Department of Energy

Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208-3621

SECURITY AND CONTINUITY OF OPERATIONS

July 2, 2013

In reply refer to: NN-1

McCullough Research
3816 SE Woodstock Blvd
Portland, OR 97202

FOIA #BPA-2013-01063-F

Dear Mr. McCullough:

This is a partial release to your request for records that was made to the Bonneville Power Administration (BPA), under the Freedom of Information Act (FOIA), 5 U.S.C. 552.

You requested the following:
BPA study entitled Columbia Generating Station Value Study authored by Robert Petty dated May 4, 2013, including all of its work papers.

Response:
Enclosed is a document entitled "Columbia Generating Station Value Study." This document is the final draft of a study authored by Robert Petty, and is dated April 19, 2013. There is no final version of this study. It is released in its entirety.

There is no study authored by Mr. Petty dated May 4, 2013. Mr. Petty's final draft study was forwarded to Energy NW. It is the ENW study that is dated May 4, 2013.

After reviewing the BPA final draft study, let this office know if your request for "work papers" is still necessary. If so, a discussion with you will be needed to define the scope of "work papers," in order to know what to search for, and to give you a timeline for the review of any responsive records.

I appreciate the opportunity to assist you. Please contact Kim Winn, FOIA Specialist, at 503-230-5273 with any questions about this letter.

Sincerely,

/s/Christina J. Munro
Christina J. Munro
Freedom of Information/Privacy Act Officer

Enclosure: Responsive document

DRAFT 4/19/13

Columbia Generating Station Value Study

Background

In public meetings, customers and stakeholders have raised questions about the economics and value of operating Columbia Generating Station (CGS) given that current natural gas and power prices are near historic lows. Energy Northwest (EN) and Bonneville Power Administration (BPA) conducted a joint economic study to determine the value that CGS provides to both the region and BPA's stakeholders.

Summary

EN and BPA compared continued CGS operation to scenarios involving either a temporary five year shutdown or permanent shutdown of the plant with replacement power coming from either market purchases or combined cycle plants. Ultimately it was concluded that not only is continued CGS operation the lowest cost source of power of those analyzed, but that continued CGS operation provides significant value in the form of firm capacity and energy as well as risk mitigation against natural gas prices and potential carbon taxes. Figure 1 below summarizes the results of the scenarios on a nominal yearly cash flow basis.

Figure 1: Nominal Revenue Requirement

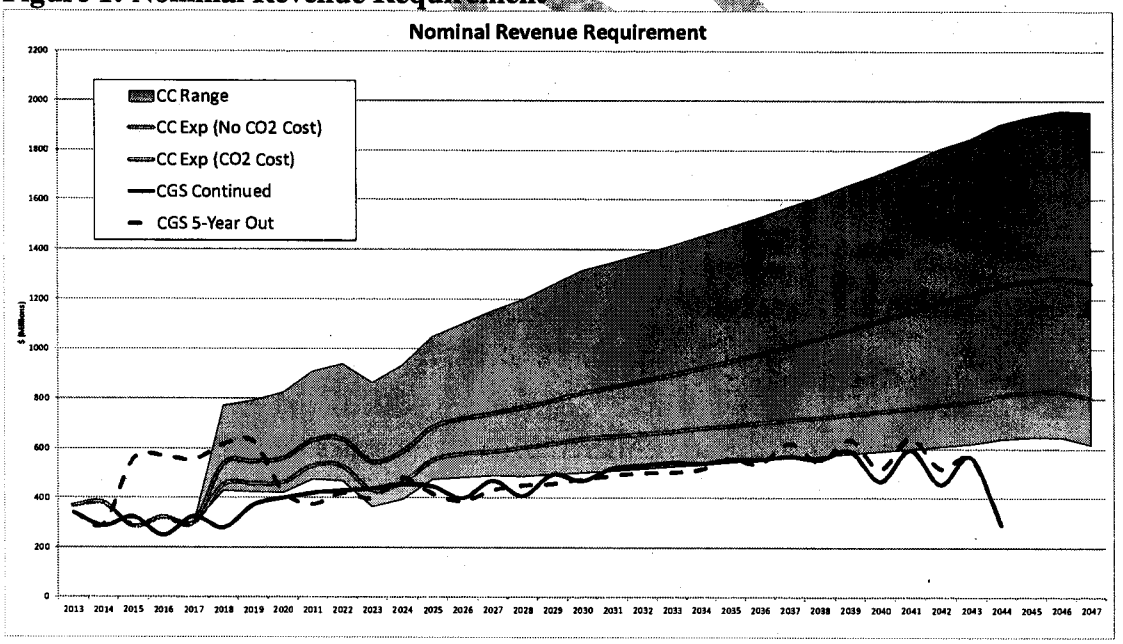

Figure 1 reflects the projected costs associated with:

- Continued CGS operation as expected (CGS Continued)
- A five-year CGS outage beginning in May 2015 with a return to full power in 2020. Market purchases are assumed for replacement power during the outage period (CGS 5-Year Out).

- A complete shutdown of CGS beginning in May 2015 with replacement power coming from market purchases until combined cycle natural gas plants equaling the capacity of CGS would start operation in 2018 (CC Exp case).
- Ranges of costs associated with the combined cycle natural gas plants based on different gas prices and potential carbon taxes (CC Range).

Table 1 depicts the results of the findings in terms of levelized costs as well as the net present value (NPV) of the revenue requirement.

