

High-Level NEM Rate Impact Analysis		Rocky Mtn Power - Utah							
Inputs									
Model Structure									
Sector / Rate Class	Residential								
Base Year	2015								
Real discount rate	5.50%								
Study Period (Years)	20								
System Parameters									
Residential Sales (MWh)	6,976,758	EIA 861, 2013							
Residential Revenues (\$)	758,356,800	EIA 861, 2013							
Number of Residential Customers (count)	733,917	EIA 861, 2013							
Sales per customer (MWh)	10	Residential Sales / # of Customers							
Customer growth rate	1.0%	User input							
Electricity usage per customer growth rate	0.0%	User input							
Rate Structure Parameters									
Energy Rate (\$/MWh)	98.37	Annual weighted average, RMP Residential rate tariff							
Customer (\$/Month)	\$6	RMP Residential rate tariff							
Minimum Bill (\$/Month)	\$8	RMP Residential rate tariff							
Fixed Portion of Energy Rate (%)	67%	RMP Presentation See: MW							
PV NEM System Parameters									
Average PV installed capacity (MW, DC)	0.005	User input							
Unit capacity factor (%)	17%	NREL PV Watts (SLC, UT)							
Unit generation (MWh)	7	Calculation based on CF and Capacity							
Percent of customers adding DG PV per year	0.5%	User input							
Number of years with additional DG PV	10	User input							
Levelized Avoided Cost Inputs									
Avoided energy (\$/MWh)	\$60	Avoided fuel, variable O&M, and line losses.							
Avoided generation capacity capital costs (\$/MWh)	\$0	Capital cost of generation to meet peak load.							
Avoided transmission capital costs (\$/MWh)	\$0	Cost of money savings resulting from deffering T&D capacity additions.							
Avoided distribution capital costs (\$/MWh)	\$0	Cost of money savings resulting from deffering T&D capacity additions. Default from CPR 2014 (assumes zero avoided distribution)							
Avoided environmental Costs (\$/MWh)	\$0	Costs to comply with environemetnal regulations and policy objectives. Default from CPR 2014.							
Fuel price guarantee/avoided risk (\$/MWh)	\$0	Cost of eliminating uncertainty in fuel price fluctuations. Default \$0.00							
Variable Avoided Costs (\$/MWh)	\$60	Includes avoided energy, avoided environmental, and fuel price guarantee							
Fixed Avoided Costs (\$/MWh)		Includes avoided capital costs associated with generation and T&D capacity							
Total Avoided Costs (\$/MWh)	\$60	Sum of variable and fixed avoided costs							
Levelized Utility Cost of Solar Integration									
Integration Costs (\$/MWh)	\$5	Per MWh of DG solar generation							

Cost Calculations		2015	2016	2017	2018	2019	2020	2021	2022	2023
Universal										
Customers (# of customers)		733,917	741,256	748,669	756,155	763,717	771,354	779,068	786,858	794,727
Usage per customer (annual MWh / customer)		9.51	9.51	9.51	9.51	9.51	9.51	9.51	9.51	9.51
Total residential electricity usage (MWh)		6,976,758	7,046,526	7,116,991	7,188,161	7,260,042	7,332,643	7,405,969	7,480,029	7,554,829
No DG PV Case										
Annual Sales										
Annual residential sales (MWh)		6,976,758	7,046,526	7,116,991	7,188,161	7,260,042	7,332,643	7,405,969	7,480,029	7,554,829
Rates										
Energy Rate - variable portion (\$/MWh)		\$ 32.8	\$ 32.8	\$ 32.8	\$ 32.8	\$ 32.8	\$ 32.8	\$ 32.8	\$ 32.8	\$ 32.8
Energy Rate - fixed portion (\$/MWh)		\$ 65.6	\$ 65.6	\$ 65.6	\$ 65.6	\$ 65.6	\$ 65.6	\$ 65.6	\$ 65.6	\$ 65.6
