

# EnergyWise Energy Consumption Projection



## Customer Information

Name: [REDACTED]  
 Street: [REDACTED]  
 City: Savannah  
 ST/ZIP: Georgia 31411  
 Phone: [REDACTED]  
 FAX: [REDACTED]  
 Attn: [REDACTED]  
 Note: Facing Northwest

## HVAC Design Specifications

Winter Indoor Temp: 70°F  
 Winter Outdoor Temp: 27°F  
 Summer Indoor Temp: 75°F  
 Summer Outdoor Temp: 95°F

Estimated Cooling Tonnage: 2.5



### Projected Annual Energy Consumption for Heating & Cooling When Built to EnergyWise Specifications with a Heat Pump (Air)

HVAC Equipment	EER	Avg. Total HVAC \$/mo	Estimated Heat kwh/yr	Estimated Cool kwh/yr	Estimated Fan kwh/yr
Air Heat Pump	14.00	\$42	4,547	2,958	included

HVAC Equipment By: Whirlpool Heating & Cooling Products

### Projected Annual Energy Consumption for Heating & Cooling When Built to Conventional Specifications with Air-to-Air Equipment

Heating Equipment	AC SEER	Avg. Total HVAC \$/mo	Estimated Heat kwh/yr	Estimated Cool kwh/yr	Estimated Fan kwh/yr
AFUE 80 Gas Furnace	10.00	\$126	1,205ccf	8,061	577
Air Heat Pump	10.00	\$130	15,377	8,061	included
Resistance Furnace	10.00	\$193	28,951	8,061	497

Energy costs calculated at: \$0.056 per kwh electricity - winter  
 \$0.086 per kwh electricity - summer  
 \$0.650 per 100 cubic feet natural gas

*These projections are subject to the efficiency and performance of the actual HVAC equipment installed.*

Log: 2007

Total Conditioned Floor Area: 2,546 sq. ft.

