

May 6, 2016

VIA HAND DELIVERY & ELECTRONIC MAIL

Luly E. Massaro, Commission Clerk
Rhode Island Public Utilities Commission
89 Jefferson Boulevard
Warwick, RI 02888

**RE: Docket 4608 - Long-Range Gas Supply Plan
Forecast Period 2015/16 to 2024/25
Responses to Division Data Requests – Set 1**

Dear Ms. Massaro:

Enclosed are ten (10) copies of National Grid's¹ responses to the first set of data requests issued by the Division in the above-referenced docket.

Please be advised that the following responses in this set will be forthcoming: DIV 1-1, DIV 1-4, DIV 1-10, DIV 1-16, and DIV 1-19 through DIV 1-24.

Thank you for your attention to this transmittal. If you have any questions, please contact me at 401-784-7288.

Very truly yours,



Jennifer Brooks Hutchinson

Enclosure

cc: Docket 4608 Service List
Steve Scialabba, Division
Leo Wold, Esq.

¹ The Narragansett Electric Company d/b/a National Grid (the Company).

Certificate of Service

I hereby certify that a copy of the cover letter and any materials accompanying this certificate was electronically transmitted to the individuals listed below.

The paper copies of this filing are being hand delivered to the Rhode Island Public Utilities Commission and to the Rhode Island Division of Public Utilities and Carriers.



Joanne M. Scanlon

May 6, 2016

Date

**Docket No. 4608 – National Grid – Gas Long-Range Resource Plan
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Division 1-2

Request:

The second paragraph of the "Overview of Planning Results: on page 4 of the Company's March 10, 2016 LRP references "growth opportunities in non-traditional markets." Please:

- a. Identify the "non-traditional markets" to which the Company refers in the referenced paragraph;
- b. Indicate where in the filed LRP the influences of growth in such non-traditional markets are reflected; and
- c. Explain the methods used to quantify the influences of the identified "non-traditional markets."

Response:

- a. In addition to its traditional residential and commercial / industrial markets, the Company monitors developments in such markets as natural gas vehicles, seasonal firm gas sales, and large-scale power generation.
- b. As per the Company's discussion on page 4, the Company did not incorporate any incremental, non-traditional projects in these markets other than that which may be included in existing customer base.
- c. A non-traditional market development would not necessarily be a projected growth within an existing rate class and, therefore, would require separate modeling and addition to the Company's econometric forecast of its traditional markets.

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Issued on April 12, 2016

Division 1-3

Request:

The first full paragraph on page 5 of the March 10, 2016 LRP discusses the Company's use of a "14-day cold snap weather scenario." Page 38, Section IV.D.2., of the LRP also indicates that the Company took actual HDD data from an a January 2-15, 1981 event adjusted by +9 HDDs to construct its "cold snap scenario. Please:

- a. Identify timing in terms of the dates of the calendar days affected for each cold snap experienced by Rhode Island over the 40-year period (1976-2015) examined by the Company;
- b. Provide the length (in days) of the longest cold snap experienced by Rhode Island in each year over the 40-year period (1976-2015) examined by the Company;
- c. Provide the actual HDDs for the longest cold snap experienced by Rhode Island in each year of the 40-year period (1976-2015) examined by the Company.

Response:

- a. Based on the Company's cold snap duration of 14 days, the historical data are:

| <u>Beginning Date</u> | <u>Ending Date</u> | <u>Total HDD</u> |
|---------------------------|------------------------|----------------------|
| 1/11/1976 | 1/24/1976 | 650 |
| 1/11/1977 | 1/24/1977 | 660 |
| 1/29/1978 | 2/11/1978 | 656 |
| 2/6/1979 | 2/19/1979 | 777 |
| 1/24/1980 | 2/6/1980 | 592 |
| 1/2/1981 | 1/15/1981 | 739 |
| 1/9/1982 | 1/22/1982 | 718 |
| 1/13/1983 | 1/26/1983 | 536 |
| 1/11/1984 | 1/24/1984 | 648 |
| 1/9/1985 | 1/22/1985 | 663 |
| 12/17/1985 | 12/30/1985 | 546 |
| 1/17/1987 | 1/30/1987 | 586 |
| 1/3/1988 | 1/16/1988 | 639 |
| 12/6/1989 | 12/19/1989 | 531 |
| 12/17/1989 | 12/30/1989 | 663 |
| 1/1/1991 | 1/14/1991 | 516 |

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| | | |
|------------|-----------|-----|
| 1/15/1992 | 1/28/1992 | 571 |
| 1/27/1993 | 2/9/1993 | 563 |
| 1/14/1994 | 1/27/1994 | 647 |
| 2/2/1995 | 2/15/1995 | 572 |
| 1/3/1996 | 1/16/1996 | 593 |
| 1/7/1997 | 1/20/1997 | 547 |
| 1/14/1998 | 1/27/1998 | 466 |
| 12/30/1998 | 1/12/1999 | 556 |
| 1/14/2000 | 1/27/2000 | 670 |
| 12/23/2001 | 1/5/2002 | 575 |
| 12/26/2002 | 1/8/2003 | 490 |
| 1/15/2003 | 1/28/2003 | 644 |
| 1/14/2004 | 1/27/2004 | 679 |
| 1/16/2005 | 1/29/2005 | 668 |
| 2/18/2006 | 3/3/2006 | 543 |
| 2/3/2007 | 2/16/2007 | 590 |
| 2/10/2008 | 2/23/2008 | 510 |
| 1/14/2009 | 1/27/2009 | 611 |
| 12/29/2009 | 1/11/2010 | 558 |
| 1/21/2011 | 2/3/2011 | 605 |
| 1/9/2012 | 1/22/2012 | 490 |
| 1/21/2013 | 2/3/2013 | 544 |
| 1/17/2014 | 1/30/2014 | 585 |
| 2/11/2015 | 2/24/2015 | 673 |

- b. Since 'cold snap' has neither a defined time period nor a definition of its measurement of severity, the Company cannot specify the length of the longest cold snap by year.
- c. Since 'cold snap' has neither a defined time period nor a definition of its measurement of severity, the Company cannot specify the actual HDDs of the longest cold snap by year.

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Division 1-5

Request:

The March 10, **2016** LRP, Section IV.D.2., indicates at the bottom of page 38 that the 40-year mean for the 15 Jan – 28 Jan period is **602 HDD** with a standard deviation of 71.1 HDD. The Company's prior March 10, **2014** LRP represented that "the mean total HDD for the period 15 Jan - 28 Jan is **515 HDD** with a standard deviation of 93.9 HDD. With respect to the foregoing, please:

- a. Provide the data from which the above referenced "means" and "standard deviations" were computed.
- b. Explain the factors that cause the "mean" HDD for the periods examined to increase from 515 to 602 (i.e., an increase of 17%).

Response:

- a. Please refer to the Excel file labeled "4608-DIV 1-05-Attachment.xlsx", which is identified as Attachment DIV 1-5, and being provided on CD-ROM. The Tab entitled "2016-RI-ColdSnap" shows the Company's HDD data. Columns E-AW contains the daily HDD data for the KPVD weather station arranged in July 1 – June 30 split years. Columns AY-CQ contains the 14-day cumulative trailing HDD for the same time periods. Please note that the Company does not include leap days in this dataset.
- b. Attachment DIV 1-5, Tab entitled "2014-RI-ColdSnap", range E387:AU387 shows the annual cumulative HDD values for the 15-28 January intervals for the 43-year calendar year period 1971 to 2013 used in the Company's 2014 Long-Range Plan. The mean is 515; the standard deviation is 93.9. The January 15-28 period was selected based on the peak of the 14-day cumulative HDD of the daily mean HDDs (Column AX).

For the Company's 2016 Long-Range Plan, the Company had made three revisions to this process:

- 1) Basing the mean and standard deviation only on the most recent 40 split-years;
- 2) Using the maximum 14-day cumulative HDD per split-year; and,
- 3) Substituting its Gas Day HDD values beginning in 2007-08 in lieu of National Weather Service midnight-to-midnight HDDs to better align the weather data with its gas volume data.

Division 1-5, page 2

Attachment DIV 1-5, Tab entitled "2016-RI-ColdSnap", range AX377:CO377 shows the minor effects of these three process changes on the annual cumulative HDD values for the 15-28 January intervals for the 43-year *split-year* period 1971-72 to 2013-14. The mean is 512.28; the standard deviation is 91.36.

Attachment DIV 1-5, Tab entitled "2016-RI-ColdSnap", range BC372:CP372 shows the maximum annual cumulative HDD values for the 40-year period 1975-76 to 2014-15. The mean is 601.75; the standard deviation is 71.08. In its 2016 Long-Range Plan, the Company made the decision to use only the most recent 40 years of observations to balance the need for an adequate sample size with which to perform this calculation and the need to track the potential for long-term trend changes that could be caused by climate change.

The mean increased from 512.28 to 601.75 as a result of the dropping of 501, 353, 406, 466 and the addition of 673 to the data sample.

Please refer to the CD-ROM for Attachment DIV 1-5.

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Division 1-6

Request:

Section IV.D.2. Cold Snap Analysis states in the paragraph at the bottom of page 38 that “*The Company took HDD data for Jan 2-15, 1981 ... to arrive at its cold snap weather pattern.*” In the prior March 2014 LRP, the comparable discussion indicates that the Company used data for the period Jan 9-22, 1982 to arrive at its cold snap weather pattern. Please:

- a. Document the daily weather and HDD patterns for each referenced period:
 - i. Jan 2-15, 1981
 - ii. Jan 9-22, 1982
- b. Explain the Company's choice of the Jan 2-15, 1981 period for use in the current (March 2016) LRP;
- c. In the context of climate change/global warming concerns, provide the Company's assessment of the reasonableness and appropriateness of using a cold snap weather pattern from more than 30 years to represent a cold snap weather pattern for the projected period in its March 2016 LRP.

Response:

- a.
 - i. Referring to Attachment DIV 1-5, Tab entitled “2014-RI-ColdSnap”, in the Company's 2014 Long-Range Plan, the targeted cold snap cumulative HDD were 708 HDD. The Jan 9-22, 1982 daily HDDs (range AZ12:AZ25) totaled 718 HDD and served as a starting point for constructing its cold snap for that filing.
 - ii. Referring to Attachment DIV 1-5, Tab entitled “2016-RI-ColdSnap”, in the Company's 2016 Long-Range Plan, the targeted cold snap cumulative HDD were 748 HDD. The Jan 2-15, 1981 daily HDDs (range BH189:BH202) totaled 739 HDD and served as a starting point for constructing its cold snap for that filing.

Division 1-6, page 2

- b. Since the Company uses actual weather patterns (with only minor modification) for its cold snap scenario, the Jan 2-15, 1981 time period served as an acceptable starting point for the construction of its 2016 Long-Range Plan cold snap scenario.
- c. As stated in the Company's response to Division 1-5 (b), in its 2016 Long-Range Plan, the Company made the decision to use only the most recent 40 years of observations to balance the need for an adequate sample size with which to perform this calculation and the need to track the potential for long-term trend changes that could be caused by climate change.

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Division 1-7

Request:

Section III. Forecasting Methodology, at page 7, states, "*The high-case scenario is based on Moody's economy.com high economic growth case.*" Please:

- a. Provide the assumptions underlying the "*Moody's economy.com high economic growth case.*"
- b. Identify any assumptions underlying the referenced Moody's high economic growth case that are:
 - i. Specific to Rhode Island
 - ii. Specific to New England
- c. Provide documentation of all inputs derived from Moody's economy.com upon which the Company has relied in the preparation of its March 10, 2016 Long Range Plan;
- d. Provide completed copies of all Moody's documents, studies, and electronic files upon which the Company has relied in the preparation of its March 10, 2016 Long Range Plan.

Response:

- a. Please refer Attachment DIV 1-7-3, page 17, for a description of Moody's S8 Scenario that the Company selected for the high economic case in its 2016 Long-Range Plan. When selecting its high scenario, the Company relies on the cases with a 10 percent probability that the economy will perform better.
- b.
 - i. Please refer to the Excel file labeled "4608-DIV 1-07-Attachment-1.xlsx", which is identified as Attachment DIV 1-7-1 and is being provided on CD-ROM (or Chart III-B-2 of the Company's filing), for the economic data. Please refer to the Excel file labeled "4608-DIV 1-07-Attachment-2.xlsx", which is identified as Attachment DIV 1-7-2 and is being provided on CD-ROM, for the fuel price data specific to Rhode Island that the Company used in its 2016 Long-Range Plan.
 - ii. The Company did not construct equivalent data for the entire New England region.

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Division 1-7, page 2

- c. Please refer to Attachment DIV 1-7-1, Attachment DIV 1-7-2, and Attachment DIV 1-7-3.
- d. Please refer to Attachment DIV 1-7-1, Attachment DIV 1-7-2, and Attachment DIV 1-7-3.

Please refer to the CD-ROM for Attachments DIV 1-7-1 and DIV 1-7-2.



November 2015

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U.S. MACROECONOMIC OUTLOOK ALTERNATIVE SCENARIOS » Table of Contents

THE U.S. MACROECONOMIC OUTLOOK ALTERNATIVE SCENARIOS ARE WRITTEN BY EDWARD FRIEDMAN

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U.S. MACROECONOMIC OUTLOOK ALTERNATIVE SCENARIOS » Baseline Forecast Assumptions

Forecast Assumptions

BY MARK ZANDI

Monetary policy

The Federal Reserve is expected to begin normalizing interest rates at the mid-December Federal Open Market Committee meeting, raising short-term rates by 0.25 percentage point. Normalization will be a long process. To be consistent with an economy at full employment, the federal funds target rate needs to eventually rise to its estimated long-run equilibrium rate of 3.5%. But the Fed has said it will be slow to increase short-term rates, implying the funds rate will not normalize until well after the economy has returned to full employment. If the economy roughly follows the Moody's Analytics outlook, the economy will achieve full employment by mid-2016 and short-term interest rates will not normalize until mid-2018.

Normalization also means that the Fed will allow its balance sheet to diminish. The balance sheet swelled to nearly \$4.5 trillion in Treasury and mortgage securities as a result of four rounds of quantitative easing. In a full-employment economy, the Fed's balance sheet should be closer to \$1 trillion.

Long-term yields will not normalize until global central banks end their quantitative easing programs and the Fed's balance sheet shrinks, probably early in the next decade. If interest rates follow this path, the economy should be able to handle the increase reasonably gracefully. Lower unemployment and stronger wage growth should largely trump the impact of higher mortgage rates on the housing market, and steadily rising corporate earnings should underpin stock prices.

In theory, the Fed should be able to manage the normalization of monetary policy, carefully calibrating its balance sheet and clearly explaining its actions to bond investors to adjust interest rates. Empirical evidence from the Fed's management of earlier quantitative easing rounds also suggests that long-term rates need not spike as the Fed normalizes policy.

Fiscal policy

The federal government's situation continues to improve. Lawmakers recently

reached a budget deal that sets tax and spending policy into early 2017. The Treasury debt limit was also increased so that it will not be an issue until then. Political brinkmanship over the budget will not be a threat to the economy until 2017 at the earliest.

Based on the budget deal and the economic outlook, the federal budget deficit should come in near \$400 billion this fiscal year, equal to 2.25% of GDP. Thus, fiscal policy will be a small positive for growth in 2016, adding about 0.2 percentage point to real GDP growth. Under current fiscal policy, Washington will come close to the goal of achieving fiscal sustainability—future budget deficits that are small enough (near 3% of GDP) that the nation's debt-to-GDP ratio stabilizes, at least through the remainder of the decade. This will be enough to satisfy financial markets and allow the recovery to gain traction as anticipated in the Moody's Analytics baseline outlook.

Deficits and debt will begin to mount again early in the next decade given prospects for large increases in entitlement spending. Medicare and Medicaid spending is likely to increase significantly. Further policy changes will need to be made and are assumed in the outlook.

U.S. dollar

The U.S. dollar has strengthened substantially against nearly all other currencies over the past year. On a real broad trade-weighted basis, it is up nearly 15% from last summer. The strong U.S. dollar reflects stronger U.S. economic growth and prospects for monetary tightening, and disappointing growth and monetary easing in much of the rest of the world.

Further dollar appreciation is likely, particularly against the euro. Behind this outlook is the expectation that the Federal Reserve will normalize U.S. monetary policy by mid-2018, but the European Central Bank will not be able to normalize policy until near decade's end. While the long-run fair value euro/dollar exchange rate is an

estimated \$1.25, the euro is expected to fall briefly below parity with the dollar by this time next year.

The dollar will also appreciate further against the Japanese yen, which has fallen sharply in value to near ¥125. Further yen depreciation is expected through mid-decade given Japan's economic struggles, with the yen/dollar rate peaking at close to ¥140.

The dollar is also expected to remain strong against the currencies of most emerging economies as the Fed normalizes monetary policy, but to depreciate slowly and unevenly against these currencies over the long run. On a real broad trade-weighted basis, the dollar has remained remarkably stable in recent years and this relative stability is expected to prevail in the long run. The dollar will remain the global economy's principal reserve currency for the foreseeable future.

Energy prices

Oil prices have declined from more than \$100 per barrel in summer 2014 to well less than \$50 per barrel. Behind the slump in oil prices was the previous ramp-up in global oil production, particularly among U.S. and Canadian shale oil producers, and the decision by Saudi Arabia not to curtail its production to accommodate the greater North American production.

Oil prices are thought to be near their bottom and are expected to make their way slowly back. Underlying this outlook is the already-apparent sharp pullback in investment in North American shale oil production.

Global oil demand should also get a lift from the lower prices. This is illustrated by the recent strength of vehicle sales in the U.S. Still, oil prices are not expected to top \$100 per barrel for another decade.

Natural gas prices will remain low, particularly compared with oil prices, for the next decade. There is a substantial glut of natural gas as demand has not fully recovered from the recession and supply has increased given the surge in shale gas production.

U.S. MACROECONOMIC OUTLOOK ALTERNATIVE SCENARIOS » Baseline Forecast Summary

| U.S. MACRO BASELINE FORECAST SUMMARY | | | | | | | | | | |
|--------------------------------------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| | Units | 15Q4 | 16Q1 | 16Q2 | 16Q3 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Gross Domestic Product | bcw\$ | 16,512.1 | 16,648.8 | 16,782.0 | 16,910.0 | 16,354.3 | 16,843.4 | 17,355.3 | 17,818.2 | 18,186.3 |
| Change | %AR | 2.9 | 3.4 | 3.2 | 3.1 | 2.5 | 3.0 | 3.0 | 2.7 | 2.1 |
| Federal Budget | \$ bil | -186.5 | -284.4 | 100.7 | -142.1 | -448.7 | -543.8 | -695.3 | -761.8 | -739.8 |
| Total Employment | mil | 142.9 | 143.5 | 144.1 | 144.8 | 141.9 | 144.5 | 147.3 | 150.0 | 151.9 |
| Change | %AR | 1.7 | 1.7 | 1.9 | 1.9 | 2.1 | 1.8 | 2.0 | 1.9 | 1.2 |
| Unemployment Rate | % | 4.9 | 4.9 | 4.9 | 5.0 | 5.3 | 4.9 | 4.9 | 4.8 | 4.7 |
| Light Vehicle Sales | mil, SAAR | 17.5 | 17.3 | 17.2 | 17.1 | 17.3 | 17.2 | 16.8 | 16.6 | 16.6 |
| Residential Housing Starts | mil, SAAR | 1.28 | 1.38 | 1.46 | 1.51 | 1.14 | 1.47 | 1.78 | 1.79 | 1.68 |
| Median Existing-Home Price | \$ ths | 222.9 | 224.9 | 226.7 | 228.3 | 220.6 | 227.4 | 232.4 | 236.0 | 243.4 |
| Change | %YA | 5.2 | 3.1 | 2.4 | 3.8 | 6.5 | 3.1 | 2.2 | 1.6 | 3.1 |
| Consumer Price Index | %AR | 1.1 | 2.0 | 2.5 | 2.4 | 0.2 | 2.0 | 2.8 | 3.0 | 2.8 |
| Federal Funds Rate | % | 0.2 | 0.3 | 0.7 | 0.8 | 0.1 | 0.7 | 2.1 | 3.7 | 3.7 |
| Treasury Yield: 10-Yr Bond | % | 2.32 | 2.58 | 2.82 | 3.17 | 2.17 | 2.97 | 4.00 | 4.18 | 4.11 |
| Baa Corp. - 10-Yr Treasury | DIFF | 2.9 | 3.0 | 3.0 | 3.1 | 2.8 | 3.1 | 3.2 | 3.1 | 3.0 |
| Corporate Profits With IVA & CCA | \$ bil | 2,156.8 | 2,227.2 | 2,282.7 | 2,311.4 | 2,086.7 | 2,276.4 | 2,307.5 | 2,427.8 | 2,523.0 |
| Change | %YA | 1.0 | 10.7 | 9.6 | 10.4 | 0.7 | 9.1 | 1.4 | 5.2 | 3.9 |
| S&P 500 | 1941=10 | 2,053.3 | 2,065.0 | 2,096.6 | 2,122.0 | 2,061.2 | 2,110.6 | 2,230.3 | 2,393.0 | 2,530.4 |
| Change | %YA | 2.0 | 0.1 | -0.3 | 4.7 | 6.8 | 2.4 | 5.7 | 7.3 | 5.7 |

U.S. MACROECONOMIC OUTLOOK ALTERNATIVE SCENARIOS » Scenario 1

Stronger Near-Term Rebound (“S1”) Scenario

This above-baseline scenario is designed so that there is a 10% probability that the economy will perform better than in this scenario, broadly speaking, and a 90% probability that it will perform worse.

The upside scenario, “Stronger Near-Term Rebound,” is based on the assumption that the persistence of lower energy prices than projected six months ago boosts household confidence, consumer spending and housing more than expected. Moreover, the euro zone begins to recover faster than the baseline projection, boosting U.S. exports, business sentiment, and therefore nonresidential investment. As a result, payroll employment accelerates faster than in the baseline.

The Federal Reserve begins the process of normalizing monetary policy, but financial markets absorb the changes smoothly, and the path of increase in the 10-year Treasury yield is not much different from the baseline. The Fed begins to raise the federal funds rate in the fourth quarter of 2015, but the pace of increase is a bit faster and the level remains higher than in the baseline until it comes close to 4% by early 2018. The gradual nature of the increases is accommodative to growth, and the expansion of credit supports above-baseline gains in the economy.

As a result, house prices rise a bit faster than in the baseline in late 2015 and early

2016. Stronger demand and household confidence raise the pace of new housing permits above the baseline in 2016 through 2017.

The stronger near-term growth in real GDP results in additional hiring compared with the baseline so that the unemployment rate declines somewhat more. Whereas the unemployment rate is about 5% in mid-2016 in the baseline, it drops to 4.6% in S1.

Real GDP rises more than a percentage point faster than in the baseline over the coming year. On an annual average basis, real GDP growth is 4% in 2016 and 3.3% in 2017, compared with 3% in both years in the baseline.

U.S. MACROECONOMIC OUTLOOK ALTERNATIVE SCENARIOS » Scenario 1

| U.S. MACRO S1 SCENARIO—DIFFERENCE FROM BASELINE | | | | | | | | | | |
|---|-----------|-------|-------|-------|-------|-------|-------|-------|------|------|
| | Units | 15Q4 | 16Q1 | 16Q2 | 16Q3 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Gross Domestic Product | bcw\$ | 0.0 | 66.2 | 125.5 | 205.6 | 0.0 | 163.0 | 212.6 | 42.4 | 18.5 |
| Change | %AR | 0.0 | 1.7 | 1.4 | 1.9 | 0.0 | 1.0 | 0.3 | -1.0 | -0.1 |
| Federal Budget | \$ bil | 0.0 | 5.8 | 13.8 | 21.3 | 0.0 | 67.0 | 102.3 | 33.6 | 10.8 |
| Total Employment | mil | 0.0 | 0.4 | 0.7 | 0.9 | 0.0 | 0.7 | 0.8 | 0.5 | 0.1 |
| Change | %AR | 0.0 | 1.0 | 0.9 | 0.5 | 0.0 | 0.5 | 0.1 | -0.2 | -0.3 |
| Unemployment Rate | % | -0.0 | -0.1 | -0.3 | -0.4 | -0.0 | -0.3 | -0.2 | -0.1 | -0.0 |
| Light Vehicle Sales | mil, SAAR | 0.0 | 0.2 | 0.7 | 0.9 | 0.0 | 0.7 | 0.9 | 0.2 | -0.0 |
| Residential Housing Starts | mil, SAAR | -0.00 | 0.04 | 0.10 | 0.12 | -0.00 | 0.09 | 0.08 | 0.08 | 0.01 |
| Median Existing-Home Price | \$ ths | 0.0 | 1.5 | 4.0 | 5.1 | 0.0 | 3.9 | 3.5 | 2.9 | 1.0 |
| Change | %YA | 0.0 | 0.7 | 1.8 | 2.3 | 0.0 | 1.8 | -0.2 | -0.3 | -0.8 |
| Consumer Price Index | %AR | 0.0 | 1.2 | 1.4 | 1.2 | 0.0 | 0.8 | 0.2 | -0.7 | -0.3 |
| Federal Funds Rate | % | 0.0 | 0.2 | 0.3 | 0.5 | 0.0 | 0.4 | 0.5 | 0.2 | 0.0 |
| Treasury Yield: 10-Yr Bond | % | 0.00 | -0.22 | 0.00 | 0.10 | 0.00 | 0.01 | 0.19 | 0.12 | 0.02 |
| Baa Corp. - 10-Yr Treasury | DIFF | -0.0 | -0.1 | -0.2 | -0.1 | -0.0 | -0.1 | -0.1 | 0.1 | 0.0 |
| Corporate Profits With IVA & CCA | \$ bil | 0.0 | 17.5 | 30.6 | 53.1 | 0.0 | 48.6 | 134.3 | 14.9 | 1.7 |
| Change | %YA | 0.0 | 0.9 | 1.5 | 2.5 | 0.0 | 2.3 | 3.7 | -5.2 | -0.6 |
| S&P 500 | 1941=10 | 0.0 | 12.6 | 103.6 | 97.5 | 0.0 | 78.6 | 48.3 | -1.1 | -1.0 |
| Change | %YA | 0.0 | 0.6 | 4.9 | 4.8 | 0.0 | 3.8 | -1.6 | -2.3 | 0.0 |

| U.S. MACRO S1 SCENARIO—FORECAST SUMMARY | | | | | | | | | | |
|---|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| | Units | 15Q4 | 16Q1 | 16Q2 | 16Q3 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Gross Domestic Product | bcw\$ | 16,512.1 | 16,715.0 | 16,907.4 | 17,115.6 | 16,354.3 | 17,006.4 | 17,567.9 | 17,860.5 | 18,204.8 |
| Change | %AR | 2.9 | 5.0 | 4.7 | 5.0 | 2.5 | 4.0 | 3.3 | 1.7 | 1.9 |
| Federal Budget | \$ bil | -186.5 | -278.6 | 114.6 | -120.8 | -448.7 | -476.8 | -593.0 | -728.1 | -729.0 |
| Total Employment | mil | 142.9 | 143.8 | 144.8 | 145.7 | 141.9 | 145.2 | 148.1 | 150.6 | 152.0 |
| Change | %AR | 1.7 | 2.7 | 2.7 | 2.5 | 2.1 | 2.3 | 2.0 | 1.6 | 0.9 |
| Unemployment Rate | % | 4.9 | 4.8 | 4.6 | 4.6 | 5.3 | 4.6 | 4.7 | 4.7 | 4.7 |
| Light Vehicle Sales | mil, SAAR | 17.5 | 17.6 | 17.8 | 18.0 | 17.3 | 17.8 | 17.6 | 16.8 | 16.6 |
| Residential Housing Starts | mil, SAAR | 1.28 | 1.42 | 1.56 | 1.63 | 1.14 | 1.56 | 1.86 | 1.87 | 1.69 |
| Median Existing-Home Price | \$ ths | 222.9 | 226.3 | 230.7 | 233.4 | 220.6 | 231.3 | 236.0 | 238.9 | 244.3 |
| Change | %YA | 5.2 | 3.8 | 4.2 | 6.1 | 6.5 | 4.9 | 2.0 | 1.2 | 2.3 |
| Consumer Price Index | %AR | 1.1 | 3.2 | 3.9 | 3.6 | 0.2 | 2.8 | 2.9 | 2.3 | 2.5 |
| Federal Funds Rate | % | 0.2 | 0.5 | 0.9 | 1.3 | 0.1 | 1.1 | 2.6 | 3.9 | 3.7 |
| Treasury Yield: 10-Yr Bond | % | 2.32 | 2.35 | 2.82 | 3.27 | 2.17 | 2.98 | 4.19 | 4.30 | 4.13 |
| Baa Corp. - 10-Yr Treasury | DIFF | 2.9 | 2.9 | 2.9 | 3.0 | 2.8 | 3.0 | 3.1 | 3.1 | 3.0 |
| Corporate Profits With IVA & CCA | \$ bil | 2,156.8 | 2,244.8 | 2,313.3 | 2,364.5 | 2,086.7 | 2,325.0 | 2,441.8 | 2,442.6 | 2,524.7 |
| Change | %YA | 1.0 | 11.5 | 11.1 | 12.9 | 0.7 | 11.4 | 5.0 | 0.0 | 3.4 |
| S&P 500 | 1941=10 | 2,053.3 | 2,077.6 | 2,200.2 | 2,219.5 | 2,061.2 | 2,189.3 | 2,278.6 | 2,391.9 | 2,529.4 |
| Change | %YA | 2.0 | 0.7 | 4.7 | 9.5 | 6.8 | 6.2 | 4.1 | 5.0 | 5.7 |

U.S. MACROECONOMIC OUTLOOK ALTERNATIVE SCENARIOS » Scenario 2

Slower Near-Term Recovery (“S2”) Scenario

In this slow-growth scenario, there is a 75% probability that economic conditions will be better, broadly speaking, and a 25% probability that conditions will be worse.

