

NAVIGANT

ENERGY

Benchmarking 2012 Demand Side Management Results for Efficiency Vermont and Burlington Electric Department – Specialized Analysis

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VT Public Service Department*

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For the specialized analysis, Navigant benchmarked 2012 EE data for six investor-owned utilities (IOUs) and agencies and four municipal/cooperative utilities in seven states. Navigant utilized NEEP's Regional Energy Efficiency Database (REED) for the northeastern utilities' data <http://www.neep-reed.org/>.

State	Organization	IOU/State Agency	Muni/Coop
VT	Efficiency Vermont (EVT-N)	X	
	Burlington Electric Department (BED-N)		X
CT	Connecticut Light & Power (CL&P-N)	X	
	Connecticut Munciple Electric Energy Cooperative (CMEEC-N)		X
MA	National Grid (NGrid-N)	X	
	NSTAR-N	X	
MD	Souther Maryland Energy Cooperative (SMECO-N)		X
ME	Efficiency Maine (EME-N)	X	
MN	Moorhead-N		X
NH	Public Service of New Hampshire (PSNH-N)	X	

Navigant's specialized benchmarking data collection process

- » The Specialized analysis excludes savings and spending on demand response, low income, fuel switching, behavioral, market transformation, and codes and standards programs.
- » Program and utility data from 2012 were collected from publicly available sources supplemented by targeted e-mail requests as necessary.
 - A subset of 10 utilities from the 2012 standard benchmarking analysis were chosen to benchmark in the specialized analysis
 - Emails were sent to utilities to fill identified data gaps.
- » Portfolio savings and spending were normalized to enable comparisons.
 - 2012 Electric EE savings and spending were normalized for the same program year baseline sales and revenue.
 - Revenue and sales volume data for EVT exclude revenue and sales from C&I Opt-out customers. We are uncertain of opt-out revenue and sales for other utilities.
- » Wherever possible, Navigant collected savings that were at the generator and gross.
 - If savings for a utility were reported at the meter, Navigant estimated generator savings by applying the reported line-loss factor.

2012 Specialized Benchmarking Data Caveats

- » EVT's baseline retail kWh sales excludes opt out sales and revenue for IBM and OMYA
- » Using DSM reports for National Grid (MA), Efficiency Maine Trust (EME), and CMEEC (CT)
 - National Grid (MA) is made up of Nantucket Electric and Massachusetts Electric. Only Massachusetts Electric is included in REED (not Nantucket Electric) so we are using National Grid's DSM report which includes both utilities.
 - CMEEC (CT) – not included in REED
 - EME – not included in 2012 REED data.
- » Savings and Spending for the following programs were excluded in this analysis
 - Demand Response
 - Low Income
 - Fuel Switching
 - Market Transformation
 - Behavioral
 - Codes and Standards

Benchmarking is not a horse race.

- » Given the variation in program offerings, deemed savings values and reporting practices across EE portfolios, no benchmarking can achieve a strict apples-to-apples comparison.
- » The usual caveats apply to any accounting information: different organizations aggregate and allocate costs differently (e.g., Key Account manager time), so these results can only be taken as indicative, particularly regarding the cost per first year kWh saved
- » Benchmarking is, however, useful to identify which organizations and programs merit being analyzed more closely.
- » Benchmarking is not a substitution for a process evaluation – it shows what utilities are achieving in terms of energy and demand savings and what they're spending on programs to achieve these savings but to derive meanings/conclusions from this data is challenging to do.
- » This benchmarking analysis is the 2012 specialized analysis. Navigant also interviewed five utilities to determine what they believe to be key factors of their performance.

Levelized Cost of Energy Savings and Cost of Lifetime Savings

- » Navigant provided benchmarking comparison on a levelized cost basis according to the following formula, which is consistent with the methodology used in the REED database.*

Levelized Cost of saved energy (CSE)

1. Cost of Saved Energy (in \$/kWh) = $(C \times 10^6) \times (\text{Capital Recovery Factor}) / (D \times 10^3)$

2. Capital Recovery Factor = $[A \times (1+A)^B] / [(1+A)^B - 1]$

Where:

A = Discount rate study (2.48%- AESC study)

B = Estimated measure life in years (total lifetime savings/total annual savings- from REED or utility reports)

C = Total program cost in millions of dollars

D = Total MWh saved that year by the energy efficiency program

- » Navigant also provided benchmarking comparison on the cost of lifetime savings where we took annual DSM spending reported for each utility divided by lifetime savings reported for each utility (where available).

* Personal communication with Cecliy McChalicher, NEEP, June 16, 2013

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2012 Overall Electric Specialized Benchmarking Results

	Spending as % of Revenue	Energy Savings as % of Sales	Summer Peak Demand Savings as % of Peak Demand	Retail Cost of Energy \$/kWh	Cost of First Year Savings		Levelized Cost of Energy Savings \$/kWh	Cost of Lifetime Savings \$/kWh
					\$/kWh	\$/kW		
All Benchmarked Median	2.7%	1.7%	0.9%	\$0.12	\$0.25	\$1,825	\$0.03	\$0.02
EVT	4.0%	2.4%	1.3%	\$0.15	\$0.24	\$1,705	\$0.03	\$0.02
BED	3.6%	1.9%	1.2%	\$0.14	\$0.26	\$2,254	\$0.03	\$0.02

EVT's Statistics Including Opt-Out Customers

	Spending as % of Revenue	Energy Savings as % of Sales	Summer Peak Demand Savings as % of Peak Demand	Retail Cost of Energy \$/kWh	Cost of First Year Savings		Levelized Cost of Energy Savings \$/kWh	Cost of Lifetime Savings \$/kWh
					\$/kWh	\$/kW		
EVT	3.7%	2.1%	1.2%	\$0.14	\$0.24	\$1,704	\$0.03	\$0.02

The following utilities were picked to participate in interviews because they achieved above median energy savings at near median costs in one or more of the sectors. The next two slides summarize their explanations for their performance.

- » EVT
- » BED
- » EME
- » CL&P
- » NSTAR (MA)

Key Successes

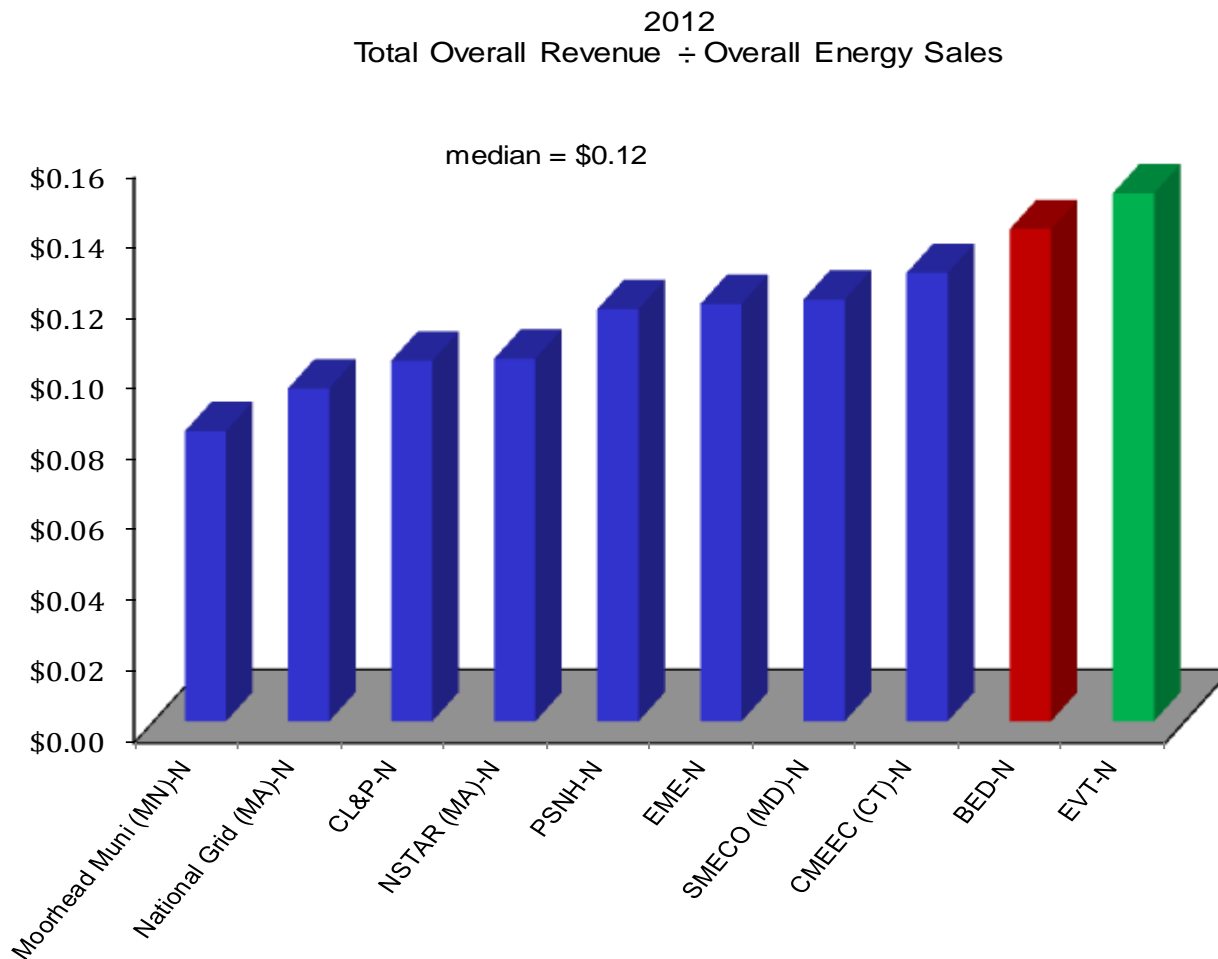
- » Efficiency Vermont (EVT)
 - Major factors that influenced 2012 results date back to 2009 “Great Recession”. EVT underspent budgets by 10-15% in 2009 given low demand for EE and was not achieving savings targets. To meet the three year performance target- EVT ramped up incentive levels and outreach in 2010 and 2011- and successfully achieved goals, but at a high cost. For 2012-primarily a budget conscious, cost-cutting, year.
- » Burlington Electric Department (BED)
 - Their Retail products program contributed to their high residential program savings. Ten percent of CFL upstream bulbs are assigned commercial savings from the TRM but tracked within the Retail Products program. Eight percent of total statewide EVT Retail Product sales are deemed to BED based on historical coupon rebate records
- » Efficiency Maine (EME)
 - They prioritized low-cost EE resource acquisition in 2012. Their philosophy was to save as much as possible, at the lowest cost. Comprehensive (and more expensive) savings were not prioritized in 2012.
 - Dropping marketing expenditures and focusing simply on higher rebates for the residential lighting program was successful in significantly increasing sales.

Key Successes

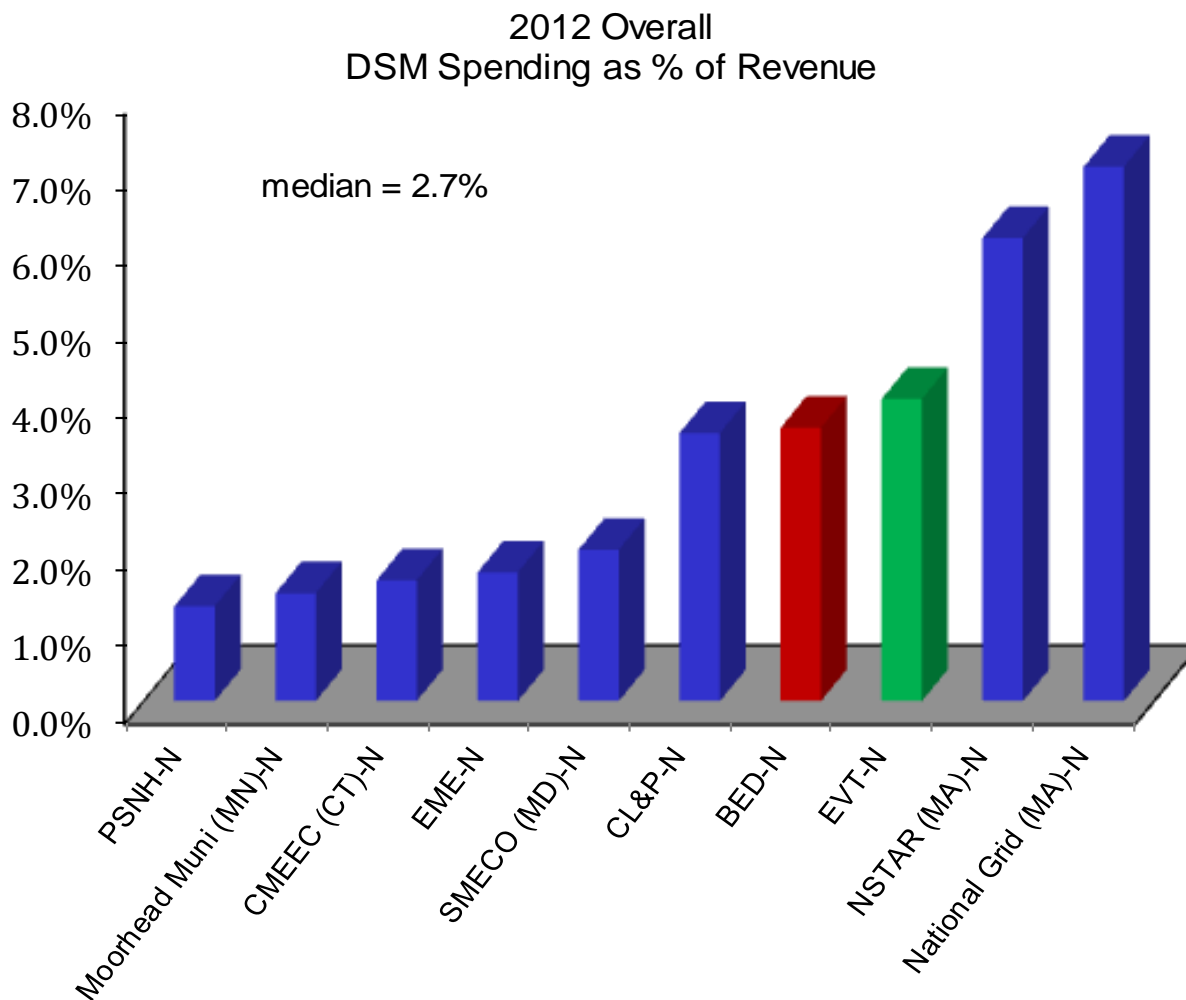
- » Connecticut Light and Power (CL&P)
 - Their residential retail lighting program, residential new construction program, and C&I large retrofit program contributed to their success.
 - They also attributed their successful performance to their Home Energy Solutions program - \$75 customer cost for a home energy audit and immediate direct install of CFLs as well as blower door guided air sealing, duct sealing, low flow shower heads and facet aerator as well as the recommendation of add on measures for additional energy savings. CL&P contracts with a pre-qualified group of trade ally vendors for this service through an RFP process.

- » NSTAR (MA)
 - They attribute their success based on their overall focus on “go-to-market” strategies in which customers are researched extensively and offered tailored participation options, including comparative benchmarks (e.g. comparing peer group building types or business types energy consumption).
 - Statewide in MA, residential customers receive generous rebates. For example, free home energy audit with direct install and free air-sealing. Additional incentives provided for insulation, up to 75% of installed cost capped at \$2,000. This statewide program and generous incentives account for higher than median residential savings costs.

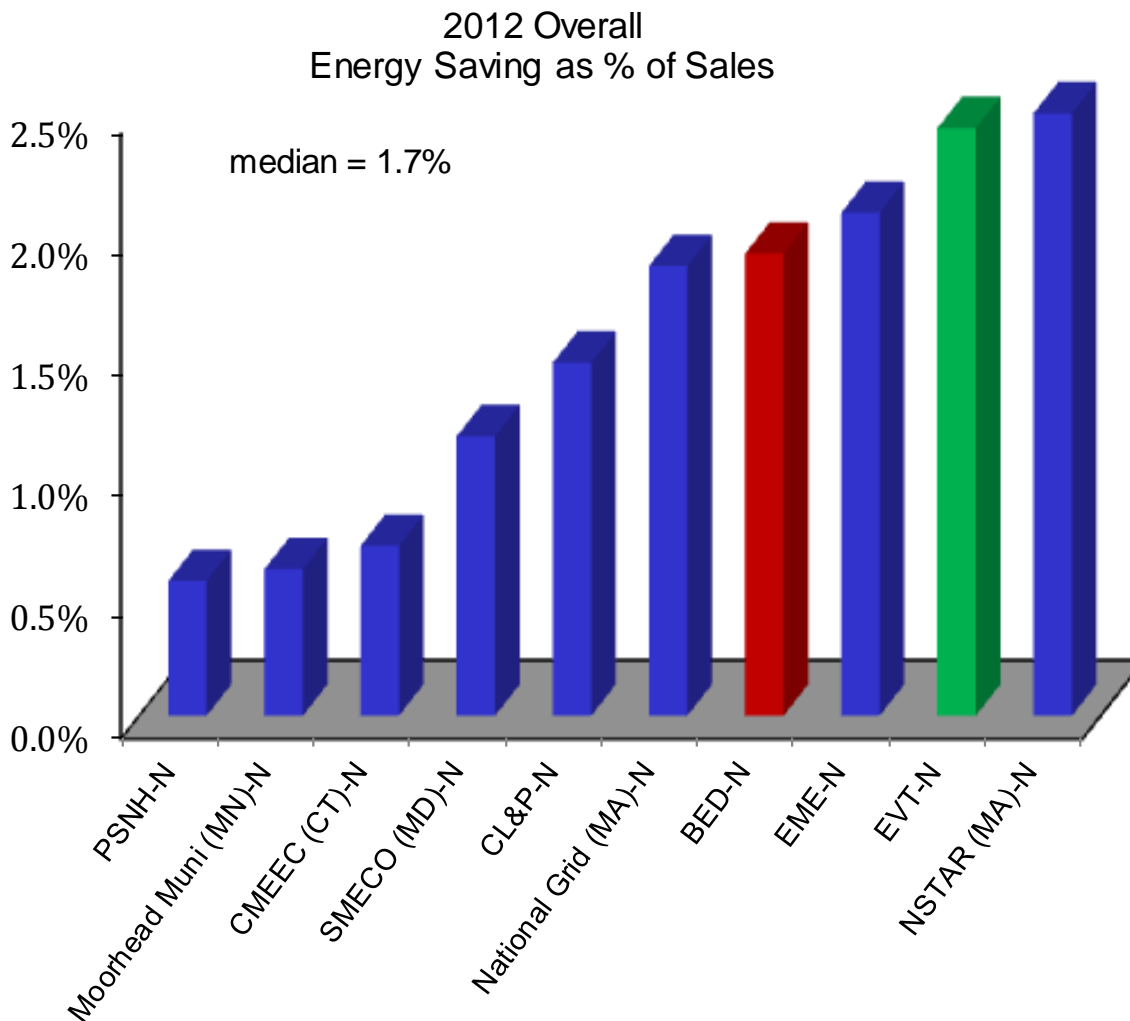
The overall cost of retail electricity in 2012 for customers receiving EE programs from EVT and BED are the highest among the group with the median being \$0.12/kWh.



