



## Case Study:





# THE MADISON ENERGY GROUP

ENERGY EFFICIENCY SOLUTIONS

## 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 Madison 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



EnerG<sup>2</sup> was developed to solve the excess energy consumption in walk-in coolers and freezers caused by measuring ambient air temperature which reacts to change more rapidly than actual food temperature which is more stable.

EnerG<sup>2</sup> retrofits to the existing thermostat air probe and provides a more accurate means of temperature measurement with its specialized gel compound that simulates food product temperature instead of ambient air temperature. Because of the conversion to a more stable temperature curve, we are able to eliminate unnecessary compressor cycles and run time. This translates into average energy savings of 15-25% and maintenance savings of 40-60% or about \$600 per walk-in per year. EnerG<sup>2</sup> is easy to install, requires no maintenance, has a lifetime warranty and a 12 month ROI.

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**Guaranteed to Reduce Energy Costs 15 – 30%**  
**Reduces Compressor Cycles by 40 – 60%**  
**Prevents Wear and Tear**  
**Extends Life of Equipment**  
**12 Month ROI**  
**Green Restaurant Associated Endorsed**  
**Reduced CO2 Emissions – Go Green!**  
**Lifetime Warranty**



# HMS Engineering Ltd.

Phillip Stewart

Engineering Consultant

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## Background and Qualifications for Energy Analysis

Mr. Stewart joined the US Military in 1982 and became a marine engineer involved with mechanical, electrical and structural engineering. After completing his military tour in 1990, he was recruited by Walt Disney World as a Control Specialist and Engineer. During that period Mr. Stewart became extremely interested in energy management systems. After opening Pleasure Island, MGM Studios, Disney Vacation Club, he realized that it was time for new growth in my life and joined Florida's largest Service Company BGSI. Mr. Stewart became certified as a Master Engineer for Refrigeration and Food Equipment.

After years of international endeavours Mr. Stewart entered semi-retirement where he established his consulting company, HMS Engineering Ltd. in 2007.

As a Chief Engineer, Renewable Energy Consultant and Food Equipment expert, he continues to educate and assist many large companies on ways to reduce their energy consumption and increase their bottom line profits. Companies he has supported over the years include Sandals, Couples Resorts, Montego Bay Convention Centre, KFC, Wendy's, Burger King, Moes, Margaritaville, and many others.

The attached Baseline/Performance Test Report was prepared by Mr. Stewart and all findings are based on analysis of the raw data logger information collected onsite and provided to him.

I certify that neither I nor my company (HMS Ltd.) ever receive any compensation which correlates in any manner whatsoever to test report results and that the referenced report findings are accurate and unbiased.

Phillip Stewart



Chief Engineer

HMS Engineering Ltd.

Referenced Report No. NE31319

Dated 3/13/2019

# HMS Engineering

Client :

The Madison Energy Group  
5 Hargett St., 4th Floor  
Raleigh, North Carolina 27601

Report Print Date:

13-Mar-19

Report No.:

NE31319

Facility / Location:

Nouria Energy / MD

Room/Equip. Tested:

Walk-in Cooler - EnerG<sup>2</sup>

## Calculation Basis

Compressor Motor: HP: 0.3 Volts: 230 RLA: 8.0 Phase: 3

Power Consumption: 2.84 kW Electricity Rate: \$0.13 per kWh

## Operating Basis

	(Without EnerG <sup>2</sup> )	With EnerG <sup>2</sup>	Change	% Change
Projected Run Hours / Yr:	6,709	5,411	-1,298	-19.3%
Projected Cycles / Yr:	12,748	6,123	-6,625	-52.0%

## Energy Use & Cost Savings per Month

	(Without EnerG <sup>2</sup> )	With EnerG <sup>2</sup>	Change	% Change
Operating Hours / Month:	559	451	-108	-19.3%
KWh / Month:	1,588	1,281	-307	-19.3%
Energy Cost / Month	\$213	\$172	-\$41	-19.3%

## Mechanical Cost Savings per Month

	(Without EnerG <sup>2</sup> )	With EnerG <sup>2</sup>	Change	% Change
Cycles / Month:	1,062	510	-552	-52.0%
Compressor Maintenance Cost/ Month:	\$42	\$20	-\$22	-52.0%

## Combined Energy and Mechanical Cost Savings

	(Without EnerG <sup>2</sup> )	With EnerG <sup>2</sup>	Change	% Change
Energy & Mechanical Cost / Month:	\$254	\$192	-\$63	-24.7%
Energy & Mechanical Cost / Year:	\$3,053	\$2,299	-\$753.81	-24.7%

EnerG<sup>2</sup> Return on Investment  
Months

9.54



Summary

.....Nouria Cooler.log (CT18040052)

Data File Name: CT18040052 Nouria Cooler Baseline (\*saved\*)  
 Logger Serial Number: CT18040052  
 Description: DENT SMART LOGGER  
 Elapsed Time Since Reset: 168.00 hrs  
 On-Time Since Reset: 128.67 hrs  
 Percent On Since Reset: 76.59 %  
 Connected Load: No Load Defined  
 Energy Cost: Unknown  
  
 Data Starts: 2/23/2019 12:00:00 PM  
 Data Ends: 3/2/2019 12:00:00 PM  
 Data Elapsed Time: 168.00 hrs  
 Estimated Annual Hours On: 6709 hrs  
  
 Number of Turn Ons: 244  
  
 Percent On: 76.59 %  
 Data On-Time: 128.67 hrs  
 Average On-Time: 0.53 hrs  
 Longest On-Time: 0.79 hrs  
 Shortest On-Time: <0.01 hrs  
  
 Number of Turn Offs: 245  
 Percent Off: 23.41 %  
 Data Off-Time: 39.33 hrs  
 Average Off-Time: 0.16 hrs  
 Longest Off-Time: 0.24 hrs  
 Shortest Off-Time: <0.01 hrs



