THE STATE OF NEW HAMPSHIRE
BEFORE THE PUBLIC UTILITIES COMMISSION

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
PETITION FOR INCREASE IN SHORT TERM DEBT LIMIT AND TO ISSUE LONG TERM DEBT

DOCKET NO. DE 09-033

CONSERVATION LAW FOUNDATION'S MEMORANDUM OF LAW ON THE PUC'S DUTY TO MAKE A PUBLIC GOOD DETERMINATION ON PSNH'S PROPOSED FINANCING

The New Hampshire Public Utilities Commission ("Commission") has requested briefing from the parties to this docket on the question whether the Commission has authority to review Public Service Company of New Hampshire's ("PSNH") proposed financing.

The New Hampshire Supreme Court has held unequivocally that the Commission has a duty pursuant to RSA 396-B:3-a to determine whether a utility's proposed financing is in the public good—and that determination involves a review of facts, including the proposed uses of the funds, beyond the mere terms of the financing:

> [T]he PUC's authority under RSA chapter 369 is [not] limited to the determination of whether the *terms* of the proposed financing are in the public good. On the contrary, this court long has held that the PUC has a duty to determine whether, under all the circumstances, the financing is in the public good—a determination which includes considerations beyond the terms of the proposed borrowing.

Appeal of Easton, 125 N.H. 205, 213 (1984) (emphasis in original).

Accordingly, citing *Appeal of Easton*, the Commission has on numerous occasions stated that "[t]he public good consideration involves looking beyond actual terms of the proposed financing to *the use of the proceeds* and *the effect on rates* to ensure that the public good is protected." *Hampstead Area Water Co.*, DW 08-088, No.

24,937, slip op. (Feb. 6, 2009) at 14 (emphasis added). *See also, e.g., Atkinson Area Wastewater Recycling, Inc.*, DW 07-131, Order No. 24,899, slip op. (Sept. 25, 2008) at 8 (*citing Appeal of Easton* for same proposition); *Pennichuck East Utility, Inc.*, DW 08-022, Order No. 24,844, slip op. (Apr. 4, 2008) at 3 (same).

Consistent with that longstanding precedent, the Commission's Order of Notice in this docket expressly provides that the docket involves "issues related to RSA 369, *the proposed use of the funds* and whether the issuance of up to $150 million of long-term debt, the mortgaging of property, the execution of an interest rate transaction and a permanent increase in PSNH's short-term debt limits are *in the public good.*" DE 09-033 Order of Notice (March 6, 2009) at 2 (emphases added).

RSA 125-O *et seq.*, ("Scrubber Law") was not intended to shield from review PSNH financing in connection with the installation of a wet flue gas desulphurization system ("FGD System"), or any other proposed use of the funds. The plain language of the statute makes clear that the Legislature did not intend the Scrubber Law to supersede any of PSNH's regulatory obligations associated with the installation of the FGD System. *See* 125-O:13, I.

Even assuming *arguendo* that the Scrubber Law shielded PSNH from an *Easton* review of such FGD System costs —which CLF disputes—those costs account for only a portion of the total proposed generation capital expenditures at Merrimack Station. *See infra* at pp. 5-7. RSA 125-0 made no public interest finding with respect to any modification except the FGD System installation itself. *Compare* 125-O:11, VI *and* 125-O:13, I *with* 125-O:13, IV ("the owner may invest in capital improvements at Merrimack Station that increase its net capability, *within the requirements and regulations of*

programs enforceable by the state or federal government, or both.") (emphasis supplied).[1]

Review is warranted to determine whether PSNH's proposed use of financing proceeds is a sound investment and in the public good, including PSNH's continuing use of funds to cover costs associated with "new capital additions." DE 09-033 Order of Notice at 1. Such capital additions—which were not defined in the Order of Notice—could have significant environmental impacts.

Modifications other than the FGD System installation mandated by RSA 125-O recently have been made to Merrimack Station's Unit 2 ("MK2") that, based on PSNH's 2009 projected actual emissions, will result in emissions *increases* over the 2006-2007 baseline for SO_2, NO_X, CO, PM, and VOCs. *See* Letter from William Smagula, Director-Generation, PSNH to DES ARD Director Robert R. Scott at Attachment 1 (Jan. 31, 2008), attached hereto as Exhibit 1. Specifically, those increases include: 527 tons per year ("tpy") post-modification increase in NO_X emissions; 1,166 tpy post-modification increase in SO_2 emissions; 4 tpy post-modification increase in CO emissions; 3 tpy post-modification increase in PM emissions; and 1 tpy post-modification increase in VOC emissions.

The post-modification output of MK2 is projected by PSNH to increase substantially; however, because PSNH has provided varying estimates of the anticipated increase to various regulatory agencies, the upper bound of the anticipated output remains to be determined. *Compare* Letter from William H. Smagula, Director-Generation, PSNH, to Robert R. Scott, DES ARD Director, at 3 (June 7, 2006) (six to thirteen

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1 This issue presently is before the Commission in DE 08-145.

megawatt increase), attached hereto as Exhibit 2, *with* Interconnection Requests to the Administered Transmission System at 4 (queue position 291) (January 31, 2009) (nearly 32 megawatt increase over MK2's current winter capacity by the commercial operation date of December 14, 2009)[2] attached hereto at Exhibit 3; *and* PSNH Objection, Site Evaluation Committee Docket No. 2009-01, ¶¶ 24, 25 (April 1, 2009) (17.175 megawatts).[3]

Capital additions to enable a capacity increase in the range of seventeen to thirty-two megawatts at a vintage coal plant are of significant environmental concern. Such capital additions have the potential substantially to increase air pollution emissions—and / or extend the expected life of Merrimack Station—the largest single source of carbon dioxide emissions in New Hampshire, and a source of thousands of tons of annual emissions of other air pollutants with known adverse health effects, including respiratory illness and premature death.

In prefiled testimony to the Commission, Randy A. Shoop testified that PSNH's request for an additional $60 million in short term debt limit "was based on PSNH's need to maintain sufficient liquidity to support its growing capital expenditure program and ongoing working capital requirements." *See* Petition of [PSNH] for Approval of [Financing], p. 000086, lines 18-20 (Feb. 20, 2009). In response to a data request issued in this docket by the Office of Consumer Advocate seeking greater detail about the nature of that "growing capital expenditure program," PSNH identified the following generation

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2 PSNH reported in its 2007 Least Cost Integrated Resource Plan (Sept. 30, 2007) that MK2's winter capacity rating is 321.75 megawatts, and the summer capacity rating is 320 megawatts. PSNH's January 2009 ISO request seeks an uprate to 340 megawatts in the summer (an increase of 20 megawatts), and to 353.5 megawatts in the winter (an increase of 31.75 megawatts).

3 Available at http://www.nhsec.nh.gov/2009-01/documents/090401psnh_objection.pdf.

capital projects at Merrimack Station to which a portion of the proposed financing proceeds would be directed:

Generation Schedule No.	Line Item No.	Project Description	2009 Budget
Schedule 1 (Projects started prior to 2009)	5001	Wet flue gas desulphurization system, Merrimack	$122,967,097
Schedule 1	5002	Install flue gas SO3 reduction system, Unit 2, Merrimack	$2,748,148
Schedule 1	5006	Mercury removal pilot program, Merrimack	$448,315
Schedule 1	5008	Replace exciter rotor Unit 2, Merrimack	$122,671
Schedule 1	5009	Replace coal sampler, Merrimack	$119,850
Schedule 1	5013	Replace breakers, Merrimack	$101,000
Schedule 1	5015	Replace motor control center, Unit 2, Merrimack	$58,083
Schedule 2 (Annual Projects)	5016	Replacement of large equipment annual, Merrimack	$2,955,260
Schedule 2	5022	Capital annual, Merrimack	$397,880
Schedule 2	5024	Capital annual material only purchases, Merrimack	$120,960
Schedule 3 (Projects Under $50,000)	5027	Replace voltage regulator on combustion turbine Unit 2 Merrimack	$45,844
Schedule 3	5028	Replace fuel nozzle Unit 1 Merrimack	$35,578
Schedule 4 (Projects $50,000 and Over)	5031	Purchase front end loader and dump truck, Merrimack	$900,000
Schedule 4	5037	Replace valves Unit 2, Merrimack	$536,244
Schedule 4	5038	Breaker replacement	$516,578

Generation Schedule No.	Line Item No.	Project Description	2009 Budget
		program, Merrimack	
Schedule 4	5039	Purchase air compressor, Merrimack	$416,011
Schedule 4	5042	Install forced draft fan silencer Unit 2, Merrimack	$278,207
Schedule 4	5044	Purchase trailers, Merrimack	$234,543
Schedule 4	5045	Replace crusher house transformer, Merrimack	$223,747
Schedule 4	5046	Replace reclaim hoppers, Merrimack	$216,208
Schedule 4	5047	Replace lower shot hopper Unit 2 Merrimack	$162,103
Schedule 4	5048	Replace selective catalytic reduction expansion joints Unit 2 Merrimack	$157,038
Schedule 4	5049	Replace air heater cold end tubes, Unit 2 Merrimack	$151,972
Schedule 4	5054	Replace condensate polisher controls, Unit 2 Merrimack	$136,350
Schedule 4	5057	Install forced draft fan silencer Unit 1, Merrimack	$127,259
Schedule 4	5058	Install vacuum system for coal handling, Merrimack	$122,383
Schedule 4	5062	Install Homeland site security, Merrimack	$102,647
Schedule 4	5066	Replace selective catalytic reduction reactor and D02 roof, Unit 2 Merrimack	$101,315
Schedule 4	5069	Replace electronic	$73,882

Generation Schedule No.	Line Item No.	Project Description	2009 Budget
		dispatch central box, Merrimack	
Schedule 4	5071	Install wastewater treatment control programmable logic controller Unit 2 Merrimack	$60, 789
TOTAL			**$134,637,962**

See PSNH Response to OCA Data Requests, Q-NOCA Set 1-002 (April 3, 2009).

Many of these capital expenses are associated with improvements and modifications to the aging Merrimack Unit 2, where in 2008 alone, PSNH spent at least $11.4 million dollars on modifications, including installing a new turbine and generator. *See* PSNH Response to Data Request TS-01, PUC Docket No. DE 08-145 (February 20, 2009). These costs, in the aggregate, raise substantial questions about whether the public good is served by continuing to pour hundreds of millions of dollars into Merrimack Station—especially when additional regulatory compliance costs, including carbon dioxide regulation—will soon be added to Merrimack's steadily inflating price tag. The Commission has a duty to review these costs, *Appeal of Easton* at 213, and should reject PSNH's attempt to yet again evade review of its activities.

This is particularly true given the existing alternatives to continuing, long term reliance on Merrimack Station that are economically, technically, and environmentally feasible. The Commission has recently recognized that there is a point at which it may no longer make economic sense to continue to spend "significant sums" on Merrimack Station. *See* DE 07-108, PSNH Least Cost Integrated Resource Plan, Order No. 24,945 (Feb. 27, 2009). That point is fast approaching, if not already passed.

Specifically, the Commission found:

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

Id. (emphasis supplied).

Currently available feasible alternatives to Merrimack Station's continued operation include "purchasing power from the market, energy efficiency savings, conversion of one or both units at Merrimack to burn biomass, the addition of other renewable resources, generating more power at existing power plants in the area, building a new combustion turbine or combined cycle facility at the Merrimack Station site and transmission system upgrades." *See* Synapse Energy Economics, Inc., "Initial Report to the New Hampshire Senate Energy, Environment and Economic Development Committee on PSNH's Merrimack Station Scrubber Project," at 6 (Mar. 20, 2009), attached hereto at Exhibit 4.

A February 2009 study completed for the Commission by GDS Associates found that the potential for statewide cost effective energy efficiency by 2018 ranged from 255 to 455 MW and from 184 to 330 MW in PSNH's service area for that same year. *See* GDS Associates, Inc., "Additional Opportunities for Energy Efficiency in New Hampshire," Final Report at 16 (January 2009).[4] That study confirms that the savings achievable in PSNH's service area by 2018—standing alone—could replace

[4] Available at http://www.puc.state.nh.us/Electric/GDS%20Report/NH%20Additional%20EE%20Opportunities%20Study%202-19-09%20-%20Final.pdf.

approximately one-half to three-quarters of the capacity supplied by Merrimack. Reliance on energy efficiency reduces air pollution, and is a far more affordable option for ratepayers.[5]

For the foregoing reasons, the Commission should conduct an *Easton* review of PSNH's proposed financing that includes a determination whether the proposed uses of the funds would serve the public good.

Respectfully submitted,

Date: April 10, 2009

Melissa A. Hoffer, N.H. Bar No. 17849
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[5] Data provided by New Hampshire utilities in 2007 show that the average cost of energy efficiency was 1.9 cents per kilowatt hour, *see* NH Saves, "Core Programs Savings Summary," compared with the current 16 cents per kilowatt hour cost of electricity. *See* http://www.nh.gov/oep/index.htm (March 2009).

CERTIFICATE OF SERVICE

I hereby certify that on the 10th day of April, 2009, a copy of the Conservation Law Foundation's Memorandum of Law on the PUC's Duty to Make a Public Good Determination on PSNH's Proposed Financing was sent electronically, and by First Class Mail, to

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Dated in Concord, New Hampshire this 10th day of April, 2009.

