e-FILING REPORT COVER SHEET

Send completed Cover Sheet and the Report in an email addressed to:
PUC.FilingCenter@state.or.us

REPORT NAME: Biennial Greenhouse Gas Emissions Rate Impact Report

COMPANY NAME: Pacific Power

DOES REPORT CONTAIN CONFIDENTIAL INFORMATION? ☐No ☒Yes

If yes, please submit only the cover letter electronically. Submit confidential information as directed in OAR 860-001-0070 or the terms of an applicable protective order.

If known, please select designation: ☒RE (Electric) ☐RG (Gas) ☐RW (Water) ☐RO (Other)

Report is required by: ☒OAR 860-085-0050
☐Statute
☐Order
☐Other

Is this report associated with a specific docket/case? ☐No ☒Yes

If yes, enter docket number: RE-84

List applicable Key Words for this report to facilitate electronic search:
Greenhouse Gas Emissions Rate Impact Report

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- OUS or RSPF Surcharge form or surcharge remittance or
- Any other Telecommunications Reporting or
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- Accident reports required by ORS 654.715

Please file the above reports according to their individual instructions.

PACIFIC POWER
A DIVISION OF PACIFICORP

825 NE Multnomah, Suite 2000
Portland, Oregon 97232

June 29, 2016

VIA ELECTRONIC FILING
AND OVERNIGHT DELIVERY

Public Utility Commission of Oregon
201 High Street SE, Suite 100
Salem, OR 97301-1166

Attention: Filing Center

Re: RE 84 – Biennial Greenhouse Gas Emissions Rate Impact Report

Pursuant to OAR 860-085-0050, PacifiCorp d/b/a Pacific Power (Company) hereby submits for filing its Biennial Greenhouse Gas Emissions Rate Impact Report.

The confidential information in this report is provided under separate cover per OAR 860-001-0070.

It is respectfully requested that all formal data requests regarding this filing be addressed to:

By e-mail (preferred): datarequest@pacificorp.com

By regular mail: Data Request Response Center
PacifiCorp
825 NE Multnomah, Suite 2000
Portland, Oregon 97232

Informal inquiries regarding this filing may be directed to Natasha Siores at (503) 813-6583.

Sincerely,

R Bryce Dalley /ncs

R. Bryce Dalley
Vice President, Regulation

Enclosures

PACIFICORP
A MIDAMERICAN ENERGY HOLDINGS COMPANY

Rate Impacts of Meeting Oregon Senate Bill 101 Carbon Dioxide Emission Goals

July 1, 2016

STUDY DESIGN

PacifiCorp conducted its analysis of Oregon Senate Bill (SB) 101 using its capacity expansion optimization model, System Optimizer (SO), to develop a base resource portfolio and two resource portfolios that result in reductions of CO_2 emissions that are 10 percent below 1990 levels by 2020 and 15 percent below 2005 levels by 2020. To develop the two portfolios that achieve targeted CO_2 emission reductions , the SO model was set up with annual CO_2 emissions hard caps that constrain the model to solve for the least-cost resource, dispatch and expansion plan that does not exceed the physical CO_2 emission limits across PacifiCorp's multi-state system in each year of the simulation. Portfolio costs from the SO model studies were used in a revenue requirement model to calculate estimates of rate impacts associated with achieving the targeted CO_2 emission reductions.

PacifiCorp initiated its analysis from its 2015 Integrated Resource Plan Update (2015 IRP Update), updated to reflect the most recent official forward price curve dated March 31, 2016. The 2015 IRP Update portfolio was re-optimized to account for the impact of updated market prices, and the re-optimized portfolio is used as the base portfolio. Potential expansion resource options available in the current study are the same as those used in the development of the 2015 IRP Update. No retirements and/or conversions of coal units to operate as natural gas fired facilities beyond those assumed in the 2015 IRP Update are included in the analysis. Consistent with the approach in PacifiCorp's 2014 filing, resources that are not currently commercially available or financially viable are not included in the resource portfolios during the 2016 through 2020 study period covered by this analysis.