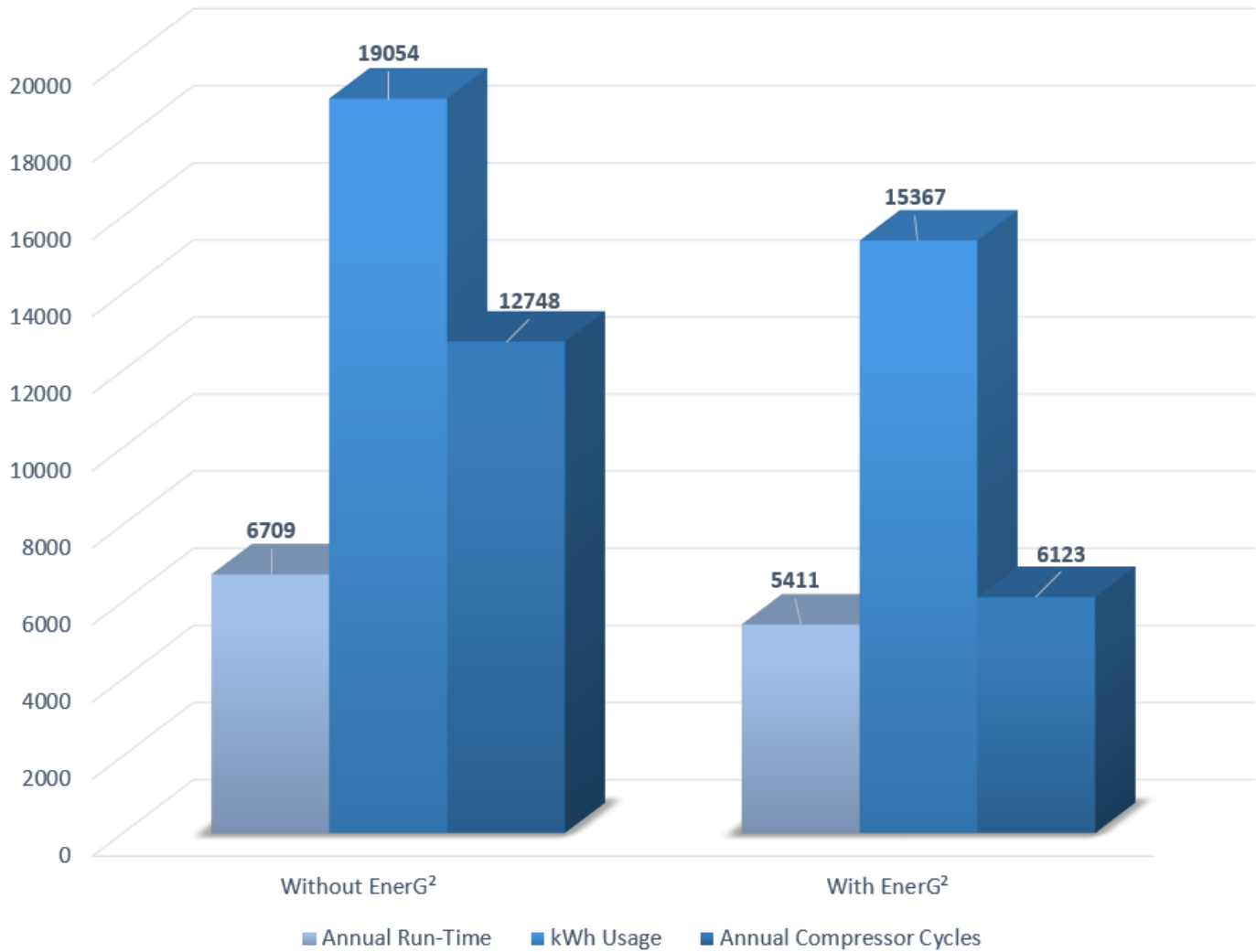
Summary

.....Nouria Cooler.log (CT18040052)

Data File Name: CT18040052 Nouria Cooler Performance (\*saved\*)  
 Logger Serial Number: CT18040052  
 Description: DENT SMART LOGGER  
 Elapsed Time Since Reset: 168.00 hrs  
 On-Time Since Reset: 103.77 hrs  
 Percent On Since Reset: 61.77 %  
 Connected Load: No Load Defined  
 Energy Cost: Unknown  
  
 Data Starts: 3/2/2019 12:00:00 PM  
 Data Ends: 3/9/2019 12:00:00 PM  
 Data Elapsed Time: 168.00 hrs  
 Estimated Annual Hours On: 5411 hrs  
  
 Number of Turn Ons: 114  
  
 Percent On: 61.77 %  
 Data On-Time: 103.77 hrs  
 Average On-Time: 0.91 hrs  
 Longest On-Time: 1.37 hrs  
 Shortest On-Time: <0.01 hrs  
  
 Number of Turn Offs: 115  
 Percent Off: 38.23 %  
 Data Off-Time: 64.23 hrs  
 Average Off-Time: 0.56 hrs  
 Longest Off-Time: 0.84 hrs  
 Shortest Off-Time: <0.01 hrs



## CT18040052 Data Graph Series | Nouria Cooler - MD





Serial Number: CT18040052

Description: DENT SMART LOGGER

On-Time Since Reset: 232.44 hrs

Off-Time Since Reset: 103.56 hrs

Date	TOU/Day (hrs)
Saturday, February 23, 2019	7.84
Sunday, February 24, 2019	15.70
Monday, February 25, 2019	17.92
Tuesday, February 26, 2019	18.52
Wednesday, February 27, 2019	19.37
Thursday, February 28, 2019	18.91
Friday, March 1, 2019	20.48
Saturday, March 2, 2019	19.86
Sunday, March 3, 2019	14.08
Monday, March 4, 2019	13.56
Tuesday, March 5, 2019	13.69
Wednesday, March 6, 2019	13.91
Thursday, March 7, 2019	15.16
Friday, March 8, 2019	15.85
Saturday, March 9, 2019	7.59



HMS Engineering

Client : The Madison Energy Group  
5 Hargett St., 4th Floor  
Raleigh, North Carolina 27601

Report Print Date: 13-Mar-19

Report No.: NE31319

Facility / Location: Nouria Energy / NH

Room/Equip. Tested: Walk-in Cooler - EnerG<sup>2</sup>

Calculation Basis

Compressor Motor: HP: 0.3 Volts: 230 RLA: 8.0 Phase: 3  
Power Consumption: 2.84 kW Electricity Rate: \$0.13 per kWh

Operating Basis

	(Without EnerG <sup>2</sup> )	With EnerG <sup>2</sup>	Change	% Change
Projected Run Hours / Yr:	6,882	5,610	-1,272	-18.5%
Projected Cycles / Yr:	11,567	5,834	-5,733	-49.6%

Energy Use & Cost Savings per Month

	(Without EnerG <sup>2</sup> )	With EnerG <sup>2</sup>	Change	% Change
Operating Hours / Month:	574	468	-106	-18.5%
KWh / Month:	1,629	1,328	-301	-18.5%
Energy Cost / Month	\$218	\$178	-\$40	-18.5%

