

The Forward Capacity Market & The Role of Energy Efficiency

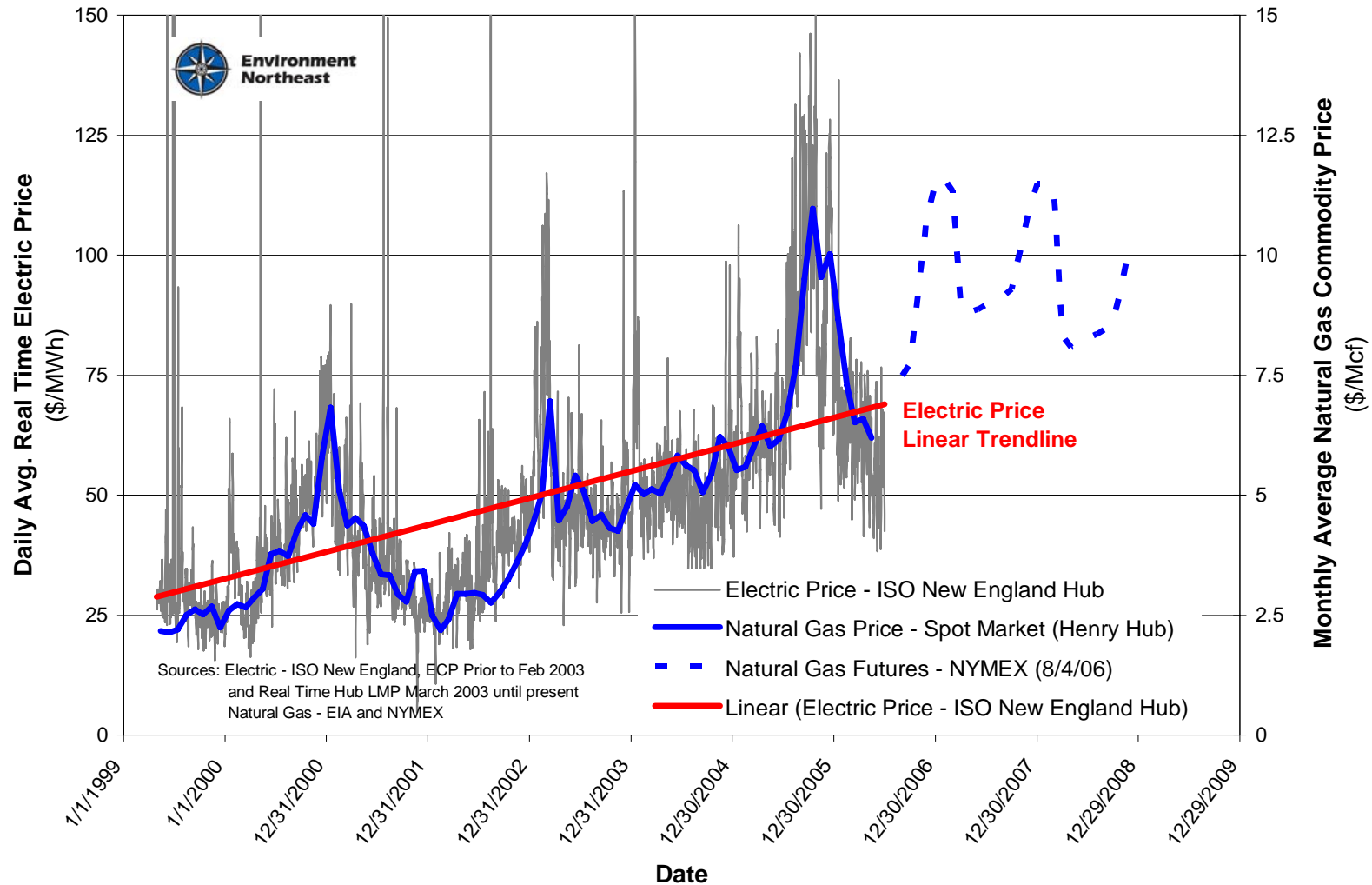
August 21, 2006

Derek K. Murrow &
Roger Koontz

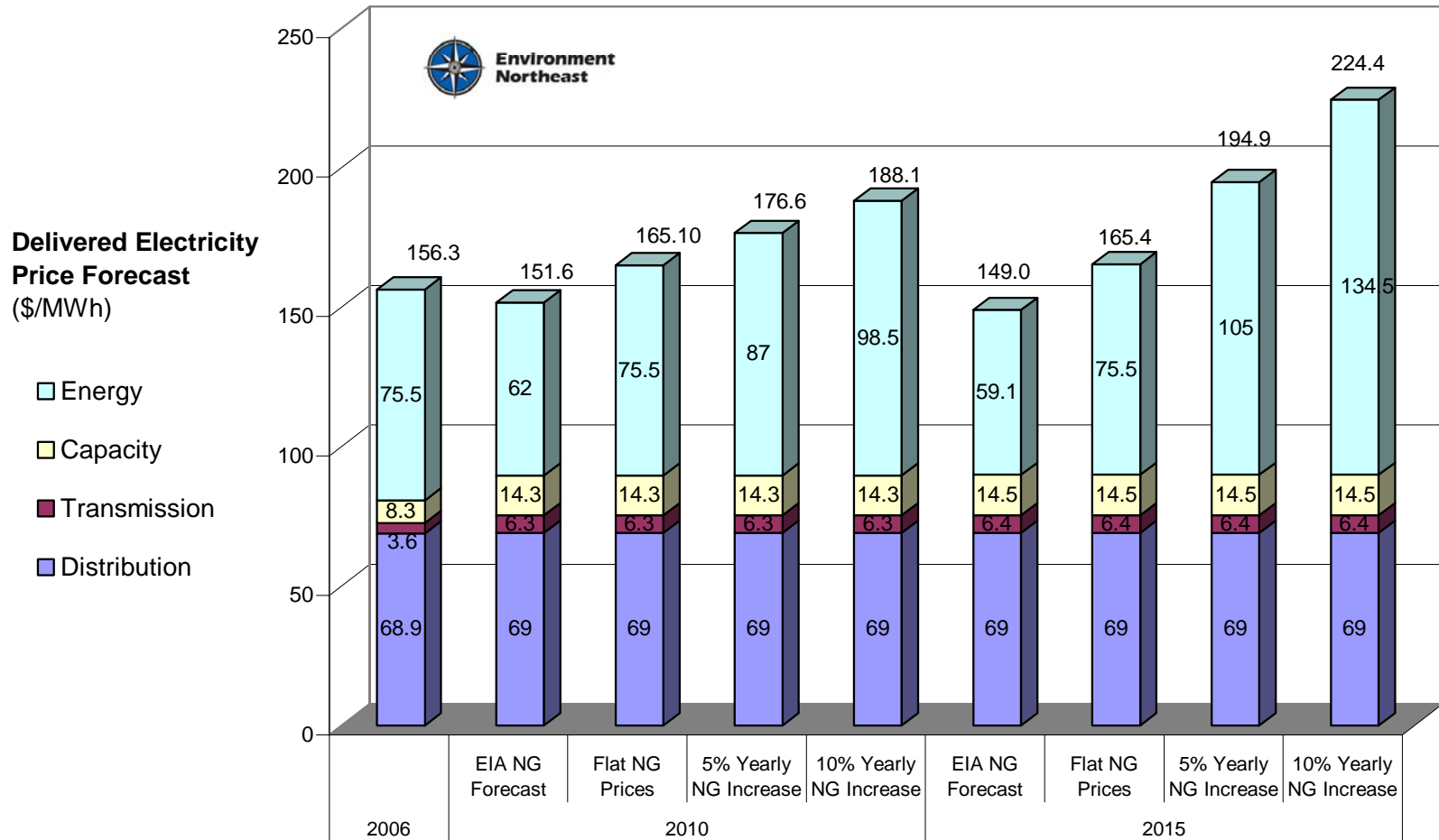


**Environment
Northeast**

ISO-NE Historic Energy Prices vs. Natural Gas Prices



Projections of Future Energy Prices

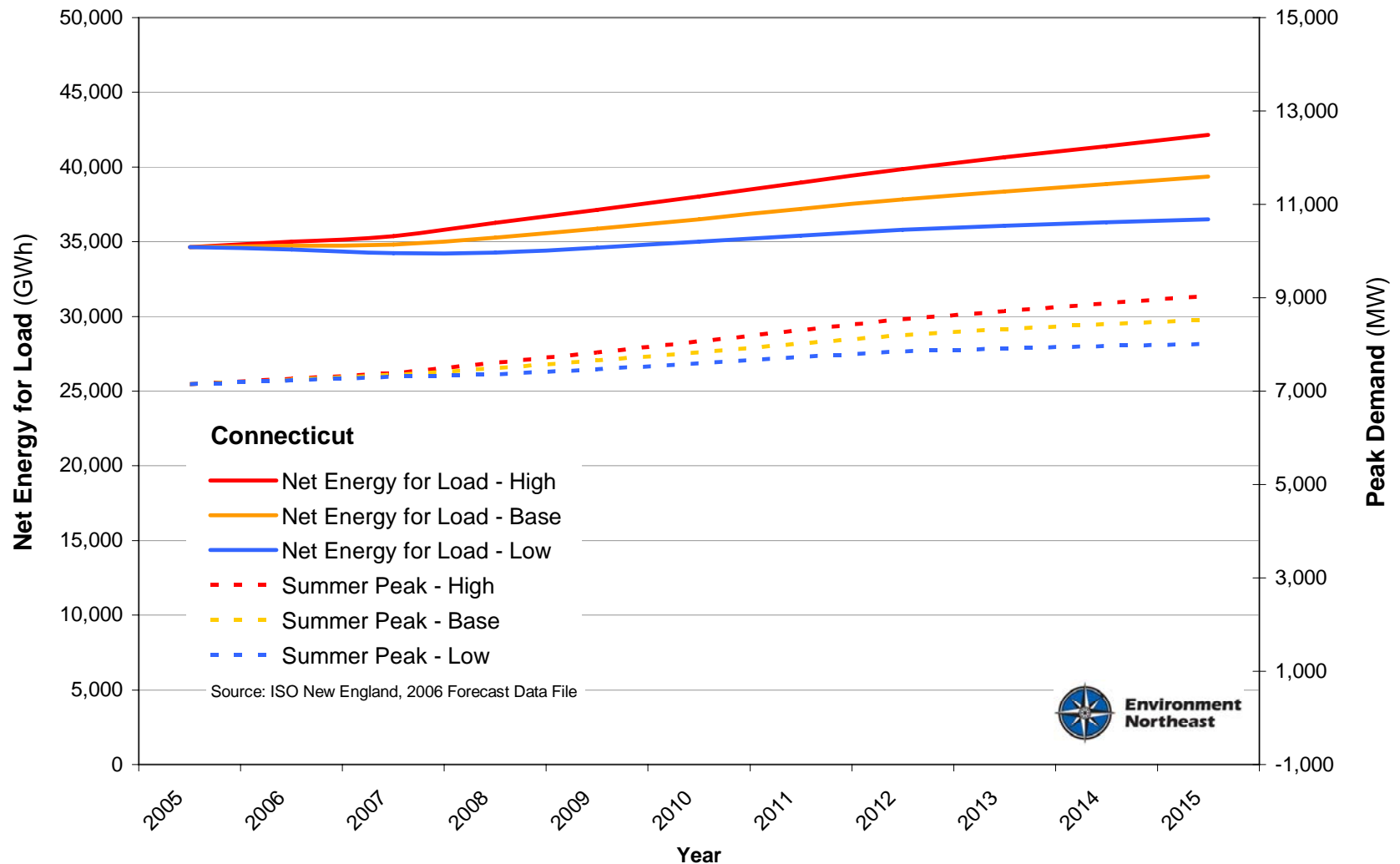


Source: ISO New England: Electricity Costs White Paper, June 1, 2006. All prices are forecast by ISO NE except that ENE has doubled the 5% natural gas price increase to represent a scenario in which natural gas prices increase by 10% per year

