



1375 Walnut Street
Suite 200
Boulder CO 80302
303.728.2500 phone
303.728.2501 fax

Memorandum

To: [REDACTED] PacifiCorp/Rocky Mountain Power
From: [REDACTED] Navigant
Date: January 6, 2016
Re: Cost Effectiveness for the See Ya Later Refrigerator Program - Utah

Navigant has developed this memo in response to PacifiCorp's proposed See Ya Later Refrigerator Program cost effectiveness modeling needs in the state of Utah.

This memo presents the cost effectiveness results of individual analysis runs for the state of Utah. Each scenario is analyzed using modeled assumptions provided by PacifiCorp. These scenarios utilize the following assumptions:

- **Avoided Costs:** Navigant utilized the "East" 71% Plug Loads decrement provided in the 2015 PacifiCorp Integrated Resource Plan along with the Utah Residential Plug load shape to calculate avoided costs.
- **Modeling Inputs:** Navigant utilized per unit measure savings provided by PacifiCorp in the file *SYLR RFP C-E Inputs.xlsx*.
- **Energy Rates:** Navigant utilized the 2014 rates provided by PacifiCorp and applied an escalation of 1.9% to arrive at estimated rates for PY2016.
- **Line Loss Factors:** Navigant utilized the residential line loss factor throughout the analysis.
- **Evaluation Period:** The evaluation period for this analysis includes only 2016.
- **Sensitivities:** Navigant ran a sensitivity analysis for a High (+10%), Expected, and Low (-10%) scenario by applying +10%, 0%, and -10% to the per unit savings.

This memo will begin by addressing the inputs used in the analysis of the Utah See Ya Later Program. The cost-effectiveness inputs are as follows:

Table 1 – SYLR Inputs

Parameter	Value
Discount Rate	6.66%
Residential Line Loss	9.32%
Residential Energy Rate (\$/kWh)	\$0.1126
Inflation Rate ¹	1.90%

¹ Future rates determined using a 1.9% annual escalator.

Table 2 – SYLR Annual Program Costs (All Sensitivities)

Measure Group	Internal Admin (per unit)	Unit Labor + Admin (per unit)	Incentives	Total Utility Costs (per unit)	Gross Customer Costs
Residential and Business Pick-Up	\$7.43	\$119.98	\$30.00	\$157.41	\$0.00

Table 3 – SYLR Savings by Measure Category

Measure Group	Sensitivity	Gross kWh Savings (per unit)	Realization Rate	Adjusted Gross kWh Savings (per unit)	Net to Gross Ratio	Net kWh Savings (per unit)	Measure Life
Residential and Business Pick-Up	High (+10%)	1,269	100%	1,269	42%	533	6
Residential and Business Pick-Up	Expected	1,153	100%	1,153	42%	484	6
Residential and Business Pick-Up	Low (-10%)	1,038	100%	1,038	42%	436	6

Table 4 – SYLR Participation by Measure Category

Measure Group	Annual Units
Residential and business pick-up and recycle 1st refrigerator/freezer	9250
Residential and business pick-up and recycle 2nd refrigerator/freezer	750

The PY2016 cost/benefits results at the program level are as follows:

Table 5 – SYLR Level Cost-Effectiveness Results (Residential and Business Pick-Up) – High (+10%)

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0578	\$1,574,073	\$1,332,268	-\$241,805	0.85
Total Resource Cost Test (TRC) No Adder	\$0.0578	\$1,574,073	\$1,211,152	-\$362,921	0.77
Utility Cost Test (UCT)	\$0.0578	\$1,574,073	\$1,211,152	-\$362,921	0.77
Rate Impact Test (RIM)		\$4,855,409	\$1,211,152	-\$3,644,256	0.25
Participant Cost Test (PCT)		\$0	\$8,111,801	\$8,111,801	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.000024128

Table 6 – SYLR Level Cost-Effectiveness Results (Residential and Business Pick-Up) – Expected

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0635	\$1,574,073	\$1,211,152	-\$362,921	0.77
Total Resource Cost Test (TRC) No Adder	\$0.0635	\$1,574,073	\$1,101,048	-\$473,025	0.70
Utility Cost Test (UCT)	\$0.0635	\$1,574,073	\$1,101,048	-\$473,025	0.70
Rate Impact Test (RIM)		\$4,557,105	\$1,101,048	-\$3,456,058	0.24
Participant Cost Test (PCT)		\$0	\$7,401,637	\$7,401,637	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.000022882

Table 7 – SYLR Level Cost-Effectiveness Results (Residential and Business Pick-Up) – Low (-10%)

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0706	\$1,574,073	\$1,090,037	-\$484,036	0.69
Total Resource Cost Test (TRC) No Adder	\$0.0706	\$1,574,073	\$990,943	-\$583,130	0.63
Utility Cost Test (UCT)	\$0.0706	\$1,574,073	\$990,943	-\$583,130	0.63
Rate Impact Test (RIM)		\$4,258,802	\$990,943	-\$3,267,859	0.23
Participant Cost Test (PCT)		\$0	\$6,691,473	\$6,691,473	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.000021636