Table 1: 30 Year Levelized Costs

Scenario	Levelized Costs ($/MWh Real 2012)	NPV of Revenue Requirement (Millions$)	Difference from Continued CGS Operation (Millions$)
Continued CGS Operation	$45.80	$7,419	$0
Five-Year CGS Outage with Replacement Power	$52.30	$8,471	$1,053
CGS Shutdown with Replacement CC Plants (No Carbon)	$59.73	$9,973	$2,554
CGS Shutdown with Replacement CC Plants (With Carbon)	$76.88	$12,837	$5,419
CC Low (Low Gas, Zero Carbon, TX Savings, Displacement Savings)	$50.88	$8,496	$1,078
CC High (High Gas, Carbon included, No TX savings, No Displacement Savings)	$113.62	$18,972	$11,553

NOTE: *Levelized costs and the revenue requirement numbers represent the present value of the total cost of future capital and operating costs of the described scenarios, converted to equal annual payments and amortized over expected annual generation.*

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Detailed Scenario Descriptions

Continued CGS Operation

This scenario, the status quo, assumed March 2013 cost estimates for CGS operations and maintenance (O&M), projected debt service, fuel, spent fuel disposal, generating taxes, and insurance. EN and BPA staff agreed to standardize the analysis by using an estimated cost escalation factor of 1.6% per year. Breaking down the costs of CGS, fixed costs represent the vast majority of those associated with the plant. This suggests that any closure or reduction of the plant's output may only result in marginal financial savings. Table 2 reflects the cost make up of CGS in terms of variable and fixed costs:

Table 2: Levelized Cost Components of CGS

Cost	Levelized ($/MWh Real 2012)	% of Total
Fixed Costs	$38.24	83.5%
Variable Costs	$7.56	16.5%
Total Costs	$45.80	100.0%

Table 3 compares strictly variable (energy) levelized costs, which further illustrates the cost advantage that CGS holds over alternatives.

Table 3: Variable Costs of different Alternatives

Variable Cost	Levelized Variable Costs ($/MWh Real 2012)
CGS	$7.56
Combined Cycle Plants (No Carbon)	$35.29
Combined Cycle Plants (With Carbon)	$48.24
Wholesale Power Market	$39.09

Table 3 indicates why there is a cost increase in the five year shut-down scenario. The forecasted market price of energy is higher than the variable cost of CGS ($7.56/MWh). Thus, replacement power costs in the form of market purchases increses the overall cost during the five year outage period. It should also be noted that at $7.56/MWh, CGS would be economically profitatable to operate during almost all heavy load hours during any time period of the year including the spring months.

Five-year CGS outage with return to full power:

This scenario assumed CGS will cease to generate power for a five-year period beginning in May 2015. During the five-year outage, power would be purchased from the wholesale market at quantities equal to CGS expected output. The market prices used in the analysis were forecasted using the AURORAxmp model based on the expected case assumptions in the BPA 2013 Resource Program. However, the expected case assumptions in the model were altered to reflect the CGS outage. After the five year outage period (2020), CGS would return to full capacity. The analysis of this scenario highlighted a few key differences from the continued CGS operation scenario.

The five-year outage scenario creates a period of significantly higher costs due to market power purchase expenses for replacement power without the benefit of significant reduced CGS cost savings. This is due to the vast majority of CGS costs being fixed costs that occur regardless of operation and the low variable cost of CGS.

- Total nominal cost of operating CGS over the 5 year outage period decreased by a modest $403M, in contrast to dramatic cost increases from power purchases from the wholesale market of over $1.4B total over the 5 year period.
- Approximately $245M of the $403M cost decreases are deferrals of capital and O&M projects during the shut down period into FY 2020-2024.
- Direct savings in nuclear fuel, spent fuel disposal and generating taxes during the outage period totaled approximately $158M.

CGS Shutdown with Combined Cycle Plants Replacement:

This scenario assumed CGS will be permanently shutdown in May of 2015. Market purchases would be made in quantities equal to the output of CGS until combined cycle plants (three combined cycle turbine plants) of equal capacity of CGS are brought on-line in 2018. The intent of this scenario is to compare the cost of new generation in the form of a combined cycle plant to the costs associated with continued operation and life extension of CGS. The BPA 2013 Resource Program indicated that a combined cycle natural gas power plant is the lowest cost potential new resource that would provide similar services to those provided by CGS

The analysis of this scenario highlighted a few major drivers of cost differences between this scenario and the others.

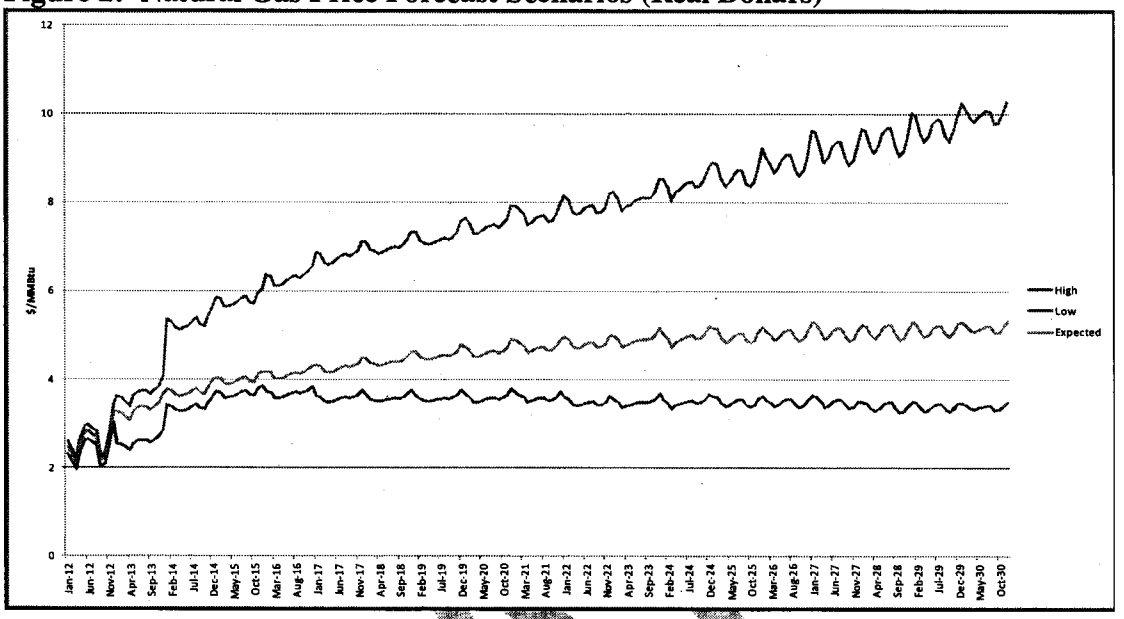
- The combined cycle plants' nominal expected cost without carbon prices are on average $136M per year higher than continued CGS operation. The expected case, with carbon prices, combined cycle generation annual nominal costs are on average $325M per year higher than continued CGS operation.
- The combined cycle range reflects substantial cost exposure due to volatility of natural gas prices and potential carbon emission costs.
- In the highest-cost scenario, which is reflective of high natural gas prices and carbon prices, annual nominal combined cycle costs $717M per year greater than continued CGS operation.
- CGS associated costs continue in the 8-year period immediately following CGS shutdown, totaling approximately $365M (nominal) over the 8 year period until nuclear fuel is completely removed from the reactor. The only capital related costs associated with CGS in this scenario are upgrades associated with the requirements resulting from Fukushima.
- Decommissioning-related costs are incurred much sooner, reducing the likelihood of trust fund sufficiency.
- Scope of the Replacement Analysis
    - As noted earlier, the intent of this analysis was to compare the costs of CGS to the costs of a resource that had similar attributes and provided similar services. This analysis was not intended to determine the most cost-effective means of replacing CGS for the BPA system. If BPA were to need to replace CGS, BPA would consider its entire system needs such as capacity, energy, balancing reserves and transmission constraints. It is highly likely that a portfolio of different resource types that could provide these services while also considering the location of the replacement resources would be the preferred resource strategy.

