

Summit County
REMP Instructions

Use the **RREMP tab** for residential projects (Group R2 & R3, 3 stories or less) or for residential portions of mixed used buildings.

1. Using the YELLOW cells in the **RREMP** tab, enter all new exterior energy uses to be installed on the site. The spreadsheet will automatically calculate e
 2. If you will be installing a heat pump, solar PV, or other alternative energy system to comply with the **REMP** program, enter system information into the Y in the **HP, PV Generation**, and **Alt Energy** tabs respectively. The offset requirements in the **RREMP** tab will automatically update.
 3. Submit the completed worksheets to the Building Department.
-

Use the **CREMP tab** for commercial projects (and Group R2 & R3, 4 stories or greater) or for commercial portions of mixed-used buildings.

1. Using the YELLOW cells in the **CREMP** tab, enter all new exterior energy uses to be installed on the site. The spreadsheet will automatically calculate e
2. If you will be installing a heat pump, solar PV, or other alternative energy system to comply with the **REMP** program, enter system information into the Y in the **HP, PV Generation**, and **Alt Energy** tabs respectively. The offset requirements in the **CREMP** tab will automatically update.
3. Submit the completed worksheets to the Building Department.

Summit County
Residential Projects
RREMP Calculation

Complete and submit this page for Residential projects.

Project Name:

1. Exterior Energy Use Calculations

Application	Efficiency	Annual Use BTU	Full Offset kW	% Offset	Offset required	
					PV kW	Payment in lieu
1. Outdoor Snowmelt	<input type="text" value="0"/> sq. ft. <input type="text" value="92.0%"/>	<input type="text" value="-"/>	<input type="text" value="0.00"/>	<input type="text" value="n/a"/>		
<i>Enter total area of proposed snowmelt.</i>						
(1a) Exempt Snowmelt:	<input type="text" value="0"/> sq. ft. <input type="text" value="92.0%"/>	<input type="text" value="-"/>	<input type="text" value="0.00"/>	<input type="text" value="n/a"/>		
<i>Calculated - 100 sq. ft. or Less Exempt.</i>						
(1b) Non-Exempt Snowmelt:	<input type="text" value="0"/> sq. ft. <input type="text" value="92.0%"/>	<input type="text" value="-"/>	<input type="text" value="0.00"/>	<input type="text" value="100%"/>	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>
<i>Calculated - Total area of snowmelt less the exempt area.</i>						
2. Outdoor Spa	<input type="text" value="0"/> sq. ft. <input type="text" value="92.0%"/>	<input type="text" value="-"/>	<input type="text" value="0.00"/>	<input type="text" value="n/a"/>		
<i>Enter total area of proposed spa.</i>						
(2a) Exempt Spa:	<input type="text" value="0"/> sq. ft. <input type="text" value="92.0%"/>	<input type="text" value="-"/>	<input type="text" value="0.00"/>	<input type="text" value="n/a"/>		
<i>Calculated - 64 sq. ft. or Less Exempt</i>						
(2b) Non-Exempt Spa:	<input type="text" value="0"/> sq. ft. <input type="text" value="92.0%"/>	<input type="text" value="-"/>	<input type="text" value="0.00"/>	<input type="text" value="100%"/>	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>
<i>Calculated - Total area of spa less the exempt area.</i>						
3. Outdoor Pool	<input type="text" value="0"/> sq. ft. <input type="text" value="100.0%"/>	<input type="text" value="-"/>	<input type="text" value="0.00"/>	<input type="text" value="100%"/>	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>
<i>Enter total area of proposed pool.</i>						
4. Outdoor Heat Tape:	<input type="text" value="0"/> watts <input type="text" value="n/a"/>	<input type="text" value="-"/>	<input type="text" value="0.00"/>	<input type="text" value="0%"/>	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>
<i>Enter watts of proposed electrical heat tape/trace/matt. Full wattage is currently exempt, enter total installed wattage in this cell.</i>						
5. Outdoor Electric Heaters:	<input type="text" value="0"/> watts <input type="text" value="n/a"/>	<input type="text" value="-"/>	<input type="text" value="0.00"/>	<input type="text" value="0%"/>	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>
<i>Enter watts of electrically powered exterior heaters. Full wattage is currently exempt, enter total installed wattage in this cell.</i>						
6. Outdoor Gas-Fired Heaters:	<input type="text" value="0"/> Btu/hr <input type="text" value="n/a"/>	<input type="text" value="-"/>	<input type="text" value="0.00"/>			
<i>Enter total gas-fired heater BTUs.</i>						
7. Outdoor Gas Fireplaces & Firepits:	<input type="text" value="0"/> Btu/hr <input type="text" value="n/a"/>	<input type="text" value="-"/>	<input type="text" value="0.00"/>			
<i>Enter total fireplace & firepit BTUs.</i>						
8. Outdoor Gas Cooking Appliances:	<input type="text" value="0"/> Btu/hr <input type="text" value="n/a"/>	<input type="text" value="-"/>	<input type="text" value="0.00"/>			
<i>Enter total gas barbeque, pizza oven, etc BTUs.</i>						
Exterior Energy RREMP Payment Subtotal:					<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>

2. Gas Energy Budget Summary

	Annual Use BTU	Full Offset kW	% Offset	Offset required	
				PV kW	Payment in lieu
1. Exterior Gas Energy Offsets:	<input type="text" value="-"/>	<input type="text" value="0.00"/>	<input type="text" value="n/a"/>		
<i>Calculated - Sum of 1.6, 1.7, 1.8 above. Total annual energy use of exterior gas cooking appliances, fireplaces, firepits, and gas fired heaters.</i>					
(1a) Reduced Offset:	<input type="text" value="-"/>	<input type="text" value="0.00"/>	<input type="text" value="10%"/>	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>
<i>Calculated - 72,800,000 BTU/yr or less.</i>					
(1b) Full Offset:	<input type="text" value="-"/>	<input type="text" value="0.00"/>	<input type="text" value="100%"/>	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>
<i>Calculated - Total annual energy less the reduced offset capacity.</i>					
Exterior Gas RREMP Payment Total:				<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>

3. On-site Renewable Credits

Supplemental Energy Sources (options for on-site offset of projected energy consumption)	Offset Applied	
	equiv PV kW	Credit applied
1. GSHP (Ground Source Heat Pump)	<input type="text" value="0"/>	<input type="text" value="0.00"/>
<i>From GSHP Btu capacity on HP tab. Complete and submit that sheet.</i>		
2. ASHP (Air Source Heat Pump)	<input type="text" value="0"/>	<input type="text" value="0.00"/>
<i>From ASHP Btu capacity on HP tab. Complete and submit that sheet.</i>		
3. SHW (Solar Hot Water)	<input type="text" value="0"/>	<input type="text" value="0.00"/>
<i>Use installed panel area.</i>		
4. PV (to be installed on site)	<input type="text" value="0.00"/>	<input type="text" value="0.00"/>
<i>From PV Generation tab. Complete and submit that sheet.</i>		
5. Alternative Renewable Energy Source		<input type="text" value="0.00"/>
<i>From Alt Energy Source tab. Complete and submit that sheet.</i>		
Supplemental Energy Credit Total:		<input type="text" value="0.00"/>

4. Total RREMP Payment:

Total from Exterior Energy (Sections 1):	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>
Total from Gas Energy Budget (Section 2 above):	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>
Total On-site mitigation (Section 3 above):	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>
Prepared by: <input type="text"/>	Amount Pre-paid:	<input type="text" value="\$0.00"/>
email: <input type="text"/>	Total RREMP Due:	<input type="text" value="\$0.00"/>

Summit County
Commercial Projects
CREMP Calculation

Complete and submit this page for Commercial projects.

Project Name:

0. Exterior Energy Use Commercial Exemptions

			Exempt sq. ft.
1. Snowmelt	Quantity of Egress Pathways	0	0.0
Enter the total number of designated emergency egress pathways proposed.			
2. Spa	Quantity of Privately Owned Units	0	0.0
For commercial buildings that contain Residential HOAs comprised entirely of privately owned units, enter the total number of privately owned Residential units.			

