not be receiving 1 billion cubic feet/day of natural gas from this line. They will be receiving 150 million cubic feet day, and 1/3 of that is allocated to drilling operators. Assuming Concentric did not factor the PA percentage in properly this means this portion of the study over stated the PA benefit by over \$437 million.

In addition, at least 5% of the production slated for PA will be used by drillers, not end consumers, so the over-estimation by Concentric is even more than that.

The conversion from wholesale rates to end user rates is unclear

The report does not indicate how Concentric translated wholesale rates into actual rates paid by end-users. Given how natural gas markets work, the impact to end-users would appear to be dramatically lower than what Concentric has indicated. In fact, looking at 10K and 10Q filings of the PennEast owner-companies, the impact from the polar vortex winter on those entities is much lower than is attributed by Concentric. It would appear from initial analysis that in fact gas flowed out of the NJ area to surrounding regions to other operators outside of NJ and PA who did **not** prepared themselves properly for the event.

⁶FERC Market Report Slide 18: “In addition to better cold-weather preparation of assets and measures approved by the Commission, such as New England’s Winter Reliability Program, electric transmission and natural gas pipeline operators are now communicating more effectively during periods of stress to improve coordination and the reliability of their systems. Moreover, as discussed below, record natural gas production, plentiful storage inventories, new pipeline infrastructure, and low oil prices, are factors that also contributed to this winter’s moderate electricity prices and the improved performance of the electricity markets.”

PennEast construction and shipping costs were not factored in

The construction costs of PennEast, and the regular transportation costs on the pipeline itself do not appear to be factored into the Concentric model. PennEast construction will cost an estimated \$1.2 billion, a cost that will be eventually passed onto rate payers. In addition, PennEast proposed in their open season to charge approximately \$0.6 per dekatherm as the average fully loaded transportation costs over the pipeline. This comes out to approximately \$219 million/year. Concentric's study did not appear to account for either of these costs anywhere, but seems to focus slowly on the spread between the wholesale Marcellus regional prices and a single city gate price. This simplifying assumption by Concentric in fact invalidates their model as it does not accurately capture real world costs and end-user rates.

Erroneous demand-growth assumption

Concentric states in their study that "As a result of the historical and expected future reliance on natural gas-fired generation to meet electricity needs, demand for natural gas by electric generators is expected to continue to grow". This is false. Only 1% of electrical generation in the region is coal-fired, and EIA.gov has projected electrical demand to be flat out to 2040. A graph in Concentric's study may explain this discrepancy. In that graph they show demand from a combination of all of NJ and *all of the state of PA*. They state that they did this because data was not available for just eastern PA. However, PA is a *very* large state, and adding the entire state into their demand growth model is not a valid when the study is focused only on a small portion of the eastern region.

Macro energy market trends are ignored

The point-in-time Concentric study is a poor predictor of future market conditions for many reasons that have already been enumerated. Another problem with the approach is that it fails to take national and world market trends into consideration. U.S. DOE and EIA studies have shown that the over-build out of capacity by PennEast and other pipeline companies will result in a surplus of gas supply that can only be satisfied by exporting natural gas via LNG exports. These exports will cause natural gas prices to rise as a result (this is covered in detail in the next section).

The exact impact is not clear as it depends on world LNG prices and supply situation, and to a degree also on which oil price model prevails (low oil or high oil). However, in all models the end result is that, contrary to what Concentric claims, natural gas prices will actually raise over time as a result of LNG export.

This argument is further bolstered by the fact that in this year the Northeast became a net-exporter of natural gas for the first time ever. This is yet more evidence that we are not regionally capacity constrained at all, but in fact have so much capacity that we are able to export gas out of the region.

The PennEast FERC application contradicts the Concentric Assumptions

In their application to FERC, multiple PennEast partners have stated that PennEast will "displace" existing natural gas supply that those companies are using today. By stating that they are displacing existing suppliers, these companies