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EXHIBIT 1

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The Northeast Utilities System

John M. MacDonald
Vice President - Energy Delivery and Generation

January 31, 2008

Mr. Robert R. Scott, Director
Air Resources Division
NH Dept. of Environmental Services
29 Hazen Drive, PO Box 95
Concord, NH 03302-0095

Public Service Company of New Hampshire
Merrimack Station – Clean Air Project
2008 Merrimack Unit #2 Outage

Dear Mr. Scott:

In response to your letter dated June 12, 2006, Public Service Company of New Hampshire submits baseline emissions data and projected actual emissions data for Merrimack Unit #2 (MK2). This submittal is being made as part of an approach, agreed upon by PSNH and the Department of Environmental Services, Air Resources Division (DES), to allow for an expedited regulatory review of balance of plant projects planned to be completed during MK2's 2008 outage. As requested, the emissions data provided in Attachment 1 is being submitted 60 days prior to the upcoming MK2 outage scheduled to begin on April 1, 2008. Please note, while this project has been generally referred to as the scrubber project during its young life, PSNH has adopted the name, The Clean Air Project, as its formal description. We will endeavor to use this new name going forward.

Project Overview

As indicated in my letter to you dated June 7, 2006, the balance of plant projects planned to be completed during the 2008 MK2 outage, including the HP/IP project and associated generator repair work, are necessary in order to maintain the output of MK2 and comply with RSA 125-O:13 which requires PSNH to install a wet scrubber at Merrimack Station, no later than July 2013. Given the large power consumption of the proposed scrubber system, the completion of this energy efficiency project is vital to Merrimack Station's long term operation.

The HP/IP project involves the replacement of one of the six steam turbine components with a functionally equivalent component. The new, state of the art turbine blades will be energy

efficient. As part of this project, the HP/IP rotor, stationary blade rings, and inner and outer cylinder casings will be replaced. The repair work to the generator involves an in-kind replacement of the generator rotor. The replacement of the generator rotor is the most cost effective approach to repairing the generator and is being completed as an alternate to the previously proposed repair approach which included installation of a long retaining ring assembly, rewinding with new copper coils, etc. The replacement of the generator requires a shorter critical-path outage duration and eliminates unknowns and risks associated with repair work.

Merrimack Unit #2 Operation

Merrimack Station is PSNH's prime base load electric generating station currently produces approximately 475 net megawatts of electricity, 321.75[1] of which is produced by MK2. Following the completion of the MK2 HP/IP turbine project and associated generator work MK2 is expected, per the contract guarantee, to produce an additional 6.5 megawatts of electricity. The actual net unit output will range between 6 and 13 megawatts – an increase that is necessary to support the large power consumption of the future, new scrubber system –due to the increased efficiency of the turbine blades. As a result of this energy efficiency project, MK2 will produce more energy without increasing fuel consumed.

Following the completion of the HP/IP turbine project and associated generator work, MK2 will be operated at the same fuel flow rates and emissions levels as it was operated prior to the MK2 2008 outage. Normal full load steam inlet conditions for flow, pressure and temperature will remain at their previous values. Because the coal flow will remain constant, there is no change or increase in air emissions associated with the HP/IP turbine and generator project.

Given the base load operation of Merrimack Station, PSNH anticipates that actual annual emissions from MK2 in the future will be very similar to historical emissions. A review of historical data for the period 1996 through 2007 reveals slight variability in MK2's annual average capacity factor, operating hours, and total fuel burned, largely the result of annual maintenance outage schedules which typically range between four and nine weeks and unplanned outages. Historical data is enclosed as Attachment 2.

Regulatory Review

The approach proposed by PSNH for regulatory review is based on EPA guidance documents, specifically those applicable to Detroit Edison's Monroe Power Plant and Otter Tail Power's Coyote Station where similar projects have been undertaken. The proposed approach is also based on existing federal PSD regulations which allow electric utilities to determine applicability using projected actual emissions. This approach, which has previously been called the "actual-to-representative-actual-annual" emissions test, allows utilities to compare projected future

[1] MK2's current winter claimed capability.

annual emissions that will occur following a non-routine physical or operational change to actual baseline emissions preceding the change. Baseline emissions, calculated using utilization rate, fuel use and applicable emission factors, are based on an average annual emissions rate in tons per year for each pollutant emitted. Projected actual emissions are based on the maximum annual rate, in tons per year, at which a regulated PSD pollutant is projected to be emitted, less any emissions that could have been accommodated during the baseline period and are not related to the change. The proposed approach allows PSNH to document that there is no emissions increase associated with the MK2 HP/IP turbine and generator project.

Baseline Emissions

PSNH understands that baseline is calculated based on the average emissions, representative of normal operation, during 2 consecutive years during the previous 5 year period. PSNH has calculated baseline emissions for MK2 based on the annual average of emissions during two consecutive calendar years, or twenty-four consecutive months, preceding the 2008 outage, specifically 2006-2007. In addition to the enclosed historical data, summaries of emissions for the previous 5 years (2003-2007) as well as baseline for TSP, CO, VOCs, SO2, and NOx are provided in Attachment 2. The baseline for NOx and SO2 was calculated using emissions data contained in PSNH's Quarterly Emissions Inventory Reports, as previously filed with DES and the NH Public Utilities Commission. Copies of these reports for the years 2006-2007 are also enclosed in Attachment 3. Baseline emissions for CO and VOCs were calculated using AP42 emissions factors published by DES and available on its web site. Baseline emissions for PM were calculated using the emissions rate documented during the most recent stack test. These calculations are identical to those used in PSNH's annual emissions reports and emissions based fees.

Projected Actual Emissions

Projected actual emissions for 2008 and 2009 have been calculated using forecasted annual capacity factors, fuel use, hours of operation and emissions rates. Projected emissions for 2008 are based on the average for the previous 5-year period, while projected emissions for 2009 are based on hours of operation, fuel use, and emissions similar to 2006. As previously stated, given the base load operation of Merrimack Station, PSNH anticipates that MK2's projected actual emissions will be comparable to its historical actual emissions. Projected actual emissions and forecasted capacity factors for MK2 are enclosed in Attachment 1. Historic capacity factors are contained in Attachments 1 and 2. In accordance with EPA guidance, the projection of post-change emissions does not include the portion of emissions that could have been accommodated before the change and is unrelated to the change. See letter from Francis X. Lyons, Regional Administrator, US EPA, to Henry Nickel, Counsel for the Detroit Edison Company, Hunton & Williams, dated May 23, 2000. Maximum potential emissions (i.e., emissions that can be accommodated prior to the change) currently allowed under TP-B-0462 and existing state and federal applicable requirements are contained in Attachment 4.

Future Recordkeeping and Reporting

As specified under 40 CFR 52.21(b)(21)(v) and 40 CFR 52.24(f)(13)(v), PSNH will maintain and submit to DES, on an annual basis for a period of 5 years, information demonstrating that there are no emissions increases as a result of the HP/IP turbine and generator project. This information may include annual utilization data, emissions data, fuel use, etc. PSNH may exclude emissions increases that are caused by other factors including, for example, increases associated with variability in control technology operation and performance or coal characteristics. Emissions increases may also exclude increases associated with increased use of MK2 due to the growth in electrical demand for the utility system as a whole since the baseline period. See Detroit Edison Applicability Determination Detailed Analysis, dated May 23, 2000.

In addition to documenting that there is no increase in emissions associated with the HP/IP turbine and generator project, the enclosed baseline and projected actual emissions fulfills the request for documentation contained in your letter dated June 12, 2007. Should you have any questions or require additional information relative to the MK2 HP/IP turbine and generator project or the enclosed data, please contact me at 634-2851 or Laurel L. Brown, Senior Environmental Analyst, at 634-2331.

Sincerely,

William H. Smagula, P.E.
Director – Generation

Enclosures

cc. Thomas S. Burack, Commissioner, DES
Harold E. Keyes, PSNH Merrimack Station

PSNH Merrimack Station
Merrimack Unit #2

Attachment 1

Historic Emissions Data

	SO2	NOx	CO	PM	VOCs
	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr
2003	17,387	2,685	196	218	43
2004	20,582	3,067	211	233	46
2005	22,948	3,283	220	234	48
2006	22,729	3,304	236	256	52
2007	25,062	2,250	228	249	50

Historic Operational Data

	Capacity	Coal	#2 Oil
	Factor %	tons/yr	gal/yr
2003	73.90	768,969	28,826
2004	80.50	841,129	22,867
2005	79.10	870,802	77,190
2006	83.90	937,595	29,070
2007	82.90	912,674	11,427

Baseline Period: January 2006 - December 2007

Baseline Emissions

SO2	NOx	CO	PM	VOCs
tons/yr	tons/yr	tons/yr	tons/yr	tons/yr
23,896	2,777	232	253	51

Projected Capacity Factor and Representative Actual Emissions

	SO2	NOx	CO	PM	VOCs	Capacity
	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	Factor %
2008	21,742	2,918	218	238	48	80.1
2009	25,062	3,304	236	256	52	83.9

PSNH Merrimack Station
Merrimack Unit #2

Attachment 2

Year	SO2 tons/yr	NOx tons/yr	CO tons/yr	PM tons/yr	VOCs tons/yr	Capacity Factor %	Nox lbs/mmBtu	SO2 lbs/mmBtu	Coal tons/yr	# 2 Oil gal/yr
1996	23,579.51	13,818.20	187.46	1,595.40	41.23	69.9	0.95	2.44	746,923	18,215
1997	26,128.10	9,804.50	223.47	1,837.00	49.16	83.0	0.88	2.15	860,559	13,054
1998	21,669.00	4,745.00	191.62	1,886.70	42.14	70.2	0.48	2.10	752,201	23,826
1999	20,518.00	4,628.00	180.78	1,416.50	39.76	68.5	0.47	2.16	692,942	16,645
2000	26,152.00	4,202.00	219.70	231.90	48.32	78.6	0.38	2.27	849,914	31,723
2001	24,562.00	3,130.00	201.17	216.20	44.25	74.8	0.30	2.31	788,202	14,317
2002	20,902.00	2,872.00	200.15	210.48	44.03	75.7	0.27	1.90	757,879	13,459
2003	17,387.00	2,684.80	195.80	217.76	43.06	73.9	0.26	1.58	768,969	28,826
2004	20,582.00	3,067.00	210.92	232.67	46.39	80.5	0.28	1.71	841,129	22,867
2005	22,948.00	3,283.00	219.70	234.11	48.30	79.1	0.29	1.93	870,802	77,190
2006	22,729.00	3,304.00	235.64	256.19	51.83	83.9	0.26	1.79	937,595	29,070
2007	25,062.40	2,249.60	228.20	249.24	50.20	82.9	0.18	1.97	912,674	11,427

MERRIMACK STATION
2007 SO2 - NOx EMISSIONS CALCULATIONS

	COAL AS BURNED													#2 OIL AS BURNED					
Month	MK1 Tons	MK2 Tons	TOTAL Tons	% MK1 Sulfur	MK1 btu/lb	% MK2 Sulfur	MK2 btu/lb	% Avg Sulfur	MK1 CEM Tons NOx	MK2 CEM Tons NOx	MK1 CEM Tons SO2	MK2 CEM Tons SO2	TOTAL CEM Tons SO2	MK1 Gal.	MK2 Gal.	TOTAL Gal.	% Sulfur	btu/lb	lbs/gal
JAN	32,573	92,454	125,027	1.59	13,024	1.46	13,049	1.50	73	193	1,047	2,695	3,742	-	266	266	0.02	19,612	7.080
FEB	26,943	64,351	91,294	1.58	13,046	1.54	12,778	1.56	68	149	953	2,209	3,162	-	2,321	2,321	0.02	19,612	7.080
MAR	28,874	94,336	123,210	1.41	13,208	1.40	12,927	1.40	68	184	832	2,495	3,327	903	58	961	0.02	19,612	7.080
APR	31,333	49,307	80,640	1.71	13,263	1.50	13,001	1.58	70	104	1,072	1,271	2,344	95	-	95	0.01	19,369	7.030
MAY	33,359	13,150	46,509	1.35	13,370	1.16	13,442	1.29	74	53	961	351	1,312	-	2,161	2,161	0.01	19,369	7.030
JUN	29,329	83,669	112,998	1.32	13,162	1.38	13,148	1.36	67	198	921	2,286	3,207	83	3,726	3,809	0.01	19,369	7.030
JUL	34,065	91,622	125,687	1.31	13,154	1.28	13,050	1.29	92	194	962	2,308	3,270	-	630	630	0.01	19,384	7.090
AUG	32,411	90,645	123,056	1.55	13,112	1.48	13,132	1.50	100	252	1,045	2,555	3,601	-	109	109	0.01	19,384	7.090
SEP	28,712	69,741	98,453	1.51	13,221	1.41	13,055	1.44	87	185	855	1,817	2,672	891	-	891	0.01	19,384	7.090
OCT	31,245	79,340	110,585	1.43	13,158	1.50	13,009	1.48	93	225	916	2,142	3,057	140	1,489	1,629	0.02	19,424	7.080
NOV	31,215	89,815	121,030	1.48	12,992	1.28	12,905	1.33	88	248	915	2,408	3,322	92	92	184	0.02	19,424	7.080
DEC	33,332	94,244	127,576	1.50	12,948	1.35	12,892	1.38	91	264	943	2,526	3,469	62	575	637	0.02	19,424	7.080
*ADDJ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YR TOTALS	373,391	912,674	1,286,065						971	2,248	11,420	25,064	36,484	2,266	11,427	13,693			
YR AVERAGE				1.48	13,138	1.40	13,004	1.43									0.01	19,444	7.059
10^12 BTU	9.811158	23.73747	33.549											0.0003	0.0016	0.0019			