Key Assumptions

Natural Gas Prices The natural gas prices used to derive the expected, high and low range for the combined cycle plant are from the BPA 2013 Resource Program. The expected forecast is also consistent with the BP-14 initial proposal rate case assumptions while the high and low scenarios are consistent with the Northwest Power and

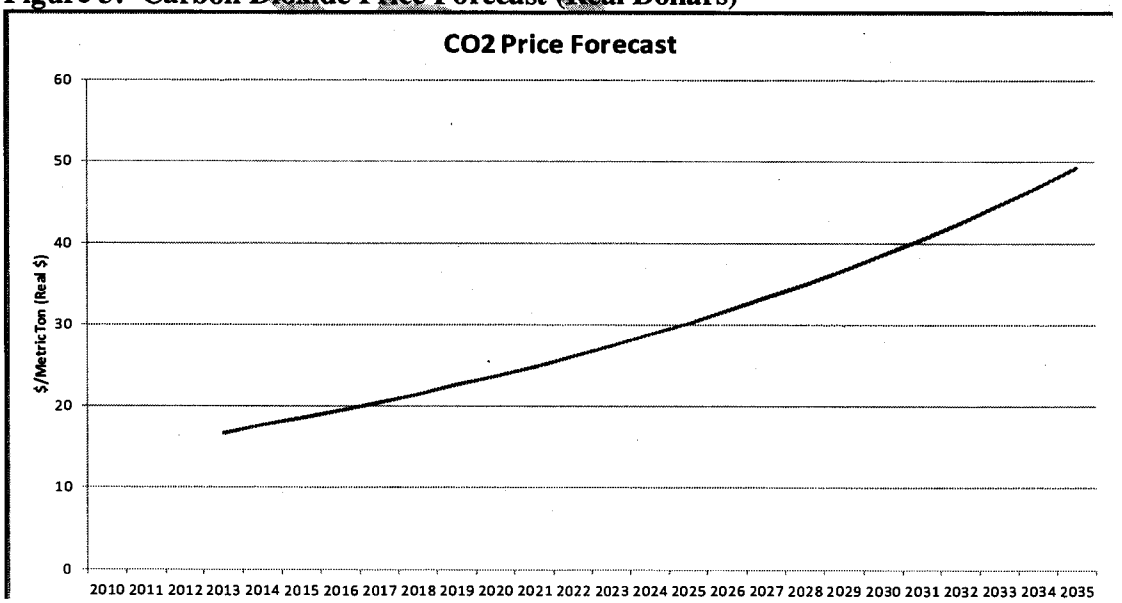
Conservation Council's forecast from their Mid-term Assessment. The following figure represents the gas price forecasts:

Figure 2: Natural Gas Price Forecast Scenarios (Real Dollars)



Carbon Costs The carbon costs assumptions are the same as those in the BPA 2013 Resource Program and were derived from futures prices for CO_2 under the California Cap and Trade Program, sourced from the Chicago Mercantile Exchange.

Figure 3: Carbon Dioxide Price Forecast (Real Dollars)



Combined Cycle Costs The costs for the combined cycle plants are based on those in the 2013 Resource Program but tailored to the time frame and operating characteristics assumed in this study. The costs include debt service, operations and maintenance, and fuel costs.

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Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208-3621

SECURITY AND CONTINUITY OF OPERATIONS

July 17, 2013

In reply refer to: NN-1

McCullough Research
3816 SE Woodstock Blvd
Portland, OR 97202

FOIA #BPA-2013-01063-F

Dear Mr. McCullough:

This is a final response to your request for records that was made to the Bonneville Power Administration (BPA), under the Freedom of Information Act (FOIA), 5 U.S.C. 552.

You requested the following:
BPA study entitled Columbia Generating Station Value Study authored by Robert Petty dated May 4, 2013, including all of its work papers.

In an email dated July 15, 2013, Jill Heimensen defined work papers to the data spreadsheets used by Robert Petty to draft his "Columbia Generating Station Value Study."

Response:
On the enclosed CD are the MS Excel spreadsheets used by Mr. Petty for his draft paper. They are released in their entirety.

Pursuant to 10 CFR 1004.8, if you are dissatisfied with this determination, or the adequacy of the search, you may appeal this FOIA response in writing within 30 calendar days of receipt of a final response letter. The appeal should be made to the Director, Office of Hearings and Appeals, HG-1, Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585-1615. The written appeal, including the envelope, must clearly indicate that a FOIA Appeal is being made.

There are no fees associated with your request due to the length of time it has taken to complete.

I appreciate the opportunity to assist you. Please contact Kim Winn, FOIA Specialist, at 503-230-5273 with any questions about this letter.