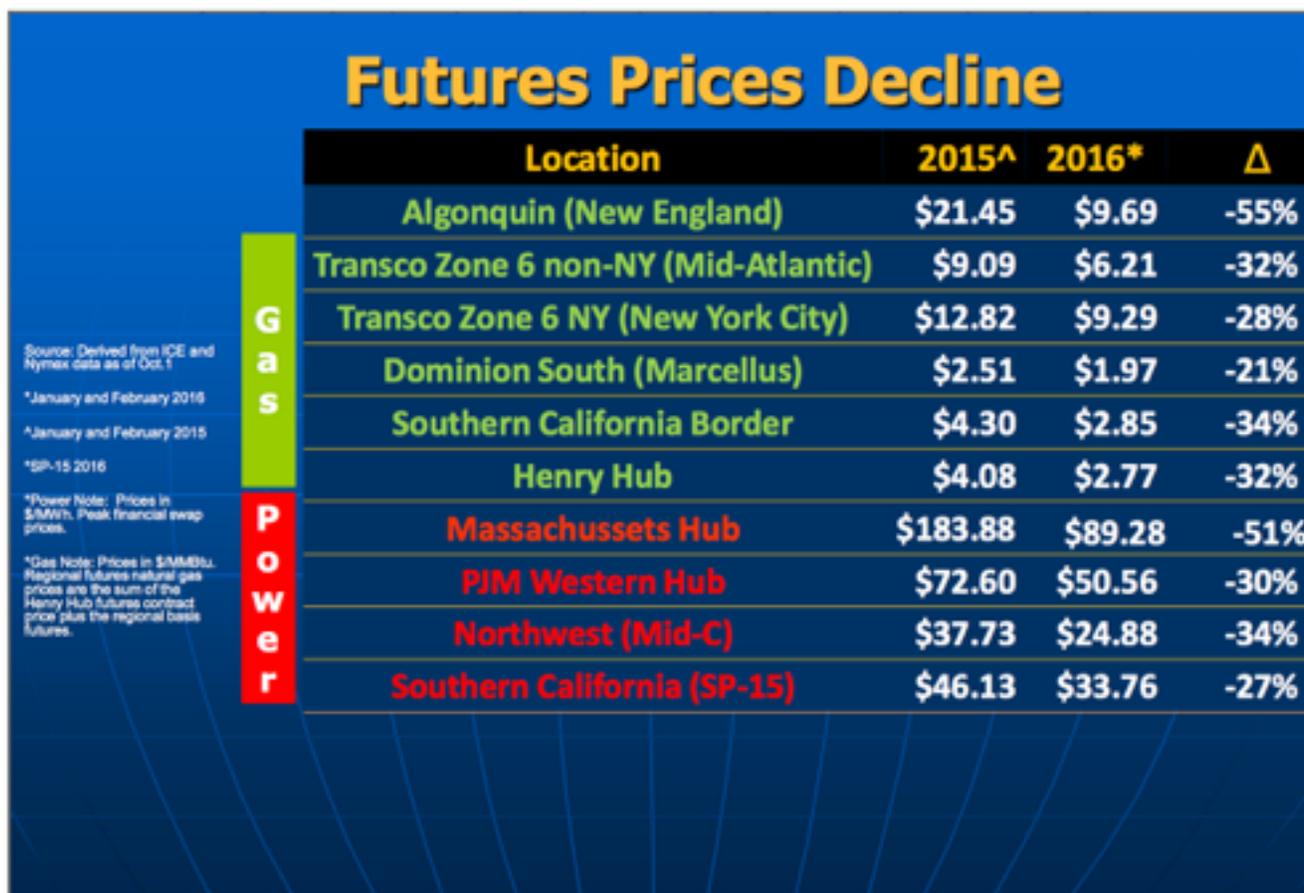


Figure 4 - comparison of futures prices 2015A to 2016E

are signaling quite clearly that they are *not* supply constrained⁷. To the contrary, they are stating that there is an over supply of gas and they are now trying to tune their economics maximize their own profits. This directly contradicts the Concentric conclusions. In fact the primary goal of building this pipeline seems to be to capture the revenue potential of each member owning a piece of a new midstream company.

FERC’s 2015/2016 projections disprove Concentric’s assumptions.

⁷ <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13995668>, pp 1-3 and 1-4. NJR: “PennEast also provides an opportunity for New Jersey Natural Gas to restructure its gas supply portfolio”. PSEG: “PSEG, as the largest utility in New Jersey and one of the largest buyers of Marcellus Shale supplies in the northeast, intends to utilize the supplies of gas from the proposed Project to displace more expensive supplies of gas from the Gulf of Mexico”. SJGas: “South Jersey’s capacity portfolio is uniquely positioned to take advantage of the Project because the Company currently has interstate pipeline capacity with a receipt point very close to the terminus of the Project. These conditions will allow for the displacement of supplies that could be very expensive with much lower, secure supply prices “

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FERC has recently issued their 2015-2016 Winter Energy Market Assessment ⁸. In it they state:

“Natural gas and electric spot and futures prices are lower than last year, consistent with expectations that energy markets are well positioned to manage potential challenges this winter. The U.S. natural gas market is well supplied, with ample production and storage. Record breaking production continues despite lower rig counts, increased exports, and the collapse of oil prices. New natural gas pipeline expansions and projects to reverse flows on some pipelines will also provide more transportation capacity from producing to market areas this winter, though no capacity additions have been made in New England.”

and:

“Growing Northeast natural gas production and new pipeline takeaway capacity continue to reshape the nation’s flow patterns and prices. Since the start of 2014, 9 Bcfd of capacity additions have come online to further link production with markets in the Mid-Atlantic, the Southeast, and the Midwest. As a result, the Northeast corner of the nation became a net exporter of natural gas for the first time this summer”.