ASSUMPTIONS

Table 1 - Study Assumptions

Assumption	Base Case	Hard Cap Scenarios	Comments
Revenue requirement forecast	[redacted]		Fall 2015 ten-year business plan[1] forecast of multi-state process base line revenue requirement (millions of dollars).
Oregon customer forecast	2016 2017 2018 2019 2020	568,918 571,840 574,698 577,492 580,243	Fall 2015 ten-year business plan annual forecast of Oregon customers.
CO_2: 1990 baseline emissions	N/A	• Emissions from owned generation per actual 1990 CO_2 emissions from fossil units. • Emissions from 1990 market purchases are estimated assuming a CO_2 emission rate of 900 lbs/MWh.	The 1990 CO_2 emissions baseline accounts for sale of Centralia and changes in other ownership positions. The emission rate for market purchases reflects Oregon Commission Staff study preparation guidelines.
CO_2: 2005 baseline emissions	N/A	• Emissions for owned generation and purchases per 2005 California Climate Action Registry (CCAR) filing. • CO_2 emissions from market purchases are estimated assuming a CO_2 emission rate of 900 lbs/MWh.	The emission rate for market purchases reflects Oregon Commission Staff study preparation guidelines.

[1] The 2015 ten-year business plan, which covers the 2016 to 2025 planning horizon, was finalized in the fall of 2015.

<table>
<tr><th>Assumption</th><th>Base Case</th><th>Hard Cap Scenarios</th><th>Comments</th></tr>
<tr><td>CO_2: yearly emissions targets</td><td>N/A</td><td>Modeled as annual emission limits starting 2016.
Annual Emission Limits
(thousands of tons)
<table><tr><th>Year</th><th>Scenario 1 (1990)</th><th>Scenario 2 (2005)</th></tr><tr><td>2016</td><td>51,398</td><td>52,933</td></tr><tr><td>2017</td><td>49,486</td><td>52,557</td></tr><tr><td>2018</td><td>47,573</td><td>52,180</td></tr><tr><td>2019</td><td>45,661</td><td>51,803</td></tr><tr><td>2020</td><td>44,890</td><td>51,800</td></tr></table></td><td>2016 starting value for scenarios is the sum of generator and purchases emissions from the Base Case.

Yearly targets represent a linear reduction from 2016 values to the 2020 target.
• Scenario 1 is based on Oregon HB 3543 emission level targets (10 percent below 1990 levels).
• Scenario 2 reflects Western Climate Initiative (WCI) emission targets (15 percent below 2005 levels).</td></tr>
<tr><td>Existing and expansion resources</td><td colspan="2">Existing and expansion resources have CO_2 emission assumptions specific to the particular technology of each resource.</td><td></td></tr>
<tr><td>Market sales and purchases</td><td colspan="2">Market purchases have a CO_2 emission rate of 900 lbs/MWh.</td><td></td></tr>
</table>

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STUDY RESULTS

Estimated Revenue Requirement Impacts

Table 2 presents the estimated customer impact for the study period of 2016 through 2020, on a total and average annual basis for the two scenarios: Scenario 1 (10 percent below 1990 levels by 2020), and Scenario 2 (15 percent below 2005 levels by 2020). The baseline revenue requirement forecast is based on the Company's 2015 ten-year business plan. The determination of customer impact assumes that all costs incurred to reach the Oregon goals set in Scenario 1 and Scenario 2 would be recovered from customers in Oregon. Appendix A provides a line item breakdown of portfolio costs from the SO model. Note that these rate impacts do not include potential costs associated with failing to meet applicable minimum-take provisions in the Company's coal supply contracts when coal generation is potentially reduced beyond the minimum-take levels.

