

**THE STATE OF NEW HAMPSHIRE
BEFORE THE
NEW HAMPSHIRE
PUBLIC UTILITIES COMMISSION**

**DE 10-261
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
2010 Least Cost Integrated Resource Plan**

**PREFILED TESTIMONY OF DOUGLAS HURLEY ON BEHALF OF THE
CONSERVATION LAW FOUNDATION**

July 27, 2011

1 **Q. Please state your name, position and business address.**

2 A. My name is Douglas Hurley. I am an Associate with Synapse Energy Economics.
3 My business address is 485 Massachusetts Avenue, Cambridge, MA 02139.

4 **Q. Please summarize your educational background and recent work experience.**

5 A. I have a B.S. in electrical engineering from Cornell University. In my current
6 position with Synapse Energy Economics, I represent the interests of state
7 consumer advocates, environmental organizations, and renewable resources at
8 numerous ISO-NE and PJM stakeholder proceedings. I have spent seven years
9 analyzing the impacts of wholesale market rules, operating procedure, and
10 planning procedure changes on these entities and their organizational goals,
11 including effects on energy supply resources and the wholesale cost of electricity.
12 I currently serve as the vice-chair of NEPOOL's Alternative Resources Sector.
13 Prior to joining Synapse, I spent seven years as a technology consultant for Ernst
14 & Young.

15 A copy of my curriculum vitae is attached as Exhibit DH-1.

16 **Q. On whose behalf are you providing testimony in this proceeding?**

17 A. I am testifying on behalf of the Conservation Law Foundation.

18 **Q. Have you testified previously before the New Hampshire Public Utilities
19 Commission or any other public utilities commission?**

20 A. This is the first time I have testified before the New Hampshire Public Utilities
21 Commission. I have testified before the Massachusetts Department of Public
22 Utilities twice, on behalf of The Cape Light Compact in support of its 2010-2012
23 energy efficiency plan (MA DPU docket 09-119) and on behalf of the

24 Conservation Law Foundation in the NU/NSTAR merger proceeding (MA DPU
25 docket 10-170). I have also submitted testimony in a recent proceeding before
26 FERC addressing the ISO-NE forward capacity market results (docket ER10-
27 2477).

28 **Q. What is the purpose of your testimony?**

29 A. I am testifying to provide the results of analysis I conducted with my colleagues
30 addressing units 4 and 6 at the Schiller Station and to suggest that a continuing
31 operation study (CUO) should be and should have been prepared for these units as
32 part of PSNH's 2010 Least Cost Integrated Resource Plan.

33 Q. Which documents have you reviewed in preparing this testimony?

34 A. In addition to materials I review in the normal course of my work in the New
35 England electricity market, I also reviewed hearing transcripts and numerous data
36 responses filed in this docket and the following publicly available documents:

- 37 • PSNH's Least Cost Integrated Resource Plan, dated September 30, 2010
- 38 • FERC Form 1 Schedule 402 data [list more formally]
- 39 • US EPA Clean Air Markets Data
- 40 • ISO New England Capacity, Energy, Load and Transmission (CELT)
41 Reports and Annual Markets Reports
- 42 • A Transmission Services Agreement filed by Northern Pass Transmission
43 with the FERC, dated December 15, 2010.
- 44 • A report titled "LMP and Congestion impacts of Northern Pass
45 Transmission Project" by Charles River Associates, filed as Appendix G of

46 that Transmission Services Agreement filing.

- 47 • *Avoided Energy Supply Costs in New England: 2011*. Report performed by
48 Synapse Energy Economics. Dated July 21, 2011.