The presentation also compares Futures prices between winter of 2015 and 2016 (see figure 4), and a dramatic fall off of prices can again be seen. In just a single year natural gas wholesale futures prices are projected to drop between 21% to 55%. Such numbers significantly undermine the Concentric assertion that there is significant capacity constraints in the NJ region. This projection from FERC shows that the Concentric study is in fact invalid, and that the study asks readers to draw the wrong conclusions about the state of the markets today.

Conclusion

The Concentric study was clearly based on a very narrow set of incorrect assumptions. In particular, PennEast’s actual FERC application contradicts a number of Concentric’s baseline assumptions, such as the regions where the gas will be headed and the mix between PA and NJ. In addition, market data and FERC reports contradict Concentric’s model and predictions as well. Contrary to their predictions, NJ and the surrounding region performed extremely well in the 2014/2015 winter, despite the fact that it was nearly as challenging a winter as the polar vortex year. And FERC is predicting that the region will do even better in 2015/2016 – all without PennEast. For these reasons policy makers and agencies should discount the Concentric report entirely as a poor study who’s predictions have been completely invalidated.

⁸<https://www.ferc.gov/market-oversight/reports-analyses/mkt-views/2015/10-15-15-A-3.pdf>

7. LNG EXPORTS

A growing factor in natural gas markets in the United States today is that of LNG exports. Historically exports of natural gas from the United States to other countries has been banned except for a few special cases. However, this has changed recently and the U.S. Department of Energy now allows export as Liquefied Natural Gas (LNG) to many countries, both with and without trade agreements with the U.S.

The reason LNG exports are being allowed is due to saturation of the domestic U.S. market. The FERC *State of the Markets* report talks about how the North East region has become a net exporter:

“The Northeast became a net exporter of natural gas for the first time last summer and future pipeline expansions are targeting exports to eastern Canada, the Midwest, the Southeast, and the Gulf Coast. As Marcellus Shale gas makes its way into neighboring regions, its impact on markets and basis relationships will broaden. Last summer New York and Boston experienced prices below Henry Hub for the first time. Market Oversight expects that Marcellus exports will moderate prices in other regions over the next few years.”

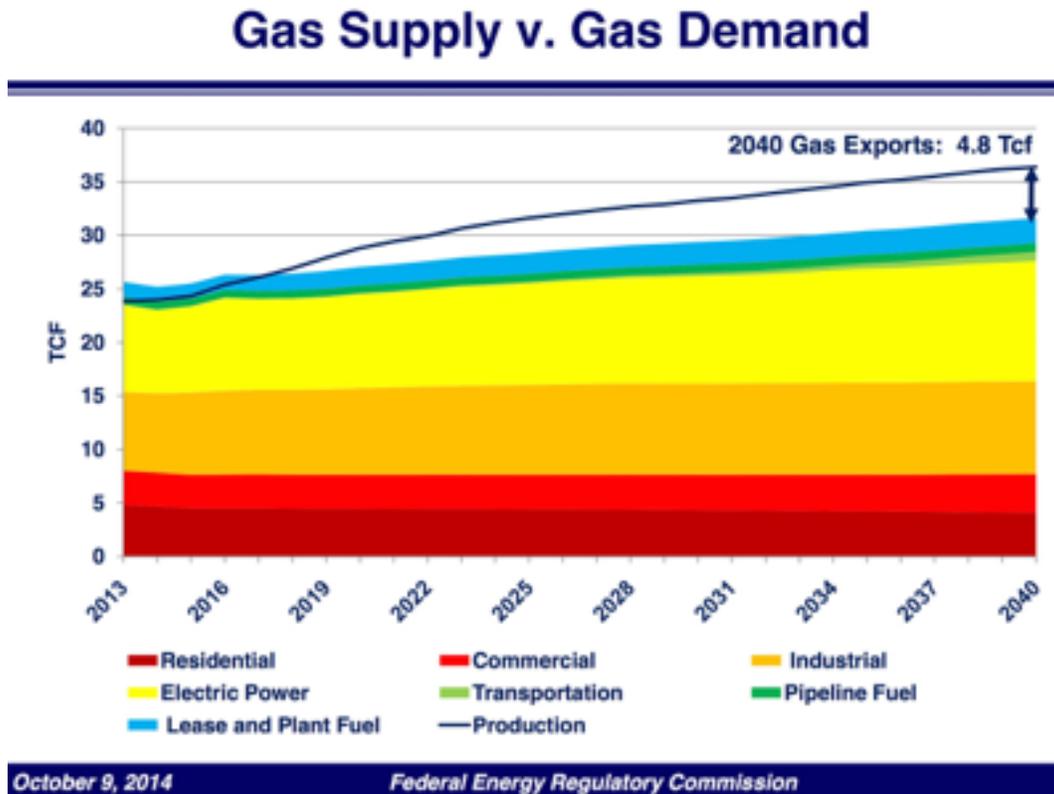


Figure 5 - Natural Gas exports driver behind growth

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Later in the report they spell out explicitly where the excess will be going - international export.