1. Exterior Energy Use Calculations

Application		Efficiency	Annual Use BTU	Full Offset kW	% Offset	Offset Required	
						PV kW	Payment in lieu
1. Snowmelt	0 sq. ft.	92.0%	-	0.00	n/a		
Enter total area of proposed snowmelt.							
(1a) Exempt Snowmelt:	0 sq. ft.	92.0%	-	0.00	n/a		
Calculated - 100 sq. ft. per designated emergency egress pathway Exempt.							
(1b) Non-Exempt Snowmelt:	0 sq. ft.	92.0%	-	0.00	100%	0.00	\$0.00
Calculated - Total area of snowmelt less the exempt area.							
2. Spa	0 sq. ft.	92.0%	-	0.00	n/a		
Enter total area of proposed spa.							
(2a) Exempt Spa:	0 sq. ft.	92.0%	-	0.00	n/a		
Calculated - 64 sq. ft. per 10 privately owned units is Exempt.							
(2b) Non-Exempt Spa:	0 sq. ft.	92.0%	-	0.00	100%	0.00	\$0.00
Calculated - Total area of spa less the exempt area.							
3. Outdoor Pool	0 sq. ft.	92.0%	-	0.00	100%	0.00	\$0.00
Enter total area of proposed pool.							
4. Outdoor Heat Tape:	0 Watts	n/a	-	0.00	0%	0.00	\$0.00
Enter watts of electrical heat tape/trace/matt. Full wattage is currently exempt, enter total installed wattage in this cell.							
5. Outdoor Electric Heaters:	0 Watts	n/a	-	0.00	10%	0.00	\$0.00
Enter watts of electrically powered exterior heaters.							
6. Outdoor Gas-Fired Heaters:	0 Btu/hr	n/a	-	0.00			
Enter total fireplace & firepit BTUs.							
7. Outdoor Gas Fireplaces & Firepits:	0 Btu/hr	n/a	-	0.00			
Enter total fireplace & firepit BTUs.							
8. Outdoor Gas Cooking Appliances:	0 Btu/hr	n/a	-	0.00			
Enter total gas barbeque, pizza oven, etc. BTUs.							
CREMP Payment Total:						0.00	\$0.00

2. Gas Energy Budget Summary

	Annual Use BTU	Full Offset kW	% Offset	Offset required	
				PV kW	Payment in lieu
1. Exterior Gas Energy Offsets:	-	0.00			
Calculated - Sum of 1.6, 1.7, 1.8 above. Total annual energy use of exterior gas cooking appliances, fireplaces, firepits, and gas fired heaters.					
(1a) Reduced Offset:	-	0.00	10%	0.00	\$0.00
Calculated - 705,600,000 BTU/yr or less.					
(1b) Full Offset:	-	0.00	100%	0.00	\$0.00
Calculated - Total annual energy less the reduced offset capacity.					
Exterior Gas CREMP Payment Total:				0.00	\$0.00

3. Onsite Renewable Credits

Supplemental Energy Sources (options for on-site offset of projected energy consumption)			Offset Applied	
			equiv PV kW	Credit applied
1. GSHP (Ground Source Heat Pump)	Btu	0	0.00	\$0.00
From GSHP Btu capacity on HP tab				
2. ASHP (Air Source Heat Pump)	Btu	0	0.00	\$0.00
From ASHP Btu capacity on HP tab. Complete and submit that sheet.				
3. SHW (Solar Hot Water)	sq. ft.	0	0.00	\$0.00
Use installed panel area. Maximum of 500ft2.				
4. PV (to be installed on site)	kW	0.00	0.00	\$0.00
From PV Generation tab				
5. Alternative Renewable Energy Source			0.00	\$0.00
See Alt Energy Source Tab of this spreadsheet				
Supplemental Energy Total:			0.00	\$0.00

4. Total CREMP Payment:

Total from Exterior Energy Use (Section 1 above):	PV kW	Payment in lieu
Total from Gas Energy Budget (Section 2 above):	0.00	\$0.00
Total on-site mitigation (Section 3 above):	0.00	\$0.00
	0.00	\$0.00
		\$0.00
		\$0.00

Amount Pre-paid:
Total CREMP Due:

Prepared by:
email

Summit County HEAT PUMP SOURCE CERTIFICATION

Complete and submit relevant sections of this page for projects using heat pump systems.

Project Name: _____

Complete sections A1 & A2 of this page for projects using air source heat pump systems.

A1. Please list the following information

Manufacturer: _____

Model: _____

A2. ASHP System Design Specifications

Total System Capacity @ -5 °F OAT _____ 0 Btu

System Performance: per applicable AHRI (or ISO) standard _____ 1.8 COP

Coefficient of Performance of the system must be at least 1.8 as per Air Conditioning, Heating, & Refrigeration Institute Standard performance method (AHRI 210, 211, 340, 550, 551) or ISO 13612-2 for air source heat pump systems (for all systems use an OAT of -5°F hydronic systems use an output water temperature of 120°F to the load side, air side systems use an discharge air temperature of 90°F) or equivalent procedure.

Complete sections G1 - G3 of this page for projects using ground source heat pump systems.

G1. Please list the following information

Agency

Designer Certification: _____

AEE

CGD number: _____

Installer Accreditation _____

IGSHPA

Number: _____

Division of Water Resources Permit: _____

G2. GSHP System Design Specifications

Number of Loops: _____ 0

Depth of Loops: _____ 0 ft.

Total Length of Tubing: _____ 0 ft.

Total System Capacity @ 30°F ground loop EWT and 110°F load EWT: _____ 0 Btu

AHRI 330 or ISO 13256-1 System Performance: _____ 3 COP

Coefficient of Performance of the system must be at least 3 as per Air Conditioning, Heating, & Refrigeration Institute Standard performance method (AHRI 330) or ISO 13256-1 for closed loop earth-coupled heat pump systems (for hydronic systems use an output temperature of 110°F to the load side, and an inlet ground loop temperature of 30°F) or equivalent procedure.

G3. Attach the following information with application.

A. GSHP unit performance sheets certified by AHRI 330 or ISO 13256-1 for all specified GSHP units, with capacity at design conditions highlighted.

B. Designer Certification Sheets

D. Installer Certification Sheets

E. Division of Water Resource Permit

F. Plans prepared by IGSHPA certified designer or Professional Engineer showing planned configuration of ground loop exchanger and heating/cooling plant with all equipment specified, pipe sizes called out and a detailed Control Sequence of operation

Prepared by: _____

email _____

phone _____

Summit County

Alternative Energy Production Calculation

Complete and submit this page for projects using renewable energy systems other than PV.

Project Name:

1. Energy Produced

Wind	0.00	kWhr/yr
Hydroelectric	0.00	kWhr/yr
Off-Site PV	0.00	kWhr/yr
Alternative	0.00	kWhr/yr
Total annual	0.00	kWhr/yr
Equivalent PV	0.00	kW

Prepared by:

email

phone

Summit County PV Array Input Worksheet

Complete and submit this page for projects PV renewable energy systems.

Project Name:

Use this tab to determine output of PV array on the site.

There are options for up to 4 unique arrays

For each array provide the following:

1. Orientation of the array in relation to south, east, etc. (see graphic below for explanation)
2. Pitch of the array from horizontal. If a free standing or racked array is used, input equivalent roof pitch.
3. Size of the array in kW.
4. Provide if the array and roof are expected to shed snow.

Array 1		
Orientation of Array	S	
Pitch of Array	0	/12
Size of array	0	kW
Does array shed snow		Choose YES if pitch is 7/12 or steeper and roof DOES NOT have snow fences or a roof surface that prohibits snow shed
Annual Generation	0	kWh/yr

Array 2		
Orientation of Array	S	
Pitch of Array	0	/12
Size of array	0	kW
Does array shed snow		Choose YES if pitch is 7/12 or steeper and roof DOES NOT have snow fences or a roof surface that prohibits snow shed
Annual Generation	0	kWh/yr

Array 3		
Orientation of Array	S	
Pitch of Array	0	/12
Size of array	0	kW
Does array shed snow		Choose YES if pitch is 7/12 or steeper and roof DOES NOT have snow fences or a roof surface that prohibits snow shed
Annual Generation	0	kWh/yr

Array 4		
Orientation of Array	S	
Pitch of Array	0	/12
Size of array	0	kW
Does array shed snow		Choose YES if pitch is 7/12 or steeper and roof DOES NOT have snow fences or a roof surface that prohibits snow shed
Annual Generation	0	kWh/yr

Total Array Size Intalled 0.00 kW
Equivalent Array Size 0.00 kW

Prepared by:

email

phone

Background Calculations for RREMP and CREMP submitta

This page is for reference only. Values to be updated per Governing body when requ

This color cell is a calculated annual energy consumption used in REMP calculation:

This color cell is adjustable (by local Governing Body) to fit local jurisdiction choices

PV Energy Cost Calcs

	\$3,500	\$/kW of array
	1,500	kWh/yr per kW
	20	years (anticipat
	30,000	kWh per kW for
	\$0.117	\$/kWh for life o
Energy cost used	\$0.117	\$/kWh
Time period used	20	ys
Conversion of Btu/kWh	3,412	
GSHP COP minimum	3	
ASHP COP minimum	1.8	

Residential Exterior Energy

	Energy Use	Units
Snowmelt	82,863	Btu/sf/yr
Pool	331,451	Btu/sf/yr
Spa	428,937	Btu/sf/yr
Heat tape	1.56	kWh/W/yr
Electric patio heaters	0.35	kWh/W/yr
Gas patio heaters	350	kBtu/kBtuh/yr
Gas fireplaces	364	kBtu/kBtuh/yr
Cooking appliances	80	kBtu/kBtuh/yr

