



FLORIDA SOLAR ENERGY CENTER®

*Creating Energy Independence*

# **45L Submission Software Verification Test Report: EnergyGauge® USA version 6.0**

April 10, 2018

## **Submitted to**

Internal Revenue Service  
Attn: Program Administrator  
CC:PSI:6, Room 5114  
P.O. Box 7604  
Ben Franklin Station  
Washington, DC 20044

## **Submitted by**

Florida Solar Energy Center

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A Research Institute of the University of Central Florida

# ASHRAE Standard 140

ASHRAE Std. 140 results for:

Software Name:

EnergyGauge USA 6.0

User input data fields indicated by pale yellow

Test result fields indicated by pale green

**Annual Heating Loads: Colorado Springs, CO**

Heating	range max	range min	Result	pass/fail
L100AC	79.48	48.75	55.74	pass
L110AC	103.99	71.88	77.09	pass
L120AC	64.30	37.82	42.76	pass
L130AC	53.98	41.82	45.57	pass
L140AC	56.48	43.24	48.30	pass
L150AC	71.33	40.95	49.37	pass
L155AC	74.18	43.53	51.61	pass
L160AC	81.00	48.78	57.57	pass
L170AC	92.40	61.03	69.28	pass
L200AC	185.87	106.41	132.73	pass
L202AC	190.05	111.32	141.22	pass
L302XC	90.52	52.66	55.57	pass
L304XC	75.32	43.91	47.09	pass
L322XC	118.20	68.35	73.34	pass
L324XC	80.04	44.01	48.39	pass

**Annual Heating Load deltas: Colorado Springs, CO**

Heating	range max	range min	Result	pass/fail
L110AC-L100AC	28.12	19.37	21.35	pass
L120AC-L100AC	-7.67	-18.57	-12.98	pass
L130AC-L100AC	-5.97	-27.50	-10.17	pass
L140AC-L100AC	-4.56	-24.42	-7.44	pass
L150AC-L100AC	-3.02	-12.53	-6.37	pass
L155AC-L150AC	6.88	-1.54	2.24	pass
L160AC-L100AC	5.10	-3.72	1.83	pass
L170AC-L100AC	17.64	7.12	13.54	pass
L200AC-L100AC	107.66	56.39	76.99	pass
L202AC-L200AC	9.94	-0.51	8.49	pass
L302XC-L100AC	14.50	-3.30	-0.17	pass
L302XC-L304XC	17.75	5.66	8.48	pass
L322XC-L100AC	39.29	15.71	17.60	pass
L322XC-L324XC	38.27	20.21	24.95	pass

**Annual Cooling Loads: Las Vegas, NV**

Cooling	range max	range min	Result	pass/fail
L100AL	64.88	50.66	54.64	pass
L110AL	68.50	53.70	56.75	pass
L120AL	60.14	47.34	49.07	pass
L130AL	45.26	32.95	38.54	pass
L140AL	30.54	19.52	25.51	pass
L150AL	82.33	62.41	70.74	pass
L155AL	63.06	50.08	56.52	pass
L160AL	72.99	58.61	64.35	pass
L170AL	53.31	41.83	43.22	pass
L200AL	83.43	60.25	67.60	pass
L202AL	75.96	52.32	55.25	pass

**Annual Cooling Load deltas: Las Vegas, NV**

Cooling	range max	range min	Result	pass/fail
L110AL-L100AL	7.84	-0.98	2.11	pass
L120AL-L100AL	0.68	-8.67	-5.57	pass
L130AL-L100AL	-13.71	-24.40	-16.10	pass
L140AL-L100AL	-27.14	-38.68	-29.13	pass
L150AL-L100AL	20.55	8.72	16.10	pass
L155AL-L150AL	-9.64	-22.29	-14.22	pass
L160AL-L100AL	12.28	3.88	9.71	pass
L170AL-L100AL	-4.83	-15.74	-11.42	pass
L200AL-L100AL	21.39	6.63	12.96	pass
L200AL-L202AL	14.86	2.03	12.35	pass

## Colorado Springs, CO

L100AC (base case)

CoolingLoad = 0.00 HeatingLoad = -55.74

L110AC (high infiltration)

CoolingLoad = 0.00 HeatingLoad = -77.09

L120AC (improved insulation)

CoolingLoad = 0.00 HeatingLoad = -42.76

L130AC (low-e windows)

CoolingLoad = 0.00 HeatingLoad = -45.57

L140AC (zero windows)

CoolingLoad = 0.00 HeatingLoad = -48.30

L150AC (all south glass)

CoolingLoad = 0.00 HeatingLoad = -49.37

L155AC (south glass with OH)

CoolingLoad = 0.00 HeatingLoad = -51.61

L160AC (east-west windows)

CoolingLoad = 0.00 HeatingLoad = -57.57

L170AC (no internal gains)

CoolingLoad = 0.00 HeatingLoad = -69.28

L200AC (inefficient)

CoolingLoad = 0.00 HeatingLoad = -132.73

L202AC (low alpha)

CoolingLoad = 0.00 HeatingLoad = -141.22

L302AC (slab case)

CoolingLoad = 0.00 HeatingLoad = -55.57

L304AC (slab with insul)

CoolingLoad = 0.00 HeatingLoad = -47.09

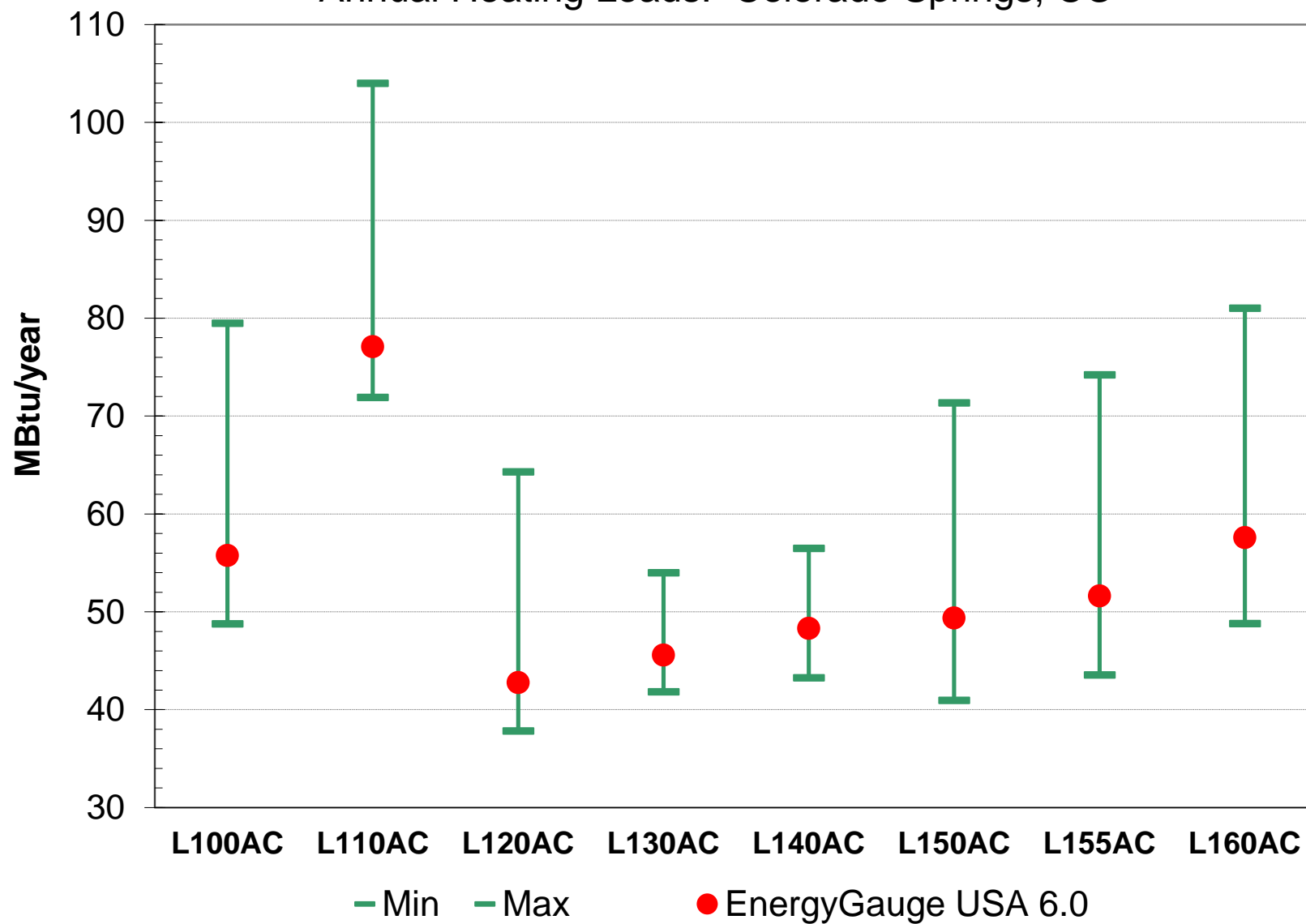
L322AC (basement)

CoolingLoad = 0.00 HeatingLoad = -73.34

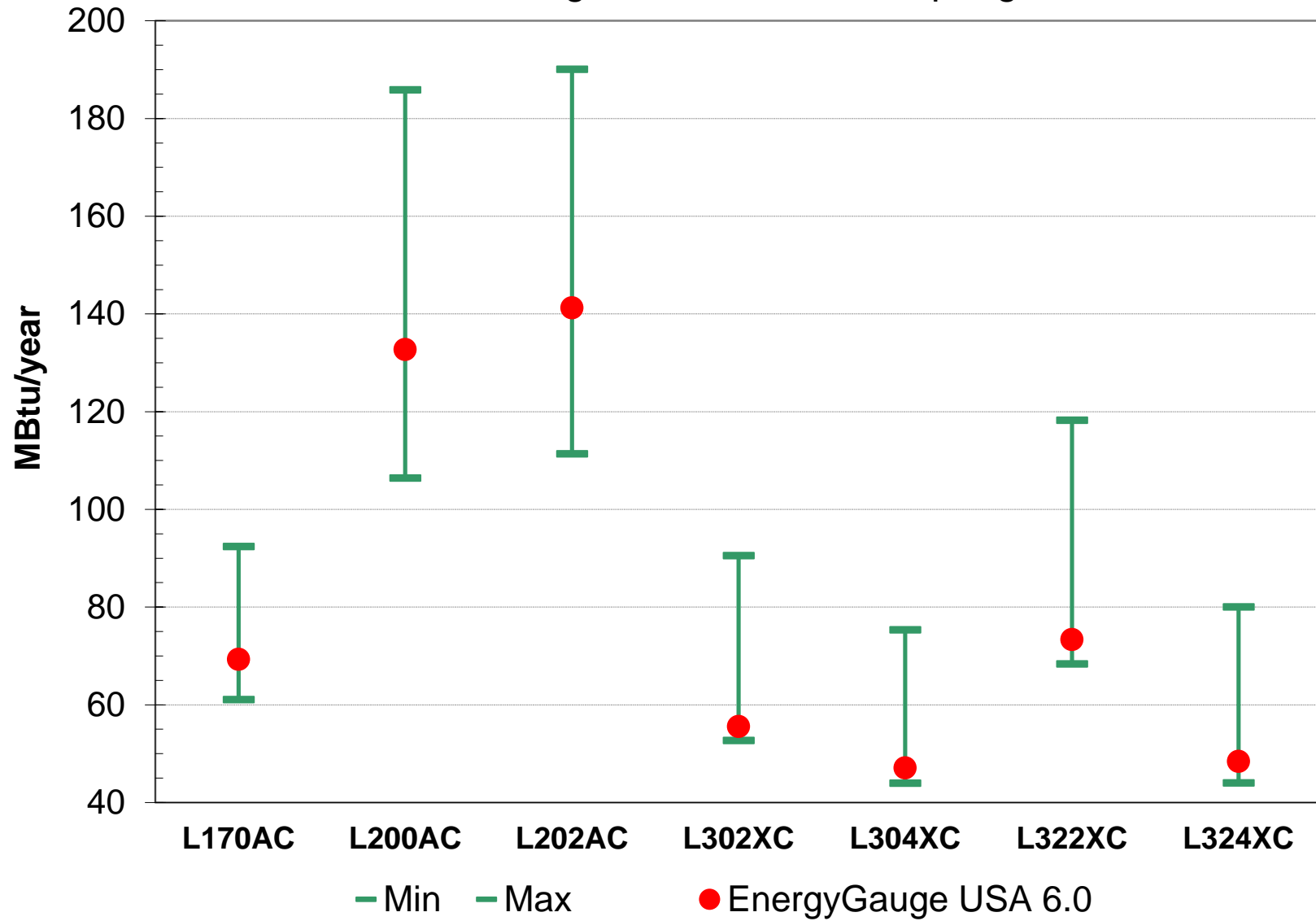
L324AC (basement-insulated)

