THE MADISON ENERGY GROUP

ENERGY EFFICIENCY SOLUTIONS

Case Study:

THE MADISON ENERGY GROUP
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Proof of Concept Protocol

Purpose: Demonstrate product performance on specified equipment at multiple pre-determined locations.

Measure Baseline Data:

I. Identify equipment
II. Ensure unit is operating properly (normal duty cycle, no visible ice, reaches set point)
III. Ensure thermostat is accessible and compatible
IV. Ensure compressor motor is accessible for data logger connection
V. Record unit information: Type, Mfg, Model #

Compressor Power Source:

I. At the compressor
    i. Single phase (hot lead)
    ii. 3 Phase (1 of 3 hot leads)
II. Locate power rating (amperage/voltage) on compressor nameplate
III. Record on datasheet; Phase, Volts and Amps
IV. Record pilot start date/time on datasheet

Record Baseline Data:

I. Install EKM Omni-meter V.3
II. Record Baseline Data – 7 days
III. Validate baseline data

Measure Performance Data:

I. Install IntelliHVAC technology
II. Record install start date/time
III. Record Performance Data – 7 days
IV. Validate Performance Data
V. Record pilot ending date/time
VI. Analyze results

intelliHVAC

INTELLIGENT SOLUTIONS FOR HEATING AND AIR

IntelliHVAC reduces energy consumption in HVAC units through efficient fan control and compressor cycling. The combination of these two technologies optimizes performance by allowing the fans, which use 8 to 15 times less energy than the compressors to capture latent energy that would otherwise be lost. It is retrofitted at the 24-volt terminal and requires no additional maintenance.

Guaranteed to Reduce Energy Costs 10 – 30%
Reduces Compressor Cycles by 20%
Prevents Wear and Tear
Extends Life of Equipment
12 - 18 Month ROI
Reduced CO2 Emissions – Go Green!
Lifetime Warranty

IntelliHVAC is a dual microprocessor technology that easily retrofits to any existing central air HVAC system. It contains both a *post-purge* and *compressor cycle functions* that work together to create a significantly more efficient environment within the system. The inefficiency and therefore *opportunity* is that there is still latent cold energy on the coil or heat energy in the exchanger and this energy is wasted as it dissipates within the system. IntelliHVAC captures this excess energy through its *post-purge function*. This process is known as latent recovery and has been verified by numerous utility companies.

When the HVAC system reaches set point, IntelliHVAC will extend and optimize the fan run-time based on the previous compressor cycle to ensure that the latent hot or cold energy has been captured and that all of that air is circulated all the way through the duct system so that it is not wasted. IntelliHVAC continues to monitor the system and adjust the post purge cycle based on its proven algorithm.

IntelliHVAC also has a *compressor cycle function* that increases the overall energy savings cycling the compressor off for 5 minutes for every 25 minutes of continuous run-time. This allows the fan, which uses 8 to 15 less energy than the compressor to capture the latent energy from the coil or heat exchanger. IntelliHVAC will run the fan for the equivalent amount of time that the compressor is off to ensure that air continues to circulate and there are no negative effects to the indoor air temperature quality.

Tower Heating and Air
Craig Andes
Owner / HVAC Contractor

J. Craig Andes, MBA

With close to 40 years of experience, Mr. Andes has been an industry veteran since 1977 and has a keen eye toward efficiency for his customers. Mr. Andes has owned and operated numerous businesses including several mechanical companies, an insulating company, has built numerous structures, and has directed large service-oriented companies. Mr. Andes has also been hired as a consultant by several companies to assist them in their growth and process management.

Currently Mr. Andes owns and operates Tower Heating and Air in the Raleigh, NC metro market.

After earning his MBA at Union University in Jackson, TN, Mr. Andes is able to merge the real-world practical side of HVAC with financial feasibility and ROI making for good common-sense guidance.

With regard to Madison Energy Group, Mr. Andes serves as an independent, 3rd party consultant and assists the company specifically with the IntelliHVAC technology. Mr. Andes has helped Madison Energy consult with companies such as Restaurant Brands International, Darden Restaurants, CBL Properties, and others in helping them to understand the mechanics of their systems as well as the benefits of the IntelliHVAC technology. Mr. Andes also manages the pilot program process, analysis and reporting on behalf of Madison.