The downside 25% scenario, “Slower Near-Term Recovery,” is based on a number of assumptions. First, the high value of the dollar limits the rebound in exports more than expected, and so do the deceleration in China and slower than expected growth in the euro zone. Second, low oil prices do not boost consumer spending because households hold off, anticipating that oil and gasoline prices will rebound.

Third, financial markets worry that the Fed will raise the federal funds rate more aggressively than anticipated. As a result, the 10-year Treasury bond yield rises more than anticipated in the first quarter of 2016, to 2.9% on a quarterly average basis, slowing the recovery in housing. The U.S. economy expands more slowly over the coming year than in the baseline, though it avoids recession. The stock market declines modestly during the first half of 2016, causing business investment to grow more slowly than in the baseline during that time.

Below-baseline real GDP growth causes the unemployment rate to rise slightly, to about 5.5% by the end of 2016. House prices

are essentially flat throughout 2016. Unit car sales drop back in the 16.8 million range, leaving sales 300,000 units per year below that of the baseline throughout 2016.

Over the course of 2016, real GDP rises more than a percentage point, more slowly than in the baseline. To support the economy, the Fed does not begin to raise the federal funds rate significantly until the fourth quarter of 2016, four quarters later than in the baseline.

Later in 2016, the U.S. economy begins to expand more strongly, especially as the European recovery gains traction, lifting exports. On an annual average basis, real GDP growth is 1.6% in 2016 and 2.5% in 2017.

U.S. MACROECONOMIC OUTLOOK ALTERNATIVE SCENARIOS » Scenario 2

| U.S. MACRO S2 SCENARIO—DIFFERENCE FROM BASELINE | | | | | | | | | | |
|---|-----------|-------|--------|--------|--------|-------|--------|--------|--------|-------|
| | Units | 15Q4 | 16Q1 | 16Q2 | 16Q3 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Gross Domestic Product | bcw\$ | 0.0 | -108.0 | -190.3 | -262.7 | 0.0 | -220.1 | -314.8 | -124.8 | -27.7 |
| Change | %AR | 0.0 | -2.7 | -2.0 | -1.7 | 0.0 | -1.3 | -0.5 | 1.2 | 0.6 |
| Federal Budget | \$ bil | 0.0 | -10.6 | -24.9 | -36.1 | 0.0 | -113.6 | -170.2 | -79.0 | -18.5 |
| Total Employment | mil | 0.0 | -0.5 | -1.1 | -1.8 | 0.0 | -1.4 | -2.9 | -1.4 | -0.3 |
| Change | %AR | 0.0 | -1.4 | -1.6 | -2.0 | 0.0 | -1.0 | -1.0 | 1.1 | 0.8 |
| Unemployment Rate | % | -0.0 | 0.2 | 0.4 | 0.5 | -0.0 | 0.4 | 0.4 | 0.0 | 0.0 |
| Light Vehicle Sales | mil, SAAR | 0.0 | -0.3 | -0.4 | -0.3 | 0.0 | -0.3 | -0.2 | -0.0 | -0.0 |
| Residential Housing Starts | mil, SAAR | -0.00 | -0.07 | -0.16 | -0.21 | -0.00 | -0.17 | -0.15 | -0.05 | -0.01 |
| Median Existing-Home Price | \$ ths | 0.0 | -2.5 | -4.6 | -6.4 | 0.0 | -5.1 | -5.0 | -0.4 | -0.0 |
| Change | %YA | 0.0 | -1.2 | -2.1 | -2.9 | 0.0 | -2.3 | 0.1 | 2.1 | 0.2 |
| Consumer Price Index | %AR | 0.0 | -0.6 | -0.8 | -0.7 | 0.0 | -0.4 | -0.3 | 0.4 | 0.2 |
| Federal Funds Rate | % | 0.0 | -0.2 | -0.5 | -0.5 | 0.0 | -0.4 | -0.4 | -0.2 | -0.1 |
| Treasury Yield: 10-Yr Bond | % | 0.00 | 0.35 | 0.00 | -0.61 | 0.00 | -0.22 | -0.75 | -0.04 | -0.02 |
| Baa Corp. - 10-Yr Treasury | DIFF | -0.0 | -0.0 | 0.1 | 0.2 | -0.0 | 0.2 | 0.3 | -0.0 | -0.1 |
| Corporate Profits With IVA & CCA | \$ bil | 0.0 | -56.6 | -139.0 | -193.5 | 0.0 | -147.0 | -140.4 | -77.3 | -2.5 |
| Change | %YA | 0.0 | -2.8 | -6.7 | -9.2 | 0.0 | -7.0 | 0.4 | 3.2 | 3.3 |
| S&P 500 | 1941=10 | 0.0 | -23.1 | -73.4 | -95.0 | 0.0 | -70.4 | -59.0 | -3.4 | -0.9 |
| Change | %YA | 0.0 | -1.1 | -3.5 | -4.7 | 0.0 | -3.4 | 0.8 | 2.8 | 0.1 |

| U.S. MACRO S2 SCENARIO—FORECAST SUMMARY | | | | | | | | | | |
|---|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| | Units | 15Q4 | 16Q1 | 16Q2 | 16Q3 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Gross Domestic Product | bcw\$ | 16,512.1 | 16,540.8 | 16,591.6 | 16,647.3 | 16,354.3 | 16,623.3 | 17,040.5 | 17,693.3 | 18,158.6 |
| Change | %AR | 2.9 | 0.7 | 1.2 | 1.3 | 2.5 | 1.6 | 2.5 | 3.8 | 2.6 |
| Federal Budget | \$ bil | -186.5 | -295.1 | 75.8 | -178.2 | -448.7 | -657.4 | -865.5 | -840.8 | -758.3 |
| Total Employment | mil | 142.9 | 143.0 | 143.1 | 143.0 | 141.9 | 143.1 | 144.4 | 148.6 | 151.6 |
| Change | %AR | 1.7 | 0.3 | 0.2 | -0.1 | 2.1 | 0.8 | 0.9 | 2.9 | 2.0 |
| Unemployment Rate | % | 4.9 | 5.0 | 5.3 | 5.5 | 5.3 | 5.3 | 5.3 | 4.8 | 4.7 |
| Light Vehicle Sales | mil, SAAR | 17.5 | 17.0 | 16.7 | 16.8 | 17.3 | 16.8 | 16.5 | 16.6 | 16.6 |
| Residential Housing Starts | mil, SAAR | 1.28 | 1.30 | 1.30 | 1.30 | 1.14 | 1.31 | 1.62 | 1.75 | 1.67 |
| Median Existing-Home Price | \$ ths | 222.9 | 222.4 | 222.1 | 221.9 | 220.6 | 222.3 | 227.4 | 235.6 | 243.4 |
| Change | %YA | 5.2 | 2.0 | 0.4 | 0.8 | 6.5 | 0.8 | 2.3 | 3.6 | 3.3 |
| Consumer Price Index | %AR | 1.1 | 1.4 | 1.7 | 1.7 | 0.2 | 1.6 | 2.5 | 3.4 | 3.0 |
| Federal Funds Rate | % | 0.2 | 0.1 | 0.1 | 0.4 | 0.1 | 0.3 | 1.7 | 3.5 | 3.6 |
| Treasury Yield: 10-Yr Bond | % | 2.32 | 2.92 | 2.82 | 2.56 | 2.17 | 2.75 | 3.25 | 4.13 | 4.09 |
| Baa Corp. - 10-Yr Treasury | DIFF | 2.9 | 3.0 | 3.1 | 3.4 | 2.8 | 3.2 | 3.5 | 3.1 | 2.9 |
| Corporate Profits With IVA & CCA | \$ bil | 2,156.8 | 2,170.6 | 2,143.8 | 2,117.9 | 2,086.7 | 2,129.4 | 2,167.1 | 2,350.5 | 2,520.5 |
| Change | %YA | 1.0 | 7.9 | 2.9 | 1.1 | 0.7 | 2.0 | 1.8 | 8.5 | 7.2 |
| S&P 500 | 1941=10 | 2,053.3 | 2,041.9 | 2,023.2 | 2,026.9 | 2,061.2 | 2,040.2 | 2,171.3 | 2,389.7 | 2,529.5 |
| Change | %YA | 2.0 | -1.0 | -3.7 | 0.0 | 6.8 | -1.0 | 6.4 | 10.1 | 5.9 |

U.S. MACROECONOMIC OUTLOOK ALTERNATIVE SCENARIOS » Scenario 3

Moderate Recession (“S3”) Scenario

In this recession scenario, there is a 90% probability that the economy will perform better, broadly speaking, and a 10% probability that it will perform worse.

The downside 10% scenario, “Moderate Recession,” is based on a number of assumptions. First, stock and risky bond markets sell off on concerns that the Chinese economy will slow substantially, leading to a significant slowdown throughout Asia. Besides reducing U.S. exports to Asia, this causes oil prices to fall, lowering business investment in energy exploration. Moreover, the reduction in business sentiment overall lowers other business investment spending. Second, bond investors believe that the Fed will mistakenly begin raising the fed funds rate anyway, and so there is also a selloff in the Treasury bond market. The 10-year Treasury yield jumps to 3.25% in the first quarter of 2016 and higher than that intra-quarter. Higher borrowing costs cause home sales to decline.

The dollar strengthens more than in the baseline and the euro zone drops back into

recession, contributing to the economic and financial stress faced by heavily indebted nations in the region, especially Greece. These developments lower U.S. exports to Europe.

The combination of weaker exports and business investment drives the U.S. economy into a second recession that begins in the first quarter of 2016. Corporate bond spreads rise well above the baseline trend, lowering business investment further. However, the downturn causes foreign investors to once again see dollar-denominated securities as a safe haven, causing Treasury bond yields to decline again. The recession is less severe than the 2008-2009 downturn but lasts through the fourth quarter of 2016.

Rising unemployment during the recession causes housing to decline even after mortgage interest rates decrease. Reduced federal support to housing relative to that in the 2008-2009 recession contributes to the weakness, as does a lack of mortgage credit availability. House prices, as measured by the National Association of Realtors me-

dian sale price, drop cumulatively by 9.1% from the fourth quarter of 2015 to the first quarter of 2017. However, the trough is well above that of 2011 following the Great Recession. Housing starts fall from the third quarter of 2015, cumulatively declining by about 25% by the end of 2016. Unit auto sales decline starting in the fourth quarter of 2015 to a trough of about 14.6 million units by late 2016. Low capacity utilization in manufacturing and weak demand cause business investment to fall significantly throughout 2016 and early 2017.

The recovery begins in the first quarter of 2017. With the economy weak, the Fed keeps the fed funds target rate near 0% until mid-2017, more than a year and a half later than in the baseline. The cumulative peak-to-trough decrease in real GDP is 2.2%. The change in real GDP, on an annual average basis, is -0.5% in 2016 and 0.1% in 2017. The contraction in the labor market causes the unemployment rate to peak at 8.2% in the first quarter of 2017.

U.S. MACROECONOMIC OUTLOOK ALTERNATIVE SCENARIOS » Scenario 3

| U.S. MACRO S3 SCENARIO—DIFFERENCE FROM BASELINE | | | | | | | | | | |
|---|-----------|-------|--------|--------|--------|-------|--------|---------|--------|--------|
| | Units | 15Q4 | 16Q1 | 16Q2 | 16Q3 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Gross Domestic Product | bcw\$ | 0.0 | -236.6 | -470.6 | -678.4 | 0.0 | -565.4 | -1061.3 | -964.6 | -556.4 |
| Change | %AR | 0.0 | -5.8 | -5.7 | -5.0 | 0.0 | -3.5 | -2.9 | 0.8 | 2.5 |
| Federal Budget | \$ bil | 0.0 | -29.0 | -68.4 | -105.2 | 0.0 | -332.0 | -610.9 | -595.6 | -429.5 |
| Total Employment | mil | 0.0 | -1.0 | -3.0 | -5.1 | 0.0 | -4.0 | -8.2 | -7.8 | -5.4 |
| Change | %AR | 0.0 | -2.9 | -5.6 | -5.7 | 0.0 | -2.8 | -2.9 | 0.4 | 1.7 |
| Unemployment Rate | % | -0.0 | 0.8 | 1.7 | 2.6 | -0.0 | 2.0 | 2.9 | 2.0 | 1.3 |
| Light Vehicle Sales | mil, SAAR | 0.0 | -1.0 | -2.0 | -2.3 | 0.0 | -1.9 | -1.8 | -0.7 | -0.3 |
| Residential Housing Starts | mil, SAAR | -0.00 | -0.13 | -0.33 | -0.52 | -0.00 | -0.40 | -0.75 | -0.45 | -0.19 |
| Median Existing-Home Price | \$ ths | 0.0 | -6.1 | -14.5 | -20.7 | 0.0 | -16.6 | -26.3 | -18.3 | -8.8 |
| Change | %YA | 0.0 | -2.8 | -6.5 | -9.4 | 0.0 | -7.5 | -4.4 | 4.0 | 4.7 |
| Consumer Price Index | %AR | 0.0 | -2.1 | -2.6 | -2.8 | 0.0 | -1.5 | -1.4 | -0.0 | 0.4 |
| Federal Funds Rate | % | 0.0 | -0.2 | -0.5 | -0.7 | 0.0 | -0.6 | -1.6 | -1.7 | -0.4 |
| Treasury Yield: 10-Yr Bond | % | 0.00 | 0.68 | 0.00 | -0.77 | 0.00 | -0.29 | -1.69 | -1.05 | -0.23 |
| Baa Corp. - 10-Yr Treasury | DIFF | -0.0 | 0.2 | 0.5 | 0.8 | -0.0 | 0.6 | 0.7 | 0.2 | -0.1 |
| Corporate Profits With IVA & CCA | \$ bil | 0.0 | -135.2 | -319.2 | -455.2 | 0.0 | -347.9 | -475.8 | -445.9 | -305.2 |
| Change | %YA | 0.0 | -6.7 | -15.3 | -21.7 | 0.0 | -16.7 | -6.4 | 3.0 | 8.0 |
| S&P 500 | 1941=10 | 0.0 | -155.0 | -282.9 | -352.4 | 0.0 | -289.9 | -375.3 | -302.8 | -203.3 |
| Change | %YA | 0.0 | -7.5 | -13.5 | -17.4 | 0.0 | -14.1 | -3.8 | 5.4 | 5.6 |

| U.S. MACRO S3 SCENARIO—FORECAST SUMMARY | | | | | | | | | | |
|---|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| | Units | 15Q4 | 16Q1 | 16Q2 | 16Q3 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Gross Domestic Product | bcw\$ | 16,512.1 | 16,412.2 | 16,311.3 | 16,231.5 | 16,354.3 | 16,278.0 | 16,294.0 | 16,853.6 | 17,629.8 |
| Change | %AR | 2.9 | -2.4 | -2.4 | -1.9 | 2.5 | -0.5 | 0.1 | 3.4 | 4.6 |
| Federal Budget | \$ bil | -186.5 | -313.4 | 32.3 | -247.3 | -448.7 | -875.8 | -1,306.2 | -1,357.3 | -1,169.3 |
| Total Employment | mil | 142.9 | 142.4 | 141.1 | 139.7 | 141.9 | 140.5 | 139.1 | 142.3 | 146.5 |
| Change | %AR | 1.7 | -1.2 | -3.7 | -3.8 | 2.1 | -1.0 | -0.9 | 2.2 | 2.9 |
| Unemployment Rate | % | 4.9 | 5.6 | 6.6 | 7.6 | 5.3 | 6.9 | 7.8 | 6.8 | 6.0 |
| Light Vehicle Sales | mil, SAAR | 17.5 | 16.4 | 15.2 | 14.8 | 17.3 | 15.2 | 15.0 | 15.9 | 16.4 |
| Residential Housing Starts | mil, SAAR | 1.28 | 1.25 | 1.13 | 0.99 | 1.14 | 1.07 | 1.03 | 1.35 | 1.49 |
| Median Existing-Home Price | \$ ths | 222.9 | 218.8 | 212.2 | 207.6 | 220.6 | 210.8 | 206.1 | 217.7 | 234.6 |
| Change | %YA | 5.2 | 0.4 | -4.1 | -5.6 | 6.5 | -4.4 | -2.2 | 5.6 | 7.8 |
| Consumer Price Index | %AR | 1.1 | -0.1 | -0.1 | -0.4 | 0.2 | 0.5 | 1.4 | 3.0 | 3.2 |
| Federal Funds Rate | % | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.5 | 2.0 | 3.4 |
| Treasury Yield: 10-Yr Bond | % | 2.32 | 3.25 | 2.82 | 2.40 | 2.17 | 2.68 | 2.31 | 3.12 | 3.88 |
| Baa Corp. - 10-Yr Treasury | DIFF | 2.9 | 3.2 | 3.5 | 3.9 | 2.8 | 3.6 | 3.8 | 3.2 | 2.8 |
| Corporate Profits With IVA & CCA | \$ bil | 2,156.8 | 2,092.1 | 1,963.5 | 1,856.2 | 2,086.7 | 1,928.5 | 1,831.7 | 1,981.9 | 2,217.8 |
| Change | %YA | 1.0 | 4.0 | -5.7 | -11.4 | 0.7 | -7.6 | -5.0 | 8.2 | 11.9 |
| S&P 500 | 1941=10 | 2,053.3 | 1,910.0 | 1,813.8 | 1,769.6 | 2,061.2 | 1,820.8 | 1,855.0 | 2,090.2 | 2,327.1 |
| Change | %YA | 2.0 | -7.4 | -13.7 | -12.7 | 6.8 | -11.7 | 1.9 | 12.7 | 11.3 |

U.S. MACROECONOMIC OUTLOOK ALTERNATIVE SCENARIOS » Scenario 4

Protracted Slump (“S4”) Scenario

In this recession scenario, there is a 96% probability that the economy will perform better, broadly speaking, and a 4% probability that it will perform worse.

The downside 4% scenario, “Protracted Slump,” is caused by multiple factors. First, stock markets sell off as evidence builds that Chinese economic growth has declined a lot, leading to declines elsewhere in Asia. U.S. exports to Asia fall, as do oil prices, lowering business investment in energy exploration. At the same time, the Fed mishandles its communications and financial markets become convinced that it will aggressively raise the federal funds rate faster and further than expected. As a result, the 10-year Treasury yield jumps to 3.55% on a quarterly average basis in the first quarter of 2016 and higher than that intra-quarter. This leads the value of the dollar to rise above the baseline path and causes financial volatility to rise sharply, and as a result, the stock market falls further.

Further, the euro zone drops back into a deep recession as the burden of fiscal

austerity forces Greece out of the euro zone and squeezes the financial systems of other heavily indebted nations, once again threatening the existence of the single-currency area. The U.S. banking system is strained as a result of its ties to the European banks, leading credit availability to shrink significantly.

The drop-off in U.S. exports and business investment precipitates a deep recession beginning in the first quarter of 2016. Foreign investors again see the dollar as a safe haven. However, the impasse among U.S. policymakers prevents a federal fiscal policy response to stem the downturn. Consumer sentiment and spending decrease sharply. Reduced household wealth and high unemployment cause consumers to pull back further on their spending. Unit auto sales decline steadily from the fourth quarter of 2015 through the third quarter of 2017 to a trough of about 12 million, compared with the baseline pace of above 16 million. Corporate bond spreads rise significantly above baseline levels, causing business investment

to drop from the fourth quarter of 2015 through mid-2017.

Foreclosures rise again, federal support to housing is more limited than in the 2008-2009 recession, and the already-low level of mortgage credit availability dries up. The result is another cycle of house price declines. The overall drop during the second dip, from the second quarter of 2015 through the third quarter of 2017, is 21%, though this is above the 2011 trough. Housing starts also fall, decreasing more than 50% from the fourth quarter of 2015 through mid-2017. The recovery in homebuilding is slow until 2019.

In this deep slump, real GDP declines a cumulative 4.7% peak to trough. On an annual average basis, the change in real GDP is -1.3% in 2016 and -2.3% in 2017. The unemployment rate reaches a high of 10.4% in the third quarter of 2017 and remains above 9% until 2019. Inflation is negative throughout 2016. To prevent the economy from sliding further, the Fed keeps interest rates near 0% until mid-2018.

U.S. MACROECONOMIC OUTLOOK ALTERNATIVE SCENARIOS » Scenario 4

| U.S. MACRO S4 SCENARIO—DIFFERENCE FROM BASELINE | | | | | | | | | | |
|---|-----------|-------|--------|--------|--------|-------|--------|---------|---------|---------|
| | Units | 15Q4 | 16Q1 | 16Q2 | 16Q3 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Gross Domestic Product | bcw\$ | 0.0 | -303.8 | -563.9 | -840.6 | 0.0 | -707.6 | -1592.2 | -1891.3 | -1852.4 |
| Change | %AR | 0.0 | -7.3 | -6.3 | -6.7 | 0.0 | -4.3 | -5.3 | -1.6 | 0.5 |
| Federal Budget | \$ bil | 0.0 | -42.5 | -95.4 | -145.6 | 0.0 | -468.6 | -965.8 | -1104.4 | -1049.5 |
| Total Employment | mil | 0.0 | -1.3 | -3.6 | -6.4 | 0.0 | -5.0 | -12.0 | -13.2 | -12.4 |
| Change | %AR | 0.0 | -3.8 | -6.4 | -7.7 | 0.0 | -3.6 | -4.9 | -0.7 | 0.7 |
| Unemployment Rate | % | -0.0 | 0.9 | 2.2 | 3.6 | -0.0 | 2.8 | 5.4 | 4.8 | 3.8 |
| Light Vehicle Sales | mil, SAAR | 0.0 | -1.5 | -2.3 | -3.2 | 0.0 | -2.7 | -4.4 | -4.0 | -3.4 |
| Residential Housing Starts | mil, SAAR | -0.00 | -0.17 | -0.51 | -0.78 | -0.00 | -0.60 | -1.21 | -1.14 | -0.92 |
| Median Existing-Home Price | \$ ths | 0.0 | -8.2 | -19.0 | -29.8 | 0.0 | -24.1 | -53.7 | -54.7 | -48.8 |
| Change | %YA | 0.0 | -3.8 | -8.6 | -13.5 | 0.0 | -10.9 | -14.3 | -0.1 | 4.2 |
| Consumer Price Index | %AR | 0.0 | -3.2 | -2.9 | -3.6 | 0.0 | -2.1 | -2.8 | -0.8 | 0.1 |
| Federal Funds Rate | % | 0.0 | -0.2 | -0.5 | -0.7 | 0.0 | -0.6 | -2.0 | -3.3 | -2.5 |
| Treasury Yield: 10-Yr Bond | % | 0.0 | 1.0 | 0.0 | -1.1 | 0.0 | -0.4 | -2.2 | -2.1 | -1.4 |
| Baa Corp. - 10-Yr Treasury | DIFF | -0.0 | 0.3 | 1.0 | 1.6 | -0.0 | 1.2 | 1.4 | 0.5 | 0.0 |
| Corporate Profits With IVA & CCA | \$ bil | 0.0 | -281.8 | -542.1 | -740.3 | 0.0 | -597.8 | -868.1 | -922.1 | -835.0 |
| Change | %YA | 0.0 | -14.0 | -26.0 | -35.3 | 0.0 | -28.6 | -15.6 | -0.6 | 8.2 |
| S&P 500 | 1941=10 | 0.0 | -217.7 | -552.7 | -726.4 | 0.0 | -579.4 | -940.0 | -978.8 | -908.3 |
| Change | %YA | 0.0 | -10.6 | -26.3 | -35.9 | 0.0 | -28.1 | -21.4 | 2.3 | 9.0 |

| U.S. MACRO S4 SCENARIO—FORECAST SUMMARY | | | | | | | | | | |
|---|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| | Units | 15Q4 | 16Q1 | 16Q2 | 16Q3 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Gross Domestic Product | bcw\$ | 16,512.1 | 16,345.0 | 16,218.1 | 16,069.4 | 16,354.3 | 16,135.9 | 15,763.1 | 15,926.9 | 16,333.9 |
| Change | %AR | 2.9 | -4.0 | -3.1 | -3.6 | 2.5 | -1.3 | -2.3 | 1.0 | 2.6 |
| Federal Budget | \$ bil | -186.5 | -326.9 | 5.3 | -287.7 | -448.7 | -1,012.4 | -1,661.1 | -1,866.2 | -1,789.3 |
| Total Employment | mil | 142.9 | 142.1 | 140.5 | 138.4 | 141.9 | 139.4 | 135.3 | 136.8 | 139.5 |
| Change | %AR | 1.7 | -2.0 | -4.6 | -5.8 | 2.1 | -1.8 | -3.0 | 1.1 | 1.9 |
| Unemployment Rate | % | 4.9 | 5.8 | 7.1 | 8.5 | 5.3 | 7.8 | 10.3 | 9.6 | 8.5 |
| Light Vehicle Sales | mil, SAAR | 17.5 | 15.9 | 14.8 | 13.9 | 17.3 | 14.5 | 12.4 | 12.5 | 13.2 |
| Residential Housing Starts | mil, SAAR | 1.28 | 1.20 | 0.95 | 0.73 | 1.14 | 0.88 | 0.56 | 0.66 | 0.76 |
| Median Existing-Home Price | \$ ths | 222.9 | 216.7 | 207.7 | 198.5 | 220.6 | 203.3 | 178.7 | 181.4 | 194.6 |
| Change | %YA | 5.2 | -0.6 | -6.2 | -9.8 | 6.5 | -7.8 | -12.1 | 1.5 | 7.3 |
| Consumer Price Index | %AR | 1.1 | -1.2 | -0.4 | -1.2 | 0.2 | -0.0 | 0.0 | 2.2 | 2.9 |
| Federal Funds Rate | % | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.4 | 1.2 |
| Treasury Yield: 10-Yr Bond | % | 2.32 | 3.55 | 2.82 | 2.11 | 2.17 | 2.62 | 1.84 | 2.08 | 2.71 |
| Baa Corp. - 10-Yr Treasury | DIFF | 2.9 | 3.3 | 4.0 | 4.7 | 2.8 | 4.2 | 4.6 | 3.6 | 3.0 |
| Corporate Profits With IVA & CCA | \$ bil | 2,156.8 | 1,945.5 | 1,740.7 | 1,571.2 | 2,086.7 | 1,678.6 | 1,439.3 | 1,505.6 | 1,688.1 |
| Change | %YA | 1.0 | -3.3 | -16.4 | -25.0 | 0.7 | -19.6 | -14.3 | 4.6 | 12.1 |
| S&P 500 | 1941=10 | 2,053.3 | 1,847.3 | 1,543.9 | 1,395.6 | 2,061.2 | 1,531.2 | 1,290.3 | 1,414.2 | 1,622.1 |
| Change | %YA | 2.0 | -10.5 | -26.6 | -31.1 | 6.8 | -25.7 | -15.7 | 9.6 | 14.7 |

U.S. MACROECONOMIC OUTLOOK ALTERNATIVE SCENARIOS » Scenario 5

Below-Trend Long-Term Growth (“S5”) Scenario

With this low-performance long-term scenario, there is a 96% probability that the economy will perform better, broadly speaking, and a 4% probability that it will perform worse.