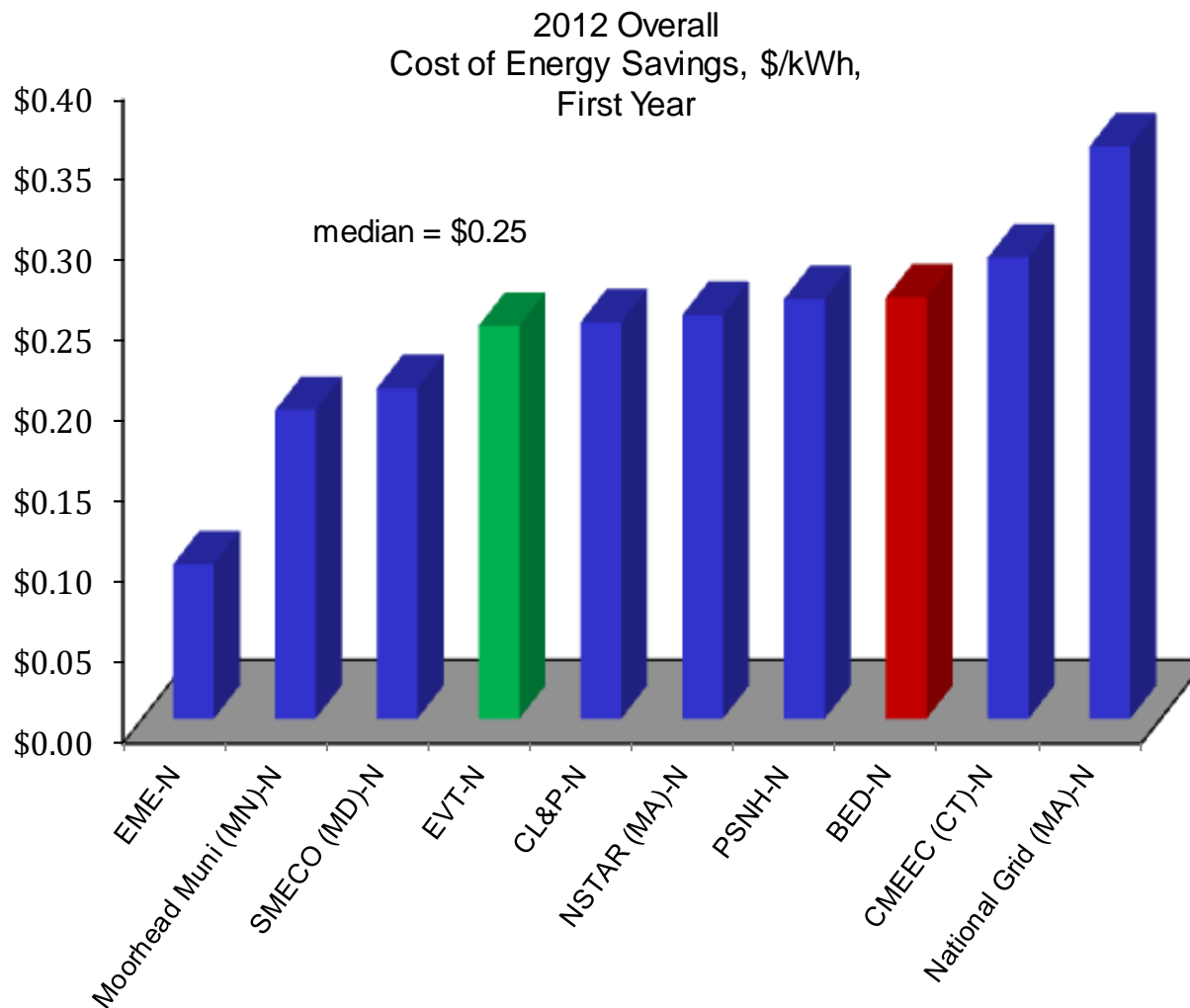
EVT's and BED's overall spending as a percentage of revenue are 4.0% and 3.6%, respectively, which are above the median of 2.7% of revenue.



EVT's and BED's overall energy savings as a percentage of sales are 2.4% and 1.9%, respectively, which are also above the median (1.7% of sales).



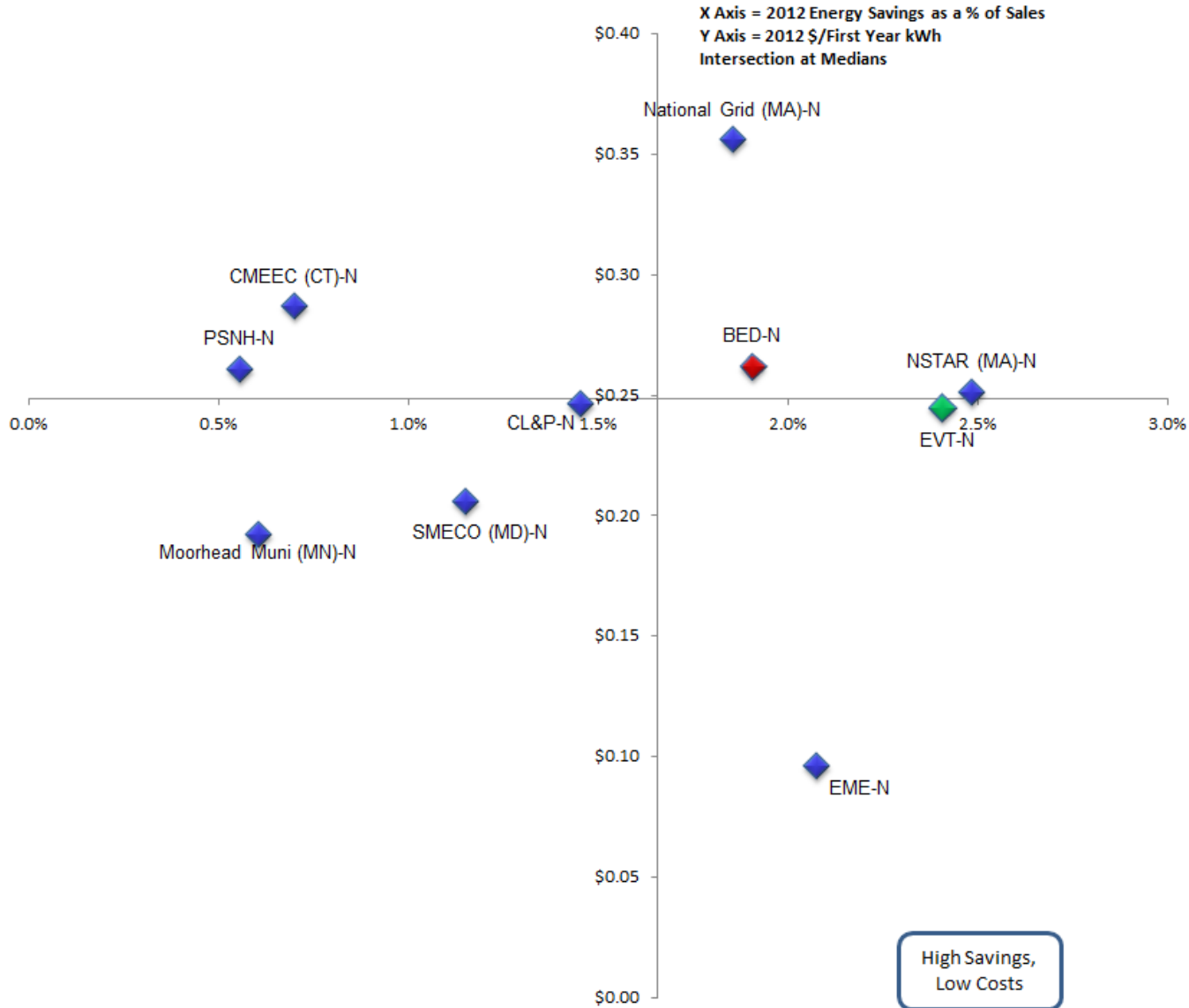
EVT's overall first year costs of energy savings is \$0.24/kWh which is just below the median of \$0.25/kWh while BED's is just above the median at \$0.26/kWh.



2012 Overall Energy Savings as % of Sales and Cost of First Year Energy Savings, \$/kWh – Scatter Plot

- » For the organizations reviewed, the scatter plot illustrates where each organization falls relative to median energy savings and median costs of savings.
- » Energy savings as a percentage of sales is on the horizontal axis; first year cost of energy savings is on the vertical axis; and the axes are set at the median values.
- » Thus, the organizations in the bottom right quadrant are the ones that achieved above median energy savings at costs below the median, i.e., high savings, low costs.

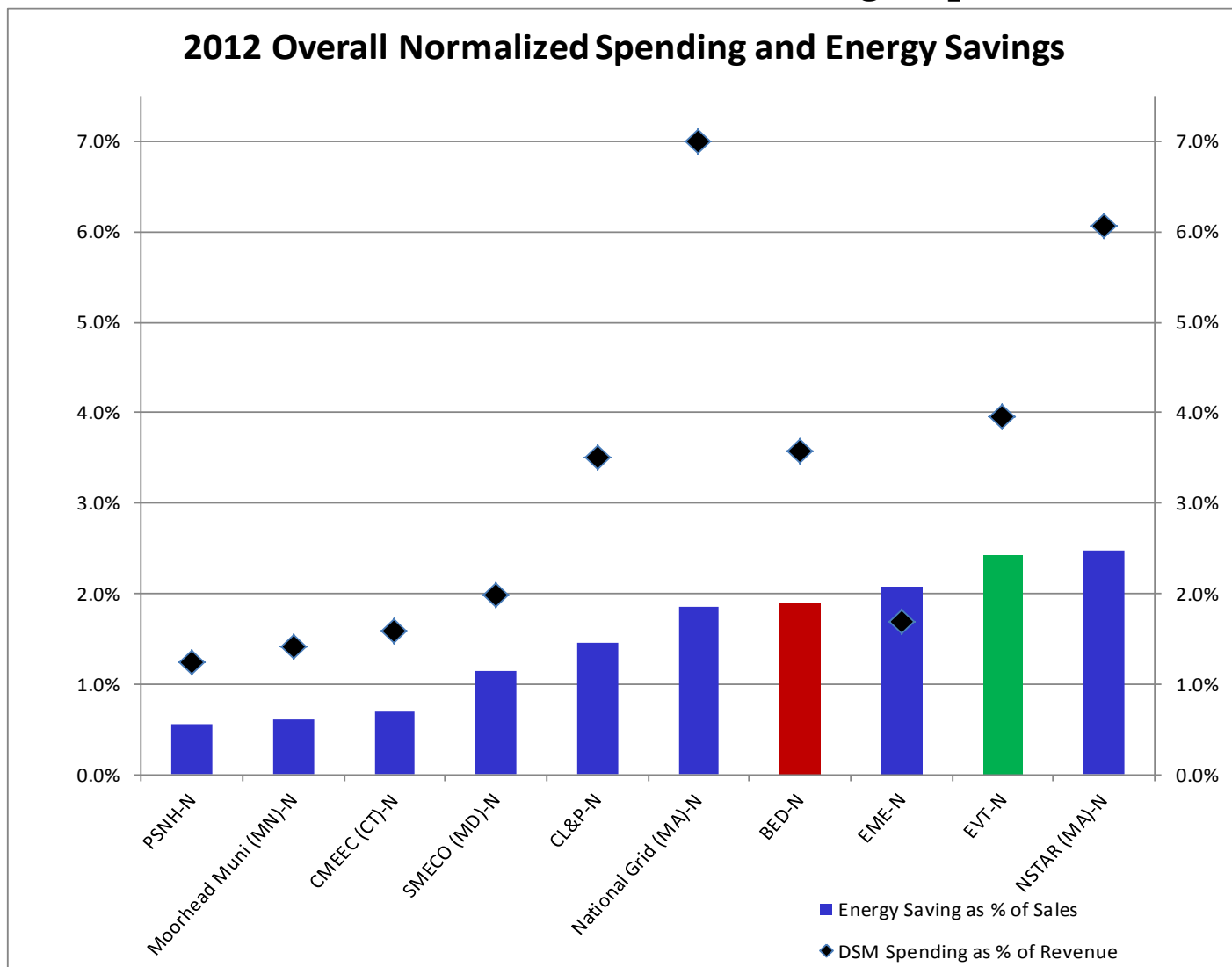
2012 Overall Energy Savings as % of Sales and Cost of First Year Energy Savings, \$/kWh



Overall Spending as % of Revenue and Energy Savings as % of Sales – Bar Chart

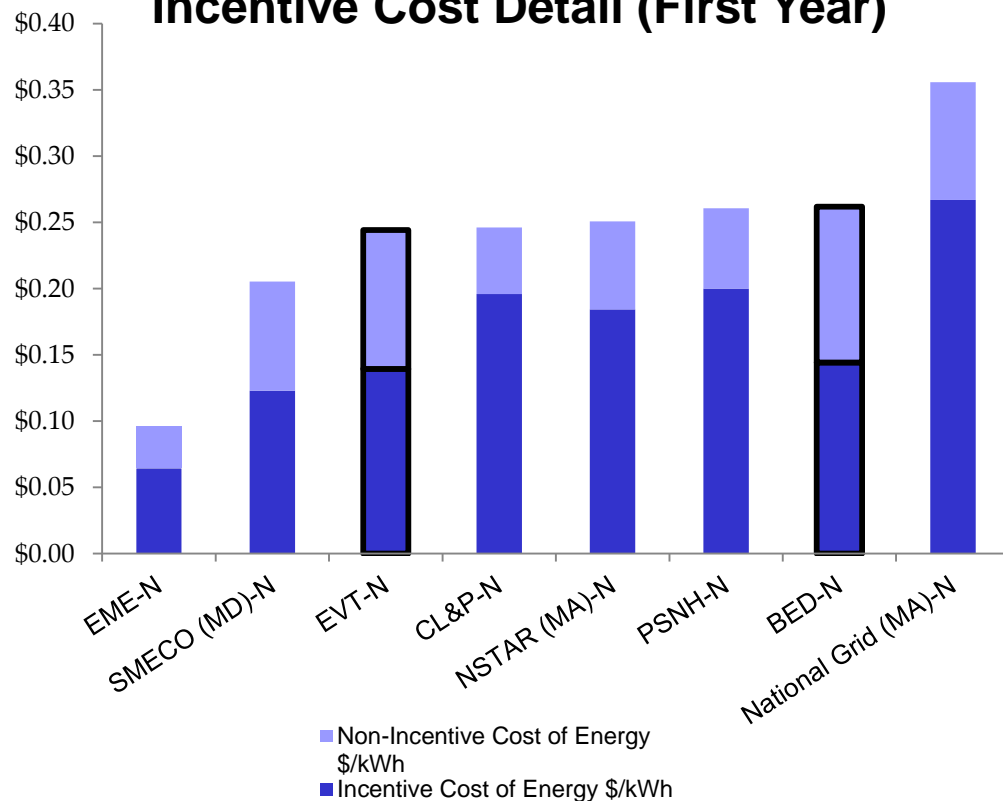
- For the organizations reviewed, the bar chart illustrates what each organization is achieving in terms of spending as a percentage of revenue and energy savings as a percentage of sales.
- The higher the location of the diamond, the larger the spending as a percent of revenue and the wider the spread between the diamond and bar chart, the more expensive the savings.

In 2012, EVT's ratio of overall spending as a percentage of revenues and annual energy savings as a percentage of sales is 1.6 to 1 while BED's 1.9 to 1. The median ratio of the benchmarked utilities is 1.7 to 1. EVT is achieving savings at a cost that is more efficient than the median of the group.



About 56% of EVT’s and BED’s overall budget is spent on incentives while the median of the group is 70%.

2012 Total Portfolio Incentive/Non-Incentive Cost Detail (First Year)

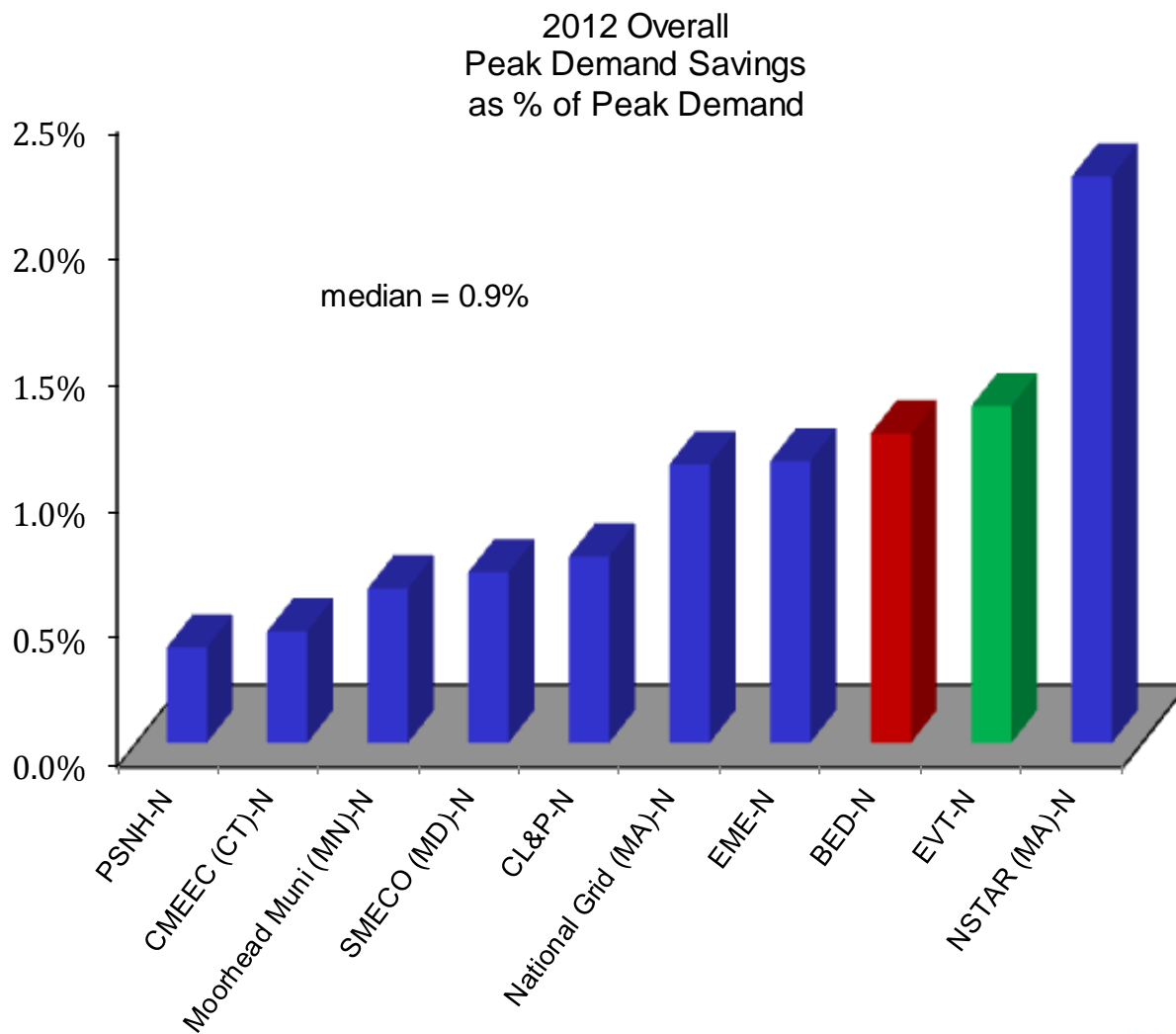


	Incentive		Non-Incentive		Total
	\$/kWh	% of Total	\$/kWh	% of Total	\$/kWh
All Region Median	\$0.16	70%	\$0.07	30%	\$0.23
EVT	\$0.14	57%	\$0.10	43%	\$0.24
BED	\$0.14	55%	\$0.12	45%	\$0.26

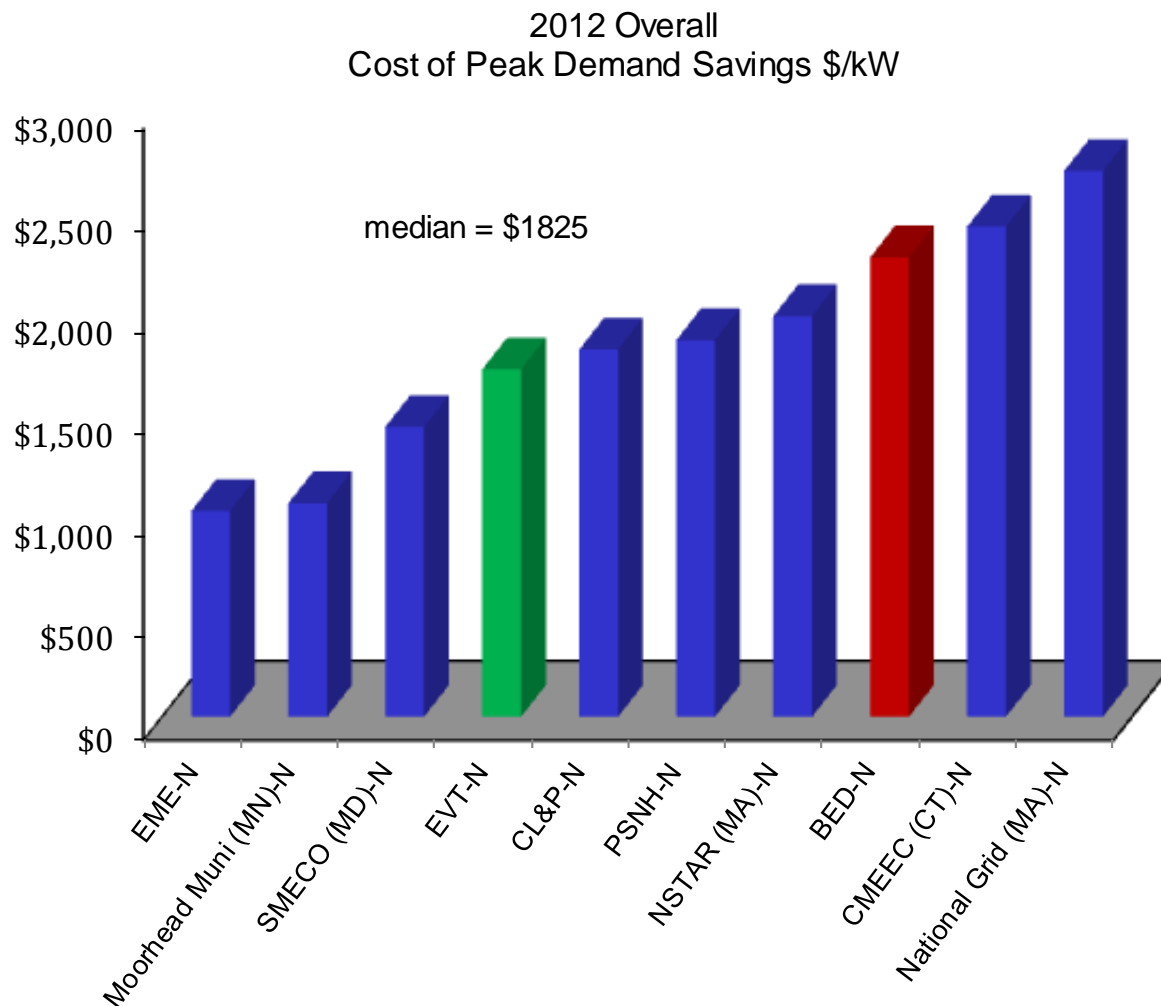
EVT’s technical assistance costs were about 16% of their total program costs. When these costs are added to the incentives, it shows about 72% of the EEC budget is used for direct customer benefits. BED’s technical assistance costs were about 24% of their total program costs. When these costs are added to incentives, it shows about 83% of the EEC budget is used for direct customer benefits. It should be noted that we do not know the % spent on technical assistance for the other utilities benchmarked.