The attached reporting is hereby approved and certified by Mr. Andes as accurate in its entirety. Mr. Andes is not compensated in any manner that is based on test results.

J. Craig Andes

Tower Heating and Air
Owner / HVAC Contractor
Date: 11/30/2018

TOWER Heating & Air

Report Date:	11/30/2018

Craig Andes
HVAC Engineering Contractor

On Behalf of:	The Madison Energy Group
For Client:	Edison Township NJ

Kwh Rate:	0.11

Location: **100 Municipal Blvd Edison, NJ**

		Start Date	Install Date	Time	Baseline kWh Consumed	End Date	Time	Performance kWh Consumed
Area:	RTU 1	10/23/2018	10/30/2018	12:00PM	**862.9**	11/6/2018	12:00 PM	**712.7**
Meter #	30348							
				kWh/Month	3,698.14		**kWh/Month**	3,054.43
				kWh/Yr	44,994.07		**kWh/Yr**	37,162.21

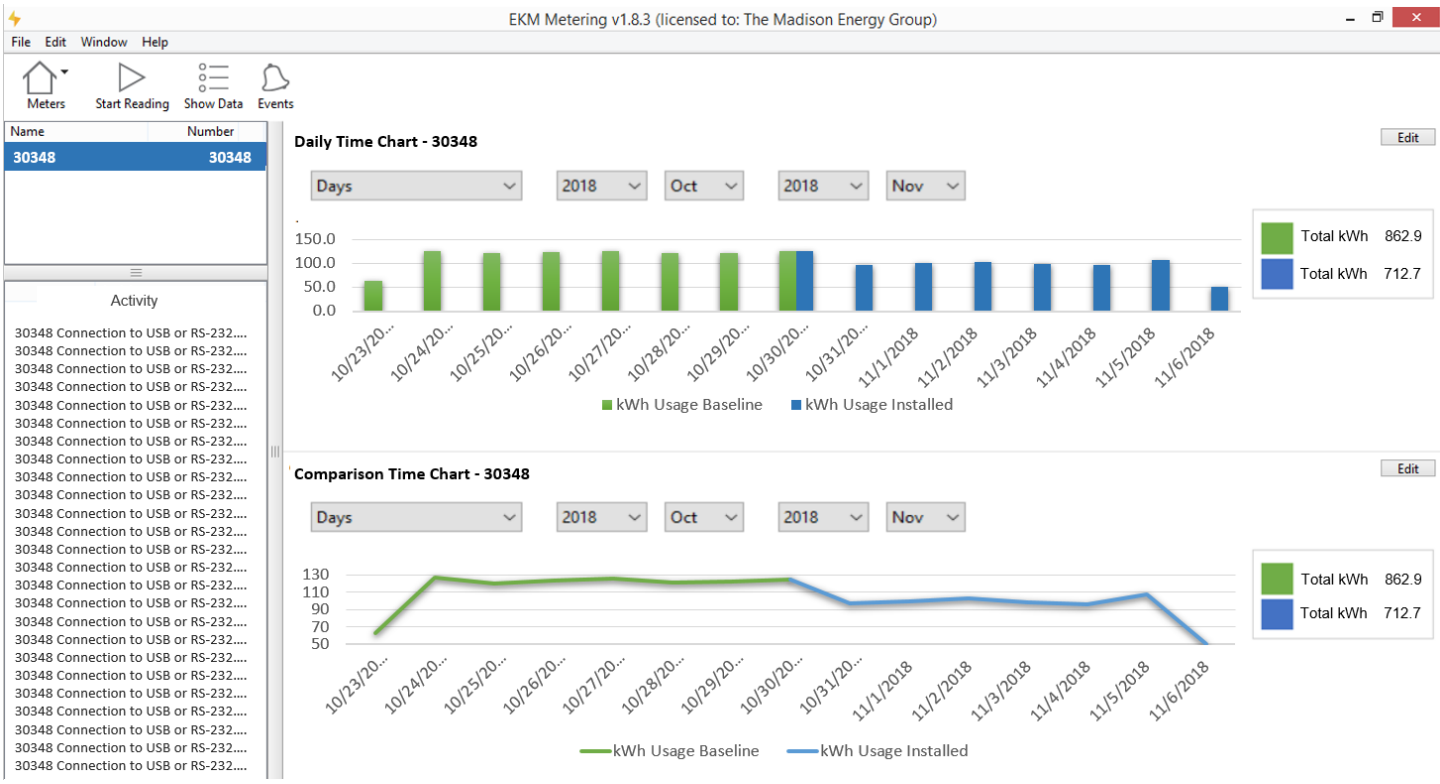
RTU Summary		
kWh Diff./Period		150.2
kWh Diff./Yr		7,831.86
% Change		17%
Savings/Yr	$	861.50