Table 2 – Customer Impact of Scenarios 1 and 2

		Scenario 1	Scenario 2
Customer Impact (%)	2014-2020	0.38%	0.00%
	Average Annual	0.08%	0.00%
Customer Impact ($/customer)	2014-2020	$33.39	$0.04
	Average Annual	$6.68	$0.01

Portfolio Resource Selection and Utilization

Tables 3 through 5 report the resources in each of the three portfolios (Base, Scenario 1, and Scenario 2). Tables 6 and 7 summarize differences between portfolios by year and cumulative differences in resources over the seven-year study period.

Model results show that the CO_2 emission reduction goals for Scenarios 1 and 2 are met largely through changes in the dispatch of existing and expansion resources along with incremental acquisition of demand side management (DSM) resources and front office transactions (FOTs).

Coal and gas units are dispatched economically by the model subject to the system-wide CO_2 emission constraints. As expected, average coal unit capacity factors are lower in the scenario studies than in the base study. Table 8 shows simple average annual capacity factors for coal resources and CCCT resources.

Table 3 - Base Resource Portfolio (MW)

	Resource	2016	2017	2018	2019	2020	Resource Totals 1/ 5-year
East	**Existing Plant Retirements/Conversions**						
	Naughton 3 (Coal Early Retirement/Conversions)	-	-	(280)	-	-	(280)
	Expansion Resources						
	DSM, Class 2, ID	3	3	4	4	3	18
	DSM, Class 2, UT	74	81	78	84	73	391
	DSM, Class 2, WY	7	7	8	10	9	41
	DSM, Class 2 Total	83	92	91	98	85	449
	FOT Mona Q3	-	-	-	129	103	47
West	**Expansion Resources**						
	DSM, Class 2, CA	1	2	2	2	1	7
	DSM, Class 2, OR	36	37	26	23	21	144
	DSM, Class 2, WA	8	8	8	8	6	38
	DSM, Class 2 Total	45	47	36	33	29	189
	FOT COB Q3	28	-	230	268	268	159
	FOT MidColumbia Q3	400	400	400	400	400	400
	FOT MidColumbia Q3 - 2	375	348	375	375	375	370
	FOT NOB Q3	100	-	100	100	100	80
	Existing Plant Retirements/Conversions	-	-	(280)	-	-	
	Annual Additions, Long Term Resources	128	138	126	132	114	
	Annual Additions, Short Term Resources	903	748	1,105	1,272	1,246	
	Total Annual Additions	1,031	886	1,231	1,404	1,360	

1/ Yearly Front Office Transaction (FOT) amounts reflect one-year transaction periods and are not additive. Total FOTs are reported as an average over the reporting period 2016-2020.

Table 4 - Scenario 1 Portfolio (MW)

(90 percent of 1990 CO_2 Emissions)

	Resource	2016	2017	2018	2019	2020	Resource Totals 1/ 5-year
East	**Existing Plant Retirements/Conversions**						
	Naughton 3 (Coal Early Retirement/Conversions)	-	-	(280)	-	-	(280)
	Expansion Resources						
	DSM, Class 2, ID	3	3	4	5	4	19
	DSM, Class 2, UT	74	81	78	84	73	391
	DSM, Class 2, WY	7	7	8	10	11	43
	DSM, Class 2 Total	83	92	91	99	88	452
	FOT Mona Q3	-	-	-	129	101	46
West	**Expansion Resources**						
	DSM, Class 2, CA	1	2	2	2	1	8
	DSM, Class 2, OR	36	37	26	23	21	144
	DSM, Class 2, WA	8	8	8	8	6	38
	DSM, Class 2 Total	45	47	36	33	29	190
	FOT COB Q3	28	-	230	268	268	159
	FOT MidColumbia Q3	400	400	400	400	400	400
	FOT MidColumbia Q3 - 2	375	248	375	375	375	350
	FOT NOB Q3	100	100	100	100	100	100
	Existing Plant Retirements/Conversions	-	-	(280)	-	-	
	Annual Additions, Long Term Resources	128	138	126	132	116	
	Annual Additions, Short Term Resources	903	748	1,105	1,272	1,244	
	Total Annual Additions	1,031	886	1,231	1,404	1,361	

1/ Yearly Front Office Transaction (FOT) amounts reflect one-year transaction periods and are not additive. Total FOTs are reported as an average over the reporting period 2016-2020.