In the downside 4% scenario, “Below-Trend Long-Term Growth,” U.S. growth continues in 2016, but the growth rate is below the baseline pace as rising interest rates and still-low mortgage credit availability leave households and businesses cautious about spending and the high value of the dollar limits exports, as does the slower than expected euro zone recovery.

However, whereas other downside scenarios feature a subsequent demand-driven recovery back to the baseline trend, supply-side constraints prevent that outcome in S5. Instead, the pace of growth remains below that of the baseline for an extended time for several reasons. Households continue to engage in more precautionary saving and therefore less spending, and mortgage credit availability is low. Less risk-taking reflects in higher yield spreads in 2016 and lower stock prices than in the baseline. Capital accumulation and productivity gains are lower than in the baseline, owing to the higher cost of borrowing and lower business investment.

Real GDP growth is lower than in the baseline over the next decade, and the level of real GDP is permanently lower than in the baseline. On an annual average basis, real GDP increases 2.2% in 2016 and 2.1% in 2017.

The unemployment rate stays above 5% over the next several years. The long dislocation in the labor market continues to hamper the typical long-term pattern of advances in worker productivity, as employees find fewer opportunities to develop their skills while on the job. The result is productivity growth that is below the long-run trend for a decade.

U.S. MACROECONOMIC OUTLOOK ALTERNATIVE SCENARIOS » Scenario 5

| U.S. MACRO S5 SCENARIO—DIFFERENCE FROM BASELINE | | | | | | | | | | |
|---|-----------|-------|-------|--------|--------|-------|--------|--------|--------|--------|
| | Units | 15Q4 | 16Q1 | 16Q2 | 16Q3 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Gross Domestic Product | bcw\$ | 0.0 | -58.2 | -106.2 | -155.8 | 0.0 | -132.8 | -290.2 | -357.9 | -419.3 |
| Change | %AR | 0.0 | -1.4 | -1.2 | -1.2 | 0.0 | -0.8 | -0.9 | -0.4 | -0.3 |
| Federal Budget | \$ bil | 0.0 | -5.8 | -11.1 | -16.9 | 0.0 | -57.1 | -131.4 | -158.8 | -160.7 |
| Total Employment | mil | 0.0 | -0.3 | -0.6 | -1.1 | 0.0 | -0.9 | -1.8 | -1.8 | -1.6 |
| Change | %AR | 0.0 | -0.8 | -1.0 | -1.4 | 0.0 | -0.6 | -0.6 | 0.0 | 0.2 |
| Unemployment Rate | % | -0.0 | 0.1 | 0.1 | 0.1 | -0.0 | 0.1 | 0.4 | 0.3 | 0.4 |
| Light Vehicle Sales | mil, SAAR | 0.0 | -0.2 | -0.4 | -0.3 | 0.0 | -0.3 | -0.2 | -0.3 | -0.4 |
| Residential Housing Starts | mil, SAAR | -0.00 | -0.08 | -0.16 | -0.20 | -0.00 | -0.17 | -0.26 | -0.28 | -0.27 |
| Median Existing-Home Price | \$ ths | 0.0 | -1.4 | -2.6 | -3.7 | 0.0 | -3.1 | -5.6 | -6.0 | -8.7 |
| Change | %YA | 0.0 | -0.6 | -1.2 | -1.7 | 0.0 | -1.4 | -1.1 | -0.1 | -1.1 |
| Consumer Price Index | %AR | 0.0 | -0.8 | -0.7 | -0.6 | 0.0 | -0.4 | -0.6 | -0.4 | -0.1 |
| Federal Funds Rate | % | 0.0 | -0.1 | -0.3 | -0.4 | 0.0 | -0.3 | -0.8 | -0.7 | -0.4 |
| Treasury Yield: 10-Yr Bond | % | 0.00 | -0.20 | -0.31 | -0.44 | 0.00 | -0.36 | -0.85 | -0.62 | -0.25 |
| Baa Corp. - 10-Yr Treasury | DIFF | -0.0 | 0.0 | 0.1 | 0.2 | -0.0 | 0.1 | 0.1 | 0.1 | 0.0 |
| Corporate Profits With IVA & CCA | \$ bil | 0.0 | -29.2 | -50.4 | -69.9 | 0.0 | -58.3 | -83.5 | -110.7 | -128.6 |
| Change | %YA | 0.0 | -1.5 | -2.4 | -3.3 | 0.0 | -2.8 | -1.1 | -1.0 | -0.6 |
| S&P 500 | 1941=10 | 0.0 | -7.8 | -15.3 | -28.4 | 0.0 | -20.7 | -51.2 | -101.8 | -113.3 |
| Change | %YA | 0.0 | -0.4 | -0.7 | -1.4 | 0.0 | -1.0 | -1.4 | -2.1 | -0.2 |

| U.S. MACRO S5 SCENARIO—FORECAST SUMMARY | | | | | | | | | | |
|---|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| | Units | 15Q4 | 16Q1 | 16Q2 | 16Q3 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Gross Domestic Product | bcw\$ | 16,512.1 | 16,590.6 | 16,675.7 | 16,754.2 | 16,354.3 | 16,710.6 | 17,065.1 | 17,460.3 | 17,767.0 |
| Change | %AR | 2.9 | 1.9 | 2.1 | 1.9 | 2.5 | 2.2 | 2.1 | 2.3 | 1.8 |
| Federal Budget | \$ bil | -186.5 | -290.2 | 89.7 | -159.0 | -448.7 | -600.9 | -826.7 | -920.5 | -900.5 |
| Total Employment | mil | 142.9 | 143.2 | 143.5 | 143.7 | 141.9 | 143.6 | 145.5 | 148.2 | 150.3 |
| Change | %AR | 1.7 | 0.9 | 0.9 | 0.5 | 2.1 | 1.2 | 1.3 | 1.9 | 1.4 |
| Unemployment Rate | % | 4.9 | 4.9 | 5.0 | 5.1 | 5.3 | 5.1 | 5.3 | 5.1 | 5.1 |
| Light Vehicle Sales | mil, SAAR | 17.5 | 17.1 | 16.7 | 16.8 | 17.3 | 16.9 | 16.5 | 16.2 | 16.2 |
| Residential Housing Starts | mil, SAAR | 1.28 | 1.30 | 1.30 | 1.31 | 1.14 | 1.31 | 1.52 | 1.52 | 1.41 |
| Median Existing-Home Price | \$ ths | 222.9 | 223.5 | 224.0 | 224.6 | 220.6 | 224.3 | 226.8 | 230.0 | 234.7 |
| Change | %YA | 5.2 | 2.5 | 1.2 | 2.1 | 6.5 | 1.7 | 1.1 | 1.4 | 2.0 |
| Consumer Price Index | %AR | 1.1 | 1.2 | 1.8 | 1.8 | 0.2 | 1.6 | 2.2 | 2.6 | 2.7 |
| Federal Funds Rate | % | 0.2 | 0.2 | 0.4 | 0.5 | 0.1 | 0.4 | 1.4 | 3.0 | 3.3 |
| Treasury Yield: 10-Yr Bond | % | 2.32 | 2.37 | 2.51 | 2.72 | 2.17 | 2.62 | 3.15 | 3.56 | 3.86 |
| Baa Corp. - 10-Yr Treasury | DIFF | 2.9 | 3.1 | 3.1 | 3.3 | 2.8 | 3.2 | 3.3 | 3.1 | 3.0 |
| Corporate Profits With IVA & CCA | \$ bil | 2,156.8 | 2,198.0 | 2,232.4 | 2,241.5 | 2,086.7 | 2,218.1 | 2,223.9 | 2,317.0 | 2,394.4 |
| Change | %YA | 1.0 | 9.2 | 7.2 | 7.0 | 0.7 | 6.3 | 0.3 | 4.2 | 3.3 |
| S&P 500 | 1941=10 | 2,053.3 | 2,057.2 | 2,081.3 | 2,093.6 | 2,061.2 | 2,090.0 | 2,179.1 | 2,291.3 | 2,417.1 |
| Change | %YA | 2.0 | -0.3 | -1.0 | 3.3 | 6.8 | 1.4 | 4.3 | 5.1 | 5.5 |

U.S. MACROECONOMIC OUTLOOK ALTERNATIVE SCENARIOS » Scenario 6

Stagflation (“S6”) Scenario

In this stagflation scenario, there is a 90% probability that the economy will perform better, broadly speaking, and a 10% probability that it will perform worse.

The downside 10% scenario, “Stagflation,” assumes that a wage-price spiral develops more quickly than expected as the U.S. economy approaches full employment. Additionally, global oil demand rebounds faster than expected, and as a result oil prices rise faster than in the baseline, ultimately reaching more than \$100 by late 2016. Pressures on core consumer prices increase as

unit labor costs accelerate and the higher oil prices push up the costs of delivering goods and services.

The Federal Reserve begins to fight inflation aggressively and increases the fed funds rate from nearly 0% in 2015 to more than 4% in the second half of 2016. Yields on 10-year Treasury securities rise to 5% by the second half of 2016 as a result of inflation expectations and Fed tightening. The economy weakens substantially and drops into recession in the second quarter of 2016. Forced to make a choice in the stagflation environment, the Fed keeps interest rates high to fight in-

flation, and as a result the downturn persists through the second quarter of 2017. The jobless rate rises to 8.2% by second half of 2017.

Inflation and inflation expectations begin to subside in 2017, allowing the Fed to reduce the fed funds rate. As a result, the economy begins to recover in the third quarter of 2017.

On an annual average basis, the change in real GDP is 0.5% in 2016 and -0.5% in 2017. Inflation, as measured by the CPI, rises to well above 5% in 2016, more than 3 percentage points above the baseline, before beginning to decelerate.

U.S. MACROECONOMIC OUTLOOK ALTERNATIVE SCENARIOS » Scenario 6

| U.S. MACRO S6 SCENARIO—DIFFERENCE FROM BASELINE | | | | | | | | | | |
|---|-----------|-------|--------|--------|--------|-------|--------|----------|----------|--------|
| | Units | 15Q4 | 16Q1 | 16Q2 | 16Q3 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Gross Domestic Product | bcw\$ | 0.0 | -115.8 | -253.3 | -514.7 | 0.0 | -408.6 | -1,172.2 | -1,208.6 | -821.0 |
| Change | %AR | 0.0 | -2.8 | -3.3 | -6.3 | 0.0 | -2.5 | -4.6 | -0.0 | 2.5 |
| Federal Budget | \$ bil | 0.0 | -8.8 | -19.0 | -49.4 | 0.0 | -161.6 | -617.1 | -758.4 | -671.4 |
| Total Employment | mil | 0.0 | -0.6 | -1.1 | -2.2 | 0.0 | -2.1 | -8.2 | -9.3 | -8.0 |
| Change | %AR | 0.0 | -1.8 | -1.2 | -3.3 | 0.0 | -1.5 | -4.3 | -0.7 | 1.0 |
| Unemployment Rate | % | -0.0 | 0.2 | 0.3 | 1.0 | -0.0 | 0.8 | 3.2 | 2.7 | 1.9 |
| Light Vehicle Sales | mil, SAAR | 0.0 | -0.2 | -0.3 | -0.9 | 0.0 | -0.7 | -2.2 | -2.1 | -1.4 |
| Residential Housing Starts | mil, SAAR | -0.00 | -0.12 | -0.27 | -0.47 | -0.00 | -0.37 | -0.87 | -0.56 | -0.29 |
| Median Existing-Home Price | \$ ths | 0.0 | -1.2 | -1.9 | -7.2 | 0.0 | -6.1 | -25.1 | -21.3 | -11.3 |
| Change | %YA | 0.0 | -0.6 | -0.9 | -3.3 | 0.0 | -2.8 | -8.5 | 2.0 | 5.0 |
| Consumer Price Index | %AR | 0.0 | 7.2 | 3.6 | 3.6 | 0.0 | 3.0 | 0.1 | -1.7 | -0.4 |
| Federal Funds Rate | % | 0.0 | 1.2 | 3.1 | 3.3 | 0.0 | 2.6 | 0.0 | -0.6 | -0.1 |
| Treasury Yield: 10-Yr Bond | % | 0.00 | 0.99 | 2.18 | 2.23 | 0.00 | 1.82 | -0.02 | -0.08 | -0.00 |
| Baa Corp. - 10-Yr Treasury | DIFF | -0.0 | -0.1 | -0.0 | 0.3 | -0.0 | 0.2 | 0.7 | 0.2 | -0.1 |
| Corporate Profits With IVA & CCA | \$ bil | 0.0 | -23.0 | -59.9 | -210.2 | 0.0 | -157.6 | -468.0 | -566.2 | -462.3 |
| Change | %YA | 0.0 | -1.1 | -2.9 | -10.0 | 0.0 | -7.6 | -14.5 | -4.0 | 6.8 |
| S&P 500 | 1941=10 | 0.0 | -25.5 | -42.0 | -201.7 | 0.0 | -145.9 | -479.6 | -639.3 | -606.1 |
| Change | %YA | 0.0 | -1.2 | -2.0 | -10.0 | 0.0 | -7.1 | -16.6 | -7.1 | 4.0 |

| U.S. MACRO S6 SCENARIO—FORECAST SUMMARY | | | | | | | | | | |
|---|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| | Units | 15Q4 | 16Q1 | 16Q2 | 16Q3 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Gross Domestic Product | bcw\$ | 16,512.1 | 16,533.0 | 16,528.6 | 16,395.3 | 16,354.3 | 16,434.8 | 16,183.1 | 16,609.6 | 17,365.3 |
| Change | %AR | 2.9 | 0.5 | -0.1 | -3.2 | 2.5 | 0.5 | -1.5 | 2.6 | 4.5 |
| Federal Budget | \$ bil | -186.5 | -293.2 | 81.8 | -191.5 | -448.7 | -705.4 | -1,312.4 | -1,520.2 | -1,411.2 |
| Total Employment | mil | 142.9 | 142.8 | 143.1 | 142.6 | 141.9 | 142.4 | 139.2 | 140.7 | 143.9 |
| Change | %AR | 1.7 | -0.0 | 0.6 | -1.3 | 2.1 | 0.3 | -2.3 | 1.1 | 2.3 |
| Unemployment Rate | % | 4.9 | 5.0 | 5.2 | 5.9 | 5.3 | 5.7 | 8.1 | 7.4 | 6.6 |
| Light Vehicle Sales | mil, SAAR | 17.5 | 17.1 | 16.8 | 16.2 | 17.3 | 16.4 | 14.5 | 14.5 | 15.2 |
| Residential Housing Starts | mil, SAAR | 1.28 | 1.26 | 1.19 | 1.04 | 1.14 | 1.10 | 0.91 | 1.23 | 1.39 |
| Median Existing-Home Price | \$ ths | 222.9 | 223.7 | 224.8 | 221.2 | 220.6 | 221.3 | 207.3 | 214.7 | 232.1 |
| Change | %YA | 5.2 | 2.6 | 1.6 | 0.5 | 6.5 | 0.3 | -6.3 | 3.5 | 8.1 |
| Consumer Price Index | %AR | 1.1 | 9.2 | 6.2 | 6.0 | 0.2 | 5.0 | 2.9 | 1.3 | 2.4 |
| Federal Funds Rate | % | 0.2 | 1.5 | 3.8 | 4.1 | 0.1 | 3.3 | 2.2 | 3.1 | 3.7 |
| Treasury Yield: 10-Yr Bond | % | 2.32 | 3.56 | 5.00 | 5.40 | 2.17 | 4.79 | 3.97 | 4.10 | 4.11 |
| Baa Corp. - 10-Yr Treasury | DIFF | 2.9 | 2.9 | 3.0 | 3.4 | 2.8 | 3.3 | 3.8 | 3.3 | 2.9 |
| Corporate Profits With IVA & CCA | \$ bil | 2,156.8 | 2,204.2 | 2,222.9 | 2,101.2 | 2,086.7 | 2,118.7 | 1,839.5 | 1,861.6 | 2,060.7 |
| Change | %YA | 1.0 | 9.5 | 6.7 | 0.3 | 0.7 | 1.5 | -13.2 | 1.2 | 10.7 |
| S&P 500 | 1941=10 | 2,053.3 | 2,039.5 | 2,054.6 | 1,920.3 | 2,061.2 | 1,964.8 | 1,750.7 | 1,753.7 | 1,924.3 |
| Change | %YA | 2.0 | -1.2 | -2.3 | -5.2 | 6.8 | -4.7 | -10.9 | 0.2 | 9.7 |

U.S. MACROECONOMIC OUTLOOK ALTERNATIVE SCENARIOS » Scenario 7

Next-Cycle Recession (“S7”) Scenario

This scenario is designed to reflect the fact that recessions periodically occur in the U.S. economy, though the timing is highly uncertain. The probability that the economy will enter this or a similar recession sometime over the next five years is estimated at 10%.

The “Next-Cycle Recession” scenario is constructed to be a benchmark, independent of current business cycle conditions. Since World War II, the U.S. economy has experienced 12 recessions. The longest was the Great Recession, which lasted 18 months; the shortest was six months in 1980. The average duration was 11 months. The shortest expansion between recessions was six months in 1980 and the longest was 120 months from 1991 to 2001. The average duration of expansion was 60 months.

Based on these data and the fact that the economy is still recovering from the Great Recession, this scenario posits that a recession would begin in the second quarter of

2018. Over the course of the following year, the unemployment rate rises more than 3 percentage points, comparable to all but the worst postwar recessions. Since the baseline unemployment rate in early 2018 is forecast to be in the range of 4.7%, the peak unemployment rate in this scenario is 8%. This increase in joblessness is consistent with a percentage decline in real GDP of just more than 2%, the average in postwar recessions.

The causes of the decline are mostly generic in nature but are exacerbated by monetary policy tightening in response to above-trend inflation. Inflation tops out at more than 3.5% in 2017 as oil prices rise to nearly \$90 per barrel, or \$20 above the baseline level. The Fed reins in price growth by raising the fed funds rate to more than 5%, or 150 basis points above the baseline. The result is broadly weaker aggregate demand, highlighted by a fallout in real estate and financial markets, coincident contraction in consumer and business sentiment and spending,

fiscal austerity as government budgets at all levels are squeezed, and declines in international trade. Consequently, yields on Treasury bonds decline once the recession begins and drop below baseline levels. The stock market drops by about 25%, and yield spreads on risky debt rise significantly. Foreclosures rise, house prices on purchase transactions cumulatively drop in the range of 10%, and the pace of new residential and nonresidential construction declines. Likewise, unit car sales fall to a comparable trough. To support the economy, the Federal Reserve eases monetary policy. However, because of long-term federal deficit issues, Congress does not engage in a fiscal stimulus.

The downturn is posited to last more than a full year, comparable to the postwar average. Consistent with all recessions since 1990, the ensuing recovery is slow for the first year. To support the economy, the Fed keeps policy rates accommodative for a few years after the recovery begins.

U.S. MACROECONOMIC OUTLOOK ALTERNATIVE SCENARIOS » Scenario 7

| U.S. MACRO S7 SCENARIO—DIFFERENCE FROM BASELINE | | | | | | | | | | |
|---|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | Units | 19Q2 | 19Q3 | 19Q4 | 20Q1 | 2018 | 2019 | 2020 | 2021 | 2022 |
| Gross Domestic Product | bcw\$ | -844.6 | -916.4 | -943.8 | -943.6 | -289.8 | -867.9 | -844.2 | -504.6 | -213.8 |
| Change | %AR | -1.7 | -1.6 | -0.5 | 0.1 | -1.7 | -3.3 | 0.2 | 2.0 | 1.6 |
| Federal Budget | \$ bil | -132.8 | -134.6 | -133.8 | -128.5 | -157.3 | -522.0 | -471.7 | -327.0 | -136.8 |
| Total Employment | mil | -5.4 | -5.7 | -5.9 | -5.7 | -1.5 | -5.5 | -5.3 | -3.1 | -0.1 |
| Change | %AR | -1.1 | -0.7 | -0.5 | 0.7 | -1.0 | -2.7 | 0.2 | 1.5 | 2.0 |
| Unemployment Rate | % | 3.4 | 3.2 | 3.0 | 2.7 | 0.9 | 3.2 | 2.2 | 1.0 | 0.2 |
| Light Vehicle Sales | mil, SAAR | -2.5 | -2.3 | -2.0 | -1.6 | -0.8 | -2.3 | -1.4 | -0.2 | 0.0 |
| Residential Housing Starts | mil, SAAR | -0.82 | -0.79 | -0.73 | -0.65 | -0.34 | -0.77 | -0.49 | -0.04 | 0.06 |
| Median Existing-Home Price | \$ ths | -32.9 | -39.1 | -38.0 | -38.6 | -6.0 | -33.7 | -37.1 | -23.9 | -8.0 |
| Change | %YA | -13.7 | -13.4 | -9.9 | -6.0 | -2.6 | -11.9 | -0.9 | 7.0 | 7.0 |
| Consumer Price Index | %AR | -1.4 | -1.8 | 0.3 | 0.5 | 0.3 | -1.4 | 0.1 | 0.6 | 0.3 |
| Federal Funds Rate | % | -1.5 | -2.0 | -1.9 | -1.6 | 0.8 | -1.6 | -1.3 | -0.4 | -0.0 |
| Treasury Yield: 10-Yr Bond | % | -1.02 | -1.13 | -0.88 | -0.66 | 0.87 | -0.88 | -0.40 | -0.02 | -0.00 |
| Baa Corp. - 10-Yr Treasury | DIFF | 0.8 | 0.8 | 0.7 | 0.6 | 0.1 | 0.8 | 0.3 | -0.1 | -0.2 |
| Corporate Profits With IVA & CCA | \$ bil | -549.5 | -556.7 | -553.7 | -546.4 | -142.3 | -538.6 | -533.5 | -429.3 | -212.6 |
| Change | %YA | -21.5 | -16.4 | -8.9 | -1.7 | -6.2 | -17.1 | 1.3 | 6.3 | 10.2 |
| S&P 500 | 1941=10 | -758.1 | -817.8 | -799.5 | -765.6 | -152.4 | -723.3 | -705.6 | -489.6 | -234.9 |
| Change | %YA | -28.5 | -26.9 | -23.0 | -11.6 | -6.8 | -25.1 | 2.7 | 13.9 | 12.1 |

| U.S. MACRO S7 SCENARIO—FORECAST SUMMARY | | | | | | | | | | |
|---|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| | Units | 19Q2 | 19Q3 | 19Q4 | 20Q1 | 2018 | 2019 | 2020 | 2021 | 2022 |
| Gross Domestic Product | bcw\$ | 17,302.9 | 17,314.3 | 17,363.3 | 17,436.0 | 17,528.4 | 17,318.4 | 17,650.5 | 18,353.3 | 19,038.6 |
| Change | %AR | 0.2 | 0.3 | 1.1 | 1.7 | 1.0 | -1.2 | 1.9 | 4.0 | 3.7 |
| Federal Budget | \$ bil | -91.6 | -318.0 | -380.4 | -472.0 | -919.1 | -1,261.8 | -1,197.4 | -1,073.8 | -925.1 |
| Total Employment | mil | 146.4 | 146.4 | 146.4 | 146.8 | 148.6 | 146.4 | 147.3 | 150.2 | 154.1 |
| Change | %AR | -0.1 | -0.0 | 0.2 | 1.2 | 0.9 | -1.5 | 0.7 | 2.0 | 2.6 |
| Unemployment Rate | % | 8.1 | 7.9 | 7.7 | 7.4 | 5.6 | 7.9 | 7.0 | 6.0 | 5.1 |
| Light Vehicle Sales | mil, SAAR | 14.2 | 14.3 | 14.7 | 15.1 | 15.8 | 14.3 | 15.3 | 16.4 | 16.7 |
| Residential Housing Starts | mil, SAAR | 0.87 | 0.87 | 0.94 | 1.02 | 1.45 | 0.91 | 1.20 | 1.73 | 1.87 |
| Median Existing-Home Price | \$ ths | 209.2 | 205.3 | 209.1 | 211.5 | 230.0 | 209.7 | 217.9 | 245.6 | 276.3 |
| Change | %YA | -10.9 | -10.0 | -6.0 | -1.7 | -1.1 | -8.8 | 3.9 | 12.7 | 12.5 |
| Consumer Price Index | %AR | 1.3 | 0.8 | 2.8 | 2.9 | 3.3 | 1.4 | 2.6 | 3.0 | 2.6 |
| Federal Funds Rate | % | 2.2 | 1.7 | 1.7 | 2.0 | 4.6 | 2.1 | 2.4 | 3.4 | 3.8 |
| Treasury Yield: 10-Yr Bond | % | 3.09 | 2.97 | 3.21 | 3.44 | 5.05 | 3.23 | 3.72 | 4.15 | 4.23 |
| Baa Corp. - 10-Yr Treasury | DIFF | 3.8 | 3.8 | 3.7 | 3.5 | 3.2 | 3.8 | 3.3 | 2.8 | 2.6 |
| Corporate Profits With IVA & CCA | \$ bil | 1,962.2 | 1,976.1 | 2,002.4 | 2,032.6 | 2,285.5 | 1,984.5 | 2,084.4 | 2,320.4 | 2,667.1 |
| Change | %YA | -17.5 | -12.7 | -5.3 | 1.8 | -1.0 | -13.2 | 5.0 | 11.3 | 14.9 |
| S&P 500 | 1941=10 | 1,764.4 | 1,730.4 | 1,763.2 | 1,817.3 | 2,240.7 | 1,807.1 | 1,930.5 | 2,343.0 | 2,769.2 |
| Change | %YA | -22.2 | -21.4 | -18.5 | -7.8 | 0.5 | -19.4 | 6.8 | 21.4 | 18.2 |

U.S. MACROECONOMIC OUTLOOK ALTERNATIVE SCENARIOS » Scenario 8

Low Oil Price (“S8”) Scenario

In this upside scenario, there is a 10% probability that the economy will perform better, broadly speaking, and a 90% probability that it will perform worse.