49 **Q. In its most recent Least Cost Integrated Resource Plan, does the Company**
50 **consider the costs of upcoming environmental regulations in its planning**
51 **process?**

52 A. The Company states that it “continuously monitors federal and state environmental
53 regulations and legislative initiatives in order to determine their impact on PSNH’s
54 ownership of fossil-fuel generating assets.” (Company Initial 2010 LCIRP Filing,
55 page 149). The Company goes on further to explain that regulations are frequently
56 reviewed by regulators, and that “the outcome of these reviews and the impact of
57 any new regulations are difficult to predict and any costs associated with such
58 regulation even more difficult to predict.” (Company Initial 2010 LCIRP Filing,
59 page 155).

60 **Q. How has the Company assessed the impact of upcoming regulations on its**
61 **existing fossil-fuel generating assets in its resource planning?**

62 A. It is very difficult to tell whether and how the Company has given any
63 consideration to upcoming environmental regulations. The Company makes clear
64 in discovery responses that it does not include any preparation for potential future
65 compliance costs in its LCIRP. For example, the Company states “As part of its
66 Least Cost Integrated Resource planning process, PSNH does not prepare analyses
67 or scenarios based upon possible regulatory rules or outcomes.” (Company
68 responses to Q-CLF-002; Q-CLF-020). In fact, the Company states that analysis
69 or scenarios of potential regulatory outcomes is “premature” (Company response
70 to Q-CLF-002).

71 The Company does appear to do some internal planning. Page 137 of Mr.
72 Smagula’s testimony described a process that involved eight to ten meetings per
73 year of an "emissions management team" and decision making with regard to "the
74 goal of complying with the emissions regulations in a cost-effective manner."

75 However, the Company treats this information as confidential business
76 information and explains “PSNH presently conducts internal strategy meetings
77 with an attorney present for the purpose of giving legal counsel and in anticipation
78 of litigation. As a result of this litigious climate, no minutes are taken.” (Company
79 response to Q-CLF-028).

80 **Q. Are there potential future regulations that might affect the Company’s**
81 **generating assets?**

82 A. Indeed there are. At the time of the LCIRP, the US EPA was poised to issue
83 multiple regulations under the Clean Air Act and the Clean Water Act including
84 the Clean Air Transport Rule, regulations for Coal Combustion Residuals,
85 Hazardous Air Pollutants (MACT), Cooling Water Intake Structures, Effluent
86 Limitation Guidelines and regulations pertaining to greenhouse gas emissions of
87 existing generating units. Alone and / or in combination, these regulations could
88 entail significant costs.

89 **Q. Given the uncertain nature of these regulations, is it reasonable to include**
90 **them in planning exercises?**

91 A. While the regulations were not final, EPA has been very clear that it is pursuing a
92 coordinated multi-faceted approach to the development of these regulations
93 precisely in order to enable power plant owners and operators to comprehensively
94 plan for compliance. Coordinated and comprehensive planning, rather than
95 piecemeal compliance evaluation for individual regulations, is essential to sound
96 planning and to ensuring consistency with least-cost principles. Failure to
97 consider these regulations and possible requirements for existing generating units
98 in a cohesive fashion will make it nearly impossible for the Commission to
99 determine whether continued operation of certain units is least-cost and whether
100 investment in continued operation of certain units is prudent.

101 **Q. Please describe the characteristics of Schiller Station units 4 and 6 that**
102 **significantly affect its cost and impacts to ratepayers**
103

104 A. Schiller units 4 and 6 are two 47 MW primarily coal-fired units built in 1952 and
105 1957. Both have heat rates above 12,500 BTU/kWh. At an initial level, an

106 experienced participant in New England markets would expect such units to run
107 very rarely under purely economic dispatch due to their high heat rates and
108 therefore production costs in comparison to supply resources in the New England
109 market. To the extent that they are running, they would seem to be more
110 expensive to operate than market revenues would support, and therefore imposing
111 substantial costs on PSNH ratepayers.

