

APPENDIX 10-C. VENTING SCENARIOS FOR GAS-FIRED STORAGE WATER HEATERS AT EFFICIENCY LEVEL 2

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APPENDIX 10-C. ANALYSIS RESULTS USING ALTERNATIVE VENTING SCENARIOS FOR GAS-FIRED STORAGE WATER HEATERS AT EFFICIENCY LEVEL 2

10-C.1 INTRODUCTION

This appendix presents results for two scenarios associated with the venting options for gas storage water heaters at Efficiency Level 2 (0.63 EF at 40 gallon). As discussed in chapter 8, DOE assumed that all natural-draft gas storage water heater installations of units with RE of 78 percent or higher include stainless steel vent connectors. However, there is uncertainty regarding the fraction of water heater installations that would require a stainless steel vent connector. To develop a range that bounds the cost associated with stainless steel vents, DOE analyzed two scenarios:

1. No stainless steel vent connectors required;
2. 100% stainless steel vent connectors required for Efficiency Level (EL) 2.

10-C.2 LCC RESULTS

Table 10-C.2.1 Gas-Fired Storage Water Heaters: LCC and PBP Results (No stainless steel vent connectors required)

Efficiency Level ID	Energy Factor	Life-Cycle Cost (2009\$)			Life-Cycle Cost Savings				Payback Period (years)	
		Average Installed Price	Average Lifetime Operating Cost	Average LCC	Average Savings (2009\$)	Households with			Median	Average
						Net Cost	No Impact	Net Benefit		
Baseline	0.59	\$1,032	\$2,473	\$3,505						
1	0.62	\$1,066	\$2,357	\$3,423	\$52	8%	36%	56%	1.6	4.3
2	0.63	\$1,141	\$2,293	\$3,434	\$42	16%	22%	62%	2.9	12.4
3	0.64	\$1,559	\$2,286	\$3,845	-\$322	74%	12%	14%	39.8	65.8
4	0.65	\$1,591	\$2,220	\$3,812	-\$290	73%	6%	21%	29.8	44.2
5	0.67	\$1,656	\$2,137	\$3,793	-\$273	73%	6%	21%	24.2	30.1
6	0.77	\$1,893	\$1,878	\$3,771	-\$251	73%	1%	26%	17.1	18.0

Table 10-C.2.2 Gas-Fired Storage Water Heaters (TSL 5 and 6): LCC and PBP Results (No stainless steel vent connectors required)

Efficiency Level ID Combination	Life-Cycle Cost (2009\$)			Life-Cycle Cost Savings				Payback Period (years)	
	Average Installed Price	Average Lifetime Operating Cost	Average LCC	Average Savings (2009\$)	Households with			Median	Average
					Net Cost	No Impact	Net Benefit		
1 (small WH) + 6 (large WH)	\$1,098	\$2,330	\$3,427	\$51	10%	33%	57%	1.9	4.6
2 (small WH) + 6 (large WH)	\$1,170	\$2,267	\$3,437	\$42	17%	21%	62%	3.2	12.4

Table 10-C.2.3 Gas-Fired Storage Water Heaters: LCC and PBP Results (100 percent stainless steel vent connectors required for EL 2)

Efficiency Level ID	Energy Factor	Life-Cycle Cost (2009\$)			Life-Cycle Cost Savings				Payback Period (years)	
		Average Installed Price	Average Lifetime Operating Cost	Average LCC	Average Savings (2009\$)	Households with			Median	Average
						Net Cost	No Impact	Net Benefit		
Baseline	0.59	\$1,079	\$2,473	\$3,552						
1	0.62	\$1,179	\$2,357	\$3,536	\$11	26%	36%	38%	2.0	17.9
2	0.63	\$1,320	\$2,293	\$3,613	-\$51	47%	22%	30%	14.2	22.8
3	0.64	\$1,559	\$2,286	\$3,845	-\$258	72%	12%	16%	35.3	55.4
4	0.65	\$1,591	\$2,220	\$3,812	-\$226	70%	6%	23%	25.7	37.5
5	0.67	\$1,656	\$2,137	\$3,793	-\$209	70%	6%	24%	21.2	25.9
6	0.77	\$1,893	\$1,878	\$3,771	-\$187	70%	1%	29%	15.4	16.5