The upside 10% “Low Oil Price” scenario assumes that the price of West Texas Intermediate remains in the range of \$35 per barrel for three full years until the end of 2018. In contrast, the baseline presumes a steady rebound in the price over that time to about \$70 per barrel, based on the assumption of strengthening global demand for energy. The fundamental basis of this scenario is that recent and prospective increases in supply are larger than anticipated and more than offset the rise in demand. Higher than anticipated growth in supply from Iran as a result of the political agreement with the U.S. is consistent with this scenario.

Although the U.S. oil industry is larger than those of most other nations, the country is a net importer of oil and the nonoil share of the economy is far greater than in such major petroleum producers as Saudi Arabia, Canada, Russia and Venezuela. Consequently, although the lower oil prices cause a decline in oil exploration and production, the effect on the rest of the economy is positive. For one thing, inflation, as measured by the top-line CPI, is a percentage point lower than in the baseline from the fourth quarter of 2015 to the third quarter of 2016.

In terms of real economic activity, lower oil prices have the same effect as a tax cut. Lower gasoline costs increase disposable income available for other consumer spending. Moreover, the reduced energy costs overall increase the profitability of industrial

production. As a result, real GDP rises faster in 2016 through 2019. By the end of 2018, the level of real GDP is 2% higher than in the baseline.

However, the energy industry itself contracts, with oil exploration and related employment declining over the course of 2016 through 2018. Oil production also falls somewhat during that time.

Oil prices begin to rise again in 2019, and as a result overall real GDP growth subsequently decelerates to the baseline over the next several years. The assumption is that oil prices rise relative to the CPI and ultimately return to the baseline level by the end of 2024. The basis for this assumption is the historical observation that, although oil prices are highly volatile, over long periods the inflation-adjusted price of oil has trended neither up nor down.

U.S. MACROECONOMIC OUTLOOK ALTERNATIVE SCENARIOS » Scenario 8

| U.S. MACRO S8 SCENARIO—DIFFERENCE FROM BASELINE | | | | | | | | | | |
|---|-----------|------|-------|-------|-------|------|-------|-------|-------|-------|
| | Units | 15Q4 | 16Q1 | 16Q2 | 16Q3 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Gross Domestic Product | bcw\$ | 0.0 | -14.2 | 34.3 | 79.3 | 0.0 | 56.9 | 252.0 | 360.5 | 364.6 |
| Change | %AR | 0.0 | -0.4 | 1.2 | 1.1 | 0.0 | 0.3 | 1.1 | 0.6 | -0.0 |
| Federal Budget | \$ bil | -0.0 | 2.7 | 11.4 | 20.8 | -0.0 | 65.9 | 209.4 | 301.4 | 330.8 |
| Total Employment | mil | -0.0 | -0.2 | 0.1 | 0.4 | -0.0 | 0.3 | 1.9 | 3.0 | 3.1 |
| Change | %AR | -0.0 | -0.6 | 0.9 | 0.8 | -0.0 | 0.2 | 1.1 | 0.7 | 0.0 |
| Unemployment Rate | % | -0.0 | -0.1 | -0.2 | -0.3 | -0.0 | -0.3 | -0.5 | -0.5 | -0.4 |
| Light Vehicle Sales | mil, SAAR | 0.0 | 0.0 | 0.8 | 1.3 | 0.0 | 0.9 | 1.9 | 1.3 | 0.5 |
| Residential Housing Starts | mil, SAAR | 0.00 | 0.01 | 0.03 | 0.06 | 0.00 | 0.05 | 0.10 | 0.09 | -0.01 |
| Median Existing-Home Price | \$ ths | -0.0 | 0.4 | 1.1 | 2.1 | -0.0 | 1.7 | 5.2 | 4.7 | 1.9 |
| Change | %YA | -0.0 | 0.2 | 0.5 | 0.9 | -0.0 | 0.8 | 1.5 | -0.3 | -1.2 |
| Consumer Price Index | %AR | -0.0 | -2.9 | -2.0 | -0.8 | -0.0 | -1.2 | -0.6 | -0.3 | 0.1 |
| Federal Funds Rate | % | 0.0 | -0.2 | -0.4 | -0.7 | 0.0 | -0.5 | -1.1 | -0.6 | 0.3 |
| Treasury Yield: 10-Yr Bond | % | 0.00 | -0.42 | -0.62 | -0.73 | 0.00 | -0.64 | -0.65 | 0.10 | 0.30 |
| Baa Corp. - 10-Yr Treasury | DIFF | -0.0 | 0.0 | -0.0 | -0.1 | -0.0 | -0.1 | -0.1 | -0.1 | -0.1 |
| Corporate Profits With IVA & CCA | \$ bil | 0.0 | 18.5 | 98.8 | 182.7 | 0.0 | 143.3 | 402.7 | 522.9 | 575.0 |
| Change | %YA | 0.0 | 0.9 | 4.7 | 8.7 | 0.0 | 6.9 | 10.6 | 3.7 | 1.1 |
| S&P 500 | 1941=10 | 0.0 | 24.1 | 59.7 | 60.4 | 0.0 | 60.2 | 128.1 | 158.5 | 127.0 |
| Change | %YA | 0.0 | 1.2 | 2.8 | 3.0 | 0.0 | 2.9 | 3.0 | 0.9 | -1.6 |

| U.S. MACRO S8 SCENARIO—FORECAST SUMMARY | | | | | | | | | | |
|---|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| | Units | 15Q4 | 16Q1 | 16Q2 | 16Q3 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Gross Domestic Product | bcw\$ | 16,512.1 | 16,634.6 | 16,816.3 | 16,989.3 | 16,354.3 | 16,900.4 | 17,607.3 | 18,178.7 | 18,550.9 |
| Change | %AR | 2.9 | 3.0 | 4.4 | 4.2 | 2.5 | 3.3 | 4.2 | 3.2 | 2.0 |
| Federal Budget | \$ bil | -186.5 | -281.8 | 112.2 | -121.3 | -448.7 | -477.9 | -485.9 | -460.4 | -409.0 |
| Total Employment | mil | 142.9 | 143.3 | 144.2 | 145.2 | 141.9 | 144.8 | 149.2 | 153.0 | 155.0 |
| Change | %AR | 1.7 | 1.2 | 2.8 | 2.7 | 2.1 | 2.0 | 3.1 | 2.5 | 1.3 |
| Unemployment Rate | % | 4.9 | 4.8 | 4.7 | 4.6 | 5.3 | 4.7 | 4.5 | 4.3 | 4.3 |
| Light Vehicle Sales | mil, SAAR | 17.5 | 17.4 | 18.0 | 18.4 | 17.3 | 18.1 | 18.6 | 17.9 | 17.2 |
| Residential Housing Starts | mil, SAAR | 1.28 | 1.39 | 1.49 | 1.56 | 1.14 | 1.52 | 1.88 | 1.88 | 1.67 |
| Median Existing-Home Price | \$ ths | 222.9 | 225.3 | 227.8 | 230.4 | 220.6 | 229.2 | 237.7 | 240.7 | 245.3 |
| Change | %YA | 5.2 | 3.3 | 2.9 | 4.7 | 6.5 | 3.9 | 3.7 | 1.3 | 1.9 |
| Consumer Price Index | %AR | 1.1 | -1.0 | 0.6 | 1.6 | 0.2 | 0.8 | 2.2 | 2.7 | 3.0 |
| Federal Funds Rate | % | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | 0.2 | 1.0 | 3.1 | 4.0 |
| Treasury Yield: 10-Yr Bond | % | 2.32 | 2.16 | 2.20 | 2.43 | 2.17 | 2.33 | 3.35 | 4.28 | 4.41 |
| Baa Corp. - 10-Yr Treasury | DIFF | 2.9 | 3.0 | 3.0 | 3.1 | 2.8 | 3.0 | 3.0 | 3.0 | 2.9 |
| Corporate Profits With IVA & CCA | \$ bil | 2,156.8 | 2,245.7 | 2,381.5 | 2,494.2 | 2,086.7 | 2,419.7 | 2,710.1 | 2,950.6 | 3,098.0 |
| Change | %YA | 1.0 | 11.6 | 14.3 | 19.1 | 0.7 | 16.0 | 12.0 | 8.9 | 5.0 |
| S&P 500 | 1941=10 | 2,053.3 | 2,089.1 | 2,156.3 | 2,182.4 | 2,061.2 | 2,170.9 | 2,358.4 | 2,551.6 | 2,657.4 |
| Change | %YA | 2.0 | 1.2 | 2.6 | 7.7 | 6.8 | 5.3 | 8.6 | 8.2 | 4.1 |

About Moody's Analytics

Economic & Consumer Credit Analytics

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Moody's Analytics added Economy.com to its portfolio in 2005. Now called Economic & Consumer Credit Analytics, this arm is based in West Chester PA, a suburb of Philadelphia, with offices in London, Prague and Sydney. More information is available at www.economy.com.

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Division 1-8

Request:

Section III.B.1.b., Econometric Models, states, "The Company's econometric modelling effort was to regress each of the two dependent variables against an array of possible independent variables." Please:

- a. Identify each independent variable and each combination of independent variables that the Company regressed against each of the two dependent variables for each rate classification analyzed.
- b. Provide the results, including all computed regression statistics for each independent variable and each combination of independent variables that the Company regressed against each of the two dependent variables for each rate classification analyzed.

Response:

- a. Please refer to Chart III-B-1 in the Company's filing for the list of economic independent variables tested to produce the Company's forecast. Please also refer to the Excel file identified as Attachment DIV 1-7-1 for that data (or Chart III-B-2 of the Company's filing).

Additionally, the Company tested residential and commercial / industrial natural gas and oil prices and gas/oil price ratios as independent variables. That data can be found in the Excel file identified as Attachment DIV 1-7-2.

- b. Please refer to the Excel file labeled "4608-DIV 1-08-Attachment.xlsx", which is identified as Attachment DIV 1-8 and is being provided on CD-ROM, for the regression statistics for the top five candidate regression equations for the meter count and use-per-customer models by internal Company rate code.

Please refer to the CD-ROM for Attachment DIV 1-: .

Division 1-9

Request:

Section III.B.2., Final Econometric Models for the Company's Demand Forecast, discusses separate analyses that were performed for (1) the Residential Heating Class; (2) the Residential Non-Heating Class; (3) the Commercial/Industrial ("C/I") Heating Class; and (4) the C/I Non-Heating Class. It also includes discussion of separate models that were used to forecast (a) numbers of customers and (b) use per customer for each class. The Company also indicates that separate models were used within the C/I Heating and Non-Heating classes for (i) Sales service, (ii) Customer Choice service, and (iii) Zero Capacity service. Please:

- a. Provide a full specification of each model used for each referenced class to forecast either number of customers or use per customer;
- b. For each econometric model for each class, provide the estimated intercept values and the estimate coefficient for each variable, as well as all computed regression statistics for each model, including but not limited to:
 - i. t-statistics
 - ii. F-statistics
 - iii. R-Squared values
 - iv. Adjusted R-Squared values
 - v. Durbin-Watson statistics
 - vi. Other computed measures of auto-correlation and/or skewedness
- c. Specifically, identify the inputs used for each model and provide any input data used in a model that is not already included in the March 2016 LRP.
- d. Explain for each class any and all adjustment to input data that were made prior to running each model;
- e. Explain how the Company's recent transfers of customers and sales volumes from Residential Non-Heating service to Residential Heating service were addressed in the models for the Residential Heating class and Residential Non-Heating class and/or within the input data used for those classes.

Division 1-9, page 2

Response:

- a. Please refer to Attachment DIV 1-9-1 on CD-ROM for the full specification of each individual meter count and use-per-customer model used in the Company's 2016 Long-Range Plan retail forecast.
- b. Please refer to Attachment DIV 1-9-1 on CD-ROM for the statistical test results of each individual meter count and use-per-customer model used in the Company's 2016 Long-Range Plan retail forecast.
- c. In addition to the economic and fuel price data discussed in the Company's response to DIV 1-7, the Company used its own internal billing data of meter counts and volumes as well as degree days as input data to its forecasting process. Please refer to:
 - The Excel file labeled "4608-DIV 1-09-Attachment-2.xlsx", which is identified as Attachment DIV 1-9-2 and is being provided on CD-ROM, for the Company's historical monthly retail billing volumes (in therms);
 - The Excel file labeled "4608-DIV 1-09-Attachment-3.xlsx", which is identified as Attachment DIV 1-9-3 and is being provided on CD-ROM, for the Company's historical monthly retail meter counts (unadjusted); and
 - The Excel file labeled "4608-DIV 1-09-Attachment-4.xlsx", which is identified as Attachment DIV 1-9-4 and is being provided on CD-ROM, for the Company's historical degree days by rate code (degree days vary by rate code based on the variations in the Company's meter-reading schedule for customers within each rate code).

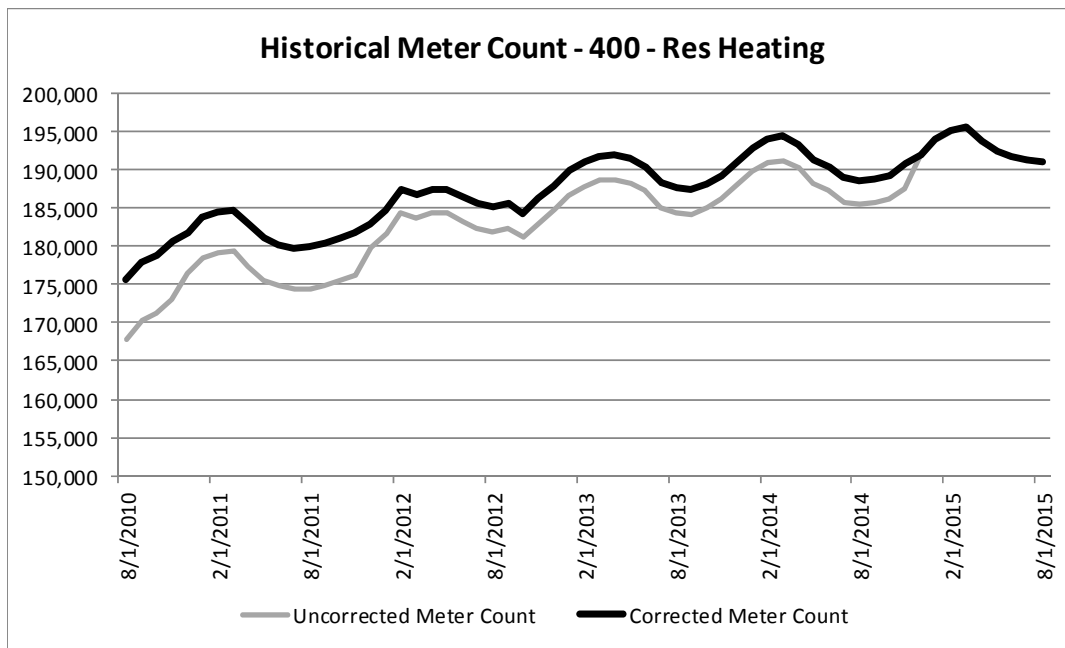
In the Excel file Attachments, the Company has included a tab mapping its internal rate codes to descriptions to facilitate understanding the data.

In preparing this response, the Company became aware that, on page 8 of its filing, the ending date of the input data was cited as February 2015 when in fact it was August 2015.

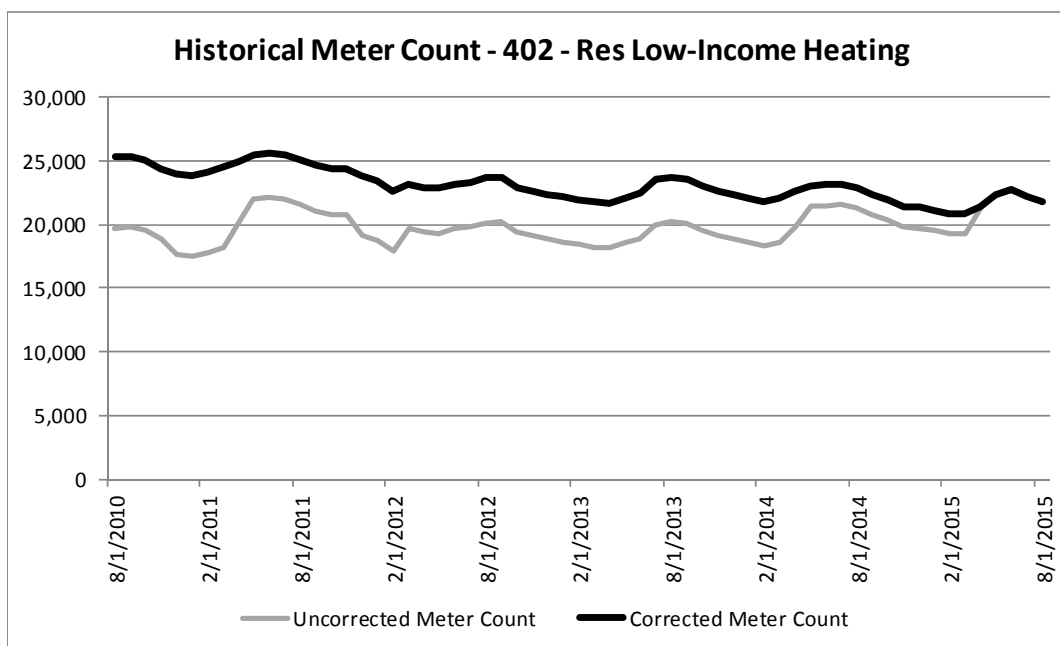
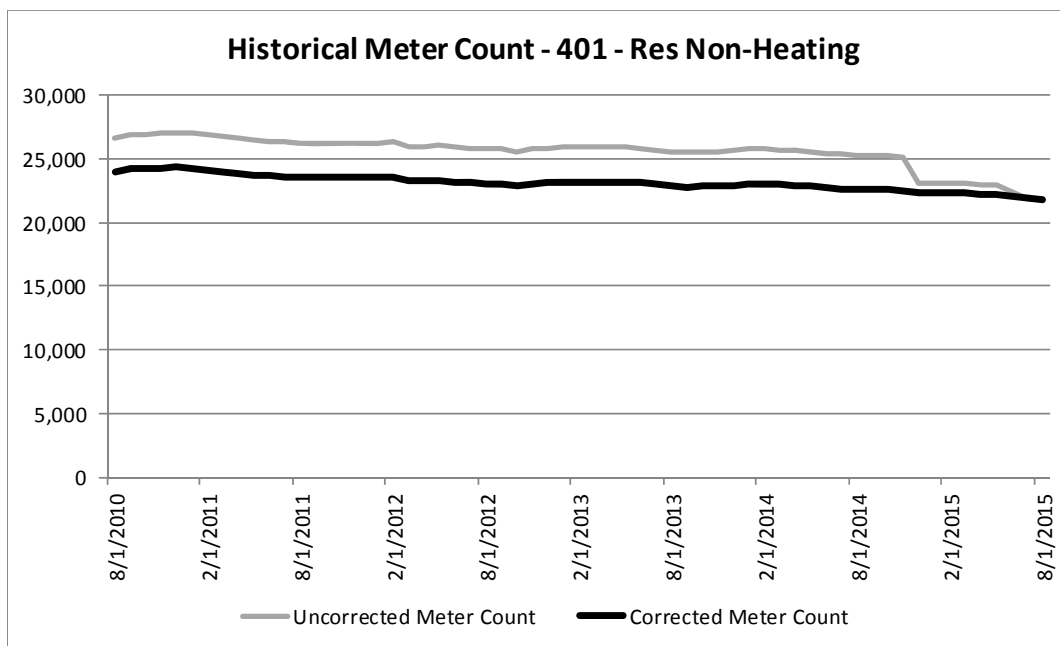
- d. Prior to running its models, the Company will clean its input data and make adjustments to reflect the switching that can occur between rate codes. Its data is aligned to reflect backward through history the most recent rate code per customer. For the Company's 2016 Long-Range Plan filing, each of the four residential rate codes was adjusted to

Division 1-9, page 3

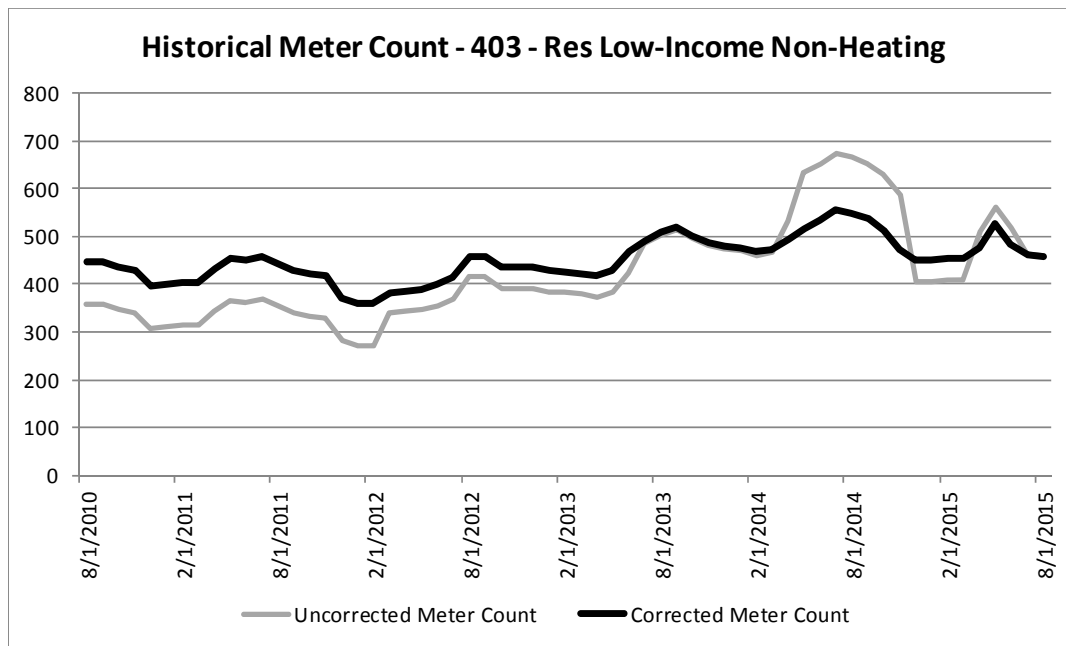
reflect rate code conversions which occurred in the historical period. The four charts below show the uncorrected and corrected versions of the meter count data.



Division 1-9, page 4



Division 1-9, page 5



- e) The Company models meter count and use-per-customer (historical volume divided by historical meter count). While the meter count is adjusted to reflect rate code conversions, the use-per-customer is based on its unadjusted data.

Please refer to the CD-ROM for Attachments DIV 1-9-1 through 1-9-4.

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4608
In Re: Gas Long-Range Resource and Requirements Plan
For Period 2015/16 to 2024/25
Responses to Division's First Set of Data Requests
Issued on April 12, 2016

Division 1-11

Request:

Re: Section III.B.2., pages 10-12, of the Company's March 10, 2016 LRP, please:

- a. Explain why the Company's March **2016** LRP contains no discussion of Commercial and Industrial Dual-Fuel Customers comparable to that found in Section III.B.2.e. of National Grid's March **2014** LRP;
- b. If no separate consideration of Commercial and Industrial Dual-Fuel Customers and their associated billing volumes is included in the Company's March 2016 LRP, please document and explain the analyses on which the Company has relied to determine that separate consideration of Commercial and Industrial Dual-Fuel customers and their associated billing volumes was necessary or appropriate;
- c. Detail the methodology used for the treatment of Commercial and Industrial Dual-Fuel customer volumes in the development of the Company's March **2016** LRP;
- d. Document all efforts by the Company to separately identify Commercial and Industrial Dual-Fuel customers and their associated monthly billing volumes as part of the preparation of its March **2016** LRP;
- e. Provide the Company's assessment of the extent to which declines in natural gas commodity prices in recent years have impacted gas use by dual-Fuel customers.

Response:

- a. The Company no longer forecasts its dual-fuel customers separately. In the past (pre February 2013), the Company did track the revenue for dual-fuel customers and then true up their revenues each year with an established benchmark as part of the On System Margin credit in the Company's annual Distribution Adjustment Clause filing. However, pursuant to the Settlement Agreement dated October 19, 2012 between the Company and the Division of Public Utilities and Carriers in the Company's 2012 general rate case, Docket No. 4323, the parties agreed that the Company would cease separate tracking of revenue for dual-fuel customers who utilize its Firm Service rate schedules. Therefore, the Company no longer maintains that information.
- b. See response (a).

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4608
In Re: Gas Long-Range Resource and Requirements Plan
For Period 2015/16 to 2024/25
Responses to Division's First Set of Data Requests
Issued on April 12, 2016

Division 1-11, page 2

- c. See response (a).
- d. See response (a).
- e. The Company has not performed an analysis of the impact of natural gas pricing on the gas usage of these dual-fuel customers.