Commercial Exterior Energy

	Energy Use	Units
Snowmelt	146,229	Btu/sf/yr
Pool	414,314	Btu/sf/yr
Spa	428,937	Btu/sf/yr
Heat tape	1.56	kWh/W/yr
Electric patio heaters	1.01	kWh/W/yr
Gas patio heaters	1,008	kBtu/kBtuh/yr
Gas fireplaces	2,016	kBtu/kBtuh/yr
Cooking appliances	390	kBtu/kBtuh/yr

Offset rates

GSHP
ASHP
Residential SHW
Commerical SHW
PV

Exterior Energy Use Exemptions

Residential	Units
Snowmelt	100 ft2
Pool	n/a
Spa	64 ft2
Heat tape	FULL
Electric patio heaters	FULL
Gas patio heaters	n/a
Gas fireplaces	n/a
Outdoor cooking	n/a

Connected Natural Gas Capacity Budget

Residential	Units
Budget	72,800,000 Btu/yr
Offset within budget	10% n/a
Offset in excess of budget	100% n/a

Exterior Energy Use Annual Calculations:

Residential Snowmelt:

Parameter	Value	units
Operational Load	125	Btuh/sf
Cleanup Load	45	Btuh/sf
Run Time	560	hrs
Clean Up Time	260	hrs
Total Annual Load	82	kBtu/sf-yr

Commercial Snowmelt:

Parameter	Value	units
Operational Load	175	Btuh/sf
Cleanup Load	45	Btuh/sf
Idle Load	16	Btuh/sf
Run Time	560	hrs
Clean Up Time	260	hrs
Idle Time	2404	hrs

Total Annual Load	148	kBtu/sf-yr
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Residential Pool:

Parameter	Value	units
Day Use	4	hrs
Night Use	4	hrs
Pool Set Point	85	F
Cover Insulation	1.5	R-value
Wind Speed	5	mph
Total Annual Load	332	kBtu/sf-yr

Commercial Pool:

Parameter	Value	units
Day Use	4	hrs
Seasonal Use	10	months
Pool Set Point	82	F
Pool Idle Set Point	68	F
Cover Insulation	0.1	R-value
Transmittance	75%	%
Solar Exposure Factor	80%	%
Pool Emissivity	0.9	n/a
Wind Speed	5	mph
Total Annual Load	414	kBtu/sf-yr

Spas (residential and commercial)

Parameter	Value	units
Day Use	10	hrs
Night Use	4	hrs
Pool Set Point	104	F
Cover Insulation	12	R-value
Wind Speed	5	mph
Total Annual Load	429	kBtu/sf-yr

Outdoor Gas Appliances:

Parameter	Fireplaces	
Type	Residential	Commercial
Number of heaters (input)	1	1
MBH (rated input)	20	250
MBH (total installed)	20	250
Hours per day	1	6

Weeks per year	52	48
Hours per year	364	2016
Annual energy consumption	7280	504000
Normalized annual energy consumption	364	2016

Gas Cooking Appliances:

Type	Residential	Commercial
Normalized annual energy consumption	80	390

Electric Patio Heaters:

Parameter	Electric Patio Heaters	
Type	Residential	Commercial
Number of heaters (input)	1	1
W (rated input)	6000	6000
W (total installed)	6000	6000
Day Use	2	4
weeks/yr	25	36
hrs/yr	350	1008
Annual energy consumption	2100	6048
Normalized annual energy consumption	0.35	1.01

Heat tape:

		S
Weather Data Location:		
Basis Product:		
Output Temperature Adjustment (linear):		
Max Output (Watt/LF):		
Max Output Temperature (Degrees F):		
Reduced Output (Watt/LF):		
Reduced Output Temperature (Degrees F):		
Adjustment Variable (m):		
Adjustment Variable (b):		
Control #1: Self Regulation		
Control #2: Manual System		
Control #3: Timer Switch		
Control #4: None		
Modeled Annual Energy Consumption per Linear Ft of Cable (kWh):		

Available Gas Combustion Thermal Efficiencies:

- 92%
- 93%
- 94%
- 95%
- 96%
- 97%
- 98%
- 99%
- 100%

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for amount of offset and local cost of equipment instal

of array
ted life of system)
r the life of system
f system

Exterior Energy Offset

Fee	% Offset	Adjusted
\$56.67	100%	\$56.67
\$226.67	100%	\$226.67
\$293.33	100%	\$293.33
\$3.65	0%	\$0.00
\$0.82	0%	\$0.00
\$0.24	0%	\$0.00
\$0.25	0%	\$0.00
\$0.05	0%	\$0.00

Exterior Energy Offset

Fee	% Offset	Adjusted
\$100.00	100%	\$100.00
\$283.33	100%	\$283.33
\$293.33	100%	\$293.33
\$3.65	0%	\$0.00
\$2.36	10%	\$0.24
\$0.69	0%	\$0.00
\$1.38	0%	\$0.00
\$0.27	0%	\$0.00

Equipment Credit

Cost	% Credit	Adjusted
\$7,500	25%	\$1,875.00
\$2,500	25%	\$625.00
\$112.25	100%	\$112.25
\$112.25	100%	\$112.25
\$3,500	100%	\$3,500.00

Commercial Units

100	ft2 per egress pathway
n/a	
64	ft2 per 10 private units
FULL	
n/a	
n/a	
n/a	
n/a	

Commercial Units

705,600,000	Btu/hr
10%	n/a
100%	n/a

Notes

Based on ASHRAE loads for Class 1: Residential & L
Wirsbo design manual load for 22-25°F and 5MPH wi
Based on data collected by the Colorado Climate Cer
Based on data collected by the Colorado Climate Cer
Energy consumed per year per square foot.

Notes

Based on ASHRAE loads for Class 2: Heavy Comme
Wirsbo design manual load for 22-25°F and 5MPH wi
Median hourly idle load: calculation performed with G
Based on data collected by the Colorado Climate Cer
Based on data collected by the Colorado Climate Cer
Number of hours the Gypsum - Eagle County Airport v

Energy consumed per year per square foot.

Notes

Hours of use during day time.

Hours of use during night time.

Pool temperature set point.

Thermal insulation value of bubble cover.

Assumed wind speed.

Energy consumed per year per square foot.

Notes

Hours of use during day time.

Months per year.

Pool temperature set point.

Pool temperature set back.

Thermal insulation value of vinyl cover

Visible transmittance of water.

Assumed solar exposure.

Assumed emissivity of pool.

Assumed wind speed.

Energy consumed per year per square foot.

Notes

Hours of use during day time.

Hours of use during night time.

Spa temperature set point.

Thermal insulation value of spa cover

Assumed wind speed.

Energy consumed per year per square foot.

Patio Heaters		[units]
Residential	Commercial	
1	1	
20	20	kBtuh
20	20	kBtuh
2	4	hrs/day

25	36	weeks/yr
350	1008	hrs/yr
7000	20160	kBtu/yr
350	1008	kBtu/kBtuh/yr

[units]	Notes
kBtu/kBtuh/yr	Energy consumed per year per inst:

	units
	Watts
	Watts
	hrs
	weeks
	hrs
	kW/yr
	kW/yr/W

Self Regulating Heat Tape Annual Energy Model (Pi

Model Assumptions

Gypsum - Eagle County Airport

Chomalox SRF-RG

Watt-Hour=mT+b

8.0 W

32.0 F

5.0 W

40.0 F

- 3/8

20.0

Seasonal and Nighly Shut-Off

ng

Seasonal Shut-off (April-1 thru November-1)

Shut-off (1800-0600)

12.58		1.573
kWh/ft of cable/yr		kWh/yr/W

lation.

Units
\$/ft2
\$/ft2
\$/ft2
\$/W
\$/W
\$/Btuh
\$/Btuh
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Units
\$/ft2
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\$/W
\$/W
\$/Btuh
\$/Btuh
\$/Btuh

Units

\$/10,000 Btu installed capacity

\$/10,000 Btu installed capacity

\$/ft² of array

\$/ft² of array

\$/kw of array

Notes

Exterior gas fired appliances (not including snowmelt, pool, and spa heat sources) are not exempt from the REMP program and are regulated according to the connected natural gas capacity budget (below).

Notes

Correspond to annual use of 200 & 350 kBtu installed capacity for Res. & Com. respectively.

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nd speed.
ter from 1980-1996.
ter from 1980-1996.

ercial
nd speed.
ypsum - Eagle County Airport weather data.
ter from 1980-1996.
ter from 1980-1996.
weather file is below a 35°F slab idle temperature set point less clean up and run time.

Calulations were performed with the DOE the Energy Smart Pools software using weather data f

Calulations were performed with the DOE the Energy Smart Pools software using weather data f

Calulations were performed with the DOE the Energy Smart Pools software using weather data f

Notes
For example puposes only.
For example puposes only.
For example puposes only.
Assumed hours per day, per committee meeting.

Assumed weeks per year, per committee meeting.
Run hours per year.
Energy consumed per year.
Energy consumed per year per installed MBH.

alled MBH. Similar to 'Outdoor Gas Appliance' Calculation w/ different run-time assumptions.