112

113 **Q. In light of your response, should PSNH have conducted a CUO as part of**
114 **their planning?**

115 A. Yes. For Schiller, the Company at a minimum should have done a reasonable
116 overview of likely regulations and some sort of evaluation of the potential impacts
117 on its existing generation fleet. In the Commission's order #24,945 (2009) DE 07-
118 108 (PSNH 2007 LCIRP), the Commission stated that:

119 "Early retirement of existing power plants for economic reasons is a practical
120 option for utility planners if continued operation entails the expenditure of
121 significant investment dollars. For this reason, we will require PSNH to include in
122 future LCIRPs an economic analysis of retirement for any unit in which the
123 alternative is the investment of significant sums to meet new emissions standards
124 and/or enhance or maintain plant performance."

125 However, by ignoring the current financial situation and then also failing to
126 anticipate and analyze upcoming regulations, and potential compliance costs,
127 PSNH will fail to notify the Commission of potential significant investment dollars
128 which could arise when the combined cost of meeting anticipated air and water
129 regulations is considered.

130

131 **Q. Has PSNH conducted such a Continued Unit Operation study?**

132 A. No. The Company has conducted no Continued Unit Operation studies for at least
133 15 years, and only this year has conducted one for the Newington station
134 (Company response to Q-CLF-001).

135 **Q. Are other utilities in the country planning for upcoming environmental**
136 **regulations?**

137 A. Yes, there are several. Ameren and KCP&L in Missouri and PacifiCorp have all
138 included planning for upcoming environmental regulations and the costs of
139 compliance in their most recent IRPs.

140 **Q. In lieu of such a study from the Company, have you performed your own**
141 **economic analysis of units 4 and 6 at the Schiller station?**

142 A. We have. Attached as Exhibit DH-3 is a brief report entitled “Economic Analysis
143 of Schiller Station Coal Units.” In that report we project and analyze the net
144 revenues of these two Schiller units over a 10 year period from 2011 – 2020.

145 **Q. What were the primary assumptions made in your analysis?**

146 A. In our reference case, this report assumes expenses and plant values based upon
147 FERC Form 1 Schedule 402 data as filed by PSNH, expected upcoming
148 environmental compliance costs, and expected wholesale market revenues based
149 upon the Avoided Energy Supply Costs in New England study performed by
150 Synapse. We also conducted various sensitivities based upon high and low natural
151 gas prices, an assumption of no future environmental control costs, and
152 assumptions of wholesale energy and capacity prices from the Newington
153 Continued Unit Operation study, as revised April 26, 2011.

154 **Q. Are the Schiller units economic in any future year in your analysis?**

155 A. No. In each year, the operating cost of these units is greater than the revenues. The
156 net revenue in every year is negative by no less than \$10 million in any one year.
157 On a net present value basis, an analysis done now, in July 2011, finds that we
158 expect these units would have a 10-year net revenue of negative \$147m.

159 **Q. Is this result robust over the various sensitivities?**

160 A. Yes, it is. Our analysis varied future environmental compliance costs, gas price
161 costs, and even used the assumptions on wholesale market revenues reported in the
162 revised Newington CUO study. In each sensitivity, these two units operated at a
163 loss in every future year. Even under the assumptions that the Company put forth
164 in its own LCIRP (in the Newington CUO), the net revenue from these two units is
165 negative in every year from 2009 – 2020, with a NPV for the ten year period 2011

166
167

- 2020 of negative \$65.5m. The figures below show the annual net revenue for both units over time, and the Net Present Value.

