
Summary of Proposed Program Modifications to Cascade's Residential Conservation Program

Radiant HVAC System with 90%+ Condensing Tankless Hot Water Delivery: After reviewing Cascade's Conservation Potential Study, the Company has discovered a lost opportunity through "Combo" radiant HVAC systems. This innovative residential measure, which utilizes a high-efficiency condensing tankless water heater as part of a radiant heat/water heat system, mitigates the need for a furnace or duct system, thus providing significant therm savings to homeowners. The Company is proposing a rebate level of **\$800** to help stimulate interest in this high-impact conservation measure.

Wall Insulation: Although wall insulation has the highest therm savings potential of the three insulation types incentivized for in Cascade's Conservation Incentive Program, customers appear reticent to install this measure due to the higher cost and drilling associated with wall insulation retrofits. By raising the wall insulation incentive from **\$.30** sq/ft to **\$.40** sq/ft, the Company believes that customers will have greater motivation to adapt this high-efficiency measure.

90%+ Furnace / PTCS Duct Sealing: Cascade's Program Management Contractors have indicated that the benefits of a high-efficiency (90%+) furnace are more pronounced, and the measures more cost effective, when installed in tandem with PTCS duct sealing. However, the current "duel" rebate of **\$300** amounts to the actual sum of the furnace rebate of **\$150** plus the PTCS duct sealing rebate of **\$150**. This does not provide additional motivation to the customer to install these measures in tandem. By raising the dual 90% Furnace/PTCS Duct Sealing rebate to **\$400**, customers will be encouraged to install these two measures as a set, thus increasing the cost effectiveness and therm savings potential of both measures.

.81 Tankless Water Heaters (new and retrofit): After carefully considering the benefits, drawbacks, and Total Resource Cost of the .81 Tankless Water Heaters, it has been determined that this measure is not cost-effective as a stand-alone incentive and should be removed from program offerings. However, 90%+ condensing tankless water heaters will be allowable when used in tandem with a Radiant HVAC "Combo" system (see above).

2.0 MEF Energy Star Qualified Clothes Washers: While Energy Star clothes washers demonstrate strong energy savings benefits from an electric and water perspective, all three Energy Star efficiency tiers yield minimum therm savings for this measure. These savings, and associated TRC, are well below levels necessary for the measure to be cost effective from a gas utility perspective. The Company remains committed to promoting any state rebates offered for high-efficiency clothes washers, but we are unable to maintain a utility rebate for this measure.

**Cascade Natural Gas Corporation Cost Effectiveness Analysis of Proposed
Residential Program Modifications In Context of 2009 Program Year**

Utility Cost Analysis

MEASURE	ZONE	ANNUAL THERM SAVINGS	MEASURE INSTALLED COST	NON-ENERGY BENEFITS (10% of cost)	MEASURE LIFE	DISCOUNTED THERM SAVINGS	ESTIMATED PROGRAM ADMIN	PROGRAM REBATE	UTILITY COST	UC W/DELIVERY & ADMIN	BENEFIT COST RATIO
90% Furnace & PTCS Duct Sealing	1	173	\$ 1,250.00	\$ 125.00	20	2,316	\$ 949	\$ 400	\$ 0.173	\$ 0.582	4.634
90% Furnace & PTCS Duct Sealing	2	160	\$ 1,250.00	\$ 125.00	20	2,142	\$ 877	\$ 400	\$ 0.187	\$ 0.596	4.286
90% Furnace & PTCS Duct Sealing	3	210	\$ 1,250.00	\$ 125.00	20	2,811	\$ 1,152	\$ 400	\$ 0.142	\$ 0.552	5.625
Wall Insulation R-11+ to fill cavity	1	0.067	\$ 0.66	\$ 0.07	45	1.35	\$ 0.37	\$ 0.40	\$ 0.296	\$ 0.568	2.558
Wall Insulation R-11+ to fill cavity	2	0.065	\$ 0.67	\$ 0.07	45	1.31	\$ 0.36	\$ 0.40	\$ 0.305	\$ 0.577	2.482
Wall Insulation R-11+ to fill cavity	3	0.076	\$ 0.66	\$ 0.07	45	1.53	\$ 0.42	\$ 0.40	\$ 0.261	\$ 0.533	2.902
Radiant HVAC w/ 90%+ Tankless	1	297	\$ 2,500.00	\$ 250.00	25	4,558	\$ 1,629	\$ 800	\$ 0.176	\$ 0.533	4.494
Radiant HVAC w/ 90%+ Tankless	2	288	\$ 2,500.00	\$ 250.00	25	4,419	\$ 1,579	\$ 800	\$ 0.181	\$ 0.538	4.358
Radiant HVAC w/ 90%+ Tankless	3	327	\$ 2,500.00	\$ 250.00	25	5,018	\$ 1,793	\$ 800	\$ 0.159	\$ 0.517	4.948