Notes
For example puposes only.
For example puposes only.
For example puposes only.
Assumed hours per day, per committee meeting.
Assumed weeks per year, per committee meeting.
Run hours per year.
Energy consumed per year.
Energy consumed per year per installed Watt.

itkin County)



Approximate average cost of PV installation in Summit County (2022), per sampling of local installers
NREL PVWatts estimated output (at optimum conditions for solar access, w/o derate for effects of shading)
Assumed system lifespan
kWh output of system over lifespan
Calculated installation cost per kWh output for life of the system

Notes

[illegible][illegible]

Notes

Average installed system upgrade cost of \$9,000 per ton of system capacity.

Average installed system upgrade cost of \$3,000 per ton of system capacity.

Average cost of SHW installation in Summit County (2021), per sampling of local installers.

Average cost of SHW installation in Summit County (2021), per sampling of local installers.

Average cost of PV installation in Summit County (2021), per sampling of local installers.

from Dillon, CO.

from Dillon, CO.

from Dillon, CO.

Notes

These assumptions were used to run an hourly annual calculation in which, each Watt-Hour/foot of energy consumption was calculated and summed. Per discussions with manufacturer's regarding the operation of "self-regulating" heat tape, the tape is modeled as consuming full rated output when the outside air temperature was below 32°F, and if the outside air temperature is above 32°F the rate of energy consumption decreased linearly to the reduced output temperature listed by the manufacturer. Calculation accounts for seasonal and nightly shutdowns per required controls.

Energy consumed per year per installed Watt.

allers by HCC.
of snow)

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Solar Electric generation derate calculations

This page is for Reference only. To quantify impacts of installation angle, orientation and snow sliding

Roof Pitch Options	Roof Orientation Options			Snow Shed Options	Month
0	1	338-22	N	No	Jan.
1	2	23-67	NE	Yes	Feb.
2	3	68-112	E		Mar
3	4	113-157	SE		Apr
4	5	158-202	S		May
5	6	203-247	SW		Jun
6	7	248-292	W		Jul
7	8	293-337	NW		Aug
8					Sep
9					Oct
10					Nov
11					Dec
12					

Note: If a free standing array, or racked array is used, input equivalent roof pitch.

Un-Reduced Month Output kWh. (Data imported from NREL PVWatts)							
Angle	Pitch	1	2	3	4	5	6
N	0	63.7	76.1	123.0	143.1	162.9	166.6
N	1	54.4	69.2	116.2	139.3	161.3	166.4
N	2	45.1	61.8	108.7	134.8	159.0	165.3
N	3	36.2	54.3	100.6	129.6	155.9	163.4
N	4	28.3	46.9	92.2	124.0	152.2	160.9
N	5	22.2	40.0	83.6	118.0	148.0	157.7
N	6	18.5	33.9	75.1	111.7	143.4	154.0
N	7	17.3	29.2	66.9	105.4	138.5	149.9
N	8	17.2	26.0	59.2	99.1	133.5	145.6
N	9	17.3	24.6	53.3	93.9	129.3	141.9
N	10	17.3	23.9	46.2	87.0	123.4	136.7
N	11	17.4	23.7	41.3	81.3	118.4	132.2
N	12	17.4	23.7	37.8	76.0	113.6	127.7
NE	0	63.7	76.1	123.0	143.1	162.9	166.6
NE	1	57.3	71.7	118.6	140.6	162.6	167.7
NE	2	51.1	66.9	113.8	137.4	161.4	167.9
NE	3	45.3	62.2	108.7	133.6	159.5	167.1
NE	4	40.2	57.7	103.4	129.5	156.9	165.6
NE	5	35.8	53.6	98.2	125.1	153.7	163.3
NE	6	32.3	49.9	93.2	120.6	150.2	160.6
NE	7	29.5	46.8	88.5	116.2	146.6	157.6
NE	8	27.3	44.1	84.2	112.1	142.9	154.3
NE	9	26.0	42.3	81.0	108.7	139.8	151.6
NE	10	24.5	40.1	77.0	104.5	135.8	147.8

NE	11	23.6	38.6	74.0	101.3	132.5	144.6
NE	12	22.9	37.3	71.5	98.3	129.4	141.7
E	0	63.7	76.1	123.0	143.1	162.9	166.6
E	1	63.9	76.7	123.5	143.3	163.9	168.3
E	2	64.0	77.1	123.7	142.8	164.2	169.2
E	3	64.1	77.1	123.4	141.9	163.8	169.4
E	4	64.0	77.0	122.6	140.6	162.9	168.9
E	5	63.8	76.7	121.8	138.9	161.7	168.0
E	6	63.6	76.3	120.6	137.1	160.1	166.9
E	7	63.3	75.8	119.3	135.3	158.3	165.3
E	8	62.9	75.3	118.0	133.3	156.5	163.8
E	9	62.6	74.8	116.9	131.6	154.9	162.4
E	10	62.1	74.0	115.2	129.5	152.6	160.3
E	11	61.7	73.3	113.8	127.7	150.7	158.5
E	12	61.3	72.7	112.4	126.0	149.0	156.8
SE	0	63.7	76.1	123.0	143.1	162.9	166.6
SE	1	70.2	81.3	128.0	145.8	164.6	167.9
SE	2	76.1	86.0	132.2	147.7	165.6	168.3
SE	3	81.2	89.9	135.6	148.9	165.9	168.3
SE	4	85.6	93.2	138.3	149.6	165.6	167.7
SE	5	89.3	95.9	140.2	149.8	164.9	166.5
SE	6	92.4	98.0	141.4	149.4	163.8	165.2
SE	7	94.9	99.7	142.0	148.7	162.4	163.5
SE	8	96.9	100.9	142.2	147.7	160.7	161.6
SE	9	98.3	101.6	142.1	146.7	159.1	159.8
SE	10	99.7	102.3	141.8	145.3	157.0	157.4
SE	11	100.6	102.7	141.4	143.9	155.2	155.4
SE	12	101.3	102.8	140.8	142.5	153.3	153.4
S	0	63.7	76.1	123.0	143.1	162.9	166.6
S	1	72.7	82.8	129.5	146.6	164.2	166.6
S	2	81.1	88.9	135.0	149.3	164.7	165.8
S	3	88.5	94.2	139.7	151.2	164.5	164.4
S	4	95.0	98.7	143.3	152.4	163.7	162.5
S	5	100.6	102.5	146.1	152.9	162.4	160.1
S	6	105.4	105.6	148.0	152.9	160.7	157.4
S	7	109.4	108.1	149.4	152.4	158.6	154.4
S	8	112.6	110.0	150.2	151.6	156.3	151.3
S	9	114.9	111.3	150.6	150.7	154.2	148.5
S	10	117.5	112.6	150.9	149.2	151.2	144.7
S	11	119.2	113.4	150.8	147.8	148.5	141.5
S	12	120.5	113.9	150.6	146.3	145.9	138.3
SW	0	63.7	76.1	123.0	143.1	162.9	166.6
SW	1	70.1	80.5	127.2	145.3	163.0	165.3
SW	2	75.9	84.2	130.7	146.8	162.6	163.6
SW	3	81.0	87.5	133.4	147.7	161.5	161.4
SW	4	85.4	90.1	135.4	148.0	160.1	158.8
SW	5	89.1	92.2	136.8	147.8	158.4	156.2
SW	6	92.1	93.8	137.6	147.2	156.4	153.4
SW	7	94.5	94.9	138.0	146.2	154.2	150.5
SW	8	96.4	95.7	138.0	145.1	151.9	147.5
SW	9	97.7	96.1	137.8	144.1	150.0	145.2
SW	10	99.1	96.5	137.1	142.4	147.5	142.1
SW	11	100.0	96.6	136.4	140.9	145.2	139.4
SW	12	100.7	96.5	135.7	139.4	143.0	136.8
W	0	63.7	76.1	123.0	143.1	162.9	166.6

W	1	63.7	75.6	122.4	142.6	161.7	164.7
W	2	63.5	74.8	121.4	141.5	159.8	162.1
W	3	63.4	73.9	120.1	140.1	157.5	159.1
W	4	63.2	73.0	118.6	138.2	154.9	155.9
W	5	62.9	72.1	116.9	136.2	152.2	152.7
W	6	62.6	71.1	115.3	134.1	149.4	149.3
W	7	62.3	70.1	113.6	131.8	146.7	146.1
W	8	62.0	69.2	111.9	129.6	144.0	143.2
W	9	61.6	68.5	110.5	127.8	141.8	140.7
W	10	61.0	67.4	108.6	125.4	139.0	137.5
W	11	60.5	66.5	107.1	123.4	136.9	135.1
W	12	60.2	65.7	105.7	121.5	134.8	132.9
NW	0	63.7	76.1	123.0	143.1	162.9	166.6
NW	1	57.1	70.9	117.8	140.1	160.9	165.1
NW	2	50.7	65.5	112.1	136.5	158.2	162.6
NW	3	44.8	60.2	106.2	132.2	154.7	159.4
NW	4	39.6	55.3	100.2	127.7	150.7	155.5
NW	5	35.3	50.9	94.5	122.9	146.2	151.1
NW	6	31.9	47.1	89.1	118.1	141.6	146.5
NW	7	29.2	43.9	84.1	113.5	137.0	141.7
NW	8	27.2	41.2	79.8	109.1	132.5	137.0
NW	9	25.9	39.4	76.5	105.6	128.9	133.2
NW	10	24.6	37.3	72.6	101.2	124.2	128.2
NW	11	23.8	35.9	69.7	97.8	120.6	124.3
NW	12	23.2	34.8	67.3	94.8	117.2	120.7

g on annual production.

