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**DE 14-238 Determination Regarding PSNH's Generation Assets Settling Response to
Dean M. Murphy Testimony Filed on 1/26/2016**

Date of Response: 2/1/2016

Witness: Billy Leung, REMI

Upon review of the testimony filed by Dean M. Murphy of Brattle Group on January 26th, 2016 the New Hampshire Public Utilities Commission requested REMI to run an additional simulation to model the \$163 million in energy cost savings over the first five year (2017-2021) time period. The purpose of this simulation is to better understand the economic impacts associated with the energy cost savings and compare them to previous simulations of the various divestiture proceeding estimated outcomes displayed in the Commission Staff Set TC-46 response. In order for REMI to input the energy cost savings, we required a breakdown of the energy cost savings per year and by customer class. Eric Chung on behalf of Eversource Energy, provided REMI with the inputs which account for energy cost changes to industrial, commercial, residential and public street lighting customers. Table one provides the energy cost savings in current millions of dollars that were inputs for this analysis. A negative dollar amount reflects a cost savings.

Table 1: Energy Cost Changes by Customer Class 2017 – 2021 in Millions of Current Dollars

| Settlement | 2017 | 2018 | 2019 | 2020 | 2021 | Total | Average |
|--|----------|----------|----------|----------|---------|-----------|----------|
| Overall energy (reductions) / increases related to generation | -\$75.00 | -\$38.00 | -\$24.00 | -\$18.00 | -\$8.00 | -\$163.00 | -\$32.60 |
| Residential | -\$36.58 | -\$18.53 | -\$11.71 | -\$8.78 | -\$3.90 | -\$79.50 | -\$15.90 |
| Commercial | -\$30.41 | -\$15.41 | -\$9.73 | -\$7.30 | -\$3.24 | -\$66.09 | -\$13.22 |
| Industrial | -\$7.79 | -\$3.95 | -\$2.49 | -\$1.87 | -\$0.83 | -\$16.94 | -\$3.39 |
| Public Street Lighting | -\$0.22 | -\$0.11 | -\$0.07 | -\$0.05 | -\$0.02 | -\$0.47 | -\$0.09 |

When running the simulation, REMI modeled the energy cost savings as the same policy variable input categories in the TC-46 response and original economic assessment report. To compare the results to the previous findings, REMI ran the energy cost savings off of the default REMI control forecast. Table two provides summary level results of the Brattle Group PSNH divestiture energy cost changes when viewed as the difference from the REMI baseline. Table three compares the various estimated outcomes based on aggregate energy cost savings compared to various applicable economic indicators. Table four provides additional comparisons to understand the aggregate energy cost changes input into REMI and the results totals for the first five year time period.

When reading Tables three and four, TC-46A is based on a net electricity cost increase whereas the other simulations are based on assumptions reflecting a net cost decrease. The differences in the results of the four net positive economic impacts are based on the ratios of the various consumer classes affected and the years in which the energy cost changes occurred.

Table 2: Economic Impact of Brattle Group Estimated PSNH Divestiture Energy Cost Changes (2017-2021)

| Category | Units | 2017 | 2018 | 2019 | 2020 | 2021 | Total | Average |
|---------------------------------|-----------------------------|--------|--------|--------|--------|--------|--------|---------|
| Total Employment | Individuals (Jobs) | 501 | 401 | 328 | 260 | 168 | 1,658 | 332 |
| Private Non-Farm Employment | Individuals (Jobs) | 468 | 362 | 289 | 224 | 137 | 1,480 | 296 |
| Residence Adjusted Employment | Individuals | 708 | 492 | 400 | 326 | 213 | 2,139 | 428 |
| Population | Individuals | 413 | 545 | 602 | 619 | 580 | 2,759 | 552 |
| Labor Force | Individuals | 296 | 349 | 374 | 375 | 339 | 1,733 | 347 |
| Gross Regional Product (GRP) | Millions of Current Dollars | 57 | 46 | 39 | 33 | 23 | 198 | 40 |
| Output | Millions of Current Dollars | 85 | 70 | 60 | 51 | 36 | 302 | 60 |
| Value Added | Millions of Current Dollars | 56 | 44 | 37 | 32 | 22 | 191 | 38 |
| Personal Income | Millions of Current Dollars | 52 | 41 | 37 | 33 | 25 | 188 | 38 |
| Disposable Personal Income | Millions of Current Dollars | 46 | 36 | 33 | 29 | 22 | 166 | 33 |
| Real Disposable Personal Income | Millions of Current Dollars | 109 | 66 | 51 | 44 | 29 | 299 | 60 |
| PCE-Price Index | Percent Change | -0.09% | -0.04% | -0.02% | -0.02% | -0.01% | -0.18% | -0.04% |