“Plans to export LNG from the U.S. continue to move forward. As of the end of 2014, eight projects had been approved, with four under construction including those at Sabine Pass, expected to enter service in 2016, and at Freeport LNG, Cove Point LNG, and Cameron LNG.”

A separate FERC presentation in 2014 on LNG exports expands upon this with a very revealing graphic (figure 5)⁹. This graph shows natural gas production vs. demand out to 2040. A few things stand out from this graph:

- Gas demand is flat in all categories except two.
- Electrical power generation shows a very gradual growth rate, as coal plants are converted to natural gas. It should be noted that this is a very gradual phase-in over the next 25 years.
- LNG exports skyrocket from effectively zero to 4.8 trillion cubic feet/year by 2040. This is by far the largest growth market for natural gas.
- It should be noted that most gains in gas fired electrical generation comes from conversion of coal plants to natural gas. New Jersey has less than 1% of its electric power generated from coal, so the growth for NJ is even lower than the modest growth predicated for the country as a whole.

The net result is that FERC understands that there is a supply glut in the country, and that pipeline infrastructure build outs are *not* being proposed to benefit states like New Jersey. The sole reason for these build outs is to support a new LNG export market.

Related to this, PennEast part-owner New Jersey Resources recently announced that they had purchased a preferred equity stake in the Cove Point LNG terminal¹⁰. This puts PennEast's assertions that “no” PennEast gas will ever be used to export at serious question.

However, much of the LNG situation has changed in 2015. Saudi Arabia exacerbated the world oil glut by increasing their output, and players such as Australia are outstripping U.S. efforts to get to export markets due to their geographical advantage. The end result is that many plans by natural gas companies that hinged upon high international LNG prices are now being called into serious question. Drilling rig counts are down dramatically in the U.S., and multiple financial news outlets are reporting that LNG export from the United States is now uneconomical exception situations where long term precedent agreements are already in place, such as with Cove Point¹¹.

⁹ FERC Office of Energy Projects 2014 <http://www.pierceatwood.com/webfiles/Natural%20Gas%20Conference%20A%20View%20from%20the%20Beltway%20%28W4532104x7AC2E%29.pdf>

¹⁰ <http://www.njresources.com/news/releases/2015/njr/15-36NJRMidstream.asp>

¹¹ <http://fuelfix.com/blog/2015/10/09/85-gas-projects-dying-on-the-vine-as-lngs-promise-falls-short/#27079101=0> “Consulting firm IHS Inc. says only one in every 20 projects planned are actually necessary by 2025 as weakening Asia economies, cheap coal, the return of nuclear power in Japan and the ever-expanding glut of shale supply in North America temper demand for the power-plant fuel, putting tens of billions of dollars worth of export projects at risk.”

This brings the rationale behind projects such as PennEast into question. PennEast appears to be built with the assumption that the PennEast owner companies will displace their existing suppliers - and those suppliers will still have markets available via LNG export. With international LNG prices plunging by over half in 2015, there are significant questions as to how much economic sense projects like PennEast make. Another billion dollar pipeline CAPEX project is not needed when existing pipes have been shown to meet regional needs.

8. LNG EXPORT EFFECTS ON NATURAL GAS MARKETS

In order to better understand the effect LNG export would have on our national markets, the Department of Energy commissioned a study in 2014 from the Energy Information Administration¹². Multiple scenarios were considered, including factoring in low and high oil price models, and factoring the rate of expansion of the LNG export market.

It is critical to understand the differences of those scenarios, how world events can influence them, and that the international energy picture is complex but also fast moving. Depending on those markets LNG export may have a dramatic impact on the United States and cause significant and fast price inflation, or its impact may be much more modest. At this time the world situation appears to be favoring the latter case as international LNG prices are plunging and competition from other countries around the world are making Marcellus shale look expensive and unappealing.

With that said, some of the conclusions from that report are as follows:

- **Increased LNG exports lead to increased natural gas prices.** Starting from the AEO2014 Reference case baseline, projected average natural gas prices in the Lower 48 states received by producers in the export scenarios are 4% (12-Bcf/d scenario) to 11% (20-Bcf/d scenario) more than their base projection over the 2015-40 period. Percentage changes in delivered natural gas prices, which include charges for gas transportation and distribution, are lower than percentage changes in producer prices, particularly for residential and commercial customers. Starting from the AEO2014 Reference case baseline, projected average Lower 48 states residential natural gas prices in the export scenarios are 2% (12-Bcf/d scenario) to 5% (20-Bcf/d scenario) above their base projection over the 2015-40 period.

- **Natural gas markets in the United States balance in response to increased LNG exports mainly through increased natural gas production.** Across the different export scenarios and baselines, higher natural gas production satisfies about 61% to 84% of the increase in natural gas demand from LNG exports, with a minor additional contribution from increased imports from Canada. Across most cases, about three-quarters of this increased production is from shale sources.