1.093 - COAL-AVE lb SULFUR PER MMBTU
0.007 - #2 OIL - AVE lb SULFUR PER MMBTU
1.093 - OVERALL AVE lb SULFUR PER MMBTU

2.175 - AVERAGE LBS SO2 PER MMBTU
4.000 - NH STATE REG MAX

0.182 - MK1 AVERAGE LBS NOx/MMBTU
0.186 - MK2 AVERAGE LBS NOx/MMBTU

NOTES:
1) ALL ANALYSES USED ARE "AS RECEIVED" ON THE FUEL ANALYSIS SHEETS.
2) SULFUR VALUES ARE PERCENT BY WEIGHT.
3) MONTHLY COMPOSITE ANALYSES USED FOR BOTH UNITS FOR REPORTING PURPOSES, EVEN DURING MONTHS WHEN TEST BURNS OCCURRED.
4) COAL TONS ARE PRORATED BURN.
* STARRED ENTRY IS AERIAL SURVEY ADJUSTMENT, FUEL ANALYSIS IS EQUAL TO STATION Y-T-D WEIGHTED AVERAGE (December was adjusted)
Emissions are based on Average emissions rate of the current year

Prepared by Leo Quinn 01/24/2008

MERRIMACK STATION
2006 SO2 - NOx EMISSIONS CALCULATIONS

	COAL AS BURNED													#2 OIL AS BURNED					
Month	MK1 Tons	MK2 Tons	TOTAL Tons	% MK1 Sulfur	MK1 btu/lb	% MK2 Sulfur	MK2 btu/lb	% Avg Sulfur	MK1 CEM Tons NOx	MK2 CEM Tons NOx	MK1 CEM Tons SO2	MK2 CEM Tons SO2	TOTAL CEM Tons SO2	MK1 Gal.	MK2 Gal.	TOTAL Gal.	% Sulfur	btu/lb	lbs/gal
JAN	30,088	90,657	120,745	1.21	13,066	1.15	13,097	1.16	209	434	809	2,194	3,003	4,813	4,179	8,992	0.04	19,474	7.020
FEB	24,958	66,161	91,117	1.31	13,333	1.08	13,281	1.14	179	327	808	1,374	2,182	3,708	5,721	9,429	0.04	19,474	7.020
MAR	31,789	88,337	120,126	1.53	13,330	1.23	13,345	1.31	227	424	999	1,979	2,968	1,193	1,780	2,973	0.04	19,474	7.020
APR	24,221	50,411	74,632	1.60	13,396	1.25	13,319	1.36	175	239	734	1,240	1,973	2,258	142	2,400	0.04	19,564	7.060
MAY	23,614	27,330	50,944	1.90	13,050	1.20	12,853	1.53	59	71	646	777	1,622	4,135	6,100	10,235	0.04	19,564	7.060
JUN	25,429	91,612	117,041	1.60	13,113	1.41	12,889	1.45	55	169	759	2,260	3,019	2,151	929	3,080	0.03	19,428	7.060
JUL	34,367	96,757	131,124	1.42	12,875	1.32	12,660	1.34	71	182	1,048	2,374	3,422	83	169	252	0.03	19,617	7.068
AUG	34,161	96,238	130,399	1.59	12,895	1.29	12,770	1.37	72	190	1,263	2,535	3,798	-	87	87	0.03	19,617	7.068
SEP	4,801	69,673	74,474	1.59	12,895	1.24	12,670	1.27	11	152	192	1,710	1,902	1,257	5,892	7,149	0.03	19,617	7.068
OCT	27,517	92,176	119,693	1.15	13,106	1.16	13,116	1.16	202	424	778	2,241	3,019	2,005	618	2,623	0.11	19,444	7.060
NOV	26,916	91,964	120,880	1.23	13,126	1.24	12,914	1.24	200	375	852	2,122	2,973	2,729	-	2,729	0.11	19,444	7.060
DEC	29,738	80,939	110,677	1.81	13,124	1.57	13,157	1.63	198	317	920	1,923	2,844	1,595	3,453	5,048	0.11	19,444	7.060
* ADDJ	(296)	(4,660)	(4,956)	1.48	13,114	1.27	13,010	1.32	-	-	-	-	-	-	-	-	-	-	-
YR TOTALS	319,301	937,595	1,256,896						1,858	3,304	9,998	22,728	32,726	25,927	29,070	54,997			
YR AVERAGE				1.48	13,114	1.27	13,010	1.32									0.05	19,506	7.047
10^12 BTU	8.374437	24.39685	32.771											0.0036	0.0040	0.0076			

1.015 - COAL-AVE lb SULFUR PER MMBTU
0.026 - #2 OIL - AVE lb SULFUR PER MMBTU
1.015 - OVERALL AVE lb SULFUR PER MMBTU

1.997 - AVERAGE LBS SO2 PER MMBTU
4.000 - NH STATE REG MAX

0.372 - MK1 AVERAGE LBS NOx/MMBTU
0.264 - MK2 AVERAGE LBS NOx/MMBTU

NOTES:
1) ALL ANALYSES USED ARE "AS RECEIVED" ON THE FUEL ANALYSIS SHEETS.
2) SULFUR VALUES ARE PERCENT BY WEIGHT.
3) MONTHLY COMPOSITE ANALYSES USED FOR BOTH UNITS FOR REPORTING PURPOSES, EVEN DURING MONTHS WHEN TEST BURNS OCCURRED.
4) COAL TONS ARE PRORATED BURN.
* STARRED ENTRY IS AERIAL SURVEY ADJUSTMENT, FUEL ANALYSIS IS EQUAL TO STATION Y-T-D WEIGHTED AVERAGE (December was adjusted)
Emissions are based on Average emissions rate of the current year

Prepared by Leo Quinn 01/26/2007

PSNH Merrimack Station
Merrimack Unit #2

Attachment 4

Current Permit Limits

max gross heat input	3,473	mmBtu/hr
max annual gross heat input	30,423,480	mmBtu
max sulfur content of coal burned	2.80	lb/mmBtu
max sulfur content of #2 fuel oil	0.40	% by weight
max fuel consumption (coal)	136.20	tons/hr
max fuel consumption (coal)	1,193,078.0	tons per 12-mo
max fuel consumption (#2 oil)	1,656.0	gal/hr
max fuel consumption (#2 oil)	14,500,000.0	gallons per 12-mo
NOx	15.40	tons per day
	5,621.00	tpy calculated = 15.4 tpd * 365
SO2		
	85,185.74	tpy calculated = 2.8 lb/mmBtu * 3473 mmBtu/hr * 8760 * 2 / 2000

EXHIBIT 2

Public Service
of New Hampshire

The Northeast Utilities System

June 7, 2006

Mr. Robert R. Scott, Director
Air Resources Division
NH Dept of Environmental Services
29 Hazen Drive, PO Box 95
Concord, NH 03302-0095

Public Service Company of New Hampshire
Merrimack Station – Scrubber Project
2008 Merrimack Unit #2 Outage

Dear Mr. Scott,

This correspondence is a follow-up to discussions held on May 16, 2005 between representatives of Public Service of New Hampshire (PSNH) and NH Department of Environmental Services, Air Resources Division (DES), specifically Craig Wright, Michele Andy, Gary Milbury, and Jeff Underhill of DES and Bill Smagula, Lynn Tillotson, and Laurel Brown of PSNH.

Engineering Study and Assessment

As discussed at the May 16, 2006 meeting, PSNH is preparing for the installation of a scrubber at Merrimack Station. As required by the recently enacted House Bill 1673-FN, a scrubber must be installed and operational at Merrimack Station no later than July 1, 2013. In anticipation of a statutory requirement, PSNH retained Sargent & Lundy to complete a comprehensive, multi-phased engineering study to evaluate multi-pollutant control technology options for the Merrimack Station and to identify the most cost effective and operationally feasible option for mercury control as well as potential challenges. This evaluation included an assessment of the boiler, balance of plant equipment, turbine-generator systems, and site work. This assessment was done to ensure the existing station equipment will perform reliably and the unit's cost will remain competitive since the large investment necessary to install a scrubber necessitates the continued operation of Merrimack Unit #2 (MK2) well beyond 2013. Lastly, to maintain the generation output and value to customers, the large power consumption of a scrubber system – as much as 6 to 10 megawatts, justified the need to fully assess balance of plant improvements necessary to offset the additional load.

Phase I of this study confirmed that the installation and operation of a scrubber at Merrimack Station is a viable option that will result in reductions in mercury and sulfur dioxide (SO_2) emissions. However, the installation of a scrubber will require a new stack, material storage and handling system, wastewater treatment system, balance of plant work, MK2 high pressure/intermediate pressure (HP/IP) turbine and generator work, in addition to the installation of the scrubber vessel.

Planned Maintenance Outages

In order to meet the July 2013 deadline, it will be necessary for PSNH to complete as much of the balance of plant work as possible during planned maintenance outages in the years preceding 2013. This will require careful planning and coordination given Merrimack Station's anticipated outage schedules. Planned maintenance outages occur on MK2 every year. PSNH typically performs annual maintenance on MK2 in the spring to prepare for the higher summer demand periods; while maintenance on MK1 is completed in the fall. The length of a particular outage varies depending on the scope of work being completed and whether or not it is a "major" outage. A "major" outage, when turbine and/or generator work is done, may last 8 to 10 weeks. Routine turbine maintenance and generator inspections, as well as routine generator maintenance, are completed every 5 years. The next major outage on MK2 is scheduled for 2008, and then again in 2013.

Regulatory Review

Prior to 2002, maintenance outage work had been scheduled, budgeted, and completed without regulatory review by DES. Beginning in 2002, PSNH began meeting with representatives of DES, at their request, to discuss capital maintenance projects scheduled to be completed during each planned maintenance outage at Merrimack Station. Following this approach, the individual projects identified as necessary by Sargent & Lundy would be included in the review conducted immediately prior to the outage during which the work is scheduled to be completed. However, due to long lead time for equipment delivery and the need to complete the work during the next planned major outage, two projects – the MK2 HP/IP turbine and generator work – warrant immediate discussion and review.

Balance of Plant Projects Summary

The MK2 HP/IP project entails the replacement of one steam turbine rotating element and stationary blades with functionally equivalent components. In order to maintain MK2's generation output capability, the new blades will be energy efficient blades and of a more reliable design. These blades are designed for maximum efficiency using three-dimensional flow analysis to optimize the steam turbine design. State of the art blade tip seals will provide additional efficiency improvements. The HP/IP rotor, stationary blade rings and inner cylinder casing will be replaced. The outer cylinder casing may also be replaced.

The associated generator repair work involves the removal of cracks in the tooth-tops of the rotor, where retaining rings are shrunk onto the rotor to hold copper bars in place. Once the cracks are removed by grinding, a long retaining ring assembly with new, larger retaining rings will be used to re-assemble the generator rotor. The generator field winding must be rewound with new copper coils as part of this repair.

Following the completion of the HP/IP turbine and generator work, PSNH will be operating MK2 at the same fuel flow and emissions levels as it was operated prior to this equipment being repaired and/or replaced. The HP/IP turbine work will not change the amount of coal burned. Normal full load steam inlet conditions for flow, pressure and temperature will also be held constant, while producing an expected 6 to 13 additional megawatts. Because the coal flow remains constant, air emissions will not change or increase as a result of these projects.

Completion of the MK2 HP/IP turbine and generator projects is expected to maintain the reliability and output of MK2, and allow for the operation of a scrubber. Although the total combined cost of these two projects is estimated to be $9M – $15M, much of the budgeted expense is associated with the routine disassembly, inspection, and reassembly of both the high speed rotating equipment and the generator. The replacement of the HP/IP turbine work is being done as a lower cost option to expensive, more frequent, and time consuming repairs.

Anticipated Schedule

PSNH has identified the next major outage, in 2008, as the appropriate outage to complete the MK2 HP/IP turbine and generator maintenance. Completion of these two projects during the 2008 outage will allow PSNH to complete the necessary maintenance and balance of plant work in time to allow for the operation of the scrubber prior to June 2013. Completion of this work during 2008 will reduce the construction crews on site, eliminate conflicts with the construction of the scrubber system, and be more manageable for Merrimack Station resources.

In order to complete the MK2 HP/IP turbine and generator maintenance during the spring 2008 outage, PSNH will have to place an order for equipment by July 2006. The lead time required for equipment delivery is approximately 2 years. Traditionally, PSNH has placed orders for equipment prior to regulatory review; however, PSNH is proceeding cautiously in order to manage risks associated with the scrubber project (due entirely to the magnitude of the project) and balance of plant work (due to the cost of the HP/IP turbine and generator maintenance work).

Approach for Expedited Review

As previously stated, the HP/IP turbine and generator work will not result in an increase in emissions. As part of the scrubber project, emissions of mercury and sulfur dioxide will be reduced significantly when the scrubber becomes operational. These projects are maintenance activities that are routinely performed throughout the industry and are necessary to maintain

turbine and system efficiencies and reliability and, therefore, are not major modifications subject to Prevention of Significant Deterioration/New Source Review (PSD/NSR) permitting requirements. PSNH acknowledges that the issue of routine and non-routine physical changes is among the PSD/NSR applicability issues that continue to be debated at a national level and that a resolution of the issues may be years away. In order to satisfy the MK2 2008 outage work and schedule, PSNH has chosen an approach for the HP/IP turbine and generator projects that will expedite the regulatory review and does not require PSNH and DES to reach a resolution relative to the routine or non-routine nature of these projects. Due to the reasons stated previously, it would not be in the best interest of PSNH or PSNH customers to delay the regulatory review and completion of the HP/IP turbine and generator work.

In order to expedite the discussion and review process, PSNH has agreed to establish "baseline" emissions and substantiate "representative actual annual emissions" for Merrimack Station. Based on previous discussions with DES, it is our understanding that this approach allows an "actual" to "representative actual annual emissions" test for the purposes of quantifying an emissions increase and, therefore, eliminates the necessity for a NSR/PSD applicability determination. PSNH accepts this "actual to representative actual annual emissions" approach as a means of documenting its position that there will be no increase in emissions as a result of the HP/IP turbine and generator projects at Merrimack Station.