CoolingLoad = 0.00 HeatingLoad = -48.39

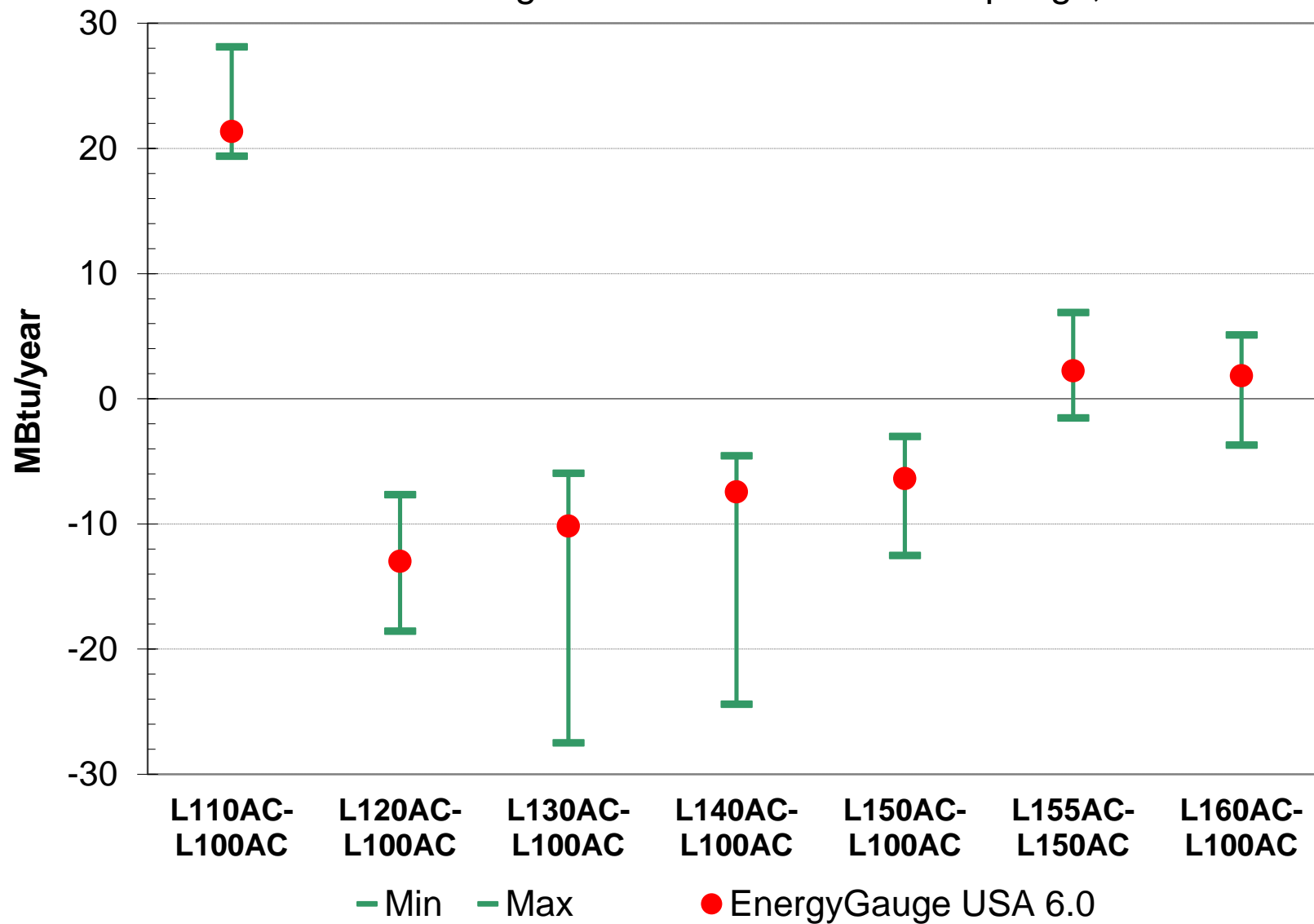
Annual Heating Loads: Colorado Springs, CO



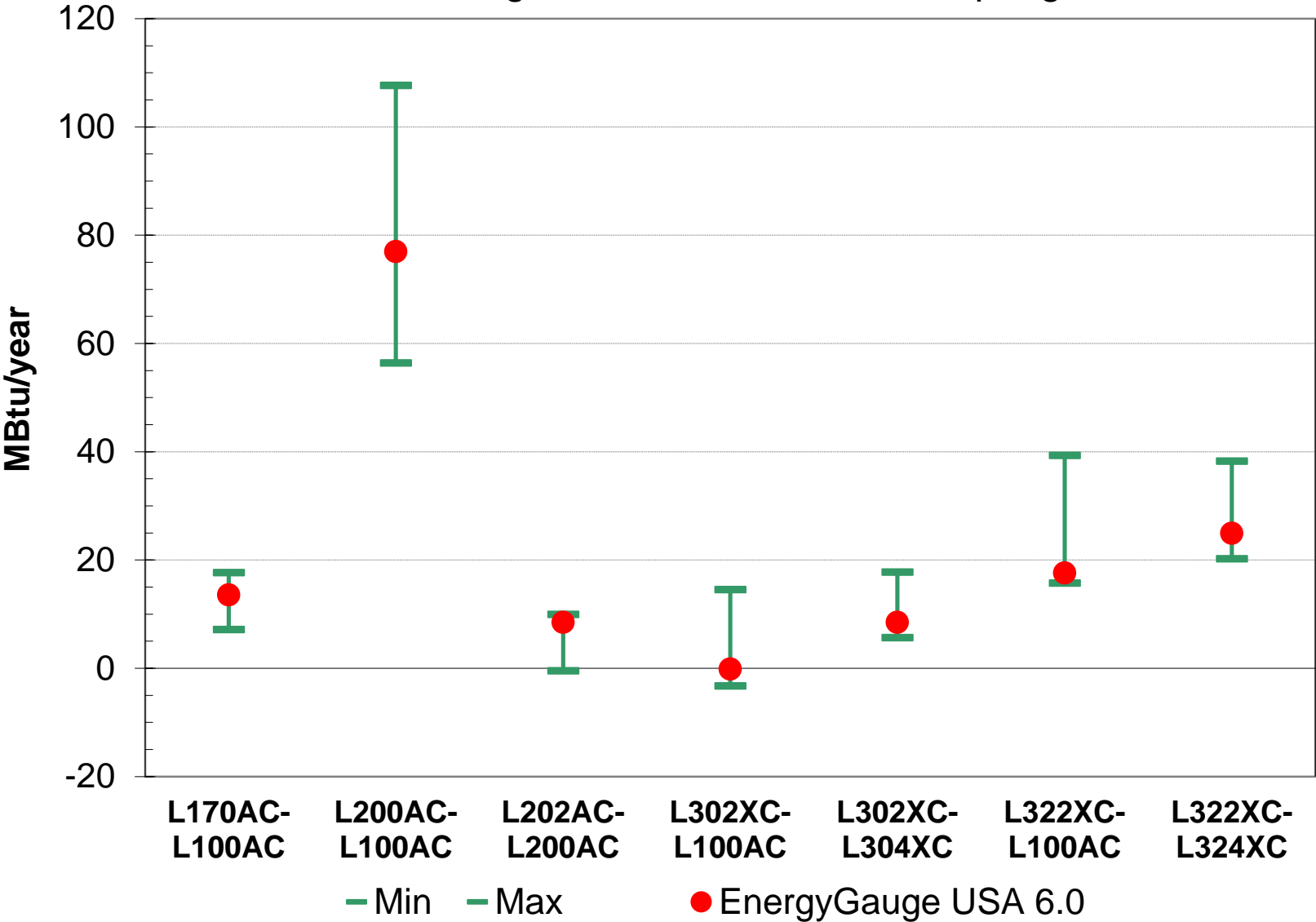
Annual Heating Loads: Colorado Springs, CO