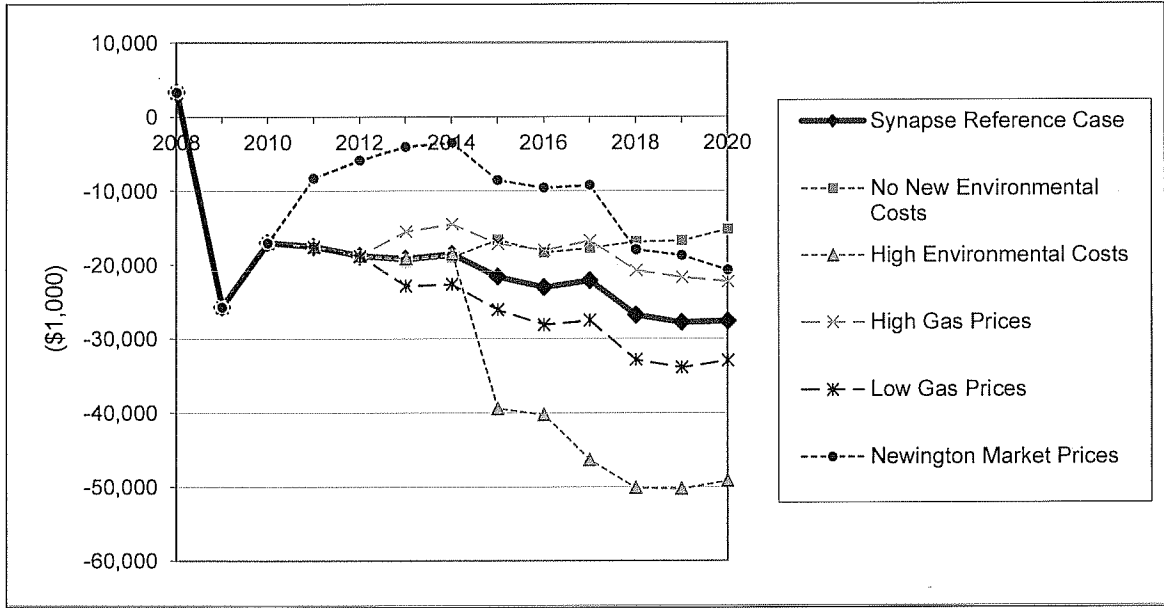


Figure 1. Schiller 4 and 6 Net Revenue

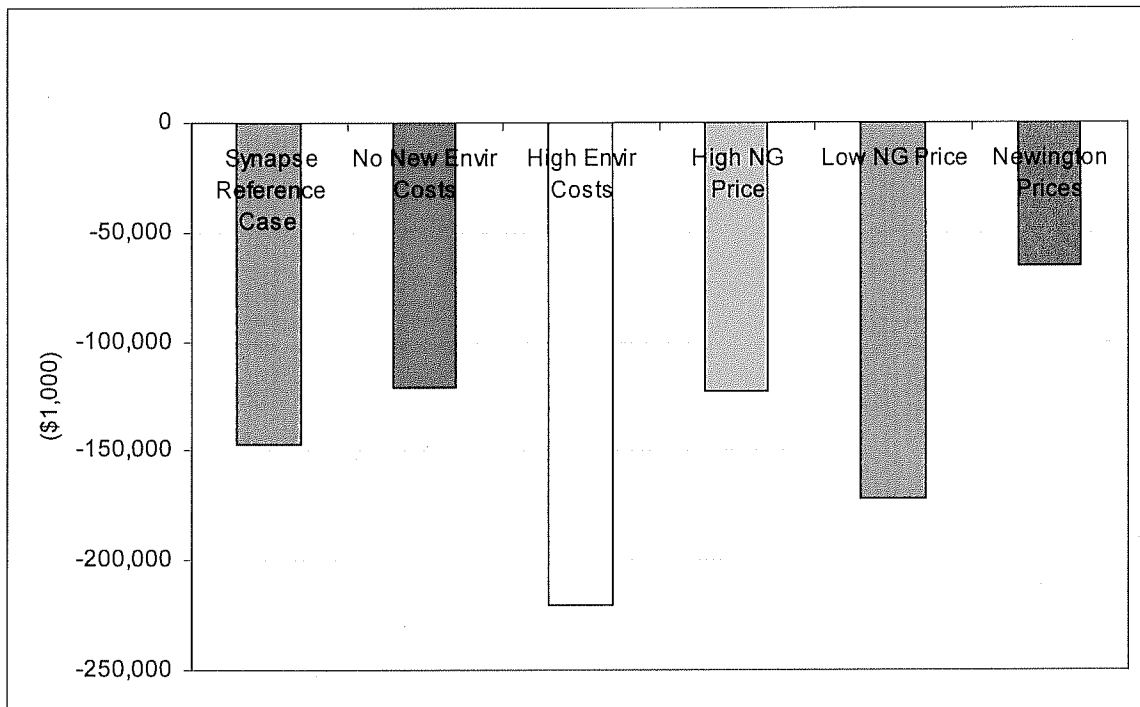


Figure 2. Schiller 4 and 6 NPV, 2011 - 2020

168 **Q. As part of this study, have you estimated potential costs for compliance with**
169 **upcoming environmental regulations?**

170 A. We have. Based upon data provided by Sargent & Lundy to the US EPA and our
171 knowledge of upcoming regulations, we expect that PSNH will be required to
172 install Baghouse and ACI equipment on the Schiller 4 and 6 units in 2015. We
173 have included these capital expenditures in our reference case, and in all cases
174 except the No Environmental Costs case. Of course these are industry average
175 estimates, and we encourage PSNH to provide their own estimates of equipment
176 costs for review by the Commission.

177
178 **Q. Is the continued operation of unit 5 at the Schiller station dependent upon the**
179 **operation of units 4 and 6?**

180 A. No. At the technical conference attended by my colleague Jeremy Fisher, PSNH
181 stated no interdependency.

182
183 **Q. Would the ratepayers be better served by PSNH meeting the load currently**
184 **served by Schiller units 4 and 6 by energy efficiency and market purchases?**

185 A. Yes, they would. As our analysis shows, the continued operation of the Schiller
186 units 4 and 6 loses money in every year even under optimistic assumptions of
187 energy revenues and environmental compliance costs. It would be far more
188 economic to serve PSNH ratepayers with cost effective energy efficiency
189 programs including those proposed by the Company or by market purchases.

190 **Q. Has the Company predicted the economic impacts of their proposed Northern**
191 **Pass Transmission Line project?**

192 A. Yes. PSNH's parent company, Northeast Utilities, has recently formed a joint
193 venture with NSTAR Electric called Northern Pass Transmission LLC, an entity
194 focused on developing the Northern Pass Transmission Line. In their TSA filing
195 with the FERC in December 2010, the company predicts wholesale energy cost