As discussed at the May 16th meeting, PSNH requests that DES concur, in writing, with this "actual" to "representative actual annual emissions" approach. With DES agreement of this approach, PSNH will provide the necessary documentation prior to the MK2 2008 planned maintenance outage, including a baseline determination, representative actual annual emissions, and supporting data to define normal source operations, if necessary.

If you would like to discuss the HP/IP turbine and generator work, or the approach outlined above, please contact me at 634-2851.

Sincerely,

William H. Smagula

William H. Smagula, P.E.
Director – Generation

cc: Craig A. Wright, DES ARD

Merrimack Station
97 River Road, Bow, New Hampshire 03304

FAX

Date: June 7, 2006
Number of pages including cover sheet: 5

To: Craig Wright
Phone:
Fax phone: 271-7053
CC:

From: Lynn Tillotson
or
Laurel Brown
Phone: (603) 224-4081 634-2440
Fax phone: (603) 634-2462

REMARKS: ☐ Urgent ☐ For your review ☐ Reply ASAP ☐ Please comment

Hard copy to follow.

Thanks

EXHIBIT 3

ACTIVE - ADMINISTERED TRANSMISSION SYSTEM
Interconnection Requests to the Administered Transmission System
Generation and Elective Transmission Upgrade Requests, and requests for transmission service

Queue Position	Req. Status[1]	Req. Type[1]	Request Date[2]	Project Name	Unit Type	Fuel Type	MW	Summer Net MW	Winter Net MW	County	ST	Projected Commercial Operation Date	Projected Initial Sync. Date	Proposed Point of Interconnection	Inter. Service Type[1]	SIS Com.	I.3.9 Apprvl.	SIS Report or Any Other Studies Available From[2,4]	Any Deviation from Timeline for Current Study[5]	RSP ZONE
89	A	G	6/6/2001	Cape Wind Turbine Generators *	WT	WND	462	462	462	N/A	MA	11/30/2010	6/30/2009	Near Barnstable 115 kV Substation	MIS	Y	Y	ISO-NE		SEMA
95	A	G	11/21/2001	Kleen Energy Project	CC	NG, DFO	620	619.8	620.0	Middlesex	CT	11/30/2010	6/28/2010	Sectionalize 353 Line	MIS	Y	Y	ISO-NE		CT
104	A	G	3/06/2003	Waterside Power - 180 MW	GT	NG, DFO	180	203.9	207.2	Fairfield	CT	6/1/2010	3/6/2010	Waterside 115 kV	MIS	Y	Y	ISO-NE		NOR
108	A	G	5/12/2003	Hoosac Wind Project	WT	WND	28.5	30	30	Berkshire &	MA	12/31/2010	10/1/2010	Line Y25S	MIS	Y	Y	NGRID		WMA
125	A	G	11/2/2004	Norwalk Harbor Station Redevelopment	GT	KER		322.5	330	Fairfield	CT	1/31/2010	12/31/2009	Norwalk 345 kV Station	MIS			ISO-NE		NOR
135	A	G	8/19/2005	Biomass	ST	WDS		55	55	Hampden	MA	6/30/2011	2/28/2011	Blanford - Southwick - Elm 115 kV line	MIS	Y	Y	ISO-NE		WMA
137	A	G	9/23/2005	Hydro	HD	WAT		N/A	N/A	Oxford	ME	TBD	TBD	CMP 115 kV switchyard located on Falls Hill, Rumford, ME	MIS	Y	Y	ISO-NE		ME
138	A	G	9/26/2005	Kibby Wind Project	WT	WND		65	65	Franklin	ME	10/1/2009	9/30/2009	Bigelow Substation	MIS	Y	Y	ISO-NE		ME
138	A	G	9/26/2005	Kibby Wind Project	WT	WND		65.5	65.5	Franklin	ME	9/1/2010	8/1/2010	Bigelow Substation	MIS	Y	Y	ISO-NE		ME
139	A	G	10/14/2005	Lowell Power Generators	GT	NG		99	99	Middlesex	MA	6/1/2010	4/1/2010	J162 115kV line between Tewksbury and Perry Street	MIS	Y	Y	ISO-NE		CMA
148	A	G	3/6/2006	Comerford Hydro	HD	WAT		169	170	Grafton	NH	11/31/2006 - 11/31/2009	11/31/2006 - 11/31/2009	NGRID Comerford Substation	MIS	Y	Y	ISO-NE		NH
150	A	G	5/25/2006	Plainfield Renewable Energy Project	ST	WDS		37.5	38.5	Windham	CT	3/31/2010	11/30/2009	CL&P Fry Brook Substation	MIS	Y	Y	ISO-NE		CT
155	A	G	6/2/2006	Gas Turbine	CT	NG, DFO		120	130	Middlesex	MA	5/1/2011	3/1/2011	NSTAR Mystic Substation	MIS			ISO-NE		BOST
157	A	G	6/21/2006	Billerica Power	GT	NG, Oil		311	341	Middlesex	MA	6/15/2011	5/15/2011	J-162 line to Tewksbury Substation	MIS	Y	Y	ISO-NE		CMA
161	A	G	7/5/2006	Devon 15-18	GT	NG, KER		196.8	196.8	New Haven	CT	6/1/2010	4/1/2010	Devon Substation	MIS	Y	Y	ISO-NE		SWCT
161	A	G	7/5/2006	Gas Turbine	GT	NG, JF, KER		215	211	Middlesex	CT	6/1/2010	4/1/2010	CL&P Middletown Substation or CL&P Scovill Rock Substation	MIS	Y	Y	ISO-NE		CT
161	A	G	7/5/2006	Middletown 11	GT	NG, JF, KER		107.5	110	Middlesex	CT	6/1/2011	4/1/2011	CL&P Middletown Substation	MIS	Y	Y	ISO-NE		CT
161	A	G	7/5/2006	Combined Cycle	CC	NG		630	690	New London	CT	5/31/2013	2/1/2013	Montville Substation	MIS			ISO-NE		CT
163	A	G	7/24/2006	Mirant Kendall Jet 2	GT	JF		18	22	Middlesex	MA	4/15/2009	4/1/2009	Kendall Station in Cambridge	MIS	Y	Y	NSTAR		BOST
164	A	G	8/1/2006	Combined Cycle(see # 201)	GT	NG		158	195	Providence	RI	6/1/2012	12/31/2011	345 kV RISE Substation	MIS			ISO-NE		RI
165	A	G	8/3/2006	Combined Cycle(See # 226)	CC	NG		563	615	Rockingham	NH	6/30/2013	12/31/2012	345 kV Seabrook Substation	MIS			ISO-NE		NH
166	A	G	8/9/2006	Wind	WT	WND		100	100	Coos	NH	12/15/2009	9/15/2009	PSNH W-179 115 kV line	MIS			ISO-NE		NH
170	A	G	8/25/2006	Gas Turbine Capacity Increase (see #155)	CT	NG, DFO		40	55	Middlesex	MA	5/1/2011	3/1/2011	NSTAR Mystic Substation	MIS			ISO-NE		BOST
171	A	G	8/29/2006	Thomas A. Watson Generating Station	GT	NG, DFO		108	115	Norfolk	MA	4/15/2009	3/1/2009	115 kV Potter Substation	MIS	Y	Y	ISO-NE		SEMA
172	A	G	8/29/2006	Sheffield Wind	WT	WND		40	40	Caledonia	VT	11/30/2009	9/1/2009	Irasburg - St. Johnsbury 115 kV	MIS	Y	Y	ISO-NE		VT
174	A	G	10/13/2006	Combined Cycle	CC	NG, DFO		280	280	Hampden	MA	6/1/2012	4/1/2012	345 kV Stony Brook Substation	MIS			ISO-NE		WMA
175	A	G	10/20/2006	Gas Turbine	GT	NG, DFO		175	203.6	Fairfield	CT	6/1/2010	2/1/2010	345 kV line # 321	MIS			ISO-NE		SWCT
178	A	G	11/2/2006	Combined Cycle	CC	NG, DFO		350	425	Plymouth	MA	6/1/2012	12/1/2011	115 kV F19 and E20 lines	MIS	Y	Y			SEMA
181	A	ET	11/9/2006	Transmission Expansion	N/A	N/A		N/A	N/A	N/A	CT	N/A	N/A	Lake Road 345 kV Substation	N/A	Y		ISO-NE		CT
182	A	G	10/20/2006	Gas Turbine Capacity Increase (See queue position #175)	GT	NG, DFO		0	18.4	Fairfield	CT	6/1/2010	2/1/2010	345 kV line # 321	MIS			ISO-NE		SWCT
185	A	G	11/22/2006	Wind	WT	WND		39	39	Penobscot	ME	12/15/2009	11/15/2009	BHE Keene Road 115 kV substation	MIS	Y	Y	ISO-NE		BHE
186	A	G	12/1/2006	Gas Turbine	GT	DFO KER		78	93	New Haven	CT	12/31/2011	10/30/2011	CL&P Shepaug 115 kV substation	MIS			ISO-NE		SWCT
186	A	G	12/1/2006	Hydro	HD	WAT		48	48	New Haven	CT	12/31/2011	10/30/2011	CL&P Shepaug 115 kV substation	MIS			ISO-NE		SWCT
190	A	G	12/22/2006	Gas Turbine	GT	DFO,		156	200	Hampden	MA	1/31/2010	10/30/2009	W Mass. Mt Tom 115 kV Substation	MIS					WMA
190	A	G	12/22/2006	Gas Turbine	GT	NG,		39	50	New London	CT	1/31/2010	10/30/2009	CL&P Tunnel 115 kV Substation	MIS			ISO-NE		CT
190	A	G	12/22/2006	Gas Turbine	GT	NG,		39	50	Litchfield	CT	1/31/2010	10/30/2009	CL&P Falls Village 69 kV Substation	MIS					CT
190	A	G	12/22/2006	Gas Turbine	GT	NG,		39	50	New Haven	CT	1/31/2010	10/30/2009	CL&P Stevenson 115 kV Substation	MIS			ISO-NE		SWCT
191	A	G	12/22/2006	Biomass Project	ST	WDS		26.25	26.75	Litchfield	CT	11/1/2010	8/1/2010	CL&P 115 kV line #1238	MIS	Y		ISO-NE		CT or SWCT
193	A	G	1/5/2007	Combined Cycle	CC	NG		60	67	New Haven	CT	6/1/2010	4/15/2010	UI Ansonia 115 kV substation	MIS					SWCT
195	A	G	1/9/2007	Gas Turbine	GT	NG KER		24	24	Bristol	MA	6/1/2009	5/1/2009	NSTAR 115 kV line #111	MIS					SEMA
196	A	G	1/16/2007	Pump Storage Capacity Upgrade	PS	WAT		1180	1180	Franklin	MA	6/30/2010	5/31/2010	W. Mass Northfield 345 kV substation	MIS					WMA
197	A	G	1/31/2007	Wind Project	WT	WND		55	55	Oxford	ME	7/1/2010	5/1/2010	115kV Rumford Substation	MIS					ME