Annual Heating Load Deltas: Colorado Springs, CO

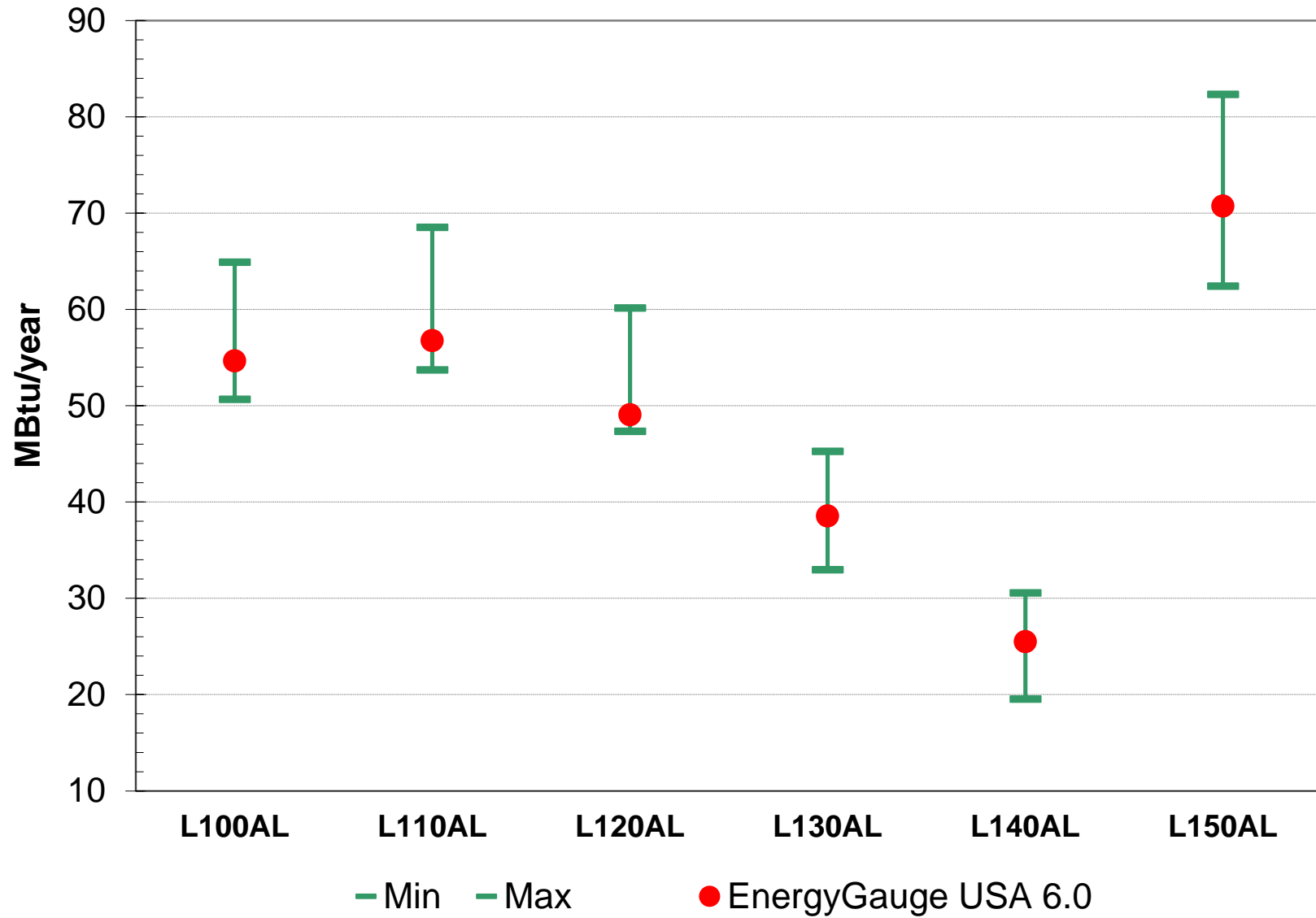


Annual Heating Load Deltas: Colorado Springs, CO

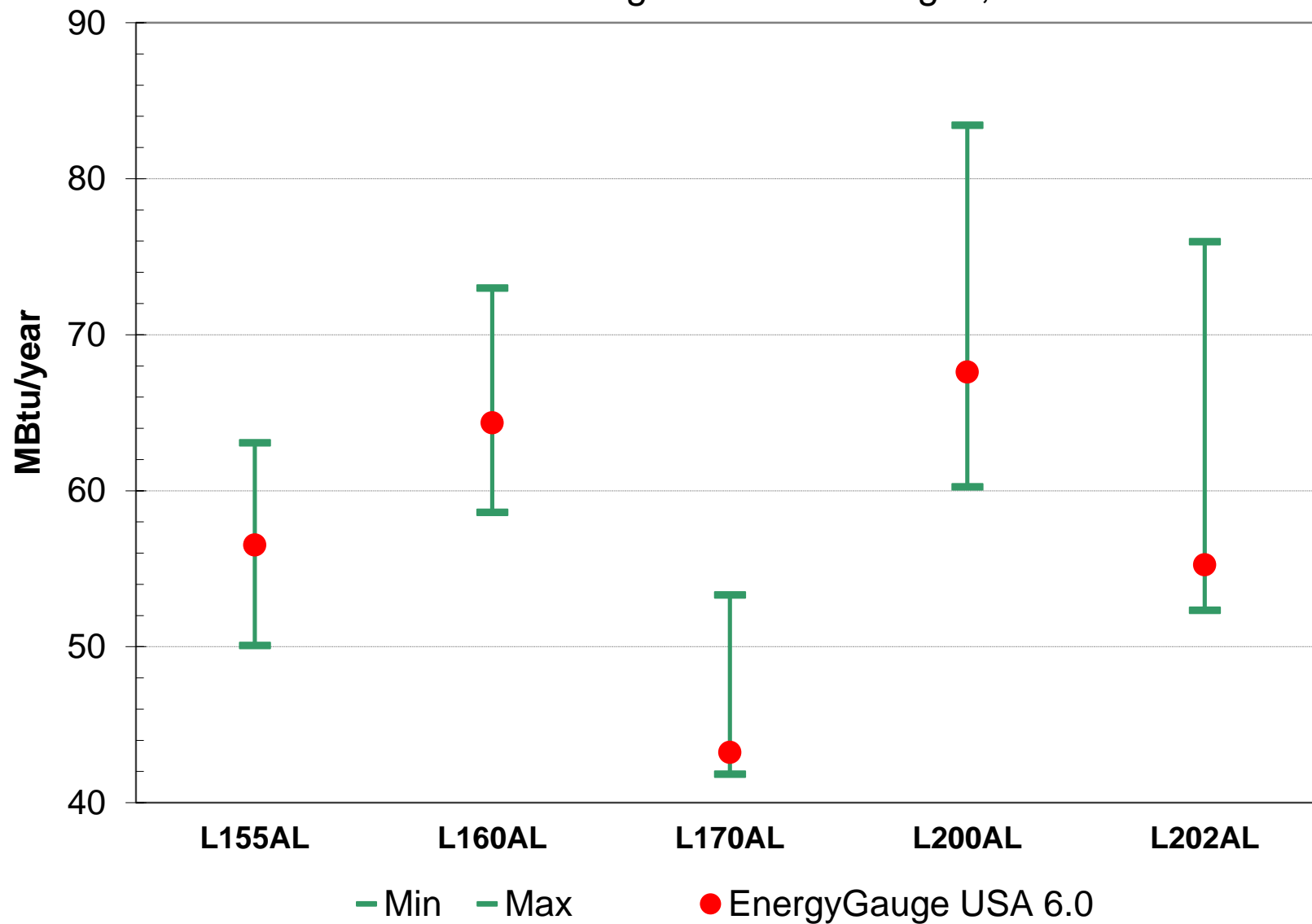




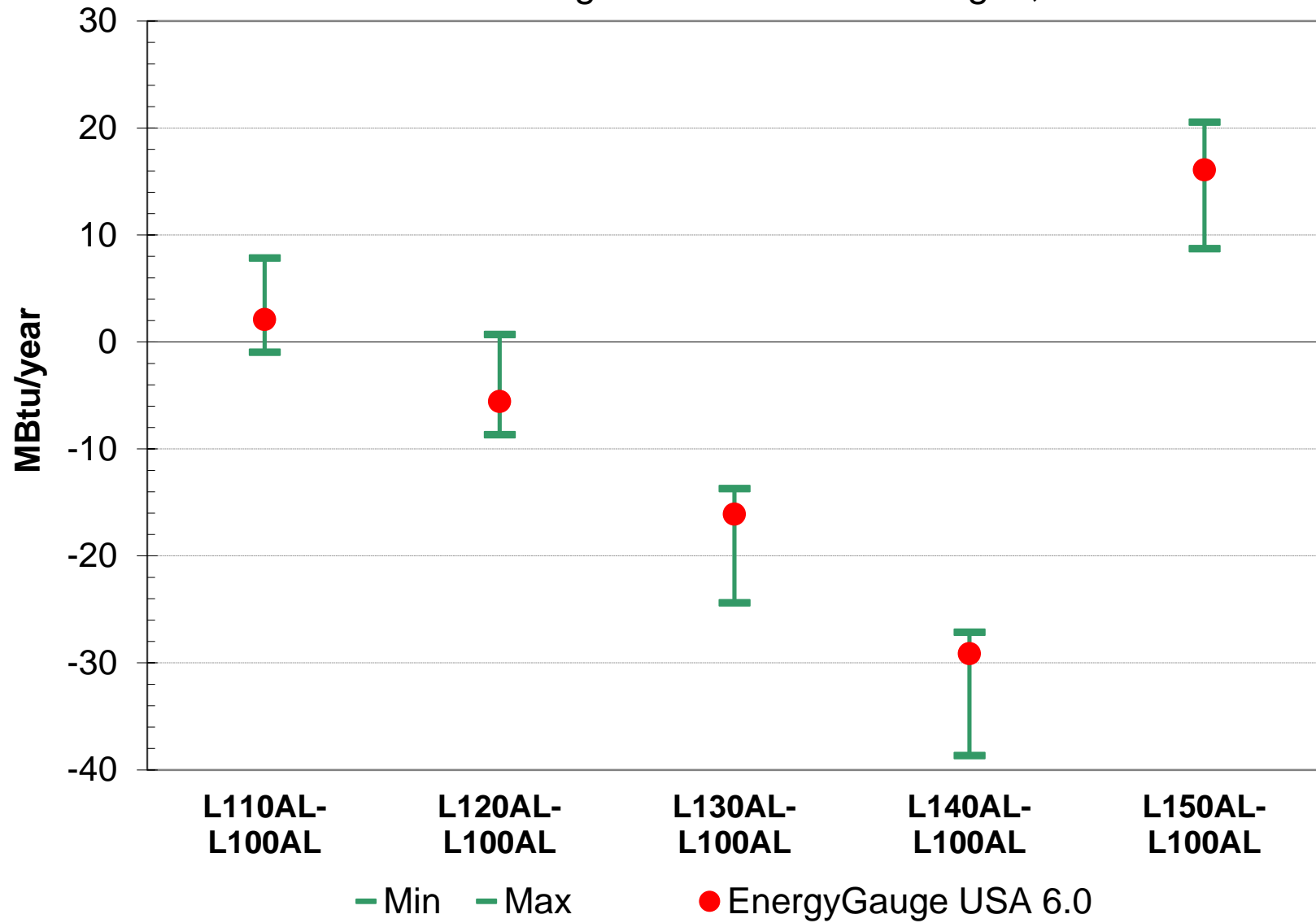
Annual Cooling Loads: Las Vegas, NV



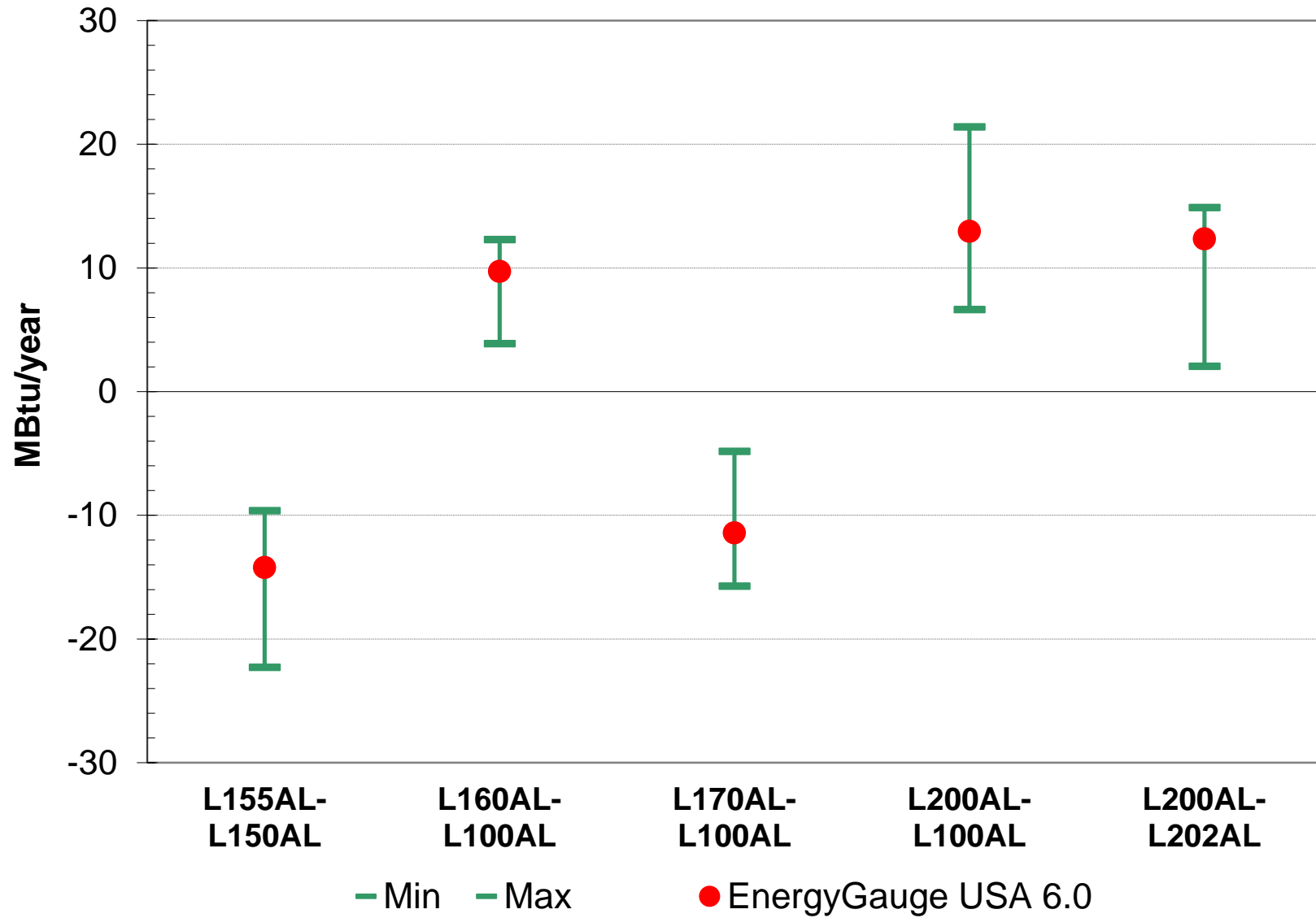
Annual Cooling Loads: Las Vegas, NV



Annual Cooling Load Deltas: Las Vegas, NV



## Annual Cooling Load Deltas: Las Vegas, NV



## **Las Vegas, NV**

### **L100AL (base case)**

CoolingLoad = 54.64 HeatingLoad = 0.00

### **L110AL (high infiltration)**

CoolingLoad = 56.75 HeatingLoad = 0.00

### **L120AL (improved insulation)**

CoolingLoad = 49.07 HeatingLoad = 0.00

### **L130AL (low-e windows)**

CoolingLoad = 38.54 HeatingLoad = 0.00

### **L140AL (zero windows)**

CoolingLoad = 25.51 HeatingLoad = 0.00

### **L150AL (all south glass)**

CoolingLoad = 70.74 HeatingLoad = 0.00

### **L155AL (south glass with OH)**

CoolingLoad = 56.52 HeatingLoad = 0.00

### **L160AL (east-west windows)**

CoolingLoad = 64.35 HeatingLoad = 0.00

### **L170AL (no internal gains)**

CoolingLoad = 43.22 HeatingLoad = 0.00

### **L200AL (inefficient)**

CoolingLoad = 67.60 HeatingLoad = 0.00

### **L202AL (low alpha)**

CoolingLoad = 55.25 HeatingLoad = 0.00

DSE-tests

**DSE Test Suite Results****Software Name:**

EnergyGauge USA 6.0

User input data fields indicated by pale yellow

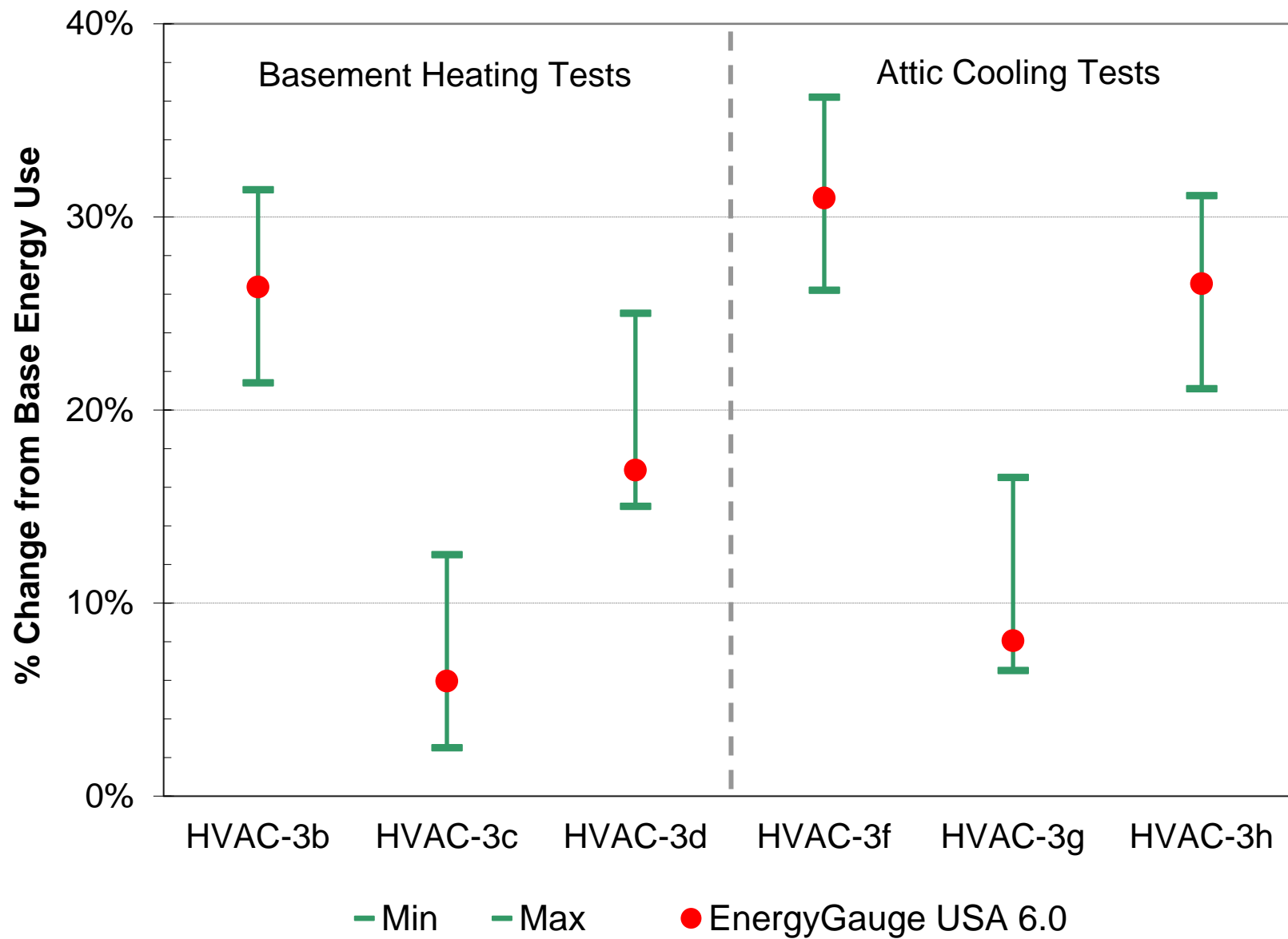
Test result fields indicated by pale green

**Results:**

Base Cases	Heat/cool	Fan	Total	% change	
HVAC-3a	742.3	581	76.21	---	base for cases 3b - 3d
HVAC-3e	5583	987	6570	---	base for cases 3f - 3h

**Criteria:**

Test Cases	Heat/cool	Fan	Total	% change	max	avg	min	Pass/Fail
HVAC-3b	944.2	553	96.31	26.4%	31.4%	26.4%	21.4%	pass
HVAC-3c	788	573	80.76	6.0%	12.5%	7.5%	2.5%	pass
HVAC-3d	869.5	623	89.08	16.9%	25.0%	20.0%	15.0%	pass
HVAC-3f	7309	1296	8605	31.0%	36.2%	31.2%	26.2%	pass
HVAC-3g	6033	1066	7099	8.1%	16.5%	11.5%	6.5%	pass
HVAC-3h	7072	1242	8314	26.5%	31.1%	26.1%	21.1%	pass





# Annual Energy Summary

## Wholehouse Summary

FSEC  
111 Anywhere Lane  
Colorado Springs, CO

Project Title:  
DSE\_HVAC-3a  
Building Type: User  
HERS BESTEST basement case