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Table 5 - Scenario 2 Portfolio (MW)

(85 percent of 2005 CO_2 Emissions)

	Resource	2016	2017	2018	2019	2020	Resource Totals 1/ 5-year
East	**Existing Plant Retirements/Conversions**						
	Naughton 3 (Coal Early Retirement/Conversions)	-	-	(280)	-	-	(280)
	Expansion Resources						
	DSM, Class 2, ID	3	3	4	4	3	18
	DSM, Class 2, UT	74	81	78	84	73	391
	DSM, Class 2, WY	7	7	8	10	9	41
	DSM, Class 2 Total	83	92	91	98	85	449
	FOT Mona Q3	-	-	-	129	103	46
West	**Expansion Resources**						
	DSM, Class 2, CA	1	2	2	2	1	8
	DSM, Class 2, OR	36	37	26	23	21	144
	DSM, Class 2, WA	8	8	8	8	6	38
	DSM, Class 2 Total	45	47	36	33	29	190
	FOT COB Q3	28	-	230	268	268	159
	FOT MidColumbia Q3	400	400	400	400	400	400
	FOT MidColumbia Q3 - 2	375	348	375	375	375	370
	FOT NOB Q3	100	-	100	100	100	80
	Existing Plant Retirements/Conversions	-	-	(280)	-	-	
	Annual Additions, Long Term Resources	128	138	126	132	114	
	Annual Additions, Short Term Resources	903	748	1,105	1,272	1,246	
	Total Annual Additions	1,031	886	1,231	1,404	1,360	

1/ Yearly Front Office Transaction (FOT) amounts reflect one-year transaction periods and are not additive. Total FOTs are reported as an average over the reporting period 2016-2020.

Table 6 - Resource Differences, Scenario 1 Portfolio minus Base Portfolio (MW)

	Resource	2016	2017	2018	2019	2020	Resource Totals 1/ 5-year
East	**Existing Plant Retirements/Conversions**						
	Expansion Resources						
	DSM, Class 2, ID	-	-	-	0.5	0.5	0.9
	DSM, Class 2, WY	-	-	-	-	2.0	2.0
	DSM, Class 2 Total	-	-	-	0.5	2.4	2.9
	FOT Mona Q3	-	-	-	(0)	(2)	(0)
West	**Existing Plant Retirements/Conversions**						
	Expansion Resources						
	DSM, Class 2, CA	-	-	0.1	-	-	0.1
	DSM, Class 2, OR	-	-	-	-	-	-
	DSM, Class 2 Total	-	-	0.1	-	-	0.1
	FOT COB Q3	-	-	(0)	-	-	(0)
	FOT MidColumbia Q3 - 2	-	(100)	-	-	-	(20)
	FOT NOB Q3	-	100	-	-	-	20
	Annual Additions, Long Term Resources	-	-	0	0	2	
	Annual Additions, Short Term Resources	-	0	(0)	(0)	(2)	
	Total Annual Additions	-	0	0	0	0	

1/ Yearly Front Office Transaction (FOT) amounts reflect one-year transaction periods and are not additive. Total FOTs are reported as an average over the reporting period 2016-2020.