Incentive/Non-incentive cost detail was not available for Moorhead (MN) and CMEEC (CT) so they are not included in any of the Incentive/Non-incentive graphics/statistics throughout the report.

EVT's and BED's overall peak demand savings as a percentage of peak demand are 1.3% and 1.2%, respectively, which are above the median of 0.9% of peak demand.



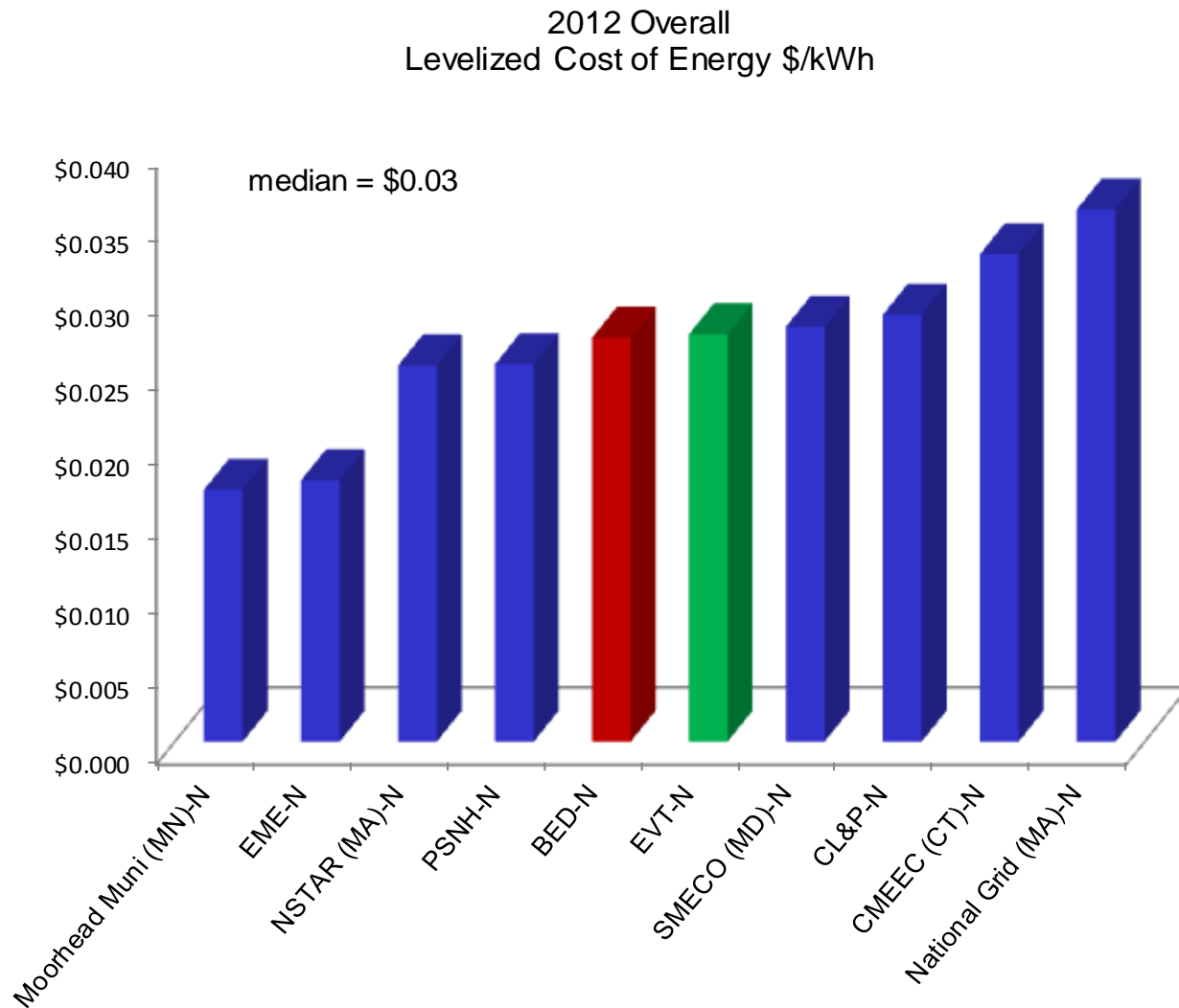
While EVT's overall cost of peak demand savings is \$1,705/kW which is below the median of \$1,825/kW, BED's cost of peak demand savings is above the median at \$2,254/kW.



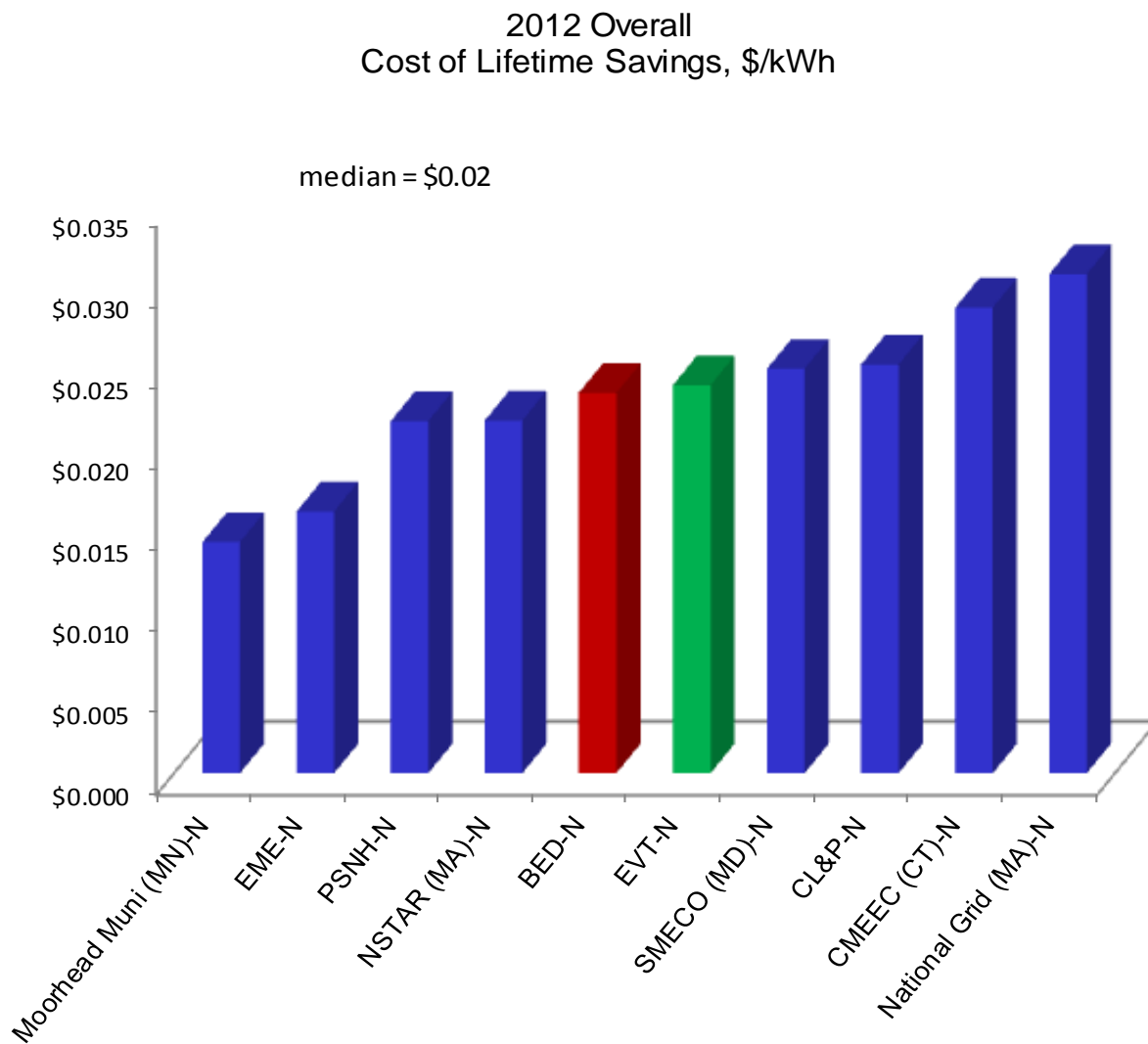
2012 Overall Summer Peak Demand Savings as % of Peak Demand and Cost of Summer Peak Demand Savings, \$/kW



EVT's and BED's overall levelized cost of energy savings are at the median of \$0.03/kWh.



EVT's and BED's overall cost of lifetime energy savings are at the median of \$0.02/kWh.



Summary of EVT's and BED's 2012 Total Portfolio Performance

Summary of EVT's and BED's Total Portfolio Performance	
EE Spending	EVT achieved total EE spending of 3.9% and BED achieved total EE spending of 3.6% (as a % of total revenue) in 2012 which are above the median of the group's at 2.7% of total revenue.
EE Savings	EVT achieved total energy savings of 2.4% and BED achieved total energy savings of 1.9% (as a % of total sales) in 2012 which are above the median of the group's at 1.6% of total sales.
EE First Year Costs	EVT's total energy savings cost of 24 ¢/kWh (first year costs) is below the median of the group's cost of energy savings at 25 ¢/kWh while BED's total energy savings cost of 26¢/kWh is slightly above the median.
EE Levelized Costs	EVT's and BED's total levelized cost of energy are \$0.03/kWh which are at the median.
EE Cost of Lifetime Savings	EVT's and BED's total cost of lifetime savings are \$0.02/kWh which are at the median.

EVT's findings in this slide exclude opt-out customers.

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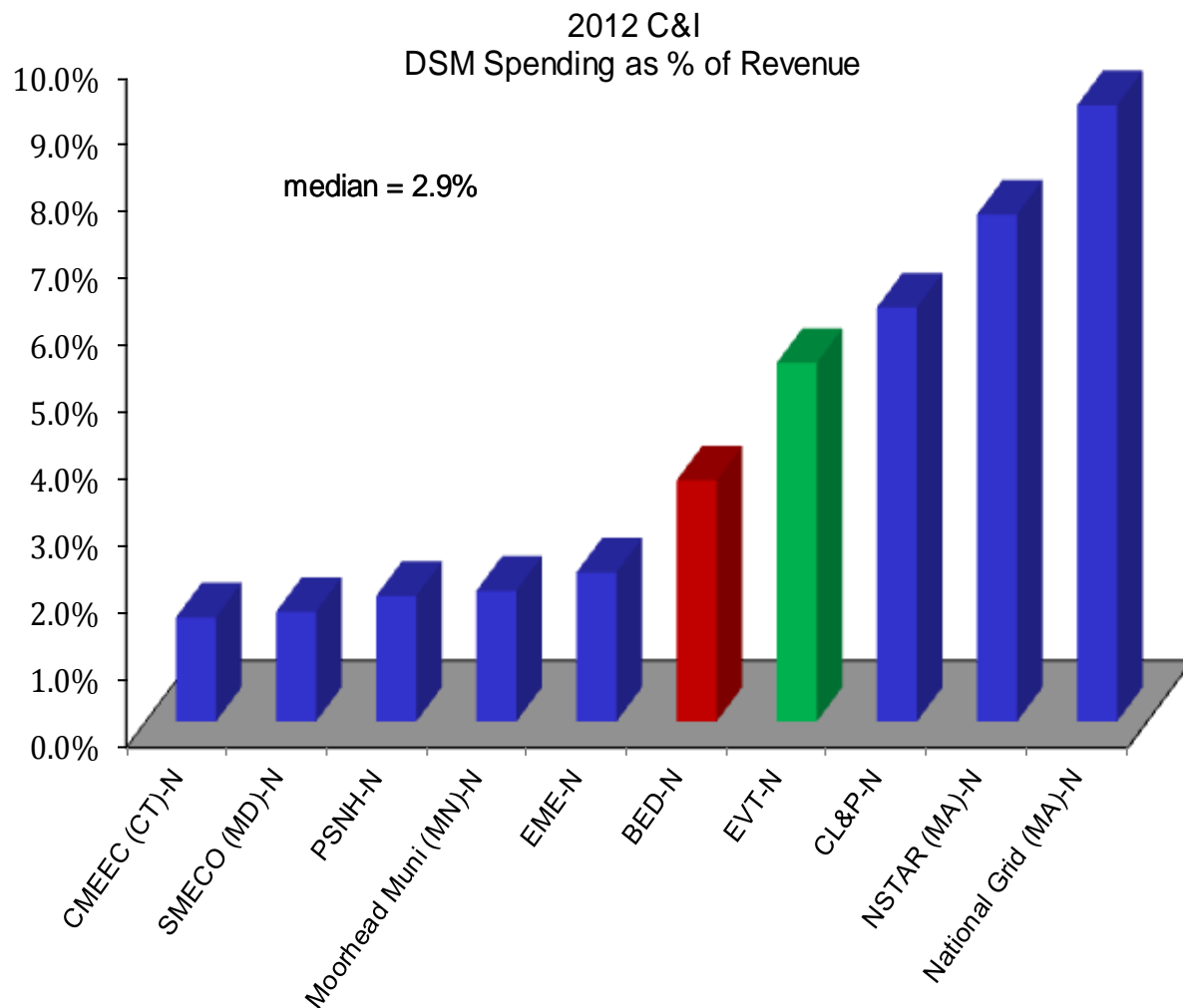
2012 C&I Electric Specialized Benchmarking Results

	Spending as % of Revenue	Energy Savings as % of Sales	Summer Peak Demand Savings as % of Peak Demand	Cost of First Year Savings		Levelized Cost of Energy Savings	Cost of Lifetime Savings
				\$/kWh	\$/kW	\$/kWh	\$/kWh
All Benchmarked Median	2.9%	1.4%	1.0%	\$0.26	\$1,805	\$0.03	\$0.02
EVT	5.4%	2.8%	1.5%	\$0.26	\$1,872	\$0.02	\$0.02
BED	3.6%	1.6%	1.4%	\$0.31	\$1,901	\$0.03	\$0.02

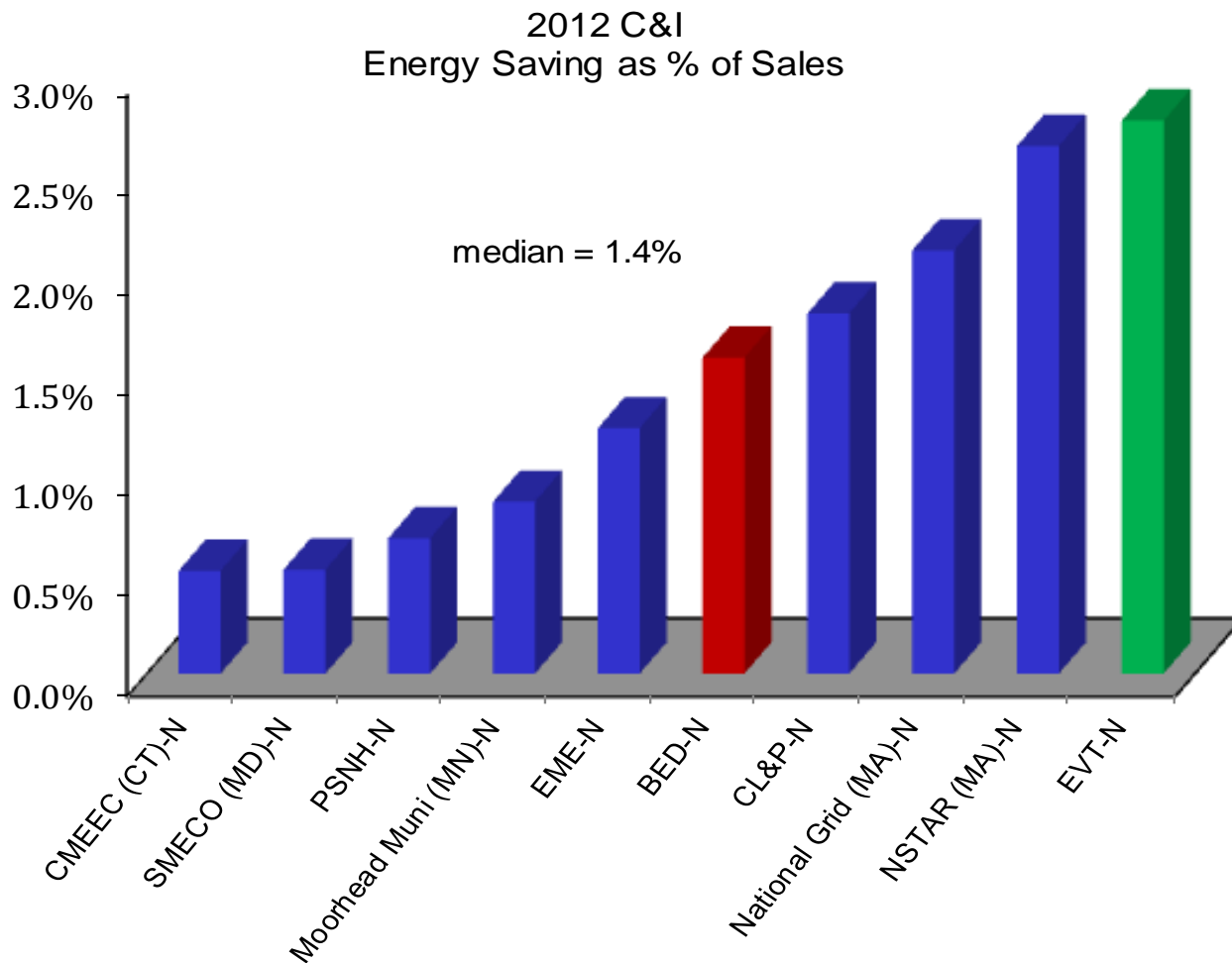
EVT's Statistics Including Opt-Out Customers

	Spending as % of Revenue	Energy Savings as % of Sales	Summer Peak Demand Savings as % of Peak Demand	Cost of First Year Savings		Levelized Cost of Energy Savings	Cost of Lifetime Savings
				\$/kWh	\$/kW	\$/kWh	\$/kWh
EVT	4.7%	2.2%	1.5%	\$0.26	\$1,872	\$0.02	\$0.02

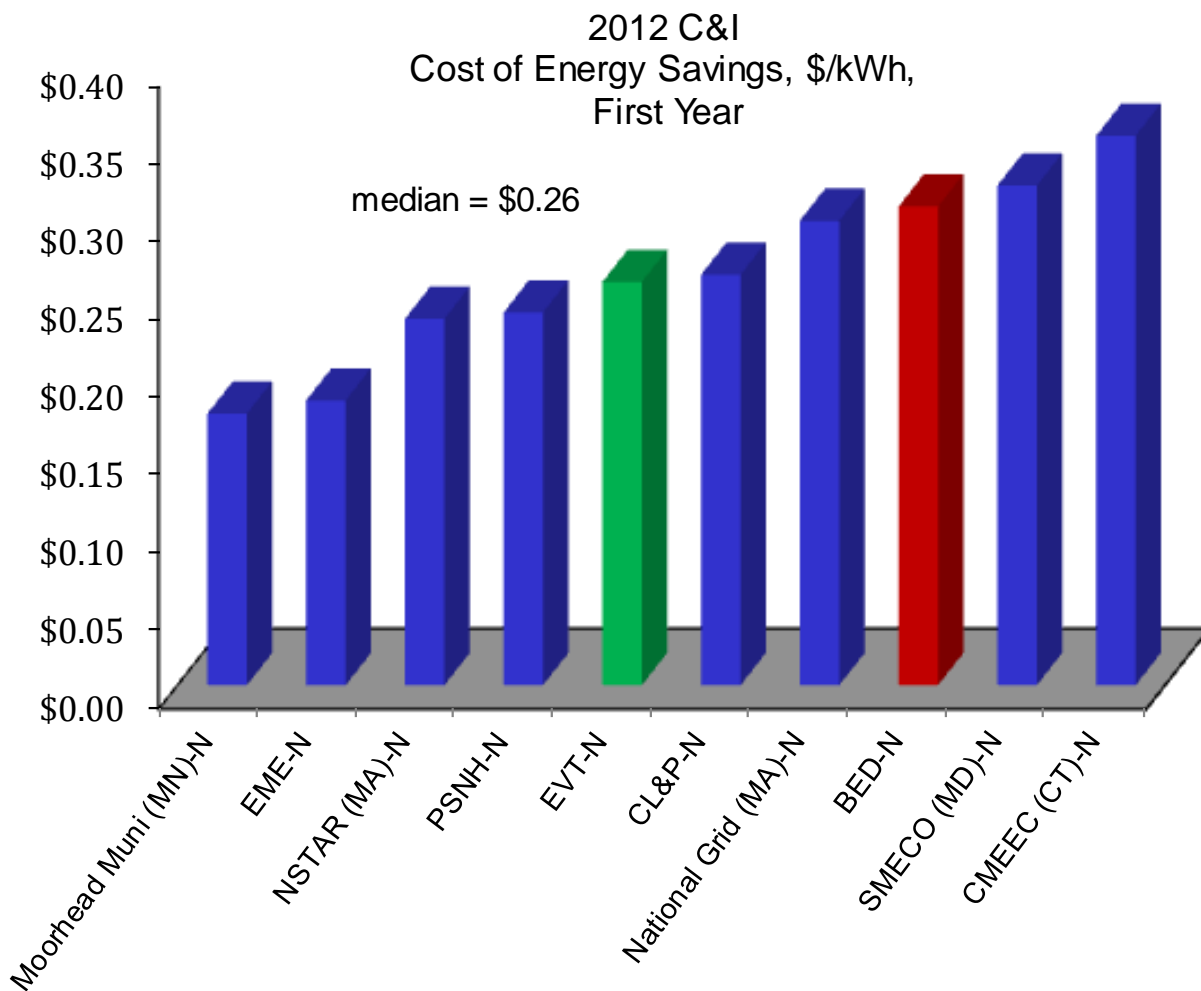
EVT's and BED's C&I spending as a percentage of revenue are 5.4% and 3.6%, respectively, which are above the median of 2.9% of revenue.