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4608
In Re: Gas Long-Range Resource and Requirements Plan
For Period 2015/16 to 2024/25
Responses to Division's First Set of Data Requests
Issued on April 12, 2016

Division 1-12

Request:

Re: Chart III-B-2, Input Economic Data. For each column of data provided in the pages of Chart III-B-2, please:

- a. Clearly indicate which years' data represent actual historical results and which data reflect estimates or projections;
- b. Provide the source of the data used for each year that is found in each column of Chart III-B-2.

Response:

- a. In Chart III-B-2, the Company presents the annual values of the economic independent variables it used in the development of its gas load forecast. The line "Historical End Date" indicates the final year of actual data; subsequent years would be forecast values.
- b. In Chart III-B-2, the Company presents the annual values of the economic independent variables it used in the development of its gas load forecast. The line "Source" indicates sources of the historical data:

BLS = U.S. Bureau of Labor Statistics

BEA = U.S. Bureau of Economic Analysis

BOC = U.S. Census Bureau

CBP = Zip Code Business Patterns, U.S. Census Bureau

Forecast values are provided by Moody's Analytics.

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4608
In Re: Gas Long-Range Resource and Requirements Plan
For Period 2015/16 to 2024/25
Responses to Division's First Set of Data Requests
Issued on April 12, 2016

Division 1-13

Request:

Sections III.B.2.a Residential Heating Class and III.B.2.b Residential Non-Heating Class contain multiple references to “*Sales and Customer Choice customers.*” Please verify that Customer Choice is not offered to residential customers in Rhode Island and that no proposal for extending Customer Choice to residential customers is presently before the RIPUC.

Response:

The Customer Choice Program is not offered to residential customers in Rhode Island, and there is no proposal presently before the RIPUC to extend the Customer Choice Program to residential customers. Residential customers are utility Sales customers.

The Company's Residential Sales are a component of its Sales and Customer Choice customer base for which the Company has a resource planning obligation. The Company did inadvertently generalize the Residential class as a “Sales and Customer Choice” class.

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4608
In Re: Gas Long-Range Resource and Requirements Plan
For Period 2015/16 to 2024/25
Responses to Division's First Set of Data Requests
Issued on April 12, 2016

Division 1-14

Request:

Re: Section III.B.3, The Impact of Energy Efficiency Programs, at pages 12-13, please provide the referenced analysis of "historical energy efficiency programs" through which the Company determined that historical data should have:

- a. 159,249 MMBtu of embedded savings for residential customers;
- b. 158,421 MMBtu of embedded savings for commercial and industrial customers;

Response:

Please refer to the Excel file labeled "4608-DIV 1-14-Attachment.xlsx", which is identified as Attachment DIV 1-14, and is being provided on CD-ROM, for the Company's analysis of its historical and forecasted energy efficiency impact on natural gas volumes in Rhode Island. The Company used the average of the most recent three years (2012-2014) of actual energy efficiency penetration as the amount of annual energy efficiency reduction embedded within its historical retail sales data. These averages are:

- a. 1,592,494 therms/year (159,249 MMBtu/year) of embedded savings for residential customers; and,
- b. 1,584,206 therms/year (158,421 MMBtu/year) of embedded savings for commercial and industrial customers.

Please refer to the CD-ROM for Attachment DIV 1-14.

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4608
In Re: Gas Long-Range Resource and Requirements Plan
For Period 2015/16 to 2024/25
Responses to Division's First Set of Data Requests
Issued on April 12, 2016

Division 1-15

Request:

Section III.B.3, in the last paragraph on page 12 of the Company's **2016** LRP states, "the Company reduced its demand forecast by the incremental saving over the historical average." Please:

- a. Provide the rationale for using computed incremental savings over the historical average as opposed to incremental savings for the most recent year;
- b. Document by year the data used to determine the referenced "historical average;"
- c. Provide the Company's planned or budgeted expenditures for residential energy efficiency programs for each forecast year in the Company's March **2016** LRP for which such data is available showing separately, if possible, estimated or budgeted costs for:
 - i. Residential energy efficiency programs;
 - ii. Commercial and Industrial energy efficiency programs;
- d. Justify the relationship between the incremental reductions in forecast residential demand of 1,251 MMBtu for years 2015 and beyond and the Company's planned or budgeted expenditures for residential energy efficiency programs;
- e. Justify the relationship between the incremental reductions in forecast Commercial and Industrial demand of 11,042 MMBtu for years 2015 and beyond and the Company's planned or budgeted expenditures for Commercial and Industrial energy efficiency programs.

Response:

- a. While the per-annum trend for energy efficiency penetration in Rhode Island has been increasing, the Company chose to use a three-year average in lieu of the most-recent year to smooth out the year-to-year fluctuations that may occur.
- b. Please refer to Attachment DIV 1-14 for the data and the calculation of the three-year average of the Company's annual energy efficiency penetration successes.

Division 1-15, page 2

- c. Please refer to the Company's Energy Efficiency Program Plan for 2014, Supplemental Filing, Docket No. 4451, as filed on November 26, 2013, which is attached as Attachment DIV 1-15, for the specific energy efficiency programs and measures that served as the basis of the Company's energy efficiency forecast. The Supplemental Filing also contains the Company's planned or budgeted expenditures for residential energy efficiency programs.
- d. As the Company's historical retail residential volume data reflects the effects of the historical penetration rates of residential energy efficiency measures due to the Company's programs, and as the Company's forecasted energy efficiency reductions exceeded the three-year historical average, the Company reduced its forecasted residential volumes to reflect the incremental portion of its forecasted residential energy efficiency programs. The balance of the impact of its forecasted residential energy efficiency programs would already be embedded within its econometric models of the net natural gas requirement of residential customers.
- e. As the Company's historical retail commercial and industrial ("C&I") volume data reflects the effects of the historical penetration rates of C&I energy efficiency measures as a result of the Company's programs, and as the Company's forecasted energy efficiency reductions exceeded the three-year historical average, the Company reduced its forecasted C&I volumes to reflect the incremental portion of its forecasted C&I energy efficiency programs. The balance of the impact of its forecasted C&I energy efficiency programs would already be embedded within its econometric models of the net natural gas requirement of C&I customers.



Jennifer Brooks Hutchinson
Senior Counsel

November 26, 2013

VIA HAND DELIVERY & ELECTRONIC MAIL

Luly E. Massaro, Commission Clerk
Rhode Island Public Utilities Commission
89 Jefferson Boulevard
Warwick, RI 02888

**RE: Docket 4451 – The Narragansett Electric Company, d/b/a National Grid
2014 Energy Efficiency Program Plan
Supplemental Filing**

Dear Ms. Massaro:

Enclosed are ten (10) copies of revised gas tables identified as Attachment 5-Revised, of National Grid's¹ proposed Energy Efficiency Program Plan for 2014 (the "2014 Plan" or "Plan") that the Company filed with the Commission on November 1, 2013. Following the November 1 filing, the Company noted that the gas sales forecast used in calculating the gas Energy Efficiency Program ("EEP") charge was inconsistent with the forecast that the Company had used in other recent regulatory proceedings. In addition, the Company noted that it had not updated the uncollectible rate in the calculation of the uncollectible gross up of the gas EEP charge. The Company has revised the forecast and updated the uncollectible rate in Attachment 5-Revised to reflect an accurate calculation of the gas EEP charge that would be assessed to customers and is submitting Attachment 5-Revised to the Commission for its approval.

The Company also filed Attachment 4-Revised on November 22, 2013 to correct inconsistencies in its electric sales forecast and to include the uncollectible gross-up adjustment in the calculation of the electric EEP charge. Together with Attachment 4-Revised, the enclosed Attachment 5-Revised completes the supplemental filing of the Company's 2014 Plan that it is presenting to the Commission for approval.

A summary of the changes contained in Attachment 5-Revised (Tables G-1 through G-9) is as follows:

- The Company corrected the forecast of gas sales in Table G-1 downward approximately 9%. Although the revised quantity of sales is from the same forecast

¹ The Narragansett Electric Company d/b/a National Grid (referred to herein as "National Grid" or the "Company").

Luly E. Massaro, Commission Clerk
Docket 4451 - EEPP Supplemental Filing (Gas)
November 26, 2013
Page 2 of 4

that the Company used in its November 1, 2013 filing, the original quantity inadvertently double-counted sales forecasted for some rate classes and omitted sales forecasted for other rate classes. In addition, the C&I sector forecast reflected in the November 1 filing omitted the forecast of Non Firm customers, who are subject to the gas EEP charge. Therefore, the Company has included the forecast for this group of customers in this supplemental filing. Also, pursuant to the settlement agreement in Docket 3790, and included in each annual EEP approved since then, certain customers are eligible for an exemption from the gas EEP charge as a result of having installed separately metered combined heat and power (“CHP”) generating facilities or having implemented a self-directed energy efficiency program. The Company has two customers who qualify and are exempt from the EEP charge for the applicable portion of their gas usage as a result of having installed CHP. Therefore, the Company has reduced the forecast in Table G-1 by the historic sales to these customers, as the Company’s forecast includes them. Finally, the November 1 forecast was presented on a calendar-month basis while the corrected forecast is presented, with all of the above corrections, on a billing-month basis. This revised forecast is consistent with the gas forecast used in other recent proceedings.

- To maintain the proposed two sector-specific gas EEP charges as close to the \$0.596 per dekatherm for residential customers and \$0.474 per dekatherm for C&I customers from the November 1 filing as possible, the Company reduced the gas budget by \$2.3 million. This results in a new gas EEP charge of \$0.600 for residential customers and \$0.492 for C&I customers, inclusive of the gross up for uncollectibles expense. The impact on the typical residential heating customer using 846 therms per year is an increase of \$15.97 or 1.3%. Schedule 2 to this letter illustrates the calculation of these figures.²
- Thus, in this supplemental filing, the Company is proposing a total gas budget of \$23.5 million (compared to \$25.8 million in the November 1 filing), as shown on Table G-1. The budget reductions include \$1.7 million from program incentives and sales support distributed across all programs, \$300,000 from C&I financing of gas energy efficiency projects, and the balance from marketing, evaluation, and regulatory and shareholder incentive costs that are based on a percentage of the budget. The resulting changes to costs and benefits are reflected in Tables G-2 through G-7, as well as G-9. In addition, as a result of the revised budget, the benefit-cost ratio increased from 1.69 to 1.70, as shown in Table G-5.
- As a result of the budget reduction, savings are 93% of the originally filed savings. The new lifetime savings expected to be produced from the gas plan is 4,052,374

² The Company submitted electric bill impacts as Schedule 1 to the Company’s November 22, 2013 filing. For ease of reference, the Company has identified the gas bill impacts included with this filing as Schedule 2.

Luly E. Massaro, Commission Clerk
Docket 4451 - EEPP Supplemental Filing (Gas)
November 26, 2013
Page 3 of 4

MMBtu, as shown in Table G-6, which translates into a lifetime bill savings of approximately \$50.7 million.³ The revised gas plan will create economic benefits of \$49.0 million over the life of the measures (compared to \$53.5 million in the November 1 filing), as shown in Table G-6. When combined with electric, the Plan will still generate more than \$416.4 million in total economic benefits over the life of the measures.

- Participation in the gas programs will decrease by approximately 1,100 customers compared to the originally filed plan, but will still increase by 46,285 participants compared to the 2013 Plan for the gas program, as shown on Table G-7.
- The Company has also updated the gross-up adjustment for the uncollectible rate of 3.18% in Table G-1, the rate approved by the Commission in the Company's last general rate case, Docket 4323, and to show the charges as they will appear on customer bills.
- For the sake of completeness the Company has included the full set of gas tables.

The Company believes it is necessary to make these corrections to its gas EEP charges and to revise its gas programs accordingly in order to balance the concerns of the parties regarding the funding levels for this year's Plan. The Company apologizes to the Commission for any inconvenience that may have been caused as a result of the errors in the original forecast, and the Company has taken steps to mitigate this occurrence in the future. The Company believes, however, that the gas programs, as revised in this supplemental filing, still meet the objectives of all parties and will provide a stable delivery of energy efficiency services to its customers, notwithstanding the reduction in the gas budget compared to the original proposal.

The Company has consulted with the settlement parties (i.e. the Division of Public Utilities and Carriers, the Rhode Island Energy Efficiency and Resources Management Council, Environment Northeast, and The Energy Council of Rhode Island), and they have each indicated their support for and approval of Attachment 5-Revised. In addition, the Company has received confirmation from The Energy Council of Rhode Island that they support and approve of the revised electric tables (Attachment 4-Revised) that the Company filed with the Commission on November 22, 2013.

The Company respectfully requests that the Commission approve the 2014 Plan, as revised in this supplemental filing.

³ Lifetime bill savings are estimated by multiplying lifetime savings by current rates in 2013 dollars.

Luly E. Massaro, Commission Clerk
Docket 4451 - EEPP Supplemental Filing (Gas)
November 26, 2013
Page 4 of 4

Thank you for your attention to this filing. If you have any questions, please feel free to contact me at (401) 784-7288.

Very truly yours,



Jennifer Brooks Hutchinson

cc: Docket 4451 Service List
Karen Lyons, Esq.
Jon Hagopian, Esq.
Steve Scialabba, Division

Certificate of Service

I hereby certify that a copy of the cover letter and/or any materials accompanying this certificate were electronically transmitted to the individuals listed below. Copies of this filing were hand delivered to the RI Public Utilities Commission and the RI Division of Public Utilities and Carriers.



Jennifer Brooks Hutchinson

November 26, 2013
Date

**Docket No. 4451 - National Grid - 2014 Energy Efficiency Program Plan
Service list updated 11/5/13**

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National Grid - RI Gas
2014 Energy Efficiency Plan Filing - 2014 Energy Efficiency Program Charge
Bill Impact Analysis with Various Levels of Consumption:

Line
No.

Residential Heating:

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | | | | | | | | | | |
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Residential Heating Low Income:

| | Annual Consumption (Therms) | Proposed Rates | Current Rates | Difference | % Chg | Difference due to: | | | | | | | | | |
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| (20) | 550 | \$816.38 | \$806.01 | \$10.37 | 1.3% | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.31 | \$10.06 | | | | |
| (21) | 608 | \$886.79 | \$875.33 | \$11.46 | 1.3% | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.34 | \$11.12 | | | | |
| (22) | 667 | \$958.30 | \$945.72 | \$12.58 | 1.3% | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.38 | \$12.20 | | | | |
| (23) | 727 | \$1,030.08 | \$1,016.36 | \$13.72 | 1.4% | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.41 | \$13.31 | | | | |
| (24) | 788 | \$1,100.29 | \$1,085.43 | \$14.87 | 1.4% | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.45 | \$14.42 | | | | |
| (25) | 846 | \$1,165.87 | \$1,149.90 | \$15.97 | 1.4% | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.48 | \$15.49 | | | | |
| (26) | 904 | \$1,231.63 | \$1,214.56 | \$17.07 | 1.4% | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.51 | \$16.56 | | | | |
| (27) | 966 | \$1,301.71 | \$1,283.50 | \$18.21 | 1.4% | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.55 | \$17.66 | | | | |
| (28) | 1,023 | \$1,365.96 | \$1,346.67 | \$19.29 | 1.4% | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.58 | \$18.71 | | | | |
| (29) | 1,081 | \$1,430.68 | \$1,410.28 | \$20.40 | 1.4% | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.61 | \$19.79 | | | | |
| (30) | 1,145 | \$1,501.21 | \$1,479.60 | \$21.61 | 1.5% | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.65 | \$20.96 | | | | |
| | Average Customer | | | | | | | | | | | | | | |

**National Grid - RI Gas
2014 Energy Efficiency Plan Filing - 2014 Energy Efficiency Program Charge
Bill Impact Analysis with Various Levels of Consumption:**

Line
No.

Residential Non-Heating:

| (31) | Annual Consumption (Therms) | Proposed Rates | Current Rates | Difference | % Chg | Difference due to: | | | |
|------|--------------------------------|-------------------|------------------|------------|-------|--------------------|----------|--------|--------|
| | | | | | | GCR | DAC | | EE |
| | | | | | | | Base DAC | ISR | |
| (32) | 140 | \$327.76 | \$325.12 | \$2.64 | 0.8% | \$0.00 | \$0.00 | \$0.00 | \$2.56 |
| (33) | 155 | \$345.59 | \$342.67 | \$2.92 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$2.83 |
| (34) | 171 | \$364.69 | \$361.46 | \$3.23 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$3.13 |
| (35) | 184 | \$380.17 | \$376.68 | \$3.48 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$3.38 |
| (36) | 198 | \$396.86 | \$393.15 | \$3.71 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$3.60 |
| (37) | 214 | \$415.56 | \$411.54 | \$4.02 | 1.0% | \$0.00 | \$0.00 | \$0.00 | \$3.90 |
| (38) | 228 | \$432.63 | \$428.33 | \$4.30 | 1.0% | \$0.00 | \$0.00 | \$0.00 | \$4.17 |
| (39) | 244 | \$451.74 | \$447.13 | \$4.61 | 1.0% | \$0.00 | \$0.00 | \$0.00 | \$4.47 |
| (40) | 258 | \$468.42 | \$463.57 | \$4.86 | 1.0% | \$0.00 | \$0.00 | \$0.00 | \$4.71 |
| (41) | 275 | \$488.62 | \$483.43 | \$5.20 | 1.1% | \$0.00 | \$0.00 | \$0.00 | \$5.04 |
| (42) | 288 | \$504.19 | \$498.76 | \$5.43 | 1.1% | \$0.00 | \$0.00 | \$0.00 | \$5.27 |

Residential Non-Heating Low Income:

| (46) | Annual Consumption (Therms) | Proposed Rates | Current Rates | Difference | % Chg | Difference due to: | | | |
|------|--------------------------------|-------------------|------------------|------------|-------|--------------------|----------|--------|--------|
| | | | | | | GCR | DAC | | EE |
| | | | | | | | Base DAC | ISR | |
| (47) | 140 | \$305.34 | \$302.70 | \$2.64 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$2.56 |
| (48) | 155 | \$322.49 | \$319.58 | \$2.92 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$2.83 |
| (49) | 171 | \$340.87 | \$337.64 | \$3.23 | 1.0% | \$0.00 | \$0.00 | \$0.00 | \$3.13 |
| (50) | 184 | \$355.76 | \$352.27 | \$3.48 | 1.0% | \$0.00 | \$0.00 | \$0.00 | \$3.38 |
| (51) | 198 | \$371.82 | \$368.10 | \$3.71 | 1.0% | \$0.00 | \$0.00 | \$0.00 | \$3.60 |
| (52) | 214 | \$389.81 | \$385.79 | \$4.02 | 1.0% | \$0.00 | \$0.00 | \$0.00 | \$3.90 |
| (53) | 228 | \$406.23 | \$401.93 | \$4.30 | 1.1% | \$0.00 | \$0.00 | \$0.00 | \$4.17 |
| (54) | 244 | \$424.62 | \$420.01 | \$4.61 | 1.1% | \$0.00 | \$0.00 | \$0.00 | \$4.47 |
| (55) | 258 | \$440.66 | \$435.81 | \$4.86 | 1.1% | \$0.00 | \$0.00 | \$0.00 | \$4.71 |
| (56) | 275 | \$460.10 | \$454.90 | \$5.20 | 1.1% | \$0.00 | \$0.00 | \$0.00 | \$5.04 |
| (57) | 288 | \$475.08 | \$469.64 | \$5.43 | 1.2% | \$0.00 | \$0.00 | \$0.00 | \$5.27 |

**National Grid - RI Gas
2014 Energy Efficiency Plan Filing - 2014 Energy Efficiency Program Charge
Bill Impact Analysis with Various Levels of Consumption:**

Line
No.

C & I Small:

| | Annual Consumption (Therms) | Proposed Rates | Current Rates | Difference | % Chg | Difference due to: | | | |
|------|--------------------------------|-------------------|------------------|----------------|-------------|--------------------|----------|--------|--------|
| | | | | | | GCR | Base DAC | DAC | ISR |
| (61) | 880 | \$1,407.00 | \$1,400.21 | \$6.79 | 0.5% | \$0.00 | \$0.00 | \$0.00 | \$0.20 |
| (62) | 973 | \$1,513.14 | \$1,505.62 | \$7.52 | 0.5% | \$0.00 | \$0.00 | \$0.00 | \$0.23 |
| (63) | 1,067 | \$1,619.66 | \$1,611.41 | \$8.25 | 0.5% | \$0.00 | \$0.00 | \$0.00 | \$0.25 |
| (64) | 1,162 | \$1,724.87 | \$1,715.89 | \$8.99 | 0.5% | \$0.00 | \$0.00 | \$0.00 | \$0.27 |
| (65) | 1,258 | \$1,825.46 | \$1,815.75 | \$9.71 | 0.5% | \$0.00 | \$0.00 | \$0.00 | \$0.29 |
| (66) | 1,352 | \$1,922.85 | \$1,912.42 | \$10.43 | 0.5% | \$0.00 | \$0.00 | \$0.00 | \$0.31 |
| (67) | 1,446 | \$2,021.06 | \$2,009.87 | \$11.20 | 0.6% | \$0.00 | \$0.00 | \$0.00 | \$0.34 |
| (68) | 1,542 | \$2,120.69 | \$2,108.76 | \$11.93 | 0.6% | \$0.00 | \$0.00 | \$0.00 | \$0.36 |
| (69) | 1,635 | \$2,217.30 | \$2,204.65 | \$12.65 | 0.6% | \$0.00 | \$0.00 | \$0.00 | \$0.38 |
| (70) | 1,730 | \$2,314.90 | \$2,301.52 | \$13.38 | 0.6% | \$0.00 | \$0.00 | \$0.00 | \$0.40 |
| (71) | 1,825 | \$2,412.54 | \$2,398.45 | \$14.09 | 0.6% | \$0.00 | \$0.00 | \$0.00 | \$0.42 |
| (72) | | | | | | | | | |
| (73) | | | | | | | | | |
| (74) | | | | | | | | | |
| (75) | | | | | | | | | |

C & I Medium:

| | Annual Consumption (Therms) | Proposed Rates | Current Rates | Difference | % Chg | Difference due to: | | | |
|------|--------------------------------|-------------------|------------------|----------------|-------------|--------------------|----------|--------|--------|
| | | | | | | GCR | Base DAC | DAC | ISR |
| (76) | 7,941 | \$9,309.28 | \$9,247.90 | \$61.38 | 0.7% | \$0.00 | \$0.00 | \$0.00 | \$1.84 |
| (77) | 8,796 | \$10,218.71 | \$10,150.70 | \$68.01 | 0.7% | \$0.00 | \$0.00 | \$0.00 | \$2.04 |
| (78) | 9,650 | \$11,126.64 | \$11,052.03 | \$74.61 | 0.7% | \$0.00 | \$0.00 | \$0.00 | \$2.24 |
| (79) | 10,505 | \$12,036.07 | \$11,954.85 | \$81.23 | 0.7% | \$0.00 | \$0.00 | \$0.00 | \$2.44 |
| (80) | 11,361 | \$12,945.90 | \$12,858.06 | \$87.84 | 0.7% | \$0.00 | \$0.00 | \$0.00 | \$2.64 |
| (81) | 12,217 | \$13,856.04 | \$13,761.57 | \$94.46 | 0.7% | \$0.00 | \$0.00 | \$0.00 | \$2.83 |
| (82) | 13,073 | \$14,766.20 | \$14,665.12 | \$101.08 | 0.7% | \$0.00 | \$0.00 | \$0.00 | \$3.03 |
| (83) | 13,928 | \$15,675.08 | \$15,567.37 | \$107.71 | 0.7% | \$0.00 | \$0.00 | \$0.00 | \$3.23 |
| (84) | 14,782 | \$16,583.57 | \$16,469.27 | \$114.30 | 0.7% | \$0.00 | \$0.00 | \$0.00 | \$3.43 |
| (85) | 15,637 | \$17,492.45 | \$17,371.51 | \$120.94 | 0.7% | \$0.00 | \$0.00 | \$0.00 | \$3.63 |
| (86) | 16,492 | \$18,401.92 | \$18,274.40 | \$127.52 | 0.7% | \$0.00 | \$0.00 | \$0.00 | \$3.83 |
| (87) | | | | | | | | | |
| (88) | | | | | | | | | |
| (89) | | | | | | | | | |
| (90) | | | | | | | | | |

National Grid - RI Gas
2014 Energy Efficiency Plan Filing - 2014 Energy Efficiency Program Charge
Bill Impact Analysis with Various Levels of Consumption:

Line
No.

C & I HLF Large:

| | Annual Consumption (Therms) | Proposed Rates | Current Rates | Difference | % Chg | Difference due to: | | | |
|-------|--------------------------------|--------------------|--------------------|-----------------|-------------|--------------------|----------|--------|---------|
| | | | | | | GCR | Base DAC | DAC | ISR |
| (91) | | | | | | | | | |
| (92) | | | | | | | | | |
| (93) | | | | | | | | | |
| (94) | | | | | | | | | |
| (95) | 41,066 | \$44,235.34 | \$43,917.82 | \$317.52 | 0.7% | \$0.00 | \$0.00 | \$0.00 | \$9.53 |
| (96) | 45,488 | \$48,765.48 | \$48,413.78 | \$351.70 | 0.7% | \$0.00 | \$0.00 | \$0.00 | \$10.55 |
| (97) | 49,910 | \$53,295.69 | \$52,909.75 | \$385.94 | 0.7% | \$0.00 | \$0.00 | \$0.00 | \$11.58 |
| (98) | 54,334 | \$57,827.65 | \$57,407.55 | \$420.10 | 0.7% | \$0.00 | \$0.00 | \$0.00 | \$12.60 |
| (99) | 58,757 | \$62,358.73 | \$61,904.41 | \$454.32 | 0.7% | \$0.00 | \$0.00 | \$0.00 | \$13.63 |
| (100) | 63,179 | \$66,889.06 | \$66,400.58 | \$488.47 | 0.7% | \$0.00 | \$0.00 | \$0.00 | \$14.65 |
| (101) | 67,600 | \$71,418.16 | \$70,895.49 | \$522.67 | 0.7% | \$0.00 | \$0.00 | \$0.00 | \$15.68 |
| (102) | 72,023 | \$75,949.23 | \$75,392.35 | \$556.88 | 0.7% | \$0.00 | \$0.00 | \$0.00 | \$16.71 |
| (103) | 76,447 | \$80,481.83 | \$79,890.74 | \$591.08 | 0.7% | \$0.00 | \$0.00 | \$0.00 | \$17.73 |
| (104) | 80,870 | \$85,012.94 | \$84,387.66 | \$625.28 | 0.7% | \$0.00 | \$0.00 | \$0.00 | \$18.76 |
| (105) | 85,292 | \$89,543.10 | \$88,883.61 | \$659.48 | 0.7% | \$0.00 | \$0.00 | \$0.00 | \$19.78 |

C & I HLF Large:

| | Annual Consumption (Therms) | Proposed Rates | Current Rates | Difference | % Chg | Difference due to: | | | |
|-------|--------------------------------|--------------------|--------------------|-----------------|-------------|--------------------|----------|--------|---------|
| | | | | | | GCR | Base DAC | DAC | ISR |
| (106) | | | | | | | | | |
| (107) | | | | | | | | | |
| (108) | | | | | | | | | |
| (109) | | | | | | | | | |
| (110) | 50,411 | \$48,294.78 | \$47,904.98 | \$389.79 | 0.8% | \$0.00 | \$0.00 | \$0.00 | \$11.69 |
| (111) | 55,841 | \$53,263.57 | \$52,831.82 | \$431.75 | 0.8% | \$0.00 | \$0.00 | \$0.00 | \$12.95 |
| (112) | 61,273 | \$58,234.07 | \$57,760.30 | \$473.77 | 0.8% | \$0.00 | \$0.00 | \$0.00 | \$14.21 |
| (113) | 66,699 | \$63,199.66 | \$62,683.91 | \$515.74 | 0.8% | \$0.00 | \$0.00 | \$0.00 | \$15.47 |
| (114) | 72,129 | \$68,168.48 | \$67,610.76 | \$557.72 | 0.8% | \$0.00 | \$0.00 | \$0.00 | \$16.73 |
| (115) | 77,558 | \$73,136.43 | \$72,536.76 | \$599.67 | 0.8% | \$0.00 | \$0.00 | \$0.00 | \$17.99 |
| (116) | 82,989 | \$78,105.33 | \$77,463.68 | \$641.65 | 0.8% | \$0.00 | \$0.00 | \$0.00 | \$19.25 |
| (117) | 88,416 | \$83,071.71 | \$82,388.06 | \$683.65 | 0.8% | \$0.00 | \$0.00 | \$0.00 | \$20.51 |
| (118) | 93,847 | \$88,041.34 | \$87,315.72 | \$725.62 | 0.8% | \$0.00 | \$0.00 | \$0.00 | \$21.77 |
| (119) | 99,275 | \$93,008.53 | \$92,240.94 | \$767.60 | 0.8% | \$0.00 | \$0.00 | \$0.00 | \$23.03 |
| (120) | 104,705 | \$97,977.42 | \$97,167.84 | \$809.58 | 0.8% | \$0.00 | \$0.00 | \$0.00 | \$24.29 |

**National Grid - RI Gas
2014 Energy Efficiency Plan Filing - 2014 Energy Efficiency Program Charge
Bill Impact Analysis with Various Levels of Consumption:**

Line
No.