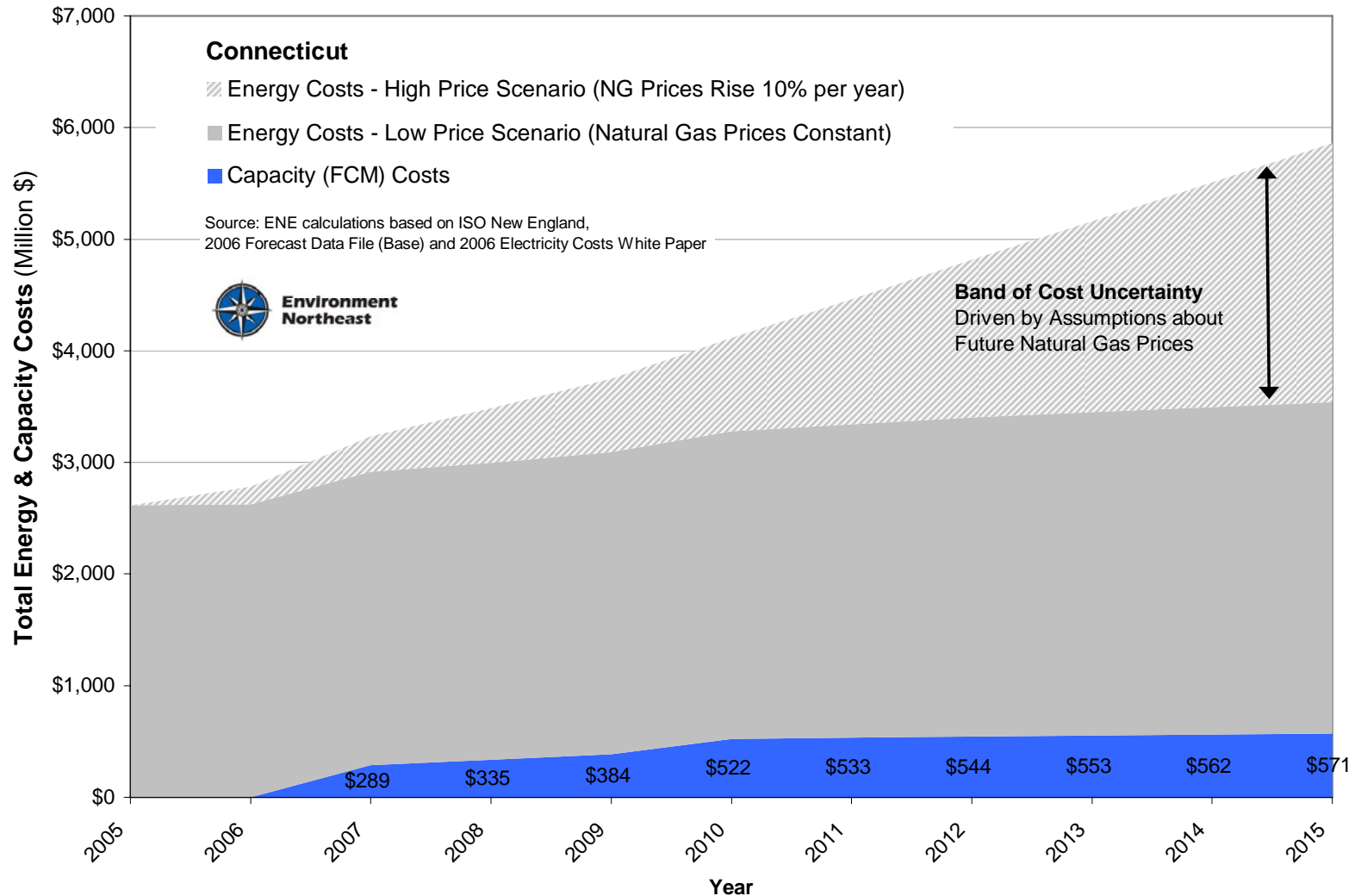
Expanded Projections of Future Capacity Prices could be Helpful

- The following tables and figures rely on data and assumptions from ISO-NE (load and capacity forecasts, LMP and FCM prices in \$/MWh) and Synapse (forecast of FCM prices in \$/kW-month)
- Development of a couple of FCM price scenarios could be helpful (low, medium, high)
- The analysis of money flowing back to state EE programs only looks at low and high performance of existing EE programs on a \$/MW basis and only one FCM price forecast

Connecticut – Load and Demand Forecast (ISO-NE)



Connecticut – Forecast of Energy & Capacity Costs (Based on ISO-NE)



Connecticut – Potential Payments to Existing Efficiency Programs



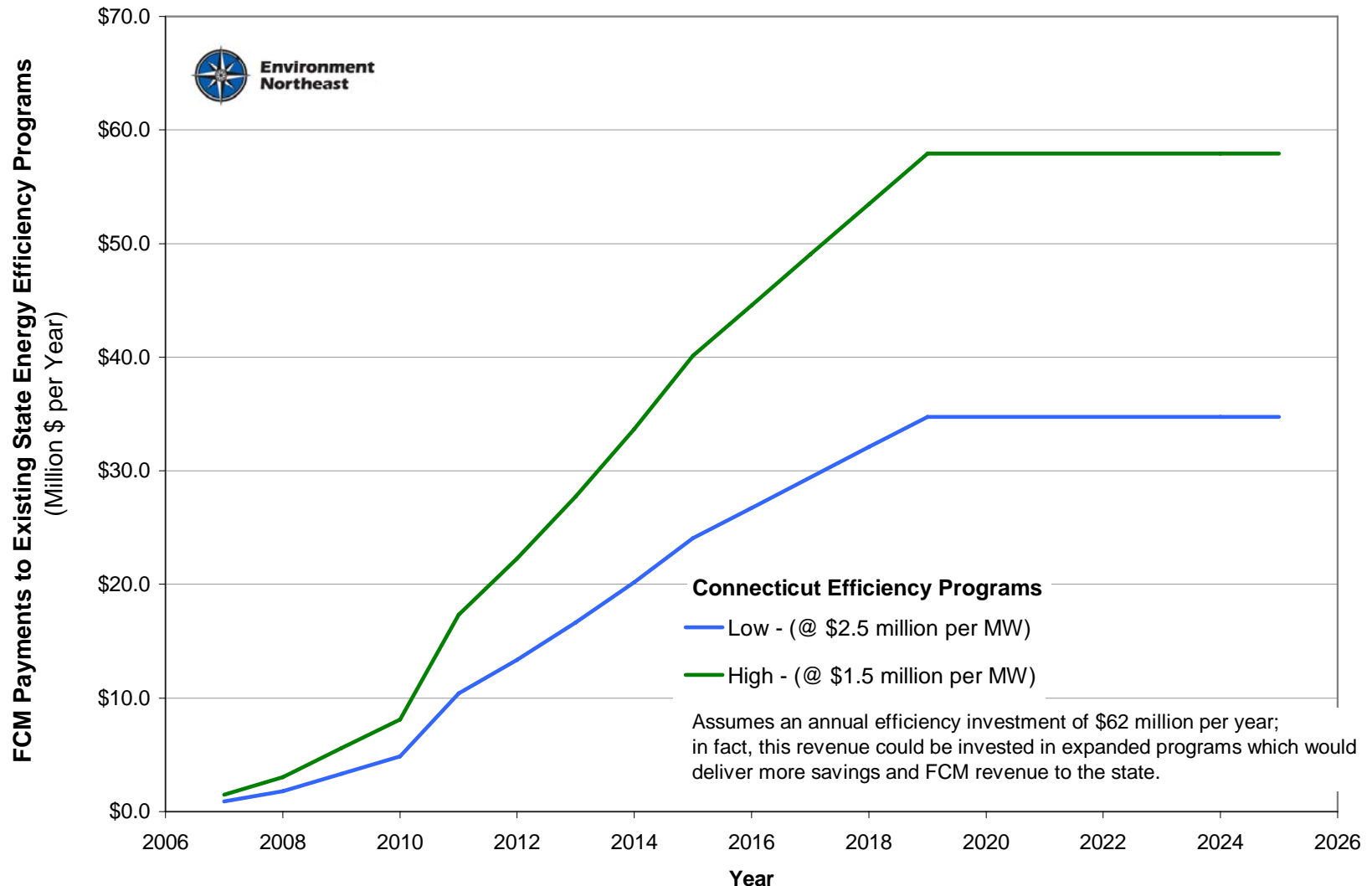
State	EE Funding Level (Mills/kWh)	Budget (Million \$ per Year)	Potential Demand Savings per Year (MW)	
			Low - (@ \$2.5 million per MW)	High - (@ \$1.5 million per MW)
Connecticut	3.0	61.9	24.8	41.3

Year	# Years of Savings	FCM Payment Type	FCM Payment (\$/kW-Month)	Flow of Payments (Million \$)			
				1 Year Investment		Cumulative Revenue	
				Low	High	Low	High
2007	1	TCP	\$3.05	\$0.9	\$1.5	\$0.9	\$1.5
2008	2	TCP	\$3.05	\$0.9	\$1.5	\$1.8	\$3.0
2009	3	TCP	\$3.75	\$1.1	\$1.9	\$3.3	\$5.6
2010	4	TCP	\$4.10	\$1.2	\$2.0	\$4.9	\$8.1
2011	5	FCM	\$7.00	\$2.1	\$3.5	\$10.4	\$17.3
2012	6	FCM	\$7.50	\$2.2	\$3.7	\$13.4	\$22.3
2013	7	FCM	\$8.00	\$2.4	\$4.0	\$16.6	\$27.7
2014	8	FCM	\$8.50	\$2.5	\$4.2	\$20.2	\$33.7
2015	9	FCM	\$9.00	\$2.7	\$4.5	\$24.1	\$40.1
2016	10	FCM	\$9.00	\$2.7	\$4.5	\$26.7	\$44.6
2017	11	FCM	\$9.00	\$2.7	\$4.5	\$29.4	\$49.0
2018	12	FCM	\$9.00	\$2.7	\$4.5	\$32.1	\$53.5
2019	13	FCM	\$9.00	\$2.7	\$4.5	\$34.8	\$57.9
2020	13	FCM	\$9.00			\$34.8	\$57.9
2021	13	FCM	\$9.00			\$34.8	\$57.9
2022	13	FCM	\$9.00			\$34.8	\$57.9
2023	13	FCM	\$9.00			\$34.8	\$57.9
2024	13	FCM	\$9.00			\$34.8	\$57.9
2025	13	FCM	\$9.00			\$34.8	\$57.9

