State Of New York Department of Public Service Case 19-G-0678
Proceeding on Motion of the Commission to Investigate Denials of Service Requests by National Grid USA, The Brooklyn Union Gas Company d/b/a National Grid NY and KeySpan Gas East Corporation d/b/a National Grid.

Energy Efficiency Performance Personal Comments of
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Introduction

I previously submitted comments on the project alternatives presented by National Grid. These comments address natural gas energy efficiency performance during the last ten years relative to National Grid's proposed options to address natural gas supply deficiencies in New York City and on Long Island that assume that New York energy efficiency will meet or exceed 80% of the CLCPA targets and that they could get substantive additional reductions from an intense weatherization project.

I am a retired utility meteorologist with nearly 40 years experience analyzing the effects of meteorology on electric and gas operations. The opinions expressed in this post do not reflect the position of any of my previous employers or any other company I have been associated with, these comments are mine alone.

Background

The National Grid analysis includes a high-demand and a low-demand scenario to bound their analysis. In the high demand scenario, they assume that 80% of the State energy efficiency targets are achieved and in the low demand scenario they assume that 100% of the targets are achieved. One of the no-infrastructure project options is incremental energy efficiency in which they propose to reduce Design Day demand through intensive weatherization measures.

In my amended comments submitted on March 2020 I stated:

> *In contrast to National Grid's optimistic projection that society will reduce demand growth by over 50% I disagree. In the first place, New York has already had extensive energy efficiency efforts in place during the time that demand growth increased 2.4%. As a result, the easiest and most effective, aka low hanging fruit, energy efficiency projects have already been implemented. Any future reductions will not be as cheap or effective. Another problem is that natural gas works well for heating and cooking so it is the preferred alternative. The "no new fossil-fuel infrastructure" argument is fine in theory but when faced with having to choose a poorer alternative I believe there will be plenty of pushback from the majority of the population that want the advantages of natural gas and are not as motivated as the environmental advocacy folks so vocal in this proceeding.*

The remainder of these comments evaluate recent natural gas use to see if recent investments have successfully reduced natural gas use and natural gas use per customer. In order to believe that energy efficiency can effectively reduce natural gas so that natural gas supply is guaranteed without additional fossil fuel infrastructure actual natural gas use has to be reduced.

Analysis

In this analysis I used data from Patterns and Trends - New York State Energy Profiles: 2002-2016, appendices that provide gas number of customers and electric and gas sales.

Appendix F-5, New York State Natural Gas Customers by Sector by Utility

- Table F-5a. Residential Sector Natural Gas Customers by Utility
- Table F-5b. Commercial Sector Natural Gas Customers by Utility
- Table F-5c. Industrial Sector Natural Gas Customers by Utility

Appendix F-6, New York State Natural Gas Sales by Sector by Utility

- Table F-6a. Residential Sector Natural Gas Sales by Utility (Millions of Cubic Feet)
- Table F-6b. Commercial Sector Natural Gas Sales by Utility (Millions of Cubic Feet)
- Table F-6c. Industrial Sector Natural Gas Sales by Utility (Millions of Cubic Feet)

These state-wide data include values for the residential, commercial and industrial sectors. Note that these data are only available back to 2001.

New York State Natural Gas System Customers, Natural Gas Sales, and Natural Gas Use per Customer Data and Trends (Table 1) lists the parameters that I think are appropriate to evaluate the likelihood that energy efficiency can reduce the amount of natural gas that will be needed for the worst case heating requirements. In 2016 the amount of natural gas used in the residential sector has increased 9.7% since 2002, in the commercial sector the amount used went down 12.8% and in the industrial sector the amount used went down 9.0%. The amount of natural gas used per customer went up 3.9%, commercial sector was down 21.1% and industrial sector was down 56.6%

I have issues with these data that should be kept in mind. In the industrial sector note that the number of industrial customers just about doubled from the 2001 to 2006 years. Looking at the utility data in Table F-5c this was because of an increase at Brooklyn Union Gas. I suspect this is more a reporting artifact than an actual change in the number of industrial customers. Fortunately, that seems to be an exception in the data.

