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The Most *Ignored* Residential Appliance

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- In the early 1990s, many people did not know if they had a gas or electric water heater!
- At that time, they said the best water heater brands were GE, Maytag and Whirlpool.
 - None of which existed!

- It is fair to say that most people never thought much about their water heater. It was hidden away and forgotten until when it failed.
- Because it commanded no respect (or love), when it was replaced, the cheapest alternative was sought.

- Even though the public had forgotten about their water heater, the U.S. government had not.
- In the late 1990's, three branches of the Federal government took interest in water heaters: The Environmental Protection Agency, The Department of Energy and The Consumer Products Safety Commission.

The Results of the Government Attention were:

- EPA-mandated Foam Replacement 1/2003
- NAECA II Energy Efficiency Upgrades 1/2004
- Flammable Vapors Ignition Resistance 7/2003

Consequently, Water Heaters are now:

- More Green and more energy efficient
- More safe?
- Much more expensive
- More complicated and less robust

Today

- Water heaters are much more expensive than 15 years ago.
- The public is much more sensitive to the issues of “greenness” and energy efficiency
- Water heater manufacturers offer a wide variety of better and more efficient models
- The average consumer still buys the cheapest water heater on the market!
 - Why?

How much does an average consumer pay for hot water?

- A gas customer spends \$250 to \$300/yr.
- An electric customer spends \$500 to \$600/yr.
- While water heating is the second biggest energy consumer in most homes, it is not costly enough to justify spending much extra on more efficient models.

Consumers expect a 3 year payback!

- If you heat with gas and could save 1/3 of your energy costs, it means you would be willing to spend \$300 more on a high efficiency water heater (\$600 if electric).
- That means the manufacturer must make this higher efficiency water heater for a cost increase of less than \$120 (\$240 for electric).
- A very tough challenge!

Cost - Performance Comparisons

Natural Gas Water Heaters

Technology	Unit Cost	Install Cost	Annual Energy Use	Annual Cost*	Total 12 yr. Cost*	Payback Period, Yrs.
0.62 Standard Atmospheric	\$400	\$400	242 Therms	\$290	\$4,280	
0.67 Power Vent	\$800	\$800	224 Therms	\$268	\$4,820	37
90% T. E. Condensing	\$1500	\$900	183 Therms**	\$219	\$5,031	23
0.82 Tankless	\$1000	\$2000	183 Therms	\$219	\$5,631	31
0.90 Tankless	\$1500	\$1200	161 Therms	\$193	\$5,020	20

*Based on \$1.20/Therm for natural gas and no maintenance costs

**Assumed EF of 0.82 for 90% T.E. storage water heater

Cost - Performance Comparisons

Electric Water Heaters

Technology	Unit Cost	Install Cost	Annual Cost*	Total 12 Year Cost*	Payback Period, Yrs.
0.90 50 Gallon Electric	\$400	\$400	\$781	\$10,167	
0.95 50 gallon Electric	\$600	\$400	\$740	\$9,874	5
2.0 Heat Pump W/H	\$1500	\$900	\$351	\$6,615	4

*Based on \$0.16/KWHr for electricity, \$2.75/Gal for propane and no maintenance costs.

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2.11 AirTap Add-On Heat pump	\$699	\$400	\$333	\$5,095	2.5

*Based on \$0.16/KWHr for electricity, \$2.75/Gal for propane and no maintenance costs.

- The problem is an economic problem, not a technology problem.
- We all know that in the future we will all heat our water with either heat pumps or condensing gas appliances.
- However, as long as the majority of the consumers believe that the only good water heater is an inexpensive water, our national energy bill for water heating will not change dramatically.

How do we change the situation?

- Government regulations
 - Too slow
- The Neptune effect
 - Tankless have been somewhat successful
- Recognize that it is an economic problem
 - Paybacks are generally terrible
 - Consumers can not afford high efficiency water heaters

Consumers can not afford high efficiency water heaters

- The Wall Street Journal says that more than 2/3rds of our population live paycheck to paycheck.
- An unexpected \$800 bill to install a new (inexpensive) water heater causes major financial problems for most families.
- They do not opt to buy the cheap model because they are dumb, they do it because they have no money to buy a more efficient model

How do we fix that situation?

- Substantial rebates?
 - Is the current \$30 rebate in CA really help with the \$800 financial crisis?
- Provide easy financing for high efficiency water heaters
 - No financing for low efficiency models.
 - I know, the utilities, the government and the W/H manufacturers are not banks but can we afford to continue to ignore this reality?
 - Attractive financing for high efficiency models could change the market over night.

Summary

- There are more high efficiency water heating options available today than ever before.
- Consumers are “greener” than ever before.
- The vast majority of consumers still purchase the least expensive water heaters.
- It is an economic problem!
- Nothing will change quickly unless we address this economic problem!