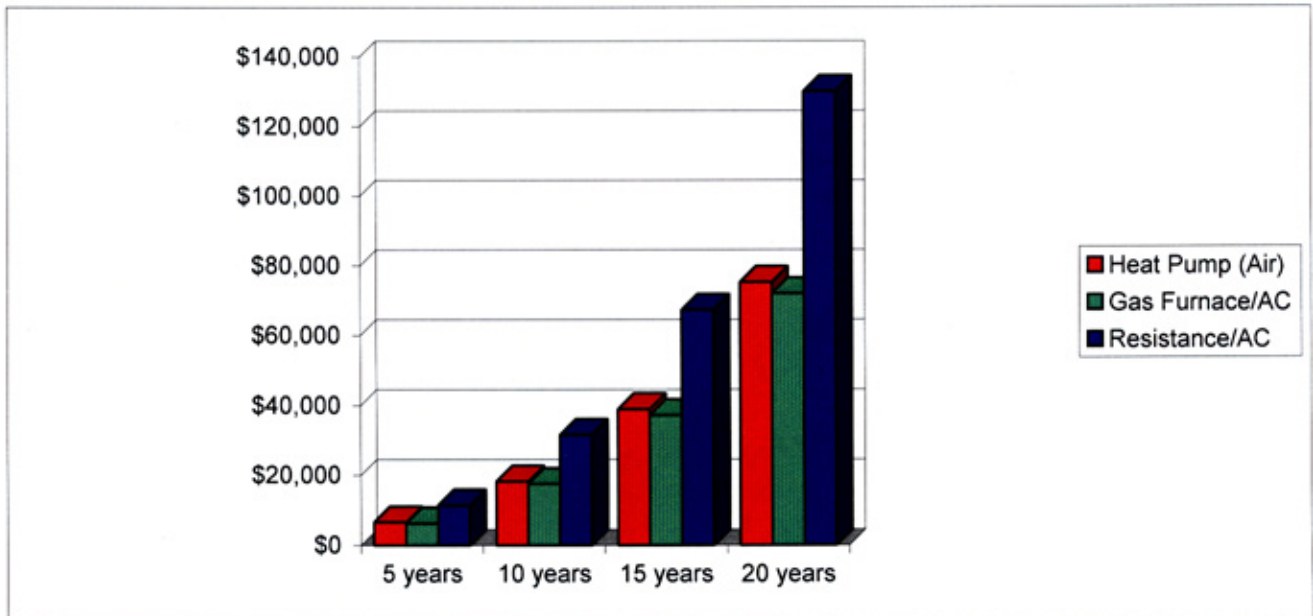
Nov 04, 2004

## EnergyWise Estimate of Fuel Savings

### EnergyWise Structure with a Heat Pump (Air)

To a Conventional Structure with.....	Heat Pump (Air)	Gas Furnace/AC	Resistance/AC	
	5 years	\$5,892	\$5,636	\$10,178
Estimated Savings at 6%	10 years	\$13,778	\$13,177	\$23,798
Annual Fuel Cost Increase	15 years	\$24,330	\$23,270	\$42,024
	20 years	\$38,452	\$36,776	\$66,415
	5 years	\$6,641	\$6,351	\$11,470
Estimated Savings at 12%	10 years	\$18,344	\$17,544	\$31,684
Annual Fuel Cost Increase	15 years	\$38,968	\$37,270	\$67,308
	20 years	\$75,316	\$72,034	\$130,089

### Estimated Savings of an EnergyWise Structure with a Heat Pump (Air) Assuming a 12% Annual Fuel Cost Increase



### Assumptions for Estimating Fuel Savings

1. Energy consumption is estimated using BIN Method calculations.
2. Weather data used is worst case winter and summer.
3. During the summer the interior temperature is maintained at or above 76° F.
4. During the winter the interior temperature is maintained at or below 72° F.
5. The EnergyWise heat pump (air) has a SEER of 14.00, 47° COP of 3.00, and a 17° COP of 2.20.
6. The comparison heat pump (air) has a SEER of 10.00, 47° COP of 2.90, and a 17° COP of 2.00.
7. The comparison gas furnace has a 80 AFUE rating. The air conditioner has a SEER of 10.00.
8. Annual fuel savings are estimated based on the differences in performance estimates between this structure built according to EnergyWise standards versus less efficient conventional standards.

Log: 2007

Nov 04, 2004

3. The HVAC contractor shall check the calibration of the thermostat at installation.
4. The heat anticipator shall be set according to the manufacturer's recommendations.

### **Electrical**

1. The HVAC contractor is responsible for the coordination of circuits and metering of the HVAC equipment to the electrician.
2. All electrical work shall be to local and national codes.
3. The EnergyWise Meter shall be furnished by the EnergyWise Dealer to be installed by the electrician for measuring KWH usage on all HVAC equipment (if applicable).

### **Supply And Return Grilles**

1. All ceiling registers shall be of **curved blade design and one directional**.
2. Average face velocity shall be 400 F.P.M. minimum to 700 F.P.M. maximum at the supply grilles.
3. Average face velocity shall be 350 F.P.M. minimum to 450 F.P.M. maximum at the return grilles.
4. The HVAC contractor is responsible for making sure that there is a **minimum of one cubic foot** of open return **per ton of air**.

### **Filter Racks And Air Filters**

1. Return air filter racks shall be of the type that will maintain an **air-tight** return and easily accessible to the owner.

### **Equipment Pads**

1. The HVAC contractor is responsible for the coordination and placement of the equipment pads with the general contractor.