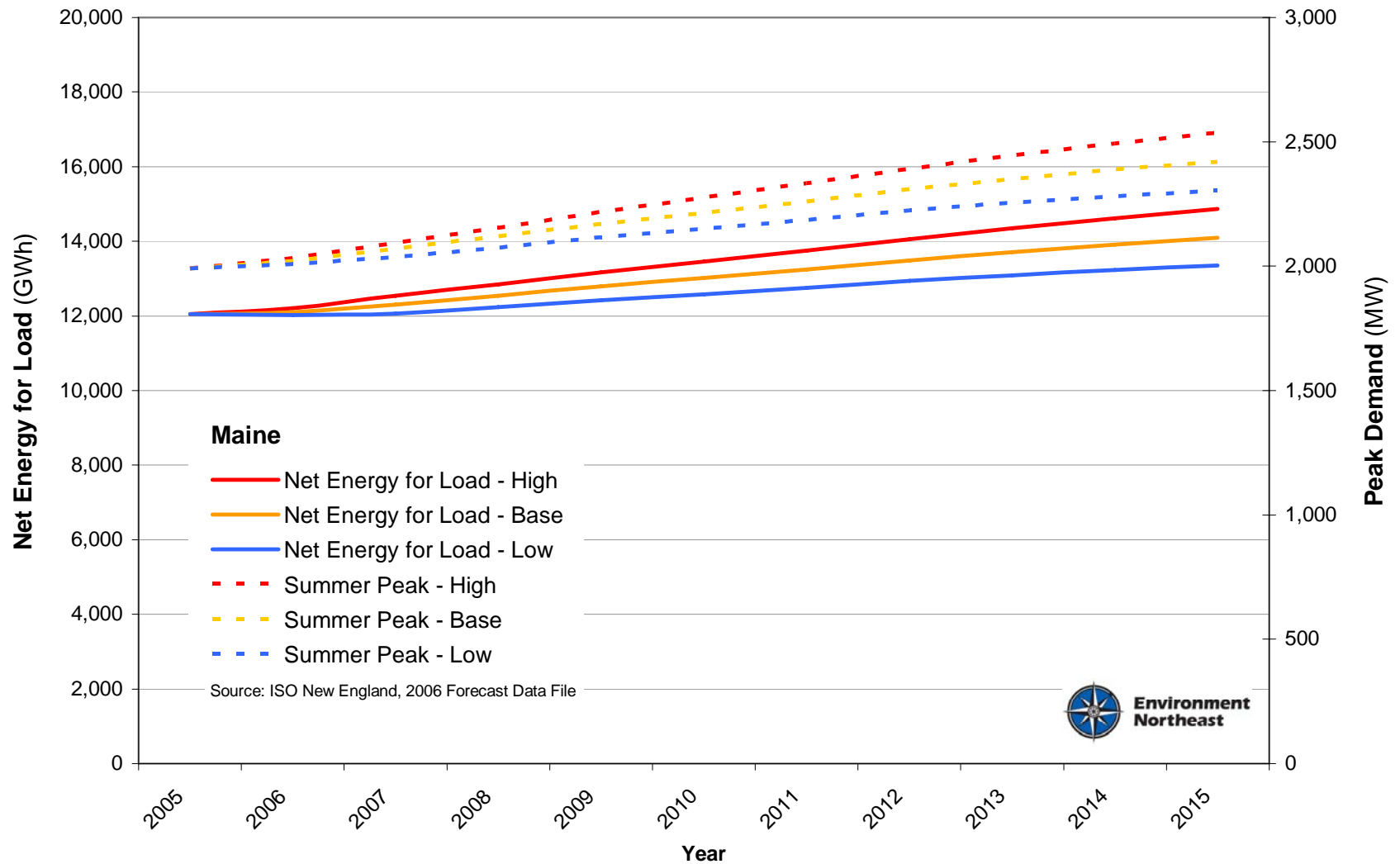
Total Revenue - 1 Year of Program Activities (Million \$)	\$27	\$45
NPV Revenue - 1 Year - 9% Discount Rate (Million \$)	\$14	\$23
Percent of Total Program Cost (NPV Revenue/Cost)	22%	37%

FCM Price Forecast
from Synapse Energy Economics

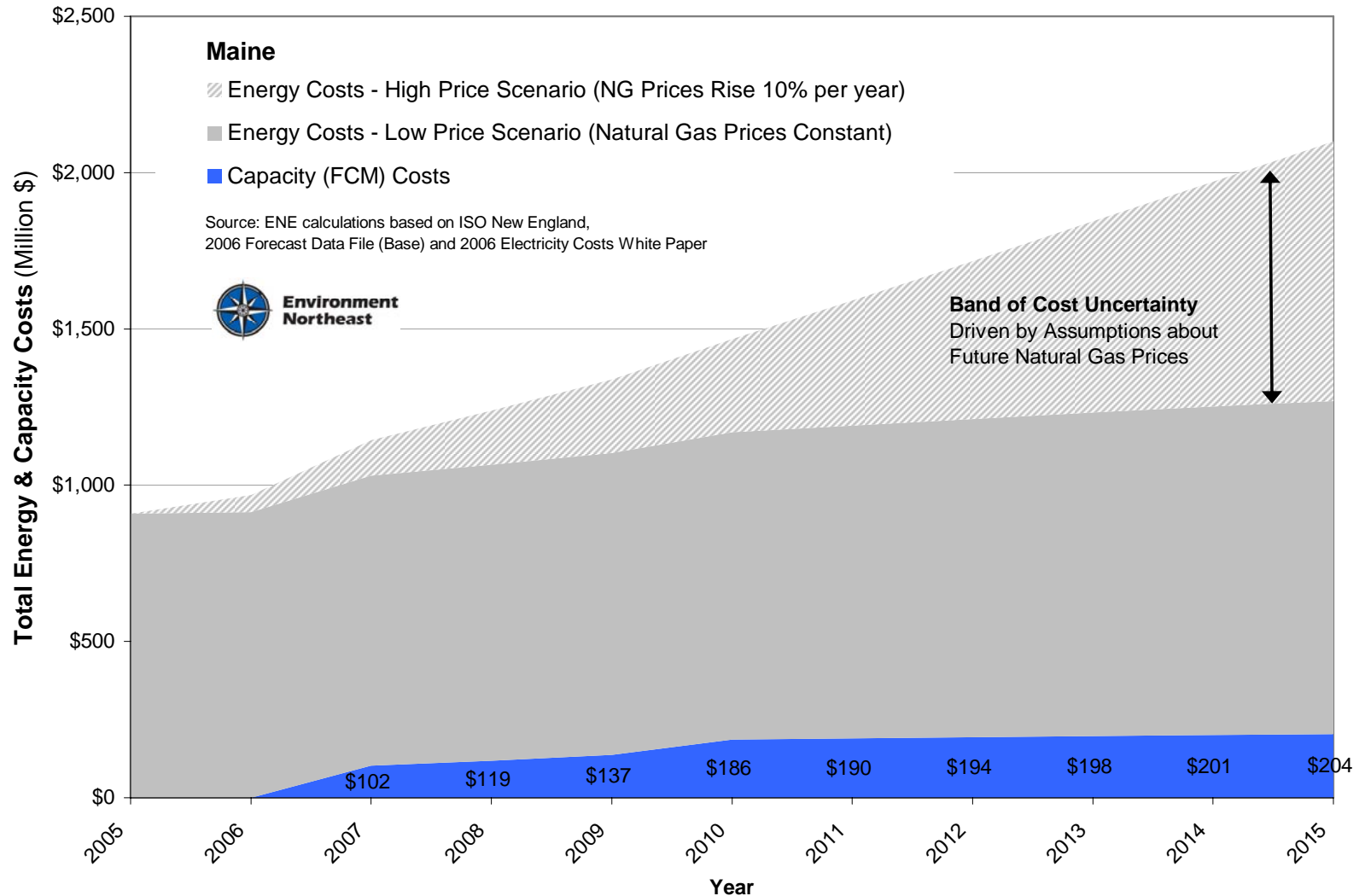
Connecticut – Potential Payments to Existing Efficiency Programs



Maine – Load and Demand Forecast (ISO-NE)



Maine – Forecast of Energy & Capacity Costs (Based on ISO-NE)



Maine – Potential Payments to Existing Efficiency Programs



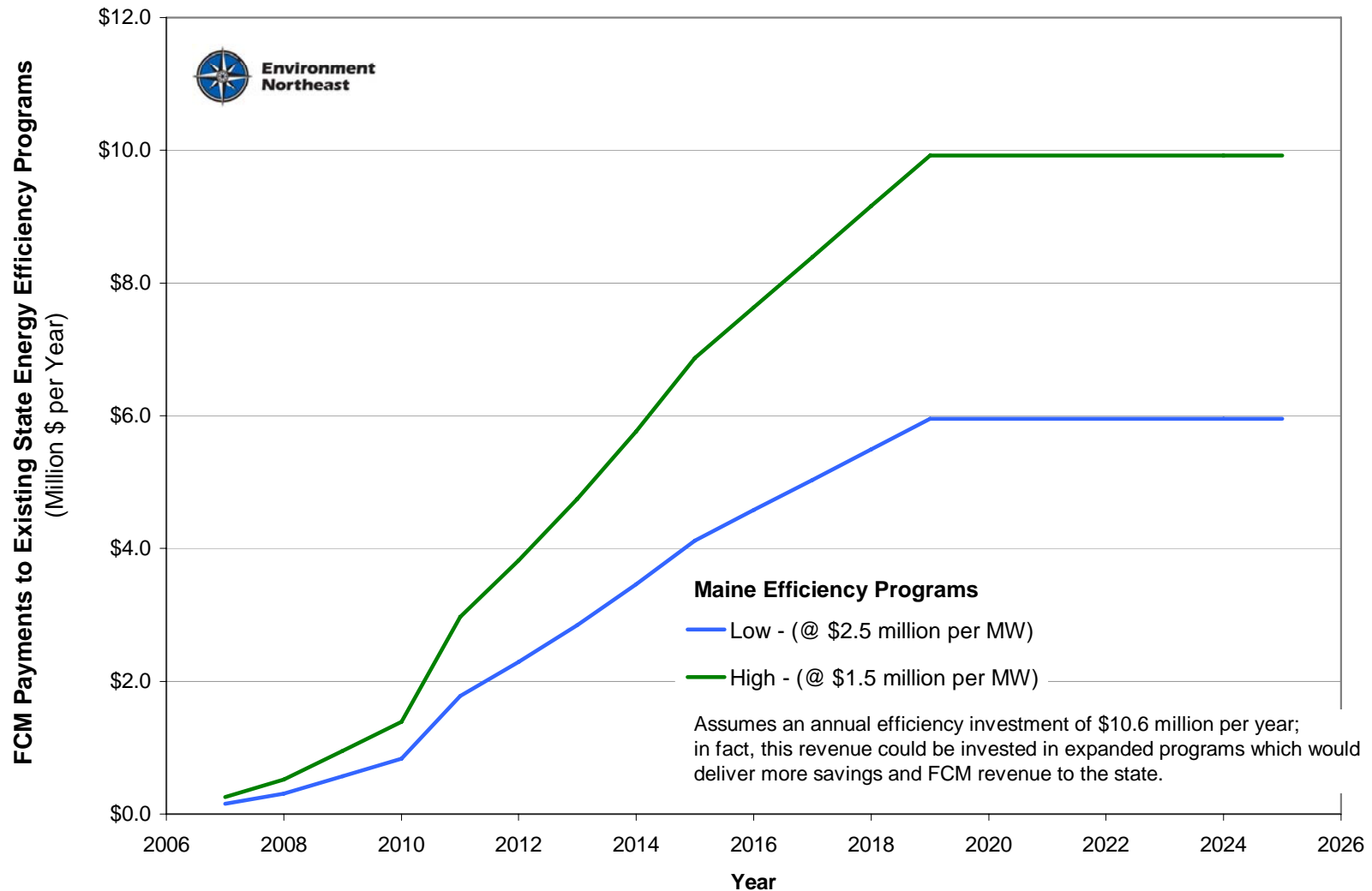
State	EE Funding Level (Mills/kWh)	Budget (Million \$ per Year)	Potential Demand Savings per Year (MW)	
			Low - (@ \$2.5 million per MW)	High - (@ \$1.5 million per MW)
Maine	1.5	10.6	4.2	7.1