- **Consumer expenditures for natural gas and electricity increase modestly with added LNG exports.** On average, from 2015 to 2040, natural gas bills paid by end-use consumers in the residential, commercial, and industrial sectors combined increase 1% to 8% over a comparable baseline case, depending on the export scenario and case, while increases in electricity bills paid by end-use customers range from 0% to 3%. These estimates reflect the combined impact of higher prices and small reductions in natural gas and electricity use.

- **Increased LNG exports result in higher total primary energy use and energy-related CO₂ emissions in the United States.** The 0.1% to 0.6% increase in total primary energy use and a -0.1% to 0.6% change in CO₂ emissions relative to baseline over the 2015-40 period reflect both increased use of natural gas to fuel

¹² Effect of Increased Levels of Liquefied Natural Gas Exports on U.S. Energy Markets <http://www.eia.gov/analysis/requests/fe/>

added liquefaction and fuel switching in the electric power sector that for some cases increases both fuel use and

Shipper	Volume	% of Total	Primary Industry	Owner
Cabot Oil & Gas Corporation	50,000	5%	Driller	N
Consolidated Edison Company of New York, Inc.	100,000	10%	LDC	N
Enerplus Resources (USA) Corporation	30,000	3%	Driller	N
New Jersey Natural Gas Company	180,000	19%	LDC	Y
NRG Rema LLC	10,000	1%	Electrical Generation	N
Pivotal Utility Holdings, Inc. (D/B/A Elizabethtown Gas)	100,000	10%	LDC	Y
PPL Energyplus, LLC	30,000	3%	Unknown	N
PSEG Power LLC	125,000	13%	Midstream/ Wholesale	Y
South Jersey Gas Company	105,000	11%	LDC	Y
Texas Eastern Transmission, LP	125,000	13%	Midstream	Y
UGI Energy Services, LLC	100,000	10%	LDC	Y
Warren Resources, Inc.	15,000	2%	Driller	N
Total	970,000	100%		
Summary	Volume	%		
Shippers who are pipeline owners	735,000	76%		

Table 2 - PennEast Subscribers Analysis

emissions intensity.

The end result here is that pipelines such as the PennEast pipeline will be enabling a a national strategy to export natural gas overseas as LNG, and that as a result consumers in the U.S. (including New Jersey) will see increased prices, consumption of natural gas will go down, and CO2 emissions will increase. We could see a 1%-8% overall price increase in natural gas and 0-3% increase in electricity.

This section is included in this report because no mention of any of these factors are to be found in PennEast's filing with FERC. An honest and candid discussion of purpose and need in resource report 1 would include macro economic factors such as world LNG prices, trends towards LNG export from the United States, and their impact on local natural gas prices. Instead PennEast presents a narrow case to FERC in a vacuum, divorced of the actual markets that the project would be embedded within should it be approved and construction completed.

9. MIDSTREAM STRATEGIES AND DISPLACEMENT

75% of the shipping capacity on PennEast has been reserved for PennEast owners (see table 2). The entities highlighted in red are subsidiaries of PennEast corporate owners. The stated goals of the companies are to diversify their supply portfolios and benefit from cheaper gas sources. However, there are clear unstated goals that are also in play here as well. A major shift for these companies is that they will no longer have to pay companies such as Williams Transco pipeline shipping fees. Instead, the member LDCs will pay their corporate siblings - the midstream subsidiaries. In this manner the parent companies - AGL Resources, South Jersey Industries, PSE&G, and NJ Resources - will secure a new, guaranteed revenue stream off of the backs of their captive LDC rate payers.

Two of PennEast's member companies have directly used the word "displacement" in recent federal filings, and a third has stated that they are "restructuring their gas portfolio". All three are thereby signaling how they plan to benefit from their ownership in PennEast¹³. PSEG states:

PSEG as the largest utility in New Jersey, and one of the largest buyers of Marcellus Shale supplies in the northeast, intends to utilize the supplies of gas from the proposed PennEast Project to displace more expensive supplies of gas from the Gulf of Mexico.

South Jersey Gas likewise indicates:

South Jersey's capacity portfolio is uniquely positioned to take advantage of the Project because the Company currently has interstate pipeline capacity with a receipt point very close to the terminus of the PennEast Project. These conditions will allow for the displacement of supplies that could be very expensive with much lower, secure supply prices.

What's unstated here is South Jersey Gas and PSEG's ownership stakes in PennEast. As part owners they will split their share of the approximately \$0.60/dekatherm average shipping costs and pocket them directly. It should also be noted that both South Jersey Gas and PSEG characterize their existing supply as "expensive" but do not cite any references for this fact. In fact the city gate prices in the NJ area are reaching record lows in the past year.

