



Geothermal Heat Pump System Economics

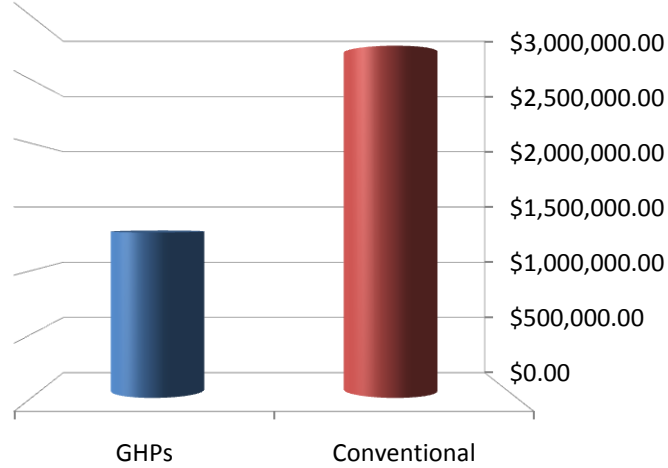
Scenario 1 – Geothermal Heat Pump System vs. Conventional HVAC System

Building Size - 260,000 ft², System Capacity - 600 tons

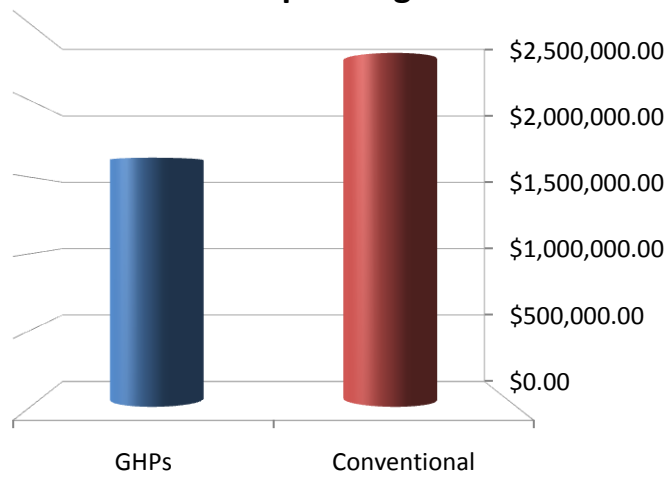
	Geothermal	Conventional
Gross HVAC System Cost	\$5,001,844.00	\$2,964,466.00
Federal 10% Investment Tax Credit Incentive (ITC)	\$500,184.40	\$0.00
Total Cost After ITC	\$4,501,659.60	\$2,964,466.00
1st Year Depreciation	\$1,900,700.72	\$39,526.21
2nd Year Depreciation	\$608,224.23	\$39,526.21
3rd Year Depreciation	\$364,934.54	\$39,526.21
4th Year Depreciation	\$218,960.72	\$39,526.21
5th Year Depreciation	\$109,480.36	\$39,526.21
Total Deprecitation	\$3,202,300.57	\$197,631.07
<small>(Geothermal Heat Pump Systems follow a 5 year MACRS deprecitaion schedule w/ a 100% 1st year bonus until 12/31/2011)</small>		
<small>(Geothermal Heat Pump System Depreciable Basis = \$4,751,751.80)</small>		
<small>(Depreciation based on 40% tax bracket)</small>		
Net Cash Cost After 5 Years	\$1,299,359.03	\$2,766,834.93
GHP Cash Savings Over 5 Years	\$1,467,475.91	
<small>(Before Operation Savings)</small>		
1st Year Operating Cost	\$309,573.00	\$439,787.00
2nd Year Operating Cost	\$317,312.33	\$450,781.68
3rd Year Operating Cost	\$325,245.13	\$462,051.22
4th Year Operating Cost	\$333,376.26	\$473,602.50
5th Year Operating Cost	\$341,710.67	\$485,442.56
Total 5 Year Operating Cost	\$1,627,217.39	\$2,311,664.95
GHP 5 Year Operation Savings	\$684,447.56	
<small>(Uses a steady 2.5% annual inflation in electricity rates)</small>		
Total Cash Savings Over 5 Years	\$2,151,923.47	