Table 3: Economic Activity Creation Comparison (First Five Years of Simulation Results)

| Category | Units | BPD | TC-46A | TC-46B | TC-46BB | TC-46BC |
|-----------------------------------|------------------------------|-------|----------|--------|---------|---------|
| Job Per Dollars Saved | Thousands of Current Dollars | \$98 | -\$225 | \$119 | \$204 | \$117 |
| GRP Per Dollars Saved | Thousands of Current Dollars | \$823 | -\$1,686 | \$978 | \$1,692 | \$978 |
| Personal Income Per Dollars Saved | Thousands of Current Dollars | \$867 | -\$1,826 | \$966 | \$1,678 | \$983 |

Table 4: First Five Year Aggregate Impact Comparison (Difference from REMI Baseline)

| Category | Units | BPD | TC-46A | TC-46B | TC-46BB | TC-46BC |
|---|-----------------------------|--------|--------|--------|---------|---------|
| Energy Cost Change (Input for Simulation) | Millions of Current Dollars | -\$163 | \$66 | -\$227 | -\$393 | -\$227 |
| Total Employment | Individuals (Jobs) | 1,658 | -292 | 1,915 | 1,924 | 1,942 |
| Gross Regional Product | Millions of Current Dollars | \$198 | -\$39 | \$232 | \$232 | \$232 |
| Personal Income | Millions of Current Dollars | \$188 | -\$36 | \$235 | \$234 | \$231 |

Simulation Comparison Key

- BPD – Brattle Group Estimated PSNH Divestiture Energy Cost Changes (Difference from REMI Default Baseline 2017-2021)
- TC-46A – TC-46(a) - La Capra High Natural Gas prices, High Sale Proceeds (Difference from REMI Default Baseline 2015-2019)
- TC-46B – TC-46(b) with Allocation Option A (Difference from REMI Default Baseline 2015-2019)
- TC-46BB – TC-46(b) with Allocation Option B (Difference from REMI Default Baseline 2015-2019)
- TC-46BC – TC-46(b) with Allocation Option C (Difference from REMI Default Baseline 2015-2019)

Additional Tables Per Request of Commission Staff, 2/4/2016:

Table 5: Change in Private Non-Farm Employment Summary
(In Descending order, Units are in Individual Jobs)

| Category | 2017 | 2018 | 2019 | 2020 | 2021 | Total | Average |
|---|------|------|------|------|------|-------|---------|
| Construction - 23 | 124 | 120 | 95 | 68 | 35 | 442 | 88 |
| Retail Trade - 44-45 | 82 | 54 | 43 | 35 | 23 | 236 | 47 |
| Accommodation and Food Services - 72 | 55 | 42 | 37 | 32 | 23 | 189 | 38 |
| Health Care and Social Assistance - 62 | 45 | 30 | 24 | 19 | 13 | 131 | 26 |
| Other Services, except Public Administration - 81 | 32 | 19 | 14 | 10 | 6 | 81 | 16 |
| Professional, Scientific, and Technical Services - 54 | 19 | 17 | 14 | 12 | 8 | 70 | 14 |
| Manufacturing - 31-33 | 16 | 14 | 12 | 9 | 6 | 57 | 11 |
| Administrative and Waste Management Services - 56 | 15 | 12 | 9 | 7 | 4 | 48 | 10 |
| Real Estate and Rental and Leasing - 53 | 12 | 10 | 8 | 7 | 5 | 43 | 9 |
| Utilities - 22 | 20 | 9 | 6 | 4 | 2 | 41 | 8 |
| Finance and Insurance - 52 | 11 | 8 | 7 | 5 | 3 | 34 | 7 |
| Wholesale Trade - 42 | 9 | 7 | 5 | 4 | 3 | 29 | 6 |
| Arts, Entertainment, and Recreation - 71 | 9 | 6 | 5 | 4 | 2 | 25 | 5 |
| Transportation and Warehousing - 48-49 | 6 | 4 | 3 | 2 | 1 | 16 | 3 |
| Educational Services - 61 | 4 | 3 | 2 | 1 | 0 | 11 | 2 |
| Information - 51 | 4 | 3 | 2 | 2 | 1 | 11 | 2 |
| Management of Companies and Enterprises - 55 | 3 | 3 | 2 | 2 | 1 | 11 | 2 |
| Mining - 21 | 2 | 2 | 1 | 1 | 1 | 7 | 1 |
| Forestry, Fishing, and Related Activities - 113-115 | 1 | 1 | 0 | 0 | 0 | 2 | 0 |