Year	# Years of Savings	FCM Payment Type	FCM Payment (\$/kW-Month)	Flow of Payments (Million \$)			
				1 Year Investment		Cumulative Revenue	
				Low	High	Low	High
2007	1	TCP	\$3.05	\$0.2	\$0.3	\$0.2	\$0.3
2008	2	TCP	\$3.05	\$0.2	\$0.3	\$0.3	\$0.5
2009	3	TCP	\$3.75	\$0.2	\$0.3	\$0.6	\$1.0
2010	4	TCP	\$4.10	\$0.2	\$0.3	\$0.8	\$1.4
2011	5	FCM	\$7.00	\$0.4	\$0.6	\$1.8	\$3.0
2012	6	FCM	\$7.50	\$0.4	\$0.6	\$2.3	\$3.8
2013	7	FCM	\$8.00	\$0.4	\$0.7	\$2.8	\$4.7
2014	8	FCM	\$8.50	\$0.4	\$0.7	\$3.5	\$5.8
2015	9	FCM	\$9.00	\$0.5	\$0.8	\$4.1	\$6.9
2016	10	FCM	\$9.00	\$0.5	\$0.8	\$4.6	\$7.6
2017	11	FCM	\$9.00	\$0.5	\$0.8	\$5.0	\$8.4
2018	12	FCM	\$9.00	\$0.5	\$0.8	\$5.5	\$9.2
2019	13	FCM	\$9.00	\$0.5	\$0.8	\$6.0	\$9.9
2020	13	FCM	\$9.00			\$6.0	\$9.9
2021	13	FCM	\$9.00			\$6.0	\$9.9
2022	13	FCM	\$9.00			\$6.0	\$9.9
2023	13	FCM	\$9.00			\$6.0	\$9.9
2024	13	FCM	\$9.00			\$6.0	\$9.9
2025	13	FCM	\$9.00			\$6.0	\$9.9

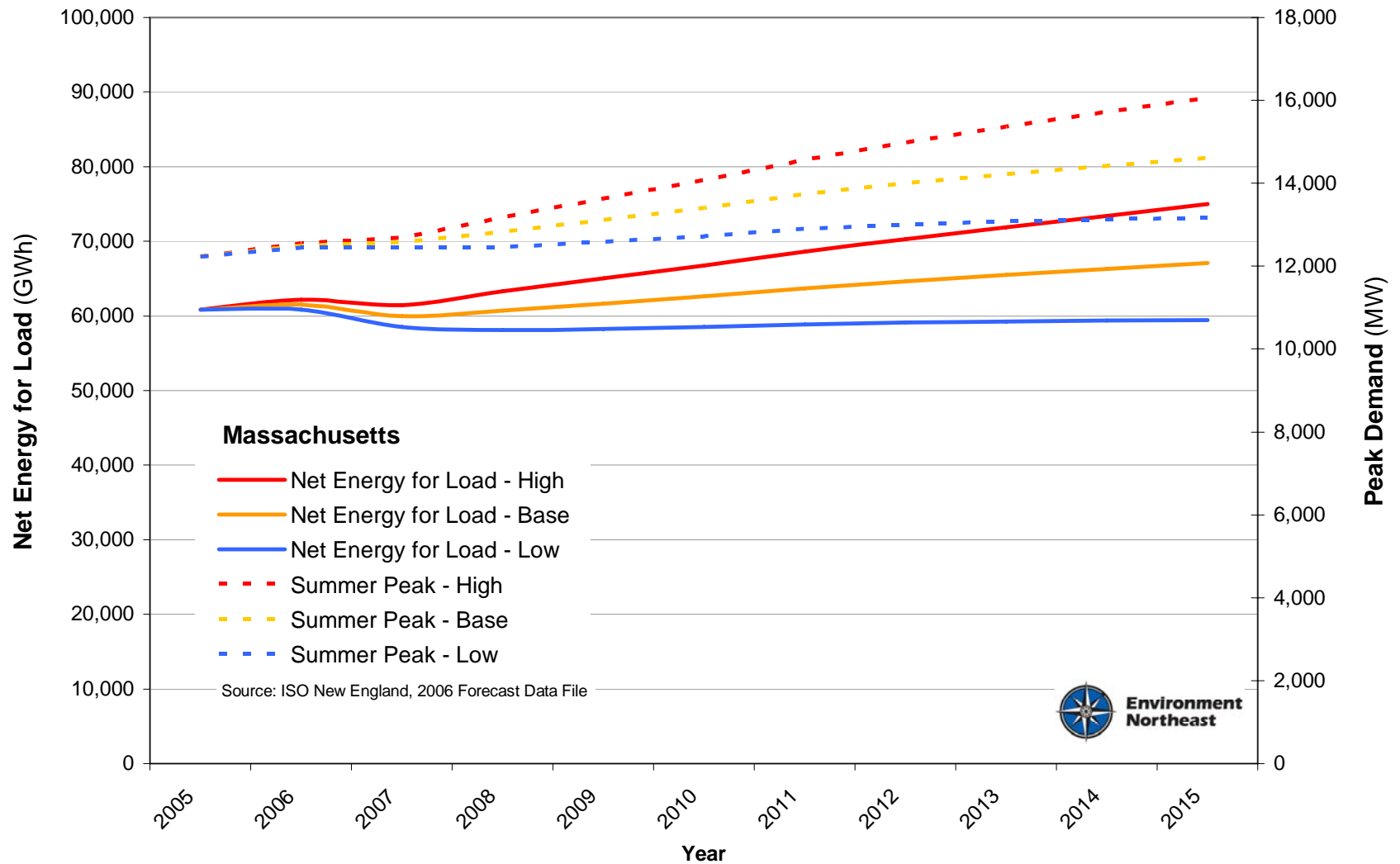
Total Revenue - 1 Year of Program Activities (Million \$)	\$5	\$8
NPV Revenue - 1 Year - 9% Discount Rate (Million \$)	\$2	\$4
Percent of Total Program Cost (NPV Revenue/Cost)	22%	37%

FCM Price Forecast
from Synapse Energy Economics

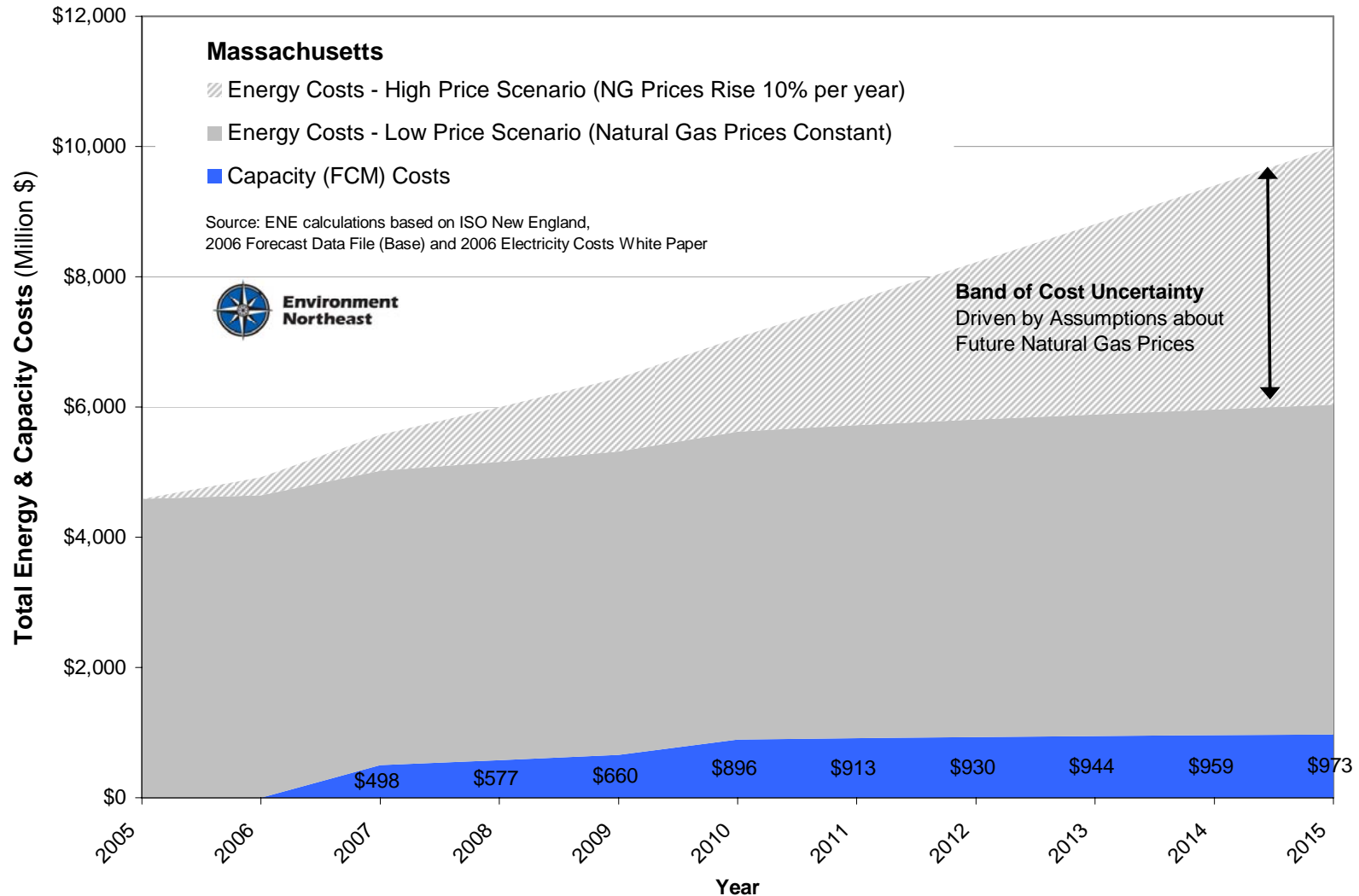
Maine – Potential Payments to Existing Efficiency Programs



Massachusetts – Load and Demand Forecast (ISO-NE)



Massachusetts – Forecast of Energy & Capacity Costs (Based on ISO-NE)



Massachusetts – Potential Payments to Existing Efficiency Programs



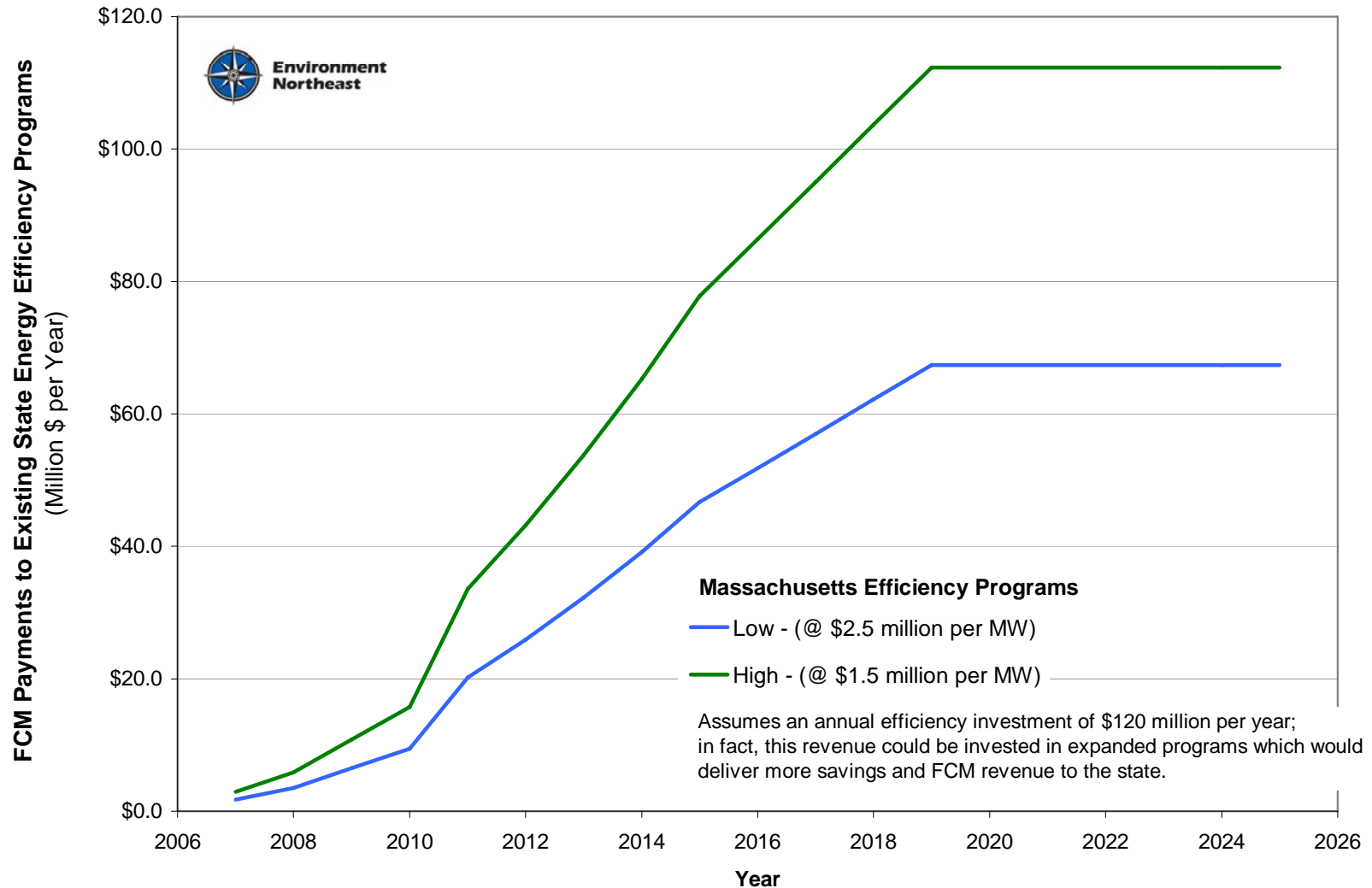
State	EE Funding Level (Mills/kWh)	Budget (Million \$ per Year)	Potential Demand Savings per Year (MW)	
			Low - (@ \$2.5 million per MW)	High - (@ \$1.5 million per MW)
Massachusetts	2.5	120.0	48.0	80.0

