

**John Hansen
Liberty Utah**

Estimated Heat Pump Cost	27549
Less tax credit	2300
Less conventional system	6500
Estimated cost for this analysis	18749
interest rate	6.00%

Geothermal Heat Pump Life Expectancy is 23 Years

Inflation rate	2%	With inflation
Propane Escalator	7%	9%
Electric Escalator	3%	5%

Electric use	Geothermal HP	15402 kWh	1.3400
Electric Use A/C & Boiler		1911 kWh	1.3400
Boiler & Water Heater Gas Use		2033 Therms	12.0500

	20,639 lbs CO ² per year
	2,561 lbs CO ² per year
	24,498 lbs CO ² per year
	6,420 lbs CO ² per year saved

Years of operation	Conventional Boiler System		Total Annual Energy Cost
	Propane Boiler Cost	Annual Propane Heating Cost	
1	\$3,810	\$830	\$4,783
2	\$4,153	\$905	\$5,208
3	\$4,527	\$986	\$5,670
4	\$4,934	\$1,075	\$6,174
5	\$5,378	\$1,172	\$6,724
6	\$5,862	\$1,277	\$7,322
7	\$6,390	\$1,392	\$7,973
8	\$6,965	\$1,517	\$8,683
9	\$7,592	\$1,654	\$9,457
10	\$8,275	\$1,803	\$10,299
11	\$9,020	\$1,965	\$11,217
12	\$9,831	\$2,142	\$12,218
13	\$10,716	\$2,335	\$13,308
14	\$11,681	\$2,545	\$14,495
15	\$12,732	\$2,774	\$15,789
16	\$13,878	\$3,023	\$17,198
17	\$15,127	\$3,295	\$18,734
18	\$16,488	\$3,592	\$20,408
19	\$17,972	\$3,915	\$22,232
20	\$19,590	\$4,268	\$24,219
21	\$21,353	\$4,652	\$26,384
22	\$23,275	\$5,070	\$28,743
23	\$25,369	\$5,527	\$31,314
	\$264,917	\$57,712	\$328,553

Geothermal Heat Pump System						Annual Heat Pump Savings
Annual Propane Water Heating	Annual Water Heating	Annual Cooling Cost	Annual Heating Cost	Total Annual Energy Cost	Annual Heat Pump Savings	
\$246	\$57	\$112	\$626	\$1,041	\$3,742	
\$258	\$60	\$118	\$657	\$1,093	\$4,115	
\$271	\$63	\$123	\$690	\$1,148	\$4,523	
\$285	\$66	\$130	\$725	\$1,205	\$4,969	
\$299	\$69	\$136	\$761	\$1,265	\$5,458	
\$314	\$73	\$143	\$799	\$1,329	\$5,993	
\$330	\$76	\$150	\$839	\$1,395	\$6,578	
\$346	\$80	\$158	\$881	\$1,465	\$7,219	
\$363	\$84	\$165	\$925	\$1,538	\$7,919	
\$382	\$88	\$174	\$971	\$1,615	\$8,684	
\$401	\$93	\$182	\$1,020	\$1,696	\$9,522	
\$421	\$97	\$192	\$1,071	\$1,780	\$10,437	
\$442	\$102	\$201	\$1,124	\$1,869	\$11,438	
\$464	\$107	\$211	\$1,180	\$1,963	\$12,532	
\$487	\$113	\$222	\$1,239	\$2,061	\$13,728	
\$511	\$118	\$233	\$1,301	\$2,164	\$15,034	
\$537	\$124	\$244	\$1,366	\$2,272	\$16,462	
\$564	\$131	\$257	\$1,435	\$2,386	\$18,022	
\$592	\$137	\$270	\$1,507	\$2,505	\$19,726	
\$622	\$144	\$283	\$1,582	\$2,631	\$21,588	
\$653	\$151	\$297	\$1,661	\$2,762	\$23,622	
\$685	\$159	\$312	\$1,744	\$2,900	\$25,843	
\$720	\$167	\$328	\$1,831	\$3,045	\$28,269	
\$10,192	\$2,362	\$4,640	\$25,935	\$32,937	\$285,424	
					(\$30,871.45)	
Net after making payments on mortgage						\$254,552

Payback of Heat Pump	Total lbs CO ² per year saved cumulative	If cost is added to mortgage annual pmt
-\$15,007	6,420	(\$1,342.24)
-\$10,893	12,839	(\$1,342.24)
-\$6,370	19,259	(\$1,342.24)
-\$1,401	25,679	(\$1,342.24)
\$4,058	32,099	(\$1,342.24)
\$10,051	38,518	(\$1,342.24)
\$16,629	44,938	(\$1,342.24)
\$23,848	51,358	(\$1,342.24)
\$31,766	57,777	(\$1,342.24)
\$40,451	64,197	(\$1,342.24)
\$49,973	70,617	(\$1,342.24)
\$60,410	77,037	(\$1,342.24)
\$71,848	83,456	(\$1,342.24)
\$84,380	89,876	(\$1,342.24)
\$98,108	96,296	(\$1,342.24)
\$113,142	102,715	(\$1,342.24)
\$129,604	109,135	(\$1,342.24)
\$147,626	115,555	(\$1,342.24)
\$167,352	121,974	(\$1,342.24)
\$188,940	128,394	(\$1,342.24)
\$212,562	134,814	(\$1,342.24)
\$238,405	141,234	(\$1,342.24)
\$266,674	147,653	(\$1,342.24)
		(\$30,871.45)