ACTIVE - ADMINISTERED TRANSMISSION SYSTEM
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Queue Position	Req. Status[1]	Req. Type[1]	Request Date[2]	Project Name	Unit Type	Fuel Type	MW	Summer Net MW	Winter Net MW	County	ST	Projected Commercial Operation Date	Projected Initial Sync. Date	Proposed Point of Interconnection	Inter. Service Type[1]	SIS Com.	I.3.9 Apprvl.	SIS Report or Any Other Studies Available From[3,4]	Any Deviation from Timeline for Current Study[5]	RSP ZONE
199	A	G	2/21/2007	Waterbury Generating Facility	GT	NG		95.7	98.1	New Haven	CT	7/1/2009	5/1/2009	CL&P Baldwin 115 kV substation	MIS	Y	Y	ISO-NE		SWCT
201	A	G	2/26/2007	Converts queue position 164 to combined cycle facility and increases capacity	CC	NG		162	162	Providence	RI	6/1/2012	12/31/2011	345 kV RISE Substation	MIS			ISO-NE		RI
202	A	G	2/27/2007	Combined Cycle	CC	NG		250	285	Windham	CT	5/31/2012	1/31/2012	CL&P 345 kV Lake Road substation	MIS					RI
207	A	G	4/3/2007	Combined Cycle	CC	NG, DFO		452	540	New Haven	CT	10/1/2010	4/1/2010	CL&P 115 kV lines between Baldwin Junction and Beacon Falls	MIS	Y	Y	ISO-NE		SWCT
212	A	G	5/15/2007	Biomass Project	ST	WDS		45	45	Hillsboro	NH	2/28/2010	12/31/2009	PSNH K-165 115 kV line	MIS					NH
213	A	G	5/15/2007	Gas Turbine	GT	NG		158.5	184.7	Worcester	MA	6/1/2010	2/1/2010	ANP Blackstone 345 kV substation	MIS					RI
215	A	G	5/24/2007	Wind Project	WT	WND		75	75	Oxford	ME	3/1/2010	12/1/2009	CMP 115 kV Rumford Substation	MIS					ME
216	A	G	6/8/2007	Combined Cycle	CC	NG, DFO		244	294	Bristol	MA	3/31/2012	2/28/2012	Cleary 115 kV substation	MIS					SEMA
217	A	G	6/13/2007	Pump Storage Equipment Replacement	PS	WAT		1180	1180	Franklin	MA	6/30/2010	5/31/2010	W. Mass Northfield 345 kV substation	MIS					WMA
221	A	G	7/18/2007	Wind Project	WT	WND		78	78	Penobscot	ME	10/31/2011	9/30/2011	115 kV line between Enfield and James River substation	MIS					BHE
222	A	G	7/16/2007	Combined Cycle	CC	NG, DFO		510	560	New Haven	CT	9/1/2009	6/1/2009	Haddam Neck-Southington 345 kV line	MIS					CT
224	A	G	8/10/2007	Gas Turbine	GT	NG, DFO		42.4	55.2	Franklin	VT	9/30/2009	8/31/2009	Swanson Village 46 kV System	MIS	Y	Y	ISO-NE		VT
225	A	G	8/13/2007	Combined Cycle Capacity Increase (See queue position 202)	CC	NG		161	127	Windham	CT	5/31/2012	1/31/2012	CL&P 345 kV Lake Road substation	MIS					RI
226	A	G	9/5/2007	Combined Cycle Capacity Increase/ - Generator Change (See queue position 165)	CC	NG		341	394	Rockingham	NH	6/30/2013	12/31/2012	345 kV Seabrook Substation	MIS					NH
227	A	G	9/26/2007	Pump Storage Capacity Upgrade	PS	WAT		333	333	Berkshire	MA	3/31/2011	3/17/2011	Bear Swamp 230 kV Substation	MIS					WMA
227	A	G	9/26/2007	Pump Storage Capacity Upgrade	PS	WAT		333	333	Berkshire	MA	3/30/2012	3/16/2012	Bear Swamp 230 kV Substation	MIS					WMA
228	A	G	10/9/2007	Wind	WT	WND		27	30	Penobscot	ME	12/31/2009	12/31/2009	BHE Keene Road Substation	MIS					BHE
229	A	G	10/15/2007	Biomass Project	ST	WDS		41	41	Coos	NH	5/31/2011	5/31/2011	PSNH 115 kV S136 line	MIS					NH
231	A	G	10/25/2007	Steam Turbine Capacity Uprate	ST	BIT		642	663	Bristol	MA	6/302012	5/31/2012	Brayton Point 345 kV Switchyard	MIS					RI
233	A	G	11/2/2007	Combined Cycle(See queue position #262)	CC	LFG		36.1	38.4	Providence	RI	9/1/2010	7/1/2010	NGRID 115 kV S171 line	MIS					RI
236	A	G	11/30/2007	Combined Cycle	CC	NG, DFO		353	421	Hampden	MA	6/1/2012	2/1/2012	115 kV line between Buck Pond and Pochassic substations-1302 line	MIS					WMA
237	A	G	12/5/2007	Combined Cycle	CC	NG		285	300	Newport	RI	6/1/2012	1/15/2012	115 kV Tiverton Substation	MIS					RI
238	A	G	12/7/2007	Barre Mass Landfill Gas	IC	LFG		1.6	2	Worcester	MA	12/1/2009	11/1/2009	13.8 kV distribution circuit	MIS	Y	Y	ISO-NE		WMA
240	A	G	12/18/2007	Gas Turbine	GT	NG, KER		94	98	New London	CT	6/1/2010	4/1/2010	Montville Substation	MIS					CT
241	A	G	12/31/2007	Combined Cycle Capacity Increase (See queue position 207)	CC	NG, DFO		489	557	New Haven	CT	1/1/2011	6/1/2010	CL&P 115 kV lines between Baldwin Junction and Beacon Falls	MIS					SWCT
242	A	G	1/3/2008	Biomass Project	ST	WDS		50	50	Cheshire	NH	6/30/2011	4/30/2011	PSNH 115 kV N186 circuit	MIS					NH
243	A	G	1/4/2008	Increase to Steam Turbine Capacity Uprate (See queue position 231)	ST	BIT		648	669	Bristol	MA	6/302012	5/31/2012	Brayton Point 345 kV Switchyard	MIS					RI
244	A	G	1/3/2008	Wind	WT	WND		148	148	Somerset	ME	12/1/2010	10/1/2010	CMP 115 kV Wyman substation or 115 kV 215 line	MIS					ME
245	A	G	1/11/2008	Wind	WT	WND		24	24	Washington	ME	12/31/2009	12/31/2009	BHE Keene Road Substation	MIS					BHE

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247	A	G	1/31/2008	Reconnect Existing Hydro	HD	WAT		4.1	4.1	Orleans	VT	5/1/2009	5/1/2009	VELCO Newport Substation 46 kV bus	MIS					VT
247	A	G	1/31/2008	Diesel generation	IC	DFO		10.3	10.3	Orleans	VT	5/1/2009	5/1/2009	VELCO Newport Substation 46 kV bus	MIS					VT
248	A	G	1/13/2008	Gas Turbine	GT	NG, DFO		178	200	New Haven	CT	6/1/2011	3/1/2011	UI East shore Substation 115 kV bus	MIS					CT
249	A	G	2/4/2008	Wind Capacity Increase- see # 245	WT	WND		30	30	Washington	ME	12/31/2009	12/31/2009	BHE Keene Road Substation	MIS					BHE
251	A	G	2/15/2008	Biomass Project	ST	WDS		61	64	Coos	NH	12/1/2009	11/15/2009	PSNH Eastside(Berlin) Substation	MIS					NH
253	A	G	3/11/2008	Combined Cycle	CC	DFO		269	310	Fairfield	CT	6/1/2011	2/1/2011	CL&P 115 kV 1876 line	MIS					SWCT
254	A	G	3/10/2008	Wind	WT	WND		19.5	19.5	Penobscot	ME	11/1/2010	11/1/2010	CMP 115 kV line # 203	MIS					ME
255	A	G	3/31/2008	Wind	WT	WND		50	50	Grafton	NH	12/31/2010	10/1/2010	TBD	MIS					NH
259	A	G	5/7/2008	Combined Cycle	CC	NG		551	616.3	Providence	RI	6/1/2009	6/1/2009	115 kV RISE Substation	MIS					RI
260	A	G	5/8/2008	Wind	WT	WND		450	450	N/A	RI	12/31/2013	6/30/2012	Brayton Point 115 kV bus or Dexter 115 kV bus	MIS					RI
260	A	G	5/8/2008	Wind	WT	WND		450	450	N/A	RI	12/31/2013	6/30/2012	Kent County 115 kV bus or Davisville 115 kV bus	MIS					RI
262	A	G	5/23/2008	Increase in capacity for queue # 233	CC	LFG		45.9	50.1	Providence	RI	9/1/2010	7/1/2010	NGRID 115 kV S171 line	MIS					RI
263	A	G	5/27/2008	Wind	WT	WND		347	347	Washington	RI	12/1/2012	6/1/2011	West Kingston Substation	MIS					RI
265	A	G	6/16/2008	Gas Turbine	GT	DFO, NG		12.5	14	Suffolk	MA	6/1/2011	5/1/2011	NSTAR Brighton Substation	MIS					BOST
266	A	G	6/19/2008	Wind	WT	WND		34	34	Orleans	VT	12/31/2011	9/15/2011	CVPS Lowell Substation	MIS					VT
267	A	G	6/24/2008	Gas Turbine Capacity Increase (See queue positions #175& #182)	GT	NG, DFO		175	222	Fairfield	CT	6/1/2011	2/1/2011	345 kV line # 321	MIS					SWCT
268	A	G	7/8/2008	Wind (increase in queue position 266)	WT	WND		8.5	8.5	Orleans	VT	12/31/2011	9/15/2011	CVPS Lowell Substation	MIS					VT
269	A	G	7/14/2008	Hydro	HD	WAT		1.2	1.2	Hampden	MA	10/31/2010	10/31/2010	WMELCO 23 kV circuit	MIS					WMA
270	A	G	7/17/2008	Pumped Storage Project	PS	WAT		1000	1000	Wiscasset	ME	6/1/2014	6/1/2014	Maine Yankee 345 kV substation	MIS					ME
271	A	ET	7/30/2008	Two terminal, 1000 MW , 500 kV, dc line	N/A	N/A		N/A	N/A	N/A	N/A	3/31/2014	N/A	Hertel S/S in Quebec or Clay S/S in NY and Norwalk S/S in CT.	N/A					N/A
271	A	ET	7/30/2008	Two terminal, 1000 MW , 500 kV, dc line	N/A	N/A		N/A	N/A	N/A	N/A	3/31/2014	N/A	Hertel S/S in Quebec or Clay S/S in NY and Glenbrook S/S in CT.	N/A					N/A
271	A	ET	7/30/2008	Two terminal, 1000 MW , 500 kV, dc line	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3/31/2014	N/A	Hertel S/S in Quebec or Clay S/S in NY and Singer S/S in CT.	N/A					N/A
271.5	A	TS	8/1/2008	MPS RNS Application	N/A	N/A		TDB	TBD	Aroostook	ME	10/1/2010	N/A	N/A	N/A					BHE & ME
272	A	G	8/1/2008	Wind	WT	WND		64	64	Franklin	ME	8/1/2012	6/1/2012	CMP Rumford or Bigelow Substation	MIS					ME
272	A	G	8/1/2008	Wind	WT	WND		150	150	Aroostook	ME	8/1/2011	5/1/2011	BHE Powersville Substation	MIS					BHE
272	A	G	8/1/2008	Wind	WT	WND		95	95	Somerset	ME	8/1/2012	6/1/2012	CMP 115 KV LINE 222	MIS					ME

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272	A	G	8/1/2008	Wind	WT	WND		128	128	Aroostook	ME	12/31/2013	10/31/2013	BHE 345 kV 396 line	MIS					BHE
272	A	G	8/1/2008	Wind	WT	WND		150	150	Aroostook	ME	8/1/2011	5/1/2011	BHE Keene Road Substation	MIS					BHE
273	A	G	8/3/2008	Biomass Project	ST	WDS		35	37	Hampden	MA	6/20/2011	5/20/2011	115 kV line near E. Springfield substation	MIS					WMA
274	A	G	8/7/2008	Gas Turbine	GT	DFO, NG		41.5	48.7	Chittenden	VT	6/1/2011	5/1/2011	GMP Gorge Substation	MIS					VT
274.5	A	TS	8/25/2008	Wind project point-to-point application-100 MW	N/A	N/A	N/A	N/A	N/A	Aroostook	ME	10/1/2011	N/A	N/A	N/A					BHE
276	A	G	9/2/2008	Wind Project	WT	WND		30	30	Bennington	VT	12/30/2010	10/1/2010	Y-25 North, 69 kV line between Searsburg and Bennington	MIS					VT
277	A	G	9/12/2008	Combined Cycle	CC	NG, DFO		695	695	Fairfield	CT	6/1/2013	1/15/2013	CL&P 345 KV 321 line	MIS					SWCT
278	A	ET	9/26/2008	Two terminal, 1000 MW , 500 kV, dc line	N/A	N/A		N/A	N/A	N/A	N/A	3/31/2014	N/A	Maine Yankee Substation, South Boston Substation	N/A					N/A
280	A	G	10/2/2008	Wind	WT	WND		180	180	Coos	NH	9/1/2011	7/1/2011	TBD	MIS					NH
281	A	G	10/6/2008	Wind	WT	WND		85	85	Rutland	VT	9/1/2011	7/1/2001	VELCO 115 kV K34 line	MIS					VT
282	A	G	10/15/2008	Biomass Project	ST	WDS		49.7	51.5	Franklin	MA	7/1/2013	4/1/2013	115 kV line near Montage or Fench King substations	MIS					WMA
283	A	ET	10/20/2008	HVDC Line	N/A	N/A		N/A	N/A	N/A	N/A	3/31/2014	N/A	Orrington ME and BostonMA	N/A					N/A
284	A	G	10/22/2008	Equipment Replacement	ST	NUC		1257	1257	Rockingham	NH	6/30/2013	12/31/2012	345 kV Seabrook Substation	MIS			ISO-NE		NH
285	A	G	10/24/2008	Biomass Project	ST	WDS		35	35	Penobscot	ME	9/30/2009	9/1/2009	BHE Powersville substation	MIS					BHE
286	A	G	12/5/2008	Alternative to queue position 177	GT	NG		187.5	199	Worcester	MA	6/1/2012	2/1/2012	115 kV bus at Millbury substation	MIS					CMA
287	A	G	12/18/2008	Wind	WT	WND		34.5	34.5	Franklin	ME	11/1/2010	10/1/2010	34.5 kV Rumford IP bus	MIS					
288	A	TS	12/18/2008	Local Service Application-87 MW	N/A	N/A		N/A	N/A	Somerset	ME	6/1/2009	N/A	N/A	N/A					ME
290	A	G	1/15/2009	Wind	WT	WND		15	15	Woodstock	ME	11/30/2010	9/30/2010	CMP Woodstock Substation	MIS					ME
291	A	G	1/21/2009	Steam Turbine Uprate	ST	BIT		340	353.5	Merrimack	NH	12/14/2009	N/A	PSNH Merrimack Substation	MIS					NH
292	A	G	1/30/2009	Biomass Project	ST	WDS		49.7	51.5	Berkshire	MA	6/1/2014	3/1/2014	Doreen 115 kV substation or F132 115 kV line	MIS					WMA

Code[1]	Definition

Other Endnotes

ACTIVE - ADMINISTERED TRANSMISSION SYSTEM
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Request Status	
C	Commercial
CT	Commercial under temporary approval
W	Withdrawn
A	Actively under study or developing interconnection
FCT	Formerly Commercial under temporary approval

Request Type	
G	Generator Interconnection Request
ET	Elective Transmission Upgrade Interconnection Request
TS	Request for transmission service

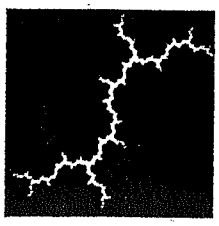
Interconnection Service Type	
MIS	Minimum Interconnection Standard

General	
N/A	Not Applicable
TBD	To Be Determined

RSP Zone	Definition
BHE	Northeast Maine
ME	Western & Central Maine/Saco Valley, New Hampshire
SME	Southeast Maine
NH	North, East & Central New Hampshire/Eastern Vermont
VT	Vermont/Southwest New Hampshire
BOST	Greater Boston, including North Shore
CMA	Central Massachusetts & Northeast Massachusetts (CMA/NEMA)
WMA	Western Massachusetts
SEMA	Southeast Massachusetts/Newport, Rhode Island
RI	Rhode Island/bordering Massachusetts
CT	North & East Connecticut
SWCT	Southwest Connecticut
NOR	Norwalk/Stamford, Connecticut

[2] Application dates have been adjusted as a result of FERC order under Docket # EL 98-69-000
[3] Check OASIS of indicated New England Transmission Owner for details on obtaining report
[4] Contact ISO-NE Customer Service if ISO-NE is indicated at 413-540-4220 or custserv@iso-ne.com
[5] If yes, time to complete study will exceed study timeline in the ISO New England Inc. Open Access Transmission Tariff
[7] Summer & Winter Net MW Ratings are the total capacity of the unit, MW is the capacity of the uprate studied

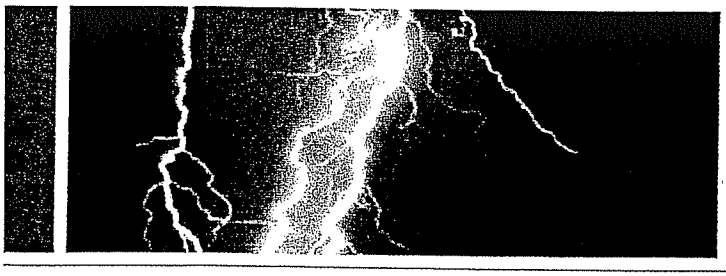
EXHIBIT 4



Synapse
Energy Economics, Inc.