Sincerely,

/s/Christina J. Munro

Christina J. Munro
Freedom of Information/Privacy Act Officer

Enclosure: CD

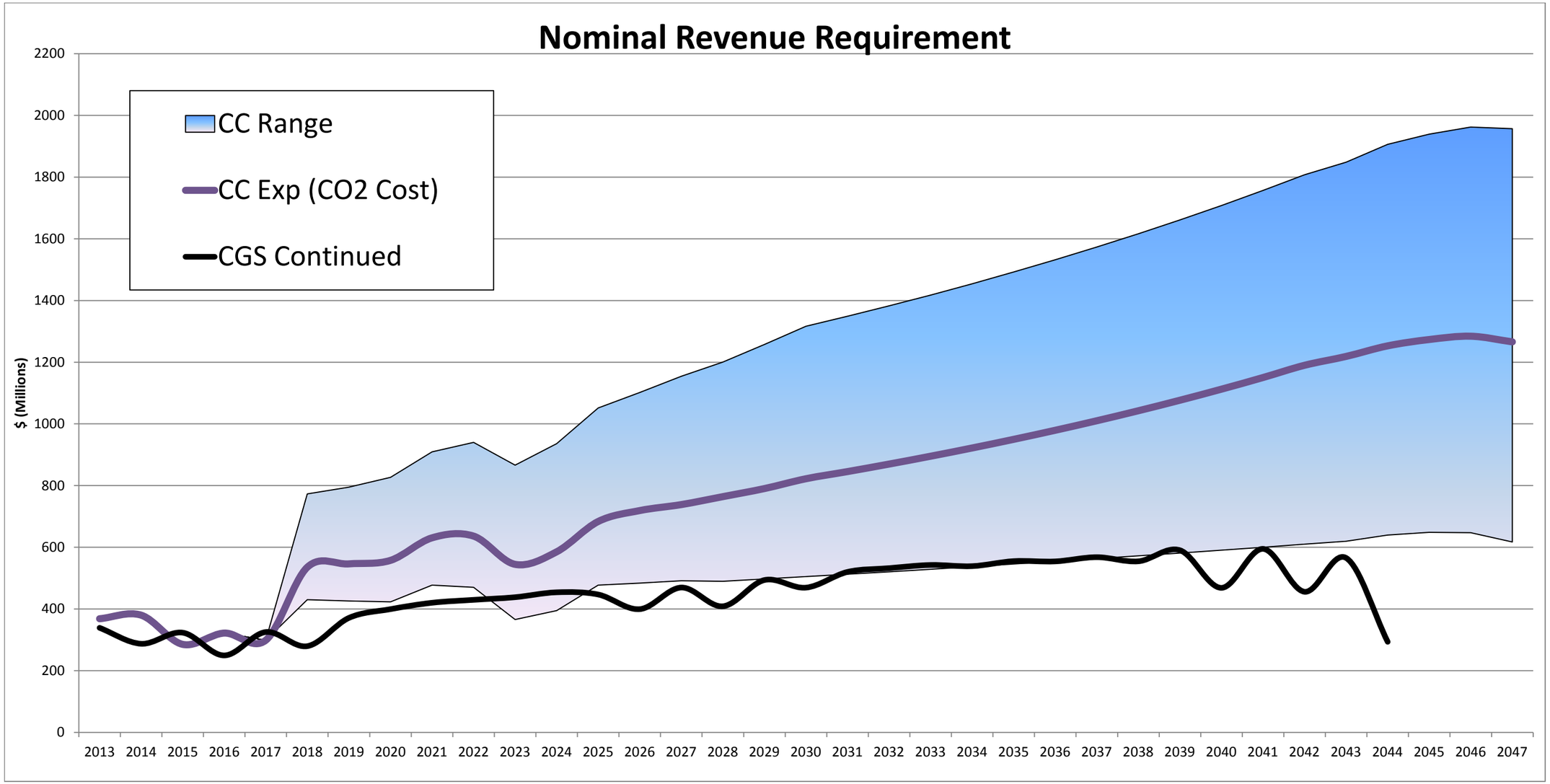
	A	B	C	E	F	H	I	K	L	N	O	P	Q	R	S	T	U	V	W	X
1		CC Low	MWH	CC Exp (No CO2)	MWH	CC Exp (Yes CO2)	MWH	CC High	MWH	Continued	5-year		Termination							
2	2013	368.48	8,473,920	368.48	8,473,920	368.48	8,473,920	368.48	8,473,920	338.93	338.93	8473.92	368.479				Scenario	Levelized Costs ($/MWh Real)	NPV of Revenue Requirement ($M)	Difference from Continued CGS ($M)
3	2014	380.05	9,516,864	380.05	9,516,864	380.05	9,516,864	380.05	9,516,864	287.35	292.03	9516.864	380.0495237				Continued CGS Operation	$45.80	$7,419	$0
4	2015	285.37	8,291,405	285.37	8,291,405	285.37	8,291,405	285.37	8,291,405	323.30	554.64	8291.4048	31.00560575				Five-Year CGS Outage with Replacement Power	$52.30	$8,471	$1,053
5	2016	321.92	9,798,552	321.92	9,798,552	321.92	9,798,552	321.92	9,798,552	249.50	569.22	9798.552	-9.715140125				CGS Shutdown with Replacement CC's (No CO2 Cost)	$59.73	$9,973	$2,554
6	2017	298.85	8,700,900	298.85	8,700,900	298.85	8,700,900	298.85	8,700,900	325.37	552.81	8700.9	-38.63553348				CGS Shutdown with Replacement CC's (CO2 Cost)	$76.88	$12,837	$5,419
7	2018	430.31	9,121,788	453.08	9,121,788	535.60	9,121,788	772.95	9,121,788	279.62	614.09	9771.78	-8.192981538				CC Low	$50.88	$8,496	$1,078
8	2019	425.99	9,121,788	458.08	9,121,788	546.31	9,121,788	794.72	9,121,788	371.14	626.59	8700.9	-18.98370926				CC High	$113.62	$18,972	$11,553
9	2020	423.01	9,121,788	463.32	9,121,788	557.62	9,121,788	826.59	9,121,788	399.50	423.49	9798.552	-28.34218547							
10	2021	477.66	9,121,788	529.90	9,121,788	630.69	9,121,788	909.44	9,121,788	420.21	373.91	8700.9	19.75213555							
11	2022	470.23	9,121,788	528.55	9,121,788	636.35	9,121,788	939.86	9,121,788	429.69	419.12	9771.78	13.62897353							
12	2023	365.63	9,121,788	429.48	9,121,788	544.74	9,121,788	866.07	9,121,788	438.22	397.72	8700.9	-97.72726043							
13	2024	395.01	9,121,788	462.18	9,121,788	585.40	9,121,788	936.00	9,121,788	454.16	479.93	9968.9616	-75.20204806							
14	2025	477.16	9,121,788	551.99	9,121,788	683.71	9,121,788	1051.57	9,121,788	446.97	416.33	8852.22								
15	2026	484.15	9,121,788	578.32	9,121,788	719.10	9,121,788	1102.03	9,121,788	399.54	386.57	9941.724								
16	2027	491.36	9,121,788	587.98	9,121,788	738.48	9,121,788	1154.61	9,121,788	469.55	430.32	8852.22								
17	2028	489.65	9,121,788	603.29	9,121,788	764.22	9,121,788	1200.23	9,121,788	408.86	449.52	9968.9616								
18	2029	497.22	9,121,788	618.25	9,121,788	790.39	9,121,788	1257.32	9,121,788	493.85	455.62	8852.22								
19	2030	504.86	9,121,788	638.14	9,121,788	822.25	9,121,788	1316.36	9,121,788	469.26	473.99	9941.724								
20	2031	512.75	9,121,788	648.53	9,121,788	845.48	9,121,788	1348.87	9,121,788	520.21	488.68	8852.22								
21	2032	520.78	9,121,788	659.11	9,121,788	869.79	9,121,788	1382.65	9,121,788	532.45	500.37	9968.9616								
22	2033	528.96	9,121,788	669.90	9,121,788	895.27	9,121,788	1417.76	9,121,788	542.73	501.99	8852.22								
23	2034	537.30	9,121,788	680.89	9,121,788	921.98	9,121,788	1454.29	9,121,788	538.94	514.23	9941.724								
24	2035	545.80	9,121,788	692.09	9,121,788	949.99	9,121,788	1492.30	9,121,788	555.20	557.85	8852.22								