Energy use is a function of weather, the economy and how the energy is used among other things that make the year to year variation and the choice of starting and ending points a concern when trying to determine what is actually going on. In order to try to address this problem I calculated the percentage change of the energy use per customer for different periods. Table 2 lists the change between the first eight-year averages and the second eight-year averages of the sixteen years of data available, the first five year averages and the last five year averages in the period of record, and the last five year averages relative to the proceeding five year averages.

Table 1: New York State Natural Gas System Customers, Natural Gas Sales, and Natural Gas Use per Customer Data and Trends

	Number of Customers			Natural Gas Sales (Millions of Cubic Feet)			Gas Use (Sales per Customer)		
Year	Residential	Commercial	Industrial	Residential	Commercial	Industrial	Residential	Commercial	Industrial
2001	4,241,177	363,471	3,055	375,652	346,981	82,423	0.089	0.95	26.98
2002	4,253,130	366,113	3,039	369,112	361,893	90,363	0.087	0.99	29.73
2003	4,213,036	385,992	2,955	409,092	338,996	79,781	0.097	0.88	27.00
2004	4,194,283	367,096	2,937	392,218	295,953	75,812	0.094	0.81	25.81
2005	4,226,499	376,008	3,726	405,630	275,362	79,018	0.096	0.73	21.21
2006	4,309,385	397,185	3,619	355,970	259,608	76,316	0.083	0.65	21.09
2007	4,374,135	393,326	7,461	399,735	284,620	75,848	0.091	0.72	10.17
2008	4,298,094	373,286	7,056	393,730	289,821	78,633	0.092	0.78	11.14
2009	4,303,059	375,102	6,612	404,364	280,312	70,288	0.094	0.75	10.63
2010	4,329,710	376,909	6,149	390,022	286,938	73,030	0.090	0.76	11.88
2011	4,347,669	377,437	6,517	393,285	290,586	72,669	0.090	0.77	11.15
2012	4,358,494	378,858	5,814	357,268	269,793	71,711	0.082	0.71	12.33
2013	4,381,076	380,654	6,248	415,775	300,345	74,437	0.095	0.79	11.91
2014	4,399,598	389,294	6,254	457,666	319,689	78,543	0.104	0.82	12.56
2015	4,432,694	397,089	5,970	451,562	310,747	76,992	0.102	0.78	12.90
2016	4,477,348	401,342	6,403	411,912	302,153	75,012	0.092	0.75	11.72
	# of customers Since 2001			Natural Gas Sales Since 2001			Sales per Customer Since 2001		
Year	Residential	Commercial	Industrial	Residential	Commercial	Industrial	Residential	Commercial	Industrial
2002	0.3%	0.7%	-0.5%	-1.7%	4.3%	9.6%	-2.0%	3.5%	10.2%
2003	-0.7%	6.2%	-3.3%	8.9%	-2.3%	-3.2%	9.6%	-8.0%	0.1%
2004	-1.1%	1.0%	-3.9%	4.4%	-14.7%	-8.0%	5.6%	-15.5%	-4.3%
2005	-0.3%	3.4%	22.0%	8.0%	-20.6%	-4.1%	8.4%	-23.3%	-21.4%
2006	1.6%	9.3%	18.5%	-5.2%	-25.2%	-7.4%	-6.7%	-31.5%	-21.8%
2007	3.1%	8.2%	144.2%	6.4%	-18.0%	-8.0%	3.2%	-24.2%	-62.3%
2008	1.3%	2.7%	131.0%	4.8%	-16.5%	-4.6%	3.4%	-18.7%	-58.7%
2009	1.5%	3.2%	116.4%	7.6%	-19.2%	-14.7%	6.1%	-21.7%	-60.6%
2010	2.1%	3.7%	101.3%	3.8%	-17.3%	-11.4%	1.7%	-20.3%	-56.0%
2011	2.5%	3.8%	113.3%	4.7%	-16.3%	-11.8%	2.1%	-19.4%	-58.7%
2012	2.8%	4.2%	90.3%	-4.9%	-22.2%	-13.0%	-7.5%	-25.4%	-54.3%
2013	3.3%	4.7%	104.5%	10.7%	-13.4%	-9.7%	7.1%	-17.3%	-55.8%
2014	3.7%	7.1%	104.7%	21.8%	-7.9%	-4.7%	17.4%	-14.0%	-53.5%
2015	4.5%	9.2%	95.4%	20.2%	-10.4%	-6.6%	15.0%	-18.0%	-52.2%
2016	5.6%	10.4%	109.6%	9.7%	-12.9%	-9.0%	3.9%	-21.1%	-56.6%

