

THE MADISON ENERGY GROUP

ENERGY EFFICIENCY SOLUTIONS

Case Study:

National Coffee Chain





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The following Case Study was performed in conjunction with a national coffee chain client. The Madison Energy Group is under NDA with said client and therefore cannot reveal its identity or other certain details. This case study was unique as it was performed independently by the client. Madison Energy supplied the technology, IntelliHVAC, and the client both installed the equipment and monitored energy consumption using their VenStar Energy Management System. All data contained in this study was supplied by the client via VenStar and then analyzed by the client's Senior Energy Manager as well as Madison Energy's HVAC engineers.

Notes:

- I. The HVAC units that were installed on are smaller 3 ton units as compared to the 7.5 – 10 ton commercial package systems that are typically installed on.
- II. Store 2 had its thermostat set to Fan On while Store 1 had t-stat set to Fan Auto. This would have had an effect on the energy reduction normally caused by IntelliHVAC's intelligent variable post purge function.
- III. The cost per kWh was .08 cents for the locations of this study.
- IV. Not all dates are included in the data. The EMS did not report data for these dates.

Energy Footprint Daily Ad Hoc Report

	Store 1		Store 2		
Date	RTU 1	RTU 2	RTU 1	RTU 2	Total
8/26/16	35.52	84.23	158.44	98.87	382.84
8/27/16	73.21	66.10	196.75	74.94	416.77
8/28/16	73.36	67.26	182.30	130.13	459.00
8/29/16	75.36	63.22	207.71	91.23	443.21
8/30/16	79.78	68.33	185.76	115.76	454.92
8/31/16	62.84	31.65	157.89	83.78	343.45
9/1/16	57.34	21.41	142.96	74.87	300.98
9/2/16	68.06	28.56	144.46	64.33	311.53
9/3/16	49.75	40.57	148.33	86.60	331.29
9/4/16	57.42	37.75	158.55	99.75	359.14
9/5/16	75.10	65.67	195.36	120.55	463.92
9/6/16	94.49	97.37	232.23	126.92	561.76
9/7/16	87.85	97.37	206.01	132.13	534.15
9/8/16	81.73	67.94	178.50	103.73	436.93
9/9/16	73.98	39.40	169.65	104.48	389.85
9/12/16	30.37	29.06	87.95	53.97	205.04
9/13/16	67.73	50.00	170.41	98.23	392.79
9/14/16	59.13	46.87	145.34	59.84	316.73
9/15/16	70.21	34.84	150.92	70.38	331.71
9/16/16	67.88	46.67	182.23	99.69	399.15
9/17/16	137.56	85.39	339.59	200.25	769.53
9/18/16	49.44	35.84	167.22	85.05	340.76
9/19/16	79.53	50.98	170.07	104.91	411.11
9/20/16	64.81	43.01	168.49	95.16	378.07
9/21/16	67.62	31.45	153.82	78.35	333.82
9/22/16	70.55	36.45	178.99	70.52	357.43
9/23/16	66.52	24.98	169.80	85.05	347.29
9/24/16	55.20	27.58	148.06	69.13	300.90
9/26/16	19.59	9.49	70.75	33.55	134.72
9/27/16	36.69	18.67	121.73	50.17	230.67
9/28/16	11.25	16.42	116.30	36.28	181.83
9/29/16	5.18	12.15	122.36	41.43	182.73
9/30/16	0.92	18.44	129.08	47.62	197.67
10/3/16	3.76	18.87	123.67	59.87	208.00
10/4/16	31.79	14.35	129.32	54.73	232.20
10/5/16	46.66	21.97	142.27	71.30	285.22
10/6/16	28.73	21.75	140.85	84.68	279.57
10/7/16	15.31	18.87	117.38	44.01	199.24
10/8/16	7.00	13.60	116.10	49.96	190.10
10/9/16	8.30	13.23	118.75	52.97	196.38
10/10/16	23.00	13.48	114.05	45.27	199.32
10/11/16	34.10	9.13	134.04	66.17	246.55
10/12/16	9.95	16.98	110.22	42.07	181.80
10/13/16	2.67	11.11	95.93	35.96	147.54
10/14/16	16.93	4.53	109.88	38.66	171.70
10/15/16	17.23	6.76	129.03	66.31	220.87
10/16/16	29.60	11.78	149.52	78.93	271.37
10/17/16	52.17	22.54	161.87	82.74	320.98
10/18/16	41.01	46.05	154.96	80.17	326.01
10/19/16	7.41	38.43	118.58	45.15	212.46
10/20/16	2.24	14.96	99.98	35.71	153.85
10/21/16	4.62	12.95	89.88	35.76	144.18
10/22/16	5.89	3.07	103.17	36.67	149.82
10/23/16	22.80	4.64	116.92	52.06	197.33
10/24/16	15.70	2.75	102.42	35.71	157.53
10/25/16	16.84	0.19	85.81	35.81	139.59
10/26/16	4.92	0.19	63.52	35.50	105.09
10/27/16	14.26	0.19	69.45	35.76	120.62
10/28/16	4.36	0.79	109.85	42.29	159.08
10/29/16	27.39	3.15	128.19	58.37	218.04
10/30/16	4.91	0.27	107.49	37.65	151.27