Scenario 1 – Geothermal Heat Pump System vs. Conventional HVAC System

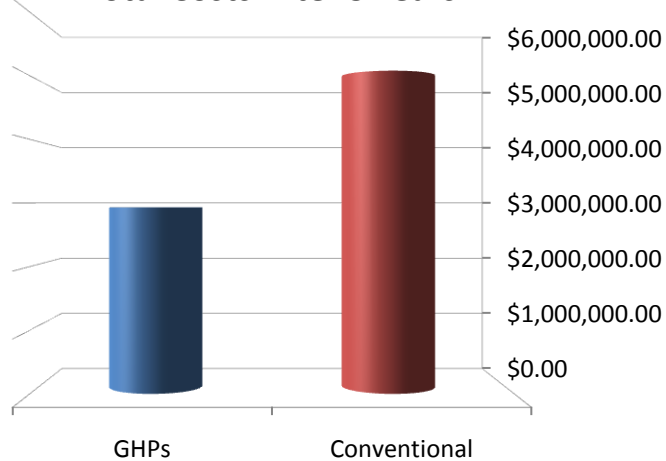
Net Cash Cost After 5 Years on Initial Investment



Total 5 Year Operating Cost



Total Costs After 5 Years



Scenario 2 – Geothermal Heat Pump Systems – 100% vs. 50% vs. 0% 1st year bonus depreciation rate

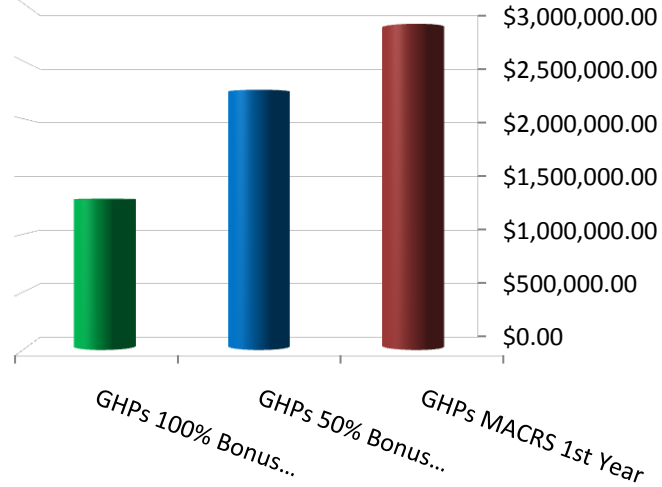
Building Size - 260,000 ft²,
System Capacity - 600 tons

	Geothermal 100% 1st year bonus	Geothermal 50% 1st year bonus	Geothermal MACRS 1st year rate
Gross HVAC System Cost	\$5,001,844.00	\$5,001,844.00	\$5,001,844.00
Federal 10% Investment Tax Credit Incentive (ITC)	\$500,184.40	\$500,184.40	\$500,184.40
Total Cost After ITC	\$4,501,659.60	\$4,501,659.60	\$4,501,659.60
1st Year Depreciation	\$1,900,700.72	\$950,350.36	\$380,140.14
2nd Year Depreciation	\$608,224.23	\$608,224.23	\$608,224.23
3rd Year Depreciation	\$364,934.54	\$364,934.54	\$364,934.54
4th Year Depreciation	\$218,960.72	\$218,960.72	\$218,960.72
5th Year Depreciation	\$109,480.36	\$109,480.36	\$109,480.36
Total Depreciation	\$3,202,300.57	\$2,251,950.21	\$1,681,740.00
(GHPs follow a 5 year MACRS deprecitaion schedule)			
(Geothermal Heat Pump System Depreciable Basis = \$4,751,751.80)			
(Depreciation based on 40% tax bracket)			
Net Cash Cost After 5 Years	\$1,299,359.03	\$2,249,709.39	\$2,819,919.60
GHP Cash Savings Over 5 Years	\$1,467,475.90	\$517,125.54	-\$53,084.67
(Compared to Conventional Costs from Scenario 1)			
(Before Operation Savings)			
GHP Total Cash Savings Over 5 Years	\$2,151,923.42	\$1,201,573.06	\$631,362.85
(Operation Costs included: Compared to Conventional System from Scenario 1)			