TMY\_City:CO\_COLORADOSPRINGS  
Elec Util: EnergyGauge Default  
Gas Util: Florida 2012  
2/16/2018

End-Use	Energy Consumption	Annual Cost
Cooling		
Cooling Fan	0 kWh	\$0
Mechanical Vent Fan	0 kWh	\$0
<b>Total Cooling</b>	<b>0 kWh</b>	<b>\$0</b>
Heating		
Therms	742.3 Therms	\$1262
Heating Fan/Pump	581 kWh	\$69
Mechanical Vent Fan	0 kWh	\$0
<b>Total Heating</b>		<b>\$1331</b>
Hot Water	0 kWh	\$0
Hot Water Pump	0 kWh	\$0
<b>Total Hot Water</b>	<b>0 kWh</b>	<b>\$0</b>
Ceiling Fans	0 kWh	\$0
Clothes Washer	37 kWh	\$4
Dehumidifier	0 kWh	\$0
Dishwasher	78 kWh	\$9
Dryer Electric	372 kWh	\$44
Lighting	1863 kWh	\$221
Miscellaneous	1401 kWh	\$166
Pool Pump	0 kWh	\$0
Range Electric	331 kWh	\$39
Refrigerator	637 kWh	\$76
Television	413 kWh	\$49
Total (kWh)	5712 kWh	\$679
Total (Therms)	742.3 Therms	\$1262
Total (Oil Gallons)	0 Gallons	\$0
Total (Propane Gallons)	0 Gallons	\$0
PV Produced (kWh)	0 kWh	\$0
Assumes net metering		
Total Cost		\$1941

**Emissions** (Calculated as Total - PV Produced)  
SO2 = 10.88 Lbs    NOX = 6917.85 Lbs    CO2 = 9.33 Tons

# Annual Energy Summary

## Wholehouse Summary

FSEC  
111 Anywhere Lane  
Colorado Springs, CO

Project Title:  
DSE\_HVAC-3b  
Building Type: User  
HERS BESTEST basement case

TMY\_City:CO\_COLORADOSPRINGS  
Elec Util: EnergyGauge Default  
Gas Util: Florida 2012  
2/16/2018

End-Use	Energy Consumption	Annual Cost
Cooling		
Cooling Fan	0 kWh	\$0
Mechanical Vent Fan	0 kWh	\$0
<b>Total Cooling</b>	<b>0 kWh</b>	<b>\$0</b>
Heating		
Therms	944.2 Therms	\$1605
Heating Fan/Pump	553 kWh	\$66
Mechanical Vent Fan	0 kWh	\$0
<b>Total Heating</b>		<b>\$1671</b>
Hot Water	0 kWh	\$0
Hot Water Pump	0 kWh	\$0
<b>Total Hot Water</b>	<b>0 kWh</b>	<b>\$0</b>
Ceiling Fans	0 kWh	\$0
Clothes Washer	37 kWh	\$4
Dehumidifier	0 kWh	\$0
Dishwasher	78 kWh	\$9
Dryer Electric	372 kWh	\$44
Lighting	1863 kWh	\$221
Miscellaneous	1401 kWh	\$166
Pool Pump	0 kWh	\$0
Range Electric	331 kWh	\$39
Refrigerator	637 kWh	\$76
Television	413 kWh	\$49
Total (kWh)	5684 kWh	\$675
Total (Therms)	944.2 Therms	\$1605
Total (Oil Gallons)	0 Gallons	\$0
Total (Propane Gallons)	0 Gallons	\$0
PV Produced (kWh)	0 kWh	\$0
Assumes net metering		
Total Cost		\$2280