Table 7 - Resource Differences, Scenario 2 Portfolio minus Base Portfolio (MW)

	Resource	2016	2017	2018	2019	2020	Resource Totals 1/ 5-year
East	**Existing Plant Retirements/Conversions**						
	Expansion Resources						
	DSM, Class 2, WY	-	-	-	-	-	-
	DSM, Class 2 Total	-	-	-	-	-	-
	FOT Mona Q3	-	-	-	(0)	(0)	(0)
West	**Existing Plant Retirements/Conversions**						
	Expansion Resources						
	DSM, Class 2, CA	-	-	0.1	-	-	0.1
	DSM, Class 2, OR	-	-	-	-	-	-
	DSM, Class 2 Total	-	-	0.1	-	-	0.1
	FOT COB Q3	-	-	(0)	-	-	(0)
	Annual Additions, Long Term Resources	-	-	0	0	-	
	Annual Additions, Short Term Resources	-	-	(0)	(0)	(0)	
	Total Annual Additions	-	-	0	(0)	(0)	

1/ Yearly Front Office Transaction (FOT) amounts reflect one-year transaction periods and are not additive. Total FOTs are reported as an average over the reporting period 2016-2020.

Table 8 - Average Annual Capacity Factors for Coal and Gas Resources (%)

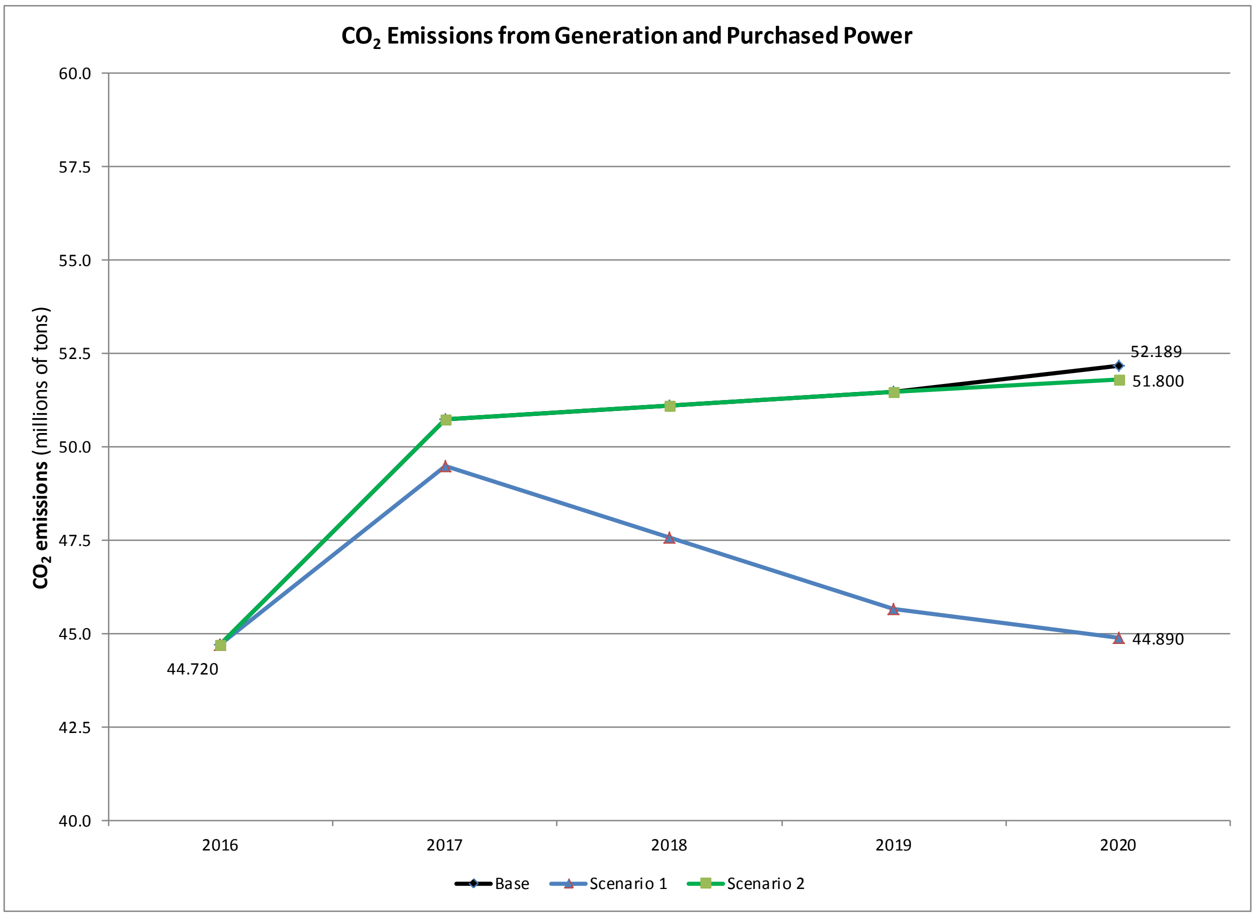
Coal Resources	2016	2017	2018	2019	2020
Base	48.5	65.4	68.5	67.9	69.5
Scenario 1	48.5	64.8	66.9	62.3	61.3
Scenario 2	48.5	65.4	68.5	67.9	69.4