25	2036	554.46	9,121,788	703.50	9,121,788	979.38	9,121,788	1531.89	9,121,788	554.32	536.28	9968.9616								
26	2037	563.29	9,121,788	715.12	9,121,788	1010.25	9,121,788	1573.14	9,121,788	568.04	619.13	8852.22								
27	2038	572.28	9,121,788	726.97	9,121,788	1042.67	9,121,788	1616.14	9,121,788	554.62	544.32	9941.724								
28	2039	581.45	9,121,788	739.04	9,121,788	1076.76	9,121,788	1661.01	9,121,788	590.52	633.22	8852.22								
29	2040	590.79	9,121,788	751.35	9,121,788	1112.61	9,121,788	1707.84	9,121,788	468.54	516.50	9968.9616								
30	2041	600.31	9,121,788	763.88	9,121,788	1150.34	9,121,788	1756.76	9,121,788	594.93	641.59	8852.22								
31	2042	610.00	9,121,788	776.65	9,121,788	1190.06	9,121,788	1807.87	9,121,788	455.82	517.69	9941.724								
32	2043	619.89	9,121,788	789.67	9,121,788	1218.76	9,121,788	1848.18	9,121,788	565.47	560.26	8852.22								
33	2044	639.64	9,121,788	815.86	9,121,788	1253.02	9,121,788	1906.32	9,121,788	293.61	297.56	4984.4808								
34	2045	648.64	9,121,788	828.17	9,121,788	1273.54	9,121,788	1939.13	9,121,788											
35	2046	647.64	9,121,788	830.54	9,121,788	1284.29	9,121,788	1962.38	9,121,788	$7,418.80	$8,471.46	161,967.62								
36	2047	617.35	9,121,788	803.70	9,121,788	1265.97	9,121,788	1956.80	9,121,788											
37										$45.80	$52.30									
38		$8,496.39	166,979,190.19	$9,972.98	166,979,190.19	$12,837.39	166,979,190.19	$18,971.78	166,979,190.19											
39																				
40		$50.88		$59.73		$76.88		$113.62		41.34	49.48									
41																				
42																				
43		CC Low	CC Range	CC Exp (CO2 Cost)	CGS Continued															
44	2013	368.479	0.00	368.479	338.9286755															
45	2014	380.0495237	0.00	380.0495237	287.3516619															
46	2015	285.3679684	0.00	285.3679684	323.2972695															
47	2016	321.9172101	0.00	321.9172101	249.5001847															
48	2017	298.8469465	0.00	298.8469465	325.3668197															
49	2018	430.3108699	342.64	535.5954429	279.6183067															
50	2019	425.9943379	368.73	546.3148427	371.1391117															
51	2020	423.0103138	403.58	557.6166753	399.5006609															
52	2021	477.6593264	431.78	630.6872443	420.2129445															
53	2022	470.2301242	469.63	636.3472514	429.6869835															
54	2023	365.6328014	500.44	544.7384996	438.2210021															
55	2024	395.0120397	540.99	585.4025477	454.1574731															
56	2025	477.1601101	574.41	683.7137383	446.9707552															
57	2026	484.1452387	617.89	719.1040337	399.5380068															
58	2027	491.3627594	663.25	738.4839713	469.5512129															
59	2028	489.6487678	710.58	764.2178396	408.8623742															
60	2029	497.222176	760.10	790.3941425	493.8546838															
61	2030	504.8639729	811.49	822.2517434	469.2645641															
62	2031	512.7454659	836.12	845.4765841	520.2092525															
63	2032	520.7771841	861.87	869.7940005	532.4484574															
64	2033	528.9619509	888.80	895.2701312	542.7277807															
65	2034	537.3026426	916.98	921.9755383	538.9377891															
66	2035	545.8021896	946.50	949.9855118	555.200801															
67	2036	554.4635775	977.42	979.3803959	554.3200143															
68	2037	563.2898479	1009.85	1010.245938	568.0372213															