**Emissions** (Calculated as Total - PV Produced)  
SO2 = 10.82 Lbs    NOX = 8795.45 Lbs    CO2 = 10.49 Tons

# Annual Energy Summary

## Wholehouse Summary

FSEC  
111 Anywhere Lane  
Colorado Springs, CO

Project Title: TMY\_City:CO\_COLORADOSPRINGS  
DSE\_HVAC-3c  
Building Type: User  
HERS BESTEST basement case

Elec Util: EnergyGauge Default  
Gas Util: Florida 2012  
2/16/2018

End-Use	Energy Consumption	Annual Cost
Cooling		
Cooling Fan	0 kWh	\$0
Mechanical Vent Fan	0 kWh	\$0
<b>Total Cooling</b>	<b>0 kWh</b>	<b>\$0</b>
Heating		
Therms	788.0 Therms	\$1340
Heating Fan/Pump	573 kWh	\$68
Mechanical Vent Fan	0 kWh	\$0
<b>Total Heating</b>		<b>\$1408</b>
Hot Water	0 kWh	\$0
Hot Water Pump	0 kWh	\$0
<b>Total Hot Water</b>	<b>0 kWh</b>	<b>\$0</b>
Ceiling Fans	0 kWh	\$0
Clothes Washer	37 kWh	\$4
Dehumidifier	0 kWh	\$0
Dishwasher	78 kWh	\$9
Dryer Electric	372 kWh	\$44
Lighting	1863 kWh	\$221
Miscellaneous	1401 kWh	\$166
Pool Pump	0 kWh	\$0
Range Electric	331 kWh	\$39
Refrigerator	637 kWh	\$76
Television	413 kWh	\$49
Total (kWh)	5704 kWh	\$678
Total (Therms)	788.0 Therms	\$1340
Total (Oil Gallons)	0 Gallons	\$0
Total (Propane Gallons)	0 Gallons	\$0
PV Produced (kWh)	0 kWh	\$0
Assumes net metering		
Total Cost		\$2017

**Emissions** (Calculated as Total - PV Produced)  
SO2 = 10.86 Lbs NOX = 7342.84 Lbs CO2 = 9.59 Tons

# Annual Energy Summary

## Wholehouse Summary

FSEC  
111 Anywhere Lane  
Colorado Springs, CO

Project Title: TMY\_City:CO\_COLORADOSPRINGS  
DSE\_HVAC-3d  
Building Type: User  
HERS BESTEST basement case

Elec Util: EnergyGauge Default  
Gas Util: Florida 2012  
2/16/2018

End-Use	Energy Consumption	Annual Cost
Cooling		
Cooling Fan	0 kWh	\$0
Mechanical Vent Fan	0 kWh	\$0
<b>Total Cooling</b>	<b>0 kWh</b>	<b>\$0</b>
Heating		
Therms	869.5 Therms	\$1478
Heating Fan/Pump	623 kWh	\$74
Mechanical Vent Fan	0 kWh	\$0
<b>Total Heating</b>		<b>\$1552</b>
Hot Water	0 kWh	\$0
Hot Water Pump	0 kWh	\$0
<b>Total Hot Water</b>	<b>0 kWh</b>	<b>\$0</b>
Ceiling Fans	0 kWh	\$0
Clothes Washer	37 kWh	\$4
Dehumidifier	0 kWh	\$0
Dishwasher	78 kWh	\$9
Dryer Electric	372 kWh	\$44
Lighting	1863 kWh	\$221
Miscellaneous	1401 kWh	\$166
Pool Pump	0 kWh	\$0
Range Electric	331 kWh	\$39
Refrigerator	637 kWh	\$76
Television	413 kWh	\$49
Total (kWh)	5754 kWh	\$684
Total (Therms)	869.5 Therms	\$1478
Total (Oil Gallons)	0 Gallons	\$0
Total (Propane Gallons)	0 Gallons	\$0
PV Produced (kWh)	0 kWh	\$0
Assumes net metering		
Total Cost		\$2162

**Emissions** (Calculated as Total - PV Produced)  
SO2 = 10.96 Lbs NOX = 8100.92 Lbs CO2 = 10.11 Tons

# Annual Energy Summary

## Wholehouse Summary

FSEC  
111 Anywhere Lane  
Las Vegas, NV

Project Title:  
DSE\_HVAC-3e  
Building Type: User  
HERS BESTEST basecase home

TMY\_City:NV\_LASVEGAS  
Elec Util: EnergyGauge Default  
Gas Util: Florida 2012  
2/16/2018

End-Use	Energy Consumption	Annual Cost
Cooling Electric	5583 kWh	\$663
Cooling Fan	987 kWh	\$117
Mechanical Vent Fan	0 kWh	\$0
<b>Total Cooling</b>	<b>6570 kWh</b>	<b>\$781</b>
Heating		
Heating Fan/Pump	0 kWh	\$0
Mechanical Vent Fan	0 kWh	\$0
<b>Total Heating</b>	<b>\$0</b>	
Hot Water	0 kWh	\$0
Hot Water Pump	0 kWh	\$0
<b>Total Hot Water</b>	<b>0 kWh</b>	<b>\$0</b>
Ceiling Fans	0 kWh	\$0
Clothes Washer	37 kWh	\$4
Dehumidifier	0 kWh	\$0
Dishwasher	78 kWh	\$9
Dryer Electric	372 kWh	\$44
Lighting	1863 kWh	\$221
Miscellaneous	1401 kWh	\$166
Pool Pump	0 kWh	\$0
Range Electric	331 kWh	\$39
Refrigerator	637 kWh	\$76
Television	413 kWh	\$49
Total (kWh)	11702 kWh	\$1390
Total (Therms)	0.0 Therms	\$0
Total (Oil Gallons)	0 Gallons	\$0
Total (Propane Gallons)	0 Gallons	\$0
PV Produced (kWh)	0 kWh	\$0
Assumes net metering		
Total Cost		\$1390

**Emissions** (Calculated as Total - PV Produced)  
SO2 = 5.02 Lbs NOX = 9.64 Lbs CO2 = 6.21 Tons

# Annual Energy Summary

## Wholehouse Summary

FSEC  
111 Anywhere Lane  
Las Vegas, NV

Project Title:  
DSE\_HVAC-3f  
Building Type: User  
HERS BESTEST basecase home

TMY\_City:NV\_LASVEGAS  
Elec Util: EnergyGauge Default  
Gas Util: Florida 2012  
2/16/2018

End-Use	Energy Consumption	Annual Cost
Cooling Electric	7309 kWh	\$868
Cooling Fan	1296 kWh	\$154
Mechanical Vent Fan	0 kWh	\$0
<b>Total Cooling</b>	<b>8605 kWh</b>	<b>\$1022</b>
Heating		
Heating Fan/Pump	0 kWh	\$0
Mechanical Vent Fan	0 kWh	\$0
<b>Total Heating</b>		<b>\$0</b>
Hot Water	0 kWh	\$0
Hot Water Pump	0 kWh	\$0
<b>Total Hot Water</b>	<b>0 kWh</b>	<b>\$0</b>
Ceiling Fans	0 kWh	\$0
Clothes Washer	37 kWh	\$4
Dehumidifier	0 kWh	\$0
Dishwasher	78 kWh	\$9
Dryer Electric	372 kWh	\$44
Lighting	1863 kWh	\$221
Miscellaneous	1401 kWh	\$166
Pool Pump	0 kWh	\$0
Range Electric	331 kWh	\$39
Refrigerator	637 kWh	\$76
Television	413 kWh	\$49
Total (kWh)	13736 kWh	\$1632
Total (Therms)	0.0 Therms	\$0
Total (Oil Gallons)	0 Gallons	\$0
Total (Propane Gallons)	0 Gallons	\$0
PV Produced (kWh)	0 kWh	\$0
Assumes net metering		
Total Cost		\$1632

**Emissions** (Calculated as Total - PV Produced)  
SO2 = 5.89 Lbs NOX = 11.32 Lbs CO2 = 7.29 Tons

# Annual Energy Summary

## Wholehouse Summary

FSEC  
111 Anywhere Lane  
Las Vegas, NV

Project Title:  
DSE\_HVAC-3g  
Building Type: User  
HERS BESTEST basecase home

TMY\_City:NV\_LASVEGAS  
Elec Util: EnergyGauge Default  
Gas Util: Florida 2012  
2/16/2018

End-Use	Energy Consumption	Annual Cost
Cooling Electric	6033 kWh	\$717
Cooling Fan	1066 kWh	\$127
Mechanical Vent Fan	0 kWh	\$0
<b>Total Cooling</b>	<b>7099 kWh</b>	<b>\$843</b>
Heating		
Heating Fan/Pump	0 kWh	\$0
Mechanical Vent Fan	0 kWh	\$0
<b>Total Heating</b>		<b>\$0</b>
Hot Water	0 kWh	\$0
Hot Water Pump	0 kWh	\$0
<b>Total Hot Water</b>	<b>0 kWh</b>	<b>\$0</b>
Ceiling Fans	0 kWh	\$0
Clothes Washer	37 kWh	\$4
Dehumidifier	0 kWh	\$0
Dishwasher	78 kWh	\$9
Dryer Electric	372 kWh	\$44
Lighting	1863 kWh	\$221
Miscellaneous	1401 kWh	\$166
Pool Pump	0 kWh	\$0
Range Electric	331 kWh	\$39
Refrigerator	637 kWh	\$76
Television	413 kWh	\$49
Total (kWh)	12230 kWh	\$1453
Total (Therms)	0.0 Therms	\$0
Total (Oil Gallons)	0 Gallons	\$0
Total (Propane Gallons)	0 Gallons	\$0
PV Produced (kWh)	0 kWh	\$0
Assumes net metering		
Total Cost		\$1453

**Emissions** (Calculated as Total - PV Produced)  
SO2 = 5.25 Lbs NOX = 10.08 Lbs CO2 = 6.49 Tons

# Annual Energy Summary

## Wholehouse Summary

FSEC  
111 Anywhere Lane  
Las Vegas, NV

Project Title:  
DSE\_HVAC-3h  
Building Type: User  
HERS BESTEST basecase home

TMY\_City:NV\_LASVEGAS  
Elec Util: EnergyGauge Default  
Gas Util: Florida 2012  
2/16/2018

End-Use	Energy Consumption	Annual Cost
Cooling Electric	7072 kWh	\$840
Cooling Fan	1242 kWh	\$148
Mechanical Vent Fan	0 kWh	\$0
<b>Total Cooling</b>	<b>8314 kWh</b>	<b>\$988</b>
Heating		
Heating Fan/Pump	0 kWh	\$0
Mechanical Vent Fan	0 kWh	\$0
<b>Total Heating</b>	<b>\$0</b>	<b>\$0</b>
Hot Water	0 kWh	\$0
Hot Water Pump	0 kWh	\$0
<b>Total Hot Water</b>	<b>0 kWh</b>	<b>\$0</b>
Ceiling Fans	0 kWh	\$0
Clothes Washer	37 kWh	\$4
Dehumidifier	0 kWh	\$0
Dishwasher	78 kWh	\$9
Dryer Electric	372 kWh	\$44
Lighting	1863 kWh	\$221
Miscellaneous	1401 kWh	\$166
Pool Pump	0 kWh	\$0
Range Electric	331 kWh	\$39
Refrigerator	637 kWh	\$76
Television	413 kWh	\$49
Total (kWh)	13446 kWh	\$1597
Total (Therms)	0.0 Therms	\$0
Total (Oil Gallons)	0 Gallons	\$0
Total (Propane Gallons)	0 Gallons	\$0
PV Produced (kWh)	0 kWh	\$0
Assumes net metering		
Total Cost		\$1597