Year	# Years of Savings	FCM Payment Type	FCM Payment (\$/kW-Month)	Flow of Payments (Million \$)			
				1 Year Investment		Cumulative Revenue	
				Low	High	Low	High
2007	1	TCP	\$3.05	\$1.8	\$2.9	\$1.8	\$2.9
2008	2	TCP	\$3.05	\$1.8	\$2.9	\$3.5	\$5.9
2009	3	TCP	\$3.75	\$2.2	\$3.6	\$6.5	\$10.8
2010	4	TCP	\$4.10	\$2.4	\$3.9	\$9.4	\$15.7
2011	5	FCM	\$7.00	\$4.0	\$6.7	\$20.2	\$33.6
2012	6	FCM	\$7.50	\$4.3	\$7.2	\$25.9	\$43.2
2013	7	FCM	\$8.00	\$4.6	\$7.7	\$32.3	\$53.8
2014	8	FCM	\$8.50	\$4.9	\$8.2	\$39.2	\$65.3
2015	9	FCM	\$9.00	\$5.2	\$8.6	\$46.7	\$77.8
2016	10	FCM	\$9.00	\$5.2	\$8.6	\$51.8	\$86.4
2017	11	FCM	\$9.00	\$5.2	\$8.6	\$57.0	\$95.0
2018	12	FCM	\$9.00	\$5.2	\$8.6	\$62.2	\$103.7
2019	13	FCM	\$9.00	\$5.2	\$8.6	\$67.4	\$112.3
2020	13	FCM	\$9.00			\$67.4	\$112.3
2021	13	FCM	\$9.00			\$67.4	\$112.3
2022	13	FCM	\$9.00			\$67.4	\$112.3
2023	13	FCM	\$9.00			\$67.4	\$112.3
2024	13	FCM	\$9.00			\$67.4	\$112.3
2025	13	FCM	\$9.00			\$67.4	\$112.3

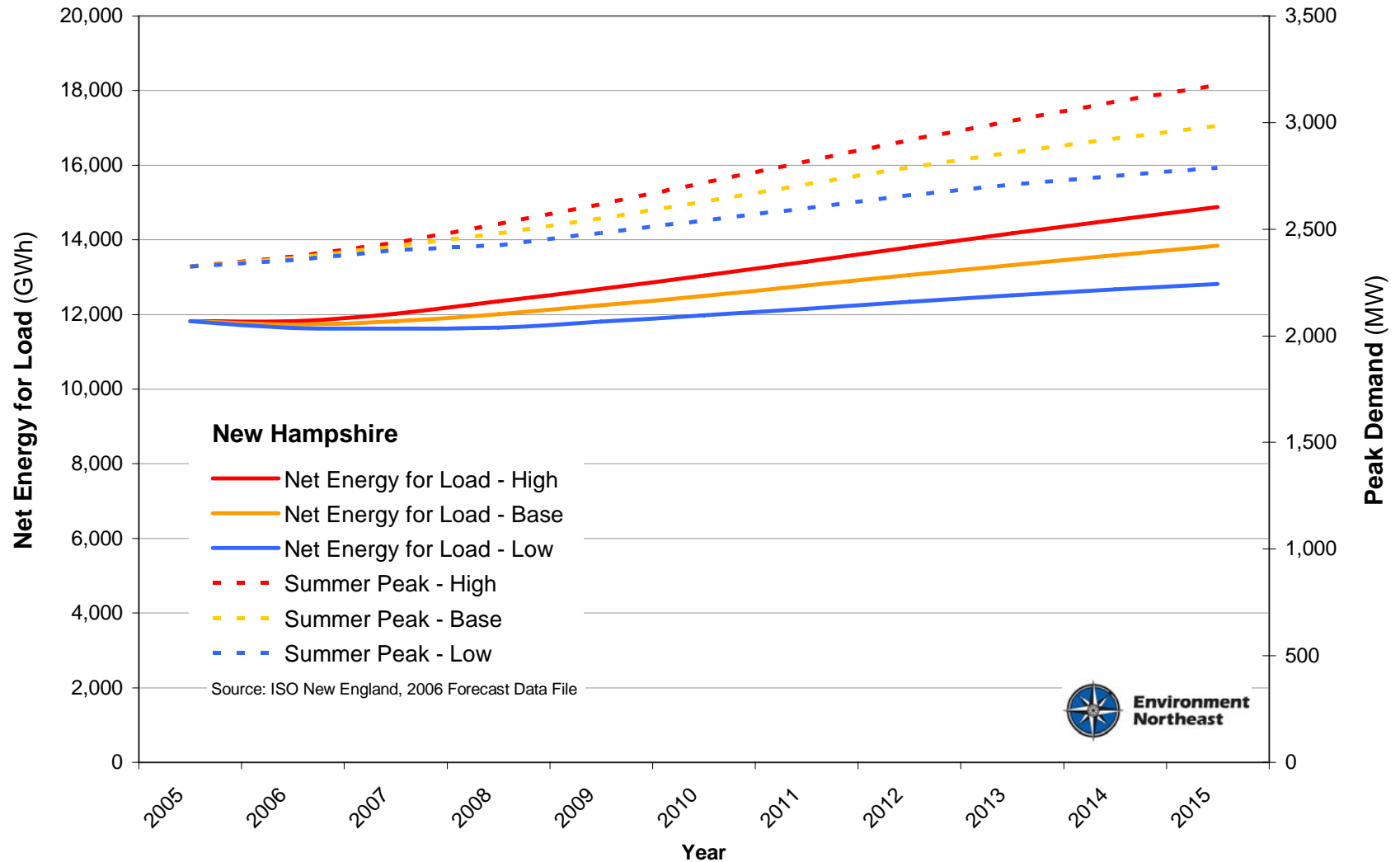
Total Revenue - 1 Year of Program Activities (Million \$)	\$52	\$86
NPV Revenue - 1 Year - 9% Discount Rate (Million \$)	\$27	\$45
Percent of Total Program Cost (NPV Revenue/Cost)	22%	37%

FCM Price Forecast
from Synapse Energy Economics

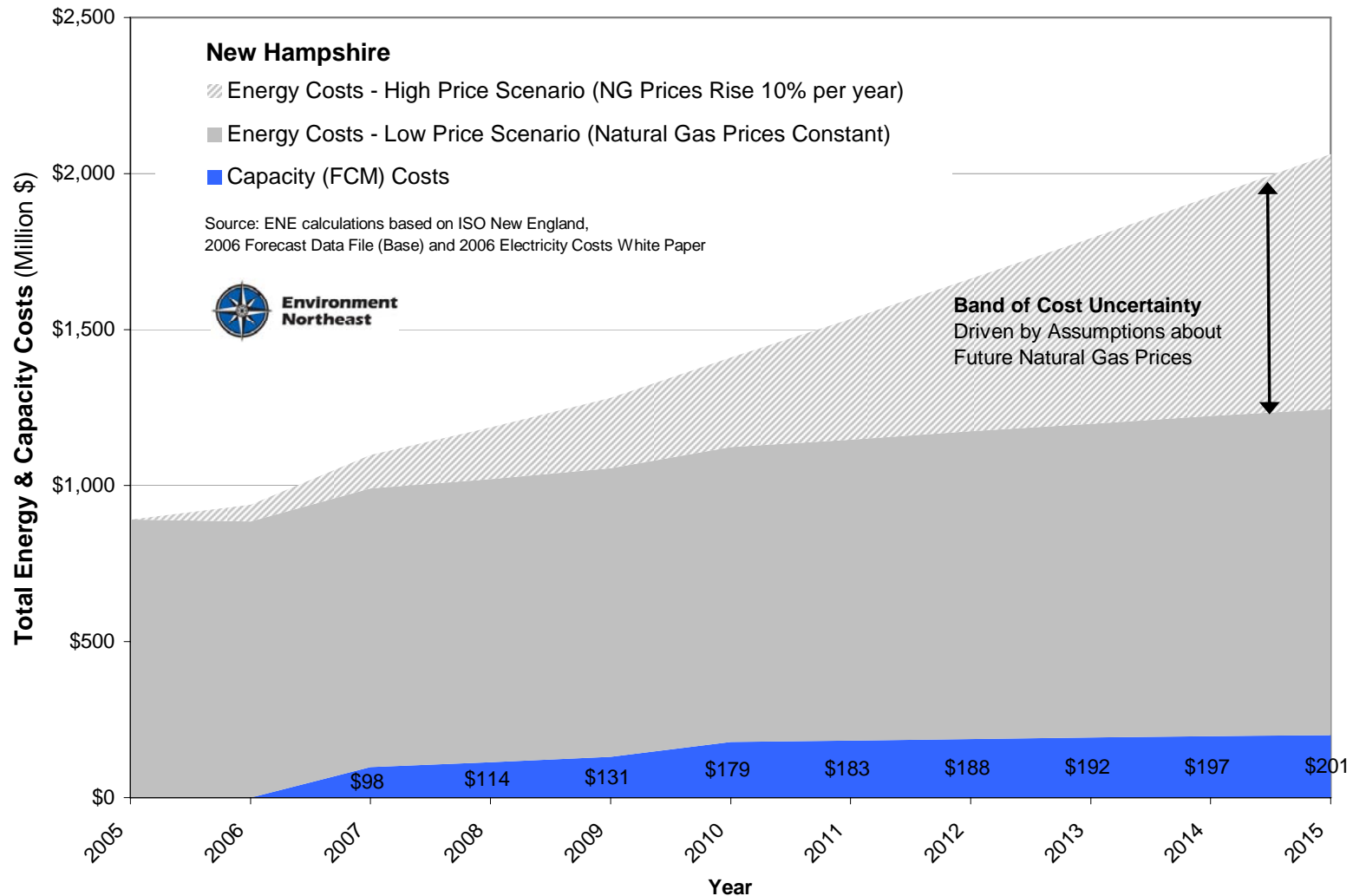
Massachusetts – Potential Payments to Existing Efficiency Programs



New Hampshire – Load and Demand Forecast (ISO-NE)



New Hampshire – Forecast of Energy & Capacity Costs (Based on ISO-NE)



