

**Project: Super Energy Saver**

	Annual therms saved	Annual kWh saved	Annual gallons diesel saved	Annual gallons gasoline saved	Annual tons of CO2 saved
Savings:	2000	3000			13.002359
2009 price per unit:	\$1.50	\$0.16	\$3.80	\$3.50	
Expected annual rate increase:	8%	7%	8%	8%	

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Expecte

	Annual Maintenance savings:	Annual Maintenance cost (- values!):
2007 cost:	\$100	-\$300

Lo:

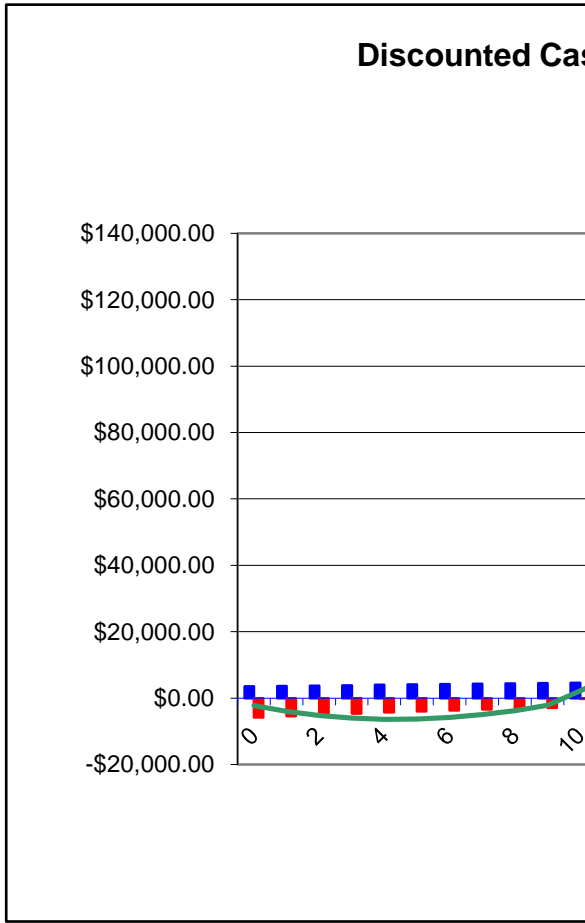
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PV Buyback \$/kWh	\$0.00
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Period	Year	Replacment Savings (Today Cost)	Additional Repair cost (Today Cost) (- values!)	Natural gas saved	Electricity saved	Electricity buyback	Diesel saved	Gasoline saved
0	2009	\$0	\$0	\$3,000	\$480	\$0	\$0	\$0
1	2010	\$0	\$0	\$3,240	\$514	\$0	\$0	\$0
2	2011	\$0	\$0	\$3,499	\$550	\$0	\$0	\$0
3	2012	\$0	\$0	\$3,779	\$588	\$0	\$0	\$0
4	2013	\$0	\$0	\$4,081	\$629	\$0	\$0	\$0
5	2014	\$0	\$0	\$4,408	\$673	\$0	\$0	\$0
6	2015	\$0	\$0	\$4,761	\$720	\$0	\$0	\$0
7	2016	\$0	\$0	\$5,141	\$771	\$0	\$0	\$0
8	2017	\$0	\$0	\$5,553	\$825	\$0	\$0	\$0
9	2018	\$0	\$0	\$5,997	\$882	\$0	\$0	\$0
10	2019	\$0	\$0	\$6,477	\$944		\$0	\$0
11	2020	\$0	\$0	\$6,995	\$1,010		\$0	\$0
12	2021	\$0	\$0	\$7,555	\$1,081		\$0	\$0
13	2022	\$0	\$0	\$8,159	\$1,157		\$0	\$0
14	2023	\$0	\$0	\$8,812	\$1,238		\$0	\$0
15	2024	\$0	\$0	\$9,517	\$1,324		\$0	\$0
16	2025	\$0	\$0	\$10,278	\$1,417		\$0	\$0
17	2026	\$0	\$0	\$11,100	\$1,516		\$0	\$0
18	2027	\$0	\$0	\$11,988	\$1,622		\$0	\$0
19	2028	\$0	\$0	\$12,947	\$1,736		\$0	\$0
20	2029	\$0	\$0	\$13,983	\$1,857		\$0	\$0
21	2030	\$0	\$0	\$15,102	\$1,987		\$0	\$0
22	2031	\$0	\$0	\$16,310	\$2,127		\$0	\$0
23	2032	\$0	\$0	\$17,614	\$2,275		\$0	\$0
24	2033	\$0	\$0	\$19,024	\$2,435		\$0	\$0
25	2034	\$0	\$0	\$20,545	\$2,605		\$0	\$0