Reductions		
Month	Percent Reduction	
	Non-Shed	Shed
1	75%	15%
2	75%	25%
3	50%	10%
4	35%	5%
5	0%	0%
6	0%	0%
7	0%	0%
8	0%	0%
9	0%	0%
10	0%	0%
11	5%	5%
12	35%	15%

s)							Reduced for Snow wit	
7	8	9	10	11	12	Total	1	2
144.1	125.6	111.8	92.4	68.2	54.5	1332.1	54.1	57.1
143.3	123.4	106.9	84.3	59.2	46.3	1270.1	46.3	51.9
141.8	120.6	101.3	75.6	50.0	38.1	1202.0	38.3	46.3
139.7	117.2	95.2	66.7	41.2	30.5	1130.4	30.7	40.7
137.0	113.4	88.8	57.8	33.1	24.1	1058.6	24.1	35.2
133.8	109.2	82.2	49.2	26.4	19.7	989.9	18.9	30.0
130.2	104.8	75.5	41.4	21.8	17.6	927.9	15.7	25.4
126.4	100.2	69.0	34.7	19.5	17.4	874.4	14.7	21.9
122.4	95.6	62.7	29.4	19.0	17.5	827.2	14.6	19.5
118.9	91.8	57.7	26.4	19.0	17.5	791.6	14.7	18.5
114.2	86.6	51.4	23.9	19.0	17.5	747.0	14.7	17.9
110.1	82.3	46.6	23.0	19.1	17.5	712.8	14.8	17.8
106.1	78.2	42.6	22.6	19.1	17.4	682.3	14.8	17.8
144.1	125.6	111.8	92.4	68.2	54.5	1332.1	54.1	57.1
145.5	125.2	108.8	87.2	62.1	48.9	1296.2	48.7	53.7
146.2	124.2	105.4	81.8	56.1	43.4	1255.7	43.5	50.2
146.1	122.6	101.7	76.6	50.5	38.4	1212.4	38.5	46.6
145.3	120.7	97.9	71.7	45.5	34.0	1168.2	34.1	43.3
143.9	118.4	94.1	67.1	41.3	30.3	1124.8	30.4	40.2
142.0	115.9	90.4	63.1	37.7	27.4	1083.4	27.4	37.4
139.9	113.4	87.0	59.5	34.9	25.3	1044.9	25.1	35.1
137.5	110.8	83.7	56.3	32.7	23.7	1009.7	23.2	33.1
135.4	108.8	81.2	54.1	31.2	22.7	982.8	22.1	31.7
132.6	106.1	78.1	51.4	29.6	21.7	949.1	20.9	30.1

130.1	103.9	75.7	49.5	28.5	21.1	923.4	20.1	28.9
127.8	101.8	73.6	47.8	27.7	20.6	900.6	19.5	28.0
144.1	125.6	111.8	92.4	68.2	54.5	1332.1	54.1	57.1
146.8	127.2	112.5	93.1	68.6	54.8	1342.5	54.3	57.6
148.7	128.3	112.8	93.6	68.9	54.9	1348.2	54.4	57.8
150.0	128.8	112.8	94.0	69.1	55.0	1349.4	54.4	57.8
150.6	129.0	112.6	94.1	69.3	55.0	1346.7	54.4	57.8
150.8	128.9	112.1	94.1	69.3	54.9	1341.0	54.3	57.5
150.5	128.5	111.4	94.0	69.2	54.7	1332.8	54.1	57.2
149.8	127.9	110.6	93.7	69.1	54.4	1322.8	53.8	56.9
148.9	127.2	109.7	93.3	68.9	54.2	1312.0	53.5	56.5
148.1	126.5	109.0	92.9	68.7	54.0	1302.2	53.2	56.1
146.7	125.4	107.8	92.3	68.3	53.5	1287.8	52.8	55.5
145.5	124.4	106.7	91.7	67.9	53.1	1275.2	52.5	55.0
144.2	123.5	105.7	91.1	67.4	52.7	1262.8	52.1	54.5
144.1	125.6	111.8	92.4	68.2	54.5	1332.1	54.1	57.1
146.4	128.1	115.6	98.4	74.7	60.4	1381.3	59.6	61.0
148.1	130.1	118.8	103.6	80.6	65.8	1422.8	64.7	64.5
149.1	131.5	121.4	108.2	85.8	70.5	1456.5	69.0	67.5
149.5	132.4	123.4	111.9	90.2	74.6	1482.1	72.8	69.9
149.4	132.9	124.8	115.0	94.0	78.0	1500.7	75.9	71.9
149.0	133.0	125.7	117.5	97.0	80.9	1513.2	78.5	73.5
148.2	132.7	126.2	119.4	99.5	83.2	1520.3	80.7	74.7
147.1	132.2	126.4	120.8	101.4	85.1	1522.8	82.4	75.7
146.0	131.6	126.4	121.6	102.7	86.3	1522.3	83.5	76.2
144.3	130.6	126.1	122.4	104.1	87.7	1518.9	84.8	76.7
142.9	129.7	125.7	122.8	105.0	88.6	1514.0	85.5	77.0
141.4	128.8	125.1	123.0	105.6	89.3	1507.3	86.1	77.1
144.1	125.6	111.8	92.4	68.2	54.5	1332.1	54.1	57.1
144.6	127.6	116.5	100.2	77.1	62.6	1391.1	61.8	62.1
144.5	128.9	120.4	107.2	85.2	70.1	1441.2	68.9	66.7
143.9	129.6	123.6	113.3	92.5	76.8	1482.1	75.2	70.6
142.7	129.7	126.1	118.5	98.8	82.7	1514.1	80.7	74.0
141.1	129.4	127.9	122.8	104.3	87.8	1537.9	85.5	76.9
139.1	128.7	129.2	126.4	108.9	92.1	1554.4	89.6	79.2
136.9	127.6	129.9	129.3	112.8	95.8	1564.6	92.9	81.1
134.5	126.3	130.3	131.5	116.1	98.9	1569.5	95.7	82.5
132.4	125.1	130.3	133.0	118.3	101.0	1570.4	97.7	83.4
129.5	123.2	130.1	134.6	120.9	103.5	1567.7	99.8	84.4
126.9	121.5	129.7	135.6	122.6	105.2	1562.7	101.3	85.0
124.4	119.8	129.1	136.3	124.0	106.6	1555.8	102.5	85.5
144.1	125.6	111.8	92.4	68.2	54.5	1332.1	54.1	57.1
142.5	125.9	114.7	97.6	74.4	60.2	1366.6	59.6	60.3
140.6	125.6	117.0	102.1	80.0	65.4	1394.5	64.5	63.2
138.2	125.0	118.8	105.9	85.0	69.9	1415.4	68.9	65.6
135.7	124.2	120.0	109.0	89.2	73.8	1429.8	72.6	67.6
133.1	123.1	120.6	111.5	92.8	77.1	1438.7	75.7	69.1
130.4	121.6	120.9	113.4	95.7	79.9	1442.4	78.3	70.3
127.5	120.1	120.9	114.9	98.0	82.1	1441.9	80.3	71.2
124.8	118.7	120.6	115.9	99.9	83.9	1438.5	82.0	71.8
122.7	117.4	120.3	116.5	101.1	85.1	1434.1	83.1	72.1
119.8	115.6	119.6	117.0	102.4	86.4	1425.5	84.3	72.4
117.3	114.0	118.8	117.1	103.2	87.2	1416.3	85.0	72.4
115.0	112.4	117.9	117.1	103.8	87.9	1406.0	85.6	72.4
144.1	125.6	111.8	92.4	68.2	54.5	1332.1	54.1	57.1