196 benefits to customers from the construction of the Northern Pass Transmission
197 line. In Tables B-1 and B-2 of their report included in that filing, Charles River
198 Associates predicts a drop in the simple average locational marginal prices in New

199 Hampshire from \$64.28/MWh to \$62.40/MWh if Northern Pass is constructed.
200 This is a 3% drop in wholesale energy prices, and therefore a 3% drop in
201 wholesale energy market revenues for all PSNH units. While we neither accept
202 nor reject this forecast, if it were correct then the Company's own estimates would
203 further exacerbate the negative cash flow situation that we have modeled for
204 Schiller units 4 and 6.

205 **Q. Based on your understanding of customer migration being experienced by**
206 **PSNH, what will be the effect of the NP project.**

207 A. The Commission is already fully aware of the migration issues facing PSNH. In
208 its July 26, 2011 order in Docket 10-160 the Commission wrote that "There
209 appears to be no dispute among the parties that many large commercial and
210 industrial customers migrated to competitive supply when the market price for
211 energy fell below the ES rate offered by PSNH. The result is that a shrinking pool
212 of ES customers – comprising primarily residential and small commercial
213 customers who do not have competitive supply options readily available to them –
214 are paying for the fixed costs of ownership and operation of PSNH's generation
215 units. "

216 If wholesale energy market prices decrease as projected by the analysis presented
217 in the TSA, the migration issue will be exacerbated still further.

218 **Q. What is the appropriate course of action for the Commission to take?**

219 A. The Commission should require an independent continuing unit operations study
220 of the Schiller units 4 and 6.

221 **Q. Does this conclude your testimony?**

222 A. Yes, this concludes my testimony.

Doug Hurley

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PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc, Cambridge, MA. Associate July 2008 – present; Research Associate, April 2004 – July 2008.