C & I LLF Extra-Large:

| | Annual Consumption (Therms) | Proposed Rates | Current Rates | Difference | % Chg | Difference due to: | | | |
|-------|--------------------------------|-------------------|------------------|-------------------|-------------|--------------------|----------|--------|--------|
| | | | | | | GCR | Base DAC | DAC | ISR |
| (121) | 174,357 | \$157,195.72 | \$155,847.62 | \$1,348.10 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| (122) | 193,136 | \$173,559.73 | \$172,066.41 | \$1,493.32 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| (123) | 211,912 | \$189,921.42 | \$188,282.92 | \$1,638.51 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| (124) | 230,688 | \$206,283.67 | \$204,499.97 | \$1,783.70 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| (125) | 249,466 | \$222,646.84 | \$220,718.00 | \$1,928.85 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| (126) | 268,243 | \$239,009.19 | \$236,935.14 | \$2,074.05 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| (127) | 287,018 | \$255,370.29 | \$253,151.09 | \$2,219.21 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| (128) | 305,796 | \$271,734.11 | \$269,369.72 | \$2,364.39 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| (129) | 324,573 | \$288,096.57 | \$285,587.00 | \$2,509.58 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| (130) | 343,350 | \$304,459.00 | \$301,804.22 | \$2,654.78 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| (131) | 362,127 | \$320,821.48 | \$318,021.54 | \$2,799.95 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| (132) | | | | | | | | | |
| (133) | | | | | | | | | |
| (134) | | | | | | | | | |
| (135) | | | | | | | | | |

C & I HLF Extra-Large:

| | Annual Consumption (Therms) | Proposed Rates | Current Rates | Difference | % Chg | Difference due to: | | | |
|-------|--------------------------------|-------------------|------------------|-------------------|-------------|--------------------|----------|--------|--------|
| | | | | | | GCR | Base DAC | DAC | ISR |
| (136) | 447,421 | \$373,404.07 | \$369,944.60 | \$3,459.47 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| (137) | 495,605 | \$413,050.44 | \$409,218.43 | \$3,832.01 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| (138) | 543,789 | \$452,697.59 | \$448,493.02 | \$4,204.57 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| (139) | 591,972 | \$492,343.23 | \$487,766.12 | \$4,577.11 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| (140) | 640,155 | \$531,988.82 | \$527,039.14 | \$4,949.68 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| (141) | 688,340 | \$571,636.42 | \$566,314.22 | \$5,322.21 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| (142) | 736,523 | \$611,282.40 | \$605,587.64 | \$5,694.75 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| (143) | 784,708 | \$650,929.52 | \$644,862.18 | \$6,067.34 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| (144) | 832,891 | \$690,575.92 | \$684,136.05 | \$6,439.87 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| (145) | 881,074 | \$730,221.53 | \$723,409.12 | \$6,812.41 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| (146) | 929,259 | \$769,869.41 | \$762,684.42 | \$7,184.99 | 0.9% | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| (147) | | | | | | | | | |
| (148) | | | | | | | | | |
| (149) | | | | | | | | | |
| (150) | | | | | | | | | |

**Table G-1
National Grid
Gas DSM Funding Sources in 2014 by Sector
\$(000)**

| | <u>Projections by Sector</u> | | | |
|--|------------------------------|----------------------|-------------------|-------------------|
| | Income Eligible | Non-Income | Commercial & | Total |
| | Residential | Eligible Residential | Industrial | |
| (1) Projected Budget (from G-2): | \$4,827.0 | \$10,289.7 | \$8,375.8 | \$23,492.5 |
| Sources of Other Funding: | | | | |
| (2) Estimated Year-End 2013 Fund Balance and Interest: | (\$200.0) | (\$1,860.3) | \$4,010.4 | \$1,950.1 |
| (3) Low Income Weatherization in Base Rates: | <u>\$200.00</u> | | | <u>\$200.00</u> |
| (4) Total Other Funding: | \$0.0 | (\$1,860.3) | \$4,010.4 | \$2,150.1 |
| (5) Customer Funding Required: | \$4,827.0 | \$12,150.0 | \$4,365.4 | \$21,342.3 |
| (6) Forecasted Firm Dth Sales | 1,815,891 | 17,284,732 | 19,492,157 | 38,592,780 |
| (7) Forecasted Non Firm Dth Sales | | | 2,717,890 | 2,717,890 |
| (8) Less: Exempt DG Customers | | | (740,708) | (740,708) |
| (9) Forecasted Dth Sales: | 1,815,891 | 17,284,732 | 21,469,338 | 40,569,962 |
| Average Energy Efficiency Program Charge per Dth | | | | |
| (10) excluding Uncollectible Recovery: | | | | \$0.526 |
| Proposed Energy Efficiency Program Charge per Dth | | | | |
| (11) excluding Uncollectible Recovery | \$0.581 | \$0.581 | \$0.477 | |
| (12) Currently Effective Uncollectible Rate | <u>3.18%</u> | <u>3.18%</u> | <u>3.18%</u> | |
| Proposed Energy Efficiency Program Charge per Dth | | | | |
| (13) including Uncollectible Recovery: | \$0.600 | \$0.600 | \$0.492 | |
| Currently Effective Energy Efficiency Program Charge | | | | |
| (14) per Dth | \$0.417 | \$0.417 | \$0.417 | |
| Adjustment to Reflect Fully Reconciling Funding | | | | |
| (15) Mechanism | \$0.183 | \$0.183 | \$0.075 | |

Notes

(1) Projected Budget from G-2 includes Regulatory costs allocated to each sector based on forecasted sales.

(2) Fund Balance projections include projected revenue and spend through year end, with Low Income sector set to \$0 through projected subsidization from other sectors. Also includes contribution from C&I sector to Residential sector consistent with 2013 Plan.

(11) As agreed to by the settling parties, the proposed EE program charges allow for the use of collections from one sector to fund energy efficiency services in other sectors that would otherwise not be supported with the proposed collection rates. The C&I charge includes collection of \$5875.5 of which \$3771.9 will be allocated to the low income sector and \$2,107.5 to the residential sector.

The Narragansett Electric Company
d/b/a National Grid
R.I.P.U.C. Docket No. 4451
In Re: 2014 Energy Efficiency Program Plan
Attachment 5 - Revised
Page 2 of 9

Table G-2
National Grid
2014 Gas Energy Efficiency Program Budget (\$000)

| | Program Planning and Administration | Marketing | Rebates and Other Customer Incentives | Sales, Technical Assistance and Training | Evaluation & Market Research | Shareholder Incentive | Grand Total |
|---|---|------------------|---|--|---------------------------------|--------------------------|-------------------|
| Non-Income Eligible Residential: | | | | | | | |
| ENERGY STAR [®] HVAC | \$53.5 | \$279.0 | \$1,449.5 | \$214.9 | \$35.2 | \$0.0 | \$2,032.0 |
| EnergyWise | \$108.4 | \$52.9 | \$4,380.0 | \$279.2 | \$28.1 | \$0.0 | \$4,848.6 |
| EnergyWise Multifamily | \$21.1 | \$5.3 | \$1,100.0 | \$188.3 | \$6.8 | \$0.0 | \$1,321.4 |
| Home Energy Reports | \$18.5 | \$0.2 | \$412.4 | \$37.2 | \$27.6 | \$0.0 | \$496.0 |
| Residential Products Pilot | \$2.4 | \$18.1 | \$62.5 | \$53.3 | \$0.1 | \$0.0 | \$136.4 |
| Residential New Construction | \$7.5 | \$0.4 | \$425.0 | \$175.6 | \$1.4 | \$0.0 | \$610.0 |
| Comprehensive Marketing - Residential | \$2.5 | \$136.8 | \$0.0 | \$0.3 | \$0.1 | \$0.0 | \$139.8 |
| Community Based Initiatives - Residential | \$0.9 | \$0.0 | \$30.0 | \$13.5 | \$5.1 | \$0.0 | \$49.5 |
| Residential Shareholder Incentive | \$0.0 | \$0.0 | \$0.0 | \$0.0 | \$0.0 | \$481.7 | \$481.7 |
| Subtotal - Non-Income Eligible Residential | \$214.9 | \$492.8 | \$7,859.3 | \$962.3 | \$104.4 | \$481.7 | \$10,115.4 |
| Income Eligible Residential: | | | | | | | |
| Single Family - Income Eligible Services | \$24.4 | \$7.2 | \$1,877.5 | \$674.9 | \$17.3 | \$0.0 | \$2,601.3 |
| Income Eligible Multifamily | \$56.0 | \$6.1 | \$1,650.0 | \$255.6 | \$10.8 | \$0.0 | \$1,978.4 |
| Income Eligible Shareholder Incentive | \$0.0 | \$0.0 | \$0.0 | \$0.0 | \$0.0 | \$229.0 | \$229.0 |
| Subtotal - Income Eligible Residential | \$80.3 | \$13.3 | \$3,527.5 | \$930.5 | \$28.2 | \$229.0 | \$4,808.7 |
| Commercial & Industrial | | | | | | | |
| Large Commercial New Construction | \$77.0 | \$118.9 | \$1,383.0 | \$517.7 | \$65.6 | \$0.0 | \$2,162.3 |
| Large Commercial Retrofit | \$119.3 | \$189.3 | \$2,543.3 | \$820.7 | \$80.8 | \$0.0 | \$3,753.3 |
| Small Business Direct Install | \$7.2 | \$40.5 | \$279.6 | \$218.6 | \$26.9 | \$0.0 | \$572.8 |
| Commercial & Industrial Multifamily | \$14.2 | \$41.3 | \$335.0 | \$98.3 | \$0.3 | \$0.0 | \$489.1 |
| Commercial & Industrial Pilots | \$6.9 | \$32.9 | \$294.7 | \$64.4 | \$0.2 | \$0.0 | \$399.1 |
| Finance Costs | \$0.0 | \$0.0 | \$200.0 | \$0.0 | \$0.0 | \$0.0 | \$200.0 |
| Comprehensive Marketing - Commercial & Industrial | \$3.9 | \$159.2 | \$0.0 | \$10.6 | \$0.1 | \$0.0 | \$173.7 |
| Community Based Initiatives - C&I | \$0.0 | \$0.0 | \$0.0 | \$30.0 | \$0.0 | \$0.0 | \$30.0 |
| Commercial & Industrial Shareholder Incentive | \$0.0 | \$0.0 | \$0.0 | \$0.0 | \$0.0 | \$379.0 | \$379.0 |
| Subtotal - Commercial & Industrial | \$228.6 | \$581.9 | \$5,035.7 | \$1,760.2 | \$173.9 | \$379.01 | \$8,159.3 |
| Regulatory | | | | | | | |
| EERMC | \$245.4 | \$0.0 | \$0.0 | \$0.0 | \$0.0 | \$0.0 | \$245.4 |
| OER | \$163.6 | \$0.0 | \$0.0 | \$0.0 | \$0.0 | \$0.0 | \$163.6 |
| Subtotal - Regulatory | \$409.0 | \$0.0 | \$0.0 | \$0.0 | \$0.0 | \$0.0 | \$409.0 |
| Grand Total | \$932.8 | \$1,088.0 | \$16,422.5 | \$3,653.0 | \$306.5 | \$1,089.7 | \$23,492.5 |

Notes:

(1) OER is equal to 0.8% and EERMC is equal to 1.2% of total collections from customers' Energy Efficiency Program Charge, reduced by 2%.

Table G-3
National Grid
Derivation of the 2014 Spending & Implementation Budgets (\$000)

| | Proposed 2013 Budget From G-2 (\$000) | Outside Finance and Stakeholder Oversight Costs (\$000) | Shareholder Incentive (\$000) | Evaluation Costs (\$000) | Eligible Sector Spending Budget for Shareholder Incentive on G-9 (\$000) ¹ | Implementation Expenses for Cost-Effectiveness on G-5 (\$000) ² |
|---|---|--|----------------------------------|-----------------------------|---|--|
| Non-Income Eligible Residential | | | | | | |
| ENERGY STAR® HVAC | \$ 2,032.0 | | \$ - | \$ 35.2 | | \$ 1,996.8 |
| EnergyWise | \$ 4,848.6 | | \$ - | \$ 28.1 | | \$ 4,820.5 |
| EnergyWise Multifamily | \$ 1,321.4 | | \$ - | \$ 6.8 | | \$ 1,314.7 |
| Home Energy Reports | \$ 496.0 | | \$ - | \$ 27.6 | | \$ 468.3 |
| Residential Products Pilot | \$ 136.4 | | \$ - | \$ 0.1 | | \$ 136.2 |
| Residential New Construction | \$ 610.0 | | | \$ 1.4 | | |
| Comprehensive Marketing - Residential | \$ 139.8 | | \$ - | \$ 0.1 | | \$ 139.7 |
| Community Based Initiatives - Residential | \$ 49.5 | | \$ - | \$ 5.1 | | \$ 44.4 |
| Residential Shareholder Incentive | \$ 481.7 | | \$ 481.7 | \$ - | | \$ - |
| Subtotal - Non-Income Eligible Residential | \$ 10,115.4 | \$ - | \$ 481.7 | \$ 104.4 | \$ 9,633.7 | \$ 9,529.3 |
| Income Eligible Residential | | | | | | |
| Single Family - Income Eligible Services | \$ 2,601.3 | | \$ - | \$ 17.3 | | \$ 2,584.0 |
| Income Eligible Multifamily | \$ 1,978.4 | | \$ - | \$ 10.8 | | \$ 1,967.6 |
| Income Eligible Shareholder Incentive | \$ 229.0 | | \$ 229.0 | \$ - | | \$ - |
| Subtotal - Income Eligible Residential | \$ 4,808.7 | \$ - | \$ 229.0 | \$ 28.2 | \$ 4,579.7 | \$ 4,551.5 |
| Commercial & Industrial | | | | | | |
| Large Commercial New Construction | \$ 2,162.3 | | \$ - | \$ 65.6 | | \$ 2,096.7 |
| Large Commercial Retrofit | \$ 3,753.3 | | \$ - | \$ 80.8 | | \$ 3,672.5 |
| Small Business Direct Install | \$ 572.8 | | \$ - | \$ 26.9 | | \$ 545.9 |
| Commercial & Industrial Multifamily | \$ 489.1 | | \$ - | \$ 0.3 | | \$ 488.8 |
| Commercial & Industrial Pilots | \$ 399.1 | | \$ - | \$ 0.2 | | \$ 398.8 |
| Finance Costs | \$ 200.0 | \$ 200.0 | \$ - | \$ - | | \$ 200.0 |
| Comprehensive Marketing - Commercial & Industrial | \$ 173.7 | | \$ - | \$ 0.1 | | \$ 173.6 |
| Community Based Initiatives - C&I | \$ 30.0 | | \$ - | \$ - | | \$ 30.0 |
| Commercial & Industrial Shareholder Incentive | \$ 379.0 | | \$ 379.0 | \$ - | | \$ - |
| Subtotal - Commercial & Industrial | \$ 8,159.3 | \$ 200.0 | \$ 379.0 | \$ 173.9 | \$ 7,580.3 | \$ 7,606.4 |
| Regulatory | | | | | | |
| EERMC | \$ 245.4 | \$ 245.4 | | | | \$ 245.4 |
| OER | \$ 163.6 | \$ 163.6 | | | | \$ 163.6 |
| Subtotal - Regulatory | \$ 409.0 | \$ 409.0 | \$ - | \$ - | | \$ 409.0 |
| Grand Total | \$ 23,492.5 | \$ 409.0 | \$ 1,089.7 | \$ 306.5 | \$ 21,793.7 | \$ 22,096.2 |

Notes:

(1) Eligible Sector Spending Budget = Budget from G-2 minus Regulatory Costs, Finance Costs, and Shareholder Incentive

(2) Implementation Expenses = Budget from G-2 minus Evaluation Costs and Shareholder Incentive

Table G-4
National Grid
Proposed 2014 Budget Compared to Approved 2013 Budget (\$000)

| | Proposed Budget 2014 from G-2 | 2013 Approved Gas Budget | Difference |
|---|--|---|-------------------|
| Non-Income Eligible Residential | | | |
| ENERGY STAR® HVAC | \$ 2,032.0 | \$ 2,441.9 | \$ (409.8) |
| EnergyWise | \$ 4,848.6 | \$ 3,511.6 | \$ 1,337.0 |
| EnergyWise Multifamily | \$ 1,321.4 | \$ 464.5 | \$ 857.0 |
| Home Energy Reports | \$ 496.0 | \$ 304.6 | \$ 191.4 |
| Residential Products Pilot | \$ 136.4 | \$ 172.9 | \$ (36.5) |
| Residential New Construction | \$ 610.0 | \$ 344.2 | \$ 265.8 |
| Comprehensive Marketing - Residential | \$ 139.8 | \$ 174.6 | \$ (34.8) |
| Community Based Initiatives - Residential | \$ 49.5 | \$ 60.0 | \$ (10.5) |
| Residential Shareholder Incentive | \$ 481.7 | \$ 373.7 | \$ 108.0 |
| Subtotal - Non-Income Eligible Residential | \$ 10,115.4 | \$ 7,847.9 | \$ 2,267.5 |
| | | | |
| Income Eligible Residential | | | |
| Single Family - Income Eligible Services | \$ 2,601.3 | \$ 2,450.1 | \$ 151.2 |
| Income Eligible Multifamily | \$ 1,978.4 | \$ 1,628.6 | \$ 349.8 |
| Income Eligible Shareholder Incentive | \$ 229.0 | \$ 203.9 | \$ 25.0 |
| Subtotal - Income Eligible Residential | \$ 4,808.7 | \$ 4,282.7 | \$ 526.0 |
| | | | |
| Commercial & Industrial | | | |
| Large Commercial New Construction | \$ 2,162.3 | \$ 2,202.1 | \$ (39.8) |
| Large Commercial Retrofit | \$ 3,753.3 | \$ 3,163.2 | \$ 590.1 |
| Small Business Direct Install | \$ 572.8 | \$ 159.2 | \$ 413.6 |
| Commercial & Industrial Multifamily | \$ 489.1 | \$ 421.5 | \$ 67.7 |
| Commercial & Industrial Pilots | \$ 399.1 | \$ 301.5 | \$ 97.5 |
| Finance Costs | \$ 200.0 | \$ 300.0 | \$ (100.0) |
| Comprehensive Marketing - Commercial & Industrial | \$ 173.7 | \$ 165.2 | \$ 8.5 |
| Community Based Initiatives - C&I | \$ 30.0 | \$ - | \$ 30.0 |
| Commercial & Industrial Shareholder Incentive | \$ 379.0 | \$ 320.6 | \$ 58.4 |
| Subtotal Commercial & Industrial | \$ 8,159.3 | \$ 7,033.4 | \$ 1,125.9 |
| | | | |
| Regulatory | | | |
| EERMC | \$ 245.4 | \$ 225.6 | \$ 19.8 |
| OER | \$ 163.6 | \$ 150.4 | \$ 13.2 |
| Subtotal Regulatory | \$ 409.0 | \$ 376.0 | \$ 33.0 |
| TOTAL BUDGET | \$ 23,492.5 | \$ 19,540.0 | \$ 3,952.5 |

Table G-5
National Grid
Calculation of 2014 Program Year Cost-Effectiveness
All Dollar Values in (\$000)

| | Rhode Island Benefit/ Cost | Total Benefit | Program Implementation Expenses | Customer Contribution | Evaluation Cost | Shareholder Incentive | TRC \$/Lifetime MMBtu |
|---|----------------------------------|--------------------|---------------------------------------|--------------------------|--------------------|--------------------------|-----------------------------|
| Non-Income Eligible Residential | | | | | | | |
| Energy Star® HVAC | 1.09 | \$ 3,717.9 | \$ 1,996.8 | \$ 1,382.4 | \$ 35.2 | | \$ 10.09 |
| EnergyWise | 1.40 | \$ 8,758.3 | \$ 4,820.5 | \$ 1,400.2 | \$ 28.1 | | \$ 10.37 |
| EnergyWise MultiFamily | 2.63 | \$ 4,316.3 | \$ 1,314.7 | \$ 322.5 | \$ 6.8 | | \$ 9.65 |
| Home Energy Reports | 1.19 | \$ 591.7 | \$ 468.3 | \$ - | \$ 27.6 | | \$ 6.71 |
| Residential New Construction | 1.11 | \$ 799.7 | \$ 608.6 | \$ 111.0 | \$ 1.4 | | \$ 12.68 |
| Comprehensive Marketing - Residential | | \$ - | \$ 139.7 | \$ - | \$ 0.1 | | |
| Community Based Initiatives - Residential | | \$ - | \$ 44.4 | \$ - | \$ 5.1 | | |
| Residential Products Pilot | | \$ - | \$ 136.2 | \$ - | \$ 0.1 | | |
| Non-Income Eligible Residential Subtotal | 1.36 | \$ 18,184.0 | \$ 9,529.3 | \$ 3,216.1 | \$ 104.4 | \$ 481.7 | \$ 10.35 |
| Income Eligible Residential | | | | | | | |
| Single Family - Income Eligible Services | 1.00 | \$ 2,599.4 | \$ 2,584.0 | \$ - | \$ 17.3 | | \$ 20.34 |
| Income Eligible Multifamily | 4.15 | \$ 8,219.7 | \$ 1,967.6 | \$ - | \$ 10.8 | | \$ 6.44 |
| Income Eligible Residential Subtotal | 2.36 | \$ 10,819.0 | \$ 4,551.5 | \$ - | \$ 28.2 | \$ 229.0 | \$ 10.52 |
| Large Commercial & Industrial | | | | | | | |
| Large Commercial New Construction | 2.50 | \$ 5,619.0 | \$ 2,096.7 | \$ 84.5 | \$ 65.6 | | \$ 3.46 |
| Large Commercial Retrofit | 2.26 | \$ 12,660.0 | \$ 3,672.5 | \$ 1,842.7 | \$ 80.8 | | \$ 3.59 |
| Small Business Direct Install | 1.16 | \$ 708.0 | \$ 545.9 | \$ 36.3 | \$ 26.9 | | \$ 9.52 |
| Commercial & Industrial Multifamily | 1.41 | \$ 1,031.4 | \$ 488.8 | \$ 241.9 | \$ 0.3 | | \$ 6.99 |
| Comprehensive Marketing - Commercial and Industrial | | \$ - | \$ 173.6 | \$ - | \$ 0.1 | | |
| Commercial and Industrial Pilots | | \$ - | \$ 398.8 | \$ - | \$ 0.2 | | |
| Community Based Initiatives - C&I | | \$ - | \$ 30.0 | \$ - | \$ - | | |
| Finance Costs | | \$ - | \$ 200.0 | \$ - | \$ - | | |
| Commercial & Industrial Subtotal | 1.93 | \$ 20,018.3 | \$ 7,606.4 | \$ 2,205.4 | \$ 173.9 | \$ 379.0 | \$ 4.20 |
| Regulatory | | | | | | | |
| EERMC | | | \$ 245.4 | | | | |
| ORR | | | \$ 163.6 | | | | |
| Regulatory Subtotal | | | \$ 409.0 | | | | |
| Grand Total | 1.70 | \$ 49,021.3 | \$ 22,096.2 | \$ 5,421.5 | \$ 306.5 | \$ 1,089.7 | \$ 6.87 |

Table G-6
National Grid
Summary of 2014 Benefits and Savings by Program

| | Benefits (\$000) | | | MMBTU Gas Saved | |
|---|-------------------|-------------------|---------------------|-----------------|------------------|
| | Total(1) | Natural Gas(2) | Non-Gas Benefit (3) | Annual | Lifetime(4) |
| Non-Income Eligible Residential | | | | | |
| EnergyWise | \$8,758.3 | \$5,493.0 | \$3,265.4 | 30,120 | 602,399 |
| Energy Star® HVAC | \$3,717.9 | \$2,982.7 | \$735.3 | 20,344 | 338,335 |
| EnergyWise Multifamily | \$4,316.3 | \$1,585.1 | \$2,731.2 | 9,256 | 170,396 |
| Home Energy Reports | \$591.7 | \$591.7 | \$0.0 | 73,877 | 73,877 |
| Residential New Construction | \$799.7 | \$799.7 | \$0.0 | 3,683 | 56,855 |
| Non-Income Eligible Residential SUBTOTAL | \$18,184.0 | \$11,452.1 | \$6,731.8 | 137,281 | 1,241,861 |
| Income Eligible Residential | | | | | |
| Single Family - Income Eligible Services | \$2,599.4 | \$1,166.3 | \$1,433.1 | 6,395 | 127,900 |
| Income Eligible Multifamily | \$8,219.7 | \$2,844.0 | \$5,375.6 | 16,824 | 307,261 |
| Income Eligible Residential SUBTOTAL | \$10,819.0 | \$4,010.3 | \$6,808.7 | 23,219 | 435,161 |
| Commercial & Industrial | | | | | |
| Large Commercial New Construction | \$5,619.0 | \$5,616.4 | \$2.6 | 31,863 | 648,426 |
| Large Commercial Retrofit | \$12,660.0 | \$12,655.7 | \$4.3 | 121,592 | 1,558,309 |
| Small Business Direct Install | \$708.0 | \$703.2 | \$4.8 | 10,496 | 64,008 |
| Commercial & Industrial Multifamily | \$1,031.4 | \$1,030.4 | \$0.9 | 5,511 | 104,608 |
| Commercial & Industrial SUBTOTAL | \$20,018.3 | \$20,005.6 | \$12.6 | 169,463 | 2,375,352 |
| TOTAL | \$49,021.3 | \$35,468.1 | \$13,553.2 | 329,963 | 4,052,374 |

Table G-7
National Grid
Comparison of 2013 and 2014 Goals

| | Proposed 2014 | | | Approved 2013 | | | Difference | |
|---|---|----------------|--------------------|---|----------------|--------------------|---|---------------|
| | Annual Energy Savings (MMBTU Natural Gas) | Participants | Population Reached | Annual Energy Savings (MMBTU Natural Gas) | Participants | Population Reached | Annual Energy Savings (MMBTU Natural Gas) | Participants |
| Non-Income Eligible Residential | | | | | | | | |
| EnergyWise | 30,120 | 2,000 | 1% | 30,333 | 2,000 | 1% | -213 | 0 |
| Energy Star® HVAC | 20,344 | 2,584 | 1% | 19,544 | 1,578 | 1% | 801 | 1,006 |
| EnergyWise Multifamily | 9,256 | 2,000 | 1% | 5,605 | 700 | 0% | 3,651 | 1,300 |
| Home Energy Reports | 73,877 | 180,000 | 87% | 35,781 | 136,475 | 66% | 38,097 | 43,525 |
| Residential New Construction | 3,683 | 392 | 13% | 2,900 | 584 | 19% | 784 | -192 |
| Non-Income Eligible Residential SUBTOTAL | 137,281 | 186,976 | 89% | 94,161 | 141,337 | 67% | 43,120 | 45,639 |
| Income Eligible Residential | | | | | | | | |
| Single Family - Income Eligible Services | 6,395 | 400 | 2% | 6,250 | 400 | 2% | 145 | 0 |
| Income Eligible Multifamily | 16,824 | 2,200 | 11% | 16,562 | 2,200 | 11% | 262 | 0 |
| Income Eligible Residential SUBTOTAL | 23,219 | 2,600 | 13% | 22,812 | 2,600 | 13% | 407 | 0 |
| Commercial & Industrial | | | | | | | | |
| Large Commercial New Construction | 31,863 | 192 | 4% | 35,967 | 170 | 4% | -4,103 | 23 |
| Large Commercial Retrofit | 121,592 | 606 | 13% | 123,451 | 235 | 5% | -1,859 | 372 |
| Small Business Direct Install | 10,496 | 316 | 2% | 6,583 | 209 | 1% | 3,913 | 107 |
| Commercial & Industrial Multifamily | 5,511 | 745 | TBD | 4,800 | 600 | TBD | 711 | 145 |
| Commercial & Industrial SUBTOTAL | 169,463 | 1,859 | 8% | 170,802 | 1,213 | 5% | -1,338 | 646 |
| TOTAL | 329,963 | 191,435 | 76% | 287,775 | 145,150 | 57% | 42,188 | 46,285 |

Note:

- (1) Participants can participate in more than one program, for example Home Energy Reports and EnergyWise. Therefore, participation can be greater than 100%.
- (2) The total population for Residential New Construction is the number of new customer homes that will be built in 2014, which is estimated as 1.5% of the current customer base.