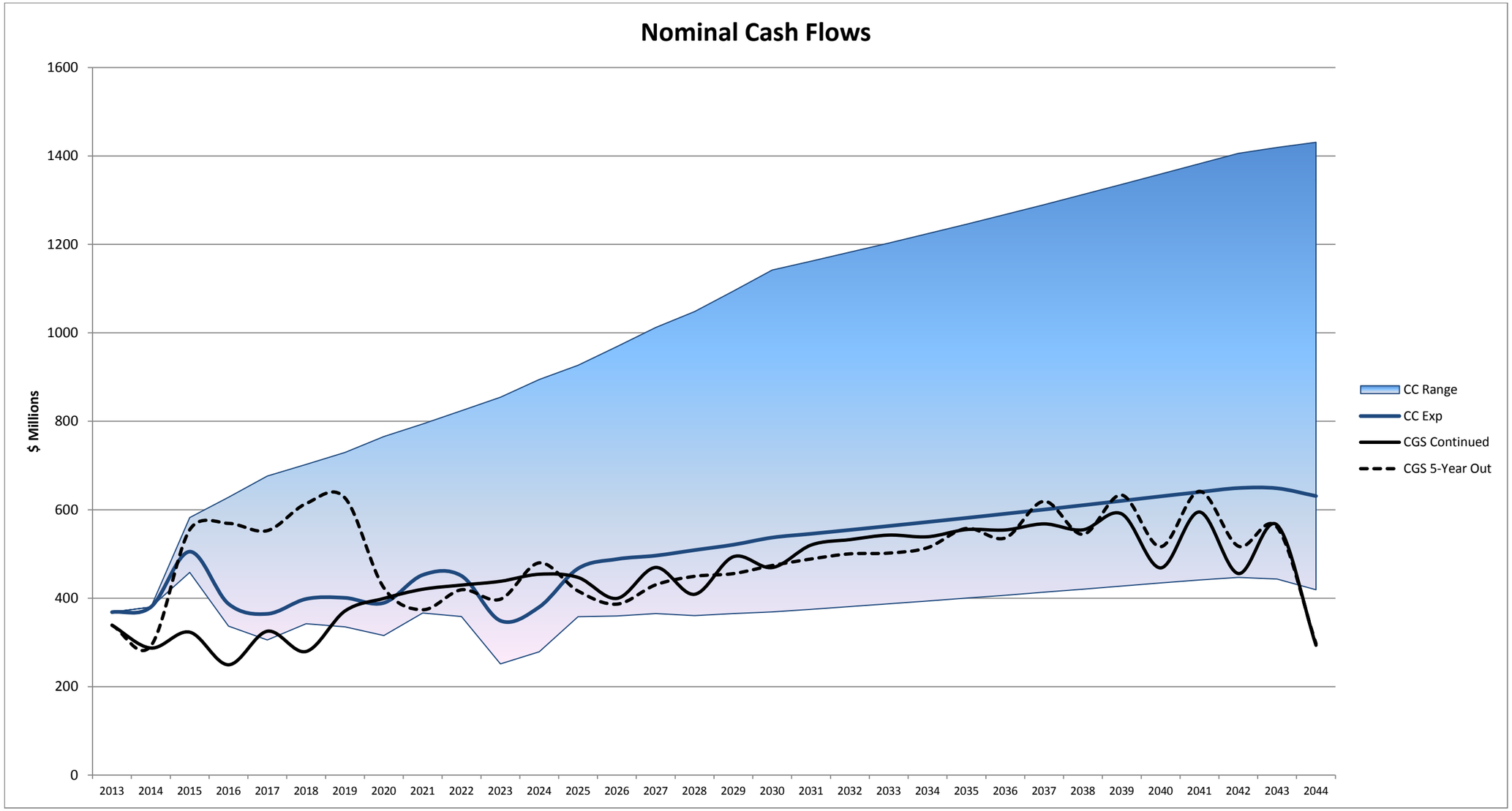
	A	B	C	E	F	H	I	K	L	N	O	P	Q	R	S	T	U	V	W	X
69	2038	572.2840996	1043.86	1042.673661	554.6164406															
70	2039	581.4494896	1079.56	1076.761263	590.5163433															
71	2040	590.7892342	1117.05	1112.613044	468.5426623															
72	2041	600.3066102	1156.45	1150.340362	594.926043															
73	2042	610.0049561	1197.87	1190.06212	455.8150614															
74	2043	619.8876729	1228.30	1218.761943	565.4694303															
75	2044	639.6358486	1266.68	1253.016087	293.6093833															
76	2045	648.6358059	1290.49	1273.543841																
77	2046	647.6352502	1314.74	1284.287733																
78	2047	617.3525356	1339.45	1265.970191																