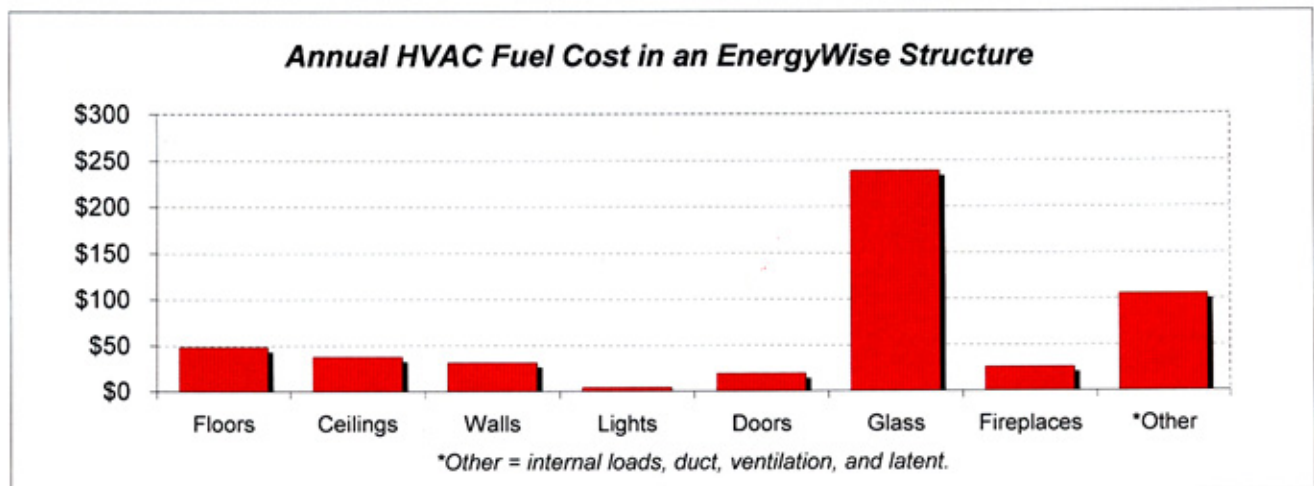
### **The HVAC Equipment**

1. The HVAC equipment will be specified according to the owner's requirements.
2. The sizing of the equipment will be done according to the results of the EnergyWise Manual "J" and Manual "M" Energy Analysis.
3. All HVAC equipment shall be installed according to manufacturer's recommendations and in compliance with local and national codes.

## EnergyWise Performance Estimate & Cost Analysis by Component

	Heating	\$/year	kwh/yr	Cooling	\$/year	kwh/yr
<b>Structural Components</b>						
Floors - slab	18.9%	\$48	861	0.0%	\$0	0
Floors - crawl	0.0%	\$0	0	0.0%	\$0	0
Ceilings	6.2%	\$16	280	8.6%	\$22	254
Walls	7.3%	\$19	331	5.0%	\$13	149
Recessed lights	1.0%	\$3	46	0.6%	\$1	17
Skylights	0.0%	\$0	0	0.0%	\$0	0
Doors	5.1%	\$13	230	2.4%	\$6	70
Glass N	0.0%	\$0	0	0.0%	\$0	0
Glass NE	9.8%	\$25	447	7.6%	\$19	225
Glass E	0.0%	\$0	0	0.0%	\$0	0
Glass SE	20.9%	\$53	949	18.5%	\$47	548
Glass S	0.0%	\$0	0	0.0%	\$0	0
Glass SW	0.0%	\$0	0	0.0%	\$0	0
Glass W	0.0%	\$0	0	0.0%	\$0	0
Glass NW	20.8%	\$53	946	16.0%	\$41	475
Fireplaces	10.1%	\$26	458	0.0%	\$0	0
Internal Load	0.0%	\$0	0	14.8%	\$38	439
Ventilation Load	0.0%	\$0	0	0.0%	\$0	0
Duct Loss/Gain	0.0%	\$0	0	0.0%	\$0	0
Latent	0.0%	\$0	0	26.5%	\$67	784
	100%	\$255	4,547	100%	\$254	2,958

Estimated Annual Fuel Cost: **\$509**



The values calculated are approximate values only and are based on using a 14.00 SEER heat pump installed in an EnergyWise structure. The actual energy consumed will be less than projected.

Solar correction heat gain for a multi-zone structure is distributed among affected components.

Note: All values are rounded to the nearest unit. So, totals will often be slightly different than column sums.

Log: 2007

Nov 04, 2004

# EnergyWise Heating & Cooling Equipment Load Estimate

## Customer Information

Name: [REDACTED]  
 Street: [REDACTED]  
 City: Savannah  
 ST/ZIP: Georgia 31411  
 Phone: [REDACTED]  
 FAX: [REDACTED]  
 Attn: [REDACTED]

Note: Facing Northwest

## HVAC Design Specifications

Winter Design Difference:	43 °F db
Summer Design Difference:	20 °F db
Latent Grains at 50% RH:	51 gr.
Total Conditioned Floor Area:	2,546 sq ft
Exposed Conditioned Volume:	22,914 cu ft
Windows, Doors, Skylights & Recessed Lights:	268 sq ft