26	2035	\$0	\$0	\$22,189	\$2,788		\$0	\$0
27	2036	\$0	\$0	\$23,964	\$2,983		\$0	\$0
28	2037	\$0	\$0	\$25,881	\$3,191		\$0	\$0
29	2038	\$0	\$0	\$27,952	\$3,415		\$0	\$0



Price: **\$45,000**

Grant: **\$5,000**

Capital Borrowed: **\$40,000**

Useful Life in Years: **30**

Interest Rate: **3.80%**

Loan term (years): **10**

Loan Cost Inflation: **3%**

Equipment Cost Inflation: **3%**

IRR/ROR 10 years: **-1.3%** guess %

IRR/ROR 15 years: **21.6%** guess %

IRR/ROR 20 years: **25.4%** guess %

IRR/ROR 25 years: **26.6%** guess %

IRR/ROR 30 years: **27.1%** guess %

**0%**

**0%**

**0%**

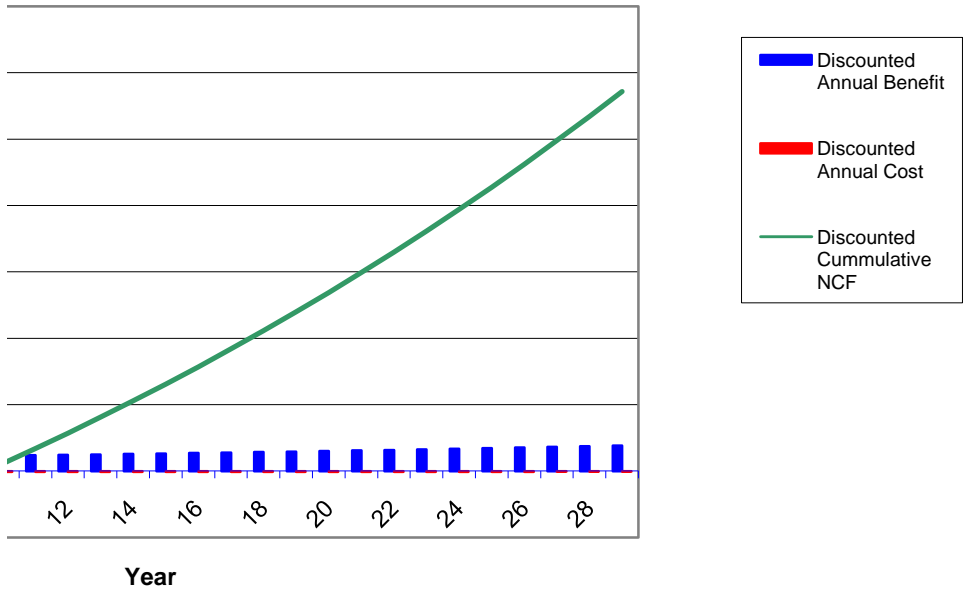
**0%**

**0%**

	Maintenance Savings	Replacement and Repair Savings	Additional Repair cost	Additional Maintenance Cost	Debt Service	Annual Benefit	Annual Cost	Net Cash Flow NCF
	\$100	\$0	\$0	-\$300	-\$5,520	\$3,580	-\$5,820	-\$2,240
	\$103	\$0	\$0	-\$309	-\$5,368	\$3,857	-\$5,677	-\$1,820
	\$106	\$0	\$0	-\$318	-\$5,216	\$4,155	-\$5,534	-\$1,379
	\$109	\$0	\$0	-\$328	-\$5,064	\$4,476	-\$5,392	-\$915
	\$113	\$0	\$0	-\$338	-\$4,912	\$4,823	-\$5,250	-\$426
	\$116	\$0	\$0	-\$348	-\$4,760	\$5,197	-\$5,108	\$89
	\$119	\$0	\$0	-\$358	-\$4,608	\$5,600	-\$4,966	\$634
	\$123	\$0	\$0	-\$369	-\$4,456	\$6,035	-\$4,825	\$1,210
	\$127	\$0	\$0	-\$380	-\$4,304	\$6,504	-\$4,684	\$1,820
	\$130	\$0	\$0	-\$391	-\$4,152	\$7,010	-\$4,543	\$2,467
	\$134	\$0	\$0	-\$403		\$7,555	-\$403	\$7,152
	\$138	\$0	\$0	-\$415		\$8,144	-\$415	\$7,728
	\$143	\$0	\$0	-\$428		\$8,778	-\$428	\$8,350
	\$147	\$0	\$0	-\$441		\$9,462	-\$441	\$9,022
	\$151	\$0	\$0	-\$454		\$10,201	-\$454	\$9,747
	\$156	\$0	\$0	-\$467		\$10,997	-\$467	\$10,529
	\$160	\$0	\$0	-\$481		\$11,855	-\$481	\$11,374
	\$165	\$0	\$0	-\$496		\$12,782	-\$496	\$12,286
	\$170	\$0	\$0	-\$511		\$13,781	-\$511	\$13,270
	\$175	\$0	\$0	-\$526		\$14,858	-\$526	\$14,332
	\$181	\$0	\$0	-\$542		\$16,021	-\$542	\$15,479
	\$186	\$0	\$0	-\$558		\$17,275	-\$558	\$16,717
	\$192	\$0	\$0	-\$575		\$18,628	-\$575	\$18,053
	\$197	\$0	\$0	-\$592		\$20,087	-\$592	\$19,495
	\$203	\$0	\$0	-\$610		\$21,662	-\$610	\$21,052
	\$209	\$0	\$0	-\$628		\$23,360	-\$628	\$22,732