Initial Report to the New Hampshire Senate Energy, Environment and Economic Development Committee on PSNH's Merrimack Station Scrubber Project

March 20, 2009



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Executive Summary

Background: Synapse Energy Economics, Inc, ("Synapse") was retained to assess the estimated cost of Public Service of New Hampshire's proposed Merrimack Station Scrubber Project and to investigate whether there are less expensive alternatives to the scrubber that would produce local jobs, reduce environmental impact, and avoid the risk of expensive future regulatory costs that would be borne by the citizens of New Hampshire.

Synapse Project Team: Members of the Synapse Project Team include David Schlissel, Christopher James, Dr. David White, Rachel Wilson, Dr. Jeremy Fisher, Dr. David Nichols, Douglas Hurley, Jennifer Kallay, Kenji Takahashi, Peter Lanzalotta and Bill Powers.

The Team's primary findings include:

1. There are technically and economically viable alternatives to the Scrubber Project for reducing the mercury and SO_x emissions from the Merrimack Station that are in regular use at coal-fired power plants around the United States.

2. PSNH significantly understates the possible future cost of power from the Merrimack Station and, therefore, substantially overstates the benefits from the scrubber project. In fact, the future cost of power from the Merrimack Station is likely to be between 10 and 47 percent higher than PSNH has claimed if more reasonable prices are assumed for purchasing carbon dioxide emissions prices under a federal greenhouse gas regulatory program.

3. There are a large number of cost-effective alternatives to generating power at the Merrimack Station, including, but not limited to, purchasing power from the market and energy efficiency.

4. Energy efficiency programs and developing alternative resources would create large numbers of new jobs.

5. PSNH has a significant financial interest in pursuing the Merrimack Station Scrubber Project.

6. PSNH has acknowledged that the contracts it has signed for the Scrubber Project are not "fixed price" contracts.

Finding 1. **There are technically and economically viable alternatives to the Scrubber Project for reducing the mercury and SO_x emissions from the Merrimack Station that are in regular use at coal-fired power plants around the United States.**

There are a number of ways to effectively reduce emissions of Mercury and SO_2 from coal-fired power plants like Merrimack Station in place of installing an expensive scrubber.

For example, a number of coal plants around the country, including plants with cyclone boilers like those at Merrimack Station, burn low sulfur coal and use Activated Carbon Injection to control SO_2 and mercury emissions. A few examples of the coal plants that do so include the Bridgeport Harbor plant (Connecticut), BL England (New Jersey), Powerton (Illinois), Joliet (Illinois), and Kincaid (Illinois). These coal-fired plants have reduced mercury and sulfur emissions, or are in the process of doing so, to meet or exceed their current state regulatory requirements. These state requirements are equal to or more stringent than New Hampshire's Clean Power Act requirements. Illinois' regulation requires 90% mercury reduction. Connecticut's regulation requires compliance with a 0.6 pounds mercury per trillion Btu heat input.

All of the Illinois plants previously listed have cyclone boilers like Merrimack. Because of their strict rule that impacts 57 coal units in that state, there are many more coal units in Illinois subject to strict mercury control requirements that will be using ACI for Hg compliance. In fact, the Institute of Clean Air Companies has reported over 90 ACI systems ordered or in service, many of these for use with low sulfur coal.

Low sulfur coal can be purchased from the Powder River Basin. Some of the plants listed above, and many others, including some on the east coast, have been converted to burn low sulfur Powder River Basin coal. And a number of the plants, such as Powerton, Kincaid and Joliet in Illinois, have cyclone boilers like Merrimack. Other low sulfur coal options include coal from Indonesia and South America, similar to what has been burned at some of the Dominion plants in Massachusetts and the Bridgeport Harbor plant in Connecticut.

If the Merrimack Station were converted to Powder River Basin coal, or another coal with similar sulfur levels, it should be possible to achieve 90 percent mercury removal using ACI and to also reduce SO_2 emissions due to the low sulfur content of the coal. Flue gas from Powder River Basin coal has little or no SO_3 present, in part, because of the low sulfur content. SO_3 is the culprit that poisons activated carbon and is why previous ACI tests at Merrimack showed limited results. Therefore, ACI can be very effective at capturing mercury from flue gas from PRB-fired boilers. Ninety percent reductions in mercury emissions have been achieved on PRB fueled boilers.

The reports on the past tests of ACI at Merrimack show that these tests were run with fuel blends that resulted in mid-to-high sulfur coal. This, combined with the SCR, resulted in high levels of SO_3 in the flue gas. The problem with SO_3 is that it competes with the mercury to be absorbed on the surface of carbon. So, when there are significant levels of SO_3 present, ACI becomes less effective at capturing mercury.

Another option would be to retrofit Merrimack with a fabric filter. A fabric filter would enable high mercury capture with ACI, and potentially little need for the ACI. This option would have higher capital costs than switching to low sulfur coal with ACI, but it would be much less expensive than a scrubber.

Finding 2. **PSNH significantly understates the possible future cost of power from the Merrimack Station and, therefore, substantially overstates the benefits from the scrubber project. In fact, if more reasonable prices are assumed for purchasing carbon dioxide emissions prices under a federal greenhouse gas regulatory program, then the future cost of power from the Merrimack Station is likely to be between 10 and 47 percent higher than PSNH has claimed.**

PSNH has not adequately quantified the future rate impacts of the Scrubber Project and the relative cost of power from Merrimack Station versus energy efficiency and other alternatives. The most important cost that PSNH has underestimated is the cost of purchasing allowances for future carbon dioxide ("CO_2") emissions in a federal cap-and-trade program.

Federal regulation of greenhouse gas emissions is a matter of when, not if. Both Houses of Congress and the new Obama Administration have stated their intent to adopt a plan to significantly reduce the nation's emissions of greenhouse gases, most particularly, CO_2. The federal government (through the Department of Energy), large financial institutions, and numerous state regulatory commissions, have concluded that it is now necessary to include carbon costs (that is, the price of purchasing CO_2 emissions allowances) in energy resource planning.

The plan proposed by the new Administration is typical of the stringent plans that have been introduced in Congress and would:

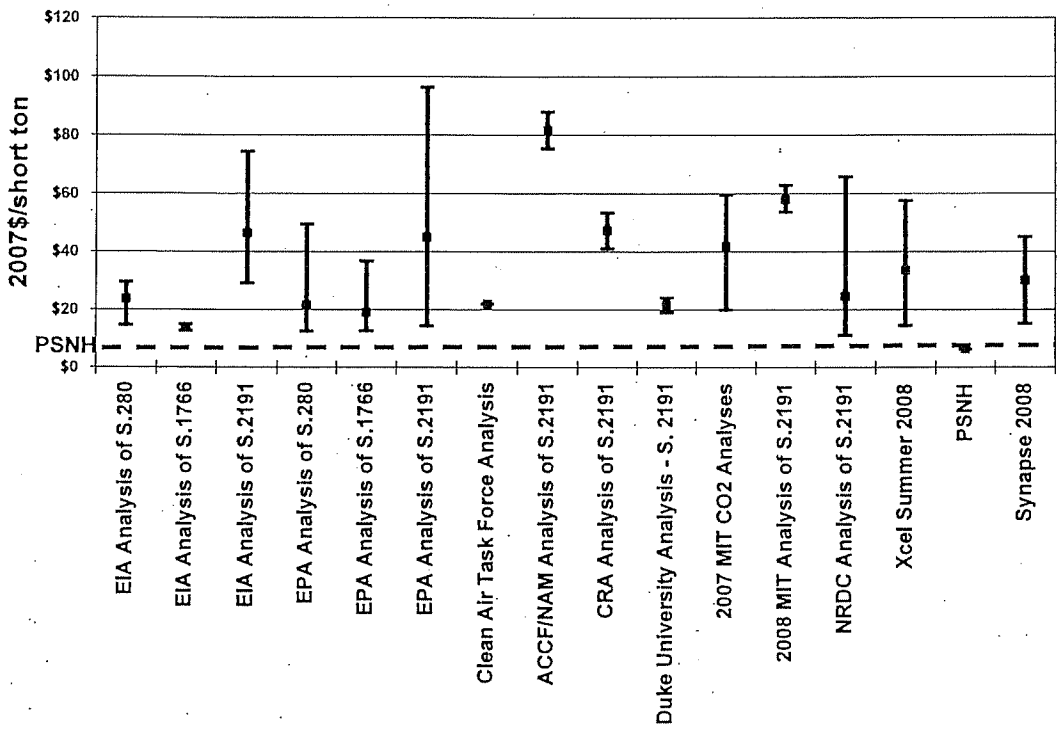
- create a federal cap-and-trade system
- require that CO2 emissions be reduced to 14 percent below 2005 levels by 2020 and 83 percent below 2005 levels by 2050
- auction all emissions allowances – none would be distributed free to generators.

Because there is currently no commercially viable technology for capturing and sequestering the CO_2 emissions from coal-fired power plants and none is anticipated to be available for 10-20 years, companies like PSNH will have to purchase allowances for the CO_2 emitted by their power plants. The estimated cost of such emissions allowances is, therefore, a critical input into the expected future cost of generating power.

PSNH, however, has assumed a price for the cost of future CO_2 regulations that is significantly below the costs projected in objective analyses by the U.S. Department of Energy, the U.S. EPA, the Massachusetts Institute of Technology, and Duke University. The figure below shows the levelized cost estimates for CO_2 allowances as modeled by

these agencies and universities compared to the estimated used by PSNH in its analysis of the future costs for power from the Merrimack Station.

Projected CO2 Emissions Allowance Prices – PSNH vs. Results of Independent Modeling of Climate Change Legislation[1]



As can be seen below, PSNH even has assumed future prices for purchasing CO_2 emissions allowances that are significantly lower than another NU-owned utility, Connecticut Light & Power Company, assumed in its 2008 Integrated Resource Plan filing to the Connecticut Department of Public Utility Control.