CCCT resources	2016	2017	2018	2019	2020
Base	73.7	43.9	47.5	49.2	48.5
Scenario 1	73.7	45.1	48.9	53.8	48.8
Scenario 2	73.7	43.9	47.5	49.2	48.6

Carbon Dioxide Emissions

For portfolio development, the annual emission reduction levels serve as upper-bound constraints on the sum of emissions from owned generation and purchased power. CO_2 emissions are capped every year to reach the required levels by 2020. Figure 1 shows the CO_2 emission levels for the base case and CO_2 reduction scenarios. Credits from wholesale sales are not included.

Figure 1 - CO_2 Emissions



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Appendix A

Scenario PVRR Costs and Comparisons to the Base (System Optimizer Model Output)

5-year PVRR @ 6.66%

Cost Components (millions)	Base	Scenario 1	Scenario 2
Existing Station Fuel Costs	$ 1,746	$ 2,141	$ 1,760
Existing Station Variable O&M Costs	$ 2,612	$ 2,080	$ 2,597
Existing Station Emission Costs	$ -	$ -	$ -
Existing Station Dispatch Adder Costs	$ -	$ -	$ -
Existing Price Station Contract Costs	$ 10	$ 10	$ 10
Existing Station Fixed Costs	$ 2,031	$ 2,031	$ 2,031
Existing Station Demand Charges	$ -	$ -	$ -
Existing Station Decomm. Costs	$ 47	$ 47	$ 47
Proposed Station Fuel Costs	$ 158	$ 158	$ 158
Proposed Station Variable O&M Costs	$ 7	$ 7	$ 7
Proposed Station Emission Costs	$ -	$ -	$ -
Proposed Station Dispatch Adder Costs	$ -	$ -	$ -
Proposed Price Station Contract Costs	$ -	$ -	$ -
Proposed Station Fixed Costs	$ -	$ -	$ -
Proposed Station Demand Charges	$ -	$ -	$ -
Proposed Station Capital Costs	$ -	$ -	$ -
Station Total Costs	**$ 6,611**	**$ 6,474**	**$ 6,609**
Existing Transmission Variable Costs	$ -	$ -	$ -
Existing Transmission Fixed Costs	$ -	$ -	$ -
Proposed Transmission Variable Costs	$ -	$ -	$ -
Proposed Transmission Fixed Costs	$ -	$ -	$ -
Proposed Transmission Capital Costs	$ -	$ -	$ -
Transmission Total Costs	**$ -**	**$ -**	**$ -**
Existing DSM Program Energy Costs	$ -	$ -	$ -
Existing DSM Program Payback Energy Costs	$ 2	$ 2	$ 2
Existing DSM Program Capacity Costs	$ -	$ -	$ -
Proposed DSM Program Energy Costs	$ 17	$ 18	$ 17
Proposed DSM Program Payback Energy Costs	$ -	$ -	$ -
Proposed DSM Program Capacity Costs	$ -	$ -	$ -
Proposed DSM Program Capital Costs	$ -	$ -	$ -
DSM Program Total Costs	**$ 19**	**$ 20**	**$ 19**
Existing Contract Energy Costs	$ 349	$ 351	$ 349
Existing Contract Capacity Costs	$ -	$ -	$ -
Existing Contract Premium Costs	$ -	$ -	$ -
Proposed Contract Energy Costs	$ -	$ -	$ -
Proposed Contract Capacity Costs	$ -	$ -	$ -
Proposed Contract Premium Costs	$ -	$ -	$ -
Contract Total Costs	**$ 349**	**$ 351**	**$ 349**
Spot Mkt Purchase Costs	$ 1,723	$ 1,222	$ 1,708
Spot Mkt Sale Revenues	$ 1,783	$ 1,134	$ 1,767
Spot Net Purchase Costs	**$ (61)**	**$ 88**	**$ (59)**
Unserved Energy Costs	$ -	$ -	$ -
Unserved Capacity Costs	$ -	$ -	$ -
Unserved Total Costs	**$ -**	**$ -**	**$ -**
Total Costs	**$ 6,918**	**$ 6,933**	**$ 6,919**