\$216	\$0	\$0	-\$647		\$25,192	-\$647	\$24,545
\$222	\$0	\$0	-\$666		\$27,169	-\$666	\$26,503
\$229	\$0	\$0	-\$686		\$29,302	-\$686	\$28,615
\$236	\$0	\$0	-\$707		\$31,602	-\$707	\$30,895

### sh Flow and Discounted Cumulative Casflow



Energy Unit	lb CO2 / Unit	metric tons CO2/Unit	kWh / Unit	lb CO2/kWh	metric tons CO2/kWh
kWh Electricity	1.755	0.000796	1	1.8	0.000796
Therm Natural Gas	11.7	0.005307	29.3	0.4	0.000181
Gallon Gasoline	19.5	0.008845	36.6	0.5	0.000242
Gallon Diesel	22.2	0.010070	40.6	0.5	0.000248

This scenario is used in the graph!!!

	Discount-rate A		Cost / Benefit Ratio	Net Present Value NPV	Discount-rate B		
	5.0%		3.45	\$114,347	3.0%		
Cummulative Net Cash flow	discountfactor	Discounted Annual Benefit	Discounted Annual Cost	Discounted Net Cash Flow NCF	Discounted Cummulative NCF	discountfactor	Discounted Annual Benefit
-\$2,240	1	\$3,580.00	-\$5,820	-\$2,240.00	-\$2,240.00	1	\$3,580.00
-\$4,060	0.952380952	\$3,672.95	-\$5,407	-\$1,733.71	-\$3,974	0.970873786	\$3,744.27
-\$5,440	0.907029478	\$3,768.56	-\$5,020	-\$1,251.18	-\$5,225	0.942595909	\$3,916.34
-\$6,355	0.863837599	\$3,866.91	-\$4,658	-\$790.75	-\$6,016	0.915141659	\$4,096.57
-\$6,782	0.822702475	\$3,968.06	-\$4,319	-\$350.84	-\$6,366	0.888487048	\$4,285.35
-\$6,692	0.783526166	\$4,072.09	-\$4,002	\$70.01	-\$6,296	0.862608784	\$4,483.10
-\$6,058	0.746215397	\$4,179.09	-\$3,706	\$473.22	-\$5,823	0.837484257	\$4,690.23
-\$4,848	0.71068133	\$4,289.13	-\$3,429	\$860.12	-\$4,963	0.813091511	\$4,907.20
-\$3,028	0.676839362	\$4,402.30	-\$3,170	\$1,231.96	-\$3,731	0.789409234	\$5,134.47
-\$561	0.644608916	\$4,518.68	-\$2,929	\$1,589.94	-\$2,141	0.766416732	\$5,372.54
\$6,591	0.613913254	\$4,638.36	-\$248	\$4,390.85	\$2,250	0.744093915	\$5,621.93
\$14,319	0.584679289	\$4,761.43	-\$243	\$4,518.63	\$6,768	0.722421277	\$5,883.16
\$22,670	0.556837418	\$4,888.00	-\$238	\$4,649.82	\$11,418	0.70137988	\$6,156.81
\$31,692	0.530321351	\$5,018.14	-\$234	\$4,784.50	\$16,203	0.68095134	\$6,443.47
\$41,438	0.505067953	\$5,151.96	-\$229	\$4,922.78	\$21,125	0.661117806	\$6,743.76
\$51,968	0.481017098	\$5,289.57	-\$225	\$5,064.75	\$26,190	0.641861947	\$7,058.32
\$63,342	0.458111522	\$5,431.07	-\$221	\$5,210.53	\$31,401	0.623166939	\$7,387.85
\$75,627	0.436296688	\$5,576.56	-\$216	\$5,360.22	\$36,761	0.605016446	\$7,733.06
\$88,897	0.415520655	\$5,726.15	-\$212	\$5,513.93	\$42,275	0.587394608	\$8,094.69
\$103,230	0.395733957	\$5,879.97	-\$208	\$5,671.79	\$47,947	0.570286027	\$8,473.53
\$118,709	0.376889483	\$6,038.12	-\$204	\$5,833.91	\$53,780	0.553675754	\$8,870.40
\$135,426	0.358942365	\$6,200.73	-\$200	\$6,000.41	\$59,781	0.537549276	\$9,286.16
\$153,479	0.341849871	\$6,367.92	-\$197	\$6,171.41	\$65,952	0.521892501	\$9,721.72
\$172,974	0.325571306	\$6,539.82	-\$193	\$6,347.05	\$72,299	0.506691748	\$10,178.02
\$194,026	0.31006791	\$6,716.55	-\$189	\$6,527.46	\$78,827	0.491933736	\$10,656.05
\$216,757	0.295302772	\$6,898.26	-\$185	\$6,712.77	\$85,540	0.477605569	\$11,156.85

