

Residential Feasibility Assessment of Tankless Gas Water Heaters in PG&E Service Territory

HYPOTHESIS

PG&E assumed at the beginning of this project that gas tankless water heaters were ready to emerge into the main stream market place. This project was designed to test this assumption by evaluating the technology, its performance, its cost benefit and installation issues.

SUMMARY

- PG&E commissioned Davis Energy Group (DEG) to conduct this study to gain a better understanding of tankless gas water heater performance, cost and related installation issues. The scope of the study included researching other government or utility-sponsored programs that encourage their use, identifying the energy savings potential and installation challenges, and completing a market segmentation analysis of early adopters. The study applied to both new construction and retrofit applications in single and multi-family applications.

- Energy savings for tankless vs. tank-type heaters were calculated by accounting for differences in load-dependent performance of both system types, and by applying typical hot water load estimates.

- Installation challenges and market barriers were identified by interviewing contractors, manufacturers, and building officials. Higher cost was identified as the predominant market barrier; since tankless heaters are typically over three times the cost of tank-type heaters. Increased installation costs for tankless heaters result from larger gas line requirements, more costly venting (Category III gas tight vent system), and the need for an electrical outlet required for the ignition controls and the combustion air blower. Incremental costs are much lower for new construction because the larger gas line and unique venting substitutes for gas piping and venting used with tank-type heaters and has a minimal cost impact. Typical incremental costs for new construction are estimated to be \$1,100.

CONCLUSION The economics of gas tankless water heaters in single-family new construction and in selected retrofit applications can result in a positive cash flow for the homeowner. Annual gas energy savings resulting from 100% market penetration in the single family new construction market alone are estimated to be greater than 11 million therms, resulting in a cumulative reduction in carbon emissions of about 62,000 tons per year. Education of consumers, design professionals, builders, and plumbing trades is needed to convey the benefits and special requirements of tankless gas water heaters. Preferred markets for tankless water heaters include high hot water use households, custom homes where multiple storage water heaters are typically installed and early adopters who embrace advanced technology. Due to the complexity of installation issues for retrofit construction and high incremental costs for new construction tract home builders, PG&E will not create a rebate program at this time. Instead, PG&E will create a Gas Tankless Water Heater Fact Sheet which will reference the Emerging Technologies study.

Estimated Annual Statewide Savings Potential for Tankless Gas Water Heaters

Heating Segment	New Construction Market	Savings*	Retrofit Market	Savings*	Total Savings*
Single Family	95,500	9.7	70,200	7.2	16.9
Multi-family	25,900	2.1	1,700	0.1	2.2
Total	121,400	11.8	71,900	7.3	19.1

*Savings in millions of therms per year.

Estimated Annual PG&E Savings Potential for Tankless Gas Water Heaters

Heating Segment	New Construction Market	Savings*	Retrofit Market	Savings*	Total Savings*
Single Family	36,500	3.7	26,800	2.7	6.4
Multi-family	9,900	0.8	650	0.05	0.9
Total	46,400	4.5	27,450	2.8	7.3

*Savings in millions of therms per year.

Field Measurement of Water Heater Performance