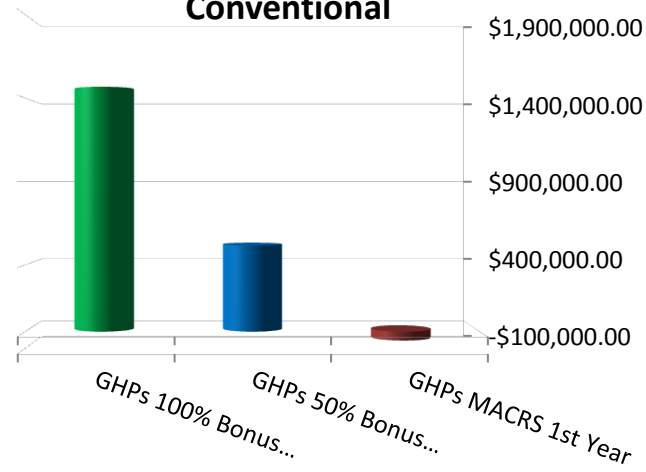
Geothermal Heat Pump Systems are eligible to receive the federal depreciation incentive, otherwise known as the Modified Accelerated Cost-Recovery System (MACRS) w/ bonus depreciation. The 100% bonus will be available until 12/31/2011. The 50% bonus will be available from 01/01/12 until 12/31/2012 at which point the incentive will continue to follow the MACRS schedule without the 1st year bonuses. The above figures (scenario 2) show the value of installing your geothermal heat pump system by the end of 2011.

Scenario 2 – Geothermal Heat Pump Systems – 100% vs. 50% vs. 0% 1st year bonus depreciation rate

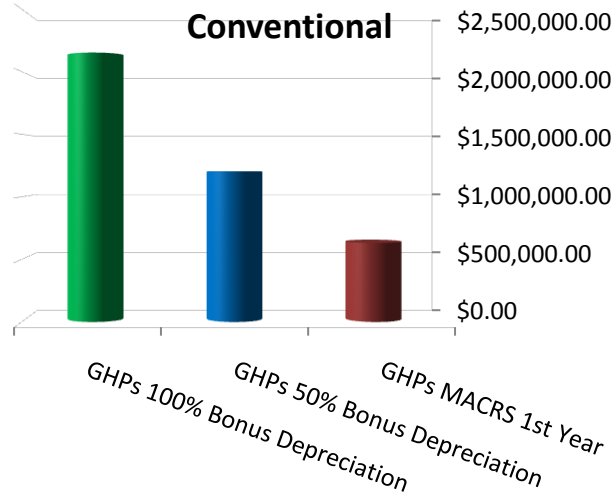
Net Cash Cost After 5 Years on Initial Investmet



Initial Cost Savings Over 5 Years Compared to Conventional



Total Cash Savings Over 5 Years Compared to Conventional



Scenario 3 – Geothermal Heat Pump System w/ 3rd Party Financing vs. Conventional HVAC System