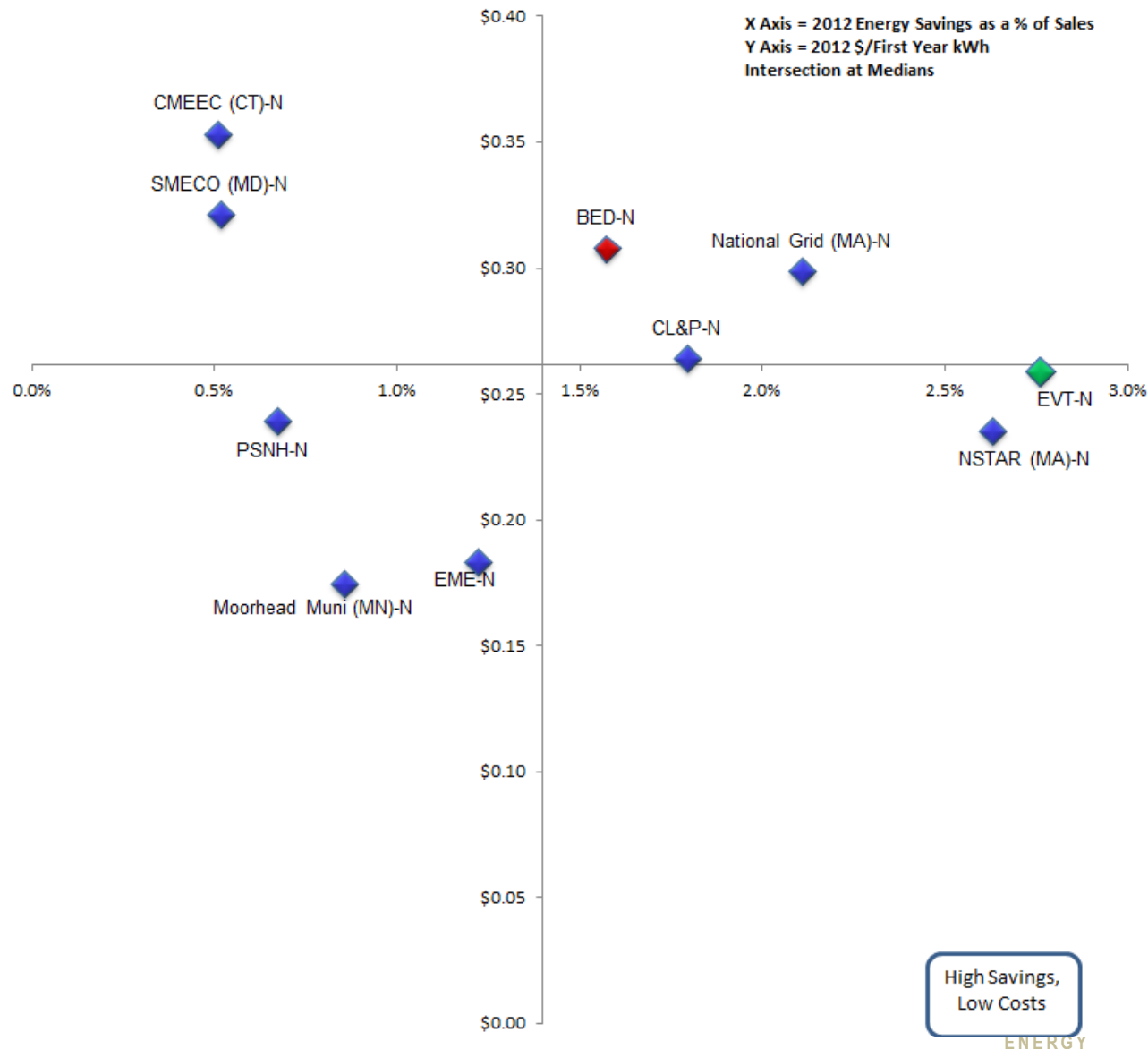
EVT and BED's C&I energy savings as a percentage of sales are 2.8% and 1.6%, respectively, which are also above the median (1.4% of sales).



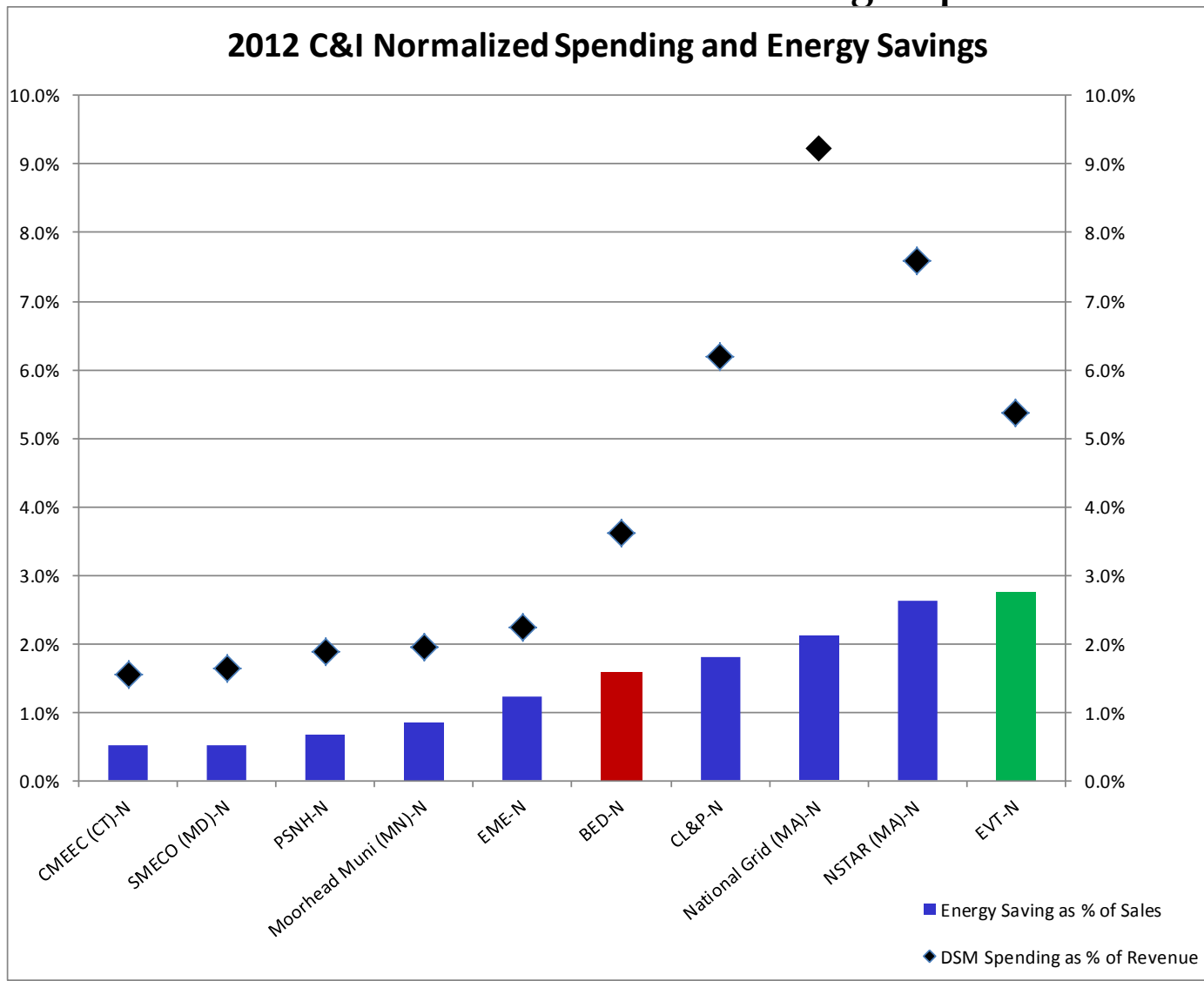
EVT's C&I cost of energy savings (first year) is \$0.26/kWh which is the median while BED's is above median at \$0.31/kWh.



2012 C&I Energy Savings as % of Sales and Cost of First Year Energy Savings, \$/kWh

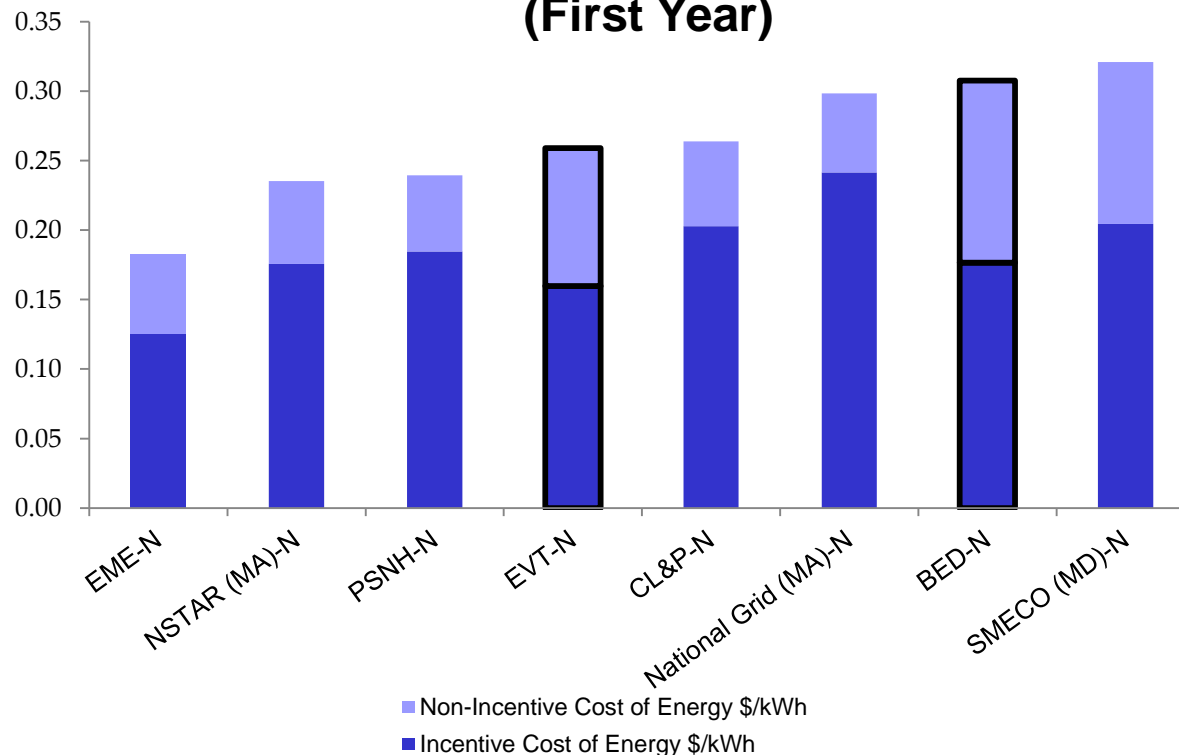


In 2012, EVT's ratio of C&I spending as a percentage of revenue to annual energy savings as a percentage of sales is 1.9 to 1 while BED's is 2.3 to 1. The median ratio of the benchmarked utilities is 2.1 to 1. EVT is achieving savings at a cost that is more efficient than the median of the group.



EVT's and BED's C&I spending on incentives (62% and 57%, respectively) are less than the median of the group's (72%).

**2012 C&I Incentive/Non-Incentive Cost Detail
(First Year)**



	Incentive		Non-Incentive		Total \$/kWh
	\$/kWh	% of Total	\$/kWh	% of Total	
All Region Median	\$0.18	72%	\$0.06	28%	\$0.24
EVT	\$0.16	62%	\$0.10	38%	\$0.26
BED	\$0.18	57%	\$0.13	43%	\$0.31

EVT's and BED's Existing Buildings programs' energy savings as a percentage of sales are among the highest compared to the other utilities' retrofit programs.

C&I Energy Savings as Percentage of Sales by Program

C&I										
	EVT-N	BED-N	CL&P-N	CMEEC (CT)-N	EME-N	Moorhead Muni (MN)-N	National Grid (MA)-N	NSTAR (MA)-N	PSNH-N	SMECO (MD)-N
Program/Measures										
Program/Measures										
Lighting						0.26%				
Cooling/Heating/Roofing						0.01%				
Refrigeration						0.06%				
Motors						0.48%				
Compressed Air						0.05%				
Prescriptive				0.03%	0.61%					0.38%
Retrofit	2.13%	1.33%	0.88%	0.48%			0.95%	1.58%	0.23%	
Custom Rebates										0.09%
Grants					0.61%					
New Construction	0.58%	0.24%	0.44%				0.77%	0.72%	0.19%	
Small Business			0.34%				0.38%	0.34%	0.22%	0.05%
Self Direct	0.04%									
O&M			0.14%							
Pilot									0.03%	
Total C&I Savings (GWh)	70.5	4.1	170.7	7.0	86.5	2.2	264.2	388.9	31.5	6.9
Annual C&I Sales (GWh)	2,559.9	259.3	9,512.6	1,377.4	7,080.3	\$259.3	\$12,530.8	\$14,794.5	\$4,683.3	\$1,332.3
C&I Savings as % of C&I Sales	2.8%	1.6%	1.8%	0.5%	1.2%	0.9%	2.1%	2.6%	0.7%	0.5%

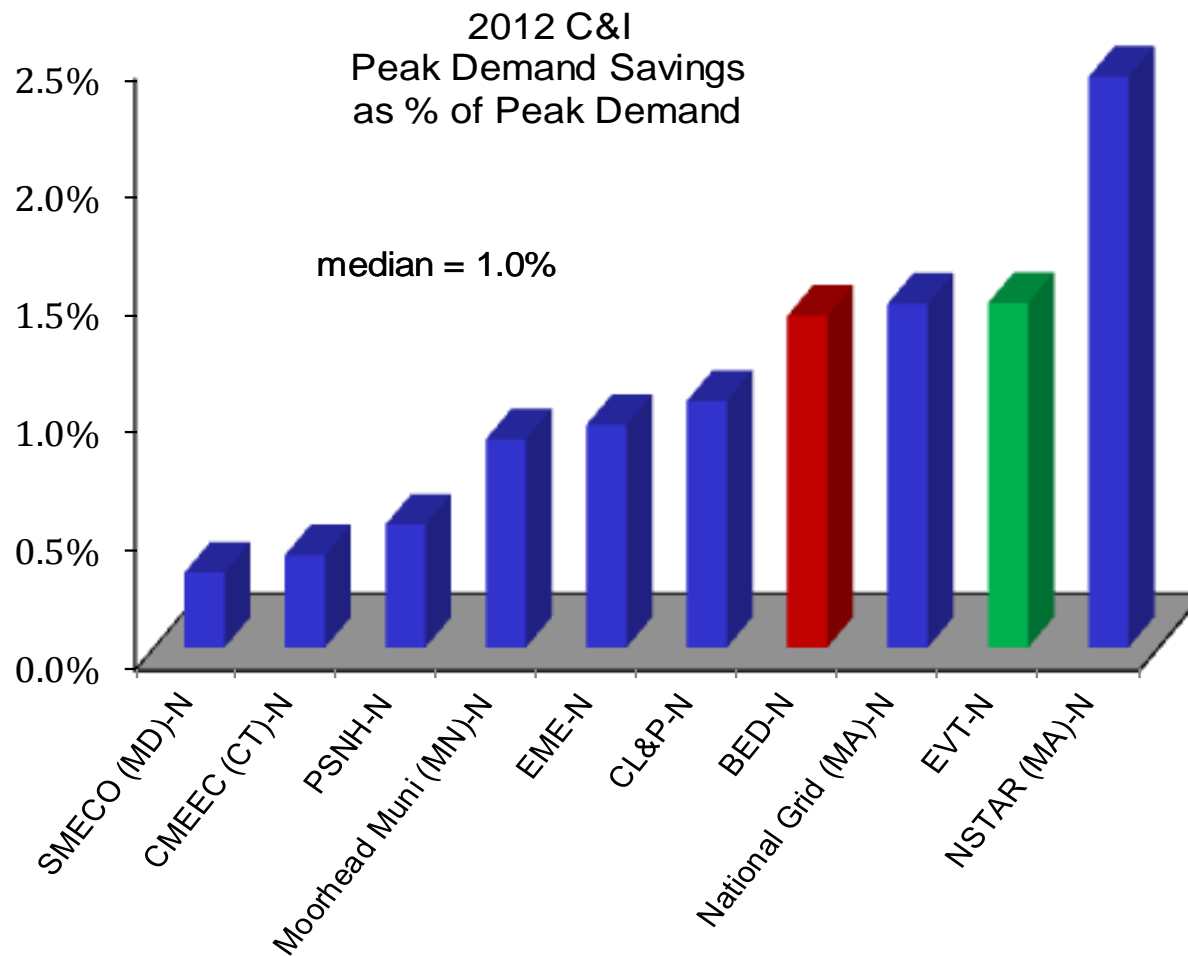
EVT and BED's Existing Buildings program is included in the Retrofit row.

EVT and BED's C&I cost of energy savings for these programs are slightly higher than most of the other utilities' retrofit programs.