Mechanical Cost Savings per Month

	(Without EnerG <sup>2</sup> )	With EnerG <sup>2</sup>	Change	% Change
Cycles / Month:	964	486	-478	-49.6%
Compressor Maintenance Cost/ Month:	\$42	\$21	-\$21	-49.6%

Combined Energy and Mechanical Cost Savings

	(Without EnerG <sup>2</sup> )	With EnerG <sup>2</sup>	Change	% Change
Energy & Mechanical Cost / Month:	\$260	\$199	-\$61	-23.5%
Energy & Mechanical Cost / Year:	\$3,119	\$2,387	-\$731.89	-23.5%

EnerG<sup>2</sup> Return on Investment Months 9.82



Summary

.....Nouria Cooler.log (CT18040056)

Data File Name: CT18040056 Nouria Cooler Baseline (\*saved\*)  
 Logger Serial Number: CT18040056  
 Description: DENT SMART LOGGER  
 Elapsed Time Since Reset: 168.00 hrs  
 On-Time Since Reset: 131.98 hrs  
 Percent On Since Reset: 78.56 %  
 Connected Load: No Load Defined  
 Energy Cost: Unknown  
  
 Data Starts: 2/22/2019 12:00:00 PM  
 Data Ends: 3/1/2019 12:00:00 PM  
 Data Elapsed Time: 168.00 hrs  
 Estimated Annual Hours On: 6882 hrs  
  
 Number of Turn Ons: 222  
  
 Percent On: 78.56 %  
 Data On-Time: 131.98 hrs  
 Average On-Time: 0.59 hrs  
 Longest On-Time: 0.89 hrs  
 Shortest On-Time: <0.01 hrs  
  
 Number of Turn Offs: 223  
 Percent Off: 21.44 %  
 Data Off-Time: 36.02 hrs  
 Average Off-Time: 0.16 hrs  
 Longest Off-Time: 0.24 hrs  
 Shortest Off-Time: <0.01 hrs



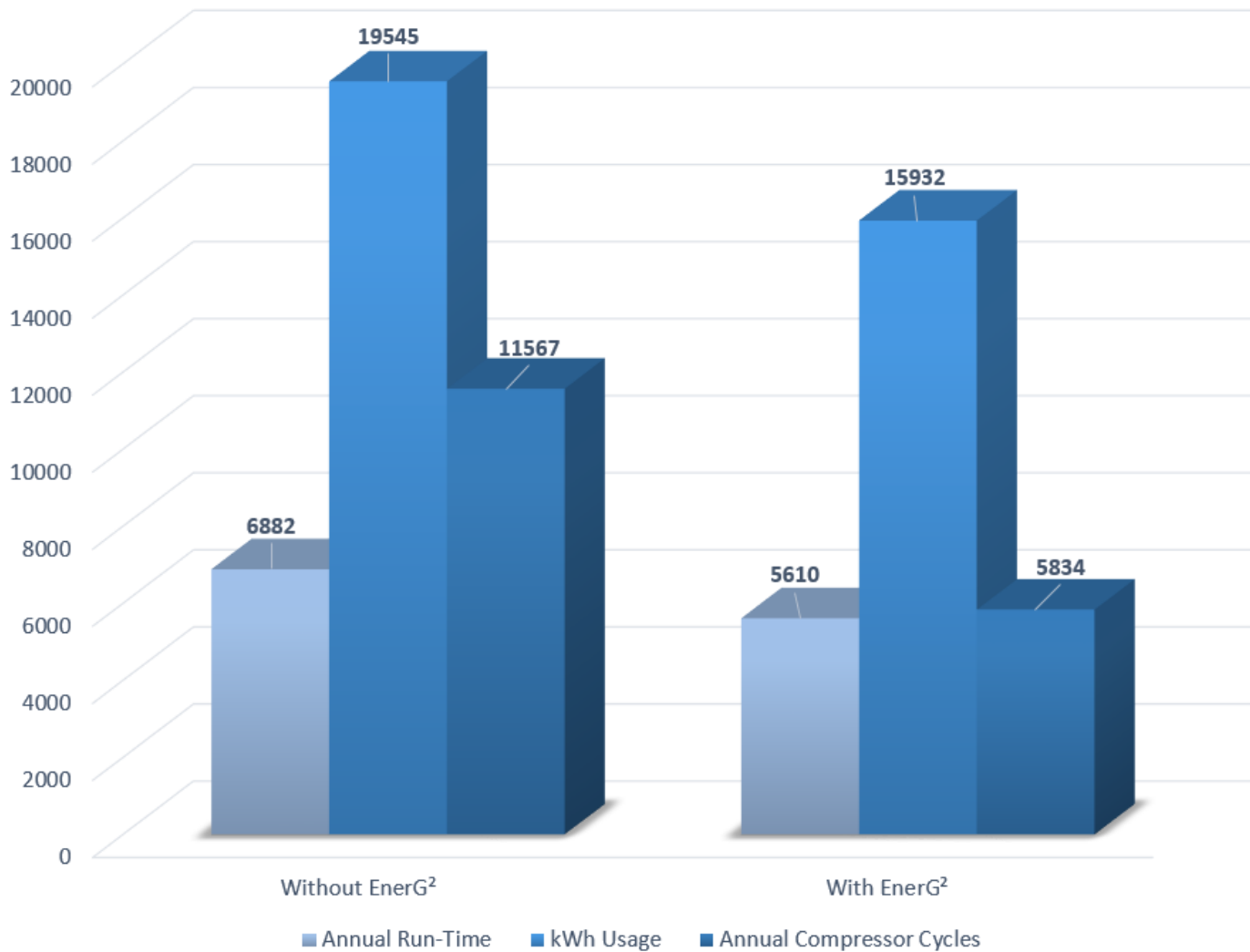
Summary

.....Nouria Cooler.log (CT18040056)

Data File Name: CT18040056 Nouria Cooler Performance (\*saved\*)  
 Logger Serial Number: CT18040056  
 Description: DENT SMART LOGGER  
 Elapsed Time Since Reset: 168.00 hrs  
 On-Time Since Reset: 107.59 hrs  
 Percent On Since Reset: 64.04 %  
 Connected Load: No Load Defined  
 Energy Cost: Unknown  
  
 Data Starts: 3/1/2019 12:00:00 PM  
 Data Ends: 3/8/2019 12:00:00 PM  
 Data Elapsed Time: 168.00 hrs  
 Estimated Annual Hours On: 5610 hrs  
  