Total Resource Cost Analysis

MEASURE	ZONE	ANNUAL THERM SAVINGS	MEASURE INSTALLED COST	NON-ENERGY BENEFITS (10% of cost)	MEASURE LIFE	DISCOUNTED THERM SAVINGS	ESTIMATED PROGRAM ADMIN	PROGRAM REBATE	TOTAL RESOURCE COST	TRC W/DELIVERY & ADMIN	BENEFIT COST RATIO
90% Furnace & PTCS Duct Sealing	1	173	\$ 1,250.00	\$ 125.00	20	2,316	\$ 919	\$ 400	\$ 0.486	\$ 0.895	1.648
90% Furnace & PTCS Duct Sealing	2	160	\$ 1,250.00	\$ 125.00	20	2,142	\$ 850	\$ 400	\$ 0.525	\$ 0.935	1.524
90% Furnace & PTCS Duct Sealing	3	210	\$ 1,250.00	\$ 125.00	20	2,811	\$ 1,115	\$ 400	\$ 0.400	\$ 0.810	2.000
Wall Insulation R-11+ to fill cavity	1	0.067	\$ 0.66	\$ 0.07	45	1.35	\$ 0.37	\$ 0.40	\$ 0.443	\$ 0.714	1.711
Wall Insulation R-11+ to fill cavity	2	0.065	\$ 0.67	\$ 0.07	45	1.31	\$ 0.36	\$ 0.40	\$ 0.458	\$ 0.730	1.655
Wall Insulation R-11+ to fill cavity	3	0.076	\$ 0.66	\$ 0.07	45	1.53	\$ 0.42	\$ 0.40	\$ 0.389	\$ 0.661	1.948
Radiant HVAC w/ 90%+ Tankless	1	297	\$ 2,500.00	\$ 250.00	25	4,558	\$ 1,629	\$ 800	\$ 0.494	\$ 0.851	1.598
Radiant HVAC w/ 90%+ Tankless	2	288	\$ 2,500.00	\$ 250.00	25	4,419	\$ 1,579	\$ 800	\$ 0.509	\$ 0.867	1.549
Radiant HVAC w/ 90%+ Tankless	3	327	\$ 2,500.00	\$ 250.00	25	5,018	\$ 1,793	\$ 800	\$ 0.448	\$ 0.806	1.795

Nominal interest rate 7.63%
 Inflation rate 3.32%
 Long term real discount rate 4.17%

2009 Program Budget \$1,348,261
 2009 Therm Target 245,850
 Estimated Program Cost per Therm \$5.48

**Cascade Natural Gas Corporation Cost Effectiveness Analysis
of Proposed Commercial Program Modifications
In Context of 2010 Program Year**

Utility Cost Analysis

MEASURE	ZONE	ANNUAL THERM SAVINGS	MEASURE INSTALLED COST	NON-ENERGY BENEFITS (10% of cost)	MEASURE LIFE	DISCOUNTED THERM SAVINGS	ESTIMATED PROGRAM ADMIN	PROGRAM REBATE	UTILITY COST	UC W/DELIVERY & ADMIN	BENEFIT COST RATIO
90% Furnace & PTCS Duct Sealing	1	173	\$ 1,250.00	\$ 125.00	20	2,316	\$ 779	\$ 400.00	\$ 0.173	\$ 0.509	4.634
90% Furnace & PTCS Duct Sealing	2	160	\$ 1,250.00	\$ 125.00	20	2,142	\$ 720	\$ 400.00	\$ 0.187	\$ 0.523	4.286
90% Furnace & PTCS Duct Sealing	3	210	\$ 1,250.00	\$ 125.00	20	2,811	\$ 946	\$ 400.00	\$ 0.142	\$ 0.479	5.625
Wall Insulation R-11 to fill cavity	1	0.067	\$ 0.66	\$ 0.07	45	1.35	\$ 0.30	\$ 0.40	\$ 0.296	\$ 0.519	2.558
Wall Insulation R-11 to fill cavity	2	0.065	\$ 0.67	\$ 0.07	45	1.31	\$ 0.29	\$ 0.40	\$ 0.305	\$ 0.528	2.482
Wall Insulation R-11 to fill cavity	3	0.076	\$ 0.66	\$ 0.07	45	1.53	\$ 0.34	\$ 0.40	\$ 0.261	\$ 0.484	2.902
Radiant HVAC w/ 90%+ Hot Water delivery	1	297	\$ 2,500.00	\$ 250.00	25	4,558	\$ 1,337.23	\$ 800.00	\$ 0.176	\$ 0.469	4.494
Radiant HVAC w/ 90%+ Hot Water delivery	2	288	\$ 2,500.00	\$ 250.00	25	4,419	\$ 1,296.71	\$ 800.00	\$ 0.181	\$ 0.474	4.358
Radiant HVAC w/ 90%+ Hot Water delivery	3	327	\$ 2,500.00	\$ 250.00	25	5,018	\$ 1,472.30	\$ 800.00	\$ 0.159	\$ 0.453	4.984