Install Date

IntelliHVAC Performance Analysis

One Week Comparison

	Store 1			Store 2		
	RTU 1	RTU 2	Total	RTU 1	RTU 2	Total
Baseline	381.00	191.64	572.63	1,011.63	481.93	1,493.56
Performance	132.34	126.40	258.74	904.95	403.63	1,308.58
kWh Reduction/Period	248.66	65.23	313.90	106.68	78.30	184.98
kWh Reduction/Annual	12,965.87	3,401.52	16,367.39	5,562.73	4,082.78	9,645.50
Reduction %	65%	34%	55%	11%	16%	12%

Two Week Comparison

	Store 1			Store 2		
	RTU 1	RTU 2	Total	RTU 1	RTU 2	Total
Baseline	912.47	542.24	1,454.71	2,337.41	1,200.30	3,537.71
Performance	234.29	208.46	442.75	1,703.92	734.69	2,438.60
kWh Reduction/Period	678.18	333.78	1,011.96	633.50	465.61	1,099.10
kWh Reduction/Annual	17,681.20	8,702.07	26,383.26	16,516.12	12,139.09	28,655.21
Reduction %	74%	62%	70%	27%	39%	31%

30 Day Comparison

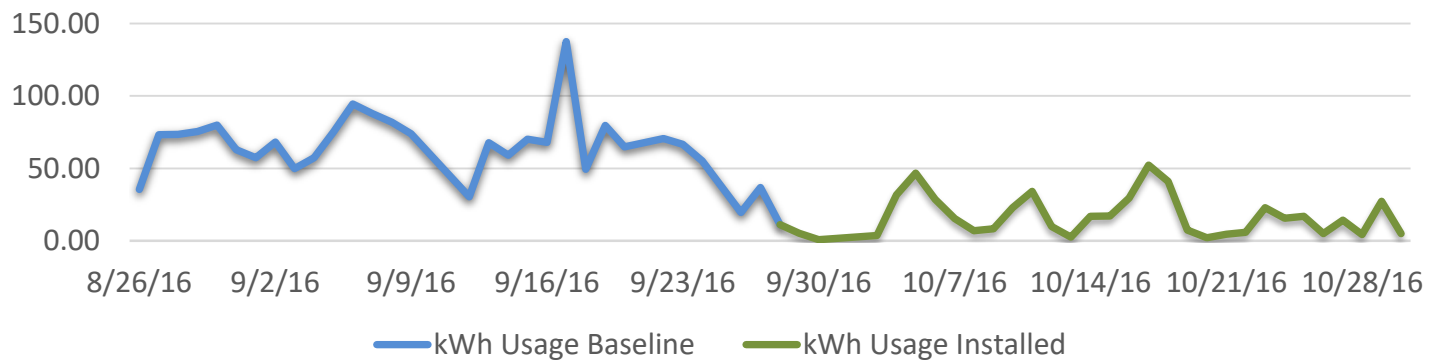
	Store 1			Store 2		
	RTU 1	RTU 2	Total	RTU 1	RTU 2	Total
Baseline	1,988.66	1,448.14	3,436.80	5,090.27	2,762.32	7,852.59
Performance	505.66	377.16	882.82	3,494.54	1,529.28	5,023.82
kWh Reduction/Period	1,483.00	1,070.98	2,553.98	1,595.73	1,233.03	2,828.76
kWh Reduction/Annual	18,043.15	13,030.23	31,073.37	19,414.70	15,001.92	34,416.61
Reduction %	75%	74%	74%	31%	45%	36%

