Date: **April 6, 2008**

To: **Jim Gilroy**

From: **Brian Hedman**

Re: **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_45 spreadsheet provided by ECOS. Administrative costs were provided via email dated January 3, 2008.

The 2008 program 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 2007 residential rate was used.

Table 1: Inputs

Parameter	Value
Discount Rate	7.126%
Line Loss	8.86%
Residential Energy Rate ($/kWh)	0.0822
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
	Program	Utility						(kWh)
2008	$791,245	$30,000	$60,000	$40,000	$574,640	$10,000	$1,505,885	3,470,668

Table 3: 2008 Measure Detail

Measure	Number of Installations	Incentives	Annual Savings (kWh)
Package	2,392	$344,326	2,512,219
Air Conditioning/Heat pump/Evaporative Cooling	160	$43,900	37,870
Dishwasher	938	$9,379	28,137
Lighting	194	$175,785	887,698
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 their respective PacifiCorp 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					
	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	0.0515	$2,068,640	$5,628,832	$3,560,192	2.721
Total Resource Cost Test (TRC) No Adder	0.0515	$2,068,640	$5,117,120	$3,048,480	2.474
Utility Cost Test (UCT)	0.0350	$1,405,714	$5,117,120	$3,711,406	3.640
Utah Rate Impact Test (URIM)		$1,633,945	$5,117,120	$3,483,175	3.132
Participant Cost Test (PCT)		$662,926	$3,419,891	$2,756,965	5.159
Lifecycle Revenue Impacts ($/kWh)				($0.0000040460)	

Table 5: Measure Detail - Packages

			AC: IRP 7% LF Decrement	
	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	$1,639,291	$5,164,835	$3,525,544	3.151
Total Resource Cost Test (TRC) No Adder	$1,639,291	$4,695,305	$3,056,013	2.864
Utility Cost Test (UCT)	$950,657	$4,695,305	$3,744,647	4.939
Utah Rate Impact Test (URIM)	$1,115,861	$4,695,305	$3,579,444	4.208
Participant Cost Test (PCT)	$688,634	$2,876,076	$2,187,442	4.176

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	$101,096	$49,848	($51,248)	0.493
Total Resource Cost Test (TRC) No Adder	$101,096	$45,316	($55,780)	0.448
Utility Cost Test (UCT)	$70,329	$45,316	($25,012)	0.644
Utah Rate Impact Test (URIM)	$72,819	$45,316	($27,503)	0.622
Participant Cost Test (PCT)	$30,768	$28,603	($2,164)	0.930

Table 7: Measure Detail - Dishwasher

			AC: IRP 46% LF Decrement	
	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	$193,929	$14,321	($179,607)	0.074
Total Resource Cost Test (TRC) No Adder	$193,929	$13,019	($180,909)	0.067
Utility Cost Test (UCT)	$180,796	$13,019	($167,777)	0.072
Utah Rate Impact Test (URIM)	$182,646	$13,019	($169,627)	0.071
Participant Cost Test (PCT)	$13,133	$18,047	$4,914	1.374

Table 8: Measure Detail - Lighting

			AC: IRP 60% LF Decrement	
	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	$126,129	$394,577	$268,449	3.128
Total Resource Cost Test (TRC) No Adder	$126,129	$358,707	$232,578	2.844
Utility Cost Test (UCT)	$199,647	$358,707	$159,060	1.797
Utah Rate Impact Test (URIM)	$258,022	$358,707	$100,685	1.390
Participant Cost Test (PCT)	($73,518)	$494,121	$567,639	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	$8,195	$5,250	($2,945)	0.641
Total Resource Cost Test (TRC) No Adder	$8,195	$4,773	($3,422)	0.582
Utility Cost Test (UCT)	$4,285	$4,773	$488	1.114
Utah Rate Impact Test (URIM)	$4,597	$4,773	$176	1.038
Participant Cost Test (PCT)	$3,910	$3,043	($867)	0.778