Location: **100 Municipal Blvd Edison, NJ**

		Start Date	Install Date	Time	Baseline kWh Consumed	End Date	Time	Performance kWh Consumed
Area:	RTU 2	10/23/2018	10/30/2018	12:00PM	**916.2**	11/6/2018	12:00PM	**756.4**
Meter #	29350							
				kWh/Month	3,926.57		**kWh/Month**	3,241.71
				kWh/Year	47,773.29		**kWh/Year**	39,440.86

RTU Summary		
kWh Diff./Period		159.80
kWh Diff./Yr		8,332.43
% Change		17%
Savings/Yr	$	916.57

Project Summary			
Total kWh/Yr Reduced		16,164.29	
Average Annual Savings	$	889.04	
Normalized for Season	$	1,511.36	
Projected ROI		7.93	**Months**


EKM Metering v1.8.3 (licensed to: The Madison Energy Group)
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Meters
Start Reading
Show Data
Events
Name
Number
30348
30348
Activity
30348 Connection to USB or RS-232....
Daily Time Chart - 30348
Edit
Days
2018
Oct
2018
Nov
150.0
100.0
50.0
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10/23/20...
10/24/20...
10/25/20...
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10/28/20...
10/29/20...
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11/2/2018
11/3/2018
11/4/2018
11/5/2018
11/6/2018
kWh Usage Baseline
kWh Usage Installed
Total kWh 862.9
Total kWh 712.7
Comparison Time Chart - 30348
Edit
Days
2018
Oct
2018
Nov
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110
90
70
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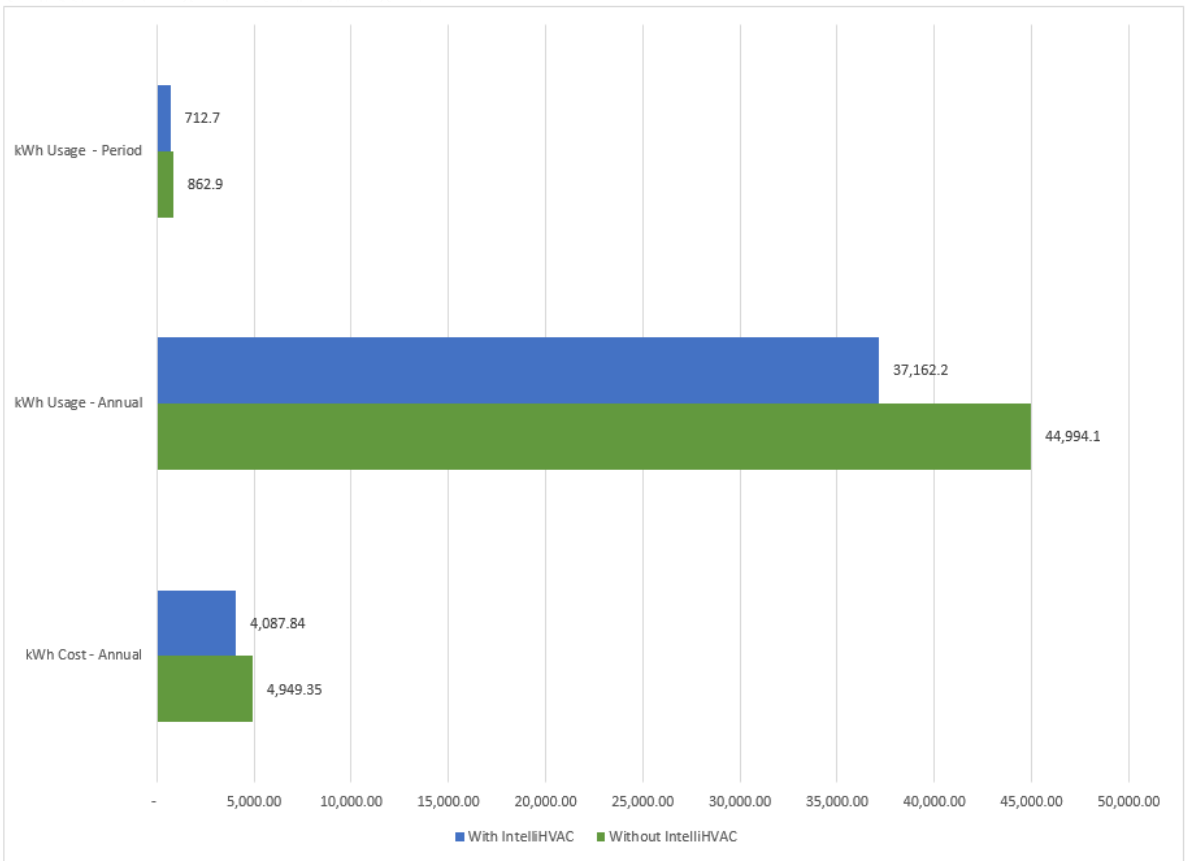
kWh Usage Baseline
kWh Usage Installed
Total kWh 862.9
Total kWh 712.7