Total Energy Rate (\$/MWh)		\$ 98.4	\$ 98.4	\$ 98.4	\$ 98.4	\$ 98.4	\$ 98.4	\$ 98.4	\$ 98.4	\$ 98.4
Customer (\$/Month)		\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00
Minimum bill (\$)		\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00
Annual Revenues and Costs										
Variable Revenues and Costs		\$ 228,815,393	\$ 231,103,547	\$ 233,414,582	\$ 235,748,728	\$ 238,106,215	\$ 240,487,278	\$ 242,892,150	\$ 245,321,072	\$ 247,774,283
Fixed Revenues and Costs		\$ 457,493,524	\$ 462,068,459	\$ 466,689,144	\$ 471,356,035	\$ 476,069,596	\$ 480,830,292	\$ 485,638,595	\$ 490,494,981	\$ 495,399,930
Total Energy Rate Revenues and Costs		\$ 686,308,917	\$ 693,172,006	\$ 700,103,726	\$ 707,104,764	\$ 714,175,811	\$ 721,317,569	\$ 728,530,745	\$ 735,816,052	\$ 743,174,213
Customer Charge Revenues and Costs		\$ 52,842,024	\$ 53,370,444	\$ 53,904,149	\$ 54,443,190	\$ 54,987,622	\$ 55,537,498	\$ 56,092,873	\$ 56,653,802	\$ 57,220,340
Total Revenues and Costs		\$ 739,150,941	\$ 746,542,450	\$ 754,007,875	\$ 761,547,954	\$ 769,163,433	\$ 776,855,068	\$ 784,623,618	\$ 792,469,854	\$ 800,394,553
Percent of total costs that are "fixed"		69%	69%	69%	69%	69%	69%	69%	69%	69%
With DG PV										
Annual Sales										
Customers with PV (%)		0.5%	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%	4.5%
Annual Customer PV Gen (MWh)		27,123	54,788	83,004	111,779	141,121	171,039	201,541	232,636	264,333
Net annual residential sales [after PV] (MWh)		6,949,635	6,991,737	7,033,986	7,076,381	7,118,921	7,161,604	7,204,428	7,247,393	7,290,497
Installed DG PV (MW)		18	37	56	76	95	116	136	157	179
Rates										
Energy Rate - variable portion (\$/MWh)		\$ 32.7102	\$ 32.6228	\$ 32.5348	\$ 32.4461	\$ 32.3567	\$ 32.2665	\$ 32.1757	\$ 32.0841	\$ 31.9918
Energy Rate - fixed portion (\$/MWh)		\$ 65.8299	\$ 66.0878	\$ 66.3477	\$ 66.6098	\$ 66.8738	\$ 67.1400	\$ 67.4083	\$ 67.6788	\$ 67.9515
Total Energy Rate (\$/kWh)		\$ 98.5400	\$ 98.7106	\$ 98.8825	\$ 99.0558	\$ 99.2305	\$ 99.4066	\$ 99.5840	\$ 99.7629	\$ 99.9433
Customer (\$/Month)		\$6	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00
Minimum bill (\$)		\$8	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00
Annual Revenues and Costs										
Avoided costs - variable		\$ 1,627,379	\$ 3,287,305	\$ 4,980,266	\$ 6,706,759	\$ 8,467,283	\$ 10,262,347	\$ 12,092,466	\$ 13,958,160	\$ 15,859,960
Avoided costs - fixed		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Utility Solar Integration Costs		\$ 135,615	\$ 273,942	\$ 415,022	\$ 558,897	\$ 705,607	\$ 855,196	\$ 1,007,705	\$ 1,163,180	\$ 1,321,663
Variable Revenues and Costs		\$ 227,323,629	\$ 228,090,184	\$ 228,849,338	\$ 229,600,866	\$ 230,344,539	\$ 231,080,126	\$ 231,807,390	\$ 232,526,092	\$ 233,235,986
Fixed Revenues and Costs		\$ 457,493,524	\$ 462,068,459	\$ 466,689,144	\$ 471,356,035	\$ 476,069,596	\$ 480,830,292	\$ 485,638,595	\$ 490,494,981	\$ 495,399,930
Total Energy Rate Revenues and Costs		\$ 684,817,153	\$ 690,158,644	\$ 695,538,482	\$ 700,956,901	\$ 706,414,135	\$ 711,910,418	\$ 717,445,985	\$ 723,021,072	\$ 728,635,917
Customer Charge Revenues and Costs		\$ 52,842,024	\$ 53,370,444	\$ 53,904,149	\$ 54,443,190	\$ 54,987,622	\$ 55,537,498	\$ 56,092,873	\$ 56,653,802	\$ 57,220,340
Total Revenues and Costs		\$ 737,659,177	\$ 743,529,088	\$ 749,442,631	\$ 755,400,091	\$ 761,401,757	\$ 767,447,916	\$ 773,538,858	\$ 779,674,874	\$ 785,856,257