New Hampshire – Potential Payments to Existing Efficiency Programs



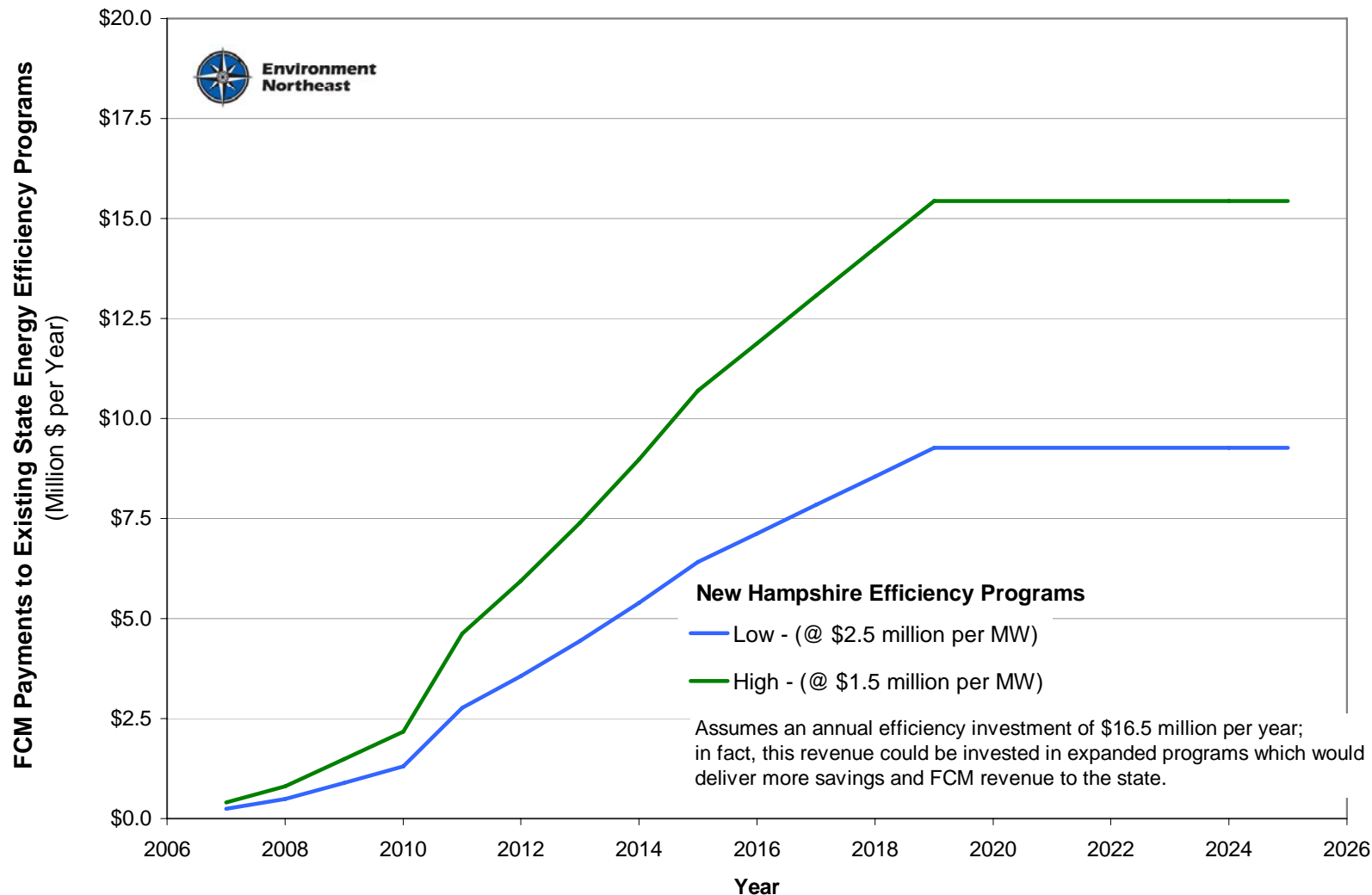
State	EE Funding Level (Mills/kWh)	Budget (Million \$ per Year)	Potential Demand Savings per Year (MW)	
			Low - (@ \$2.5 million per MW)	High - (@ \$1.5 million per MW)
New Hampshire	1.8	16.5	6.6	11.0

Year	# Years of Savings	FCM Payment Type	FCM Payment (\$/kW-Month)	Flow of Payments (Million \$\$)			
				1 Year Investment		Cumulative Revenue	
				Low	High	Low	High
2007	1	TCP	\$3.05	\$0.2	\$0.4	\$0.2	\$0.4
2008	2	TCP	\$3.05	\$0.2	\$0.4	\$0.5	\$0.8
2009	3	TCP	\$3.75	\$0.3	\$0.5	\$0.9	\$1.5
2010	4	TCP	\$4.10	\$0.3	\$0.5	\$1.3	\$2.2
2011	5	FCM	\$7.00	\$0.6	\$0.9	\$2.8	\$4.6
2012	6	FCM	\$7.50	\$0.6	\$1.0	\$3.6	\$5.9
2013	7	FCM	\$8.00	\$0.6	\$1.1	\$4.4	\$7.4
2014	8	FCM	\$8.50	\$0.7	\$1.1	\$5.4	\$9.0
2015	9	FCM	\$9.00	\$0.7	\$1.2	\$6.4	\$10.7
2016	10	FCM	\$9.00	\$0.7	\$1.2	\$7.1	\$11.9
2017	11	FCM	\$9.00	\$0.7	\$1.2	\$7.8	\$13.1
2018	12	FCM	\$9.00	\$0.7	\$1.2	\$8.6	\$14.3
2019	13	FCM	\$9.00	\$0.7	\$1.2	\$9.3	\$15.4
2020	13	FCM	\$9.00			\$9.3	\$15.4
2021	13	FCM	\$9.00			\$9.3	\$15.4
2022	13	FCM	\$9.00			\$9.3	\$15.4
2023	13	FCM	\$9.00			\$9.3	\$15.4
2024	13	FCM	\$9.00			\$9.3	\$15.4
2025	13	FCM	\$9.00			\$9.3	\$15.4

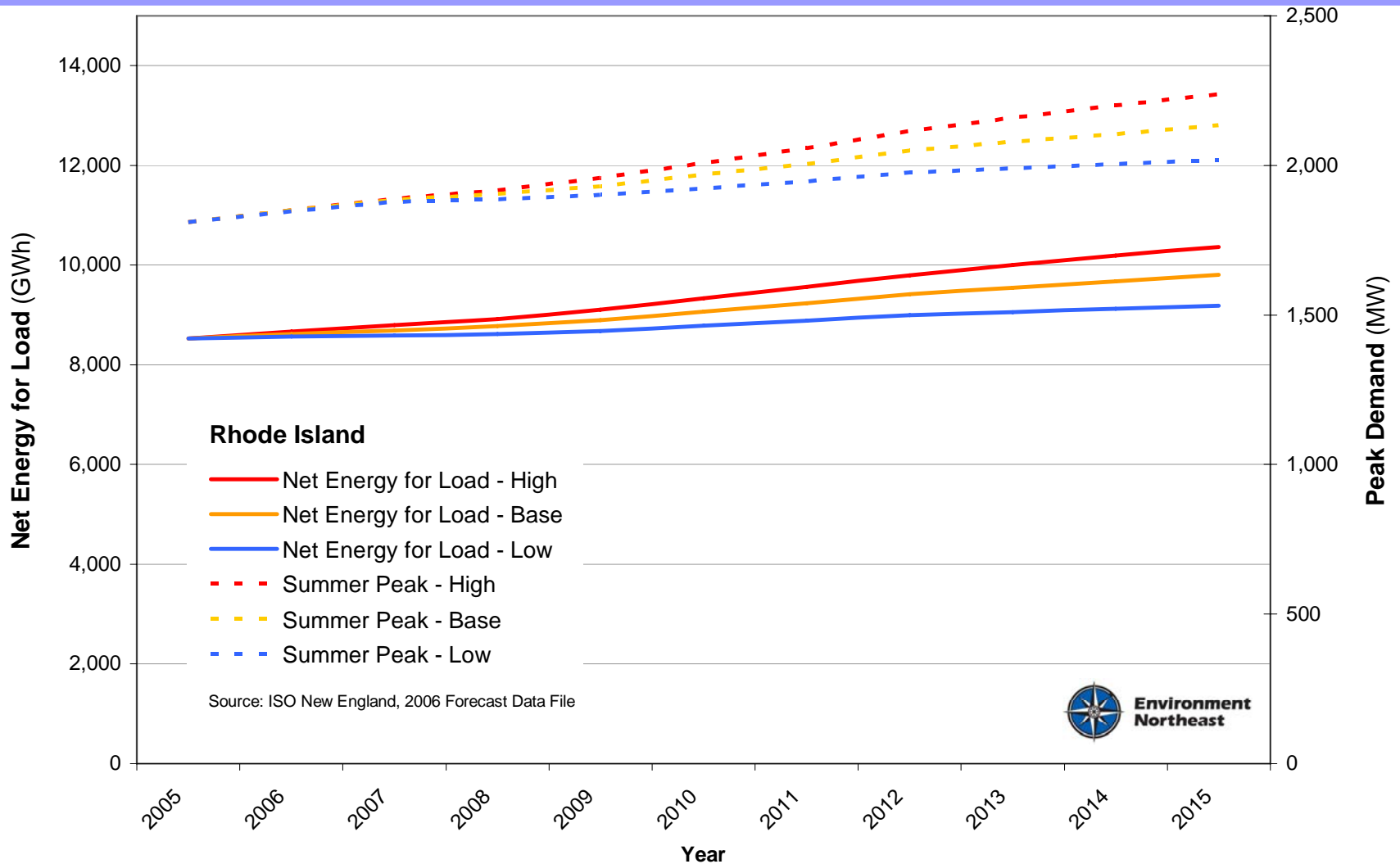
Total Revenue - 1 Year of Program Activities (Million \$)	\$7	\$12
NPV Revenue - 1 Year - 9% Discount Rate (Million \$)	\$4	\$6
Percent of Total Program Cost (NPV Revenue/Cost)	22%	37%

