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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!