Table 2 Alternate Natural Gas Use Trends Comparison

	Gas Use (Sales per Customer)			Gas Sales (Millions of Cubic Feet)		
	Residential	**Commercial**	**Industrial**	**Residential**	**Commercial**	**Industrial**
2001-2008	0.091	0.81	18.85	3,101,140	2,453,233	638,195
2009-2016	0.094	0.77	11.86	3,281,854	2,360,563	592,682
% Difference	3.0%	-5.5%	-37.1%	5.8%	-3.8%	-7.1%
2001-2005	0.092	0.87	25.93	1,951,704	1,619,184	407,398
2012-2016	0.09	0.77	12.27	2,094,183	1,502,727	376,695
% Difference	2.8%	-11.4%	-52.7%	7.3%	-7.2%	-7.5%
2007-2011	0.091	0.76	10.96	1,587,852	1,141,691	297,799
2012-2016	0.095	0.77	12.27	2,094,183	1,502,727	376,695
% Difference	3.8%	2.2%	12.0%	31.9%	31.6%	26.5%

Both the commercial and industrial sectors show impressive reductions in use per customer in the first two alternatives. However, the industrial sector values are skewed by the questionable number of customers data. It is very concerning that during the period 2007 to 2016, when there was extensive energy efficiency investment, that the energy use per customer and gas sales in all three sectors went up significantly.

In the event that state-wide numbers hide better performance in New York City and on Long Island I did the same analysis but only included data from Brooklyn Union Gas and Keyspan (now National Grid) and Consolidated Edison. Because of the number of customers issue described above Table 3, New York City and Long Island Natural Gas System Customers, Natural Gas Sales, and Natural Gas Use per Customer Data and Trends, comparisons to the first year of data are suspect. Table 4 lists the change between the first eight-year averages and the second eight-year averages of the sixteen years of data available, the first five year averages and the last five year averages in the period of record, and the last five year averages relative to the proceeding five year averages.

Table 4: Alternate Natural Gas Use Trends Comparison for New York City and Long Island Only

	Gas Use (Sales per Customer)			Gas Sales (Millions of Cubic Feet)		
	Residential	**Commercial**	**Industrial**	**Residential**	**Commercial**	**Industrial**
2001-2008	0.083	0.85	3.16	1,694,435	1,544,006	34,635
2009-2016	0.093	0.81	1.36	1,950,940	1,480,626	42,170
% Difference	12.6%	-4.5%	-56.9%	15.1%	-4.1%	21.8%
2001-2005	0.082	0.94	17.01	1,045,922	1,041,882	17,584
2012-2016	0.10	0.82	1.31	1,258,543	949,814	25,211
% Difference	15.4%	-12.5%	-92.3%	20.3%	-8.8%	43.4%
2007-2011	0.088	0.78	1.39	915,288	696,820	23,443
2012-2016	0.095	0.82	1.31	1,258,543	949,814	25,211
% Difference	8.2%	5.5%	-5.3%	37.5%	36.3%	7.5%

In the first two comparisons commercial sector sales and use go down. Remember that there are issues with the number of industrial sector customers so the first two comparisons are suspect. On the other hand, residential and industrial sector gas sales go up for all three comparisons and gas use per customer goes up for all three comparisons in the residential sector.

Conclusion

In my opinion the best statistic to evaluate recent energy efficiency performance is gas use per customer measured as the change over the last five years relative to the five previous years. In Table 4 the residential and commercial sectors gas use per customer went up despite on-going energy efficiency efforts. In order to justify National Grid's high-demand (80% of future efficiency targets) and a low-demand scenario (100% of future efficiency targets) bounds to their analysis and the feasibility of the no-infrastructure project option for incremental energy efficiency it is incumbent on National Grid to explain why the residential and commercial sector gas use per customer has been increasing over the last ten years. If the Public Service Commission ultimately requires National Grid to include the incremental energy efficiency project as part of the solution it is up to them to show why the future results will differ from the recent past. Failure to do so will result in inadequate gas supplies at the time people need heat to survive.