Difference of 5-year PVRR @ 6.66% (Scenario minus Base)

Cost Components (millions)	Scenario 1	Scenario 2
Existing Station Fuel Costs	$ 395	$ 14
Existing Station Variable O&M Costs	$ (532)	$ (15)
Existing Station Emission Costs	$ -	$ -
Existing Station Dispatch Adder Costs	$ -	$ -
Existing Price Station Contract Costs		
Existing Station Fixed Costs	$ -	$ -
Existing Station Demand Charges		
Existing Station Decomm. Costs	$ -	$ -
Proposed Station Fuel Costs	$ 0	$ (0)
Proposed Station Variable O&M Costs	$ (0)	$ (0)
Proposed Station Emission Costs	$ -	$ -
Proposed Station Dispatch Adder Costs	$ -	$ -
Proposed Price Station Contract Costs		
Proposed Station Fixed Costs	$ -	$ -
Proposed Station Demand Charges		
Proposed Station Capital Costs	$ -	$ -
Station Total Costs	**$ (137)**	**$ (2)**
Existing Transmission Variable Costs	$ -	$ -
Existing Transmission Fixed Costs	$ -	$ -
Proposed Transmission Variable Costs	$ -	$ -
Proposed Transmission Fixed Costs	$ -	$ -
Proposed Transmission Capital Costs	$ -	$ -
Transmission Total Costs	**$ -**	**$ -**
Existing DSM Program Energy Costs	$ -	$ -
Existing DSM Program Payback Energy Costs		
Existing DSM Program Capacity Costs	$ -	$ -
Proposed DSM Program Energy Costs	$ 0	$ 0
Proposed DSM Program Payback Energy Costs		
Proposed DSM Program Capacity Costs	$ -	$ -
Proposed DSM Program Capital Costs	$ -	$ -
DSM Program Total Costs	**$ 0**	**$ 0**
Existing Contract Energy Costs	$ 2	$ 0
Existing Contract Capacity Costs	$ -	$ -
Existing Contract Premium Costs	$ -	$ -
Proposed Contract Energy Costs	$ -	$ -
Proposed Contract Capacity Costs	$ -	$ -
Proposed Contract Premium Costs	$ -	$ -
Contract Total Costs	**$ 2**	**$ 0**
Spot Mkt Purchase Costs	$ (501)	$ (15)
Spot Mkt Sale Revenues	$ (649)	$ (16)
Spot Net Purchase Costs	**$ 149**	**$ 2**
Unserved Energy Costs	$ -	$ -
Unserved Capacity Costs	$ -	$ -
Unserved Total Costs	**$ -**	**$ -**
Total Costs	**$ 14**	**$ 0**