Table G-8
National Grid
Avoided Costs Used in 2014 Benefit-Cost Model

| Year | RESIDENTIAL | | | | COMMERCIAL & INDUSTRIAL | | | ALL RETAIL END USES |
|------|----------------|-----------|---------|------|-------------------------|---------|------|---------------------------|
| | Non Heating | Hot Water | Heating | All | Non Heating | Heating | All | |
| 2013 | 5.32 | 5.78 | 6.90 | 6.73 | 5.51 | 6.35 | 6.05 | 6.41 |
| 2014 | 5.53 | 5.98 | 7.10 | 6.93 | 5.72 | 6.56 | 6.26 | 6.61 |
| 2015 | 5.54 | 5.98 | 7.09 | 6.93 | 5.72 | 6.56 | 6.26 | 6.61 |
| 2016 | 5.61 | 6.08 | 7.21 | 7.03 | 5.81 | 6.66 | 6.36 | 6.71 |
| 2017 | 5.71 | 6.34 | 7.51 | 7.30 | 5.96 | 6.91 | 6.57 | 6.95 |
| 2018 | 6.02 | 6.62 | 7.79 | 7.58 | 6.26 | 7.20 | 6.86 | 7.24 |
| 2019 | 6.46 | 6.95 | 8.08 | 7.90 | 6.66 | 7.53 | 7.22 | 7.58 |
| 2020 | 6.73 | 7.20 | 8.33 | 8.15 | 6.93 | 7.78 | 7.48 | 7.83 |
| 2021 | 6.87 | 7.36 | 8.48 | 8.30 | 7.07 | 7.93 | 7.62 | 7.98 |
| 2022 | 7.07 | 7.55 | 8.67 | 8.50 | 7.27 | 8.12 | 7.82 | 8.18 |
| 2023 | 7.20 | 7.67 | 8.80 | 8.62 | 7.40 | 8.25 | 7.95 | 8.30 |
| 2024 | 7.33 | 7.82 | 8.95 | 8.77 | 7.53 | 8.39 | 8.08 | 8.44 |
| 2025 | 7.52 | 7.99 | 9.12 | 8.94 | 7.72 | 8.57 | 8.27 | 8.62 |
| 2026 | 7.64 | 8.13 | 9.25 | 9.07 | 7.84 | 8.70 | 8.39 | 8.75 |
| 2027 | 7.76 | 8.25 | 9.37 | 9.19 | 7.96 | 8.82 | 8.51 | 8.87 |
| 2028 | 7.86 | 8.34 | 9.46 | 9.29 | 8.06 | 8.91 | 8.61 | 8.97 |
| 2029 | 7.86 | 8.34 | 9.46 | 9.29 | 8.06 | 8.91 | 8.61 | 8.97 |
| 2030 | 7.86 | 8.34 | 9.46 | 9.29 | 8.06 | 8.91 | 8.61 | 8.97 |
| 2031 | 7.86 | 8.34 | 9.46 | 9.29 | 8.06 | 8.91 | 8.61 | 8.97 |
| 2032 | 7.86 | 8.34 | 9.46 | 9.29 | 8.06 | 8.91 | 8.61 | 8.97 |
| 2033 | 7.86 | 8.34 | 9.46 | 9.29 | 8.06 | 8.91 | 8.61 | 8.97 |
| 2034 | 7.86 | 8.34 | 9.46 | 9.29 | 8.06 | 8.91 | 8.61 | 8.97 |
| 2035 | 7.86 | 8.34 | 9.46 | 9.29 | 8.06 | 8.91 | 8.61 | 8.97 |
| 2036 | 7.86 | 8.34 | 9.46 | 9.29 | 8.06 | 8.91 | 8.61 | 8.97 |
| 2037 | 7.86 | 8.34 | 9.46 | 9.29 | 8.06 | 8.91 | 8.61 | 8.97 |
| 2038 | 7.86 | 8.34 | 9.46 | 9.29 | 8.06 | 8.91 | 8.61 | 8.97 |
| 2039 | 7.86 | 8.34 | 9.46 | 9.29 | 8.06 | 8.91 | 8.61 | 8.97 |
| 2040 | 7.86 | 8.34 | 9.46 | 9.29 | 8.06 | 8.91 | 8.61 | 8.97 |
| 2041 | 7.86 | 8.34 | 9.46 | 9.29 | 8.06 | 8.91 | 8.61 | 8.97 |
| 2042 | 7.86 | 8.34 | 9.46 | 9.29 | 8.06 | 8.91 | 8.61 | 8.97 |
| 2043 | 7.86 | 8.34 | 9.46 | 9.29 | 8.06 | 8.91 | 8.61 | 8.97 |

From 2013 Avoided Cost Study
Appendix C for Southern New England

Table G-9
National Grid
2014 Targeted Shareholder Incentive

Incentive Rate: 5.00%

| | (1) | (2) | (3) | (4) | (5) |
|---------------------------------|----------------------------------|--------------------------|-----------------------------|---------------------------|-----------------------------------|
| Sector | Eligible Spending Budget \$(000) | Target Incentive \$(000) | Target Savings Goal (MMBTU) | Threshold Savings (MMBTU) | Target Incentive Per Annual MMBTU |
| Income Eligible Residential | \$4,580 | \$229.0 | 23,219 | 17,414 | \$9.862 |
| Non-Income Eligible Residential | \$9,634 | \$481.7 | 137,281 | 102,961 | \$3.509 |
| Commercial & Industrial | \$7,580 | \$379.0 | 169,463 | 127,097 | \$2.237 |
| Total | \$ 21,794 | \$1,089.7 | 329,963 | 247,472 | \$3.302 |

Notes:

- (1) Eligible Spending Budget excludes EERMC, OER, Finance Costs, and Shareholder Incentive. See Table G-3 for details.
- (2) Equal to the incentive rate (5.0%) x Column (1).
- (3) See Table G-7
- (4) 75% of Column (3). No incentive is earned on annual MMBTU savings in the sector unless the Company achieves at least this threshold level of performance.
- (5) Column (2)*1000/Column (3). This illustration is for achieved savings equal to the savings target. The incentive earned per MMBtu will vary with the percent of the savings target achieved

The shareholder incentive will be calculated as follow, where SB is the Spending Budget in the sector:

- From 75% of savings to 100% of savings: Shareholder Incentive = SB x (0.15 x % of savings achieved – 0.10)
- From 100% of savings to 125% of savings: Shareholder Incentive = SB x (0.05 x % of savings achieved)

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4608
In Re: Gas Long-Range Resource and Requirements Plan
For Period 2015/16 to 2024/25
Responses to Division's First Set of Data Requests
Issued on April 12, 2016

Division 1-17

Request:

The Company's **March 2016 LRP**, Section III.C., Translation of Customer Demand into Customer Requirements, states at page 14 "... *the Company has not observed any non-linear characteristics at cold temperatures* as can be seen in Chart III-C." Please:

- a. Verify that there is no Chart III-C provided as part of the Company's **2016 LRP**, and the intended reference is to Chart III-C-1.
- b. Provide the workpapers, data, studies, and other documents upon which the Company relied to assess the existence of "non-linear characteristics in sendout at cold temperatures" for other time periods.
- c. Verify that it is the Company's position that the sensitivity of gas use to degree days for its Rhode Island system is the same for all months of the year, such that a one degree day variation in June, October, or April will produce approximately the same change in gas use as a comparable degree day change would evoke in the months of December, January or February.
- d. Provide plots of data in a format comparable to Chart III-C-1 that reflect the Company's actual experience for its 2012-13, 2013-14 and 2014-15 gas supply (GCR) years, as well as the supporting data for the plots.
- e. Specify what constitutes "*cold temperatures*" in the context of the quoted statement;
- f. Explain why the use of a "*piecewise linear*" regression model should not be interpreted as recognizing non-linear attributes of the relationships being modeled.
- g. Verify that the "*piecewise linear*" regression models the Company employs demonstrate that the relationship between HDDs and gas use for Rhode Island is not uniform across all HDD measures.

Response:

- a. Yes. The reference to "Chart III-C" on page 14 of the Company's filing should read "Chart III-C-1."

Division 1-17, page 2

- b. Annually, in preparing its Rhode Island gas load forecast, the Company reviews its wholesale volumes versus heating degree days to ensure it is using an appropriate model of the temperature vs. load relationship. Please refer to Attachment DIV 1-17-1 for the annual charts for the time periods April 2007 – March 2008 through April 2014 – March 2015 for its Providence division (the charts are ordered left to right and then top to bottom) as well as Chart III-C-1 of the filing.
- c. No, it is not the Company's position that the sensitivity of gas use to degree days for its Rhode Island system is the same for all months of the year, such that a one degree day variation in June, October, or April will produce approximately the same change in gas use as a comparable degree day change would evoke in the months of December, January or February. The Company's use of its segmented regression equations for its four divisions effectively separates the heating sensitivity in the time of year when heating equipment is on versus when it is not in use. That being said, if there was a day in the summertime cold enough to indicate that heating equipment would be used, then the Company's models will forecast heating use.
- d. Please refer to Attachment DIV 1-17-2 for the annual charts for the time periods April 2007 – March 2008 through April 2014 – March 2015 for its Bristol-Warren division (the charts are ordered left to right and then top to bottom).

Please refer to Attachment DIV 1-17-3 for the annual charts for the time periods April 2007 – March 2008 through April 2014 – March 2015 for its Westerly division (the charts are ordered left to right and then top to bottom).

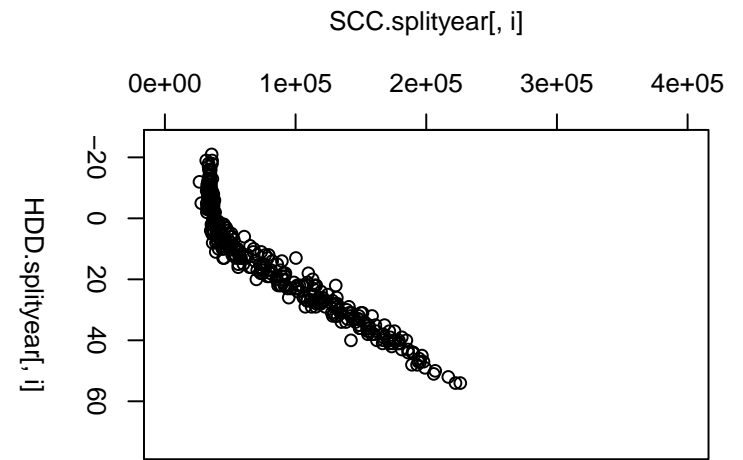
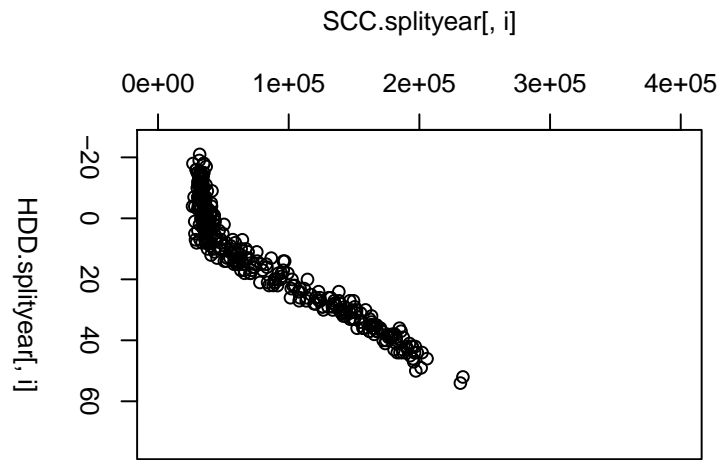
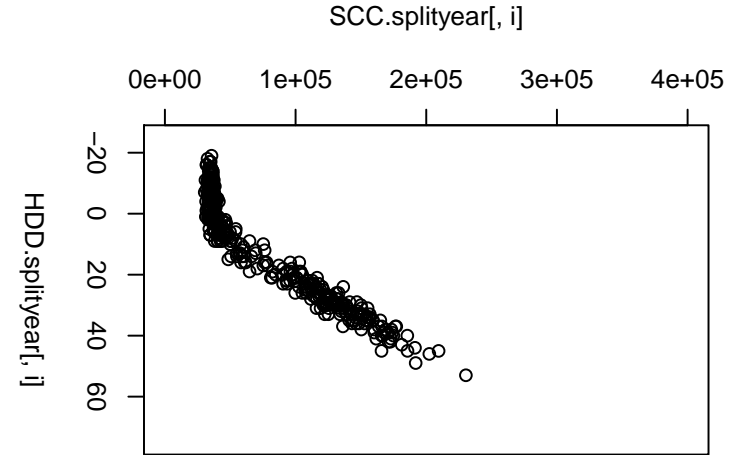
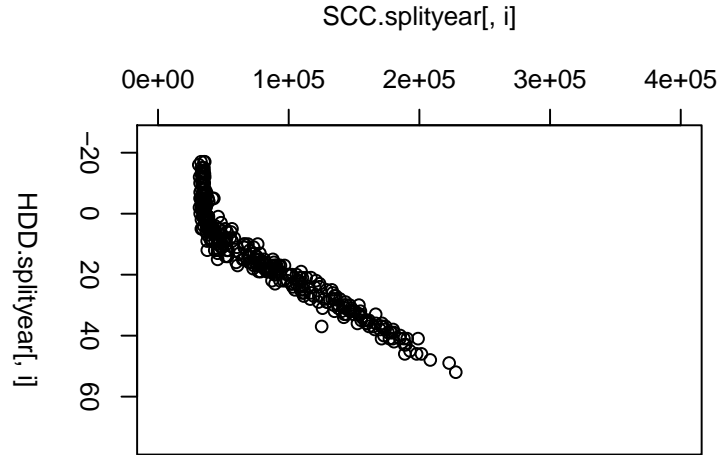
Please refer to Attachment DIV 1-17-4 for the annual charts for the time periods April 2007 – March 2008 through April 2014 – March 2015 for its Valley division (the charts are ordered left to right and then top to bottom).

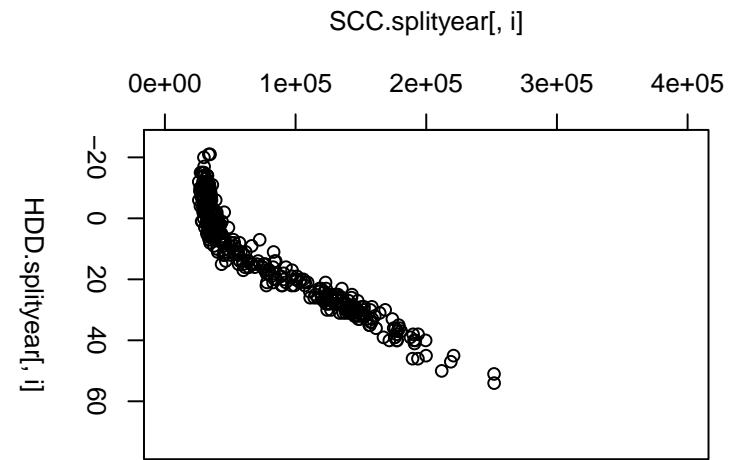
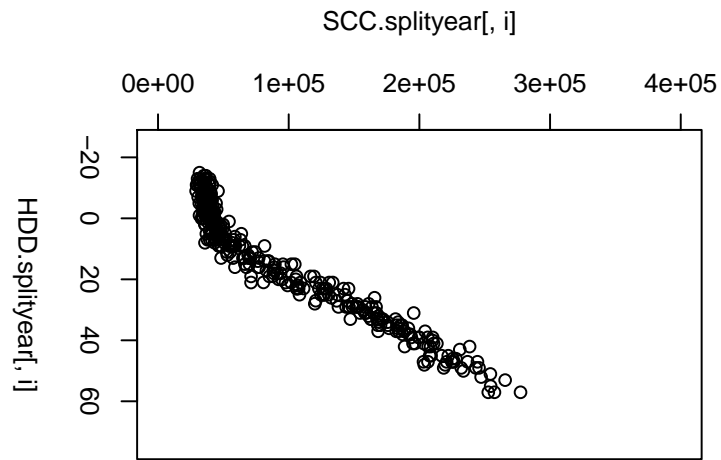
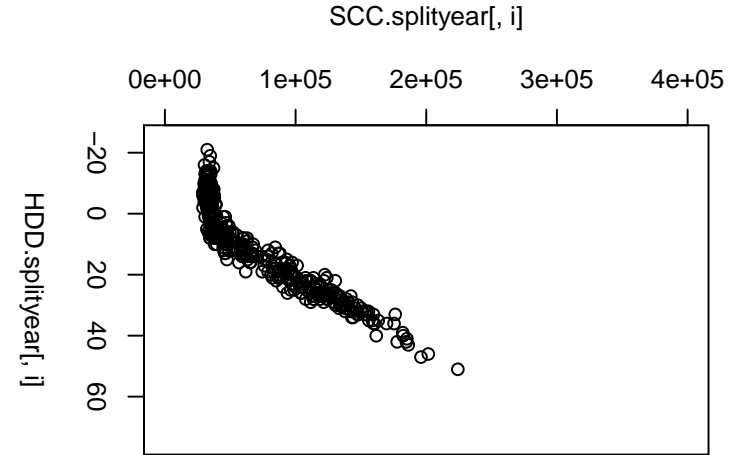
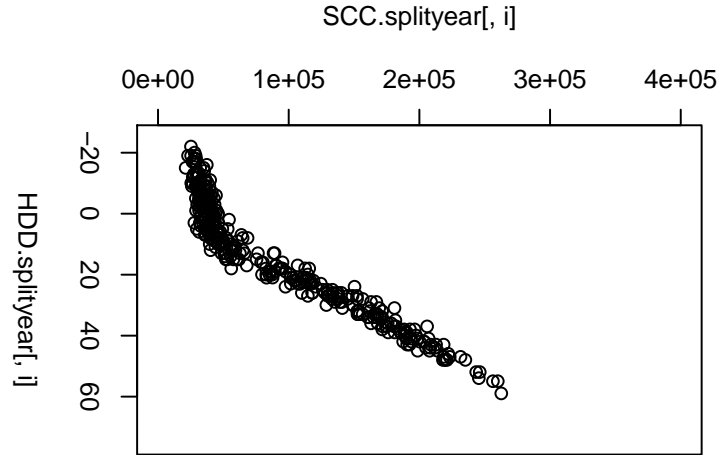
Please refer to the Excel file labeled "4608-DIV 1-17-Attachment-5.xlsx", which is identified as Attachment DIV 1-17-5 and is being provided on CD-ROM, for the Company's actual daily throughput by division for April 2007 – March 2015 and its actual daily gas day heating degree day data.

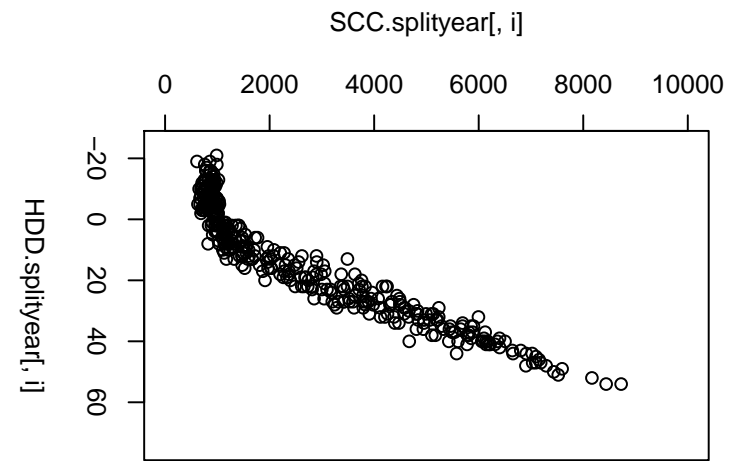
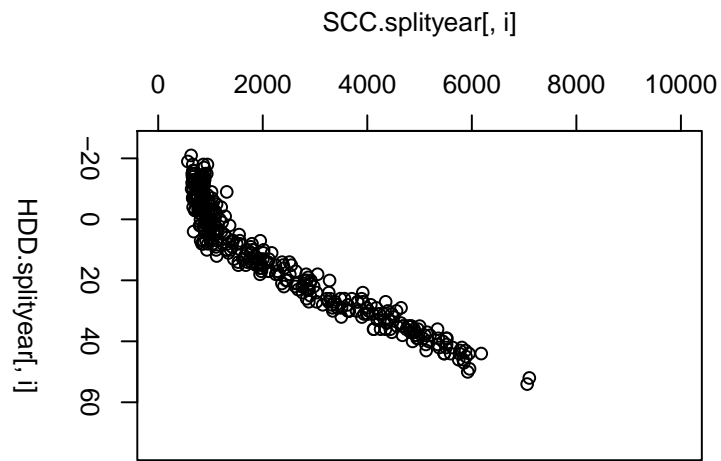
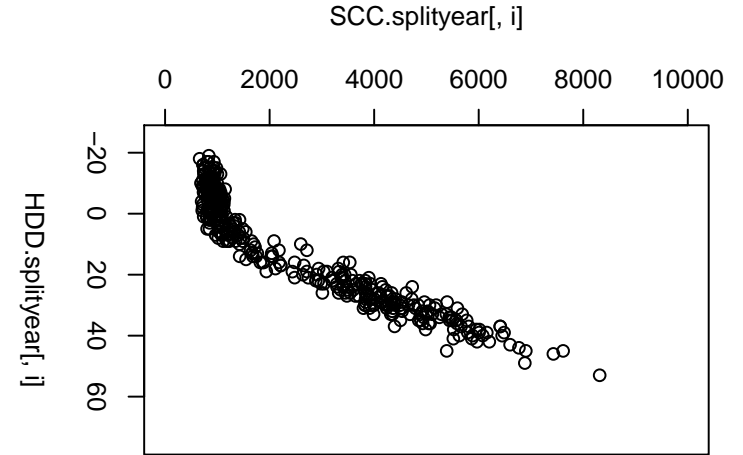
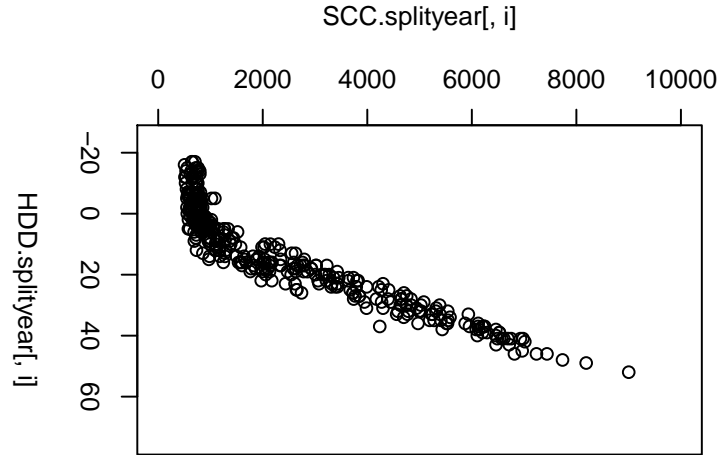
- e. "Cold temperatures," in the context of the quote, would refer to the coldest observed temperatures in the Company's data records.

