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| To: | Don Jones Jr., PacifiCorp/Rocky Mountain Power |
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| From: | David Basak, Navigant |
|  |  |
| Date: | September 10, 2015 |
|  |  |
| Re: | Cost Effectiveness for the See Ya Later Refrigerator Program - Washington |

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

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

* ***Avoided Costs:*** Navigant utilized the “West” 61% Plug Loads decrement provided in the 2015 PacifiCorp Integrated Resource Plan along with the Washington Residential Plug load shape to calculate avoided costs.
* ***Modeling Inputs:*** Navigant utilized individual measure savings provided by PacifiCorp in the file *NTG method for PC.xlsx* and *JACO 2015 Pricing Oct-2014.pdf*.
* ***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 uses program year 2016 as year one.

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

Table 1 – SYLR Inputs

|  |  |
| --- | --- |
| **Parameter** | **Value** |
| Discount Rate | 6.66% |
| Residential Line Loss | 9.67% |
| Residential Energy Rate ($/kWh) | $0.0873 |
| Inflation Rate¹ | 1.90% |
| ¹ Future rates determined using a 1.9% annual escalator. | |

Table 2 – SYLR Annual Program Costs

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Measure Group** | **Unit Marketing** | **Unit Labor / Admin** | **Incentives** | **Total Utility Costs** | **Gross Customer Costs** |
| Refrigerator – res/business pick- up | $25.00 | $78.00 | $30.00 | $133.00 | $0.00 |
| Freezer – res/business pick-up | $25.00 | $78.00 | $30.00 | $133.00 | $0.00 |
| Refrigerator – retailer pick-up | $0.00 | $72.00 | $20.00 | $92.00 | $0.00 |
| Freezer – retailer pick-up | $0.00 | $72.00 | $20.00 | $92.00 | $0.00 |
| Refrigerator – retailer pick-up – RTF for would be acquirer | $0.00 | $72.00 | $20.00 | $92.00 | $0.00 |

Table 3 – SYLR Savings by Measure Category

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Measure Group** | **Gross kWh Savings** | **Realization Rate** | **Adjusted Gross kWh Savings** | **Net to Gross Ratio** | **Net kWh Savings** | **Measure Life** |
| Refrigerator – res/business pick- up | 1,112 | 100% | 1,112 | 30% | 328 | 6 |
| Freezer – res/business pick-up | 964 | 100% | 964 | 33% | 321 | 5 |
| Refrigerator – retailer pick-up | 1,112 | 100% | 1,112 | 30% | 328 | 6 |
| Freezer – retailer pick-up | 964 | 100% | 964 | 33% | 321 | 5 |
| Refrigerator – retailer pick-up – RTF for would be acquirer | 1,112 | 100% | 1,112 | 27% | 299 | 6 |

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

Table 4 – SYLR Level Cost-Effectiveness Results (Refrigerator – res/business pick- up)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Cost-Effectiveness Test** | **Levelized $/kWh** | **Costs** | **Benefits** | **Net Benefits** | **Benefit/Cost Ratio** |
| Total Resource Cost Test (PTRC) + Conversation Adder | $0.0793 | $133 | $108 | -$25 | 0.81 |
| Total Resource Cost Test (TRC) No Adder | $0.0793 | $133 | $98 | -$35 | 0.74 |
| Utility Cost Test (UCT) | $0.0793 | $133 | $98 | -$35 | 0.74 |
| Rate Impact Test (RIM) |  | $290 | $98 | -$192 | 0.34 |
| Participant Cost Test (PCT) |  | $0 | $561 | $561 | n/a |
| Lifecycle Revenue Impacts ($/kWh) | $0.000000008 | | | | |

Table 5 – SYLR Level Cost-Effectiveness Results (Freezer – res/business pick-up)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Cost-Effectiveness Test** | **Levelized $/kWh** | **Costs** | **Benefits** | **Net Benefits** | **Benefit/Cost Ratio** |
| Total Resource Cost Test (PTRC) + Conversation Adder | $0.0951 | $133 | $89 | -$44 | 0.67 |
| Total Resource Cost Test (TRC) No Adder | $0.0951 | $133 | $80 | -$53 | 0.60 |
| Utility Cost Test (UCT) | $0.0951 | $133 | $80 | -$53 | 0.60 |
| Rate Impact Test (RIM) |  | $264 | $80 | -$183 | 0.31 |
| Participant Cost Test (PCT) |  | $0 | $422 | $422 | n/a |
| Lifecycle Revenue Impacts ($/kWh) | $0.000000009 | | | | |

Table 6 – SYLR Level Cost-Effectiveness Results (Refrigerator – retailer pick-up)

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| --- | --- | --- | --- | --- | --- |
| **Cost-Effectiveness Test** | **Levelized $/kWh** | **Costs** | **Benefits** | **Net Benefits** | **Benefit/Cost Ratio** |
| Total Resource Cost Test (PTRC) + Conversation Adder | $0.0548 | $92 | $108 | $16 | 1.17 |
| Total Resource Cost Test (TRC) No Adder | $0.0548 | $92 | $98 | $6 | 1.06 |
| Utility Cost Test (UCT) | $0.0548 | $92 | $98 | $6 | 1.06 |
| Rate Impact Test (RIM) |  | $249 | $98 | -$151 | 0.39 |
| Participant Cost Test (PCT) |  | $0 | $551 | $551 | n/a |
| Lifecycle Revenue Impacts ($/kWh) | $0.000000006 | | | | |

Table 7 – SYLR Level Cost-Effectiveness Results (Freezer – retailer pick-up)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Cost-Effectiveness Test** | **Levelized $/kWh** | **Costs** | **Benefits** | **Net Benefits** | **Benefit/Cost Ratio** |
| Total Resource Cost Test (PTRC) + Conversation Adder | $0.0658 | $92 | $89 | -$3 | 0.96 |
| Total Resource Cost Test (TRC) No Adder | $0.0658 | $92 | $80 | -$12 | 0.87 |
| Utility Cost Test (UCT) | $0.0658 | $92 | $80 | -$12 | 0.87 |
| Rate Impact Test (RIM) |  | $223 | $80 | -$142 | 0.36 |
| Participant Cost Test (PCT) |  | $0 | $412 | $412 | n/a |
| Lifecycle Revenue Impacts ($/kWh) | $0.000000007 | | | | |

Table 8 – SYLR Level Cost-Effectiveness Results (Refrigerator – retailer pick-up – RTF for would be acquirer)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Cost-Effectiveness Test** | **Levelized $/kWh** | **Costs** | **Benefits** | **Net Benefits** | **Benefit/Cost Ratio** |
| Total Resource Cost Test (PTRC) + Conversation Adder | $0.0602 | $92 | $98 | $6 | 1.07 |
| Total Resource Cost Test (TRC) No Adder | $0.0602 | $92 | $89 | -$3 | 0.97 |
| Utility Cost Test (UCT) | $0.0602 | $92 | $89 | -$3 | 0.97 |
| Rate Impact Test (RIM) |  | $235 | $89 | -$146 | 0.38 |
| Participant Cost Test (PCT) |  | $0 | $551 | $551 | n/a |
| Lifecycle Revenue Impacts ($/kWh) | $0.000000006 | | | | |