

Utah 2008 Energy Star Home Program Cost Effectiveness

The tables below present the assumptions and cost effectiveness findings of the Utah Residential New Construction Cost/Benefit Analysis for 2008. The revised information is based on the PacifiCorpRNC_42 spreadsheet provided by ECOS. Administrative costs were provided via email dated January 3, 2008.

The 2-year scenario was tested using PacifiCorp's 2007 IRP residential cooling 7% load factor decrement.

Cost Effectiveness Assumptions

The discount rates in Table 1 were obtained from two sources. PacifiCorp's most recent cost of capital from Docket 04-35-42 served as the discount rate. Line losses were taken from the June, 2004 PacifiCorp line loss study. The average 2006 residential rate was used.

Table 1: Inputs

Parameter	Value
Discount Rate	7.126%
Line Loss	8.86%
Residential Energy Rate (\$/kWh)	0.0748
Net-to-Gross ratio	80%

Table 2 presents the program costs and savings for 2008. Table 3 presents the savings, incentives and number of installations by measure for 2008.

Table 2: Program Costs and Savings

Year	Administration		Evaluation	Code Training	Incentives	Inspections	Total Utility Cost	Annual Savings (kWh)
	Program	Utility						
2008	\$791,245	\$30,000	\$60,000	\$40,000	660,397	\$10,000	\$1,591,642	3,561,983

Table 3: 2008 Measure Detail

Measure	Number of Installations	Incentives	Annual Savings (kWh)
Package	2,366	\$344,326	2,500,737
Air Conditioning/Heat pump/Evaporative Cooling	428	\$130,500	153,290
Dishwasher	938	\$9,379	28,137
Lighting	202	\$174,942	875,074
Fans	17	\$1,250	4,745

Results

The cost-effectiveness of the Utah Residential New Construction program was calculated using Quantec’s Demand Impact and Cost Effectiveness model. The model distributes the assumed annual kWh savings across the year based on hourly residential air conditioning, lighting and general household load shapes for Utah. Each of these hourly saving values is multiplied by the associated hourly avoided-costs from PacifiCorp’s IRP decrements. These products are all discounted back to the present (see Table 1). This approach accurately captures the hourly differences in the value of a kWh during the year.

The program is cost effective under all scenarios. Table 4 presents the program cost effectiveness results. Tables 5 – 9 present the cost effectiveness of the individual program measures.

Table 4: IRP 7% Load Factor Decrement

All Measures	AC: IRP 7% LF Decrement				
	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	0.0391	\$1,919,365	\$6,670,937	\$4,751,573	3.476
Total Resource Cost Test (TRC) No Adder	0.0391	\$1,919,365	\$6,064,488	\$4,145,124	3.160
Utility Cost Test (UCT)	0.0303	\$1,485,766	\$6,064,488	\$4,578,722	4.082
Utah Rate Impact Test (URIM)		\$1,698,915	\$6,064,488	\$4,365,573	3.570
Participant Cost Test (PCT)		\$433,598	\$3,515,383	\$3,081,784	8.107
Lifecycle Revenue Impacts (\$/kWh)				(\$0.0000050710)	

Table 5: Measure Detail - Packages

	AC: IRP 7% LF Decrement			
	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$1,418,347	\$5,822,741	\$4,404,394	4.105
Total Resource Cost Test (TRC) No Adder	\$1,418,347	\$5,293,401	\$3,875,054	3.732
Utility Cost Test (UCT)	\$931,724	\$5,293,401	\$4,361,677	5.681
Utah Rate Impact Test (URIM)	\$1,081,368	\$5,293,401	\$4,212,033	4.895
Participant Cost Test (PCT)	\$486,623	\$2,947,590	\$2,460,967	6.057

Table 6: Measure Detail - Air Conditioning/Heat pump/Evaporative Cooling

	AC: IRP 7% LF Decrement			
	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$185,318	\$201,775	\$16,456	1.089
Total Resource Cost Test (TRC) No Adder	\$185,318	\$183,432	(\$1,887)	0.990
Utility Cost Test (UCT)	\$159,229	\$183,432	\$24,202	1.152
Utah Rate Impact Test (URIM)	\$168,402	\$183,432	\$15,029	1.089
Participant Cost Test (PCT)	\$26,089	\$105,356	\$79,267	4.038

Table 7: Measure Detail - Dishwasher

				AC: IRP 7% LF Decrement
	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$24,377	\$22,700	(\$1,677)	0.931
Total Resource Cost Test (TRC) No Adder	\$24,377	\$20,636	(\$3,741)	0.847
Utility Cost Test (UCT)	\$15,622	\$20,636	\$5,014	1.321
Utah Rate Impact Test (URIM)	\$17,306	\$20,636	\$3,331	1.192
Participant Cost Test (PCT)	\$8,755	\$16,422	\$7,667	1.876

Table 8: Measure Detail - Lighting

				AC: IRP 7% LF Decrement
	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$286,103	\$618,471	\$332,368	2.162
Total Resource Cost Test (TRC) No Adder	\$286,103	\$562,246	\$276,144	1.965
Utility Cost Test (UCT)	\$376,866	\$562,246	\$185,380	1.492
Utah Rate Impact Test (URIM)	\$429,230	\$562,246	\$133,016	1.310
Participant Cost Test (PCT)	(\$90,763)	\$443,244	\$534,008	NA

Table 9: Measure Detail - Fans

				AC: IRP 7% LF Decrement
	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$5,219	\$5,250	\$31	1.006
Total Resource Cost Test (TRC) No Adder	\$5,219	\$4,773	(\$447)	0.914
Utility Cost Test (UCT)	\$2,325	\$4,773	\$2,448	2.053
Utah Rate Impact Test (URIM)	\$2,609	\$4,773	\$2,164	1.830
Participant Cost Test (PCT)	\$2,895	\$2,769	(\$125)	0.957