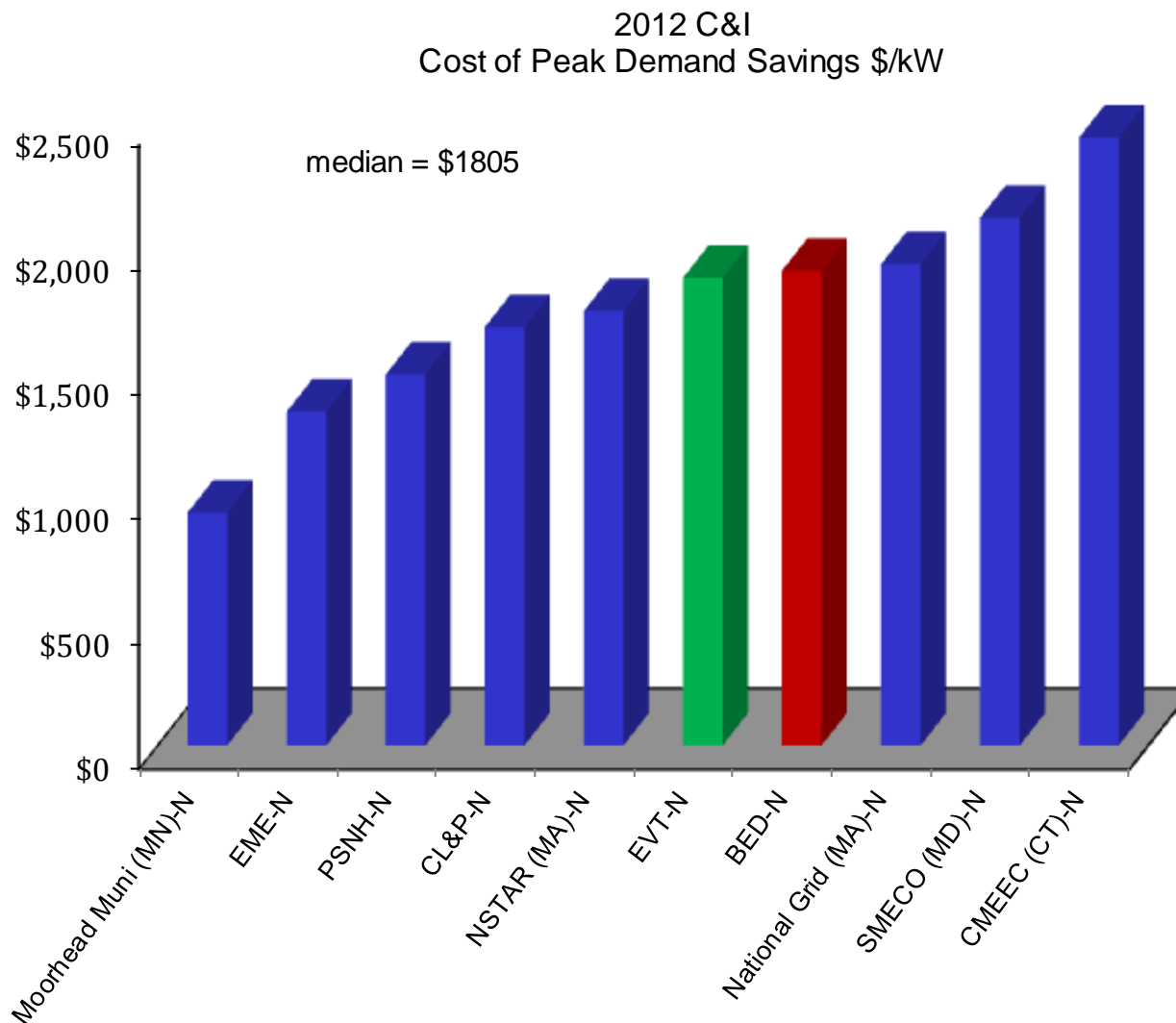
First Year Cost of C&I Energy Savings by Program

C&I										
	EVT-N	BED-N	CL&P-N	CMEEC (CT)-N	EME-N	Moorhead Muni (MN)-N	National Grid (MA)-N	NSTAR (MA)-N	PSNH-N	SMECO (MD)-N
Program/Measures										
Lighting						\$0.20				
Cooling/Heating/Roofing						\$0.89				
Refrigeration						\$0.07				
Motors						\$0.05				
Compressed Air						\$0.12				
Prescriptive				\$0.30	\$0.22					\$0.23
Retrofit	\$0.27	\$0.29	\$0.24	\$0.36			\$0.29	\$0.20	\$0.20	
Custom Rebates										\$0.46
New Construction	\$0.23	\$0.43	\$0.22				\$0.23	\$0.21	\$0.23	
Small Business			\$0.41				\$0.43	\$0.45	\$0.28	\$0.75
Self Direct	\$0.19									
O&M			\$0.16							
Pilot									\$0.32	
Total C&I Savings (GWh)	70.5	4.1	170.7	7.0	86.5	2.2	264.2	388.9	31.5	6.9
Total Costs (\$M)	\$18.26	\$1.3	\$45.00	\$2.49	\$15.83	\$0.39	\$78.83	\$91.52	\$7.55	\$2.21
Costs of C&I Savings (\$/kWh)	\$0.26	\$0.31	\$0.26	\$0.35	\$0.18	\$0.17	\$0.30	\$0.24	\$0.24	\$0.32

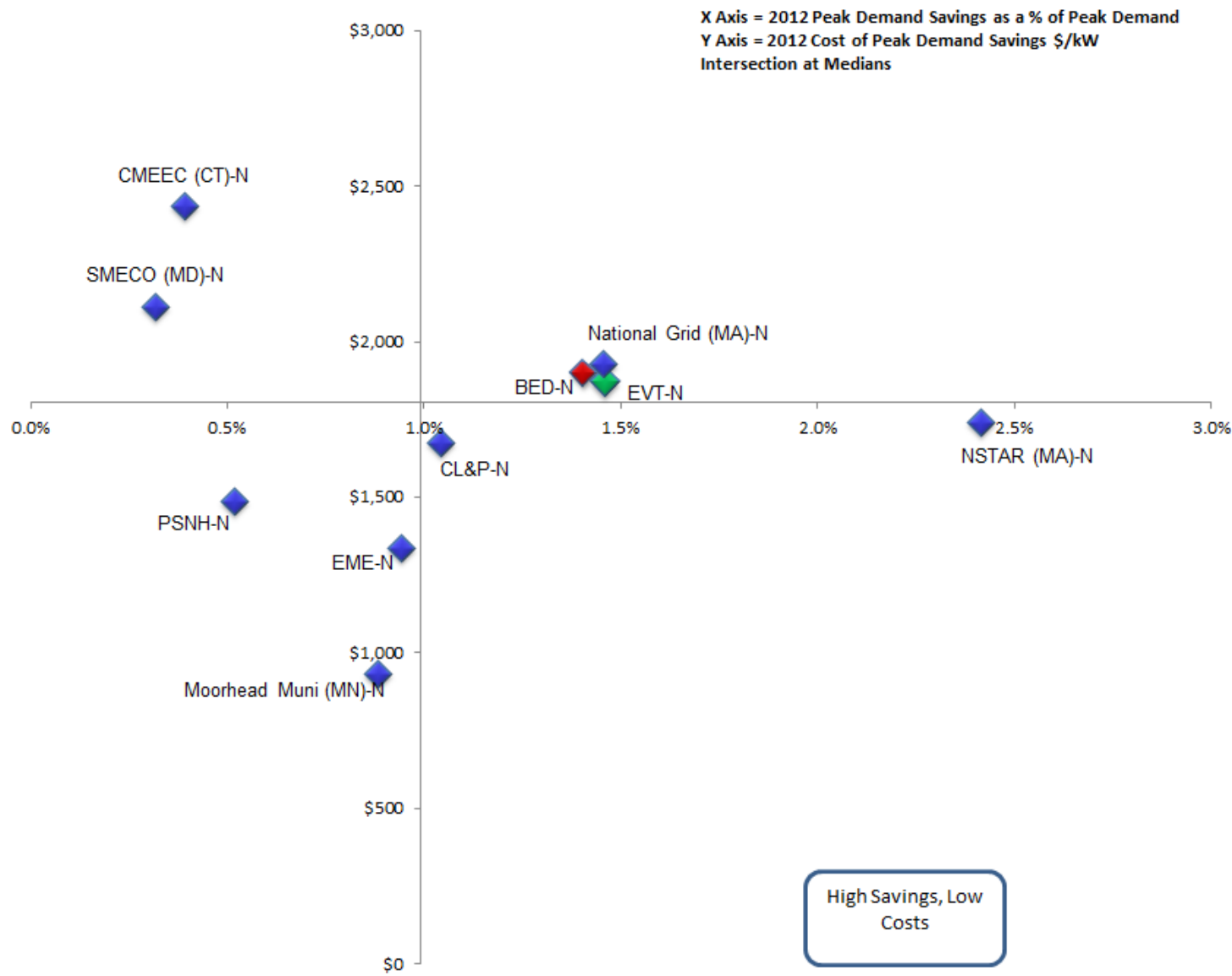
EVT's and BED's C&I peak demand savings as a percentage of peak demand are about 1.5% which is greater than the median of 1.0% of peak demand.



EVT's and BED's C&I cost of peak demand savings are \$1,872/kW and \$1,901/kW, respectively, which are just above the median of \$1,805/kW.

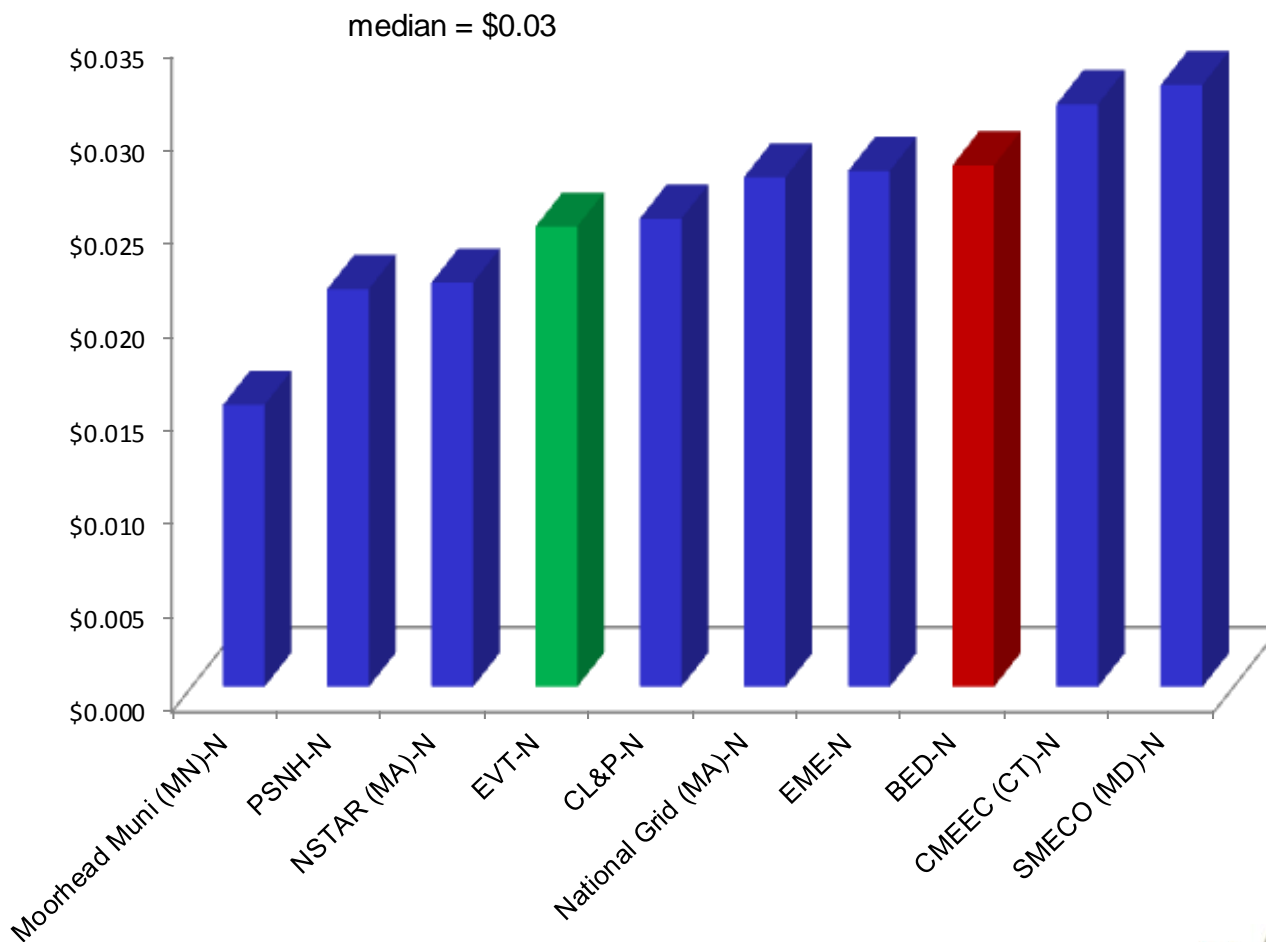


2012 C&I Summer Peak Demand Savings as % of Peak Demand and Cost of Summer Peak Demand Savings, \$/kW

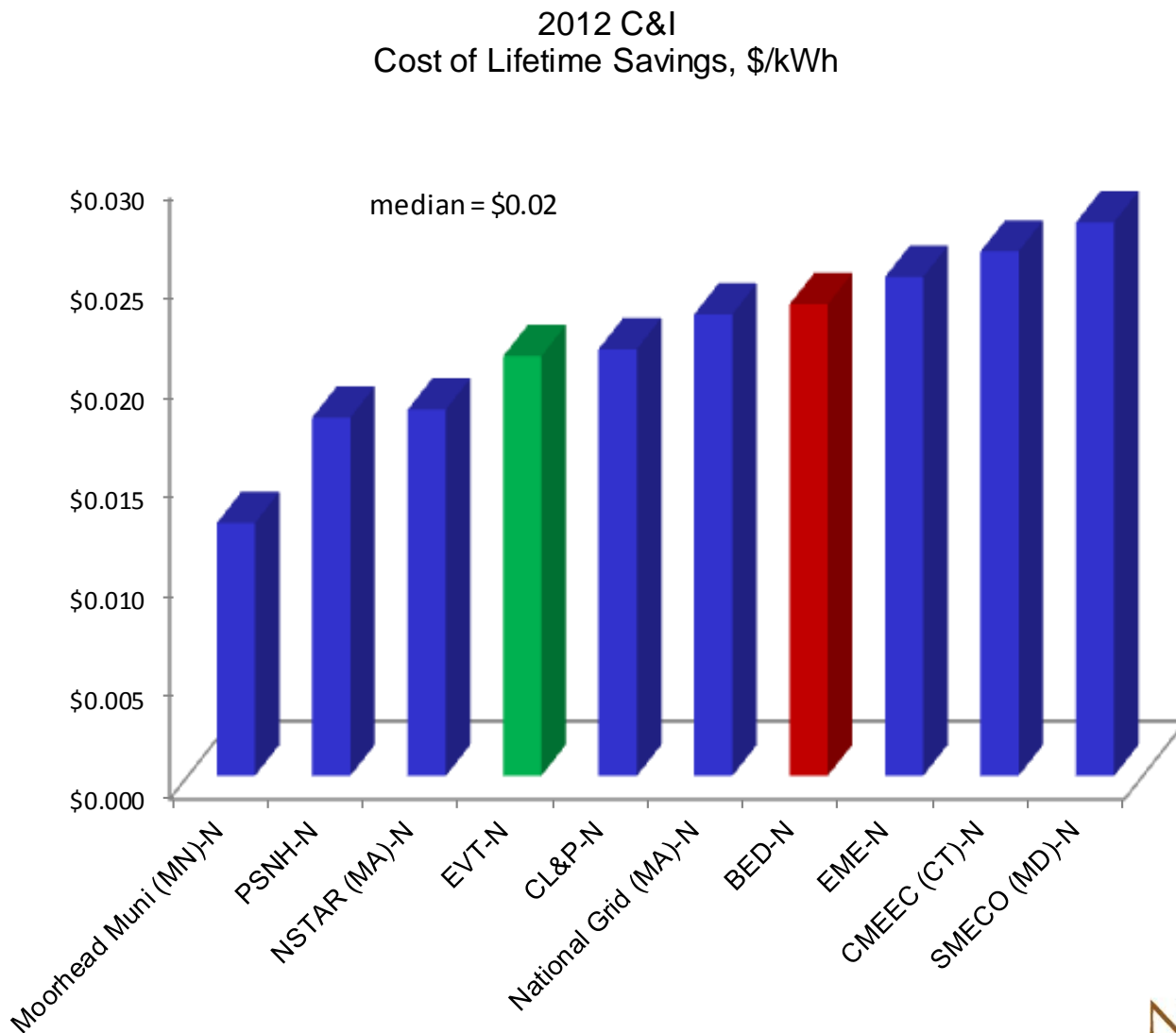


EVT's C&I levelized cost of energy is \$0.02/kWh which is below the median of \$0.03/kWh while BED's is about the median.

2012 C&I
Levelized Cost of Energy \$/kWh



EVT's and BED's C&I cost of lifetime energy savings are both about equal to the median of \$0.02/kWh.



Summary of EVT's and BED's 2012 C&I Sector Performance

Summary of EVT's and BED's C&I Sector Performance	
EE Spending	EVT achieved C&I EE spending of 5.3% and BED achieved C&I EE spending of 3.6% (as a % of revenue) in 2012 which are above the median of the group's at 2.8% of C&I revenue.
EE Savings	EVT achieved C&I energy savings of 2.7% and BED achieved C&I energy savings of 1.6% (as a % of C&I sales) in 2012 which are above the median of the group's at 1.2% of C&I sales.
EE First Year Costs	EVT's C&I energy savings cost 26 ¢/kWh which is the median of the group's while BED's C&I energy savings cost 31 ¢/kWh (first year costs) is above the median.
EE Levelized Costs	EVT's C&I levelized cost of energy is \$0.02/kWh which is below the median of the group (\$0.026/kWh) while BED's C&I levelized cost of energy is about the median at \$0.028/kWh.
EE Cost of Lifetime Savings	EVT's and BED's C&I cost of lifetime energy savings are about equal to the median of \$0.02/kWh.

EVT's findings in this slide exclude opt-out customers.

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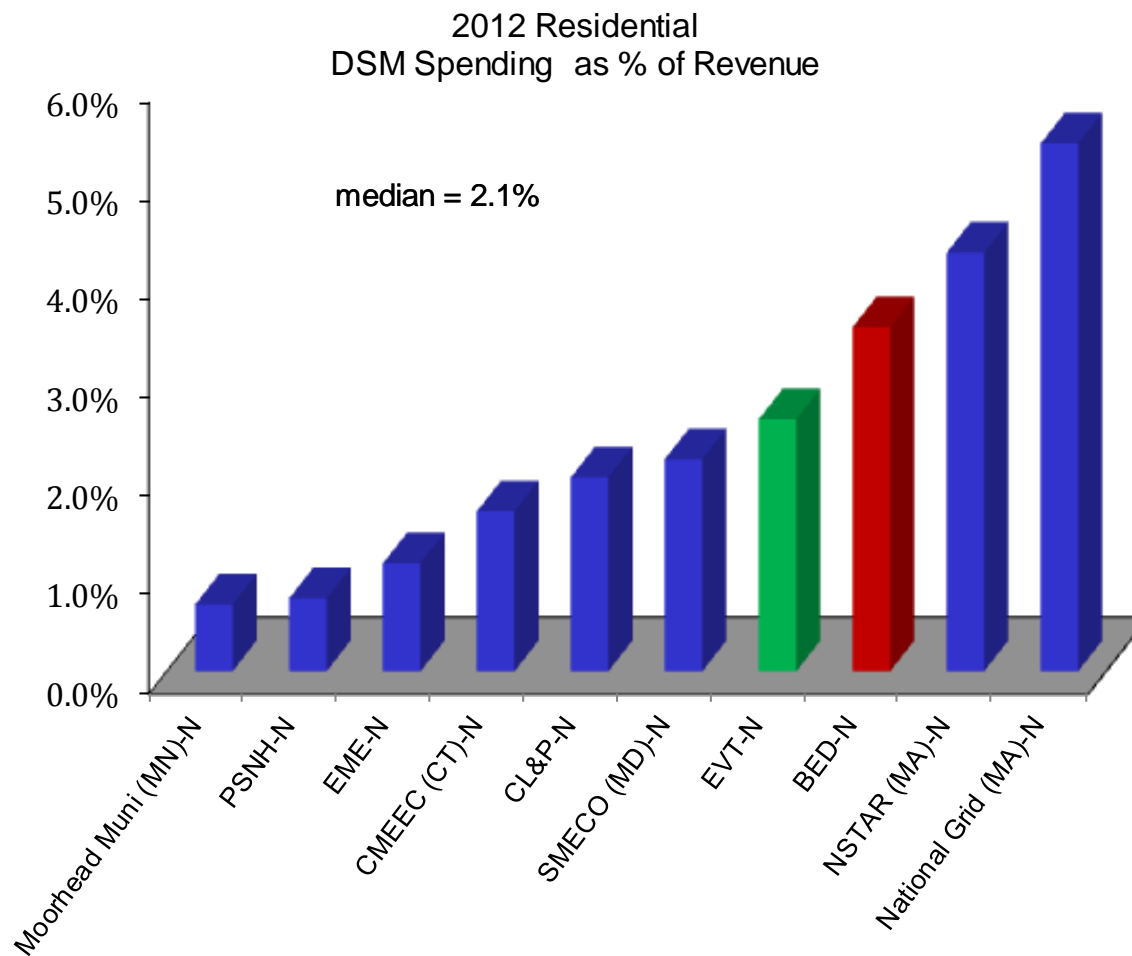
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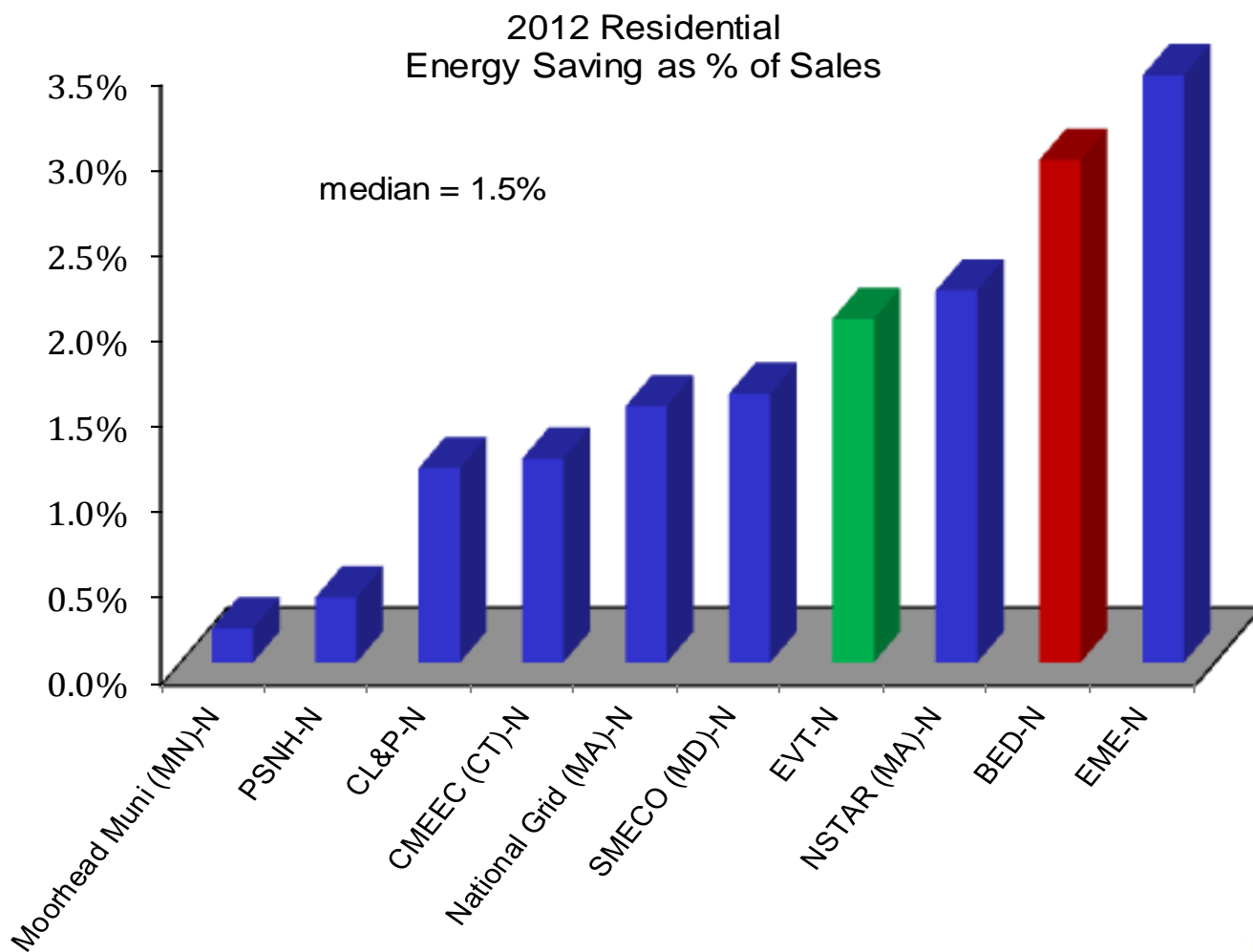
2012 Residential Electric Specialized Benchmarking Results