Table 10-C.2.4 Gas-Fired Storage Water Heaters (TSL 5 and 6): LCC and PBP Results (100 percent stainless steel vent connectors required for EL 2)

Efficiency Level ID Combination	Life-Cycle Cost (2009\$)			Life-Cycle Cost Savings				Payback Period (years)	
	Average Installed Price	Average Lifetime Operating Cost	Average LCC	Average Savings (2009\$)	Households with			Median	Average
					Net Cost	No Impact	Net Benefit		
1 (small WH) + 6 (large WH)	\$1,206	\$2,330	\$3,535	\$14	28%	33%	39%	2.3	17.7
2 (small WH) + 6 (large WH)	\$1,342	\$2,267	\$3,609	-\$47	48%	21%	31%	14.2	22.3

10-C.3 NIA RESULTS

Table 10-C.3.1 Cumulative National Energy Savings and Consumer Net Present Value for Gas-Fired Storage Water Heaters (No stainless steel vent connectors required)

Trial Standard Level (TSL)	Efficiency Level (EF)	NES (Quads)	NPV (billion 2009\$)	
			7% Discount Rate	3% Discount Rate
1	0.62	0.69	2.20	5.73
2	0.63	1.17	1.78	6.03
3	0.63	1.17	1.78	6.03
4	0.63	1.17	1.78	6.03
5	0.62	0.79	1.69	4.95
6	0.63	1.27	1.27	5.27
7	0.63	1.17	1.78	6.03
8	0.77	4.91	-12.34	-11.90

Table 10-C.3.2 Cumulative National Energy Savings and Consumer Net Present Value for Gas-Fired Storage Water Heaters (100 percent stainless steel vent connectors required for EL 2)

Trial Standard Level (TSL)	Efficiency Level (EF)	NES (Quads)	NPV (billion 2009\$)	
			7% Discount Rate	3% Discount Rate
1	0.62	0.69	0.39	2.35
2	0.63	1.17	-2.28	-1.51
3	0.63	1.17	-2.28	-1.51
4	0.63	1.17	-2.28	-1.51
5	0.62	0.81	0.08	2.02
6	0.63	1.32	-2.39	-1.38
7	0.63	1.17	-2.28	-1.51
8	0.77	4.91	-9.58	-6.77