141.2	123.9	111.1	91.9	68.2	54.4	1321.3	54.1	56.7
137.8	121.8	110.2	91.2	68.2	54.3	1306.8	54.0	56.1
134.2	119.6	108.9	90.5	68.1	54.1	1289.5	53.9	55.4
130.5	117.3	107.5	89.7	67.9	54.0	1270.8	53.7	54.8
126.8	114.9	106.1	88.8	67.8	53.7	1251.1	53.4	54.1
123.2	112.8	104.5	87.9	67.6	53.4	1231.2	53.2	53.3
120.0	110.7	103.0	87.1	67.3	53.2	1212.0	53.0	52.6
116.9	108.7	101.6	86.2	66.9	52.9	1193.2	52.7	51.9
114.4	107.3	100.5	85.5	66.7	52.7	1177.8	52.3	51.4
111.4	105.4	98.9	84.4	66.3	52.2	1157.5	51.9	50.6
109.0	103.9	97.5	83.7	65.9	51.8	1141.4	51.5	49.9
106.8	102.4	96.4	83.0	65.4	51.4	1126.0	51.1	49.3
144.1	125.6	111.8	92.4	68.2	54.5	1332.1	54.1	57.1
141.4	122.9	107.9	86.3	61.8	48.7	1280.9	48.6	53.1
138.1	119.6	103.5	80.0	55.6	43.0	1225.3	43.1	49.1
134.2	115.8	98.9	74.0	49.8	37.9	1167.9	38.1	45.1
129.8	111.8	94.1	68.3	44.7	33.5	1111.2	33.7	41.5
125.1	107.7	89.5	63.1	40.4	29.9	1056.7	30.0	38.2
120.3	103.6	85.2	58.6	36.9	27.1	1005.9	27.1	35.3
115.5	99.7	81.2	54.8	34.1	25.0	959.7	24.8	32.9
110.9	96.2	77.6	51.6	31.9	23.4	918.5	23.1	30.9
107.3	93.4	74.9	49.5	30.4	22.4	887.6	22.1	29.6
102.7	90.0	71.7	46.9	28.9	21.4	849.9	20.9	28.0
99.0	87.5	69.4	45.2	27.9	20.9	822.1	20.2	26.9
95.8	85.2	67.3	43.8	27.1	20.4	797.6	19.7	26.1

th Shedding Month Output kWh

3	4	5	6	7	8	9	10	11
110.7	135.9	162.9	166.6	144.1	125.6	111.8	92.4	64.8
104.6	132.3	161.3	166.4	143.3	123.4	106.9	84.3	56.2
97.8	128.0	159.0	165.3	141.8	120.6	101.3	75.6	47.5
90.6	123.1	155.9	163.4	139.7	117.2	95.2	66.7	39.1
83.0	117.8	152.2	160.9	137.0	113.4	88.8	57.8	31.5
75.3	112.1	148.0	157.7	133.8	109.2	82.2	49.2	25.1
67.6	106.2	143.4	154.0	130.2	104.8	75.5	41.4	20.7
60.2	100.2	138.5	149.9	126.4	100.2	69.0	34.7	18.6
53.3	94.2	133.5	145.6	122.4	95.6	62.7	29.4	18.0
48.0	89.2	129.3	141.9	118.9	91.8	57.7	26.4	18.0
41.6	82.6	123.4	136.7	114.2	86.6	51.4	23.9	18.1
37.2	77.3	118.4	132.2	110.1	82.3	46.6	23.0	18.1
34.0	72.2	113.6	127.7	106.1	78.2	42.6	22.6	18.2
110.7	135.9	162.9	166.6	144.1	125.6	111.8	92.4	64.8
106.8	133.6	162.6	167.7	145.5	125.2	108.8	87.2	59.0
102.4	130.5	161.4	167.9	146.2	124.2	105.4	81.8	53.3
97.8	127.0	159.5	167.1	146.1	122.6	101.7	76.6	48.0
93.0	123.0	156.9	165.6	145.3	120.7	97.9	71.7	43.3
88.3	118.9	153.7	163.3	143.9	118.4	94.1	67.1	39.2
83.8	114.6	150.2	160.6	142.0	115.9	90.4	63.1	35.8
79.7	110.4	146.6	157.6	139.9	113.4	87.0	59.5	33.2
75.8	106.5	142.9	154.3	137.5	110.8	83.7	56.3	31.0
72.9	103.3	139.8	151.6	135.4	108.8	81.2	54.1	29.6
69.3	99.3	135.8	147.8	132.6	106.1	78.1	51.4	28.1

66.6	96.2	132.5	144.6	130.1	103.9	75.7	49.5	27.1
64.3	93.4	129.4	141.7	127.8	101.8	73.6	47.8	26.3
110.7	135.9	162.9	166.6	144.1	125.6	111.8	92.4	64.8
111.2	136.1	163.9	168.3	146.8	127.2	112.5	93.1	65.1
111.3	135.7	164.2	169.2	148.7	128.3	112.8	93.6	65.5
111.0	134.8	163.8	169.4	150.0	128.8	112.8	94.0	65.6
110.4	133.6	162.9	168.9	150.6	129.0	112.6	94.1	65.8
109.6	132.0	161.7	168.0	150.8	128.9	112.1	94.1	65.9
108.6	130.3	160.1	166.9	150.5	128.5	111.4	94.0	65.8
107.4	128.5	158.3	165.3	149.8	127.9	110.6	93.7	65.6
106.2	126.6	156.5	163.8	148.9	127.2	109.7	93.3	65.5
105.2	125.0	154.9	162.4	148.1	126.5	109.0	92.9	65.3
103.7	123.0	152.6	160.3	146.7	125.4	107.8	92.3	64.9
102.4	121.3	150.7	158.5	145.5	124.4	106.7	91.7	64.5
101.1	119.7	149.0	156.8	144.2	123.5	105.7	91.1	64.1
110.7	135.9	162.9	166.6	144.1	125.6	111.8	92.4	64.8
115.2	138.5	164.6	167.9	146.4	128.1	115.6	98.4	70.9
118.9	140.3	165.6	168.3	148.1	130.1	118.8	103.6	76.6
122.0	141.5	165.9	168.3	149.1	131.5	121.4	108.2	81.5
124.5	142.1	165.6	167.7	149.5	132.4	123.4	111.9	85.7
126.2	142.3	164.9	166.5	149.4	132.9	124.8	115.0	89.3
127.2	142.0	163.8	165.2	149.0	133.0	125.7	117.5	92.2
127.8	141.2	162.4	163.5	148.2	132.7	126.2	119.4	94.5
128.0	140.3	160.7	161.6	147.1	132.2	126.4	120.8	96.4
127.9	139.3	159.1	159.8	146.0	131.6	126.4	121.6	97.6
127.6	138.0	157.0	157.4	144.3	130.6	126.1	122.4	98.9
127.2	136.7	155.2	155.4	142.9	129.7	125.7	122.8	99.7
126.7	135.4	153.3	153.4	141.4	128.8	125.1	123.0	100.3
110.7	135.9	162.9	166.6	144.1	125.6	111.8	92.4	64.8
116.5	139.3	164.2	166.6	144.6	127.6	116.5	100.2	73.2
121.5	141.8	164.7	165.8	144.5	128.9	120.4	107.2	80.9
125.7	143.7	164.5	164.4	143.9	129.6	123.6	113.3	87.9
129.0	144.8	163.7	162.5	142.7	129.7	126.1	118.5	93.9
131.5	145.3	162.4	160.1	141.1	129.4	127.9	122.8	99.1
133.2	145.2	160.7	157.4	139.1	128.7	129.2	126.4	103.5
134.4	144.8	158.6	154.4	136.9	127.6	129.9	129.3	107.2
135.2	144.0	156.3	151.3	134.5	126.3	130.3	131.5	110.3
135.6	143.1	154.2	148.5	132.4	125.1	130.3	133.0	112.4
135.8	141.7	151.2	144.7	129.5	123.2	130.1	134.6	114.8
135.7	140.4	148.5	141.5	126.9	121.5	129.7	135.6	116.5
135.5	139.0	145.9	138.3	124.4	119.8	129.1	136.3	117.8
110.7	135.9	162.9	166.6	144.1	125.6	111.8	92.4	64.8
114.5	138.0	163.0	165.3	142.5	125.9	114.7	97.6	70.7
117.6	139.5	162.6	163.6	140.6	125.6	117.0	102.1	76.0
120.1	140.3	161.5	161.4	138.2	125.0	118.8	105.9	80.7
121.9	140.6	160.1	158.8	135.7	124.2	120.0	109.0	84.8
123.1	140.5	158.4	156.2	133.1	123.1	120.6	111.5	88.1
123.9	139.8	156.4	153.4	130.4	121.6	120.9	113.4	90.9
124.2	138.9	154.2	150.5	127.5	120.1	120.9	114.9	93.1
124.2	137.9	151.9	147.5	124.8	118.7	120.6	115.9	94.9
124.0	136.9	150.0	145.2	122.7	117.4	120.3	116.5	96.0
123.4	135.3	147.5	142.1	119.8	115.6	119.6	117.0	97.3
122.8	133.9	145.2	139.4	117.3	114.0	118.8	117.1	98.0
122.1	132.4	143.0	136.8	115.0	112.4	117.9	117.1	98.6
110.7	135.9	162.9	166.6	144.1	125.6	111.8	92.4	64.8