FCM Price Forecast
from Synapse Energy Economics

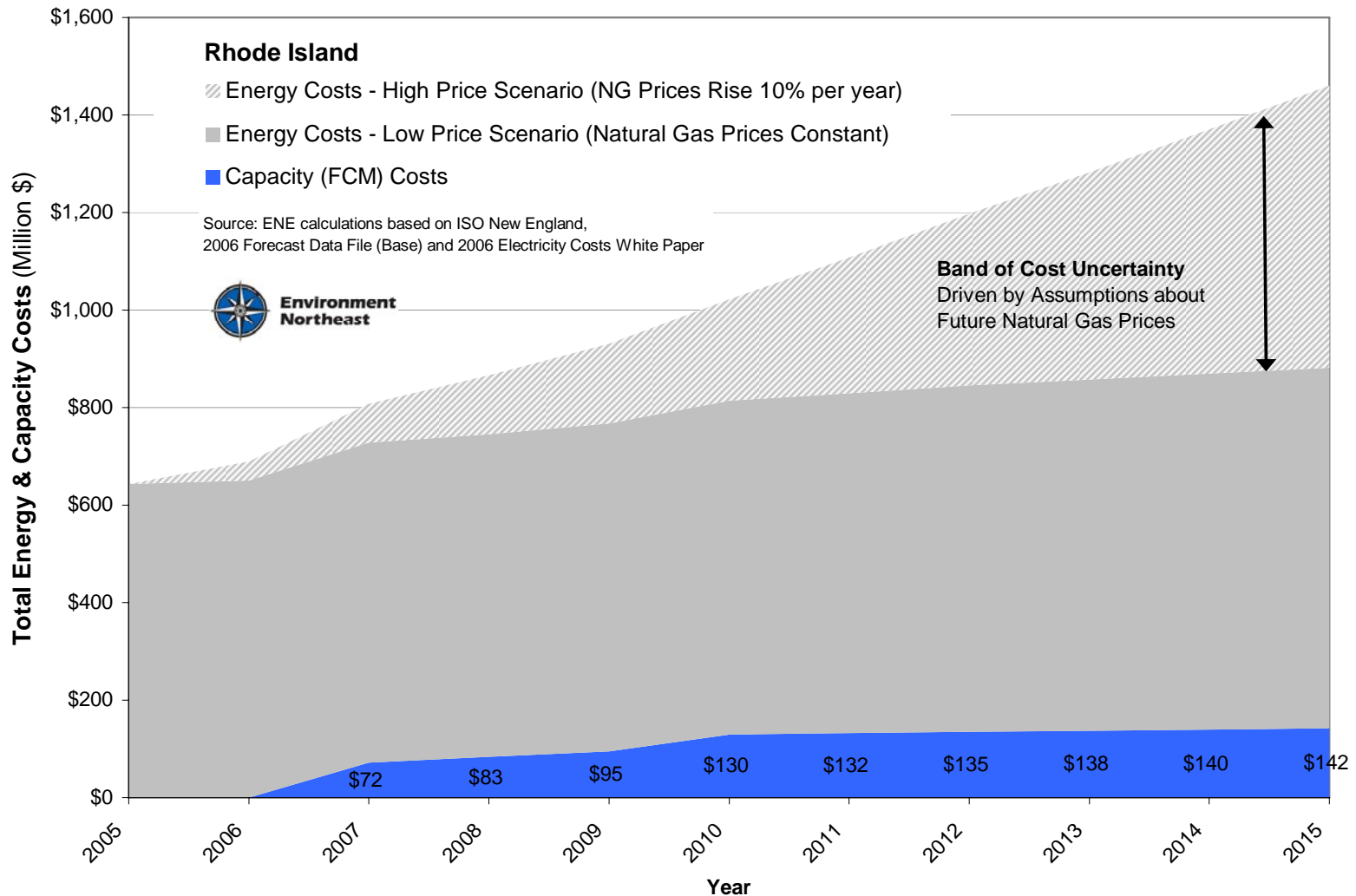
New Hampshire – Potential Payments to Existing Efficiency Programs



Rhode Island – Load and Demand Forecast (ISO-NE)



Rhode Island– Forecast of Energy & Capacity Costs (Based on ISO-NE)



Rhode Island – Potential Payments to Existing Efficiency Programs



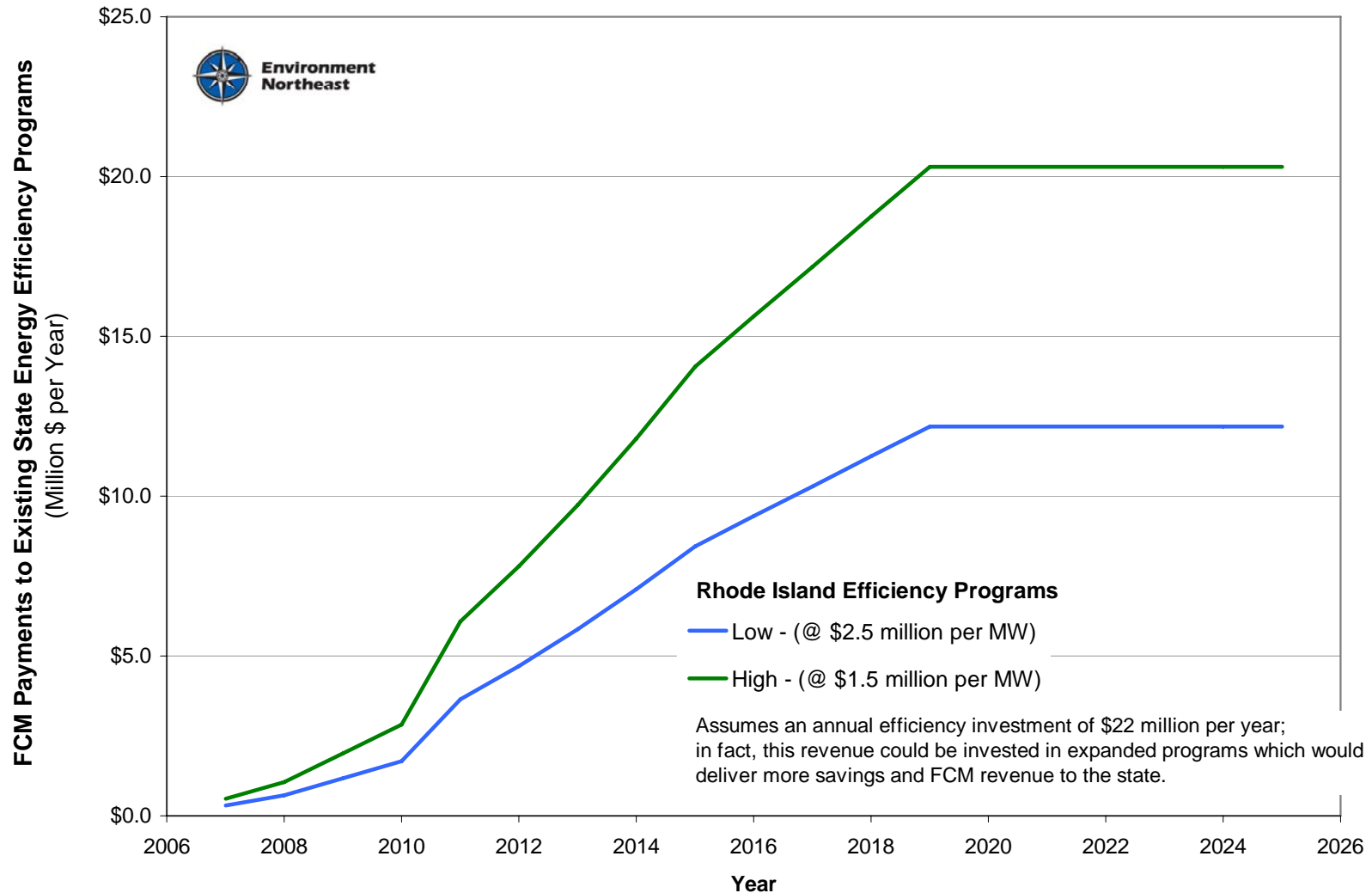
State	EE Funding Level (Mills/kWh)	Budget (Million \$ per Year)	Potential Demand Savings per Year (MW)	
			Low - (@ \$2.5 million per MW)	High - (@ \$1.5 million per MW)
Rhode Island	2.0	21.7	8.7	14.5

Year	# Years of Savings	FCM Payment Type	FCM Payment (\$/kW-Month)	1 Year Investment		Cumulative Revenue	
				Low	High	Low	High
				2007	1	TCP	\$3.05
2008	2	TCP	\$3.05	\$0.3	\$0.5	\$0.6	\$1.1
2009	3	TCP	\$3.75	\$0.4	\$0.7	\$1.2	\$2.0
2010	4	TCP	\$4.10	\$0.4	\$0.7	\$1.7	\$2.8
2011	5	FCM	\$7.00	\$0.7	\$1.2	\$3.6	\$6.1
2012	6	FCM	\$7.50	\$0.8	\$1.3	\$4.7	\$7.8
2013	7	FCM	\$8.00	\$0.8	\$1.4	\$5.8	\$9.7
2014	8	FCM	\$8.50	\$0.9	\$1.5	\$7.1	\$11.8
2015	9	FCM	\$9.00	\$0.9	\$1.6	\$8.4	\$14.1
2016	10	FCM	\$9.00	\$0.9	\$1.6	\$9.4	\$15.6
2017	11	FCM	\$9.00	\$0.9	\$1.6	\$10.3	\$17.2
2018	12	FCM	\$9.00	\$0.9	\$1.6	\$11.2	\$18.7
2019	13	FCM	\$9.00	\$0.9	\$1.6	\$12.2	\$20.3
2020	13	FCM	\$9.00			\$12.2	\$20.3
2021	13	FCM	\$9.00			\$12.2	\$20.3
2022	13	FCM	\$9.00			\$12.2	\$20.3
2023	13	FCM	\$9.00			\$12.2	\$20.3
2024	13	FCM	\$9.00			\$12.2	\$20.3
2025	13	FCM	\$9.00			\$12.2	\$20.3

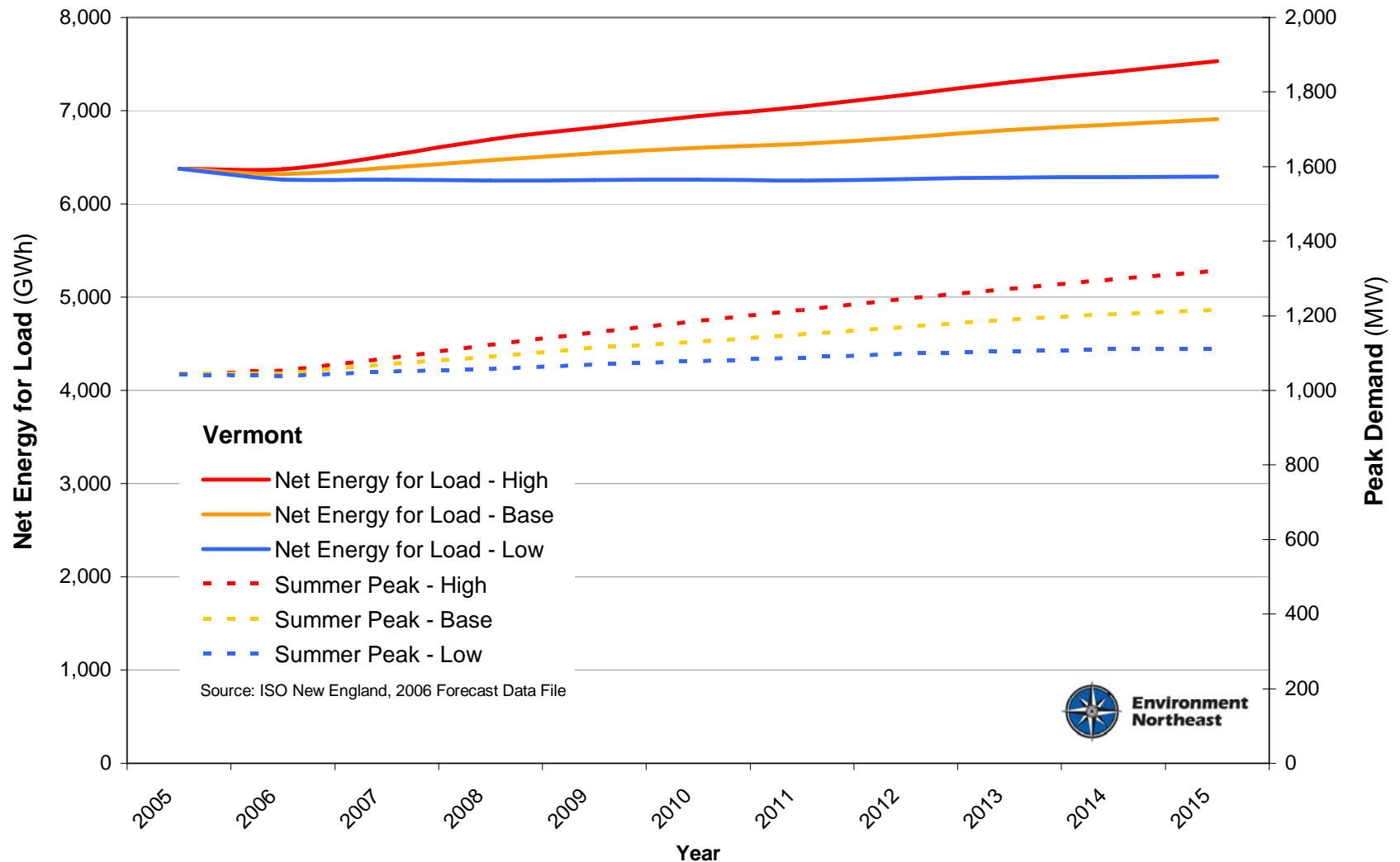
Total Revenue - 1 Year of Program Activities (Million \$)	\$9	\$16
NPV Revenue - 1 Year - 9% Discount Rate (Million \$)	\$5	\$8
Percent of Total Program Cost (NPV Revenue/Cost)	22%	37%