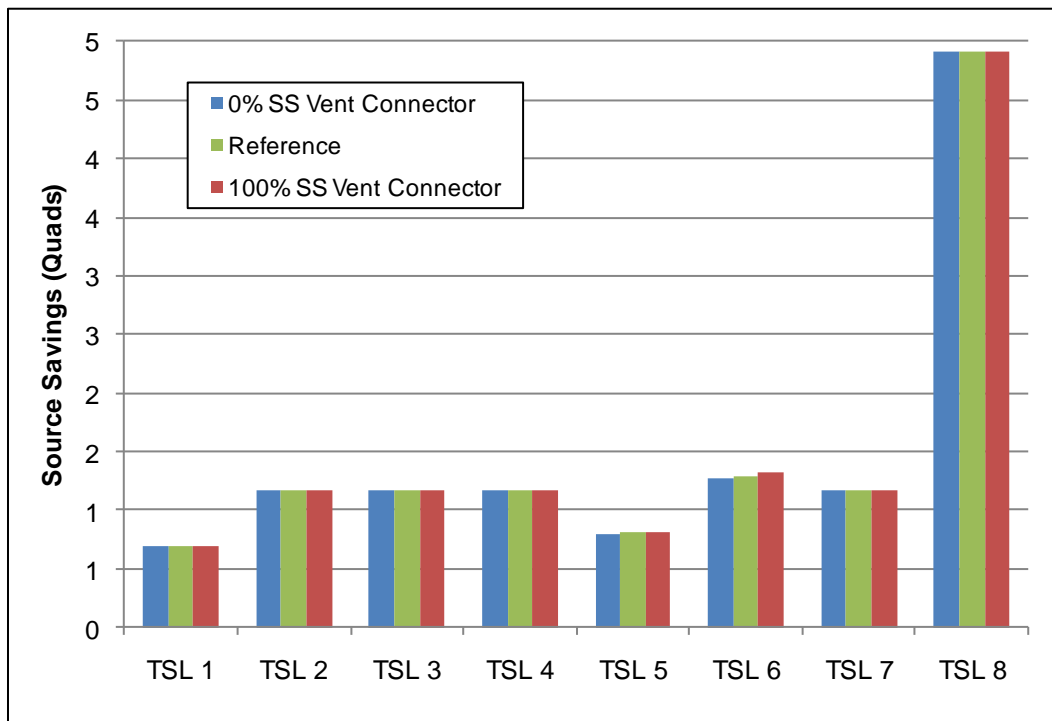


Figure 10-C.3.2 NES in Gas-Fired Storage Water Heater Comparison of Scenario Results

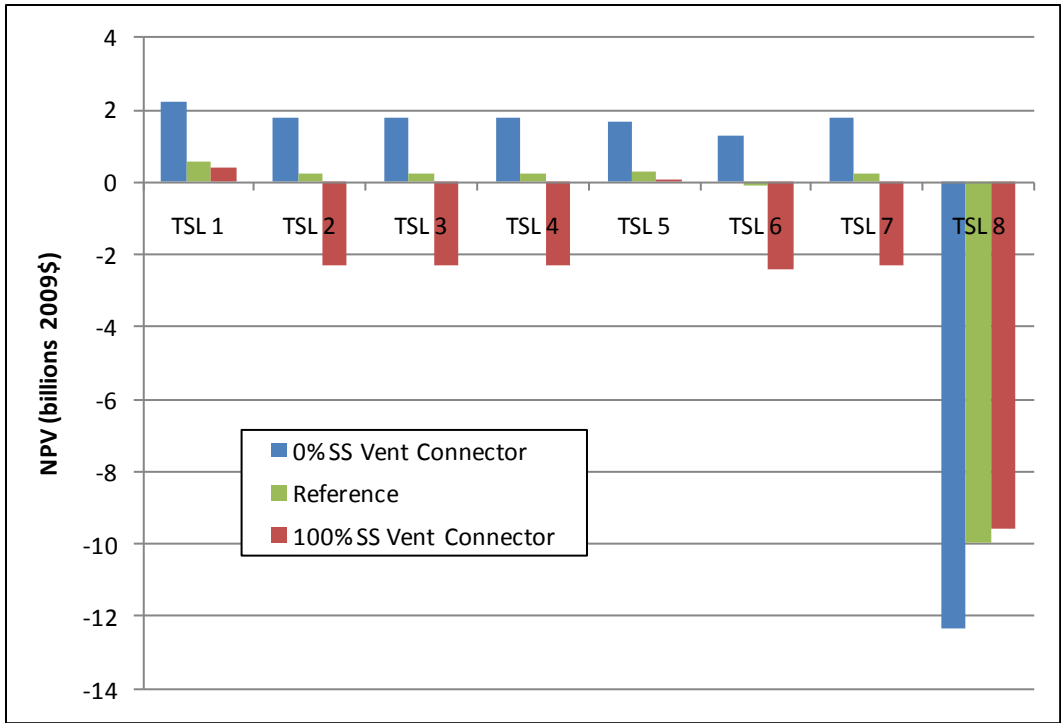


Figure 10-C.3.3 NPV in Gas-Fired Storage Water Heater Comparison of Scenario Results

REFERENCES