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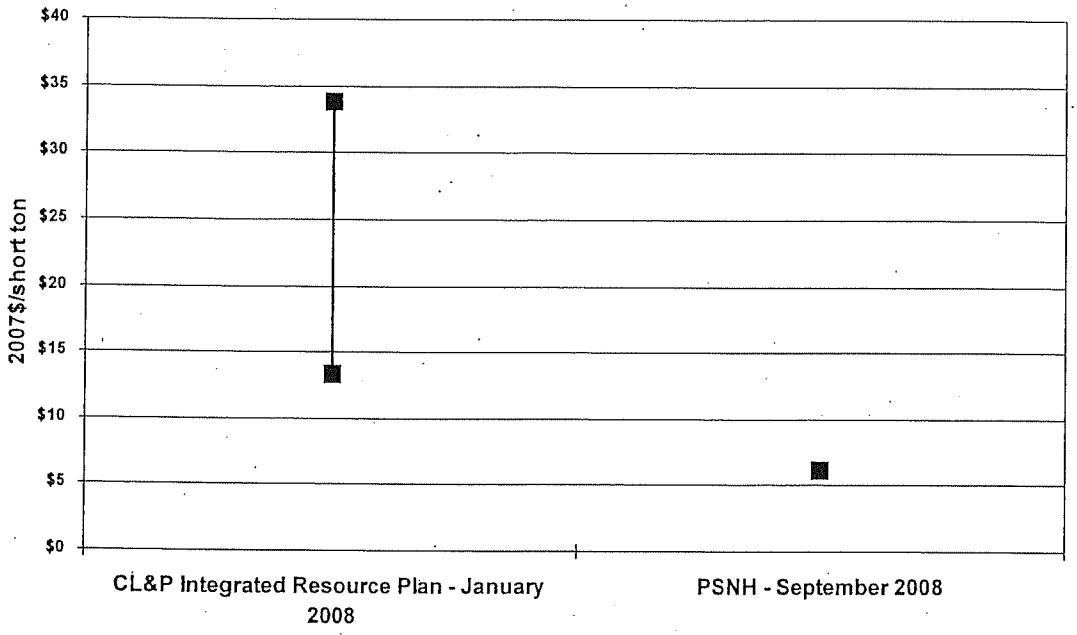
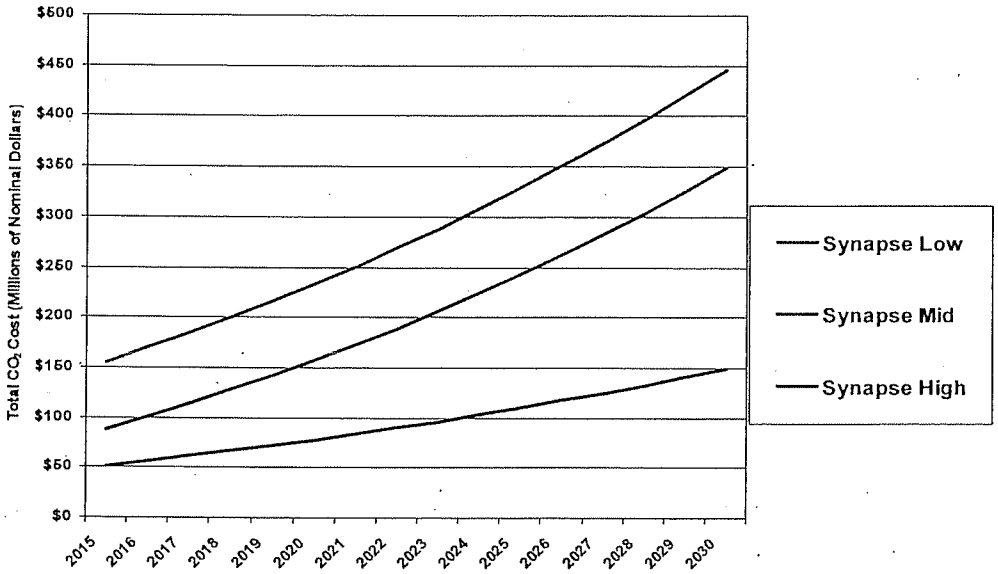
1 See the *Synapse 2008 CO2 Price Forecasts*, July, 2008, for more information on the analyses presented in this figure and the factors underlying the range of future CO2 prices that Synapse recommends be used in resource planning. A copy of this report is available at http://www.synapse-energy.com/Downloads/SynapsePaper.2008-07.0.2008-Carbon-Paper.A0020.pdf.

Assumed CO2 Emissions Allowance Prices – PSNH vs. CL&P



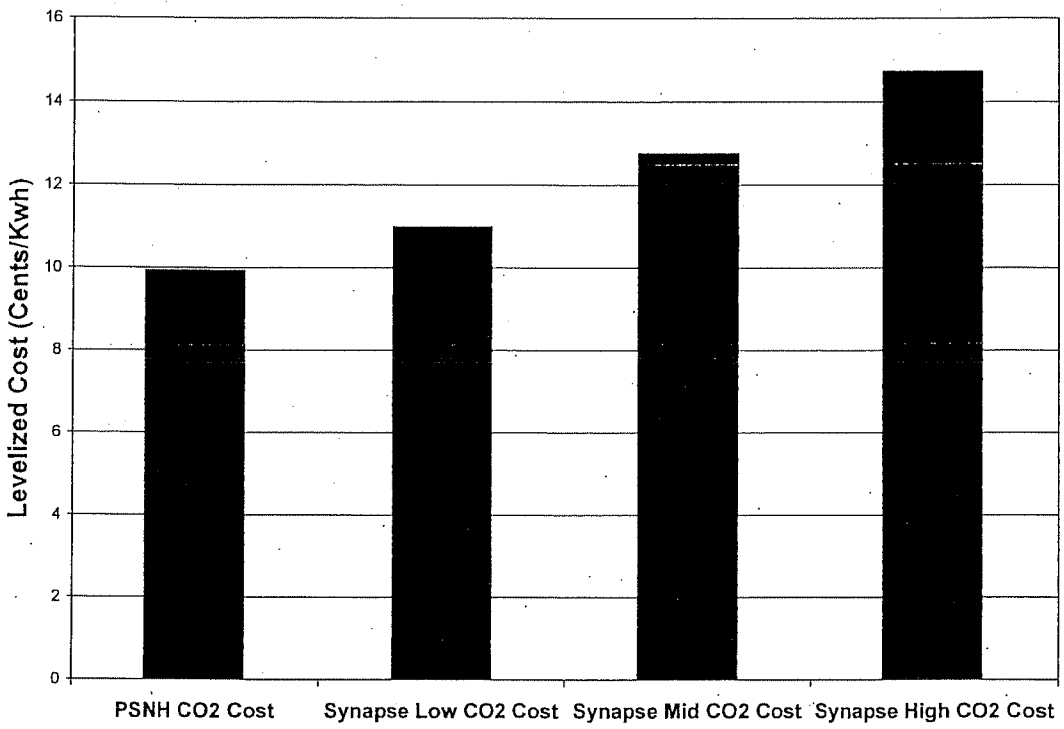
It is therefore clear that when the federal government begins to regulate greenhouse gas emissions, paying for the CO_2 emissions from the Merrimack Station will be very expensive. As shown in the following figure, PSNH's ratepayers can expect to pay between $50 to $150 million in 2015 just for CO_2 emissions allowances with the cost rising to between $110 and $325 million in 2025. It is reasonable to expect that PSNH will seek to pass these costs along to its ratepayers.

Total Annual Expenditures for CO_2 Emissions Allowances under Synapse CO_2 Price Forecasts



The costs presented in this figure were calculated by multiplying the 3.7 million tons of CO_2 that Merrimack Station can be expected to emit each year by the estimated cost of purchasing each emissions allowance (that is, one allowance for each ton of CO_2 emitted). As can be seen, adjusting PSNH's calculations to reflect a more reasonable range of future CO_2 emission allowance prices results in a substantially higher range for the potential cost for power from the Merrimack Station that will then be passed on to the ratepayers.

Cost of Power from Merrimack: PSNH and Synapse Low, Mid and High CO2 Emission Allowance Prices



In fact, the future levelized cost of power from Merrimack Station is more likely to be in the range of 11 cents to 14.7 cents per kilowatt hour as opposed to the approximately 10 cents per kilowatt hour claimed by PSNH in its September 2008 PUC Filing.

Finally, PSNH also has not accounted for any future costs associated with either an EPA mandated conversion of Merrimack Station to a closed-cycle cooling system or from any new federal coal ash regulations. These costs would raise the cost of power from Merrimack Station even higher than the 11 to 14.7 cents per kilowatt shown above.

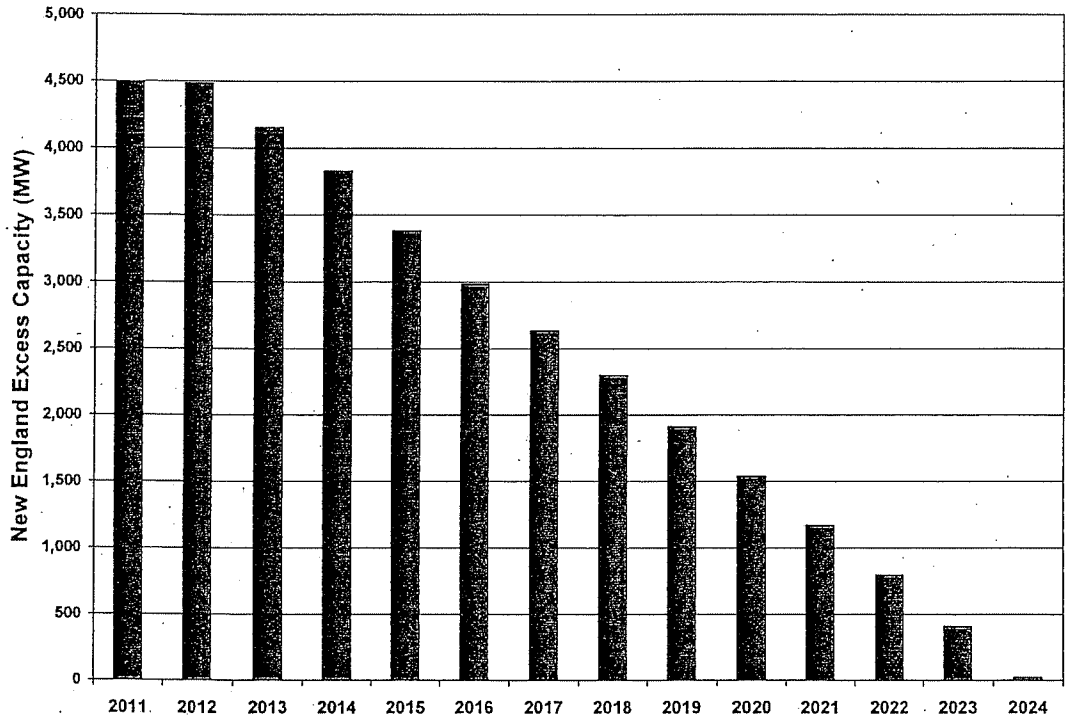
Finding 3. There are a large number of cost-effective alternatives to generating power at the Merrimack Station, including, but not limited to, purchasing power from the market and energy efficiency.

There are a number of lower cost alternatives to generating power at Merrimack Station if the plant were phased out over a reasonable period of time. These alternatives include purchasing power from the market, energy efficiency savings, conversion of one or both units at Merrimack to burn biomass, the addition of other renewable resources, generating more power at existing power plants in the area, building a new combustion turbine or combined cycle facility at the Merrimack Station site and transmission system upgrades.

A. There will be a significant amount of excess capacity in New England that could be used to replace the generation of power at Merrimack Station.

The following figure shows that there will be substantial amounts of excess capacity in New England after 2012 that could be purchased to replace Merrimack Station. In fact, New England can be expected to have more than 500 MW of excess capacity, or more than the capacity of the Merrimack Station, through 2022.

Excess Capacity in New England, 2012-2024



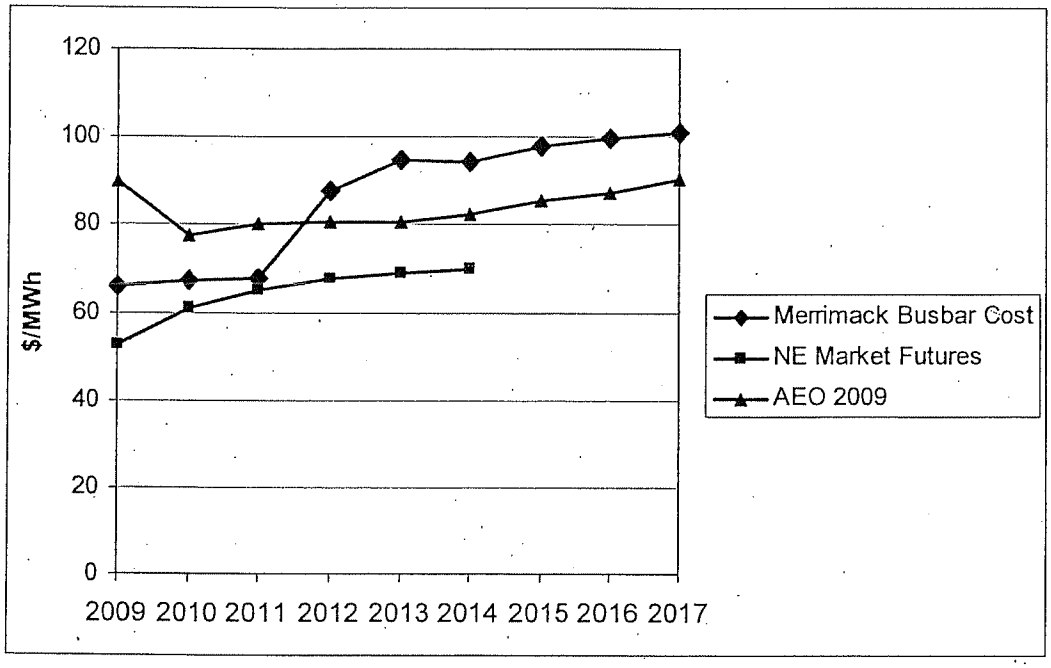
These estimates of future regional excess capacity are based on (1) the actual amount of capacity bid into the future capacity market for the 2011- 2012 power year and (2) ISO-NE's most recent load and energy sales forecasts. Moreover, these estimates are very conservative given that:

- They reflect only very modest amounts of energy efficiency savings – therefore, they do not reflect the additional potential for energy efficiency that has been identified in New Hampshire and the other New England states.
- They do not reflect any additions of the new renewable resources that will be needed after 2011 to meet the renewable portfolio standards.

If more aggressive energy efficiency spending and savings and additional renewable resources were included, even more excess capacity would be available in New England well into the 2020s or maybe even the 2030s.

Not surprisingly, given that there will be excess capacity and that current natural gas prices are low, it also appears that the cost of purchasing power in New England will be substantially lower than PSNH's estimated cost of power from Merrimack.

Cost of Power from Merrimack vs. Cost of Purchasing Power from the Market



The New England Market Futures prices in the above figure were taken from NYMEX's all-hours prices of March 13, 2009, adjusted to include a capacity charge. These NYMEX prices reflect the prices that could be paid today for energy to be delivered through 2014. The AEO 2009 prices reflect the estimated New England generation costs in the US Department of Energy's Annual Energy Outlook for 2009.

B. Energy Efficiency Savings could replace the power generated at Merrimack Station

A February 2009 study by GDS Associates for the New Hampshire PUC examined the energy efficiency potential for the State.[2] As shown in the following two tables, this study found that there was a potential for cost effective energy efficiency of between 255 MW and 330 MW by 2018, in the state as a whole, and between 184 MW and 330 MW just in PSNH's service area.