\$241,303	0.281240735	\$7,085.09	-\$182	\$6,903.13	\$92,443	0.463694727	\$11,681.51
\$267,805	0.267848319	\$7,277.16	-\$178	\$7,098.67	\$99,541	0.450189056	\$12,231.17
\$296,420	0.255093637	\$7,474.64	-\$175	\$7,299.55	\$106,841	0.437076753	\$12,807.03
\$327,316	0.242946321	\$7,677.67	-\$172	\$7,505.91	\$114,347	0.424346362	\$13,410.33

Cost / Benefit Ratio	Net Present Value NPV	Discount-rate C		Cost / Benefit Ratio	Net Present Value NPV
<b>4.32</b>	<b>\$171,991</b>	7.0%		<b>2.82</b>	<b>\$77,110</b>
Discounted Annual Cost	Discounted Net Cash Flow NCF	discountfactor	Discounted Annual Benefit	Discounted Annual Cost	Discounted Net Cash Flow NCF
-\$5,820	-\$2,240.00	1	\$3,580.00	-\$5,820	-\$2,240.00
-\$5,512	-\$1,767.38	0.934579439	\$3,604.30	-\$5,306	-\$1,701.31
-\$5,217	-\$1,300.24	0.873438728	\$3,629.00	-\$4,834	-\$1,204.85
-\$4,934	-\$837.71	0.816297877	\$3,654.10	-\$4,401	-\$747.23
-\$4,664	-\$378.90	0.762895212	\$3,679.60	-\$4,005	-\$325.34
-\$4,406	\$77.08	0.712986179	\$3,705.49	-\$3,642	\$63.71
-\$4,159	\$531.10	0.666342224	\$3,731.77	-\$3,309	\$422.57
-\$3,923	\$984.06	0.622749742	\$3,758.44	-\$3,005	\$753.70
-\$3,698	\$1,436.86	0.582009105	\$3,785.50	-\$2,726	\$1,059.35
-\$3,482	\$1,890.38	0.543933743	\$3,812.95	-\$2,471	\$1,341.62
-\$300	\$5,321.93	0.508349292	\$3,840.78	-\$205	\$3,635.83
-\$300	\$5,583.16	0.475092796	\$3,869.00	-\$197	\$3,671.71
-\$300	\$5,856.81	0.444011959	\$3,897.60	-\$190	\$3,707.68
-\$300	\$6,143.47	0.414964448	\$3,926.58	-\$183	\$3,743.76
-\$300	\$6,443.76	0.387817241	\$3,955.94	-\$176	\$3,779.96
-\$300	\$6,758.32	0.36244602	\$3,985.69	-\$169	\$3,816.28
-\$300	\$7,087.85	0.338734598	\$4,015.81	-\$163	\$3,852.74
-\$300	\$7,433.06	0.31657439	\$4,046.32	-\$157	\$3,889.34
-\$300	\$7,794.69	0.295863916	\$4,077.20	-\$151	\$3,926.10
-\$300	\$8,173.53	0.276508333	\$4,108.47	-\$145	\$3,963.01
-\$300	\$8,570.40	0.258419003	\$4,140.11	-\$140	\$4,000.09
-\$300	\$8,986.16	0.241513087	\$4,172.14	-\$135	\$4,037.35
-\$300	\$9,421.72	0.225713165	\$4,204.55	-\$130	\$4,074.80
-\$300	\$9,878.02	0.210946883	\$4,237.33	-\$125	\$4,112.44
-\$300	\$10,356.05	0.19714662	\$4,270.50	-\$120	\$4,150.28
-\$300	\$10,856.85	0.184249178	\$4,304.06	-\$116	\$4,188.32

-\$300	\$11,381.51	0.172195493	\$4,337.99	-\$111	\$4,226.59
-\$300	\$11,931.17	0.160930367	\$4,372.31	-\$107	\$4,265.07
-\$300	\$12,507.03	0.150402212	\$4,407.02	-\$103	\$4,303.79
-\$300	\$13,110.33	0.140562815	\$4,442.11	-\$99	\$4,342.74