2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034		
802,674	810,701	818,808	826,996	835,266	843,619	852,055	860,575	869,181	877,873	886,652		
9.51	9.51	9.51	9.51	9.51	9.51	9.51	9.51	9.51	9.51	9.51		
7,630,377	7,706,681	7,783,748	7,861,586	7,940,201	8,019,603	8,099,799	8,180,797	8,262,605	8,345,231	8,428,684		
7,630,377	7,706,681	7,783,748	7,861,586	7,940,201	8,019,603	8,099,799	8,180,797	8,262,605	8,345,231	8,428,684		
\$ 32.8	\$ 32.8	\$ 32.8	\$ 32.8	\$ 32.8	\$ 32.8	\$ 32.8	\$ 32.8	\$ 32.8	\$ 32.8	\$ 32.8	\$ 32.8	\$ 32.8
\$ 65.6	\$ 65.6	\$ 65.6	\$ 65.6	\$ 65.6	\$ 65.6	\$ 65.6	\$ 65.6	\$ 65.6	\$ 65.6	\$ 65.6	\$ 65.6	\$ 65.6
\$ 98.4	\$ 98.4	\$ 98.4	\$ 98.4	\$ 98.4	\$ 98.4	\$ 98.4	\$ 98.4	\$ 98.4	\$ 98.4	\$ 98.4	\$ 98.4	\$ 98.4
\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00
\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00
\$ 250,252,025	\$ 252,754,546	\$ 255,282,091	\$ 257,834,912	\$ 260,413,261	\$ 263,017,394	\$ 265,647,568	\$ 268,304,043	\$ 270,987,084	\$ 273,696,955	\$ 276,433,924		
\$ 500,353,930	\$ 505,357,469	\$ 510,411,044	\$ 515,515,154	\$ 520,670,306	\$ 525,877,009	\$ 531,135,779	\$ 536,447,137	\$ 541,811,608	\$ 547,229,724	\$ 552,702,021		
\$ 750,605,955	\$ 758,112,015	\$ 765,693,135	\$ 773,350,066	\$ 781,083,567	\$ 788,894,402	\$ 796,783,346	\$ 804,751,180	\$ 812,798,692	\$ 820,926,679	\$ 829,135,945		
\$ 57,792,543	\$ 58,370,469	\$ 58,954,174	\$ 59,543,715	\$ 60,139,152	\$ 60,740,544	\$ 61,347,949	\$ 61,961,429	\$ 62,581,043	\$ 63,206,854	\$ 63,838,922		
\$ 808,398,498	\$ 816,482,483	\$ 824,647,308	\$ 832,893,781	\$ 841,222,719	\$ 849,634,946	\$ 858,131,296	\$ 866,712,609	\$ 875,379,735	\$ 884,133,532	\$ 892,974,868		
69%	69%	69%	69%	69%	69%	69%	69%	69%	69%	69%		
5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%		
296,640	299,606	302,602	305,628	308,685	311,772	314,889	318,038	321,219	324,431	327,675		
7,333,737	7,407,075	7,481,146	7,555,957	7,631,517	7,707,832	7,784,910	7,862,759	7,941,387	8,020,801	8,101,009		
201	203	205	207	209	211	213	215	217	219	222		
\$ 31.8987	\$ 31.8987	\$ 31.8987	\$ 31.8987	\$ 31.8987	\$ 31.8987	\$ 31.8987	\$ 31.8987	\$ 31.8987	\$ 31.8987	\$ 31.8987	\$ 31.8987	\$ 31.8987
\$ 68.2263	\$ 68.2263	\$ 68.2263	\$ 68.2263	\$ 68.2263	\$ 68.2263	\$ 68.2263	\$ 68.2263	\$ 68.2263	\$ 68.2263	\$ 68.2263	\$ 68.2263	\$ 68.2263
\$ 100.1250	\$ 100.1250	\$ 100.1250	\$ 100.1250	\$ 100.1250	\$ 100.1250	\$ 100.1250	\$ 100.1250	\$ 100.1250	\$ 100.1250	\$ 100.1250	\$ 100.1250	\$ 100.1250
\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00	\$ 6.00
\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00
\$ 17,798,399	\$ 17,976,383	\$ 18,156,147	\$ 18,337,709	\$ 18,521,086	\$ 18,706,296	\$ 18,893,359	\$ 19,082,293	\$ 19,273,116	\$ 19,465,847	\$ 19,660,506		
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -		
\$ 1,483,200	\$ 1,498,032	\$ 1,513,012	\$ 1,528,142	\$ 1,543,424	\$ 1,558,858	\$ 1,574,447	\$ 1,590,191	\$ 1,606,093	\$ 1,622,154	\$ 1,638,375		
\$ 233,936,826	\$ 236,276,194	\$ 238,638,956	\$ 241,025,346	\$ 243,435,599	\$ 245,869,955	\$ 248,328,655	\$ 250,811,941	\$ 253,320,061	\$ 255,853,261	\$ 258,411,794		
\$ 500,353,930	\$ 505,357,469	\$ 510,411,044	\$ 515,515,154	\$ 520,670,306	\$ 525,877,009	\$ 531,135,779	\$ 536,447,137	\$ 541,811,608	\$ 547,229,724	\$ 552,702,021		
