

# Heating/Cooling System Comparison for 2,763 sq. ft. Single Family, New Construction

2447 NW Romancier Dr., Corvallis, OR 97330

Option # 1	Option # 2	Option # 3	Option # 4	Option # 5
<b>Natural Gas Heating Electric Cooling</b> (68F Winter, 75F Summer) (1)	<b>Electric Resistance Heating Electric Cooling</b> (68F Winter, 75F Summer) (3)	<b>Electric Air-to-Air Heat Pump</b> (68F Winter, 75F Summer) (5)	<b>Electric Geothermal Heat Pump w/Vertical GHX</b> (68F Winter, 75F Summer) (7)	<b>Electric Geothermal Heat Pump w/Municipal Water Grid</b> (68F Winter, 75F Summer) (9)
(2) 1.4000 0.0850	(4) 1.4000 0.0850	(6) 1.4000 0.0850	(8) 1.4000 0.0850	(10) 1.4000 0.0850
Total System Cost: \$18,718	Total System Cost: \$16,260	Total System Cost: \$16,725	Total System Cost: \$26,352	Total System Cost: \$16,352
AFUE*: 0.95%	COP*: 1.00	COP*: 3.8	COP*: 4.50	COP*: 4.50
SEER*: 17.9	SEER*: 17.9	SEER*: 17.9	EER*: 27	EER*: 27
Electricity/Yr (kWh): 1,931	Electricity/Yr (kWh): 19,828	Electricity/Yr (kWh): 12,721	Electricity/Yr (kWh): 6,845	Electricity/Yr (kWh): 6,161
Natural Gas/Yr (therm): 824				
Total Energy Cost/Yr: \$1,318	Total Energy Cost/Yr: \$1,685	Total Energy Cost/Yr: \$1,081	Total Energy Cost/Yr: \$582	Total Energy Cost/Yr: \$524
Interest/Yr @ 6.5%: \$1,217	Interest/Yr @ 6.5%: \$1,057	Interest/Yr @ 6.5%: \$1,087	Interest/Yr @ 6.5%: \$1,713	Interest/Yr @ 6.5%: \$1,063
Maintenance Cost/Yr.: \$180	Maintenance Cost/Yr.: \$180	Maintenance Cost/Yr.: \$360	Maintenance Cost/Yr.: \$180	Maintenance Cost/Yr.: \$180
Total Cost for 1st Year: \$3,650	Total Cost for 1st Year: \$3,735	Total Cost for 1st Year: \$3,365	Total Cost for 1st Year: \$3,792	Total Cost for 1st Year: \$2,584
Life Span (average years): 15	Life Span (average years): 15	Life Span (average years): 15	Life Span: 20-25 year average: 20	Life Span: 20-25 year average: 20
Study Period (years): 20	Study Period (years): 20	Study Period (years): 20	Study Period (years): 20	Study Period (years): 20
<b>Pollutants Produced:</b>				
CO2 (metric tons): 5.51	CO2 (metric tons): 14.24	CO2 (metric tons): 9.13	CO2 (metric tons): 4.91	CO2 (metric tons): 4.42

**Notes:**

1. Energy consumption based on eQuest software using a full year weather tape for Salem, Oregon.
  2. All internal and building loads are constant for all models with only the building systems being changed.
  3. CO2 production based on 0.005 metric tons per therm and 0.000718 metric tons per kWh.
  4. Options 4 and 5 have no outdoor noise pollution resulting from the outdoor condensing unit require for Options 1, 2 and 3.
  5. The Ground Coupled Heat Pump utilizes the earth as a heat sink and a free heat source at a relatively constant 53 degrees Fahrenheit.
  6. The Ground Coupled Heat Pump is more reliable than solar and wind energy as it relies on solar energy stored over time in the ground.
  7. Electricval energy cost based on CPI: \$0..085/kWh
  8. Natural Gas cost based on Northwest Natural: \$1.40/therm
- \*AFUE = Annual Fuel Utilization Efficiency (heating); \* SEER = Seasonal Energy Efficiency Ratio (cooling); \*EER = Energy Efficiency Ratio (cooling)  
 \*HSPF = Heating Seasonal Performance Factor; \*COP = Coefficient of Performance (eq. 1 unit of electricity produces 5 units of heat)