	Spending as % of Revenue	Energy Savings as % of Sales	Summer Peak Demand Savings as % of Peak Demand	Cost of First Year Savings		Levelized Cost of Energy Savings	Cost of Lifetime Savings
				\$/kWh	\$/kW	\$/kWh	\$/kWh
All Benchmarked Median	2.1%	1.5%	0.6%	\$0.22	\$2,221	\$0.04	\$0.03
EVT	2.6%	2.0%	1.2%	\$0.22	\$1,438	\$0.04	\$0.03
BED	3.5%	2.9%	0.7%	\$0.19	\$4,599	\$0.03	\$0.02

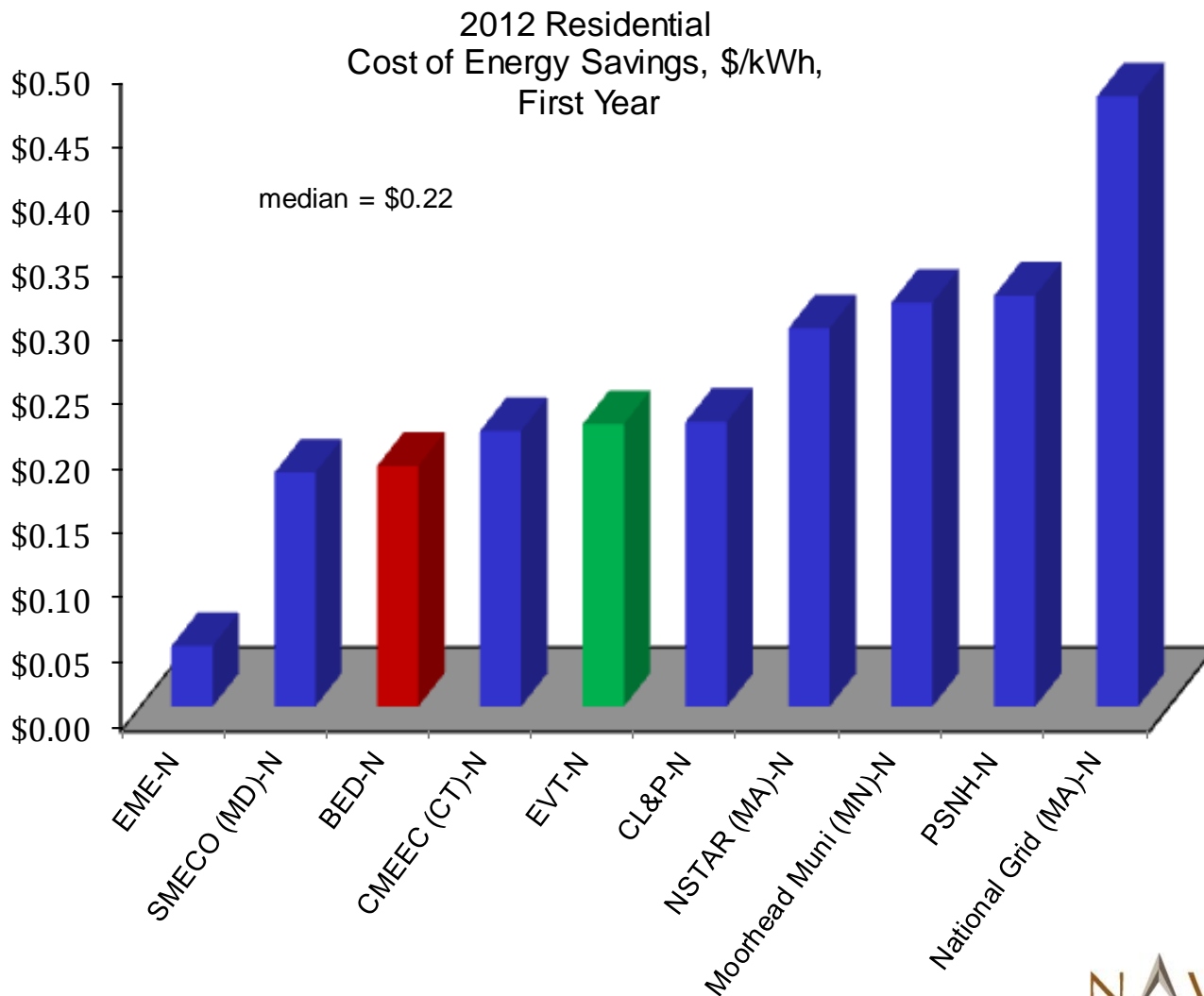
EVT's and BED's residential spending as a percentage of revenue are 2.6% and 3.5%, respectively, which are above the median of 2.1% of revenue.



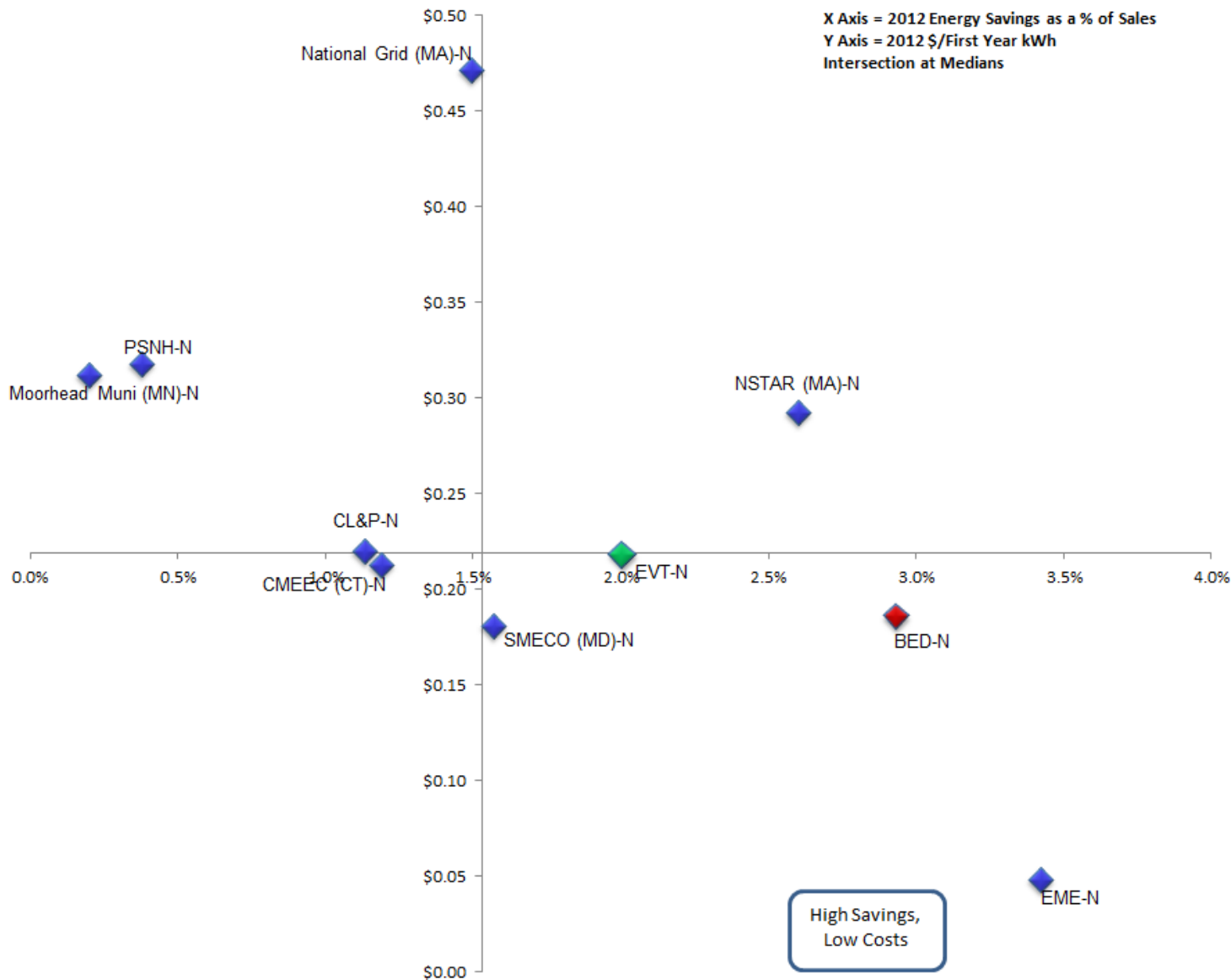
EVT's and BED's residential energy savings as a percentage of revenue are 2.0% and 2.9%, respectively, which are also above the median (1.5% of sales).



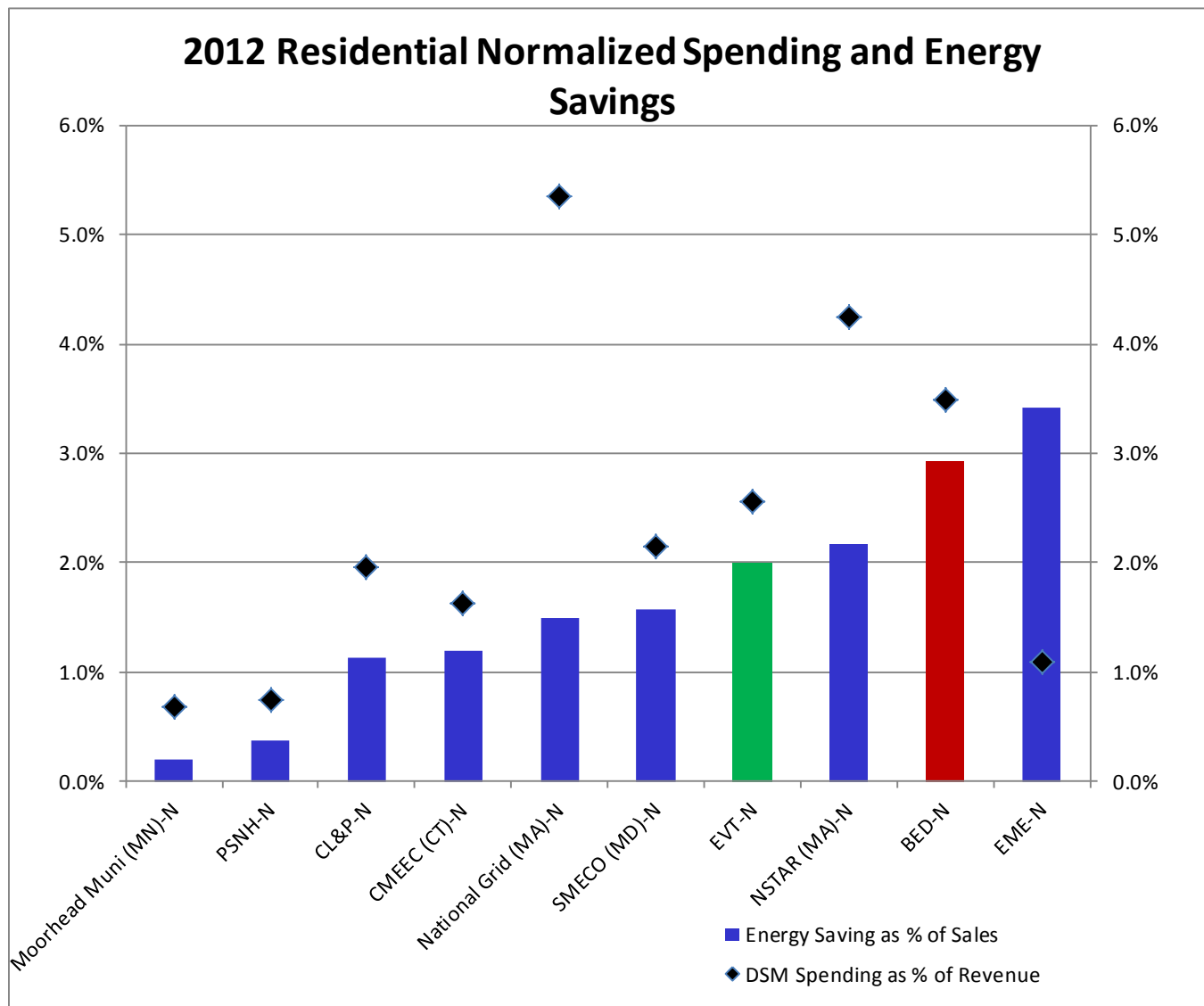
EVT's residential cost of energy savings (first year) is \$0.22/kWh which is the median of the group while BED's residential cost of energy savings (first year) is below the median at \$0.19/kWh.



2012 Residential Energy Savings as % of Sales and Cost of First Year Energy Savings, \$/kWh

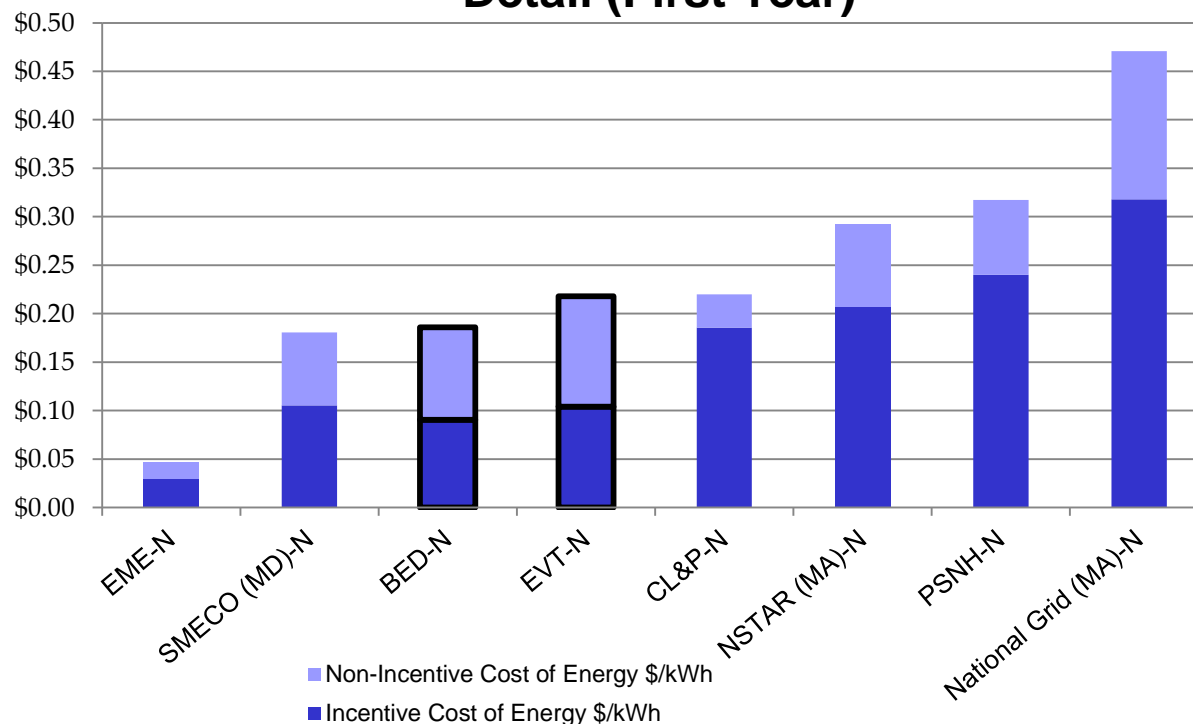


EVT's and BED's ratio of residential EE spending as a percentage of revenue to annual energy savings as a percentage of sales is about 1.3 to 1, which is also the median ratio of the benchmarked utilities.



EVT's and BED's residential spending on incentives (about 49%) are less than the median of the group's (65%).

2012 Residential Incentive/Non-Incentive Cost Detail (First Year)



	Incentive		Non-Incentive		Total \$/kWh
	\$/kWh	% of Total	\$/kWh	% of Total	
All Region Median	\$0.15	65%	\$0.08	35%	\$0.23
EVT	\$0.10	48%	\$0.11	52%	\$0.22
BED	\$0.09	49%	\$0.10	51%	\$0.19

EVT's and BED's Efficient Products programs' (which include lighting measures) residential energy savings as a percentage of sales are among the highest of the group.

Residential Energy Savings as Percentage of Sales by Program

Residential										
	EVT-N	BED-N	CL&P-N	CMEEC (CT)-N	EME-N	Moorhead Muni (MN)-N	National Grid (MA)-N	NSTAR (MA)-N	PSNH-N	SMECO (MD)-N
Program/Measures										
Lighting				0.67%	3.21%	0.01%	1.00%	1.54%	0.26%	1.10%
Cooling/Heating/Roofing						0.10%	0.04%	0.03%		0.06%
ES Appliances				0.01%	0.13%	0.05%	0.10%	0.14%	0.08%	0.06%
Products	1.84%	2.66%	0.94%							
Appliance Recycling					0.09%	0.04%				0.07%
Retrofit	0.11%	0.22%	0.17%	0.51%			0.20%	0.28%	0.01%	0.21%
Multifamily							0.13%	0.13%		
New Construction	0.06%	0.05%	0.02%				0.03%	0.05%	0.03%	0.07%
Total Residential Savings (GWh)	40.2	2.5	113.1	6.3	153.3	0.3	131.3	146.6	11.9	32.0
Annual Residential Sales (GWh)	2,011	84	9,978	534	4,481	160.3	8,792.2	6,763.0	3,137.5	2,044.3
Residential Savings as % of Residential Sales	2.0%	2.9%	1.1%	1.2%	3.4%	0.2%	1.5%	2.2%	0.4%	1.6%

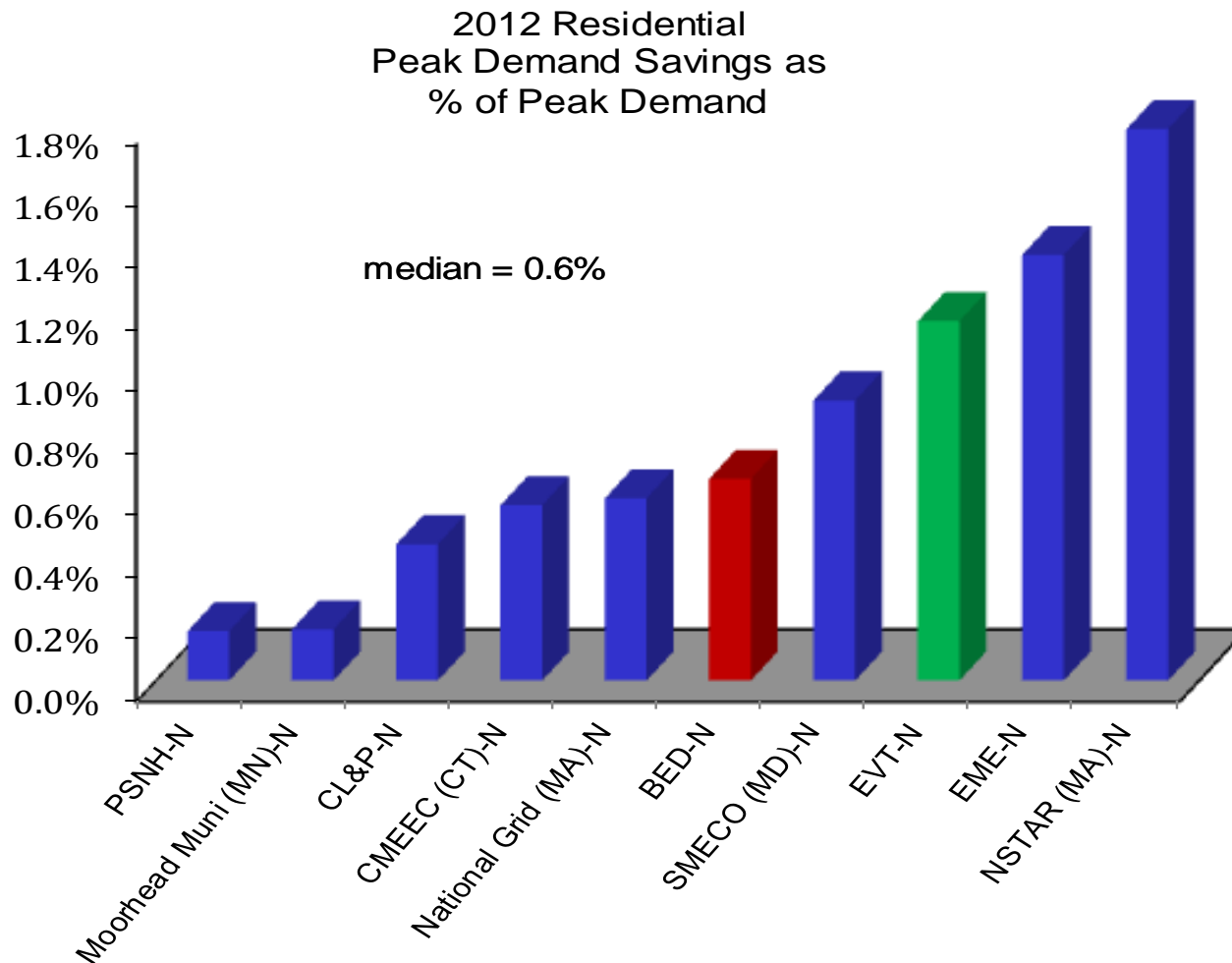
The cost of EVT and BED's Efficient Products programs are also among the highest while the cost of their Existing Homes programs are among the lowest.