\$ 734,290,756	\$ 741,633,663	\$ 749,050,000	\$ 756,540,500	\$ 764,105,905	\$ 771,746,964	\$ 779,464,434	\$ 787,259,078	\$ 795,131,669	\$ 803,082,985	\$ 811,113,815		
\$ 57,792,543	\$ 58,370,469	\$ 58,954,174	\$ 59,543,715	\$ 60,139,152	\$ 60,740,544	\$ 61,347,949	\$ 61,961,429	\$ 62,581,043	\$ 63,206,854	\$ 63,838,922		
\$ 792,083,299	\$ 800,004,132	\$ 808,004,174	\$ 816,084,215	\$ 824,245,057	\$ 832,487,508	\$ 840,812,383	\$ 849,220,507	\$ 857,712,712	\$ 866,289,839	\$ 874,952,737		

Input References						
RMP Residential Tariff						
https://www.rockymountainpower.net/content/dam/rocky_mountain_power/doc/About_Us/Rates_and_Regulation/Utah/Approved_Tariffs/Rate_Schedules/Residential_Service.pdf						
Customer Charge						
Single Phase	6	per customer month				
Three phase	12	per customer month				
Energy Charge	cents per kwh		usage block			
Summer Block 1	8.8498	400 kWh	5	moths of the year		
Summer Block 2	11.5429	600 kWh	5	moths of the year		
Summer Block 3	14.4508	all remainin	5	moths of the year		
Winter Block 1	8.8498	400	7	months of the year		
Winter Block 2	10.3111	600 all remainin	7	months of the year		
Summer Average	10.19635	Synapse Calculation				
Winter Average	9.58045	Synapse Calculation				
Annual Weighted Average	9.837075	Synapse Calculation				
Minimum Bill						
Single Phase	8	per customer month				
Three phase	16	per customer month				
Utah Solar Generation Profile						
Available online at: www.pvwatts.nrel.gov						
PVWatts: Monthly PV Performance Data						
Requested Location:	Salt Lake City Utah					
Location:	SALT LAKE CITY, UT					
Lat (deg N):	40.77					
Long (deg W):	111.97					
Elev (m):	1288					
DC System Size (kW):	5					
Module Type:	Standard					
Array Type:	Fixed (roof mount)					
Array Tilt (deg):	20					
Array Azimuth (deg):	180					
System Losses:	14					
Invert Efficiency:	96					
DC to AC Size Ratio:	1.1					
Average Cost of Electricity Purchased from Utility	0.1					
Initial Cost	3.3					
Cost of Electricity Generated by System (\$/kWh)	0.18					
Month	AC System Output(kWh)	Solar Radi	Plane of Ar	DC array C	Value (\$)	
1	362.8890076	2.756125	85.43987	381.1025	37.41	
2	455.8474121	3.898676	109.1629	477.0622	47	
3	608.9019165	4.835629	149.9045	636.7689	62.78	
4	678.0981445	5.717371	171.5211	708.8629	69.91	
5	836.8475952	7.018649	217.5781	873.9233	86.28	
6	802.8485107	7.256892	217.7068	838.452	82.77	
7	840.4923706	7.551991	234.1117	877.5559	86.65	
8	812.5726318	7.217674	223.7479	848.5435	83.78	
9	698.034729	6.16008	184.8024	728.7742	71.97	
10	594.208374	4.935166	152.9901	620.8773	61.26	
11	401.7036743	3.314213	99.42639	421.0105	41.42	
12	298.8479309	2.268929	70.3368	314.5163	30.81	
Total	7391.292297	62.93139	1916.729	7727.45	762.04	
Avoided Costs in Utah						
Value of Solar in Utah Clean Power Research 2014.						
Available online: http://www.psc.utah.gov/utilities/electric/13docs/13035184/255147Exhibit%20A%20to%20a%20Wright%20Testimony%20-%20UCE%202_1%20DT%20-%20Value%20of%20Solar%20in%20Utah%205-22-2014.pdf						
Fuel Value	0.043	(\$/kWh)		43	\$/MWh	
Plant O&M Value	0.013	(\$/kWh)		13	\$/MWh	
Generation Capacity Value	0.014	(\$/kWh)		14	\$/MWh	
Avoided T&D Capacity Cost	0.011	(\$/kWh)		11	\$/MWh	
Avoided Environmental Cost	0.009	(\$/kWh)		9	\$/MWh	
Fuel Price Guarantee Value	0.026	(\$/kWh)		26	\$/MWh	
Conversion factors						
kWh per MWh	1000					
cents per dollar	100					