Proof of Concept Project Summary

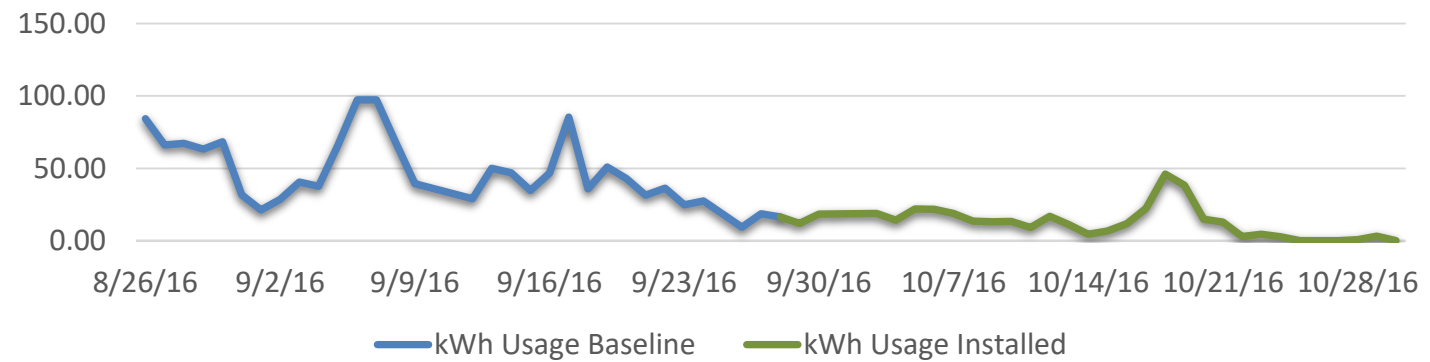
	Store 1	Store 2
Projected Annual kWh Savings per Store	16367.39	9645.50
Project Annual Cost Reduction per Store	\$ 1,309.39	\$ 771.64
Savings Weather Normalized per Store	\$ 1,546.76	\$ 1,713.18
Average Projected Annual Cost Reduction per RTU	\$ 773.38	\$ 856.59
Combined Average Annual Cost Reduction per Store	\$ 1,629.97	
Combined Average Annual Cost Reduction per RTU	\$ 814.99	
Return on Investment	14.71	Months



IntelliHVAC Performance - Store 1 / RTU 1

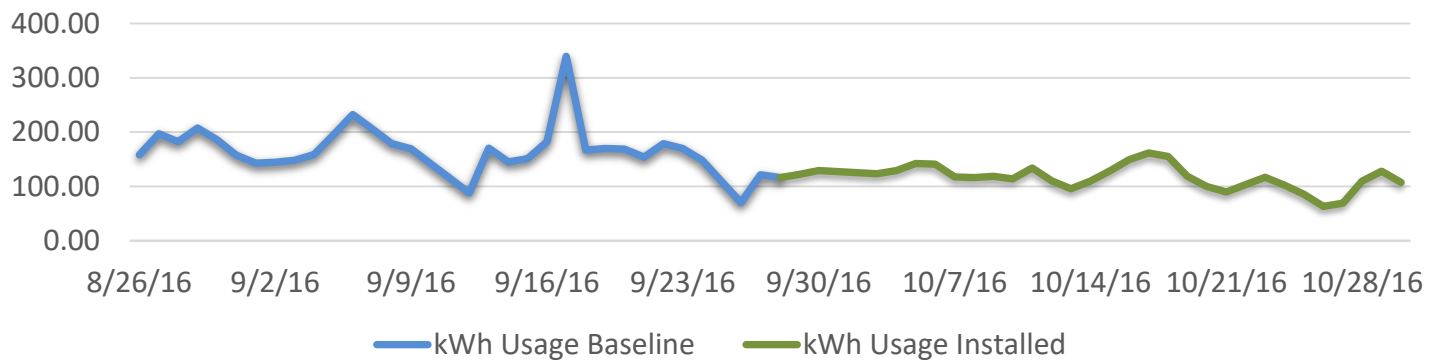


IntelliHVAC Performance – Store 1 / RTU 2

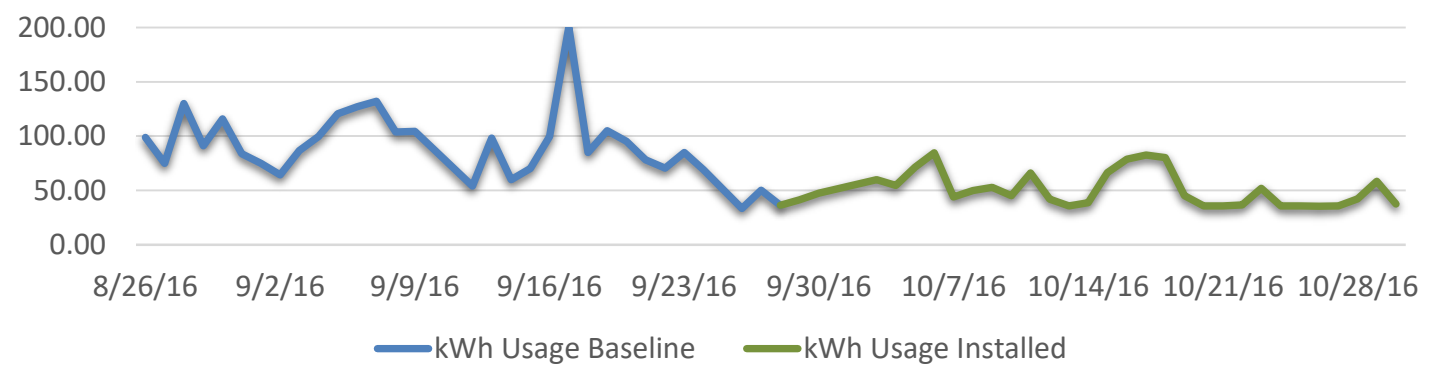




IntelliHVAC Performance - Store 2 / RTU 1



IntelliHVAC Performance – Store 2 / RTU 2





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