 Number of Turn Ons: 112  
  
 Percent On: 64.04 %  
 Data On-Time: 107.59 hrs  
 Average On-Time: 0.96 hrs  
 Longest On-Time: 1.44 hrs  
 Shortest On-Time: <0.01 hrs  
  
 Number of Turn Offs: 113  
 Percent Off: 35.96 %  
 Data Off-Time: 60.41 hrs  
 Average Off-Time: 0.53 hrs  
 Longest Off-Time: 0.80 hrs  
 Shortest Off-Time: <0.01 hrs



CT18040056 Data Graph Series | Nouria Cooler - NH





Serial Number: CT18040056

Description: DENT SMART LOGGER

On-Time Since Reset: 239.57 hrs

Off-Time Since Reset: 96.43 hrs

Date	TOU/Day (hrs)
Friday, February 22, 2019	8.02
Saturday, February 23, 2019	15.50
Sunday, February 24, 2019	17.99
Monday, February 25, 2019	18.93
Tuesday, February 26, 2019	19.44
Wednesday, February 27, 2019	20.26
Thursday, February 28, 2019	21.59
Friday, March 1, 2019	20.50
Saturday, March 2, 2019	14.33
Sunday, March 3, 2019	13.65
Monday, March 4, 2019	14.11
Tuesday, March 5, 2019	15.38
Wednesday, March 6, 2019	15.17
Thursday, March 7, 2019	16.21
Friday, March 8, 2019	8.49



ASHDC was developed because of a design flaw in cooler and freezer door applications such as those in convenience stores and grocery stores. These doors have heaters that run 24 hours a day to ensure that the glass remains free of condensation. These heaters do not need to run anywhere close to that length of time.

ASHDC retrofits to the door system and intercepts the communication between power and the heaters. The controllers have sensor based technology in them that read moisture levels and only allow the heaters to run when necessary (15-20% of the time).

ASHDC also has Random Start Technology built in that assures that PMC, Programmed Maintenance Cycle will at different time and on different cases even in the event of a loss of power which allows the ASHDC to save more energy than any other controller on the market.

All of this translates into energy savings of 80-85% or approximately \$1,000 per door set per year. ASHDC is simple to install, requires no maintenance, has a 3 year warranty and a 12 month ROI.

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**Guaranteed to Reduce Energy Costs Up to 80%**  
**Display Cases Remain Sweat, Frost and Ice Free**  
**Installation is Simple**  
**Less Than 12 Month ROI**  
**Prescriptive Rebates Available in Most Areas**  
**Components Exceed UL Standards**



HMS Engineering

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5 Hargett St., 4th Floor  
Raleigh, North Carolina 27601

Report Print Date: 13-Mar-19

Report No.: NE31319

Facility / Location: Nouria Energy / MD

Room/Equip. Tested: Walk-in Cooler - ASH|DC

Calculation Basis

Compressor Motor: HP: 0.0 Volts: 230 RLA: 12.0 Phase: 3  
Power Consumption: 0.84 kW Electricity Rate: \$0.13 per kWh

Operating Basis

	(Without EnerG <sup>2</sup> )	With EnerG <sup>2</sup>	Change	% Change
Projected Run Hours / Yr:	8,631	0	-8,631	-100.0%
Projected Cycles / Yr:	2	1	-1	-50.0%

Energy Use & Cost Savings per Month

	(Without EnerG <sup>2</sup> )	With EnerG <sup>2</sup>	Change	% Change
Operating Hours / Month:	719	0	-719	-100.0%
KWh / Month:	604	0	-604	-100.0%
Energy Cost / Month	\$81	\$0	-\$81	-100.0%

Mechanical Cost Savings per Month

	(Without EnerG <sup>2</sup> )	With EnerG <sup>2</sup>	Change	% Change
Cycles / Month:	0	0	0	-50.0%
Compressor Maintenance Cost/ Month:	\$0	\$0	\$0	-50.0%

Combined Energy and Mechanical Cost Savings

	(Without EnerG <sup>2</sup> )	With EnerG <sup>2</sup>	Change	% Change
Energy & Mechanical Cost / Month:	\$81	\$0	-\$81	-99.9%
Energy & Mechanical Cost / Year:	\$973	\$1	-\$972.01	-99.9%

EnerG<sup>2</sup> Return on Investment Months 11.10



Summary

.....Nouria Door log (CT18040062)

Data File Name: CT18040062 Nouria Door Baseline (\*saved\*)  
 Logger Serial Number: CT18040062  
 Description: DENT SMART LOGGER  
 Elapsed Time Since Reset: 168.00 hrs  
 On-Time Since Reset: 165.53 hrs  
 Percent On Since Reset: 98.53 %  
 Connected Load: No Load Defined  
 Energy Cost: Unknown  
  
 Data Starts: 2/23/2019 12:00:00 PM  
 Data Ends: 3/2/2019 12:00:00 PM  
 Data Elapsed Time: 168.00 hrs  
 Estimated Annual Hours On: 8631 hrs  
  
 Number of Turn Ons: 2  
  
 Percent On: 98.53 %  
 Data On-Time: 165.53 hrs  
 Average On-Time: 82.76 hrs  
 Longest On-Time: 124.14 hrs  
 Shortest On-Time: <0.01 hrs  
  
 Number of Turn Offs: 3  
 Percent Off: 1.47 %  
 Data Off-Time: 2.47 hrs  
 Average Off-Time: 0.82 hrs  
 Longest Off-Time: 1.24 hrs  
 Shortest Off-Time: <0.01 hrs