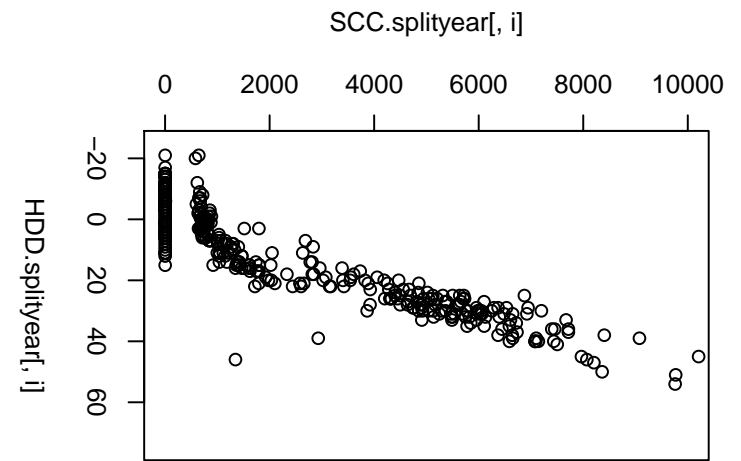
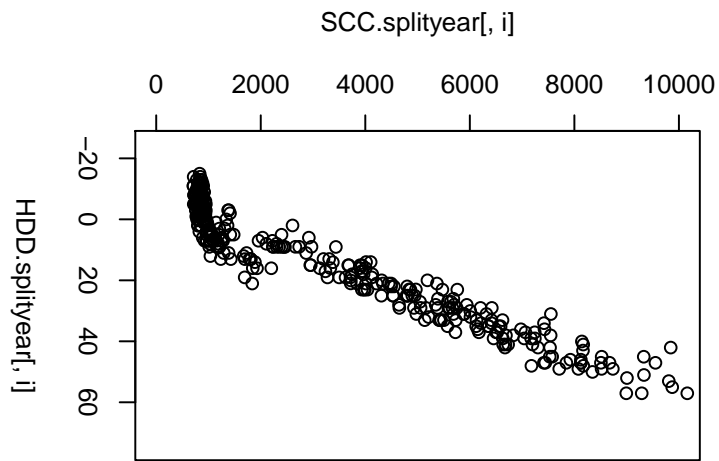
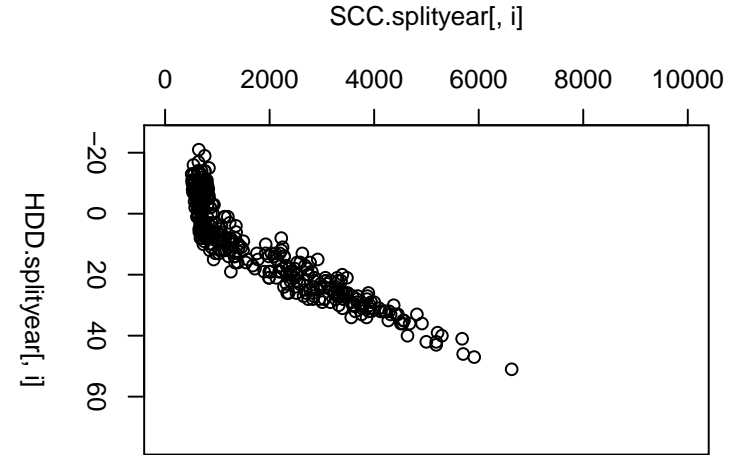
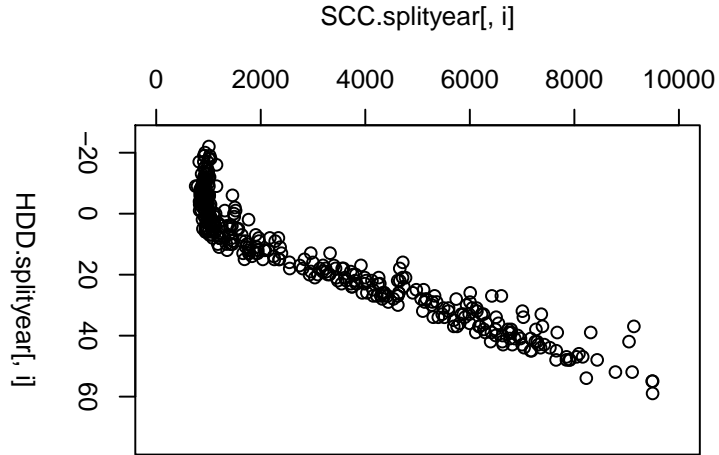
Division 1-17, page 3

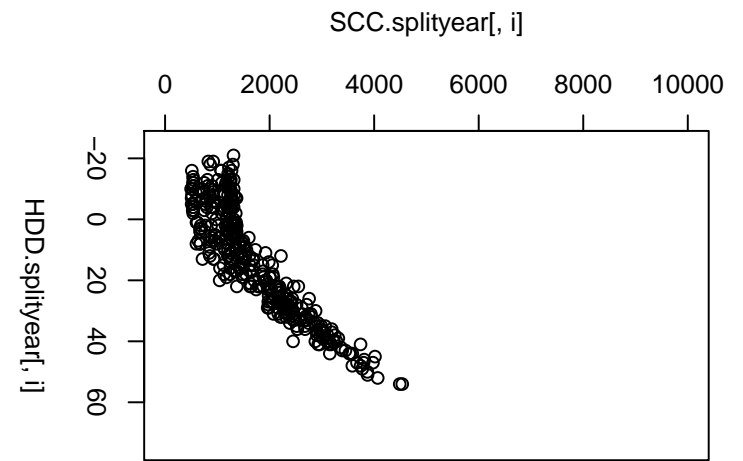
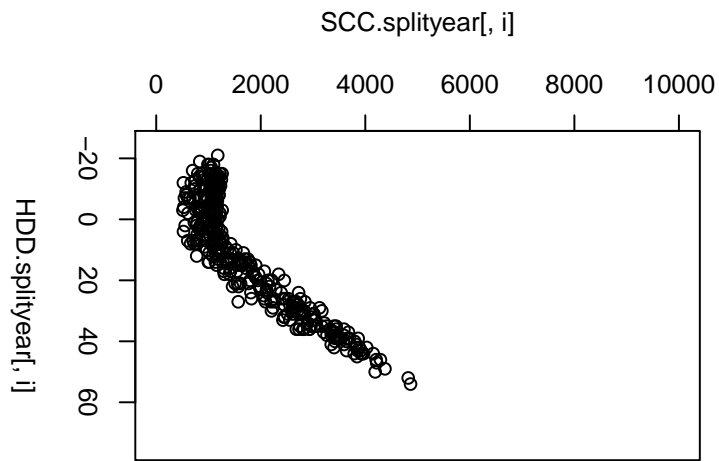
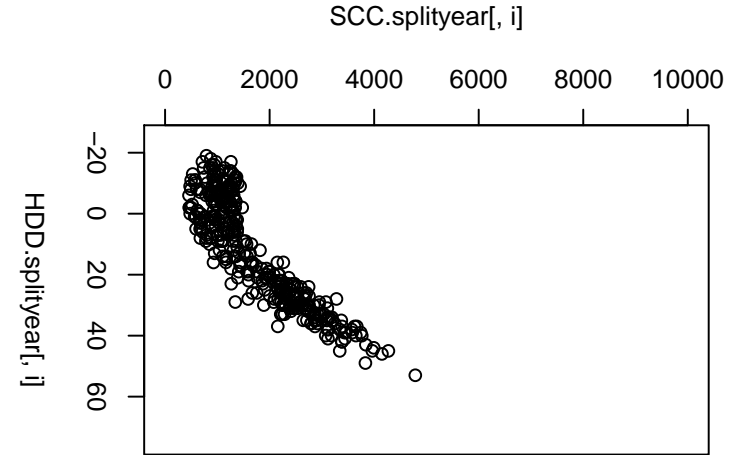
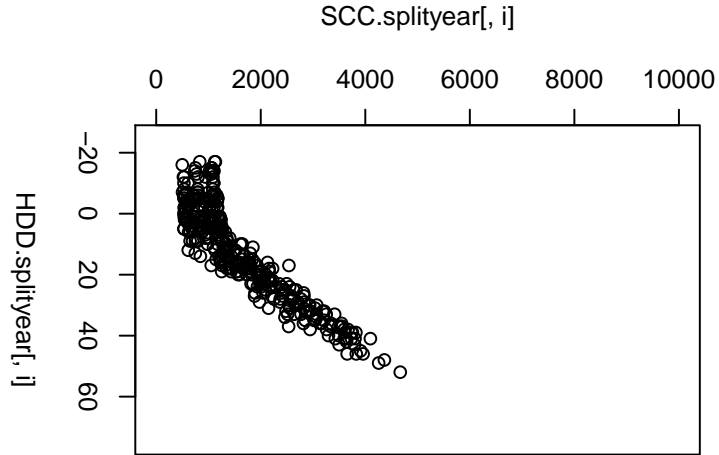
- f. The Company's use of a "*piecewise linear*" regression model should be interpreted as recognizing non-linear attributes of the relationships being modeled. The point that the Company is trying to make is that, at extreme temperatures, the Company has not observed a "bend-over effect" (i.e. saturation of gas heating equipment) that had been observed at other gas distribution companies in the U.S. and, hence, the Company is confident that it can extrapolate linearity of sendout requirements out to its selected design day.
- g. As stated in (f) above, the Company's use of a "*piecewise linear*" regression model should be interpreted as recognizing non-linear attributes of the relationships being modeled. The non-linearity captured by the Company is the point at which heating equipment is used or not used and, when in use, the heating load is linear out to the coldest temperatures that the Company has observed.

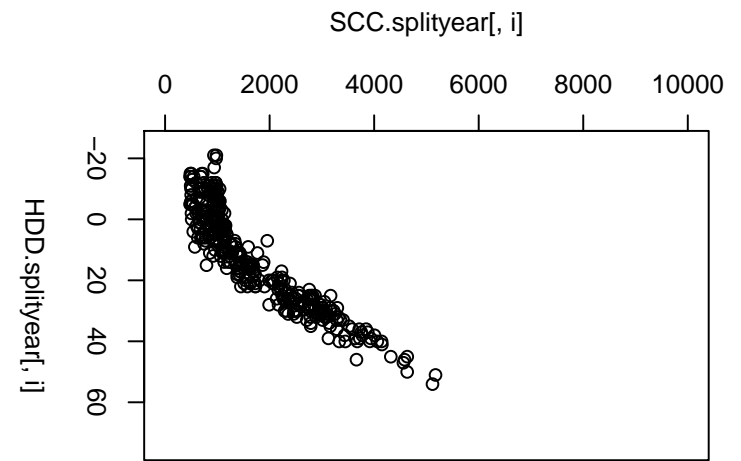
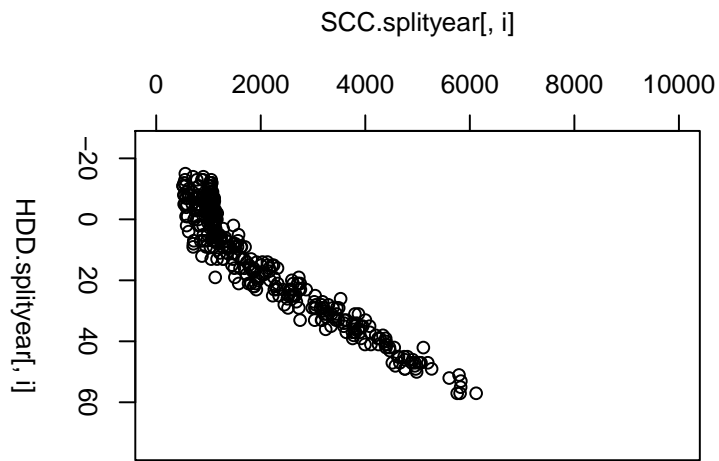
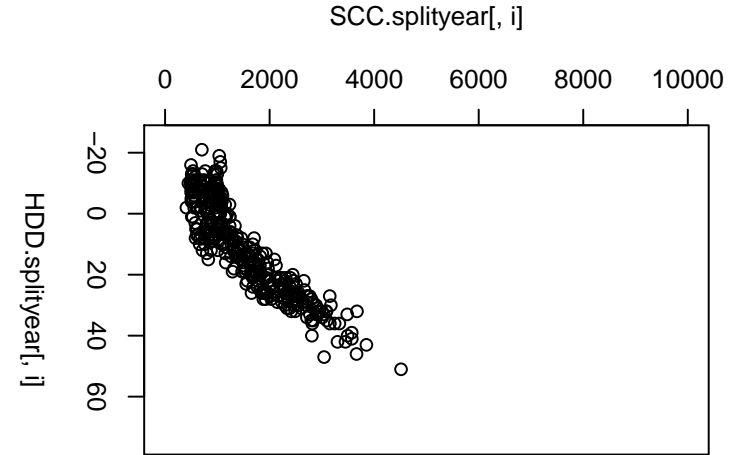
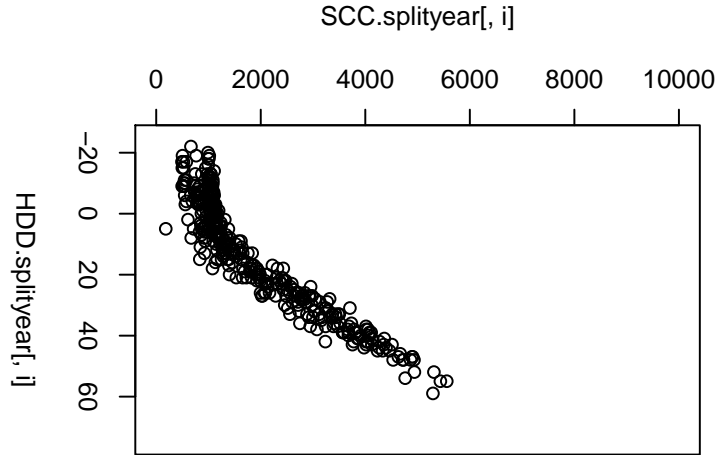


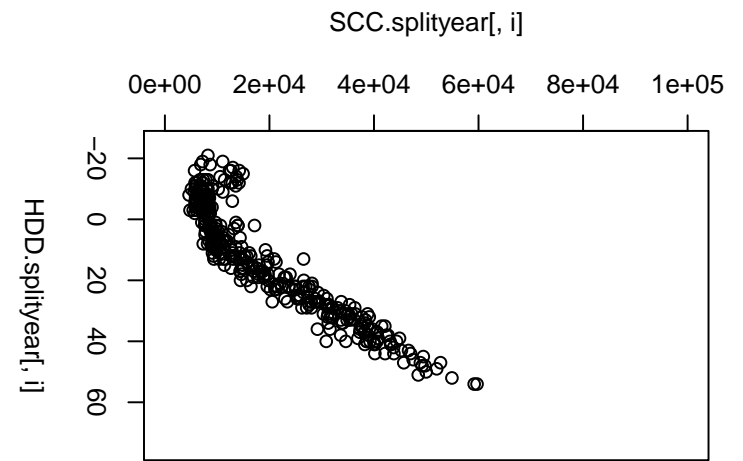
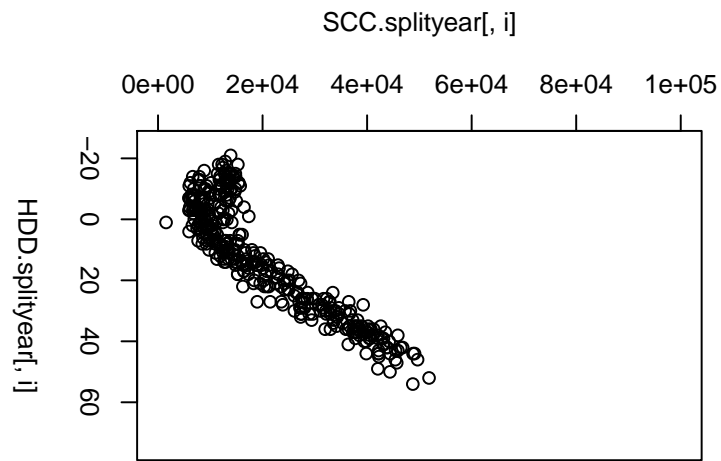
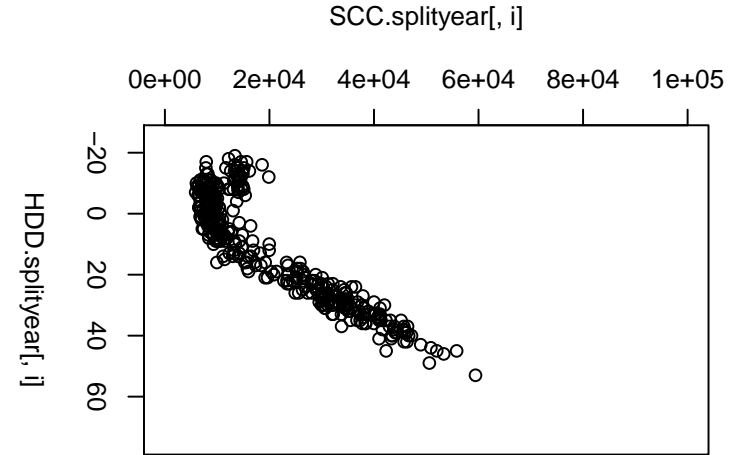
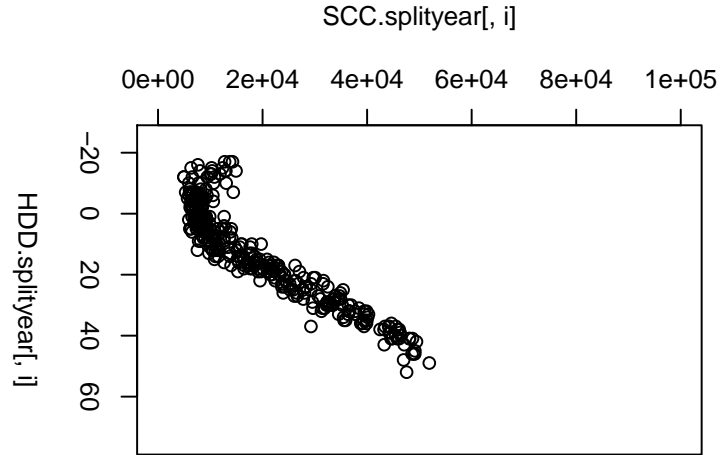


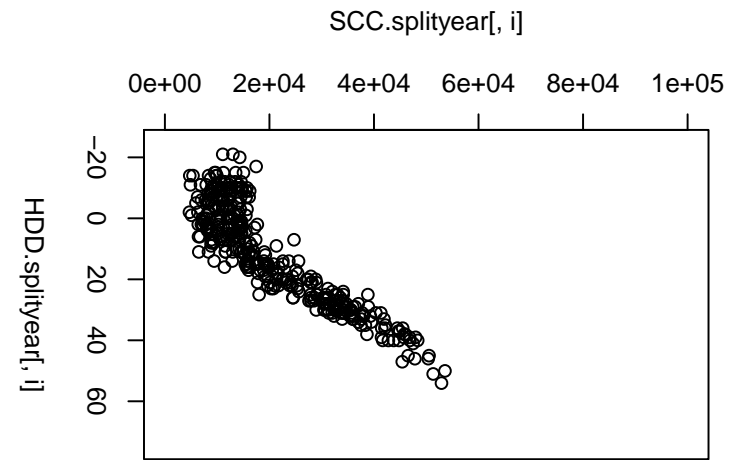
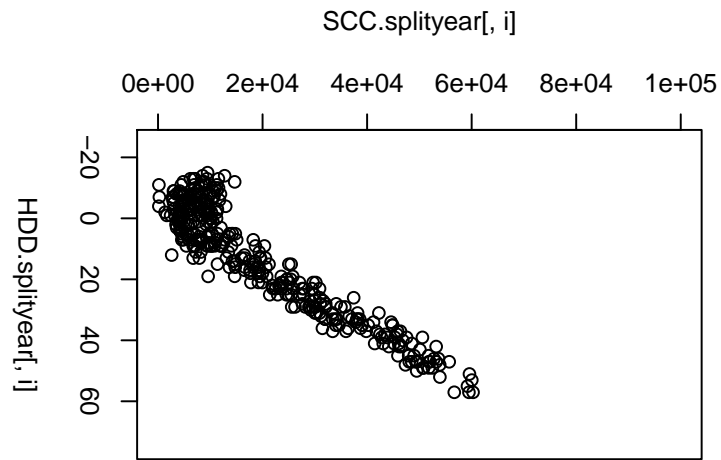
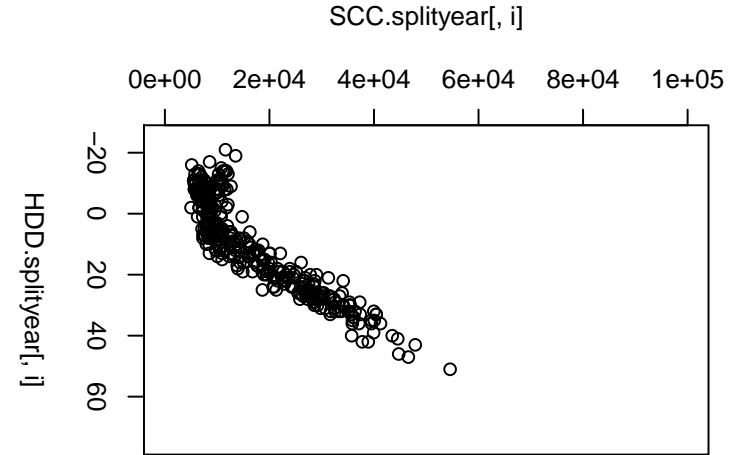
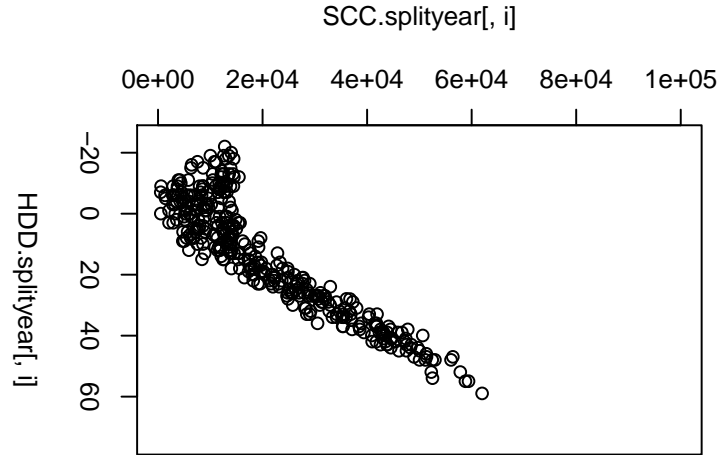












Please refer to the CD-ROM for Attachment DIV 1-17-5.

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4608
In Re: Gas Long-Range Resource and Requirements Plan
For Period 2015/16 to 2024/25
Responses to Division's First Set of Data Requests
Issued on April 12, 2016

Division 1-18

Request:

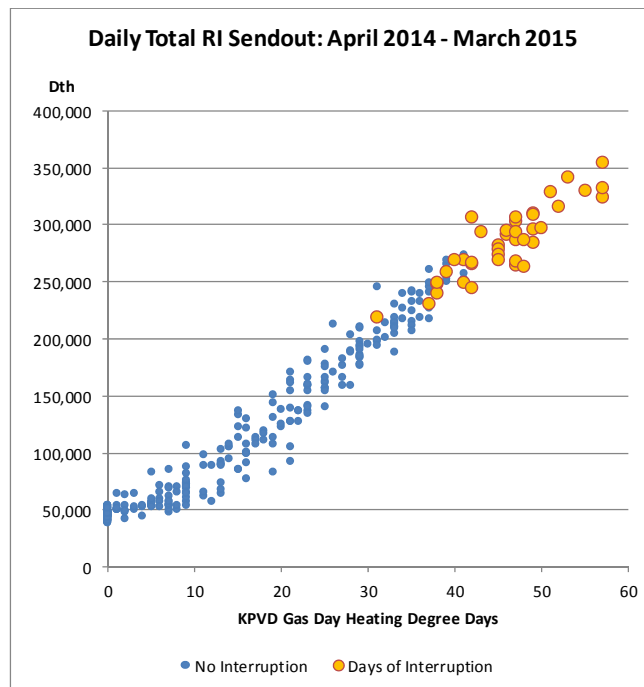
Re: Chart III-C-1, please:

- a. Provide the data for each observation plotted in Chart III-C-1 clearly labeling the date of each observation and explaining the manner in which the data plotted are developed from the Company's records;
- b. Verify that the data in Chart III-C-1 reflects system sendout requirements, as opposed to summations of estimated demands for the Company's firm service rate classifications.
- c. Verify that system sendout includes gas volumes delivered to:
 - i. Capacity Exempt (Zero-Capacity) customers;
 - ii. Non-Firm service customers;
 - iii. Dominion's Manchester Street Station for "gas heater use"; as well as
 - iv. Company Use; and
 - v. Lost and Unaccounted for gas volumes
- d. Verify that the system sendout data plotted in Chart III-C-1 includes the effects of gas service interruptions for non-firm gas service customers;
- e. Identify each observation plotted in Chart III-C-1 which includes the effects of an interruption or curtailment of gas service to one or more non-firm gas service customers, and provide the attributes of each requested interruption of non-firm service during the period represented by the data plotted in Chart III-C-1 including:
 - i. The start and end date for each period of service interruption;
 - ii. The number of non-firm customers receiving the interruption request;
 - iii. The estimated volumes of service lost on each affected day due to each interruption request.

Division 1-18, page 2

Response:

- a. Please see Attachment DIV 1-17-5 for sendout and heating degree day data used to recreate Chart III-C-1. The total Rhode Island sendout is the sum of the four divisions.
- b. The sendout data portrayed in Chart III-C-1 (and included in Attachment DIV 1-17-5) represents actual daily total natural gas throughput (supply received at the Company's citygates plus any supplementals that were dispatched).
- c. Yes, the sendout data portrayed in Chart III-C-1 (and included in Attachment DIV 1-17-5) includes the information in items (i) through (v) of part (c), above.
- d. Yes, if non-firm customers were interrupted then the daily sendout would reflect such interruption.
- e. The chart below identifies the daily total throughput in the period April 2014 – March 2015 on the days where non-firm customers were interrupted.



The Narragansett Electric Company
d/b/a National Grid
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Issued on April 12, 2016

Division 1-18, page 3

i. Apr 2014 – Mar 2015 Rhode Island Non-Firm Customer Curtailments

| Effective Date | Resume Date | Number of Gas Days |
|----------------|-------------|--------------------|
| 01/06/15 | 01/11/15 | 5 |
| 01/13/15 | 01/17/15 | 4 |
| 01/25/15 | 02/07/15 | 13 |
| 02/09/15 | 02/21/15 | 12 |
| 02/23/15 | 03/01/15 | 6 |
| 03/05/15 | 03/07/15 | 2 |

ii. There were four distinct customers that were interrupted.

iii. The Company estimates that up to approximately 2,000 Dth/day of load was interrupted.