Total Resource Cost Analysis

MEASURE	ZONE	ANNUAL THERM SAVINGS	MEASURE INSTALLED COST	NON-ENERGY BENEFITS (10% of cost)	MEASURE LIFE	DISCOUNTED THERM SAVINGS	ESTIMATED PROGRAM ADMIN	PROGRAM REBATE	TOTAL RESOURCE COST	TRC W/DELIVERY & ADMIN	BENEFIT COST RATIO
90% Furnace & PTCS Duct Sealing	1	173	\$ 1,250.00	\$ 125.00	20	2,316	\$ 779	\$ 400.00	\$ 0.486	\$ 0.816	1.648
90% Furnace & PTCS Duct Sealing	2	160	\$ 1,250.00	\$ 125.00	20	2,142	\$ 720	\$ 400.00	\$ 0.525	\$ 0.856	1.524
90% Furnace & PTCS Duct Sealing	3	210	\$ 1,250.00	\$ 125.00	20	2,811	\$ 946	\$ 400.00	\$ 0.400	\$ 0.731	2.000
Wall Insulation R-11 to fill cavity	1	0.067	\$ 0.66	\$ 0.07	45	1.35	\$ 0.30	\$ 0.40	\$ 0.443	\$ 0.666	1.711
Wall Insulation R-11 to fill cavity	2	0.065	\$ 0.67	\$ 0.07	45	1.31	\$ 0.29	\$ 0.40	\$ 0.458	\$ 0.681	1.655
Wall Insulation R-11 to fill cavity	3	0.076	\$ 0.66	\$ 0.07	45	1.53	\$ 0.34	\$ 0.40	\$ 0.389	\$ 0.612	1.984
Radiant HVAC w/ 90%+ Hot Water delivery	1	297	\$ 2,500.00	\$ 250.00	25	4,558	\$ 1,337.23	\$ 800.00	\$ 0.494	\$ 0.787	1.598
Radiant HVAC w/ 90%+ Hot Water delivery	2	288	\$ 2,500.00	\$ 250.00	25	4,419	\$ 1,296.71	\$ 800.00	\$ 0.509	\$ 0.803	1.549
Radiant HVAC w/ 90%+ Hot Water delivery	3	327	\$ 2,500.00	\$ 250.00	25	5,018	\$ 1,472.30	\$ 800.00	\$ 0.448	\$ 0.742	1.759

Nominal interest rate (post tax cost of cap.) 7.63%
 Inflation rate 3.32%
 Long term real discount rate 4.17%