Changing gas supplies from their existing suppliers to PennEast is highly significant because it changes the economics for these companies significantly. Currently commodity rates, including transportation costs over pipelines, are merely passed on to the consumer and companies such as PSE&G and South Jersey Gas cannot benefit from them in any way. However, by transferring their gas supplies to PennEast, they can now reap the benefit of the transport costs and thereby secure a new revenue stream from themselves. In this case the PennEast

¹³ PennEast Resource Report 1 as of July 31st, 2015, Purpose and Need Justification Page 1-4: <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13946534>

member companies, collectively, can reap a total of \$289 million a year in new revenue. Note that this benefit only applies to the companies and not the end consumers.

In addition, by stating that they are looking to displace existing gas supplies with gas from PennEast, these companies are also signaling that they have sufficient gas supplies today, and that PennEast in fact will not be alleviating any real or perceived shortage of natural gas. Instead, this is simply an exercise in these companies attempting to extract more profit from the market for themselves.

10. CORPORATE FILINGS AND INVESTOR PRESENTATIONS

The intentions of the PennEast member companies are clear from their SEC filings, and their investor relations. In these filings PennEast is mentioned overwhelmingly as a midstream revenue growth strategy for the companies.

PSE&G

PSE&G's presentations and filings slot PennEast into their PSE&G Power subsidiary. Their 2015 Investor presentation is available below:

http://investor.pseg.com/sites/pseg.investorhq.businesswire.com/files/doc_library/file/PSEG-2015INVESTOR-FINAL_WEB_1.pdf

In it they talk about Power's growth investments. Some quotes from the presentation:

PSE&G Power's Growth Investments

PennEast pipeline - equity investment and gas portfolio enhancement

PSE&G Earnings from PennEast: \$13 million 2019

PSE&G Power's Gas for Generation in 2014:

** PSEG Power's gas for generation was ~100 bcf in 2014, of which >60% was supplied by Shale gas*

** PSEG Power procured over 400 BCF in 2014 with ~75% going to PSE&G's utility gas customers*

** When gas is surplus to customer needs, PSEG Power sells surplus to others*

The presentation also talks about the effect of pipelines on prices:

Market Review - Marcellus Region

** New pipeline investment is expected to increase takeaway capacity from the low cost Marcellus/Utica shale and reduce regional surpluses and increase gas prices by 2018.*

PSEG Customer Demand Growth (2010-2014)

Electric: 0.3%

Gas: 0.3%

It also includes demand growth estimates. As you can see it's a paltry 0.3% in both the electric and gas markets, which is no where near the capacity of what PennEast brings (over 35% over capacity for the entire state).

New Jersey Resources

New Jersey Resources had been experimenting with small-scale midstream market investments with some success. With PennEast they intend to broaden that investment significantly. From their midstream web site:

<http://www.njresources.com/about/midstream.asp>

"With an ongoing commitment to shareowners, New Jersey Resources has made a strategic decision to begin investing in the midstream asset sector, specifically natural gas storage and transportation pipelines. These investments, in the form of equity ownership, will provide NJR's share owners with another source of earnings. As a result, NJR created two wholly owned subsidiaries:

NJR Storage Holdings Company and NJR Pipeline Company, both housed under our NJR Energy Holdings subsidiary. "

NJ Resources 2014 Annual Report goes into more detail about their midstream plans. This report is available here:

http://files.shareholder.com/downloads/NJR/748142669x0x798134/c68a78e7-47df-413b-af82-03c634c31573/NJR_Annual_Report_2014.pdf

Relevant quotes:

Our Midstream segment invests in natural gas assets, such as natural gas transportation and storage facilities. NJR believes that acquiring, owning and developing these midstream assets, which operate under a tariff structure that has either regulated or market-based rates, can provide a growth opportunity for the Company. To that end, NJR has a 50 percent ownership interest in Steckman Ridge, a storage facility that operates under market-based rates, a 5.53 percent ownership interest in Iroquois, a natural gas pipeline operating with regulated rates and a 20 percent ownership interest in PennEast, a natural gas pipeline, which the Company estimates will be completed and operational by November 2017. NJR is pursuing other potential opportunities that meet its investment and development criteria.

NJ Resource's 2015 Q3 report goes into more detail on their growth strategy involving PennEast.

http://files.shareholder.com/downloads/NJR/748142669x0x842599/F0D6CACF-BF47-4D47-A169-37B747EC3322/NJR_3Q_FY_2015_final.pdf

Growth Slide

Invest in Midstream projects such as PennEast Pipeline

Targeted NFE (**Net financial Earnings**) contribution from **Regulated and Midstream of 65 - 80 percent**

As with PSE&G, NJR indicates that demand growth is effectively flat. Unlike PSE&G, NJR expects PennEast to become an outsized growth driver for them.