Assist clients in navigating the complex labyrinth of RTO market rules, especially regarding reliability assessments for coal-fired power plants and participation of energy efficiency and distributed generation in wholesale capacity markets. Analyze and report the benefits of demand resource participation in wholesale capacity markets. Currently serving as vice-chair of NEPOOL's Alternative Resources sector. Maintain our End User and AR Sector clients' interests at ISO-NE and PJM stakeholder meetings. Estimate and prepare expert testimony on avoided costs of energy and capacity for PURPA Qualifying Facilities. Analyze economic dispatch models and prepare expert testimony for regulatory proceedings. Analyze economic and environmental implications of renewable portfolio standards and clean energy policy scenarios. Investigate electricity market price trends and fluctuations.

Massachusetts Inst. of Technology, Cambridge, MA. Consultant, 2002 - 2003.

Redesigned and renovated database for applicant information and reporting for the Department of Economics.

Outward Bound, On Thompson Island in Boston Harbor, MA. Instructor, 2001 – present. Led both multi-day youth courses for Outward Bound and one-day adult courses for Outward Bound Professional. Youth courses focused on character development for teenage boys and girls. Adult courses focused on team building for departments and entire corporations with emphasis on effective communication, rapid consensus-building, and courageous leadership.

Logictier, Inc., San Mateo, CA. West Coast Research & Development, 2000 - 2001.

Led the West Coast R&D team of this Web Hosting company. Helped to grow the fledgling company from 25 to 150 people, and the R&D group from a team of 2 to a department of 10.

Ernst & Young, Tyson's Corner, VA. Consultant, 1992 - 1999.

Consulted to a number of Fortune 500 companies and public service organizations in various industries. Issues regarded information acquisition, network and application strategies, and database design, development, and deployment. Led teams of up to 10 people. Major clients included PSE&G of New Jersey, Public Service Company of Colorado, Coca Cola, Honda, Reebok, Lotus Development Corp., AmSouth Bank, Kaiser-Permanente, and OntarioHydro.

EDUCATION

Cornell University, Ithaca, NY. 1988-1992.

B.S. in Electrical Engineering, received May 1992.

PUBLICATIONS

- “Public Policy Impacts on Transmission Planning.” December 2010.
- “Demand Response Potential in ISO New England’s Day-Ahead Energy Market”
October 2010.
- “Impact of Impact of PRD Participation in Day-Ahead Energy Market.” Prepared for
NEPOOL Clients in Alternative Resources and End User Sectors, October 2009.
- “Cost and Benefits of Electric Utility Energy Efficiency in Massachusetts.” August 2008.
- “Prime Time for Efficiency.” Public Utilities Fortnightly. June 2008.
- “Incorporating Demand Resources in the PJM Reliability Pricing Model”. Prepared for the
Office of the Ohio Consumers’ Counsel, Pennsylvania Office of Consumer Advocate, Office
of the People’s Counsel for the District of Columbia, EnerNOC, and Conservation Services
Group. February 2008.
- “ISO New England Scenario Analysis Companion Report – Constructing a Future that Meets
Regional Goals.” Prepared for Conservation Law Foundation and Northeast Energy
Efficiency Partnerships. August 2007.
- “Demand Resources in the New England Forward Capacity Market,” Presentation by Paul
Peterson and Doug Hurley at the ACEEE and CEE National Symposium on Market
Transformation, March 2007.
- “Options for State Funded Energy Efficiency Programs in the Forward Capacity Market,”
November 2006.
- “Incorporating Energy Efficiency into the ISO New England Forward Capacity Market:
Ensuring the Capacity Market Properly Values Energy Efficiency Resources,” prepared for
Conservation Services Group, June 2006.
- “Update on New England's Demand Response Programs,” January 2006.

Resume dated December 2010.