EKM METERING
kWh Usage - Period
712.7
862.9
kWh Usage - Annual
37,162.2
44,994.1
kWh Cost - Annual
4,087.84
4,949.35
-
5,000.00
10,000.00
15,000.00
20,000.00
25,000.00
30,000.00
35,000.00
40,000.00
45,000.00
50,000.00
With IntelliHVAC
Without IntelliHVAC

EKM METERING

EKM-OmniMeter v.3
Edison Township RTU 1 LogFile
Total kWh Usage for Period: 1575.6

Date	Kilowatt Hour	Avg. Voltage	Avg. Amps	Avg. Watts	Avg. Cosî¸ (Power Factor)
10/23/2018	62.8	121.7	25.6	2462	LO.87
10/24/2018	126.2	121.8	25.4	2450	LO.86
10/25/2018	120.3	123.2	26.0	2582	LO.87
10/26/2018	123.7	123.5	24.8	2564	LO.86
10/27/2018	125.0	122.6	24.6	2532	LO.87
10/28/2018	120.5	123.8	24.6	2520	LO.88
10/29/2018	122.1	122.4	26.0	2460	LO.87
10/30/2018	124.6	122.5	25.2	2420	LO.85
10/31/2018	97.1	121.3	25.2	2442	LO.85
11/1/2018	99.6	121.4	24.2	2510	LO.85
11/2/2018	102.2	121.9	25.2	2518	LO.87
11/3/2018	98.2	122.3	24.4	2440	LO.86
11/4/2018	95.8	122.1	24.2	2460	LO.86