Table 3: NYS & LI Natural Gas System Customers, Natural Gas Sales, and Natural Gas Use per Customer Data and Trends

	Number of Customers			Natural Gas Sales (Millions of Cubic Feet)			Gas Use (Sales per Customer)		
Year	Residential	Commercial	Industrial	Residential	Commercial	Industrial	Residential	Commercial	Industrial
2001	2,566,672	216,608	0	202,914	222,557	3,417	0.079	1.03	N/A
2002	2,572,723	219,324	46	193,060	252,725	3,807	0.075	1.15	82.76
2003	2,522,179	235,436	50	214,412	221,582	2,918	0.085	0.94	58.36
2004	2,496,251	215,606	55	208,958	182,423	1,309	0.084	0.85	23.80
2005	2,520,991	222,053	883	226,578	162,595	6,132	0.090	0.73	6.94
2006	2,609,775	243,805	838	197,757	155,341	5,083	0.076	0.64	6.07
2007	2,662,884	240,133	4,734	226,336	169,887	5,879	0.085	0.71	1.24
2008	2,575,231	219,860	4,369	224,420	176,896	6,090	0.087	0.80	1.39
2009	2,572,323	220,960	4,008	235,229	169,771	5,514	0.091	0.77	1.38
2010	2,589,656	222,666	3,668	229,303	180,266	5,961	0.089	0.81	1.63
2011	2,602,578	222,664	4,101	227,865	180,775	5,484	0.088	0.81	1.34
2012	2,611,930	224,455	3,476	211,266	170,006	4,707	0.081	0.76	1.35
2013	2,618,579	225,288	3,912	245,928	190,835	5,126	0.094	0.85	1.31
2014	2,628,033	231,910	3,933	272,883	200,345	5,448	0.104	0.86	1.39
2015	2,682,623	235,267	3,705	274,713	194,003	4,977	0.102	0.82	1.34
2016	2,684,460	237,980	4,181	253,753	194,625	4,953	0.095	0.82	1.18
	# of customers Since 2001			Natural Gas Sales Since 2001			Sales per Customer Since 2001		
Year	Residential	Commercial	Industrial	Residential	Commercial	Industrial	Residential	Commercial	Industrial
2002	0.2%	1.3%	N/A	-4.9%	13.6%	11.4%	-5.1%	12.1%	N/A
2003	-1.7%	8.7%	N/A	5.7%	-0.4%	-14.6%	7.5%	-8.4%	N/A
2004	-2.7%	-0.5%	N/A	3.0%	-18.0%	-61.7%	5.9%	-17.7%	N/A
2005	-1.8%	2.5%	N/A	11.7%	-26.9%	79.4%	13.7%	-28.7%	N/A
2006	1.7%	12.6%	N/A	-2.5%	-30.2%	48.7%	-4.2%	-38.0%	N/A
2007	3.7%	10.9%	N/A	11.5%	-23.7%	72.0%	7.5%	-31.1%	N/A
2008	0.3%	1.5%	N/A	10.6%	-20.5%	78.2%	10.2%	-21.7%	N/A
2009	0.2%	2.0%	N/A	15.9%	-23.7%	61.3%	15.7%	-25.2%	N/A
2010	0.9%	2.8%	N/A	13.0%	-19.0%	74.4%	12.0%	-21.2%	N/A
2011	1.4%	2.8%	N/A	12.3%	-18.8%	60.5%	10.7%	-21.0%	N/A
2012	1.8%	3.6%	N/A	4.1%	-23.6%	37.7%	2.3%	-26.3%	N/A
2013	2.0%	4.0%	N/A	21.2%	-14.3%	50.0%	18.8%	-17.6%	N/A
2014	2.4%	7.1%	N/A	34.5%	-10.0%	59.4%	31.3%	-15.9%	N/A
2015	4.5%	8.6%	N/A	35.4%	-12.8%	45.6%	29.5%	-19.7%	N/A
2016	4.6%	9.9%	N/A	25.1%	-12.6%	44.9%	19.6%	-20.4%	N/A