**Emissions** (Calculated as Total - PV Produced)  
SO2 = 5.77 Lbs NOX = 11.08 Lbs CO2 = 7.13 Tons



HVAC-tests

**RESNET HVAC Test Suite Results:****Software Name:** EnergyGauge USA 6.0

User input data fields indicated by pale yellow

Test result fields indicated by pale green

**Results**

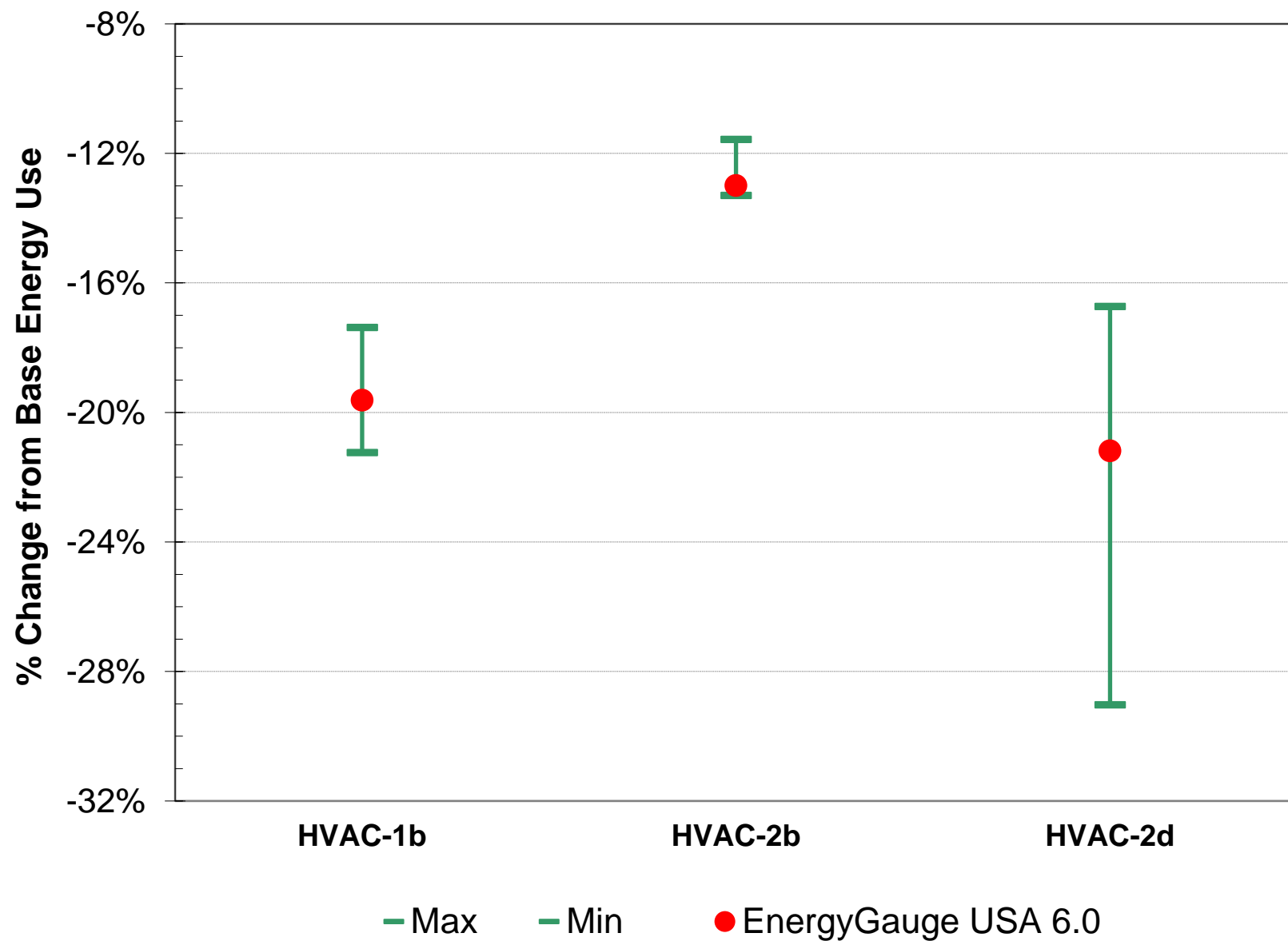
## Cooling tests:

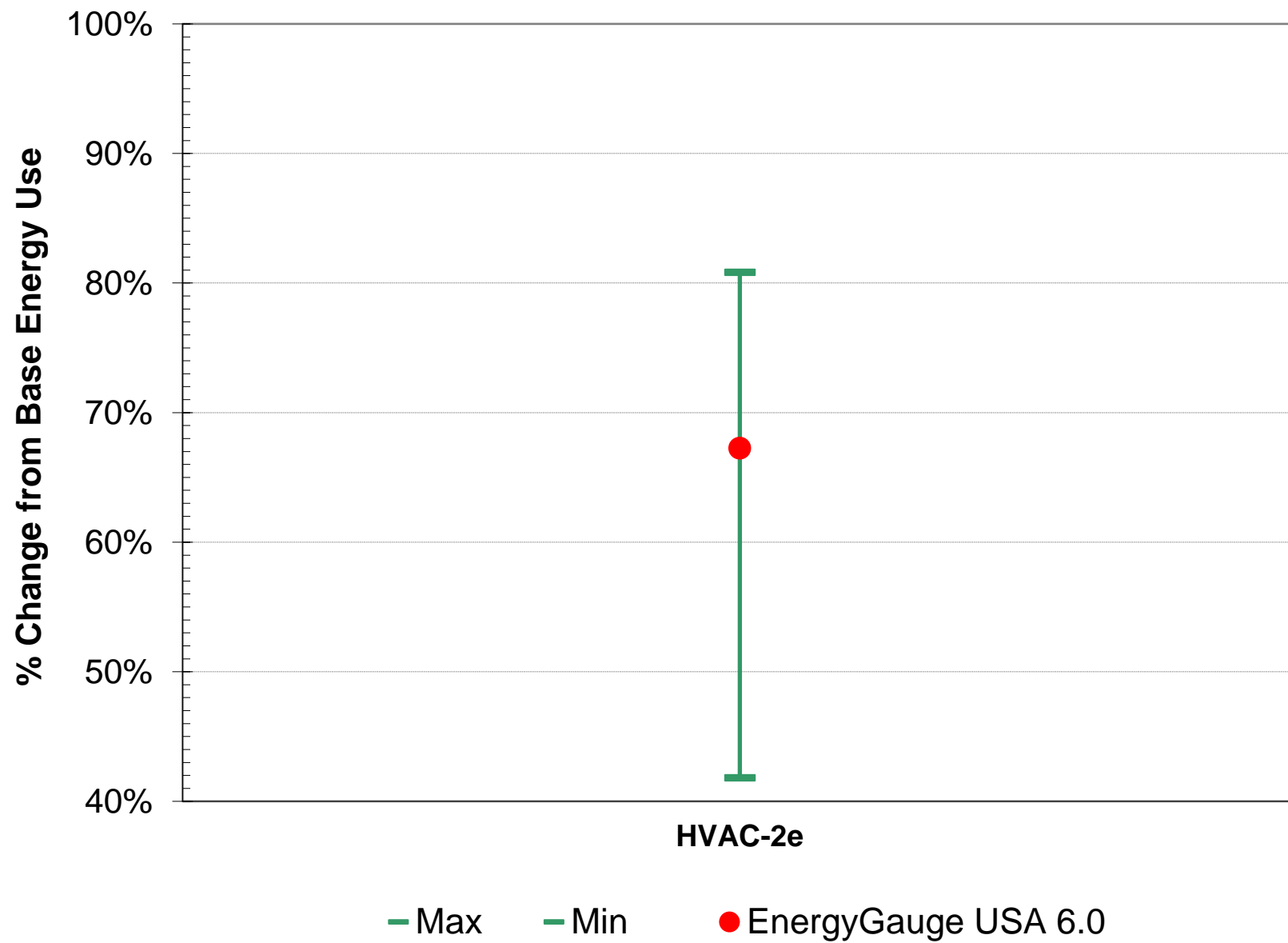
Case	Cool	Cool Fan	Cool Tot	% change	Criteria		
					min	max	
HVAC-1a	5522	975	6497	---			
HVAC-1b	4247	975	5222	-19.62%	-21.24%	-17.38%	pass

## Heating tests:

Case	Heat	Heat Fan	Heat Tot	% change	Criteria		
					min	max	
HVAC-2a	845.1	659	86.76	---			
HVAC-2b	732.4	659	75.49	-12.99%	-13.30%	-11.57%	pass

Case	Heat	Heat Fan	Heat Tot	% change	Criteria		
					min	max	
HVAC-2c	9996	1407	11403	---			
HVAC-2d	7911	1076	8987	-21.19%	-29.03%	-16.73%	pass
HVAC-2e	18083	989	19072	67.25%	41.81%	80.81%	pass





# Annual Energy Summary

## Wholehouse Summary

FSEC  
111 Anywhere Lane  
Las Vegas, NV

Project Title:  
HVAC\_TestCase-1a  
Building Type: User  
RESNET HVAC test suite

TMY\_City:NV\_LASVEGAS  
Elec Util: EnergyGauge Default  
Gas Util: Florida 2012  
2/16/2018

End-Use	Energy Consumption	Annual Cost
Cooling Electric	5522 kWh	\$656
Cooling Fan	975 kWh	\$116
Mechanical Vent Fan	0 kWh	\$0
<b>Total Cooling</b>	<b>6497 kWh</b>	<b>\$772</b>
Heating		
Heating Fan/Pump	0 kWh	\$0
Mechanical Vent Fan	0 kWh	\$0
<b>Total Heating</b>		<b>\$0</b>
Hot Water	0 kWh	\$0
Hot Water Pump	0 kWh	\$0
<b>Total Hot Water</b>	<b>0 kWh</b>	<b>\$0</b>
Ceiling Fans	0 kWh	\$0
Clothes Washer	37 kWh	\$4
Dehumidifier	0 kWh	\$0
Dishwasher	78 kWh	\$9
Dryer Electric	372 kWh	\$44
Lighting	1863 kWh	\$221
Miscellaneous	1401 kWh	\$166
Pool Pump	0 kWh	\$0
Range Electric	331 kWh	\$39
Refrigerator	637 kWh	\$76
Television	413 kWh	\$49
Total (kWh)	11628 kWh	\$1381
Total (Therms)	0.0 Therms	\$0
Total (Oil Gallons)	0 Gallons	\$0
Total (Propane Gallons)	0 Gallons	\$0
PV Produced (kWh)	0 kWh	\$0
Assumes net metering		
Total Cost		\$1381

### **Emissions** (Calculated as Total - PV Produced)

SO2 = 4.99 Lbs NOX = 9.58 Lbs CO2 = 6.17 Tons

# Annual Energy Summary

## Wholehouse Summary

FSEC  
111 Anywhere Lane  
Las Vegas, NV

Project Title:  
HVAC\_TestCase-1b  
Building Type: User  
RESNET HVAC test suite