110.2	135.5	161.7	164.7	141.2	123.9	111.1	91.9	64.8
109.3	134.5	159.8	162.1	137.8	121.8	110.2	91.2	64.8
108.1	133.1	157.5	159.1	134.2	119.6	108.9	90.5	64.7
106.8	131.3	154.9	155.9	130.5	117.3	107.5	89.7	64.5
105.3	129.4	152.2	152.7	126.8	114.9	106.1	88.8	64.4
103.7	127.4	149.4	149.3	123.2	112.8	104.5	87.9	64.2
102.3	125.2	146.7	146.1	120.0	110.7	103.0	87.1	63.9
100.7	123.1	144.0	143.2	116.9	108.7	101.6	86.2	63.6
99.4	121.4	141.8	140.7	114.4	107.3	100.5	85.5	63.3
97.7	119.1	139.0	137.5	111.4	105.4	98.9	84.4	63.0
96.4	117.2	136.9	135.1	109.0	103.9	97.5	83.7	62.6
95.1	115.4	134.8	132.9	106.8	102.4	96.4	83.0	62.2
110.7	135.9	162.9	166.6	144.1	125.6	111.8	92.4	64.8
106.1	133.1	160.9	165.1	141.4	122.9	107.9	86.3	58.7
100.9	129.6	158.2	162.6	138.1	119.6	103.5	80.0	52.8
95.6	125.6	154.7	159.4	134.2	115.8	98.9	74.0	47.3
90.2	121.3	150.7	155.5	129.8	111.8	94.1	68.3	42.5
85.0	116.8	146.2	151.1	125.1	107.7	89.5	63.1	38.4
80.2	112.2	141.6	146.5	120.3	103.6	85.2	58.6	35.0
75.7	107.8	137.0	141.7	115.5	99.7	81.2	54.8	32.4
71.8	103.6	132.5	137.0	110.9	96.2	77.6	51.6	30.3
68.9	100.3	128.9	133.2	107.3	93.4	74.9	49.5	28.9
65.3	96.1	124.2	128.2	102.7	90.0	71.7	46.9	27.4
62.8	92.9	120.6	124.3	99.0	87.5	69.4	45.2	26.5
60.5	90.1	117.2	120.7	95.8	85.2	67.3	43.8	25.8

		Reduced for Snow without Shedding Month Output kWh						
12	Total	1	2	3	4	5	6	7
46.3	1272.4	15.9	19.0	61.5	93.0	162.9	166.6	144.1
39.4	1216.2	13.6	17.3	58.1	90.5	161.3	166.4	143.3
32.4	1154.0	11.3	15.4	54.3	87.6	159.0	165.3	141.8
25.9	1088.2	9.0	13.6	50.3	84.3	155.9	163.4	139.7
20.5	1022.0	7.1	11.7	46.1	80.6	152.2	160.9	137.0
16.7	958.1	5.6	10.0	41.8	76.7	148.0	157.7	133.8
14.9	899.8	4.6	8.5	37.5	72.6	143.4	154.0	130.2
14.8	849.0	4.3	7.3	33.4	68.5	138.5	149.9	126.4
14.8	803.7	4.3	6.5	29.6	64.4	133.5	145.6	122.4
14.8	769.2	4.3	6.2	26.7	61.1	129.3	141.9	118.9
14.8	725.8	4.3	6.0	23.1	56.5	123.4	136.7	114.2
14.8	692.5	4.3	5.9	20.7	52.9	118.4	132.2	110.1
14.8	662.6	4.4	5.9	18.9	49.4	113.6	127.7	106.1
46.3	1272.4	15.9	19.0	61.5	93.0	162.9	166.6	144.1
41.6	1240.4	14.3	17.9	59.3	91.4	162.6	167.7	145.5
36.9	1203.7	12.8	16.7	56.9	89.3	161.4	167.9	146.2
32.6	1164.2	11.3	15.5	54.3	86.9	159.5	167.1	146.1
28.9	1123.6	10.0	14.4	51.7	84.2	156.9	165.6	145.3
25.8	1083.4	8.9	13.4	49.1	81.3	153.7	163.3	143.9
23.3	1044.7	8.1	12.5	46.6	78.4	150.2	160.6	142.0
21.5	1008.6	7.4	11.7	44.3	75.6	146.6	157.6	139.9
20.1	975.3	6.8	11.0	42.1	72.8	142.9	154.3	137.5
19.3	949.8	6.5	10.6	40.5	70.7	139.8	151.6	135.4
18.4	917.7	6.1	10.0	38.5	67.9	135.8	147.8	132.6

17.9	893.2	5.9	9.6	37.0	65.8	132.5	144.6	130.1
17.5	871.2	5.7	9.3	35.7	63.9	129.4	141.7	127.8
46.3	1272.4	15.9	19.0	61.5	93.0	162.9	166.6	144.1
46.6	1282.6	16.0	19.2	61.8	93.1	163.9	168.3	146.8
46.7	1288.1	16.0	19.3	61.8	92.8	164.2	169.2	148.7
46.7	1289.4	16.0	19.3	61.7	92.2	163.8	169.4	150.0
46.7	1286.8	16.0	19.3	61.3	91.4	162.9	168.9	150.6
46.6	1281.4	16.0	19.2	60.9	90.3	161.7	168.0	150.8
46.5	1273.6	15.9	19.1	60.3	89.1	160.1	166.9	150.5
46.3	1264.1	15.8	19.0	59.6	87.9	158.3	165.3	149.8
46.1	1253.7	15.7	18.8	59.0	86.6	156.5	163.8	148.9
45.9	1244.3	15.6	18.7	58.4	85.5	154.9	162.4	148.1
45.5	1230.5	15.5	18.5	57.6	84.2	152.6	160.3	146.7
45.2	1218.5	15.4	18.3	56.9	83.0	150.7	158.5	145.5
44.8	1206.6	15.3	18.2	56.2	81.9	149.0	156.8	144.2
46.3	1272.4	15.9	19.0	61.5	93.0	162.9	166.6	144.1
51.3	1317.6	17.5	20.3	64.0	94.7	164.6	167.9	146.4
55.9	1355.4	19.0	21.5	66.1	96.0	165.6	168.3	148.1
59.9	1385.9	20.3	22.5	67.8	96.8	165.9	168.3	149.1
63.4	1408.9	21.4	23.3	69.1	97.3	165.6	167.7	149.5
66.3	1425.4	22.3	24.0	70.1	97.4	164.9	166.5	149.4
68.7	1436.3	23.1	24.5	70.7	97.1	163.8	165.2	149.0
70.7	1442.0	23.7	24.9	71.0	96.6	162.4	163.5	148.2
72.3	1443.6	24.2	25.2	71.1	96.0	160.7	161.6	147.1
73.4	1442.5	24.6	25.4	71.1	95.3	159.1	159.8	146.0
74.6	1438.6	24.9	25.6	70.9	94.4	157.0	157.4	144.3
75.3	1433.3	25.2	25.7	70.7	93.6	155.2	155.4	142.9
75.9	1426.5	25.3	25.7	70.4	92.6	153.3	153.4	141.4
46.3	1272.4	15.9	19.0	61.5	93.0	162.9	166.6	144.1
53.2	1325.9	18.2	20.7	64.7	95.3	164.2	166.6	144.6
59.6	1371.1	20.3	22.2	67.5	97.0	164.7	165.8	144.5
65.3	1407.6	22.1	23.5	69.8	98.3	164.5	164.4	143.9
70.3	1435.9	23.7	24.7	71.7	99.1	163.7	162.5	142.7
74.6	1456.6	25.1	25.6	73.0	99.4	162.4	160.1	141.1
78.3	1470.5	26.3	26.4	74.0	99.4	160.7	157.4	139.1
81.4	1478.6	27.3	27.0	74.7	99.1	158.6	154.4	136.9
84.0	1481.9	28.2	27.5	75.1	98.5	156.3	151.3	134.5
85.9	1481.7	28.7	27.8	75.3	97.9	154.2	148.5	132.4
88.0	1477.9	29.4	28.1	75.4	97.0	151.2	144.7	129.5
89.4	1472.1	29.8	28.3	75.4	96.1	148.5	141.5	126.9
90.6	1464.7	30.1	28.5	75.3	95.1	145.9	138.3	124.4
46.3	1272.4	15.9	19.0	61.5	93.0	162.9	166.6	144.1
51.2	1303.2	17.5	20.1	63.6	94.4	163.0	165.3	142.5
55.5	1327.8	19.0	21.1	65.3	95.4	162.6	163.6	140.6
59.4	1345.9	20.3	21.9	66.7	96.0	161.5	161.4	138.2
62.8	1358.0	21.4	22.5	67.7	96.2	160.1	158.8	135.7
65.6	1365.1	22.3	23.0	68.4	96.1	158.4	156.2	133.1
67.9	1367.3	23.0	23.4	68.8	95.7	156.4	153.4	130.4
69.8	1365.6	23.6	23.7	69.0	95.0	154.2	150.5	127.5
71.3	1361.5	24.1	23.9	69.0	94.3	151.9	147.5	124.8
72.3	1356.6	24.4	24.0	68.9	93.6	150.0	145.2	122.7
73.4	1347.6	24.8	24.1	68.6	92.6	147.5	142.1	119.8
74.1	1338.2	25.0	24.1	68.2	91.6	145.2	139.4	117.3
74.7	1327.8	25.2	24.1	67.8	90.6	143.0	136.8	115.0
46.3	1272.4	15.9	19.0	61.5	93.0	162.9	166.6	144.1