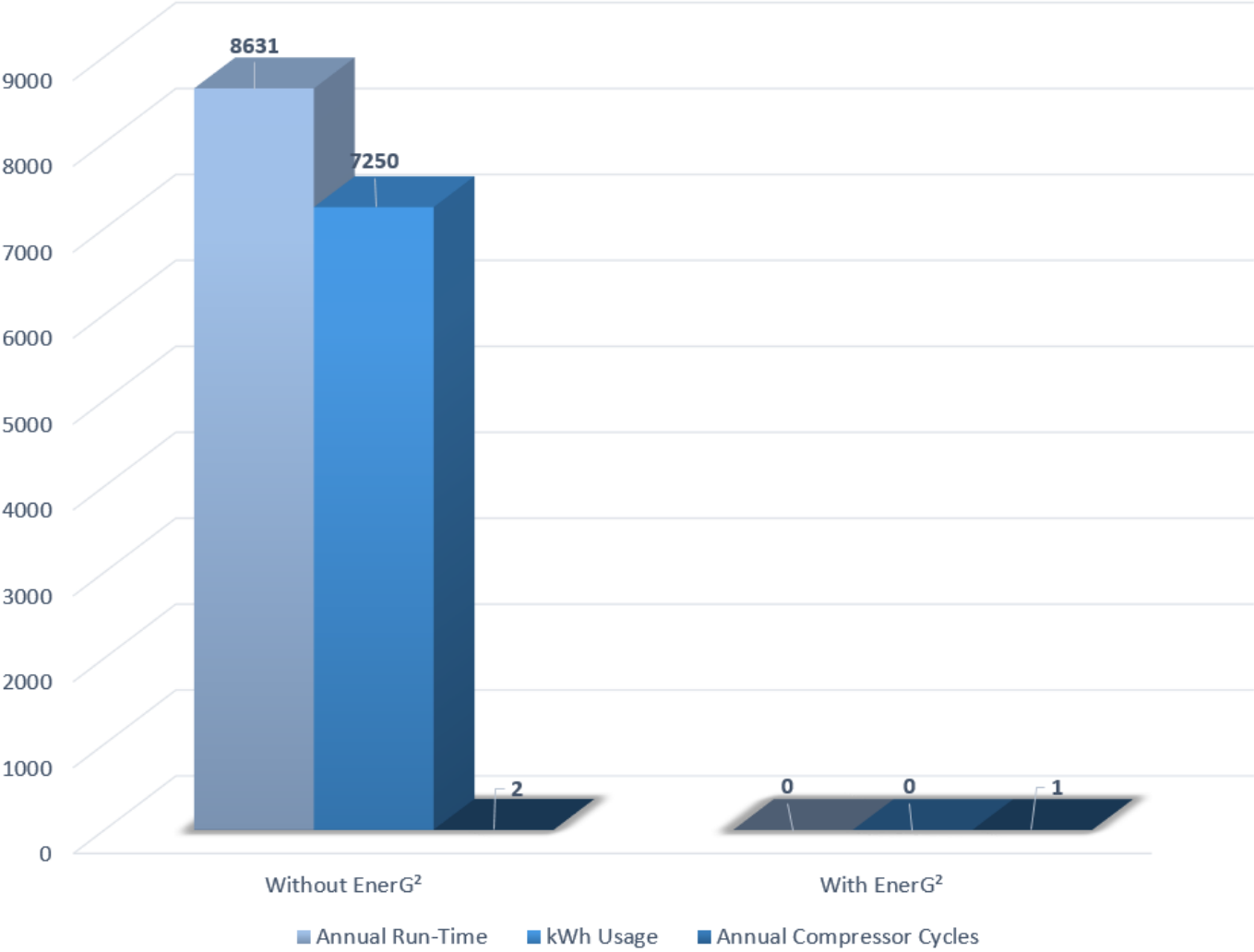
Summary

.....Nouria Door log (CT18040062)

Data File Name: CT18040062 Nouria Door Performance (\*saved\*)  
 Logger Serial Number: CT18040062  
 Description: DENT SMART LOGGER  
 Elapsed Time Since Reset: 168.00 hrs  
 On-Time Since Reset: 0.00 hrs  
 Percent On Since Reset: 0.00 %  
 Connected Load: No Load Defined  
 Energy Cost: Unknown  
  
 Data Starts: 3/2/2019 12:00:00 PM  
 Data Ends: 3/9/2019 12:00:00 PM  
 Data Elapsed Time: 168.00 hrs  
 Estimated Annual Hours On: 0 hrs  
  
 Number of Turn Ons: 1  
  
 Percent On: 0.00 %  
 Data On-Time: 0.00 hrs  
 Average On-Time: 0.00 hrs  
 Longest On-Time: 0.00 hrs  
 Shortest On-Time: <0.01 hrs  
  
 Number of Turn Offs: 2  
 Percent Off: 100.00 %  
 Data Off-Time: 168.00 hrs  
 Average Off-Time: 84.00 hrs  
 Longest Off-Time: 126.00 hrs  
 Shortest Off-Time: <0.01 hrs



CT18040062 Data Graph Series | Nouria Cooler Doors - MD







Serial Number: CT18040062

Description: DENT SMART LOGGER

On-Time Since Reset: 232.44 hrs

Off-Time Since Reset: 103.56 hrs

Date	TOU/Day (hrs)
Saturday, February 23, 2019	12.00
Sunday, February 24, 2019	24.00
Monday, February 25, 2019	24.00
Tuesday, February 26, 2019	24.00
Wednesday, February 27, 2019	24.00
Thursday, February 28, 2019	24.00
Friday, March 1, 2019	24.00
Saturday, March 2, 2019	19.06
Sunday, March 3, 2019	0.00
Monday, March 4, 2019	0.00
Tuesday, March 5, 2019	0.00
Wednesday, March 6, 2019	0.00
Thursday, March 7, 2019	0.00
Friday, March 8, 2019	0.00
Saturday, March 9, 2019	0.00

HMS Engineering

Client : The Madison Energy Group  
5 Hargett St., 4th Floor  
Raleigh, North Carolina 27601

Report Print Date: 13-Mar-19

Report No.: NE31319

Facility / Location: Nouria Energy / NH

Room/Equip. Tested: Walk-in Cooler - ASH|DC

Calculation Basis

Compressor Motor: HP: 0.0 Volts: 230 RLA: 12.0 Phase: 3  
Power Consumption: 0.84 kW Electricity Rate: \$0.13 per kWh

Operating Basis

	(Without EnerG <sup>2</sup> )	With EnerG <sup>2</sup>	Change	% Change
Projected Run Hours / Yr:	8,502	0	-8,502	-100.0%
Projected Cycles / Yr:	2	1	-1	-50.0%

Energy Use & Cost Savings per Month

	(Without EnerG <sup>2</sup> )	With EnerG <sup>2</sup>	Change	% Change
Operating Hours / Month:	709	0	-709	-100.0%
KWh / Month:	595	0	-595	-100.0%
Energy Cost / Month	\$80	\$0	-\$80	-100.0%

Mechanical Cost Savings per Month

	(Without EnerG <sup>2</sup> )	With EnerG <sup>2</sup>	Change	% Change
Cycles / Month:	0	0	0	-50.0%
Compressor Maintenance Cost/ Month:	\$0	\$0	\$0	-50.0%