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2 *Additional Opportunities for Energy Efficiency in New Hampshire, Final Report – January 2009,* prepared for the New Hampshire Public Utilities Commission by GDS Associates, Inc., at page 16.

Potential Energy Efficiency Savings – State of New Hampshire

	Estimated Annual Energy Savings by 2018	Estimated Annual Demand Savings by 2018
	(GWh)	(MW)
Maximum Achievable Cost Effective	2,680	455
Potentially Obtainable	1,404	255

Potential Energy Efficiency Savings – PSNH Service Area

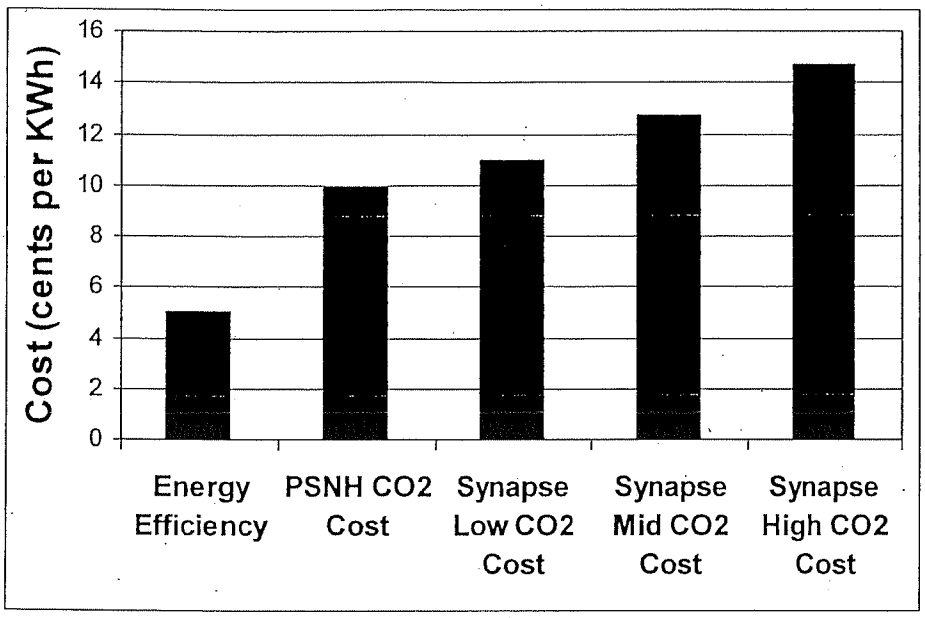
	Estimated Annual Energy Savings by 2018	Estimated Annual Demand Savings by 2018
	(GWh)	(MW)
Maximum Achievable Cost Effective	1,956	330
Potentially Obtainable	1,023	184

Thus, if you only focus on savings achievable in the PSNH service area, by 2018 energy efficiency could replace one-half to three-quarters of the capacity supplied by Merrimack Station and one-third to approximately 60 percent of the energy generated at the plant, and that is if you only focus on savings achievable in the PSNH service area. If you look at the state of New Hampshire as a whole, between one-half and all of the capacity from Merrimack and between 45 and 85 percent of the energy from the plant, could be replaced by energy efficiency savings.

Indeed, it appears that New Hampshire can achieve even higher savings from energy efficiency than are estimated in the GDS report. New Hampshire's 2007 energy efficiency program was the lowest performing in New England. Neighboring Vermont, with about one-half the electricity consumption of New Hampshire, saved 103 GWh of electricity in 2007, compared to 78 GWh in New Hampshire. Vermont's energy savings rates are more than twice that of New Hampshire. Connecticut and Massachusetts's energy savings rates are 25% to 50% higher than those achieved to date in New Hampshire.

It also is reasonable to expect that these savings could be achieved at lower cost than even PSNH's low projected cost of power from Merrimack Station. For example, analyses have shown that substantial amounts of energy efficiency savings are available at expenditure levels of 3 to 5 cents per kilowatt. As shown below, this is substantially lower than either PSNH's projected cost of power from Merrimack or from the cost of power from the plant which reflects the Synapse Low, Mid and High forecast CO_2 emissions allowance prices.

Projected Cost of Energy Efficiency vs. Cost of Power from Merrimack Station



There also is a significant potential for cost effective energy efficiency in the other New England states as well as a substantial potential for cost effective renewable resources in both New Hampshire, specifically, and in New England, as a whole.

C. Other potential sources for power if Merrimack Station were phased out

In addition to purchasing power from the market and energy efficiency, there are other potential alternatives sources for the capacity and energy currently being provided from Merrimack Station. These include: renewable wind and biomass facilities, repowering one or both units at Merrimack to burn biomass, generating more energy at existing and underutilized power plants in the State and the region, and building a new combustion turbine or combined cycle facility at the Merrimack Station site. The cost of generating power at these alternatives can be expected to be lower than the cost of power from Merrimack Station, especially if reasonable CO_2 costs are considered.

D. Transmission system upgrades

Transmission system upgrades to allow additional imports of power are another alternative source for the capacity and energy currently being provided from Merrimack. For example, Northeast Utilities is planning to construct a new transmission line from Quebec through northern New Hampshire (to connect wind resources being constructed in Coos County) to a location near Merrimack Station. The 1200 MW capacity of the line is three times that of Merrimack. Once constructed, this line will provide new energy and capacity resources at less cost than Merrimack, and avoid saddling NH citizens with future costs from new mercury, clean water and greenhouse gas regulations

Finding 4. Energy efficiency programs and developing alternate capacity would create large numbers of new jobs.

There is a reasonable concern that potential construction and permanent jobs would be lost if the Merrimack Station Scrubber Project is not pursued. However, PSNH's claim that the project would create large number of new jobs, 1200 we believe, needs to be scrutinized closely for several reasons. First, the number of new jobs that would be create must reflect the adverse impact of the higher electric rates that PSNH's customers would have to pay for the $457 million cost of the project. These higher rates will dampen economic activity and, thereby, offset the number of new jobs created. Second, the number of jobs that would be created as a result of the Scrubber Project must be measured against the numbers of jobs that would be created if alternate activities were undertaken in place of installing a scrubber at Merrimack.

For example, achieving the cost-effective energy efficiency that GDS Associates identified for New Hampshire in its recent report for the Public Utilities Commission would create an estimated 700 to 1345 net new long-term jobs in New Hampshire that cannot be outsourced to other states or countries. These jobs would last longer than the three year construction jobs that PSNH is offering as part of the Scrubber Project. They also would lead to the creation of hundreds to thousands of long term indirect jobs.

By way of contrast, PSNH appears to be offering a total of perhaps 6 to 10 new permanent long-term jobs once the construction of the scrubber is completed.

Renewable resource alternatives and/or the construction of new gas-fired capacity also would provide both short-term construction jobs and long-term permanent operations and maintenance jobs. Thus, jobs would be created if an alternative to the Scrubber Project is chosen. The real question is which investments would provide more construction and long-term jobs for New Hampshire's residents. Indeed, much of the $457 million cost for the scrubber will be for financing costs and the cost of fabricating equipment out of state. Benefits will accrue to out-of-state workers and out-of state companies.

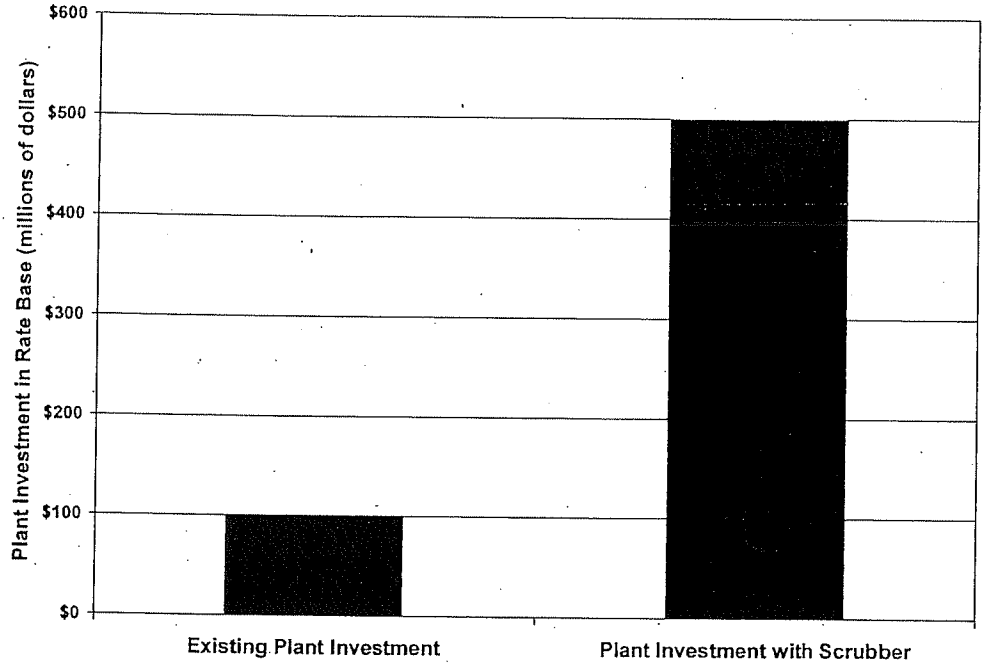
Finding 5. PSNH has a significant financial interest in pursuing the Merrimack Station Scrubber Project.

Under state regulation, PSNH earns an allowed rate of return on its investment in rate base where rate base is the current value of the capital expenditures it has made on plant and equipment. The investment in power plants generally declines over time as the original rate base investment is depreciated (although there are periodic capital expenditures that increase the rate base value of the plant) Thus, an aging plant like Merrimack Station can be expected to have a relatively small rate base value and, consequently, will produce declining profits for PSNH unless an expensive capital expenditure is made and/or the plant is retired and an expensive replacement is built whose cost can then be placed into the utility's rate base. This is the context in which PSNH is pursuing the Merrimack Station Scrubber Project.

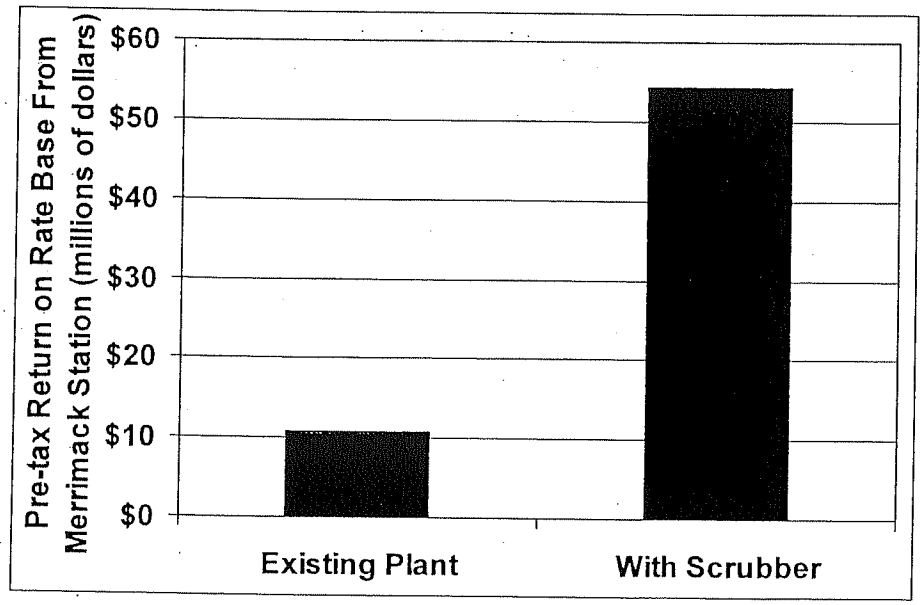
An expensive, capital-intensive investment like the Scrubber Project will dramatically increase PSNH's investment in the Merrimack Station and, consequently, will

significantly increase its pre- and post-tax earnings from the plant. This can be seen in the following two figures which reflect the rate base investments and PSNH's pre-tax return on rate base in the year 2013 if (a) the Scrubber Project is not undertaken or (b) the Scrubber Project is completed and its cost is added to rate base. The year 2013 is being used as an illustration because that is the year the scrubber is scheduled to go into service.

Impact of Scrubber Project on Investment in Merrimack Station in Year 2013



Impact of Scrubber Project on PSNH's Yearly Return on its Investment in Merrimack Station in Year 2013



A less expensive capital project to reduce mercury emissions, such as the installation of an Activated Carbon Injection System, when combined with the purchase of low sulfur coal (which would also reduce mercury emissions) would not increase PSNH's rate base or return on rate base as much as the Scrubber Project because the cost of purchasing the coal is not an investment. Purchasing fuel is treated as an expense, the cost of which is passed along to ratepayers. Therefore, PSNH benefits substantially more from the capital-intensive Scrubber Project than from a less expensive alternative.

Finding 6. PSNH has acknowledged that the contracts it has signed for the Scrubber Project are not "fixed price" contracts.

PNSH has repeatedly said that the majority of the contracts for the Scrubber Project and were "fixed price."[3] However, at the March 13, 2009 legislative hearing, PSNH CEO Gary Long said that there are escalator clauses in the contracts which mean that the price could increase over time. This means that these are not "fixed price" contracts.

Moreover, Company acknowledges that only $250 million of the total $457 million of the estimated cost for the Scrubber Project is under what it has called "fixed price contracts." This leaves over $200 million of estimated project costs exposed to future escalation. Much of this $200 million would be for financing costs that are extremely uncertain in the current financial crisis and, consequently, these financing costs could be substantially higher than PSNH has estimated.

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3 For example, see PSNH's March 5, 2009 Responses to Questions from the Office of Consumer Advocate and the March 13, 2009 report on *The Economic Impacts of Constructing a Scrubber at Merrimack Station*, at page 3.