Table 6: Change in Private Non-Farm Industry Sales Summary
(In Descending order, in Current Millions of Dollars)

| Category | 2017 | 2018 | 2019 | 2020 | 2021 | Total | Average |
|---|------|------|------|------|------|-------|---------|
| Construction - 23 | 15.8 | 16.2 | 13.5 | 10.3 | 6 | 62 | 12 |
| Utilities - 22 | 16.7 | 8.5 | 5.5 | 4.2 | 2 | 37 | 7 |
| Manufacturing - 31-33 | 7.7 | 7.7 | 7.1 | 6.3 | 4.9 | 34 | 7 |
| Retail Trade - 44-45 | 8.5 | 6.1 | 5.2 | 4.6 | 3.4 | 28 | 6 |
| Real Estate and Rental and Leasing - 53 | 5.2 | 4.5 | 4 | 3.4 | 2.5 | 20 | 4 |
| Accommodation and Food Services - 72 | 4.5 | 3.9 | 3.7 | 3.4 | 2.8 | 18 | 4 |
| Health Care and Social Assistance - 62 | 5.3 | 3.7 | 3.1 | 2.7 | 2 | 17 | 3 |
| Wholesale Trade - 42 | 3 | 2.6 | 2.3 | 2.1 | 1.7 | 12 | 2 |
| Professional, Scientific, and Technical Services - 54 | 2.7 | 2.6 | 2.3 | 2.1 | 1.6 | 11 | 2 |
| Finance and Insurance - 52 | 3.1 | 2.3 | 2 | 1.7 | 1.1 | 10 | 2 |
| Information - 51 | 2.1 | 1.7 | 1.5 | 1.3 | 1 | 8 | 2 |
| Administrative and Waste Management Services - 56 | 1.7 | 1.6 | 1.5 | 1.4 | 1.1 | 7 | 1 |
| Other Services, except Public Administration - 81 | 2.4 | 1.5 | 1.2 | 1 | 0.6 | 7 | 1 |
| Management of Companies and Enterprises - 55 | 0.6 | 0.6 | 0.6 | 0.5 | 0.4 | 3 | 1 |
| Transportation and Warehousing - 48-49 | 0.6 | 0.5 | 0.4 | 0.3 | 0.2 | 2 | 0 |
| Educational Services - 61 | 0.5 | 0.4 | 0.4 | 0.4 | 0.3 | 2 | 0 |
| Arts, Entertainment, and Recreation - 71 | 0.4 | 0.3 | 0.2 | 0.2 | 0.2 | 1 | 0 |
| Mining - 21 | 0.3 | 0.3 | 0.2 | 0.2 | 0.1 | 1 | 0 |
| Forestry, Fishing, and Related Activities - 113-115 | 0.1 | 0.1 | 0.1 | 0.1 | 0 | 0 | 0 |

Table 7: Production Cost Change - Percent Change from REMI Default Baseline (In Descending order)

| Category | 2017 | 2018 | 2019 | 2020 | 2021 | Average |
|--|--------|--------|--------|--------|--------|---------|
| Administrative and Waste Management Services - 56 | -0.17% | -0.08% | -0.04% | -0.03% | -0.01% | -0.07% |
| Accommodation and Food Services - 72 | -0.14% | -0.06% | -0.03% | -0.02% | -0.01% | -0.05% |
| Educational Services - 61 | -0.12% | -0.05% | -0.03% | -0.02% | -0.01% | -0.05% |
| Arts, Entertainment, and Recreation - 71 | -0.08% | -0.03% | -0.02% | -0.01% | 0.00% | -0.03% |
| Wholesale Trade - 42 | -0.08% | -0.03% | -0.02% | -0.01% | 0.00% | -0.03% |
| Construction - 23 | -0.06% | -0.02% | -0.01% | -0.01% | 0.00% | -0.02% |
| Retail Trade - 44-45 | -0.06% | -0.02% | -0.01% | -0.01% | 0.00% | -0.02% |
| Real Estate and Rental and Leasing - 53 | -0.06% | -0.01% | 0.00% | 0.00% | 0.01% | -0.01% |
| Mining - 21 | -0.05% | -0.01% | -0.01% | 0.00% | 0.00% | -0.01% |
| Information - 51 | -0.05% | -0.02% | -0.01% | -0.01% | 0.00% | -0.02% |
| Health Care and Social Assistance - 62 | -0.05% | -0.02% | -0.01% | -0.01% | 0.00% | -0.02% |
| Other Services, except Public Administration - 81 | -0.05% | -0.01% | -0.01% | 0.00% | 0.00% | -0.01% |
| Management of Companies and Enterprises - 55 | -0.04% | -0.02% | -0.01% | -0.01% | 0.00% | -0.01% |
| Manufacturing - 31-33 | -0.04% | -0.02% | -0.01% | -0.01% | 0.00% | -0.01% |
| Professional, Scientific, and Technical Services - 54 | -0.03% | -0.01% | -0.01% | 0.00% | 0.00% | -0.01% |
| Forestry, Fishing, and Related Activities - 113-115 | -0.03% | 0.00% | 0.00% | 0.00% | 0.00% | -0.01% |
| Finance and Insurance - 52 | -0.02% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Utilities - 22 | -0.02% | 0.01% | 0.01% | 0.01% | 0.01% | 0.00% |
| Transportation and Warehousing - 48-49 | -0.01% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |

For reference, Tables Five, Six and Seven include the summary level private non-farm industry and the corresponding NAICS code.