

The Search for Persuasive Yet Truthful Marketing Messages

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My Solar Water Heater



How Much Money
Am I Saving?

Appliance-Based Payback Calculation

System installed Jan. 2006, upgraded September 2007

- Initial installed cost \$5600
 - Focus on Energy Cash Back Award - 1832
 - Federal tax credit - 1280
 - Upgrade (09-07) + 2970
- Total out-of pocket cost \$5458
- Amount of NG saved per year 110 therms
- Value of therm saved in 2007 \$0.95
- Amortization period 45 years, 10 mos.

My, that's a long payback!

I might not live so long.

And what if we sell the house?

Would we recover any portion of that investment?

Rate of Return Calculation - SDHW

- Out-of-pocket cost \$ 5,658
- Gas savings in 2008 (\$0.95/therm) \$ 104.50
- Rate of gas price increase 7%
- ROR on alternative 4%
- Net present value of project (\$1,024.66)

IRR 1.7%

- Market value of SDHW system
if house sold in 10 years \$5,249.32

These outcomes from this model are very sensitive to one's economic assumptions. In reality, natural gas prices have risen almost 9% per annum over the last 30 years.

So what would happen if we project natural gas prices increasing at 9% per year?

Retail Natural Gas Prices (residential)

<u>2005</u>	<u>2006</u>	<u>2007</u>
Jan. \$0.93	Jan. \$1.25	Jan. \$ 1.04
Feb. 0.91	Feb. 1.18	Feb. 1.07
Mar. 0.90	Mar. 1.12	Mar. 1.09
Apr. 0.96	Apr. 0.97	Apr. 1.02
May 0.98	May 0.94	May 1.03
June 0.91	June 0.85	June 1.06
July 0.95	July 0.83	July 1.01
Aug. 0.98	Aug. 0.92	Aug. 0.92
Sept. 1.17	Sept. 0.90	Sept. 0.88
Oct. 1.46	Oct. 0.66	Oct. 0.97
Nov. 1.49	Nov. 0.99	Nov. 1.03
Dec. 1.29	Dec. 1.11	Dec.

Source: My MGE bills

Recalculated Rate of Return

▪ Out-of-pocket cost	\$5,658
▪ Gas savings in 2008 (\$0.95/therm in 2007)	\$ 104.50
▪ Rate of gas price increase	9%
▪ ROR on alternative	4%
▪ Net present value of project	\$ 747.11

Project IRR 5.4%

▪ Market value of SDHW system if house sold in 10 years*	\$7,707.57
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How Is Market Value Calculated?

The market value of the SDHW system in 10 years equals the present value in year 10 of the natural gas savings over the next 20 years based on the projected rate of increase in NG prices. This is an estimate of how much of the selling price of the home would be represented by the SDHW system if the buyer only cared about savings on NG.

Preliminary Conclusions

- Given today's energy prices, there has to be another driver besides payback to justify the expense of a SHW system.
- One is energy price insurance—protection from rapidly rising natural gas prices.
- Chances are likely the customer will recover the full value of the SHW system if the house is sold 10 years from date of installation.
- **Question:** can the same thing be said about granite countertops or clawfoot bathtubs?

Energy Measures Undertaken in 2007

Conservation

- ✓ Air-sealing house (07-07)
- ✓ Increasing attic insulation (07-07)
from R-30 to R-50

Budget*

\$ 710

\$1400

Energy Capture

- ✓ Upgrading SDHW system (09-07)

\$2,970

* Represents out-of-pocket costs

Rate of Return Calculation Conservation Measures

▪ Cost of installation	\$2,260
▪ Out-of-pocket cost	\$2,110
▪ Annual therm savings	150
▪ Estimated \$\$ savings in 2008 (\$0.95/therm in 2007)	\$ 152.48
▪ Rate of gas price increase	7%
▪ ROR on alternative	4%
▪ Net present value of project	\$ 4,208.45

Project IRR **18.5%**

▪ Market value of efficiency measures if house sold in 10 years	\$ 7,158.17
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Rate of Return Calculation Conservation + SDHW Measures

■ Cost of installation	\$11,330
■ Out-of-pocket cost	\$ 7,768
■ Estimated gas savings in 2008 (\$0.95/therm)	\$ 264.29
■ Rate of gas price increase	7%
■ ROR on alternative	4%
■ Net present value of project	\$ 3183.63

Project IRR

8.5%

■ Market value of combined measures if house sold in 10 years	\$12,407.49
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Household Use of Natural Gas

<u>Year</u>	<u>Therms</u>	<u>Degree-Days</u>
■ 2004	734	6707
■ 2005	763	6540
■ 2006	604 ¹	5983 ²

1 *Changes in household laundry practices also contributed to reduced NG consumption.*

2 *The winter months of 2006 (January and December) were unusually mild. Overall, the year was cloudier than usual.*



Using the solar radiation available on the morning of November 24, 2007 to preheat water and dry clothes

Consider a Package Deal

- Bundling conservation with on-site energy capture increases the return on a customer's up-front investment.
- Combining the two enables the customer to afford a larger up-front investment in solar.

Focus Incentives Complement Package Deals

Focus on Energy now provides an additional \$500 incentive to a solar system if the installation follows a Home Performance measure (such as air-sealing).

In Conclusion, Owning an SHW System ...

- Increases One's Motivation to Save Energy
 - Efficiency Improvements (insulation, CFL's)
 - Induced Behavioral Changes (air-drying laundry, turning off computer monitors, etc.)
- Reduces Exposure to Rapid Energy Price Increases
- Appreciates in Value Over Time (unlike cars, boats and appliances)

Bottom line: On-site energy capture creates a sustainable wealth stream that is not fully accounted for in standard economic analysis.

What About REC's or Carbon Credits?

In the absence of a carbon policy or an energy policy that specifically promotes solar technologies, CO₂ reductions from SDHW systems will be undervalued (\$3/ton). Examples: my system would yield \$1.50/yr; Kalahari - \$185/yr.

- Policy solutions:
 - 1) Carbon cap/trade
 - 2) Redefine solar to include therm savings from SHW
 - 3) Solar carve-out in RPS
- Note: Governor's Task Force on Global Warming examining options 1 and 2.

Free Advice from David Mamet

A - B - C

A - Always

B - Be

C - Closing

Source: ***Glengarry Glen Ross***

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