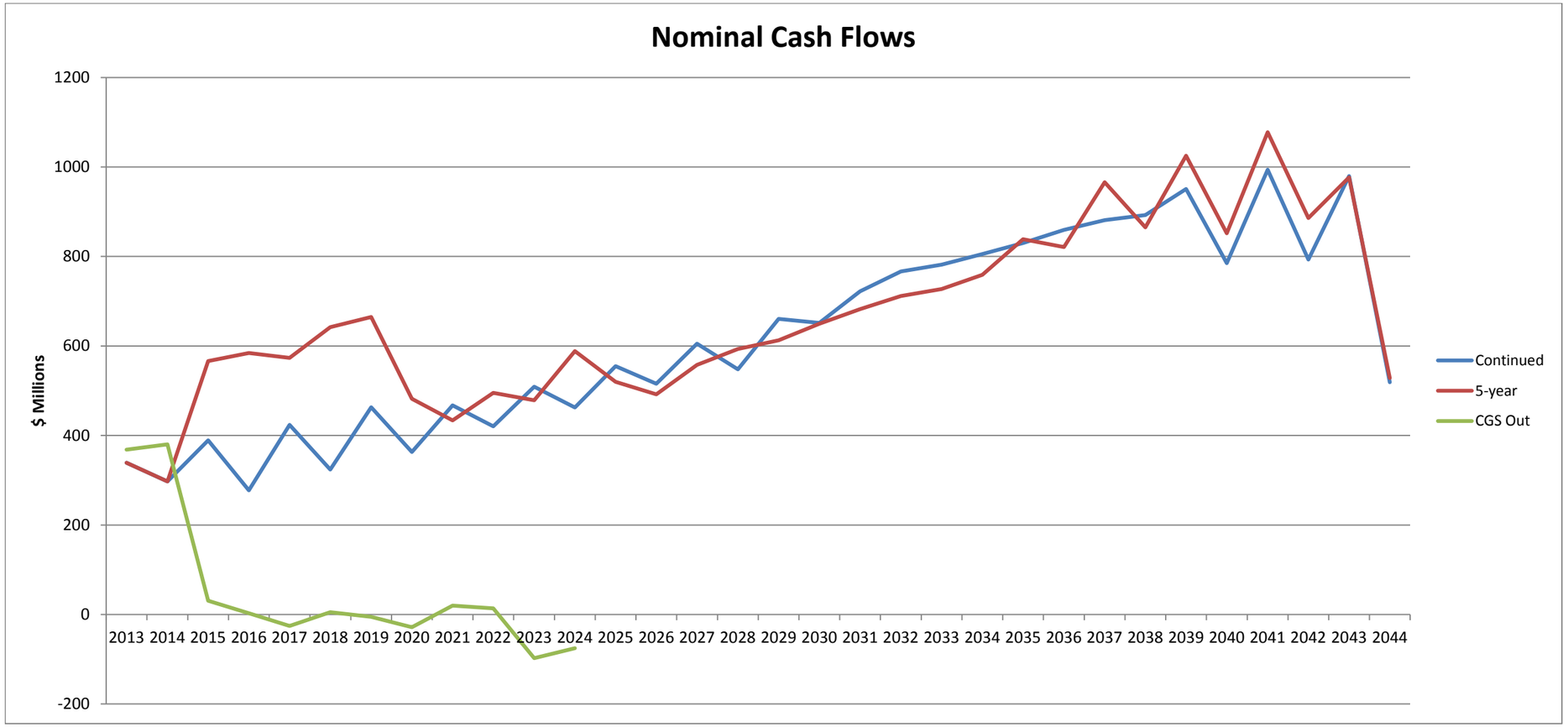
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1		CC Low	CC Range	CC Exp		CC Low	CC Range	CC Exp	Continued	5-year	New Scenario					70	89					32840						
2	2013				2013	368.479	0	368.479	338.9287	338.9287	308.2869		308.2869	368.479														
3	2014				2014	380.0495	0	380.04952	287.3517	292.0339	241.4341		241.4341	380.0495				Amt from c	amt from tx									
4	2015	427.4484	154.6661	441.3868	2015	458.454	123.6605	505.23237	323.2973	554.6379	412.5554		412.5554	505.2324	2016	384.6573	451.1908959	66.53356	32.84	99.37356		582.1145		123.6605		538.0724		181.9351
5	2016	433.4672	194.8489	450.9911	2016	336.8515	291.4645	387.21545	249.5002	569.2201	350.8922	99.373555	251.5187	287.8419	2017	390.5804	458.4587594	67.87835	32.84	100.7184		628.316		291.4645		420.0554		137.7153
6	2017	432.0526	244.0772	458.2781	2017	305.6083	370.5215	364.6739	325.3668	552.8063	342.0093	100.71835	241.2909	263.9555	2018	393.3557	461.7113351	68.35561	32.84	101.1956		676.1298		370.5215		397.5139		39.30708
7	2018	438.4102	264.0653	461.5289	2018	342.3831	360.0924	398.34178	279.6183	614.0871	348.1033	101.19561	246.9077	297.1462	2019	406.1085	477.6411416	71.53264	32.84	104.3726		702.4755		360.0924		431.1818		118.7235
8	2019	444.9454	284.7478	477.52	2019	335.4182	394.275	400.83281	371.1391	626.5888	407.7485	104.37264	303.3759	296.4602	2020	417.9122	492.3690122	74.45683	32.84	107.2968		729.6932		394.275		433.6728		29.6937
9	2020	451.38	313.9707	492.3035	2020	315.741	449.6097	389.50451	399.5007	423.487	417.3498	107.29683	310.0529	282.2077	2021	432.8064	511.0176138	78.21126	32.84	111.0513		765.3507		449.6097		422.3445		-9.99616
10	2021	457.9964	336.0078	511.0269	2021	366.6972	427.307	452.56774	420.2129	373.9132	307.0398	111.05126	195.9885	341.5165	2022	436.8225	515.8182975	78.99579	32.84	111.8358		794.0042		427.307		485.4077		32.3548
11	2022	456.6305	367.3108	515.8316	2022	358.4237	465.5176	450.46476	429.687	419.1159	341.1745	111.83579	229.3387	338.629	2023	446.8107	528.2123817	81.4017	32.84	114.2417		823.9413		465.5176		483.3048		20.77778
12	2023	463.4519	391.0208	528.2679	2023	251.483	602.9898	349.13892	438.221	397.722	424.2282	114.2417	309.9865	234.8972	2024	455.122	538.4698844	83.34784	32.84	116.1878		854.4728		602.9898		381.9789		-89.0821
13	2024	470.3692	424.0972	538.5566	2024	278.9793	615.4871	380.00667	454.1575	479.9336	437.0154	116.18784	320.8276	263.8188	2025	466.9573	553.2032746	86.24598	32.84	119.086		894.4664		615.4871		412.8467		-74.1508
14	2025	477.3793	449.3955	553.3433	2025	358.2933	568.4815	467.09735	446.9708	416.3292	460.694	119.08598	341.608	348.0114	2026	488.109	579.7800008	91.67097	32.84	124.511		926.7749		568.4815		499.9373		20.12659
15	2026	484.4288	484.3356	580.0328	2026	359.9179	608.8466	488.36185	399.538	386.5744	455.5218	124.51097	331.0109	363.8509	2027	496.0242	589.5160682	93.49186	32.84	126.3319		968.7645		608.8466		521.2018		88.82384
16	2027	491.7127	520.5147	589.7963	2027	365.3809	646.8465	496.30442	469.5512	430.3155	463.4644	126.33186	337.1326	369.9726	2028	508.4328	604.9540797	96.52123	32.84	129.3612		1012.227		646.8465		529.1444		26.75321
17	2028	489.9283	557.975	605.2896	2028	360.5671	687.3362	508.76839	408.8624	449.5211	475.9284	129.36123	346.5672	379.4072	2029	520.5785	620.0431681	99.46468	32.84	132.3047		1047.903		687.3362		541.6084		99.90601
18	2029	497.57	596.859	620.4313	2029	365.2653	729.1636	520.96665	493.8547	455.6216	488.1266	132.30468	355.822	388.662	2030	536.6452	640.1142519	103.469	32.84	136.309		1094.429		729.1636		553.8066		27.11196
19	2030	505.2806	636.8915	640.5798	2030	368.9716	773.2006	537.11083	469.2646	473.9938	504.2708	136.30902	367.9618	400.8018	2031	545.1674	650.5809964	105.4136	32.84	138.2536		1142.172		773.2006		569.9508		67.84626