Combined Energy and Mechanical Cost Savings

	(Without EnerG <sup>2</sup> )	With EnerG <sup>2</sup>	Change	% Change
Energy & Mechanical Cost / Month:	\$80	\$0	-\$80	-99.9%
Energy & Mechanical Cost / Year:	\$958	\$1	-\$957.49	-99.9%

EnerG<sup>2</sup> Return on Investment Months 11.27



Summary

.....Nouria Door log (CT18040063)

Data File Name: CT18040063 Nouria Door Baseline (\*saved\*)  
 Logger Serial Number: CT18040063  
 Description: DENT SMART LOGGER  
 Elapsed Time Since Reset: 168.00 hrs  
 On-Time Since Reset: 163.05 hrs  
 Percent On Since Reset: 97.05 %  
 Connected Load: No Load Defined  
 Energy Cost: Unknown  
  
 Data Starts: 2/22/2019 12:00:00 PM  
 Data Ends: 3/1/2019 12:00:00 PM  
 Data Elapsed Time: 168.00 hrs  
 Estimated Annual Hours On: 8502 hrs  
  
 Number of Turn Ons: 2  
  
 Percent On: 97.05 %  
 Data On-Time: 163.05 hrs  
 Average On-Time: 81.53 hrs  
 Longest On-Time: 122.29 hrs  
 Shortest On-Time: <0.01 hrs  
  
 Number of Turn Offs: 3  
 Percent Off: 2.95 %  
 Data Off-Time: 4.95 hrs  
 Average Off-Time: 1.65 hrs  
 Longest Off-Time: 2.47 hrs  
 Shortest Off-Time: <0.01 hrs



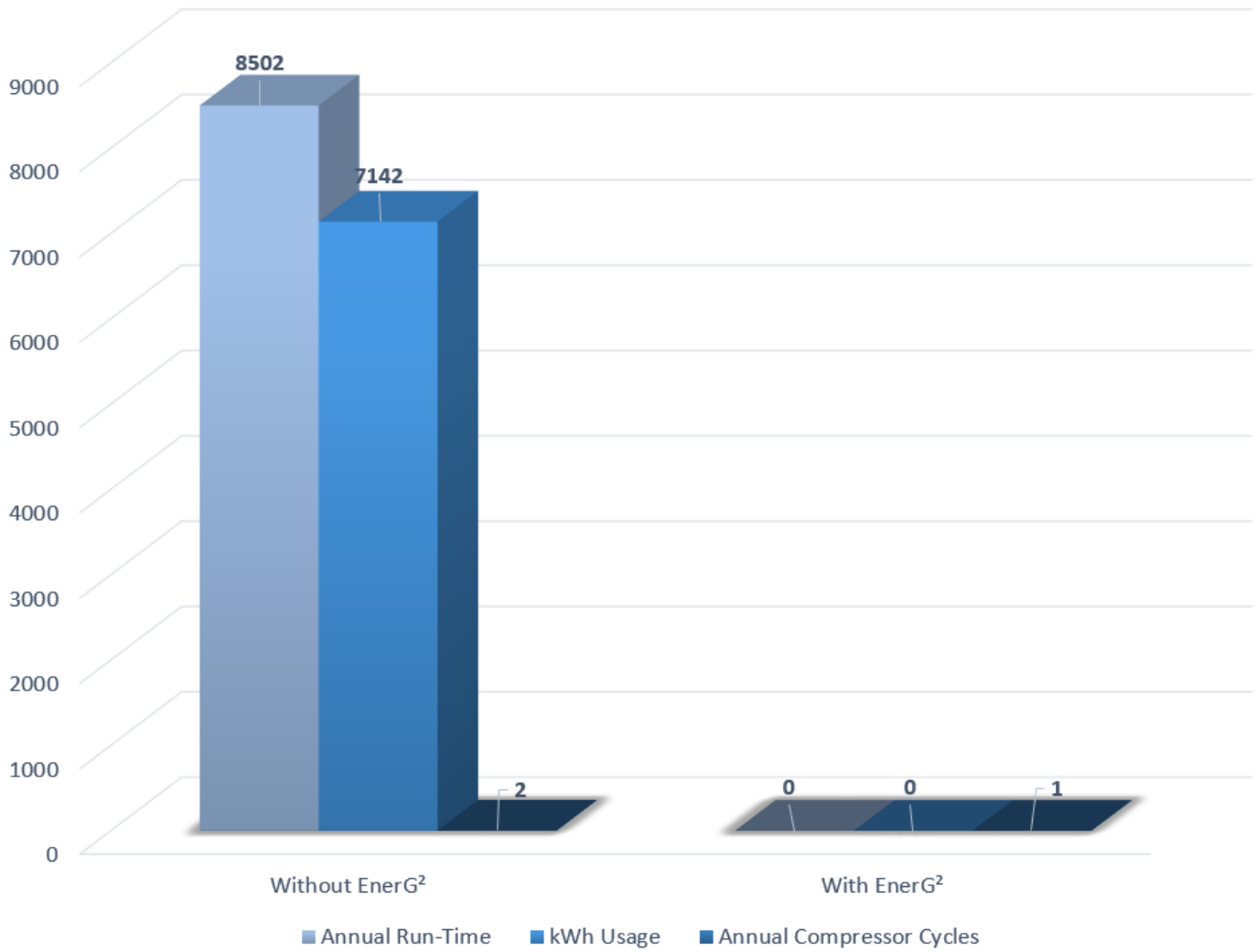
Summary

.....Nouria Door log (CT18040063)

Data File Name: CT18040063 Nouria Door Performance (\*saved\*)  
 Logger Serial Number: CT18040063  
 Description: DENT SMART LOGGER  
 Elapsed Time Since Reset: 168.00 hrs  
 On-Time Since Reset: 0.00 hrs  
 Percent On Since Reset: 0.00 %  
 Connected Load: No Load Defined  
 Energy Cost: Unknown  
  
 Data Starts: 3/1/2019 12:00:00 PM  
 Data Ends: 3/8/2019 12:00:00 PM  
 Data Elapsed Time: 168.00 hrs  
 Estimated Annual Hours On: 0 hrs  
  
 Number of Turn Ons: 1  
  
 Percent On: 0.00 %  
 Data On-Time: 0.00 hrs  
 Average On-Time: 0.00 hrs  
 Longest On-Time: 0.00 hrs  
 Shortest On-Time: <0.01 hrs  
  