Building Size - 260,000 ft², System Capacity - 600 tons

Earth Heat Exchanger Costs = \$2,172,868

Heat Pumps and Air Distribution Costs = \$2,828,976

	Geothermal 3rd Pary Financing	Conventional
Gross HVAC System Cost	\$5,001,844.00	\$2,964,466.00
3rd Party Financing (Earth Heat Exchanger)	\$2,172,868.00	\$0.00
Total Cost After Financing	\$2,828,976.00	\$2,964,466.00
Federal 10% Investment Tax Credit Incentive (ITC)	\$282,897.60	\$0.00
Total Cost After ITC	\$2,546,078.40	\$2,964,466.00
1st Year Depreciation	\$1,075,010.88	\$39,526.21
2nd Year Depreciation	\$344,003.48	\$39,526.21
3rd Year Depreciation	\$206,402.09	\$39,526.21
4th Year Depreciation	\$123,841.25	\$39,526.21
5th Year Depreciation	\$61,920.63	\$39,526.21
Total Deprecitation	\$1,811,178.33	\$197,631.07

(Geothermal Heat Pump Systems follow a 5 year MACRS deprecitaion schedule w/ a 100% 1st year bonus until 12/31/2011)

(Geothermal Heat Pump System Depreciable Basis = \$4,751,751.80)

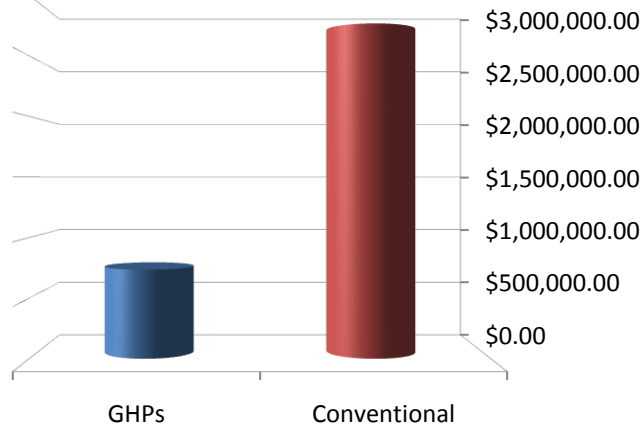
(Depreciation based on 40% tax bracket)

Net Cash Cost After 5 Years	\$734,900.07	\$2,766,834.93
GHP Cash Savings Over 5 Years Before Operation Savings	\$2,031,934.86	
GHP 5 Year Operation Savings (as calculated in scenario 1)	\$684,447.56	
Total Cash Savings Over 5 Years	\$2,716,382.42	

There are many 3rd party financing structures that can be taken advantage of for Geothermal Heat Pump System, all of which will reduce the initial cost as in the above scenario. It can be seen that the initial costs become less than that of a conventional system, and after only 5 years the amount of cash savings exceeds the amount financed.

Scenario 3 – Geothermal Heat Pump System w/ 3rd Party Financing vs. Conventional HVAC System

Net Cash Cost After 5 Years on Initial Investment



Calculating Incentives

System Cost: \$5,001,844.00

10% Investment Tax Credit (ITC) = System Cost x 10%
= \$5,001,844.00 x 0.1 = \$500,184.40

Total Cost After ITC: \$4,501,659.60

Depreciable Basis = System Cost – ITC/2
= \$5,001,844.00 - \$500,184.40/2
= \$4,751,751.80

MACRS Schedule :

1st Year: 20% (100% bonus until 12/31/2011)
2nd Year: 32%
3rd Year: 19.2%
4th Year: 11.52%
5th Year: 5.76%

Depreciation = Depreciable Basis x Scheduled % x Tax Bracket % (40% for the example)

1st Year = \$4,751,751.80 x 1 x 0.4
= \$1,900,700.72

2nd Year = \$4,751,751.80 x 0.32 x 0.4
= \$608,224.23

3rd Year = \$4,751,751.80 x 0.192 x .4
= \$364,934.54

4th Year = \$4,751,751.80 x 0.1152 x 0.4
= \$218,960.72

5th Year = \$4,751,751.80 x 0.0576 x 0.4
= \$109,480.36

Total Depreciation = \$3,202,300.57

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