## Equipment Load

	Area	Heat Pump Heating	Furnace Heating	HP/AC Cooling
<b>Structural Components</b>				
Floors - slab	195 lin ft	6,806 Btuh	6,806 Btuh	0 Btuh
Floors - crawl	0 sq ft	0 Btuh	0 Btuh	0 Btuh
Ceilings	2,153 sq ft	2,213 Btuh	2,213 Btuh	2,313 Btuh
Walls	1,782 sq ft	2,614 Btuh	2,614 Btuh	1,356 Btuh
Recessed lights	6 sq ft	363 Btuh	363 Btuh	151 Btuh
Skylights	0 sq ft	0 Btuh	0 Btuh	0 Btuh
Doors	27 sq ft	1,822 Btuh	1,822 Btuh	638 Btuh
Glass N	0 sq ft	0 Btuh	0 Btuh	0 Btuh
Glass NE	45 sq ft	3,530 Btuh	3,530 Btuh	2,050 Btuh
Glass E	0 sq ft	0 Btuh	0 Btuh	0 Btuh
Glass SE	95 sq ft	7,503 Btuh	7,503 Btuh	4,994 Btuh
Glass S	0 sq ft	0 Btuh	0 Btuh	0 Btuh
Glass SW	0 sq ft	0 Btuh	0 Btuh	0 Btuh
Glass W	0 sq ft	0 Btuh	0 Btuh	0 Btuh
Glass NW	95 sq ft	7,478 Btuh	7,478 Btuh	4,329 Btuh
Fireplaces		3,620 Btuh	3,620 Btuh	0 Btuh
Internal Load		0 Btuh	0 Btuh	4,000 Btuh
Ventilation Load		0 Btuh	0 Btuh	0 Btuh
Duct Loss/Gain		0 Btuh	0 Btuh	0 Btuh
Multiple-Zone Solar Correction		0 Btuh	0 Btuh	0 Btuh
<i>Sensible Subtotal</i>		35,949 Btuh	35,949 Btuh	19,830 Btuh
Rating & Swing Multipliers		100%	100%	100%
<i>Equipment Sizing Load - Sensible</i>		35,949 Btuh	35,949 Btuh	19,830 Btuh
Latent Internal Loads				1,840 Btuh
Latent Ventilation Load				0 Btuh
Latent Infiltration Load				5,308 Btuh
<i>Equipment Sizing Load - Latent</i>				7,148 Btuh
<b>Equipment Sizing Load</b>		<b>35,949 Btuh</b>	<b>35,949 Btuh</b>	<b>26,978 Btuh</b>

Heating and cooling loads are calculated in accordance with ACCA Manual J, 7th Edition. Calculations include consideration for conduction, convection, radiation, and infiltration of the structure's components.

Note: All values are rounded to the nearest unit. So, totals will often be slightly different than column sums.

Log: 2007

Nov 04, 2004

## EnergyWise Duct Design Criteria

### Duct Design Specifications

<i>Available External Static Pressure:</i> 0.50	<i>Supply Register Pressure Losses:</i> 0.03
<i>Total Pressure Losses:</i> 0.06	<i>Return Grill Pressure Losses:</i> 0.03
<i>Duct System Design Static:</i> 0.44	<i>Cooling Coil Pressure Loss:</i> 0.00
<i>Supply System Design Static:</i> 0.26	<i>Filter Pressure Loss:</i> 0.00
<i>Return System Design Static:</i> 0.18	<i>Other Pressure Losses:</i> 0.00
<i>Return Design: Multiple Returns, Moderate Distance</i>	

### Heat Pump Specifications

Zone	Estimated Cooling Tonnage	Cooling Design CFM	Cooling Load BTUh	Sensible Load BTUh	Design Drop over Coils in °F	Heat Strip Output BTUh	Total Heat Loss BTUh	Heating Blower CFM	Temp Rise Heat Strips °F
1	2.5	899	26,974	19,827	21	35,949	35,949	899	36

### Duct CFM Specifications by Room (Design CFM is for summer comfort)

Room	Suggested No. Ducts	Design CFM	Comfort in Winter	Cooling CFM	Heating CFM	Cooling Load	Heating Load
Zone 1: Entry	1	71		71	81	2,125	3,245
Zone 1: Family Room	2	280		280	220	8,390	8,808
Zone 1: Game Room	1	95		95	127	2,854	5,080
Zone 1: Justin's Room	1	50	cool	50	75	1,501	3,005
Zone 1: Bath 4	0	6		6	6	176	224
Zone 1: Jase's Room	1	45		45	58	1,352	2,330
Zone 1: Jordan's Room	1	60		60	87	1,788	3,491
Zone 1: Bath 3	0	9		9	18	278	721
Zone 1: Guest Bedroom	1	45		45	58	1,341	2,322
Zone 1: Guest Bath	0	9		9	21	264	822
Zone 1: Kitchen/Pantry	1	74	warm	74	1	2,222	33
Zone 1: Dining Room	1	156		156	147	4,684	5,867

*Zones are designed for balanced cooling. Rooms with substantial differences in Cooling and Heating CFM may be uncomfortable during the winter. Under such circumstances, consider installing a zone dampering system to rebalance the loads. Rooms with 60 CFM or less should be combined with adjacent rooms that share circulation. Design CFM is calculated at 400 CFM per 12,000 BTUh of Cooling Load. The Design Temperature Drop over the Coils may require a proportional adjustment of the CFMs. Heating Blower CFM will need adjusting if the Temperature Rise is out of range.*