 Number of Turn Offs: 2  
 Percent Off: 100.00 %  
 Data Off-Time: 168.00 hrs  
 Average Off-Time: 84.00 hrs  
 Longest Off-Time: 126.00 hrs  
 Shortest Off-Time: <0.01 hrs



## CT18040063 Data Graph Series | Nouria Cooler Doors - NH





Serial Number: CT18040063

Description: DENT SMART LOGGER

On-Time Since Reset: 170.10 hrs

Off-Time Since Reset: 165.90 hrs

Date	TOU/Day (hrs)
Friday, February 22, 2019	12.00
Saturday, February 23, 2019	24.00
Sunday, February 24, 2019	24.00
Monday, February 25, 2019	24.00
Tuesday, February 26, 2019	24.00
Wednesday, February 27, 2019	24.00
Thursday, February 28, 2019	24.00
Friday, March 1, 2019	14.10
Saturday, March 2, 2019	0.00
Sunday, March 3, 2019	0.00
Monday, March 4, 2019	0.00
Tuesday, March 5, 2019	0.00
Wednesday, March 6, 2019	0.00
Thursday, March 7, 2019	0.00
Friday, March 8, 2019	0.00

# IntelliHVAC

INTELLIGENT SOLUTIONS FOR HEATING AND AIR

IntelliHVAC was developed based on a utility study (PG&E) which found that all HVAC systems lose approximately 30% of the energy they create. The reason is that the manufacturers' post purge setting is often times not long enough to capture all of the energy that has been created by the unit. That latent energy then dissipates outside and is lost.

IntelliHVAC retrofits to the 24 volt terminal of package and split HVAC units and has two functions: The 1st is an intelligent variable post purge and the 2nd is the intelligent compressor cycling function.

The Intelligent Variable Post Purge monitors the HVAC system and adjusts the length of post purge timing based on the previous compressor cycle. This ensures that we capture all of the energy that has been created and get it into the building so that it hasn't been wasted.

The Intelligent Compressor Cycling Function turns the compressor off for 5 minutes every time it runs for 25 minutes continuously and runs the post purge fan for that same length of time instead. The reason this works is because after 25 minutes of continuous run-time, the cool is fully energized which is to say that the cup is full. It is holding all the energy it can hold but is continuing to run because the thermostat is telling it to and doesn't know any better.

All of this translates into energy savings of 10-30% or approximately \$1500 per HVAC unit per year. IntelliHVAC is simple to install, requires no maintenance, has a lifetime warranty and a 12 month ROI.

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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



Tower Engineering  
Craig Andes  
Owner / HVAC Engineer

---

**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 Engineering 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, 3<sup>rd</sup> party consultant and assists the company specifically with the IntelliHVAC technology. Mr. Andes has helped Madison Energy consult with companies such as Starbucks, 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 Engineering  
Owner / HVAC Engineer  
Date: 3/14/2019



**Report Date:** 3/14/2019

Craig Andes  
HVAC Engineering Contractor

On Behalf of: The Madison Energy Group  
For Client: Nouria Energy

**Kwh Rate:** 0.13

**Location:** Shrewbury MD

		Start Date	Install Date	Time	Baseline kWh Consumed	End Date	Time	Performance kWh Consumed
<b>Area:</b>	RTU 1	2/23/2019	3/2/2019	12:00PM	836.8	3/9/2019	12:00 PM	712.0
<b>Meter #</b>	28338							
				kWh/Month	3,586.29		kWh/Month	3,051.43
				kWh/Yr	43,633.14		kWh/Yr	37,125.71

RTU Summary	
kWh Diff./Period	124.8
kWh Diff./Yr	6,507.43
% Change	15%
Savings/Yr	\$ 872.00

**Location:** Amherst NH

		Start Date	Install Date	Time	Baseline kWh Consumed	End Date	Time	Performance kWh Consumed
<b>Area:</b>	RTU 2	2/22/2019	3/1/2019	12:00PM	859.6	3/8/2019	12:00 PM	703.3
<b>Meter #</b>	27479							
				kWh/Month	3,684.00		kWh/Month	3,014.14
				kWh/Year	44,822.00		kWh/Year	36,672.07

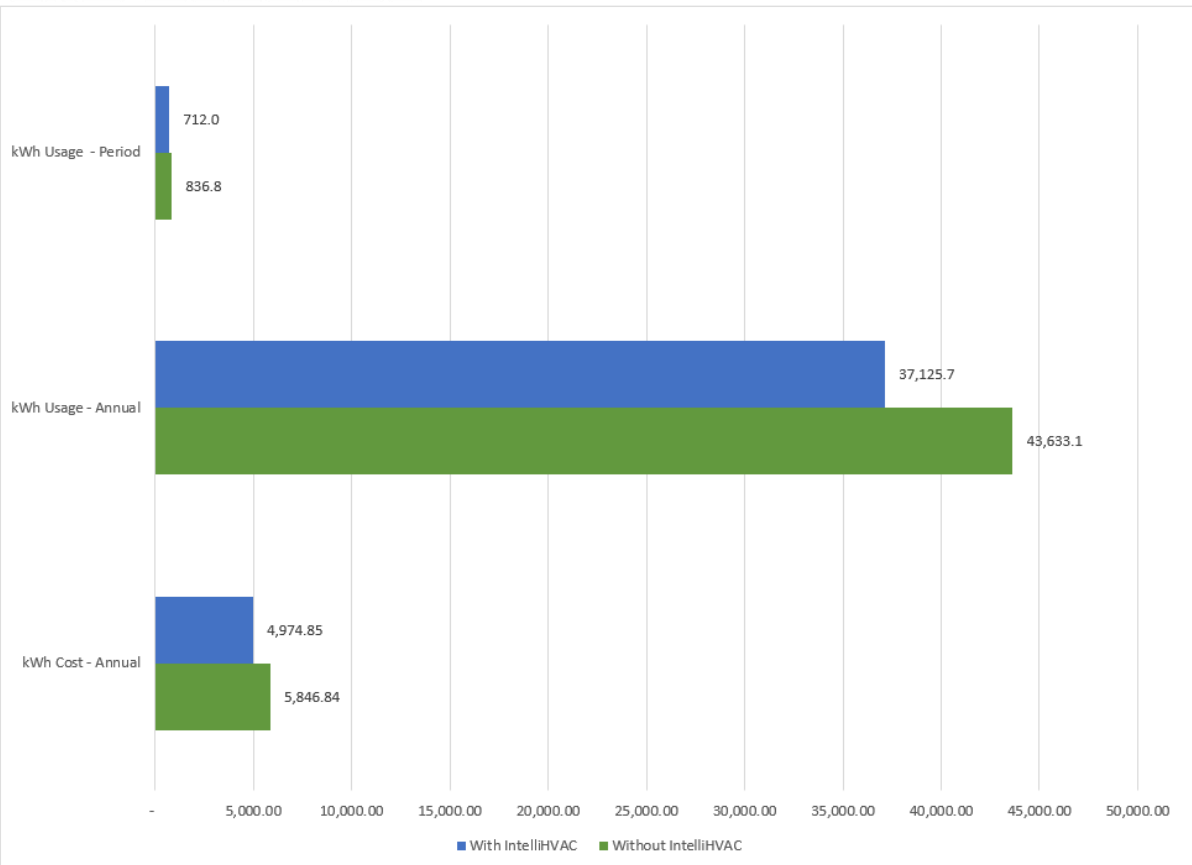
RTU Summary	
kWh Diff./Period	156.30
kWh Diff./Yr	8,149.93
% Change	18%
Savings/Yr	\$ 1,092.09