First Year Cost of Residential Energy Savings by Program

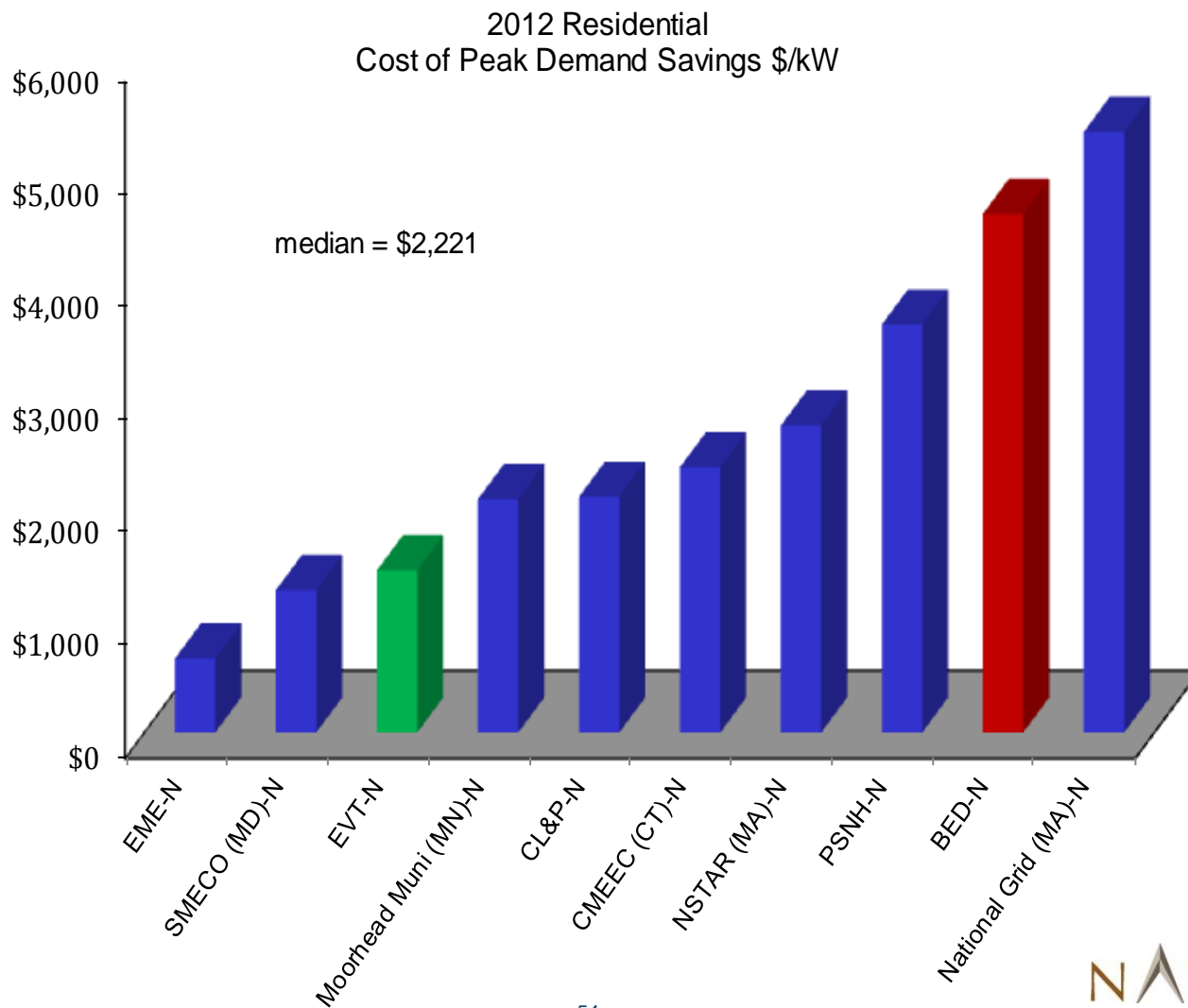
Residential										
	EVT-N	BED-N	CL&P-N	CMEEC (CT)-N	EME-N	Moorhead Muni (MN)-N	National Grid (MA)-N	NSTAR (MA)-N	PSNH-N	SMECO (MD)-N
Program/Measures										
Lighting				\$0.10	\$0.03	\$0.49	\$0.13	\$0.09	\$0.10	\$0.05
Cooling/Heating/Roofing						\$0.22	\$1.10	\$1.32		\$0.68
ES Appliances				\$6.53	\$0.31	\$0.30	\$0.37	\$0.23	\$0.29	\$0.82
Products	\$0.16	\$0.10	\$0.08							
Appliance Recycling					\$0.15	\$0.10				\$0.24
Retrofit	\$0.37	\$0.85	\$0.92	\$0.27			\$1.46	\$1.14	\$3.02	\$0.37
Multifamily							\$0.63	\$0.60		
New Construction	\$1.86	\$1.75	\$0.81				\$0.72	\$0.43	\$1.10	\$0.65
Total Residential Savings (GWh)	40.2	2.5	113.1	6.3	153.3	0.3	131.3	146.6	11.9	32.0
Total Costs (\$M)	\$8.8	\$0.5	\$24.9	\$1.3	\$7.2	\$0.1	\$61.8	\$42.8	\$3.8	\$5.8
Costs of Residential Savings (\$/kWh)	\$0.22	\$0.19	\$0.22	\$0.21	\$0.05	\$0.31	\$0.47	\$0.29	\$0.32	\$0.18

EVT and BED's Existing Homes program is included in the Retrofit row.

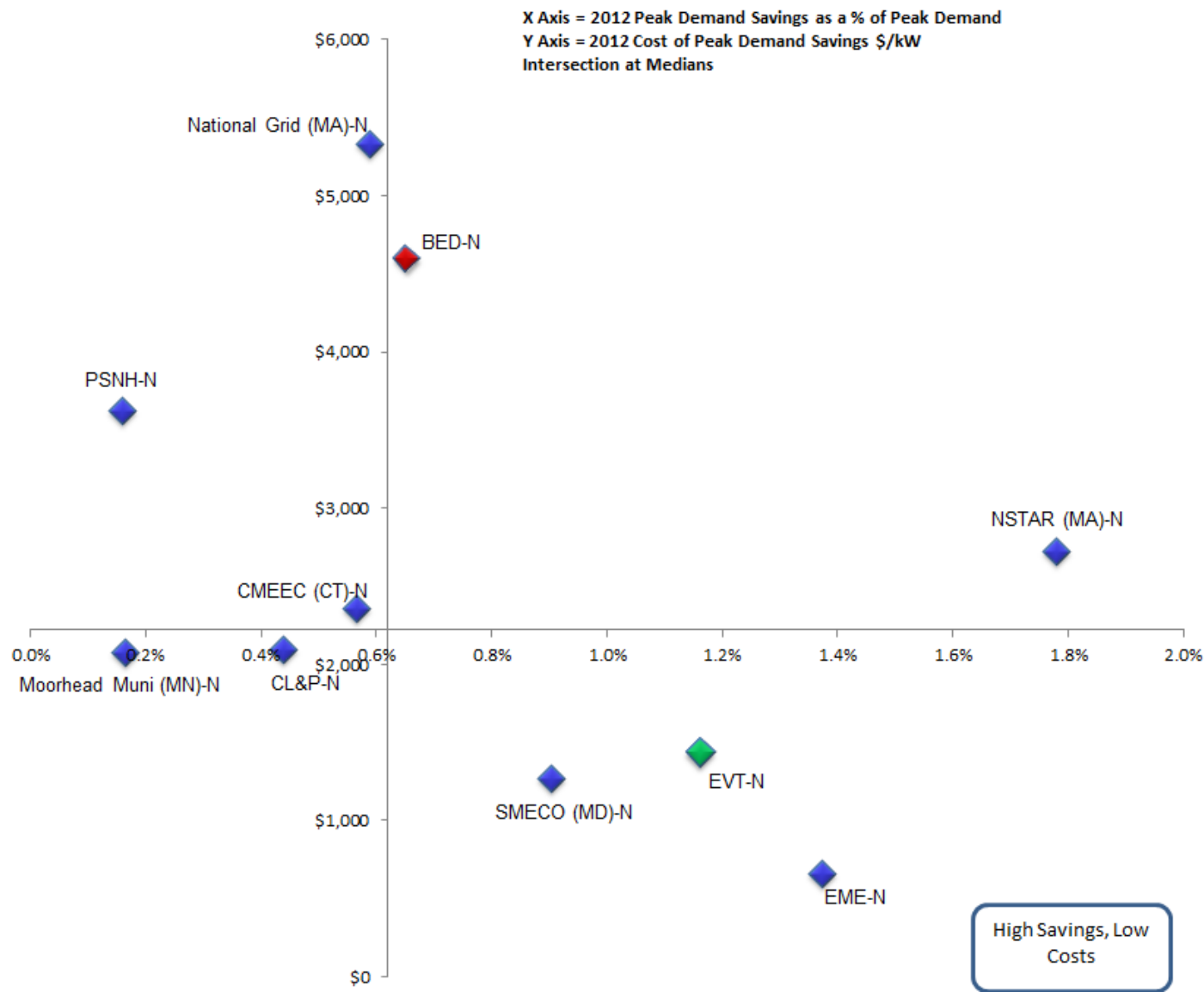
EVT's and BED's residential peak demand savings as a percentage of peak demand are 1.2% and 0.7%, respectively, which are above the median of 0.6% of peak demand.



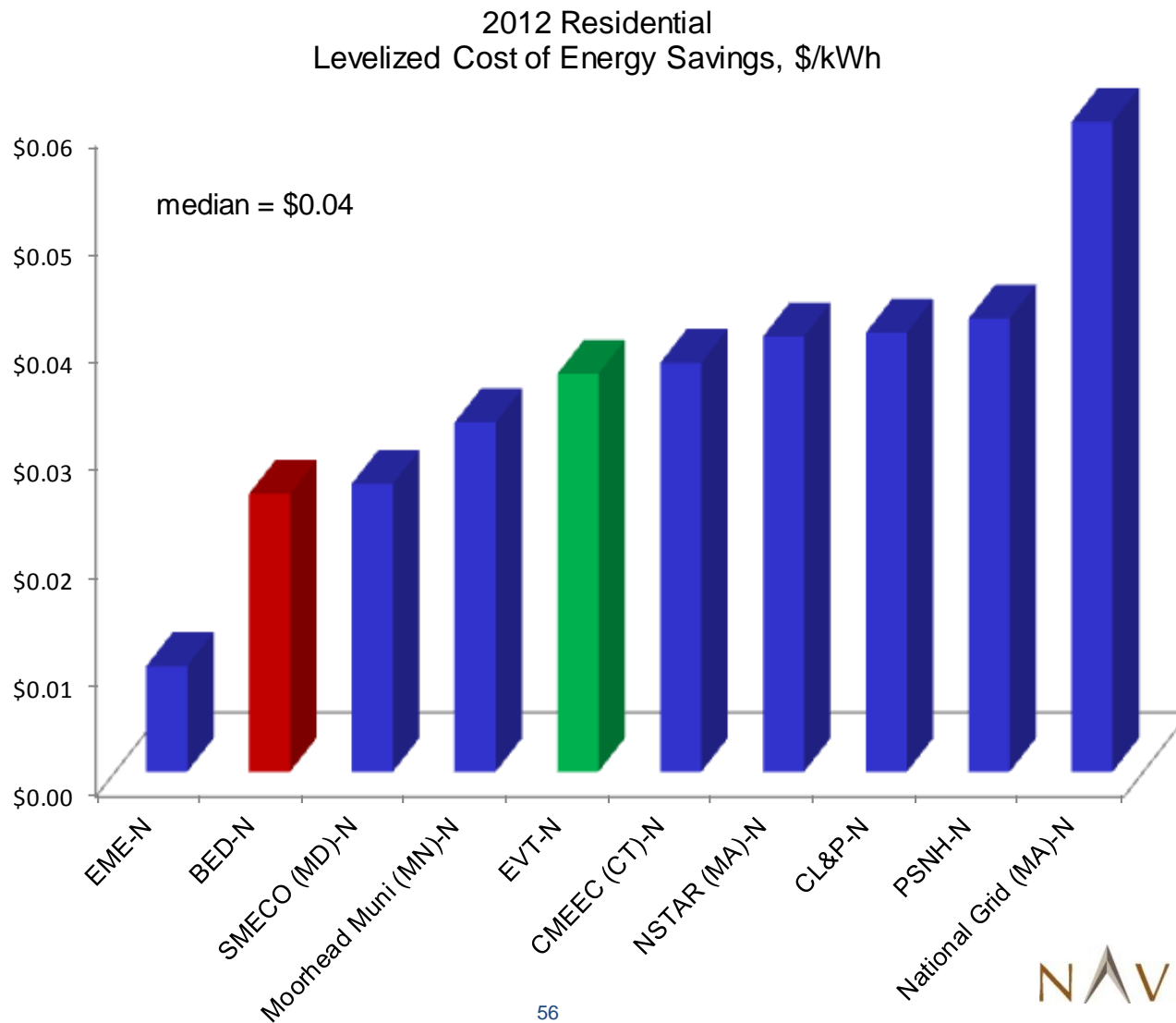
EVT's cost of peak demand savings is \$1,438/kW which is below the median of \$2,221/kW while BED's is above the median at \$4,599/kW.



2012 Residential Summer Peak Demand Savings as % of Peak Demand and Cost of Summer Peak Demand Savings, \$/kW

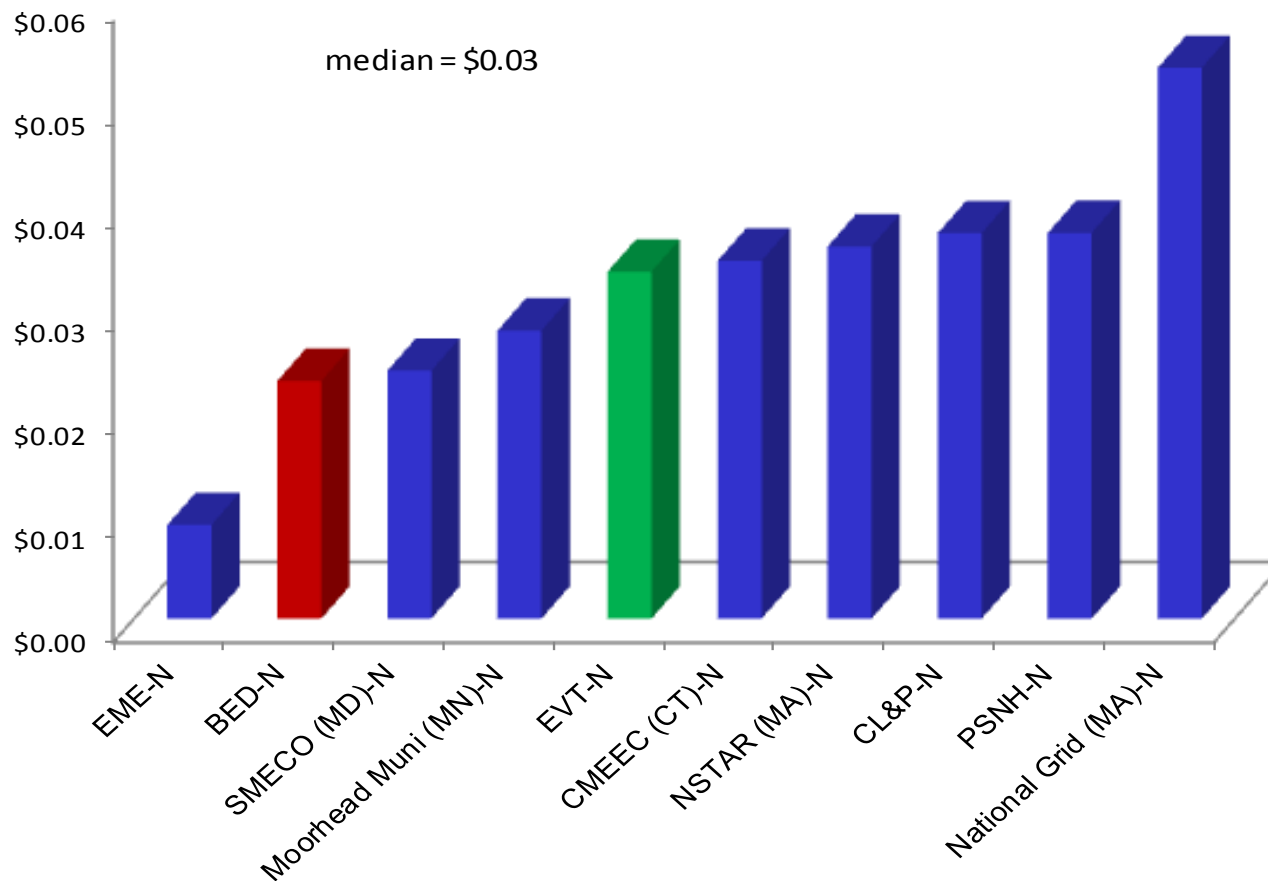


EVT's residential levelized cost of energy is \$0.04/kWh which is the median while BED's residential levelized cost of energy is below the median at \$0.03/kWh



EVT's residential cost of lifetime savings is \$0.03/kWh which is the median while BED's residential cost of lifetime energy savings is below the median at \$0.02/kWh.

2012 Residential
Cost of Lifetime Savings, \$/kWh



Summary of EVT and BED's 2012 Residential Sector Performance

Summary of EVT's and BED's Residential Sector Performance	
EE Spending	EVT achieved residential EE spending of 2.6% and BED achieved residential EE spending of 3.5% (as a % of revenue) in 2012 which are above the median of the group's at 2.1% of residential revenue.
EE Savings	EVT achieved residential energy savings of 2.0% and BED achieved residential energy savings of 2.9% (as a % of residential sales) in 2012 which are above the median of the group's at 1.5% of residential sales.
EE First Year Costs	EVT's residential energy savings cost 22 ¢/kWh while BED's residential energy savings cost 19 ¢/kWh (first year costs). BED's first year cost of residential energy savings is below the median of the group while EVT's is the median (22 ¢/kWh).
EE Levelized Costs	EVT's residential levelized cost of energy is \$0.04/kWh which is the median while BED's residential levelized cost of energy (\$0.03/kWh) is below the median of the group.
EE Cost of Lifetime Savings	EVT's residential cost of lifetime savings is \$0.03/kWh which is the median while BED's residential cost of lifetime savings is below the median at \$0.02/kWh

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Total Portfolio

- » **EVT and BED's energy efficiency programs have higher energy savings compared to most of the organizations benchmarked for this analysis.** EVT's programs saved about 2.4% of baseline sales, while BED's programs saved about 1.9% of baseline sales. The median savings for the benchmarked organizations is 1.7% of baseline sales.
- » **EVT's first year cost of saved energy is less than the median for the organizations benchmarked in this analysis while BED's is just above the median.** EVT's cost of saved energy is about \$0.24/kWh, while BED's cost of saved energy is \$0.26/kWh. The median cost of saved energy for the benchmarked organizations is \$0.25/kWh.
- » **EVT and BED's energy efficiency programs have the second and third highest peak demand savings compared to the rest of the benchmarked organizations.** EVT and BED's programs saved about 1.3% of retail peak demand, while the median savings for the group of organizations is less 1.0% retail peak demand.
- » **EVT's cost of peak demand savings is less than the median for the organizations benchmarked while BED's cost of peak demand savings is above the median.** EVT's cost of peak demand savings is \$1,705/kW, while BED's cost of peak demand savings is \$2,254/kW. The median cost of saved peak demand is \$1,825/kW.