11/5/2018	107.0	121.0	24.0	2432	LO.87
11/6/2018	50.5	121.2	24.4	2450	LO.85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Oct
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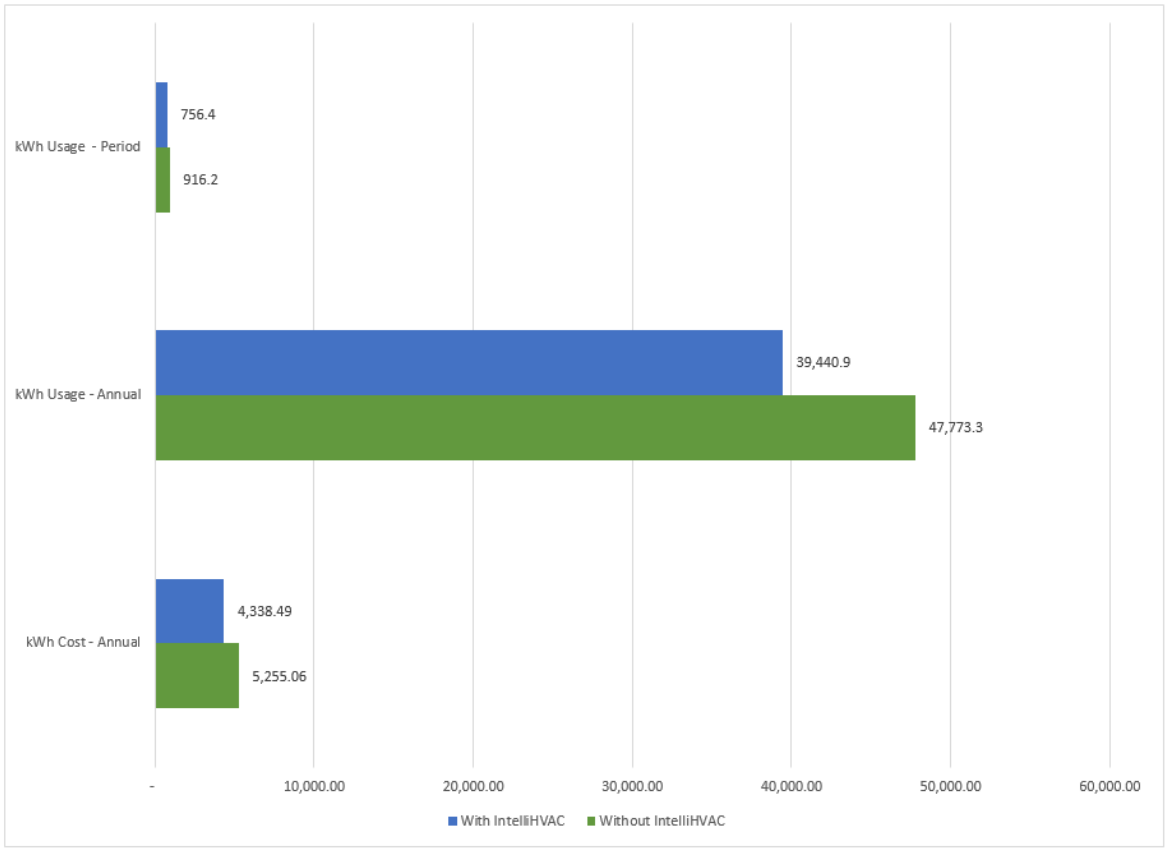
Nov
150.0
100.0
50.0
0.0
10/23/20...
10/24/20...
10/25/20...
10/26/20...
10/27/20...
10/28/20...
10/29/20...
10/30/20...
10/31/20...
11/1/2018
11/2/2018
11/3/2018
11/4/2018
11/5/2018
11/6/2018
kWh Usage Baseline
kWh Usage Installed
Total kWh 916.2
Total kWh 756.4
Comparison Time Chart - 29350
Edit
Days
2018
Oct
2018
Nov
140.0
90.0
40.0
kWh Usage Baseline
kWh Usage Installed
Total kWh 916.2
Total kWh 756.4


EKM METERING
kWh Usage - Period
756.4
916.2
kWh Usage - Annual
39,440.9
47,773.3
kWh Cost - Annual
4,338.49
5,255.06
-
10,000.00
20,000.00
30,000.00
40,000.00
50,000.00
60,000.00
With IntelliHVAC
Without IntelliHVAC

EKM METERING

EKM-OmniMeter v.3
Edison Township RTU 2 LogFile
Total kWh Usage for Period: 1672.6