Project Summary			
Total kWh/Yr Reduced		14,657.36	
Average Annual Savings	\$	982.04	
*Normalized for Season*	\$	1,669.47	
Projected ROI		7.18	Months





**EKM METERING**   





EKM-OmniMeter v.3  
Nouria RTU 1 LogFile  
Total kWh Usage for Period: 1490.0

Date	Kilowatt Hour	Avg. Voltage	Avg. Amps	Avg. Watts	Avg. CosÎ (Power Factor)
2/23/2019	71.3	118.4	25.9	2492	LO.87
2/24/2019	114.8	117.9	26.3	2486	LO.85
2/25/2019	101.2	118.6	26.1	2504	LO.87
2/26/2019	107.6	118.5	25.7	2470	LO.85
2/27/2019	115.6	119.1	25.9	2466	LO.88
2/28/2019	128.9	118.6	26.1	2508	LO.88
3/1/2019	135.1	118.5	26.3	2482	LO.87
3/2/2019	124.5	117.3	25.7	2448	LO.86
3/3/2019	56.7	117.0	25.9	2440	LO.86
3/4/2019	100.2	117.2	25.7	2414	LO.85
3/5/2019	105.8	118.0	25.5	2406	LO.85
3/6/2019	89.2	117.5	25.5	2394	LO.86
3/7/2019	92.0	117.3	25.5	2398	LO.85
3/8/2019	95.8	117.1	25.3	2396	LO.87
3/9/2019	51.3	116.0	25.3	2388	LO.86





EKM-OmniMeter v.3  
Nouria RTU 2 LogFile  
Total kWh Usage for Period: 1562.8

Date	Kilowatt Hour	Avg. Voltage	Avg. Amps	Avg. Watts	Avg. Cos <sup>2</sup> (Power Factor)
2/22/2019	68.7	123.2	24.2	2638	LO.86
2/23/2019	132.7	123.7	26.0	2662	LO.86
2/24/2019	112.5	123.8	25.4	2640	LO.86
2/25/2019	105.1	123.2	25.6	2662	LO.87
2/26/2019	117.7	123.9	25.2	2622	LO.87
2/27/2019	123.0	123.8	25.6	2600	LO.86
2/28/2019	131.4	123.1	25.0	2592	LO.86
3/1/2019	136.9	123.1	25.2	2636	LO.87
3/2/2019	107.0	123.0	25.6	2512	LO.86
3/3/2019	90.0	122.7	25.4	2528	LO.85
3/4/2019	91.3	122.5	25.6	2530	LO.85
3/5/2019	94.2	122.1	25.6	2488	LO.86
3/6/2019	98.9	122.7	25.0	2486	LO.86
3/7/2019	107.1	123.0	24.8	2512	LO.86
3/8/2019	46.3	121.9	24.8	2516	LO.85



# THE MADISON ENERGY GROUP

## ENERGY EFFICIENCY SOLUTIONS

### Proof of Concept Performance Summary

Program Duration - 2/22/2019 - 3/9/2019

#### EnerG<sup>2</sup> Summary

Annual Savings - Cooler 1	\$	752.81		
Annual Savings - Cooler 2	\$	731.89		
Average Annual Savings per Unit	\$	742.35		
Projected Annual Savings for		234	units	\$ 173,709.90
Projected Savings Over 10 Years				\$ 1,737,099.00
Return on Investment -----		9.68		Months

#### ASH|DC Summary

Annual Savings - Door Set 1	\$	972.01		
Annual Savings - Door Set 2	\$	957.49		
Average Annual Savings per Unit	\$	964.75		
Annual Savings Normalized for Season	\$	820.04		
Projected Annual Savings for		234	units	\$ 191,888.78
Projected Savings Over 10 Years				\$ 1,918,887.75
Return on Investment -----		14.62		Months

#### IntelliHVAC Summary

Annual Savings - RTU 1	\$	872.00		
Annual Savings - RTU 2	\$	1,092.09		
Average Annual Savings per Unit	\$	982.05		
Annual Savings Normalized for Season	\$	1,669.47		
Projected Annual Savings for		234	units	\$ 390,655.98
Projected Savings Over 10 Years				\$ 3,906,559.80
Return on Investment -----		7.18		Months

#### Overall Summary of Performance

Combined Monthly Energy Savings	\$	63,021.22
Combined Annual Energy Savings	\$	756,254.66
Combined Energy Savings Over 10 Years	\$	7,562,546.55
Cumulative Return on Investment/Months		11.02





**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) EnerG<sup>2</sup> 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 EnerG<sup>2</sup> unit is damaged, another EnerG<sup>2</sup> 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 be 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 EnerG<sup>2</sup> unit is void if 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 EnerG<sup>2</sup> 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 EnerG<sup>2</sup> within 30 days of purchase at [www.themadisonenergygroup.com](http://www.themadisonenergygroup.com). Coverage is non-transferable.



PHONE: 919-443-2404  
FAX: 919-800-3700  
[INFO@THEMADISONENERGYGROUP.COM](mailto:INFO@THEMADISONENERGYGROUP.COM)

5 WEST HARGETT ST. • 4TH FLOOR  
RALEIGH, NC 27601  
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ENERGY EFFICIENCY SOLUTIONS

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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 be 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 if 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.

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# THE MADISON ENERGY GROUP

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