FCM Price Forecast
from Synapse Energy Economics

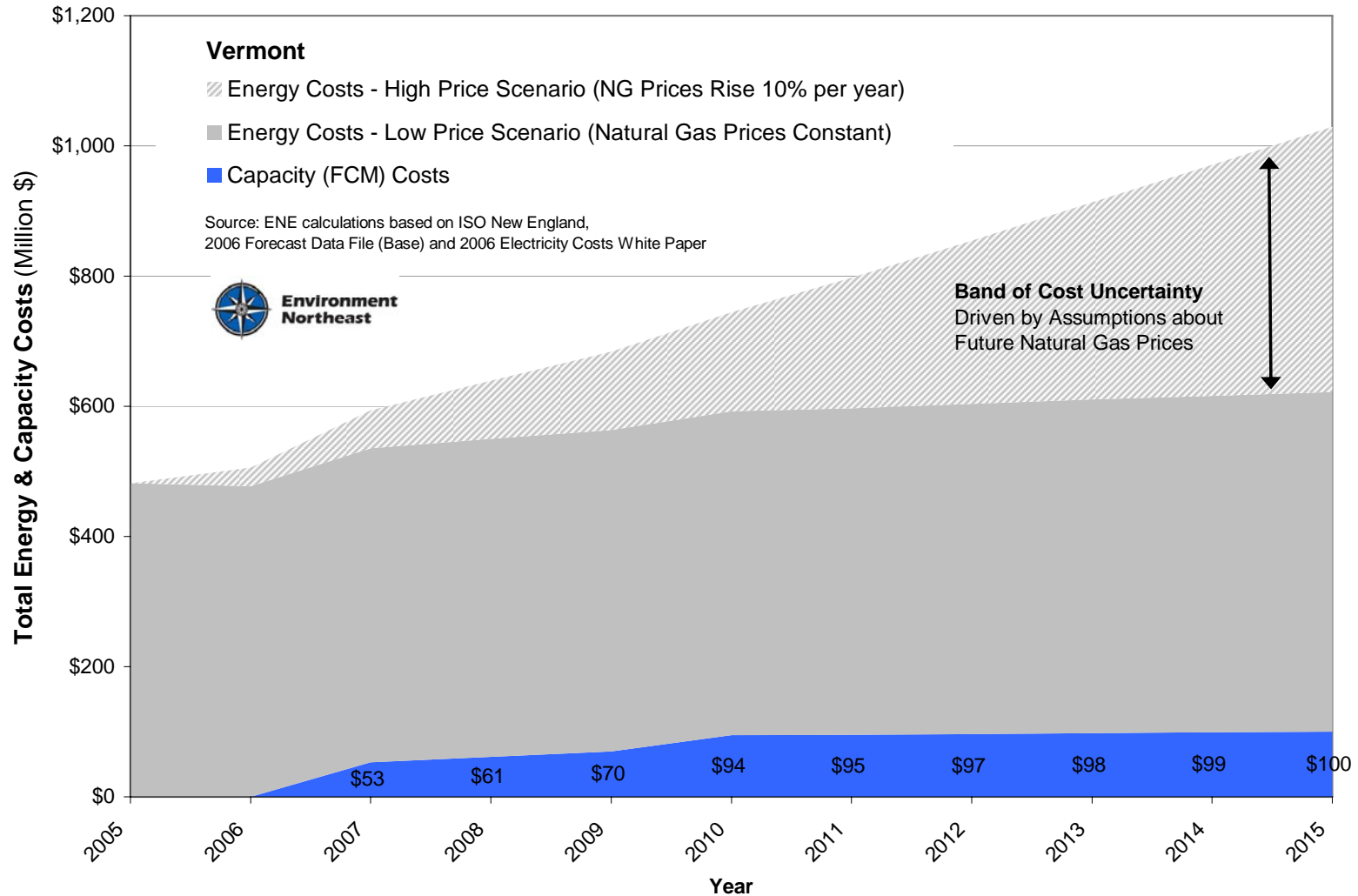
Rhode Island – Potential Payments to Existing Efficiency Programs



Vermont – Load and Demand Forecast (ISO-NE)



Vermont – Forecast of Energy & Capacity Costs (Based on ISO-NE)



Vermont – Potential Payments to Existing Efficiency Programs



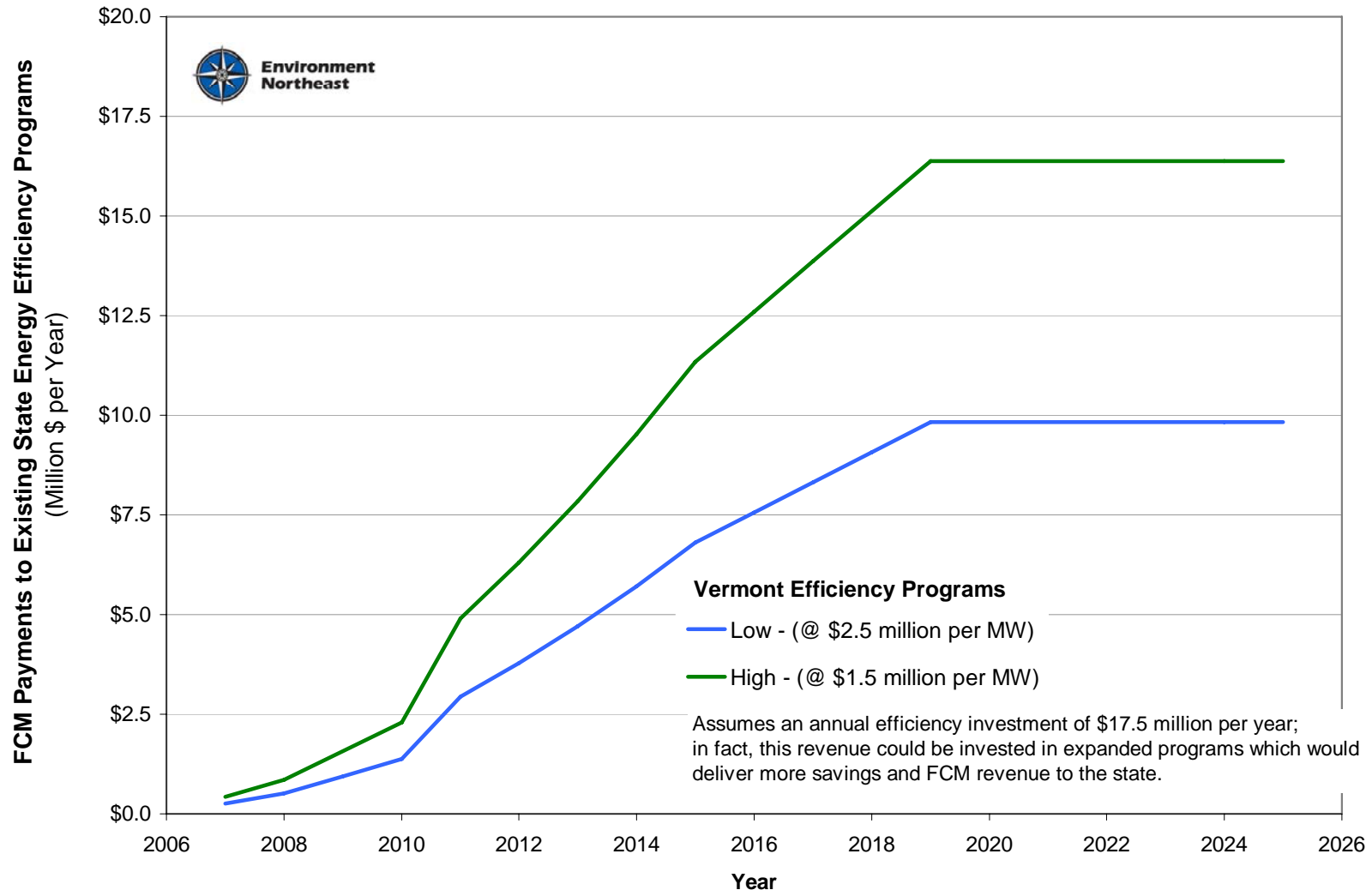
State	EE Funding Level (Mills/kWh)	Budget (Million \$ per Year)	Potential Demand Savings per Year (MW)	
			Low - (@ \$2.5 million per MW)	High - (@ \$1.5 million per MW)
Vermont	2.5	17.5	7.0	11.7

Year	# Years of Savings	FCM Payment Type	FCM Payment (\$/kW-Month)	Flow of Payments (Million \$)			
				1 Year Investment		Cumulative Revenue	
				Low	High	Low	High
2007	1	TCP	\$3.05	\$0.3	\$0.4	\$0.3	\$0.4
2008	2	TCP	\$3.05	\$0.3	\$0.4	\$0.5	\$0.9
2009	3	TCP	\$3.75	\$0.3	\$0.5	\$0.9	\$1.6
2010	4	TCP	\$4.10	\$0.3	\$0.6	\$1.4	\$2.3
2011	5	FCM	\$7.00	\$0.6	\$1.0	\$2.9	\$4.9
2012	6	FCM	\$7.50	\$0.6	\$1.1	\$3.8	\$6.3
2013	7	FCM	\$8.00	\$0.7	\$1.1	\$4.7	\$7.8
2014	8	FCM	\$8.50	\$0.7	\$1.2	\$5.7	\$9.5
2015	9	FCM	\$9.00	\$0.8	\$1.3	\$6.8	\$11.3
2016	10	FCM	\$9.00	\$0.8	\$1.3	\$7.6	\$12.6
2017	11	FCM	\$9.00	\$0.8	\$1.3	\$8.3	\$13.9
2018	12	FCM	\$9.00	\$0.8	\$1.3	\$9.1	\$15.1
2019	13	FCM	\$9.00	\$0.8	\$1.3	\$9.8	\$16.4
2020	13	FCM	\$9.00			\$9.8	\$16.4
2021	13	FCM	\$9.00			\$9.8	\$16.4
2022	13	FCM	\$9.00			\$9.8	\$16.4
2023	13	FCM	\$9.00			\$9.8	\$16.4
2024	13	FCM	\$9.00			\$9.8	\$16.4
2025	13	FCM	\$9.00			\$9.8	\$16.4

Total Revenue - 1 Year of Program Activities (Million \$)	\$8	\$13
NPV Revenue - 1 Year - 9% Discount Rate (Million \$)	\$4	\$6
Percent of Total Program Cost (NPV Revenue/Cost)	22%	37%

FCM Price Forecast
from Synapse Energy Economics

Vermont – Potential Payments to Existing Efficiency Programs



Potential FCM Payments to Existing Efficiency Programs

Cummulative FCM Payments by 2020 (Million \$)

State	Low	High
Connecticut	34.8	57.9
Maine	6.0	9.9
Massachusetts	67.4	112.3
New Hampshire	9.3	15.4
Rhode Island	12.2	20.3
Vermont	9.8	9.8
New England Total	139.4	225.8

Note: assumes no reinvestment or expansion of EE programs



**Environment
Northeast**

Contact Information

Derek K. Murrow, Director of Policy Analysis
(203) 495-8224, dmurrow@env-ne.org

Roger Koontz, Senior Attorney
(860) 526-4852, rkoontz@env-ne.org



**Environment
Northeast**

101 Whitney Avenue
New Haven, CT 06510
(203) 495-8224

Rockport, ME / Portland, ME / Boston, MA / Hartford, CT

www.env-ne.org