Date	Kilowatt Hour	Avg. Voltage	Avg. Amps	Avg. Watts	Avg. Cosî¸ (Power Factor)
10/23/2018	64.8	122.5	26.0	2710	LO.86
10/24/2018	124.7	122.3	26.2	2716	LO.86
10/25/2018	132.3	121.8	25.6	2724	LO.87
10/26/2018	128.4	121.9	25.8	2718	LO.86
10/27/2018	131.0	123.0	25.6	2690	LO.87
10/28/2018	129.6	123.4	25.4	2676	LO.87
10/29/2018	136.8	121.7	25.6	2684	LO.87
10/30/2018	137.2	121.5	26.0	2708	LO.87
10/31/2018	92.1	121.4	25.2	2714	LO.86
11/1/2018	102.5	121.6	25.0	2642	LO.86
11/2/2018	118.0	120.8	25.2	2658	LO.85
11/3/2018	116.0	120.6	25.2	2630	LO.85
11/4/2018	109.6	120.8	24.8	2636	LO.85
11/5/2018	105.2	121.2	24.6	2684	LO.87
11/6/2018	44.4	121.4	24.6	2612	LO.85

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ENERGY EFFICIENCY SOLUTIONS

Proof of Concept Performance Summary

Program Duration - 10/23/2018 - 11/6/2018

IntelliHVAC Summary

Annual Savings - RTU 1	$	861.50			
Annual Savings - RTU 2	$	916.57			
Average Annual Savings per Unit	$	889.04			
Annual Savings Normalized for Season	$	1,511.36			
Projected Annual Savings for		20	units	$	30,227.20
Projected Savings Over 10 Years				$	302,272.00
Return on Investment ----------			7.93		Months

Overall Summary of Performance

Projected Monthly Energy Savings	$	2,518.93
Projected Annual Energy Savings	$	30,227.20
Projected Energy Savings Over 10 Years	$	302,272.00
Cumulative Return on Investment/Months		9.59

MADISON ENERGY GROUP
ENERGY EFFICIENCY SOLUTIONS

Limited Lifetime Replacement Warranty

Guarantor: The Madison Energy Group, located at 5 West Hargett St. 4th Floor Raleigh, NC 27601 will fulfill and administer the obligations of this performance guarantee.

This performance guarantee certifies that The Madison Energy Group's (manufacturer) IntelliHVAC will perform satisfactorily during the guarantee period in accordance with its original energy saving standards. If the unit is defective when received or becomes defective, it will be replaced in accordance with this Limited Lifetime Warranty/Performance Guarantee. Please call The Madison Energy Group at 919-443-2404 Option 2 if this occurs.

The performance guarantee does not cover negligent, fraudulent and/or intentional damage. If the IntelliHVAC unit is damaged, another IntelliHVAC unit will be sent immediately as a replacement. For coverage to be valid, the client must register with The Madison Energy Group and provide proof of purchase in the form of a paid invoice from either The Madison Energy Group or one of its qualified, contracted distributors. The unit must also e installed properly along with manufacturer specifications.

This performance guarantee is effective from the date of purchase, provided that adequate proof of purchase is maintained, the product is properly registered (see below) and the product is installed properly. The Madison Energy Group must be notified immediately of any defects in the unit with all records being made available for inspection. Defects will be verified. This guarantee is exclusive and in lieu of any other performance guarantee or warranty of merchantability or fitness for a particular purpose.

In no event shall The Madison Energy Group be liable for any special, indirect, incidental or consequential damages. This guarantee, covering the replacement of the IntelliHVAC unit is void is the product covered by the guarantee has been subject to: intentional damage, alteration, tampering, acts of God and other insurance perils, faulty installation or claims covered by insurance or service contract. The coverage applies only to IntelliHVAC and no other product. Claims not submitted in accordance with the terms and conditions of this guarantee are void. Damage by unreasonable or unintended use, neglect, improper service or other causes not arising of defects in material or workmanship are not covered.

To Make a Claim: For service please contact The Madison Energy Group support line at 919-443-2404

To Register: In order for coverage to be valid, you must register your IntelliHVAC within 30 days of purchase at www.themadisonenergygroup.com. Coverage is non-transferable.

PHONE: 919-443-2404
FAX: 919-800-3700
INFO@THEMADISONENERGYGROUP.COM

5 WEST HARGETT ST. · 4TH FLOOR
RALEIGH, NC 27601
WWW.THEMADISONENERGYGROUP.COM

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