South Jersey Gas

South Jersey Gas is just entering into the midstream market beginning with PennEast. These quotes are from their 2014 Q4 earnings call transcript with equity analysts below:

<http://seekingalpha.com/article/2959556-south-jersey-industries-sji-ceo-edward-graham-on-q4-2014-results-earnings-call-transcript?part=single>

"The **exciting discussion about SJI Midstream**, which is our significant investment in PennEast, which is fully subscribed, has the **potential for expansion and earns record level returns** and then moving to our non-reg side, with great growth opportunities we continue to have with CHP in thermal, the renewables and, of course, the newest area of growth, fuel management for large generators."

From their 2015 Q1 earnings call transcript:

<http://seekingalpha.com/article/3162616-south-jersey-industries-sji-management-on-q1-2015-results-earnings-call-transcript?part=single>

"**One key part of our longer term growth is our 20% ownership interest in the 1 bcf PennEast Pipeline.** This fully subscribed pipeline is being driven by climates [ph] of more than 800,000 decatherms from recent utilities and utility affiliates, and has the **potential to provide at least 10% of the SJI economic earnings in 2018** when it is expected to be fully in service.

This opportunity layers nicely increasing values on our successfully operating CHP assets and the ability to expand and optimize our wholesale and retail commodity businesses. Wholesale in particular is an area poised for accelerated growth as legacy contracts expire, and the capacity we've acquired over the past few years increases in value."

And finally we have SJI's annual report for 2014:

http://www.sjindustries.com/sites/default/files/SJI_2014_AR.pdf

"SJI MIDSTREAM

Outside of SJG, we're very excited about our participation in the Penneast Pipeline through our newly created subsidiary SJI Midstream. With our anticipated investment of approximately \$200 million, this FERC regulated project.

* a 108-mile pipeline starting in Luzerne County, PA, and traveling southeast to Mercer County, NJ

* could come online as early as 2017, and once fully operational, will significantly benefit SJI's long-term earnings."

Conclusions on Varying PennEast Audiences

I have included PennEast's member companies financial and investor reports to highlight the three very different views the companies are giving to the world. The three views depend upon the audience, and they are:

- The general public
- FERC
- Investors

The General Public

When addressing the general public, PennEast member companies highlight that it will benefit strictly NJ and PA

homes and businesses - see figure 6 for a snapshot of their web site home page.



Figure 6 - PennEast web site

From their project overview on their website at http://penneastpipeline.com/wp-content/uploads/2015/10/Overview_PennEast-10-12-15.pdf, they claim:

The proposed PennEast Pipeline Project will bring affordable natural gas to customers in Pennsylvania and New Jersey. Representing a nearly \$1 billion investment, this 118-mile, 36-inch pipeline is designed to deliver approximately 1 billion cubic feet (Bcf) of natural gas per day - enough to serve the equivalent of more than 4.7 million homes.

Upon completion of the Project, it is expected natural gas and electric customers will see significant savings from lower transportation costs associated with locally produced, abundant natural gas.

The majority of the material on the public site is clearly almost entirely marketing driven with numbers such as “4.7 million homes” that have no bearing on the actual motivations behind building PennEast. It's little more than an attempt to deceive the public as to why this project is being built. Research clearly shows this at PennEast's FERC filings and investor materials completely contradict their public message. FERC and other agencies should question why PennEast is advertising a false message to the general public that is contradicted by their other less-publicly advertised material.

FERC

When speaking to FERC, PennEast indicates that this project is being pursued to decrease price volatility, stabilize supplies, and “displace” existing supplies for the LDCs who are subsidiaries of the owners. Prices are mentioned as a hoped-for benefit, not an actual goal of PennEast. This is most likely because the member companies are aware that FERC understands the markets, and knows that natural gas and electric prices will be rising because of pipelines like PennEast (and as PSE&G indicates in their investor material).

Most of the emphasis in the FERC submission in fact focuses on the fact that the Open Season was fulfilled and they have essentially full capacity subscribed.

What they fail to mention is that 75% of the open season subscription is from the owners of PennEast itself. They are essentially self-dealing to shift shipping costs from others to themselves.

Investors

When speaking to investors, all the member companies make it clear what their real goal are: get more of the midstream market; get a guaranteed revenue stream to our midstream subsidiaries on pipeline shipping costs, paid for by the captured rate payers of our LDCs; and finally be able to show growth in a stagnant price environment.

FERC and other agencies should ask themselves (and PennEast): why do the PennEast member companies need three different stories on purpose and need?