TMY\_City:NV\_LASVEGAS  
Elec Util: EnergyGauge Default  
Gas Util: Florida 2012  
2/16/2018

End-Use	Energy Consumption	Annual Cost
Cooling Electric	4247 kWh	\$505
Cooling Fan	975 kWh	\$116
Mechanical Vent Fan	0 kWh	\$0
<b>Total Cooling</b>	<b>5222 kWh</b>	<b>\$620</b>
Heating		
Heating Fan/Pump	0 kWh	\$0
Mechanical Vent Fan	0 kWh	\$0
<b>Total Heating</b>		<b>\$0</b>
Hot Water	0 kWh	\$0
Hot Water Pump	0 kWh	\$0
<b>Total Hot Water</b>	<b>0 kWh</b>	<b>\$0</b>
Ceiling Fans	0 kWh	\$0
Clothes Washer	37 kWh	\$4
Dehumidifier	0 kWh	\$0
Dishwasher	78 kWh	\$9
Dryer Electric	372 kWh	\$44
Lighting	1863 kWh	\$221
Miscellaneous	1401 kWh	\$166
Pool Pump	0 kWh	\$0
Range Electric	331 kWh	\$39
Refrigerator	637 kWh	\$76
Television	413 kWh	\$49
Total (kWh)	10354 kWh	\$1230
Total (Therms)	0.0 Therms	\$0
Total (Oil Gallons)	0 Gallons	\$0
Total (Propane Gallons)	0 Gallons	\$0
PV Produced (kWh)	0 kWh	\$0
Assumes net metering		
Total Cost		\$1230

**Emissions** (Calculated as Total - PV Produced)  
SO2 = 4.44 Lbs NOX = 8.53 Lbs CO2 = 5.49 Tons

# Annual Energy Summary

## Wholehouse Summary

FSEC  
111 Anywhere Lane  
Colorado Springs, CO

Project Title:  
HVAC\_TestCase-2a  
Building Type: User  
HERS BESTEST basecase home

TMY\_City:CO\_COLORADOSPRINGS  
Elec Util: EnergyGauge Default  
Gas Util: Florida 2012  
2/16/2018

End-Use	Energy Consumption	Annual Cost
Cooling		
Cooling Fan	0 kWh	\$0
Mechanical Vent Fan	0 kWh	\$0
<b>Total Cooling</b>	<b>0 kWh</b>	<b>\$0</b>
Heating		
Therms	845.1 Therms	\$1437
Heating Fan/Pump	659 kWh	\$78
Mechanical Vent Fan	0 kWh	\$0
<b>Total Heating</b>		<b>\$1515</b>
Hot Water	0 kWh	\$0
Hot Water Pump	0 kWh	\$0
<b>Total Hot Water</b>	<b>0 kWh</b>	<b>\$0</b>
Ceiling Fans	0 kWh	\$0
Clothes Washer	37 kWh	\$4
Dehumidifier	0 kWh	\$0
Dishwasher	78 kWh	\$9
Dryer Electric	372 kWh	\$44
Lighting	1863 kWh	\$221
Miscellaneous	1401 kWh	\$166
Pool Pump	0 kWh	\$0
Range Electric	331 kWh	\$39
Refrigerator	637 kWh	\$76
Television	413 kWh	\$49
Total (kWh)	5790 kWh	\$688
Total (Therms)	845.1 Therms	\$1437
Total (Oil Gallons)	0 Gallons	\$0
Total (Propane Gallons)	0 Gallons	\$0
PV Produced (kWh)	0 kWh	\$0
Assumes net metering		
Total Cost		\$2125

**Emissions** (Calculated as Total - PV Produced)  
SO2 = 11.02 Lbs NOX = 7874.09 Lbs CO2 = 10.00 Tons

# Annual Energy Summary

## Wholehouse Summary

FSEC  
111 Anywhere Lane  
Colorado Springs, CO

Project Title:  
HVAC\_TestCase-2b  
Building Type: User  
HERS BESTEST basecase home

TMY\_City:CO\_COLORADOSPRINGS  
Elec Util: EnergyGauge Default  
Gas Util: Florida 2012  
2/16/2018

End-Use	Energy Consumption	Annual Cost
Cooling		
Cooling Fan	0 kWh	\$0
Mechanical Vent Fan	0 kWh	\$0
<b>Total Cooling</b>	<b>0 kWh</b>	<b>\$0</b>
Heating		
Therms	732.4 Therms	\$1245
Heating Fan/Pump	659 kWh	\$78
Mechanical Vent Fan	0 kWh	\$0
<b>Total Heating</b>		<b>\$1323</b>
Hot Water	0 kWh	\$0
Hot Water Pump	0 kWh	\$0
<b>Total Hot Water</b>	<b>0 kWh</b>	<b>\$0</b>
Ceiling Fans	0 kWh	\$0
Clothes Washer	37 kWh	\$4
Dehumidifier	0 kWh	\$0
Dishwasher	78 kWh	\$9
Dryer Electric	372 kWh	\$44
Lighting	1863 kWh	\$221
Miscellaneous	1401 kWh	\$166
Pool Pump	0 kWh	\$0
Range Electric	331 kWh	\$39
Refrigerator	637 kWh	\$76
Television	413 kWh	\$49
Total (kWh)	5790 kWh	\$688
Total (Therms)	732.4 Therms	\$1245
Total (Oil Gallons)	0 Gallons	\$0
Total (Propane Gallons)	0 Gallons	\$0
PV Produced (kWh)	0 kWh	\$0
Assumes net metering		
Total Cost		\$1933

**Emissions** (Calculated as Total - PV Produced)  
SO2 = 11.02 Lbs    NOX = 6825.98 Lbs    CO2 = 9.33 Tons



# Annual Energy Summary

## Wholehouse Summary

FSEC  
111 Anywhere Lane  
Colorado Springs, CO

Project Title:  
HVAC\_TestCase-2c  
Building Type: User  
HERS BESTEST basecase home

TMY\_City:CO\_COLORADOSPRINGS  
Elec Util: EnergyGauge Default  
Gas Util: Florida 2012  
2/16/2018

End-Use	Energy Consumption	Annual Cost
Cooling		
Cooling Fan	0 kWh	\$0
Mechanical Vent Fan	0 kWh	\$0
<b>Total Cooling</b>	<b>0 kWh</b>	<b>\$0</b>
Heating Electric	9996 kWh	\$1188
Heating Fan/Pump	1407 kWh	\$167
Mechanical Vent Fan	0 kWh	\$0
<b>Total Heating</b>	<b>11403 kWh</b>	<b>\$1355</b>
Hot Water	0 kWh	\$0
Hot Water Pump	0 kWh	\$0
<b>Total Hot Water</b>	<b>0 kWh</b>	<b>\$0</b>
Ceiling Fans	0 kWh	\$0
Clothes Washer	37 kWh	\$4
Dehumidifier	0 kWh	\$0
Dishwasher	78 kWh	\$9
Dryer Electric	372 kWh	\$44
Lighting	1863 kWh	\$221
Miscellaneous	1401 kWh	\$166
Pool Pump	0 kWh	\$0
Range Electric	331 kWh	\$39
Refrigerator	637 kWh	\$76
Television	413 kWh	\$49
Total (kWh)	16534 kWh	\$1964
Total (Therms)	0.0 Therms	\$0
Total (Oil Gallons)	0 Gallons	\$0
Total (Propane Gallons)	0 Gallons	\$0
PV Produced (kWh)	0 kWh	\$0
Assumes net metering		
Total Cost		\$1964

**Emissions** (Calculated as Total - PV Produced)  
SO2 = 31.48 Lbs    NOX = 41.86 Lbs    CO2 = 14.36 Tons

# Annual Energy Summary

## Wholehouse Summary

FSEC  
111 Anywhere Lane  
Colorado Springs, CO

Project Title:  
HVAC\_TestCase-2d  
Building Type: User  
HERS BESTEST basecase home

TMY\_City:CO\_COLORADOSPRINGS  
Elec Util: EnergyGauge Default  
Gas Util: Florida 2012  
2/16/2018

End-Use	Energy Consumption	Annual Cost
Cooling		
Cooling Fan	0 kWh	\$0
Mechanical Vent Fan	0 kWh	\$0
<b>Total Cooling</b>	<b>0 kWh</b>	<b>\$0</b>
Heating Electric	7911 kWh	\$940
Heating Fan/Pump	1076 kWh	\$128
Mechanical Vent Fan	0 kWh	\$0
<b>Total Heating</b>	<b>8987 kWh</b>	<b>\$1068</b>
Hot Water	0 kWh	\$0
Hot Water Pump	0 kWh	\$0
<b>Total Hot Water</b>	<b>0 kWh</b>	<b>\$0</b>
Ceiling Fans	0 kWh	\$0
Clothes Washer	37 kWh	\$4
Dehumidifier	0 kWh	\$0
Dishwasher	78 kWh	\$9
Dryer Electric	372 kWh	\$44
Lighting	1863 kWh	\$221
Miscellaneous	1401 kWh	\$166
Pool Pump	0 kWh	\$0
Range Electric	331 kWh	\$39
Refrigerator	637 kWh	\$76
Television	413 kWh	\$49
Total (kWh)	14118 kWh	\$1677
Total (Therms)	0.0 Therms	\$0
Total (Oil Gallons)	0 Gallons	\$0
Total (Propane Gallons)	0 Gallons	\$0
PV Produced (kWh)	0 kWh	\$0
Assumes net metering		
Total Cost		\$1677

**Emissions** (Calculated as Total - PV Produced)  
SO2 = 26.88 Lbs NOX = 35.75 Lbs CO2 = 12.26 Tons

# Annual Energy Summary

## Wholehouse Summary

FSEC  
111 Anywhere Lane  
Colorado Springs, CO

Project Title:  
HVAC\_TestCase-2e  
Building Type: User  
HERS BESTEST basecase home

TMY\_City:CO\_COLORADOSPRINGS  
Elec Util: EnergyGauge Default  
Gas Util: Florida 2012  
2/16/2018

End-Use	Energy Consumption	Annual Cost
Cooling		
Cooling Fan	0 kWh	\$0
Mechanical Vent Fan	0 kWh	\$0
<b>Total Cooling</b>	<b>0 kWh</b>	<b>\$0</b>
Heating Electric	18083 kWh	\$2148
Heating Fan/Pump	989 kWh	\$117
Mechanical Vent Fan	0 kWh	\$0
<b>Total Heating</b>	<b>19072 kWh</b>	<b>\$2266</b>
Hot Water	0 kWh	\$0
Hot Water Pump	0 kWh	\$0
<b>Total Hot Water</b>	<b>0 kWh</b>	<b>\$0</b>
Ceiling Fans	0 kWh	\$0
Clothes Washer	37 kWh	\$4
Dehumidifier	0 kWh	\$0
Dishwasher	78 kWh	\$9
Dryer Electric	372 kWh	\$44
Lighting	1863 kWh	\$221
Miscellaneous	1401 kWh	\$166
Pool Pump	0 kWh	\$0
Range Electric	331 kWh	\$39
Refrigerator	637 kWh	\$76
Television	413 kWh	\$49
Total (kWh)	24204 kWh	\$2875
Total (Therms)	0.0 Therms	\$0
Total (Oil Gallons)	0 Gallons	\$0
Total (Propane Gallons)	0 Gallons	\$0
PV Produced (kWh)	0 kWh	\$0
Assumes net metering		
Total Cost		\$2875