2010 Program Budget \$1,233,439
 2010 Therm Target 273,948
 Estimated Program Cost per Therm \$4.50

**Cascade Natural Gas Corporation Cost Effectiveness Analysis
of Measures Proposed for Elimination**

**Analysis of Measures Within Context
of 2009 Program Year Budget**

MEASURE	ZONE	ANNUAL SAVINGS	MEASURE INSTALLED COST	NON-ENERGY BENEFITS (10% of cost)	MEASURE LIFE	DISC THERM SAVINGS	EST DELIV & ADMIN	PROGRAM REBATE	UTILITY COST	UC W/ ADMIN	BENEFIT COST RATIO	TOTAL RESOURCE COST	TRC & ADMIN	BENEFIT COST RATIO
.81 Tankless Water Heater	1	43	\$ 800.00	\$ 80.00	20	576	\$ 236	\$ 200.00	\$ 0.347	\$ 0.757	2.304	\$ 1.251	\$ 1.660	0.640
.81 Tankless Water Heater	2	43	\$ 800.00	\$ 80.00	20	576	\$ 236	\$ 200.00	\$ 0.347	\$ 0.757	2.304	\$ 1.251	\$ 1.660	0.640
.81 Tankless Water Heater	3	43	\$ 800.00	\$ 80.00	20	576	\$ 236	\$ 200.00	\$ 0.347	\$ 0.757	2.304	\$ 1.251	\$ 1.660	0.640
.81 Tankless U pgrade	1	43	\$ 800.00	\$ 80.00	20	576	\$ 236	\$ 100.00	\$ 0.174	\$ 0.583	4.607	\$ 1.251	\$ 1.660	0.640
.81 Tankless U pgrade	2	43	\$ 800.00	\$ 80.00	20	576	\$ 236	\$ 100.00	\$ 0.174	\$ 0.583	4.607	\$ 1.251	\$ 1.660	0.640
.81 Tankless U pgrade	3	43	\$ 800.00	\$ 80.00	20	576	\$ 236	\$ 100.00	\$ 0.174	\$ 0.583	4.607	\$ 1.251	\$ 1.660	0.640
2.0 MEF E* Clothes Washer	1	6	\$ 113.00	\$ 147.63	12	56	\$ 33	\$ 75.00	\$ 1.345	\$ 1.935	0.637	\$ (0.621)	\$ (0.310)	(1.380)
2.0 MEF E* Clothes Washer	2	6	\$ 113.00	\$ 147.63	12	56	\$ 33	\$ 75.00	\$ 1.345	\$ 1.935	0.637	\$ (0.621)	\$ (0.310)	(1.380)
2.0 MEF E* Clothes Washer	3	6	\$ 113.00	\$ 147.63	12	56	\$ 33	\$ 75.00	\$ 1.345	\$ 1.935	0.637	\$ (0.621)	\$ (0.310)	(1.380)

Nominal interest rate	7.63%
Inflation rate	3.32%
Long term real discount rate	4.17%
2009 Program Budget	\$1,348,261
2009 Therm Target	245,850
Estimated Cost per Therm	\$5.48

**Analysis of Measures
Within Context of 2010
Program Year Budget**

MEASURE	ZONE	ANNUAL SAVINGS	MEASURE INSTALLED COST	NON-ENERGY BENEFITS (10% of cost)	MEASURE LIFE	DISC THERM SAVINGS	EST DELIV & ADMIN	PROGRAM REBATE	UTILITY COST	UC W/ ADMIN	BENEFIT COST RATIO	TOTAL RESOURCE COST	TRC & ADMIN	BENEFIT COST RATIO
.81 Tankless Water Heater	1	43	\$ 800.00	\$ 80.00	20	576	\$ 194	\$ 200.00	\$ 0.347	\$ 0.684	2.304	\$ 1.251	\$ 1.587	0.640
.81 Tankless Water Heater	2	43	\$ 800.00	\$ 80.00	20	576	\$ 194	\$ 200.00	\$ 0.347	\$ 0.684	2.304	\$ 1.251	\$ 1.587	0.640
.81 Tankless Water Heater	3	43	\$ 800.00	\$ 80.00	20	576	\$ 194	\$ 200.00	\$ 0.347	\$ 0.684	2.304	\$ 1.251	\$ 1.587	0.640
.81 Tankless U pgrade	1	43	\$ 800.00	\$ 80.00	20	576	\$ 194	\$ 100.00	\$ 0.174	\$ 0.510	4.607	\$ 1.251	\$ 1.587	0.640
.81 Tankless U pgrade	2	43	\$ 800.00	\$ 80.00	20	576	\$ 194	\$ 100.00	\$ 0.174	\$ 0.510	4.607	\$ 1.251	\$ 1.587	0.640
.81 Tankless U pgrade	3	43	\$ 800.00	\$ 80.00	20	576	\$ 194	\$ 100.00	\$ 0.174	\$ 0.510	4.607	\$ 1.251	\$ 1.587	0.640
2.0 MEF E* Clothes Washer	1	6	\$ 113.00	\$ 147.63	12	56	\$ 27	\$ 75.00	\$ 1.345	\$ 1.830	0.637	\$ (0.621)	\$ (0.137)	(1.380)
2.0 MEF E* Clothes Washer	2	6	\$ 113.00	\$ 147.63	12	56	\$ 27	\$ 75.00	\$ 1.345	\$ 1.830	0.637	\$ (0.621)	\$ (0.137)	(1.380)
2.0 MEF E* Clothes Washer	3	6	\$ 113.00	\$ 147.63	12	56	\$ 27	\$ 75.00	\$ 1.345	\$ 1.830	0.637	\$ (0.621)	\$ (0.137)	(1.380)

Nominal interest rate	7.63%
Inflation rate	3.32%
Long term real discount rate	4.17%
2010 Program Budget	\$1,233,439
2010 Therm Target	273,948
Estimated Cost per Therm	\$4.50