11. THE “NO ACTION” ALTERNATIVE

Resource Report 10 includes PennEast’s Alternatives analysis¹⁴. It states in part:

“The no-action alternative would result in not constructing the Project, and would therefore not meet the Project shippers’ need for the firm transportation capacity commencing on November 1, 2017 as reflected in their commitments in the precedent agreements. Accordingly, this option would have adverse consequences on the markets they serve. An additional supply of natural gas to the region would provide a benefit to consumers, utilities and electric generators by providing enhanced competition among suppliers and pipeline transportation providers. Constructing the Project would satisfy the needs of shippers seeking (i) additional supply flexibility, diversity and reliability; (ii) liquid points for trading in locally produced gas from the Marcellus Shale and the Utica Shale; (iii) direct access to premium markets in the northeast and mid-Atlantic regions; (iv) the ability to capture pricing differentials between the various interconnected market pipelines; (v) enhanced natural gas transportation system reliability to the region with modern, state-of-the art facilities and (vi) firm access to currently the most affordable long-lived dry gas reserves. These benefits would not be realized with the no-action alternative”.

Most of this paragraph has been shown by this research paper to not be an accurate characterization of the actual gas markets in the region or of PennEast’s true intent. If PennEast is not constructed, NJ will continue to lead the nation in being among the lowest residential natural gas prices. Our price volatility will also be much lower than the nations average. FERC’s own projections show futures prices dramatically lower for the winter of 2015/2016 compared to 2014/2015 (let alone the polar vortex winter).

PennEast continues in their application:

“The 2013-2014 winter season demonstrated that there were constraints in the Mid-Atlantic supply system, evidenced by the dramatic regional price impacts described in Figure 1.1-2 of Resource Report 1. The lack of a new pipeline with access to supply sources in Pennsylvania will continue to create dramatic seasonal pricing fluctuations in Pennsylvania and New Jersey with higher gas and electric rates and potential for energy shortages during peak demand, resulting in threats to business continuity, public safety and national security. While the extreme pricing events of the 2013-2014 winter were not as significant in the 2014-2015 winter for a number of external factors, such as lower oil prices, the sustained difference between natural gas prices in the northeastern Pennsylvania production region and the market regions served by the Project were significant and lasted longer. This is shown in Figure 1.1-3 of Resource Report”.

The research presented herein has also proved these assertions by PennEast to be false. Pricing fluctuations have actually *dropped* dramatically since 2013-2014, and are projected to drop even further - without PennEast. We are also going into the 2015/2016 with record storage injections, showing that storage, not pipelines, is the true solution to winter supply issues. What PennEast will bring is exceptional over supply to our region.

¹⁴ Resource Report 10: <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13995683>

PennEast does not mention this in their analysis, but the true impact of the “No-action” alternative is that it will deprive them of \$280 million/year in revenue. This is not sufficient justification for building a 114 mile pipeline, and as such the “no-action” alternative is in reality the proper choice.

12. CONCLUSION

The research on PennEast makes it clear that they have a different message for each audience, that those messages are often contradictory, and that they are trying to keep their true motivations hidden from the general public - and from FERC.

When you look at PennEast's arguments about "demand" in NJ, research shows that no such demand exists.

Looking at PennEast's Concentric study, we see that it was built on a large number of flawed assumptions, it entirely ignores huge market changes that have occurred since the Polar Vortex winter, and that PennEast's own FERC application contradicts the report on several levels. The entire report is, in fact, invalid, inaccurate and misleading.

FERC's own analysis and projections also bely PennEast's purpose and need justification. One FERC study and projection after another is showing a rosier and rosier picture of the North East's natural gas situation, and clearly shows gas commodity prices starting to race to the bottom. In these studies there is clearly no need for yet another 1 bcfd pipeline in the region, unless you believe a high oil model will kick in in the near term and lift internal LNG prices to a point where LNG export from the U.S. East Coast is economically viable again. But PennEast has asserted flatly on repeated occasions that no gas from PennEast will be used for LNG export projects. Which leaves us at an impasse. Is FERC wrong, or is PennEast not being factual in its purpose and need section of its application?

Finally, we have the PennEast member companies own words, in the form of their own investor presentations and SEC filings. Those words paint a picture of companies trying to maneuver themselves so that their rate payers pay for a new pipeline, and then those same captured rate payers help pay PennEast shipping costs - which go into their midstream subsidiaries revenue stream. The people of NJ and PA will not benefit from this - in fact, every current model of natural gas markets show that pipelines like PennEast will serve to raise the cost of natural gas for end-users.

Agencies and organizations need to look at these facts and determine for themselves what the true motivations behind PennEast are, and if these motivations and end-results really are sufficient to receive a Certificate of Public Need and Convenience. Are all of the very real and broad-based environmental impacts we know PennEast construction and operation are going to cause worth allowing the member companies to shift pipeline shipping charges to themselves? Does this serve in the public good? Based on this research, the answer is "No".

It seems clear that the best option to pursue for the PennEast project for the general good is the "No Build" option. Untold amounts of environmental damage will be averted. And the predominant negative outcome would appear to be that SJ, NJR, and AGL Resources won't be able to tout high revenue growth from their new midstream businesses, and PSE&G power won't be able to similarly profit in their division. FERC and industry reports show that a withdrawal or rejection of PennEast will not have any deleterious effect on the region at all.