C&I Sector

- » **EVT achieved the largest C&I energy savings of any of the organizations reviewed, about 2.8% of C&I baseline sales.** This amount of savings is about double the median of the benchmarked utilities (1.4% of sales).
- » **EVT's first year cost of C&I energy savings of \$0.26/kWh is about the median first year cost of C&I energy savings for the group.** The main reason for EVT's above median energy savings at median costs is due to its Existing Buildings program. This program achieved more than 75% of EVT's C&I energy savings at costs just above the median \$0.27/kWh. About 60% of savings for this program came from lighting measures and 17% of savings came from industrial process efficiencies. EVT's New Construction program achieved 21% of its C&I energy savings at below median costs, \$0.23/kWh.
- » **BED's C&I energy savings of 1.6% of baseline sales is also above the median of the benchmarked utilities.**
- » **BED's first year cost of C&I energy savings of \$0.31/kWh is above the median first year cost of C&I energy savings.** BED also achieved most of its C&I energy savings (85%) through its Existing Buildings programs at above median costs, \$0.29/kWh. About 60% of the savings for this program came from lighting measures and 30% of savings came from ventilation measures. Its New Construction program achieved 15% of its C&I energy savings at above median costs, \$0.43/kWh.

Residential Sector

- » **EVT and BED's residential energy efficiency programs have higher energy savings compared to most of the organizations benchmarked in this analysis.** EVT's residential programs saved about 2.0% of residential baseline sales, while BED's residential programs saved about 2.9% of residential baseline sales. The median savings for the other benchmarked organizations is 1.5% of residential baseline sales.
- » **EVT's residential first year cost of saved energy is the residential median for the organizations benchmarked while BED's residential first year cost of saved energy is below the median.** EVT's residential cost of saved energy is about \$0.22/kWh, while BED's residential cost of saved energy is \$0.19/kWh. The median cost of residential energy saved is \$0.22/kWh
- » **The Retail Products programs account for about 92% of both EVT and BED's total residential energy savings.** Lighting measures account for about 88% of these programs' energy savings. Relying on one technology for almost 90% of residential savings is a more risky strategy than having a more balanced portfolio of programs. Future CFL regulations or legislation or increasing market saturation of CFLs could lead to significant decreases of residential portfolio savings for EVT and BED in the future if they continue to rely on CFLs for almost all of their residential energy savings. This conclusion also applies to peer program administrators who also achieved most of their residential savings from lighting programs as well.

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What Factors Drive 2012 Performance Among the Select Group?

» To better understand the 2012 performance of EVT and BED, Navigant completed interviews with the following organizations:

- Efficiency Vermont
- Burlington Electric Department
- Efficiency Maine
- Connecticut Light & Power
- NSTAR

» Key Questions

- Which of your programs do you consider to be working well in terms of program delivery?
- Which of your programs are having some difficulty in terms of program delivery?
- Overall, what do you consider to be the key factors that contributed to your 2012 portfolio results? Was there something new or innovative in 2012 in particular that you believe significantly influenced portfolio or program performance?

Burlington Electric Department

» Success Areas

- Retail products- CFL lighting in particular- is a major source for portfolio savings. Eight percent of total statewide EVT retail product sales are deemed to BED based on historical coupon rebate records.
- Ten percent of CFL sales are assumed to be installed in commercial applications with longer run time hours.
- Business Existing Facilities Program- largest program- represents ~60% of portfolio savings.

» Challenges

- Split incentive challenge still exists with rental property upgrades (70% of commercial space is leased).
- Many different small contractors active with Burlington's residential retro-fit market. Challenging to engage small contractors.

» Key Factors for 2012 and Innovations

- BED uses extensive account management, person-to-person relationship development to gain trust and participation in C&I programs, while projects are still in the design stage.
- To increase participation, BED increased incentives by ~25% in 2012.
- Increasingly BED is starting to use "continuous building improvement" software systems to monitor commercial building performance and identify savings opportunities.

Efficiency Vermont

» Success Areas

- EVT's regulatory framework allows the organization flexibility to creatively meet multiple objectives through promotion of a diversified portfolio.
- EVT prioritizes meeting performance goal targets while also maximizing economic development (job creation or retention) and other societal objectives, in particular reducing energy costs and thereby generating other associated benefits for low income customers.
- EVT, partnering with other energy groups, is working upstream with product manufacturers to specify efficiency improvements in products before they are available to the public (e.g. efficiency specification improvements for LEDs, CFLs, advanced power strips, high-efficiency HVAC)
- EVT leverages significant high-touch C&I account management. This has led to greater efficiency participation at lower incentive dollars/kWh saved.

» Challenges

- Achieving significant savings with small to medium size business customers. EVT believes increased partnership with trade allies will help and they have developed the "energy excellence network" that is an enhanced and scalable account management program for trade allies.
- EVT does not currently offer a dedicated small business direct install program.

» Key Factors for 2012 and Innovations

- Major factors that influenced 2012 results date back to 2009 "Great Recession". EVT underspent budgets by 10-15% in 2009 given low demand for EE and was not achieving savings targets. To meet the three year performance target- EVT ramped up incentive levels and outreach in 2010 and 2011- and successfully achieved goals, but at a high cost. For 2012-primarily a budget conscious, cost-cutting, year.
- One of EVT's key innovations is to invest in staff resources to better understand niche markets- and optimize measure and program design offerings (e.g. snow making industry). Offer customers what they want and need.

Efficiency Maine Trust (EMT)

» Success Areas

- Retail products- CFL lighting in particular- is the major source for portfolio savings.
- EMT significantly revised residential lighting program strategy. Discontinued marketing efforts, and instead increased product incentives to cover up to 100% of incremental cost. Sales increased dramatically. Major retailers, pro-actively, created end-cap displays for CFL products- with no additional financial or motivational support from EMT.
- Business Incentive Program, another success area. EMT's objective is to maximize incentive payments to customers, and minimize administrative and program delivery costs.

» Challenges

- EMT discontinued the Appliance Recycling program in 2012 due to benefit-cost concerns from low-levels of observed savings persistence.

» Key Factors for 2012 and Innovations

- EMT prioritized low-cost EE resource acquisition in 2012. Philosophy was to save as much as possible, at the lowest cost. Comprehensive (and more expensive) savings were not prioritized in 2012.
- Dropping marketing expenditures and focusing simply on higher rebates for the residential lighting program was successful in significantly increasing sales.

Connecticut Light & Power

» Success Areas

- Residential retail lighting, residential new construction program, C&I Large Retrofit Program.
- Home Energy Solutions program - \$75 customer cost for a home energy audit and immediate direct install of CFLs as well as blower door guided air sealing, duct sealing, low flow shower heads and facet aerator as well as the recommendation of add on measures for additional energy savings. CL&P contracts with a pre-qualified group of trade ally vendors for this service through an RFP process.

Challenges

- In 2012 approximately 15% (in 2013 – 19%) of customers participating in the Home Energy Solutions program take follow-up action for additional major EE upgrades. A challenge is increasing the conversion rate for major add on measures (insulation, HVAC, etc.). The 2014 goal is 26%.
- The Retro-commissioning program is not achieving significant follow-through of identified savings potential after the initial assessment.

» Key Factors for 2012 and Innovations

- Ramping up residential Behavioral Pilot Program (CL&P currently uses O-power).
- Per regulatory mandate, CL&P offers on-bill 0% financing for up to 4 years that participate in Small Business Energy Advantage Direct Install program. This program has a 90% participation rate of eligible customers that select on-bill financing for their Small Business Direct Install program which covers up to 50% of installed costs.
- Clean Energy Communities “Challenge Program”. Friendly competition between towns for energy savings and renewable energy purchases.. Points awarded based on type, complexity, and participation percentage of residents. Communities stand to win grants for EE improvements of \$5K to \$15K.

NSTAR

» Success Areas

- NSTAR attributes their success based on their overall focus on “go-to-market” strategies in which customers are researched extensively and offered tailored participation options, including comparative benchmarks (e.g. comparing peer group building types or business types energy consumption) .
- NSTAR views their approach to DSM based on customer market opportunities, not “program” based parameters.
- Approximately 80% of sales come from the C&I sector, savings generated are proportional to sales.
- Statewide in MA, residential customers receive generous rebates. For example, free home energy audit with direct install and free air-sealing. Additional incentives provided for insulation, up to 75% of installed cost capped at \$2,000. This statewide program and generous incentives account for higher than median residential savings costs.

Challenges

- Achieving greater participation and savings from the commercial real-estate market is a challenge. They are conducting market research currently with tenants and property owners to try and learn more how to solve the “split-incentive” challenge, which may include options addressing lease modifications for energy efficiency.

» Key Factors for 2012 and Innovations

- Customer market research and key account segmentation and targeted EE offerings are highlighted as reasons for success.
- Approximately 30 customers represent ~25% of energy sales. NSTAR dedicated energy efficiency account managers work to gain senior level support for energy efficiency with key accounts. This leads to organizational support and facilitates direct marketing and follow-up with facility managers who make final decisions. Essentially- NSTAR works to “pre-sell” EE with senior staff first, followed up with detailed promotion with building managers.

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2012 DSM Results by State

2012 Normalized DSM Results by State

Customer Sector	Utility	2012 Normalized DSM Results by State																	
		2012 DSM Results						2012 Retail				Normalized DSM Results					Levelized Cost of Lifetime Savings	Cost of Lifetime Savings	
		Lifetime GWh	Annual Generator GWh	Annual Meter GWh	Measure Life	MW	Costs \$M	Customers	Annual GWh	Peak MW	Revenue \$M	Cost of Energy	Spending as % of Revenue	Energy Savings as % of Sales	Demand Savings as % of Peak	Cost of Savings			
											\$/kWh				\$/kWh	\$/kW	\$/kWh	\$/kWh	
Residential	Median	251.4	36.1	33.2	7.8	5.3	\$6.5	358,062	2,591	591	\$427	\$0.15	2.1%	1.5%	0.6%	\$0.22	\$2,221	\$0.04	\$0.03
VT	EVT-N	261.7	40.2	37.0	6.5	6.1	\$8.8	292,517	2,011	526	\$343	\$0.17	2.6%	2.0%	1.2%	\$0.22	\$1,438	\$0.04	\$0.03
	BED-N	19.9	2.5	2.3	8.1	0.1	\$0.5	16,502	84	15	\$13	\$0.16	3.5%	2.9%	0.7%	\$0.19	\$4,599	\$0.03	\$0.02
CT	CL&P-N	667.0	113.1	104.0	5.9	11.9	\$24.9	1,103,397	9,978	2,703	\$1,264	\$0.13	2.0%	1.1%	0.4%	\$0.22	\$2,090	\$0.04	\$0.04
	CMEEC (CT)-N	39.0	6.3	6.1	6.1	0.6	\$1.3	61,974	534	101	\$83	\$0.16	1.6%	1.2%	0.6%	\$0.21	\$2,352	\$0.04	\$0.03
MA	National Grid (MA)-N	1,161.4	131.3	117.2	8.8	11.6	\$61.8	1,136,085	8,792	1,975	\$1,155	\$0.13	5.4%	1.5%	0.6%	\$0.47	\$5,327	\$0.06	\$0.05
	NSTAR (MA)-N	1,189.8	146.6	134.9	8.1	15.7	\$42.8	998,675	6,763	883	\$1,008	\$0.15	4.2%	2.2%	1.8%	\$0.29	\$2,722	\$0.04	\$0.04
MD	SMECO (MD)-N	241.2	32.0	29.4	7.5	4.6	\$5.8	138,995	2,044	506	\$269	\$0.13	2.2%	1.6%	0.9%	\$0.18	\$1,263	\$0.03	\$0.02
ME	EME-N	793.8	153.3	144.0	5.2	10.9	\$7.2	703,770	4,481	796	\$657	\$0.15	1.1%	3.4%	1.4%	\$0.05	\$657	\$0.01	\$0.01
MN	Moorhead Muni (MN)-N	3.6	0.3	0.3	11.2	0.0	\$0.1	14,906	160	29	\$15	\$0.09	0.7%	0.2%	0.2%	\$0.31	\$2,069	\$0.03	\$0.03
NH	PSNH-N	101.1	11.9	10.9	8.5	1.0	\$3.8	423,607	3,138	656	\$511	\$0.16	0.7%	0.4%	0.2%	\$0.32	\$3,617	\$0.04	\$0.04
C&I	Median	528.3	51.0	-	12.9	7.4	\$11.7	62,032	3,622	824	\$371	\$0.09	2.9%	1.4%	1.0%	\$0.26	\$1,805	\$0.03	\$0.02
VT	EVT-N	870.8	70.5	64.9	12.3	9.8	\$18.3	47,622	2,560	669	\$340	\$0.13	5.4%	2.8%	1.5%	\$0.26	\$1,872	\$0.02	\$0.02
	BED-N	53.3	4.1	3.8	13.0	0.7	\$1.3	3,815	259	47	\$35	\$0.13	3.6%	1.6%	1.4%	\$0.31	\$1,901	\$0.03	\$0.02
CT	CL&P-N	2,110.5	170.7	157.0	12.4	26.9	\$45.0	108,557	9,513	2,577	\$726	\$0.08	6.2%	1.8%	1.0%	\$0.26	\$1,674	\$0.03	\$0.02
	CMEEC (CT)-N	94.9	7.0	6.7	13.5	1.0	\$2.5	10,613	1,377	262	\$159	\$0.12	1.6%	0.5%	0.4%	\$0.35	\$2,434	\$0.03	\$0.03
MA	National Grid (MA)-N	3,419.2	264.2	235.7	12.9	40.9	\$78.8	158,243	12,531	2,814	\$854	\$0.07	9.2%	2.1%	1.5%	\$0.30	\$1,926	\$0.03	\$0.02
	NSTAR (MA)-N	5,000.2	388.9	357.8	12.9	52.6	\$91.5	174,321	14,794	2,181	\$1,205	\$0.08	7.6%	2.6%	2.4%	\$0.24	\$1,739	\$0.02	\$0.02
MD	SMECO (MD)-N	79.9	6.9	6.3	11.6	1.0	\$2.2	14,920	1,332	330	\$135	\$0.10	1.6%	0.5%	0.3%	\$0.32	\$2,112	\$0.03	\$0.03
ME	EME-N	634.8	86.5	81.3	7.3	11.8	\$15.8	91,828	7,080	1,258	\$709	\$0.10	2.2%	1.2%	0.9%	\$0.18	\$1,336	\$0.03	\$0.02
MN	Moorhead Muni (MN)-N	30.6	2.2	2.1	13.8	0.4	\$0.4	1,978	259	47	\$20	\$0.08	2.0%	0.9%	0.9%	\$0.17	\$932	\$0.02	\$0.01
NH	PSNH-N	421.7	31.5	29.0	13.4	5.1	\$7.6	76,441	4,683	978	\$401	\$0.09	1.9%	0.7%	0.5%	\$0.24	\$1,485	\$0.02	\$0.02
Overall	Median	827.7	77.1	70.9	10.7	11.0	\$17.2	420,094	6,196	1,415	\$798	\$0.12	2.7%	1.7%	0.9%	\$0.25	\$1,825	\$0.03	\$0.02
VT	EVT-N	1,132.5	110.8	101.9	10.2	15.9	\$27.0	340,139	4,571	1,195	\$683	\$0.15	4.0%	2.4%	1.3%	\$0.24	\$1,705	\$0.03	\$0.02
	BED-N	73.2	6.5	6.0	11.2	0.8	\$1.7	20,317	344	62	\$48	\$0.14	3.6%	1.9%	1.2%	\$0.26	\$2,254	\$0.03	\$0.02
CT	CL&P-N	2,777.5	283.7	261.0	9.8	38.8	\$69.9	1,211,954	19,491	5,280	\$1,990	\$0.10	3.5%	1.5%	0.7%	\$0.25	\$1,802	\$0.03	\$0.03
	CMEEC (CT)-N	133.9	13.4	12.8	10.0	1.6	\$3.8	72,587	1,912	363	\$243	\$0.13	1.6%	0.7%	0.4%	\$0.29	\$2,404	\$0.03	\$0.03
MA	National Grid (MA)-N	4,580.7	395.5	352.9	11.6	52.5	\$140.7	1,294,328	21,323	4,789	\$2,009	\$0.09	7.0%	1.9%	1.1%	\$0.36	\$2,678	\$0.04	\$0.03
	NSTAR (MA)-N	6,190.0	535.6	492.7	11.6	68.4	\$134.3	1,172,996	21,557	3,064	\$2,213	\$0.10	6.1%	2.5%	2.2%	\$0.25	\$1,965	\$0.03	\$0.02
MD	SMECO (MD)-N	321.1	38.9	35.8	8.3	5.6	\$8.0	153,915	3,377	836	\$403	\$0.12	2.0%	1.2%	0.7%	\$0.21	\$1,421	\$0.03	\$0.02
ME	EME-N	1,428.7	239.8	225.2	6.0	22.8	\$23.0	795,598	11,561	2,054	\$1,366	\$0.12	1.7%	2.1%	1.1%	\$0.10	\$1,010	\$0.02	\$0.02
MN	Moorhead Muni (MN)-N	34.2	2.5	2.4	13.5	0.5	\$0.5	16,884	420	76	\$34	\$0.08	1.4%	0.6%	0.6%	\$0.19	\$1,048	\$0.02	\$0.01
NH	PSNH-N	522.9	43.4	40.0	12.0	6.1	\$11.3	500,048	7,821	1,634	\$912	\$0.12	1.2%	0.6%	0.4%	\$0.26	\$1,848	\$0.03	\$0.02

2012 Total Portfolio Incentive/Non-Incentive Cost Detail (First Year)

Organization	Incentive		Non-Incentive		Total
	\$/kWh	% of Total	\$/kWh	% of Total	
EME-N	\$0.06	67%	\$0.03	33%	\$0.10
SMECO (MD)-N	\$0.12	60%	\$0.08	40%	\$0.21
EVT-N	\$0.14	57%	\$0.10	43%	\$0.24
CL&P-N	\$0.20	80%	\$0.05	20%	\$0.25
NSTAR (MA)-N	\$0.18	73%	\$0.07	27%	\$0.25
PSNH-N	\$0.20	77%	\$0.06	23%	\$0.26
BED-N	\$0.14	55%	\$0.12	45%	\$0.26
National Grid (MA)-N	\$0.27	79%	\$0.07	21%	\$0.34

EVT's technical assistance costs were about 16% of their total program costs. When these costs are added to the incentives, it shows about 72% of the EEC budget is used for direct customer benefits. BED's technical assistance costs were about 24% of their total program costs. When these costs are added to incentives, it shows about 83% of the EEC budget is used for direct customer benefits. It should be noted that we do not know the % spent on technical assistance for the other utilities benchmarked.

2012 C&I Incentive/Non-Incentive Cost Detail (First Year)

Organization	Incentive		Non-Incentive		Total \$/kWh
	\$/kWh	% of Total	\$/kWh	% of Total	
NSTAR (MA)-N	\$0.18	75%	\$0.06	25%	\$0.24
PSNH-N	\$0.18	77%	\$0.05	23%	\$0.24
EME-N	\$0.15	59%	\$0.10	41%	\$0.26
EVT-N	\$0.16	62%	\$0.10	38%	\$0.26
CL&P-N	\$0.20	77%	\$0.06	23%	\$0.26
National Grid (MA)-N	\$0.24	81%	\$0.06	19%	\$0.30
BED-N	\$0.18	57%	\$0.13	43%	\$0.31
SMECO (MD)-N	\$0.20	64%	\$0.12	36%	\$0.32

2012 Residential Incentive/Non-Incentive Cost Detail (First Year)

Organization	Incentive		Non-Incentive		Total
	\$/kWh	% of Total	\$/kWh	% of Total	
EME-N	\$0.03	63%	\$0.02	37%	\$0.05
SMECO (MD)-N	\$0.11	58%	\$0.08	42%	\$0.18
BED-N	\$0.09	49%	\$0.10	51%	\$0.19
EVT-N	\$0.10	48%	\$0.11	52%	\$0.22
CL&P-N	\$0.19	84%	\$0.03	16%	\$0.22
NSTAR (MA)-N	\$0.21	71%	\$0.08	29%	\$0.29
PSNH-N	\$0.24	76%	\$0.08	24%	\$0.32
National Grid (MA)-N	\$0.32	68%	\$0.15	32%	\$0.47

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