46.3	1261.9	15.9	18.9	61.2	92.7	161.7	164.7	141.2
46.1	1247.8	15.9	18.7	60.7	92.0	159.8	162.1	137.8
46.0	1231.0	15.9	18.5	60.0	91.0	157.5	159.1	134.2
45.9	1212.8	15.8	18.3	59.3	89.8	154.9	155.9	130.5
45.6	1193.7	15.7	18.0	58.5	88.5	152.2	152.7	126.8
45.4	1174.4	15.6	17.8	57.6	87.1	149.4	149.3	123.2
45.2	1155.8	15.6	17.5	56.8	85.7	146.7	146.1	120.0
45.0	1137.7	15.5	17.3	56.0	84.2	144.0	143.2	116.9
44.8	1122.8	15.4	17.1	55.2	83.1	141.8	140.7	114.4
44.4	1103.3	15.3	16.9	54.3	81.5	139.0	137.5	111.4
44.0	1087.7	15.1	16.6	53.6	80.2	136.9	135.1	109.0
43.7	1073.0	15.0	16.4	52.9	79.0	134.8	132.9	106.8
46.3	1272.4	15.9	19.0	61.5	93.0	162.9	166.6	144.1
41.4	1225.5	14.3	17.7	58.9	91.1	160.9	165.1	141.4
36.5	1174.1	12.7	16.4	56.1	88.7	158.2	162.6	138.1
32.2	1120.7	11.2	15.0	53.1	86.0	154.7	159.4	134.2
28.5	1067.7	9.9	13.8	50.1	83.0	150.7	155.5	129.8
25.5	1016.6	8.8	12.7	47.2	79.9	146.2	151.1	125.1
23.1	968.6	8.0	11.8	44.5	76.8	141.6	146.5	120.3
21.2	924.8	7.3	11.0	42.1	73.8	137.0	141.7	115.5
19.9	885.6	6.8	10.3	39.9	70.9	132.5	137.0	110.9
19.1	856.0	6.5	9.9	38.3	68.6	128.9	133.2	107.3
18.2	819.9	6.2	9.3	36.3	65.8	124.2	128.2	102.7
17.7	793.1	6.0	9.0	34.9	63.6	120.6	124.3	99.0
17.3	769.6	5.8	8.7	33.6	61.6	117.2	120.7	95.8

8	9	10	11	12	Total
125.6	111.8	92.4	64.8	35.4	1093.1
123.4	106.9	84.3	56.2	30.1	1051.4
120.6	101.3	75.6	47.5	24.8	1004.5
117.2	95.2	66.7	39.1	19.8	954.2
113.4	88.8	57.8	31.5	15.7	902.7
109.2	82.2	49.2	25.1	12.8	852.0
104.8	75.5	41.4	20.7	11.4	804.7
100.2	69.0	34.7	18.6	11.3	762.2
95.6	62.7	29.4	18.0	11.3	723.4
91.8	57.7	26.4	18.0	11.4	693.5
86.6	51.4	23.9	18.1	11.4	655.4
82.3	46.6	23.0	18.1	11.3	625.8
78.2	42.6	22.6	18.2	11.3	598.9
125.6	111.8	92.4	64.8	35.4	1093.1
125.2	108.8	87.2	59.0	31.8	1070.7
124.2	105.4	81.8	53.3	28.2	1044.2
122.6	101.7	76.6	48.0	25.0	1014.7
120.7	97.9	71.7	43.3	22.1	983.6
118.4	94.1	67.1	39.2	19.7	952.2
115.9	90.4	63.1	35.8	17.8	921.5
113.4	87.0	59.5	33.2	16.4	892.2
110.8	83.7	56.3	31.0	15.4	864.8
108.8	81.2	54.1	29.6	14.8	843.6
106.1	78.1	51.4	28.1	14.1	816.5

103.9	75.7	49.5	27.1	13.7	795.5
101.8	73.6	47.8	26.3	13.4	776.6
125.6	111.8	92.4	64.8	35.4	1093.1
127.2	112.5	93.1	65.1	35.6	1102.6
128.3	112.8	93.6	65.5	35.7	1107.9
128.8	112.8	94.0	65.6	35.7	1109.4
129.0	112.6	94.1	65.8	35.7	1107.7
128.9	112.1	94.1	65.9	35.7	1103.4
128.5	111.4	94.0	65.8	35.5	1097.0
127.9	110.6	93.7	65.6	35.4	1089.0
127.2	109.7	93.3	65.5	35.2	1080.3
126.5	109.0	92.9	65.3	35.1	1072.4
125.4	107.8	92.3	64.9	34.8	1060.6
124.4	106.7	91.7	64.5	34.5	1050.3
123.5	105.7	91.1	64.1	34.3	1040.2
125.6	111.8	92.4	64.8	35.4	1093.1
128.1	115.6	98.4	70.9	39.3	1127.8
130.1	118.8	103.6	76.6	42.7	1156.5
131.5	121.4	108.2	81.5	45.8	1179.2
132.4	123.4	111.9	85.7	48.5	1195.8
132.9	124.8	115.0	89.3	50.7	1207.3
133.0	125.7	117.5	92.2	52.6	1214.3
132.7	126.2	119.4	94.5	54.1	1217.2
132.2	126.4	120.8	96.4	55.3	1216.8
131.6	126.4	121.6	97.6	56.1	1214.6
130.6	126.1	122.4	98.9	57.0	1209.7
129.7	125.7	122.8	99.7	57.6	1204.2
128.8	125.1	123.0	100.3	58.1	1197.4
125.6	111.8	92.4	64.8	35.4	1093.1
127.6	116.5	100.2	73.2	40.7	1132.6
128.9	120.4	107.2	80.9	45.6	1165.2
129.6	123.6	113.3	87.9	49.9	1190.8
129.7	126.1	118.5	93.9	53.8	1210.0
129.4	127.9	122.8	99.1	57.1	1223.1
128.7	129.2	126.4	103.5	59.9	1231.0
127.6	129.9	129.3	107.2	62.3	1234.3
126.3	130.3	131.5	110.3	64.3	1234.0
125.1	130.3	133.0	112.4	65.7	1231.5
123.2	130.1	134.6	114.8	67.3	1225.3
121.5	129.7	135.6	116.5	68.4	1218.2
119.8	129.1	136.3	117.8	69.3	1210.0
125.6	111.8	92.4	64.8	35.4	1093.1
125.9	114.7	97.6	70.7	39.1	1114.4
125.6	117.0	102.1	76.0	42.5	1130.7
125.0	118.8	105.9	80.7	45.4	1141.9
124.2	120.0	109.0	84.8	48.0	1148.3
123.1	120.6	111.5	88.1	50.1	1151.0
121.6	120.9	113.4	90.9	51.9	1150.0
120.1	120.9	114.9	93.1	53.4	1146.0
118.7	120.6	115.9	94.9	54.5	1140.2
117.4	120.3	116.5	96.0	55.3	1134.6
115.6	119.6	117.0	97.3	56.2	1125.0
114.0	118.8	117.1	98.0	56.7	1115.6
112.4	117.9	117.1	98.6	57.1	1105.5
125.6	111.8	92.4	64.8	35.4	1093.1

123.9	111.1	91.9	64.8	35.4	1083.3
121.8	110.2	91.2	64.8	35.3	1070.4
119.6	108.9	90.5	64.7	35.2	1055.1
117.3	107.5	89.7	64.5	35.1	1038.6
114.9	106.1	88.8	64.4	34.9	1021.6
112.8	104.5	87.9	64.2	34.7	1004.3
110.7	103.0	87.1	63.9	34.6	987.7
108.7	101.6	86.2	63.6	34.4	971.6
107.3	100.5	85.5	63.3	34.2	958.5
105.4	98.9	84.4	63.0	33.9	941.4
103.9	97.5	83.7	62.6	33.7	927.9
102.4	96.4	83.0	62.2	33.4	915.0
125.6	111.8	92.4	64.8	35.4	1093.1
122.9	107.9	86.3	58.7	31.6	1056.8
119.6	103.5	80.0	52.8	27.9	1016.6
115.8	98.9	74.0	47.3	24.6	974.0
111.8	94.1	68.3	42.5	21.8	931.2
107.7	89.5	63.1	38.4	19.5	889.3
103.6	85.2	58.6	35.0	17.6	849.4
99.7	81.2	54.8	32.4	16.2	812.6
96.2	77.6	51.6	30.3	15.2	779.3
93.4	74.9	49.5	28.9	14.6	754.0
90.0	71.7	46.9	27.4	13.9	722.7
87.5	69.4	45.2	26.5	13.6	699.4
85.2	67.3	43.8	25.8	13.3	678.8