**Emissions** (Calculated as Total - PV Produced)  
SO2 = 46.08 Lbs    NOX = 61.28 Lbs    CO2 = 21.02 Tons

TaxCredit\_AutoGen

Tax Credit Auto-Gen Test Results:  
(see RESNET Publication 001-16)

Software Name: EnergyGauge USA 6.0

User input data fields indicated by pale yellow

Reference Home Building Component	Test 1	Results	Test 2	Results	Test 3	Results	Test 4	Results
Above-grade walls ( $U_o$ )	0.082	0.082	0.082	0.082	0.082	0.082	0.06	0.06
Above-grade wall solar absorptance ( $\alpha$ )	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Above-grade wall infrared emittance ( $\epsilon$ )	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Basement walls ( $U_o$ )	n/a	n/a	n/a	n/a	n/a	n/a	0.059	0.059
Above-grade floors ( $U_o$ )	0.047	0.047	0.047	0.047	n/a	n/a	n/a	n/a
Slab insulation R-Value	n/a	n/a	n/a	n/a	0	0	0	0
Ceilings ( $U_o$ )	0.03	0.03	0.035	0.035	0.035	0.035	0.03	0.03
Roof solar absorptance ( $\alpha$ )	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Roof infrared emittance ( $\epsilon$ )	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Attic vent area* ( $\text{ft}^2$ )	5.13	5.13	5.13	5.13	5.13	5.13	5.13	5.13
Crawlspace vent area* ( $\text{ft}^2$ )	n/a	n/a	10.26	10.26	n/a	n/a	n/a	n/a
Exposed masonry floor area* ( $\text{ft}^2$ )	n/a	n/a	n/a	n/a	307.8	307.8	307.8	307.8
Carpet & pad R-Value	n/a	n/a	n/a	n/a	2	2	2	2
Door Area ( $\text{ft}^2$ )	40	40	40	40	40	40	40	40
Door U-Factor	0.4	0.4	0.65	0.65	1.2	1.2	0.35	0.35
North window area* ( $\text{ft}^2$ )	67.50	67.50	67.50	67.50	67.50	67.50	50.02	50.02
South window area* ( $\text{ft}^2$ )	67.50	67.50	67.50	67.50	67.50	67.50	50.02	50.02
East window area* ( $\text{ft}^2$ )	67.50	67.50	67.50	67.50	67.50	67.50	50.02	50.02
West window area* ( $\text{ft}^2$ )	67.50	67.50	67.50	67.50	67.50	67.50	50.02	50.02
Window U-Factor	0.40	0.40	0.65	0.65	1.20	1.20	0.35	0.35
Window SHGC <sub>o</sub> (heating)	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Window SHGC <sub>o</sub> (cooling)	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
SLA <sub>o</sub> * ( $\text{ft}^2/\text{ft}^2$ )	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036
Sensible Internal gains* (Btu/day)	55,470	55,481	52,794	52,801	48,111	48,117	83,103	83,116
Latent Internal gains* (Btu/day)	13,807	13,809	12,698	12,701	9,259	9,263	17,934	17,937
Labeled heating system rating and efficiency	AFUE = 78%	78%	HSPF = 7.7	7.7	HSPF = 7.7	7.7	AFUE = 78%	78
Labeled cooling system rating and efficiency	SEER = 13	13	SEER = 13	13	SEER = 13	13	SEER = 13	13
Air Distribution System Efficiency	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Thermostat Type	Manual	Manual	Manual	Manual	Manual	Manual	Manual	Manual
Heating thermostat settings	68 F (all hours)	68	68 F (all hours)	68	68 F (all hours)	68	68 F (all hours)	68
Cooling thermostat settings	78 F (all hours)	78	78 F (all hours)	78	78 F (all hours)	78	78 F (all hours)	78
e-Ratio		1.000		0.998		0.998		1.000

# Reference Home Characteristics

FSEC  
111 Anywhere Lane  
Baltimore, MD,  
Registration #:

Title: TaxCredit-AutoGen\_case1  
TaxRef13

TMY City: MD\_BALTIMORE\_BL  
Elec Util: EnergyGauge Default  
Gas Util: EnergyGauge Default  
Run Date:

HERS BESTEST basecase home

Above-grade Walls (Uo)	0.082
Above-grade Wall Solar Absorptance	0.75
Above-grade Wall Infrared Emittance	0.90
Basement Walls (Uo)	n/a
Above-grade Floors (Uo)	0.047
Slab Insulation R-Value	n/a
Ceilings (Uo)	0.030
Roof Solar Absorptance	0.75
Roof Infrared Emittance	0.90
Attic Vent Area (ft²)	5.13
Crawlspace Vent Area (ft²)	n/a
Exposed Masonry Floor Area (ft²)	n/a
Carpet & Pad R-Value	n/a
Door Area (ft²)	40
Door U-Factor	0.40
North Window Area (ft²)	67.50
South Window Area (ft²)	67.50
East Window Area (ft²)	67.50
West Window Area (ft²)	67.50
Window U-Factor	0.40
Window SHGC (Heating)	0.3400
Window SHGC (Cooling)	0.280
SLA (ft²/ft²)	0.00036
Internal Gains Sensible (Btu/day)	55481.3
Internal Gains latent (Btu/day)	13809.1
Internal Gains Total (Btu/day)	69290.4
Labeled Heating System Rating and Efficiency	AFUE = 78%
Labeled Cooling System Rating and Efficiency	SEER = 13.0
Air Distribution System Efficiency	0.80
Gallons per day	49.02
Thermostat Type	Manual
Mechanical Ventilation (kWh/y)	0.0
DHW pipe length (ft)	88.5
DHW loop length (ft)	156.9
Heating Thermostat Settings	68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0
	68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0
	68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0
Cooling Thermostat Settings	78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0
	78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0
	78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0

# Reference Home Characteristics

FSEC  
111 Anywhere Lane  
Dallas, TX,  
Registration #:

Title: TaxCredit-AutoGen\_case2  
TaxRef13

TMY City: TX\_ABILENE\_DYES  
Elec Util: EnergyGauge Default  
Gas Util: EnergyGauge Default  
Run Date:

HERS BESTEST basecase home

Above-grade Walls (Uo)	0.082
Above-grade Wall Solar Absorptance	0.75
Above-grade Wall Infrared Emittance	0.90
Basement Walls (Uo)	n/a
Above-grade Floors (Uo)	0.047
Slab Insulation R-Value	n/a
Ceilings (Uo)	0.035
Roof Solar Absorptance	0.75
Roof Infrared Emittance	0.90
Attic Vent Area (ft²)	5.13
Crawlspace Vent Area (ft²)	10.26
Exposed Masonry Floor Area (ft²)	n/a
Carpet & Pad R-Value	n/a
Door Area (ft²)	40
Door U-Factor	0.65
North Window Area (ft²)	67.50
South Window Area (ft²)	67.50
East Window Area (ft²)	67.50
West Window Area (ft²)	67.50
Window U-Factor	0.65
Window SHGC (Heating)	0.3400
Window SHGC (Cooling)	0.280
SLA (ft²/ft²)	0.00036
Internal Gains Sensible (Btu/day)	52801.2
Internal Gains latent (Btu/day)	12701.4
Internal Gains Total (Btu/day)	65502.6
Labeled Heating System Rating and Efficiency	HSPF = 7.7
Labeled Cooling System Rating and Efficiency	SEER = 13.0
Air Distribution System Efficiency	0.80
Gallons per day	44.61
Thermostat Type	Manual
Mechanical Ventilation (kWh/y)	0.0
DHW pipe length (ft)	88.5
DHW loop length (ft)	156.9
Heating Thermostat Settings	68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0
	68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0
	68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0
Cooling Thermostat Settings	78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0
	78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0
	78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0

# Reference Home Characteristics

FSEC  
111 Anywhere Lane  
Miami, FL,  
Registration #:

Title: TaxCredit-AutoGen\_case3  
TaxRef13

TMY City: FL\_MIAMI\_INTL\_AP  
Elec Util: Florida Average  
Gas Util: Florida Average  
Run Date:

HERS BESTEST insulated slab case

Above-grade Walls (Uo)	0.082
Above-grade Wall Solar Absorptance	0.75
Above-grade Wall Infrared Emittance	0.90
Basement Walls (Uo)	n/a
Above-grade Floors (Uo)	n/a
Slab Insulation R-Value	0
Ceilings (Uo)	0.035
Roof Solar Absorptance	0.75
Roof Infrared Emittance	0.90
Attic Vent Area (ft²)	5.13
Crawlspace Vent Area (ft²)	n/a
Exposed Masonry Floor Area (ft²)	307.8
Carpet & Pad R-Value	2.0
Door Area (ft²)	40
Door U-Factor	1.20
North Window Area (ft²)	67.50
South Window Area (ft²)	67.50
East Window Area (ft²)	67.50
West Window Area (ft²)	67.50
Window U-Factor	1.20
Window SHGC (Heating)	0.3400
Window SHGC (Cooling)	0.280
SLA (ft²/ft²)	0.00036
Internal Gains Sensible (Btu/day)	48116.5
Internal Gains latent (Btu/day)	9262.5
Internal Gains Total (Btu/day)	57379.0
Labeled Heating System Rating and Efficiency	HSPF = 7.7
Labeled Cooling System Rating and Efficiency	SEER = 13.0
Air Distribution System Efficiency	0.80
Gallons per day	32.10
Thermostat Type	Manual
Mechanical Ventilation (kWh/y)	0.0
DHW pipe length (ft)	88.5
DHW loop length (ft)	156.9
Heating Thermostat Settings	68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0
	68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0
	68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0
Cooling Thermostat Settings	78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0
	78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0
	78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0



# Reference Home Characteristics

FSEC  
111 Anywhere Lane  
Colorado Springs, CO,  
Registration #:

Title: TaxCredit-AutoGen\_case4  
TaxRef13

TMY City: CO\_COLORADO\_SP  
Elec Util: Colorado Average  
Gas Util: Colorado Average  
Run Date:

HERS BESTEST insulated basement case

Above-grade Walls (Uo)	0.060
Above-grade Wall Solar Absorptance	0.75
Above-grade Wall Infrared Emittance	0.90
Basement Walls (Uo)	0.059
Above-grade Floors (Uo)	n/a
Slab Insulation R-Value	0
Ceilings (Uo)	0.030
Roof Solar Absorptance	0.75
Roof Infrared Emittance	0.90
Attic Vent Area (ft²)	5.13
Crawlspace Vent Area (ft²)	n/a
Exposed Masonry Floor Area (ft²)	307.8
Carpet & Pad R-Value	2.0
Door Area (ft²)	40
Door U-Factor	0.35
North Window Area (ft²)	67.50
South Window Area (ft²)	67.50
East Window Area (ft²)	67.50
West Window Area (ft²)	67.50
Window U-Factor	0.35
Window SHGC (Heating)	0.3400
Window SHGC (Cooling)	0.280
SLA (ft²/ft²)	0.00036
Internal Gains Sensible (Btu/day)	83115.7
Internal Gains latent (Btu/day)	17936.9
Internal Gains Total (Btu/day)	101052.6
Labeled Heating System Rating and Efficiency	AFUE = 78%
Labeled Cooling System Rating and Efficiency	SEER = 13.0
Air Distribution System Efficiency	0.80
Gallons per day	60.91
fmix	0.709
Thermostat Type	Manual
Heating Thermostat Settings	68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0 68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0 68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0, 68.0
Cooling Thermostat Settings	78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0 78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0 78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0, 78.0