20	2031	513.2329	648.8612	651.075	2031	374.9793	787.1148	545.66138	520.2093	488.675	512.8214	138.2536	374.5678	407.4078	2032	553.8518	661.2465018	107.3947	32.84	140.2347		1162.094		787.1148		578.5014		25.45213
21	2032	521.3368	661.0558	661.7694	2032	381.102	801.2906	554.37466	532.4485	500.3683	521.5347	140.23473	381.2999	414.1399	2033	562.7014	672.1145034	109.4131	32.84	142.2531		1182.393		801.2906		587.2147		21.9262
22	2033	529.5949	673.4796	672.6668	2033	387.3418	815.7327	563.25372	542.7278	501.9884	530.4137	142.2531	388.1606	421.0006	2034	571.7194	683.1888069	111.4694	32.84	144.3094		1203.075		815.7327		596.0937		20.52594
23	2034	538.0103	686.1369	683.7711	2034	393.7009	830.4463	572.30168	538.9378	514.2329	539.4617	144.30939	395.1523	427.9923	2035	580.909	694.4732897	113.5643	32.84	146.4043		1224.147		830.4463		605.1417		33.36389
24	2035	546.5859	699.0321	695.086	2035	400.1815	845.4365	581.52171	555.2008	557.8495	548.6817	146.40434	402.2774	435.1174	2036	590.2732	705.9719017	115.6987	32.84	148.5387		1245.618		845.4365		614.3617		26.32091
25	2036	555.3246	712.1696	706.6157	2036	406.786	860.7083	590.91705	554.32	536.2765	558.077	148.53865	409.5384	442.3784	2037	599.8156	717.6886673	117.8731	32.84	150.7131		1267.494		860.7083		623.757		36.59703
26	2037	564.2296	725.5541	718.3641	2037	413.5166	876.2672	600.49099	568.0372	619.1326	567.651	150.71308	416.9379	449.7779	2038	609.5393	729.6276864	120.0884	32.84	152.9284		1289.784		876.2672		633.331		32.45377
27	2038	573.304	739.1901	730.3353	2038	420.3757	892.1184	610.24689	554.6164	544.3201	577.4069	152.92837	424.4785	457.3185	2039	619.4478	741.793136	122.3453	32.84	155.1853		1312.494		892.1184		643.0869		55.63045
28	2039	582.551	753.0823	742.5335	2039	427.3657	908.2676	620.18817	590.5163	633.2205	587.3482	155.1853	432.1629	465.0029	2040	629.5446	754.1892718	124.6446	32.84	157.4846		1335.633		908.2676		653.0282		29.67183
29	2040	591.9738	767.2356	754.963	2040	434.4892	924.7203	630.31831	468.5427	516.5012	597.4783	157.48464	439.9937	472.8337	2041	639.8332	766.820429	126.9872	32.84	159.8272		1359.209		924.7203		663.1583		161.7756
30	2041	600.8932	781.655	766.9455	2041	441.066	941.4822	639.95831	594.926	641.5941	607.1183	159.8272	447.2911	480.1311	2042	649.6326	779.0063461	129.3738	32.84	162.2138		1382.548		941.4822		672.7983		45.03227
31	2042	609.2611	796.3453	778.4342	2042	447.0473	958.5591	649.06039	455.8151	517.6948	616.2204	162.21378	454.0066	486.8466	2043	658.8882	790.6933757	131.8052	32.84	164.6452		1405.606		958.5591		681.9004		193.2453
32	2043	607.9549	811.3117	780.3074	2043	443.3096	975.9569	648.50216	565.4694	560.2566	615.6622	164.64522	451.0169	483.8569	2044	669.6012	806.4072268	136.806	32.84	169.646		1419.267		975.9569		681.3422		83.03273
33	2044	588.9201	842.0937	767.8118	2044	419.2741	1011.74	631.00581	293.6094	297.5575	598.1658	169.64603	428.5198	461.3598	2045	640.7802	780.1573508	139.3772	32.84	172.2172		1431.014		1011.74		663.8458		337.3964
34																												
35								$3,524.19																				
36								$39.95																				
37																												

	A	B	C	D
1		Continued	5-year	CGS Out
2	2013	338.9286755	338.9286755	368.479
3	2014	297.4951825	297.4951825	380.0495237
4	2015	389.2676014	566.2448104	31.00560575
5	2016	277.4481724	584.1631189	2.757935969
6	2017	424.000681	573.3524048	-25.72589972
7	2018	324.0194705	642.2506916	5.1684894
8	2019	462.8862843	664.8162611	-5.154586841
9	2020	363.2777037	482.1327349	-28.34218547
10	2021	467.1920688	433.6545638	19.75213555
11	2022	420.476996	495.1695225	13.62897353
12	2023	508.9946654	478.6808401	-97.72726043
13	2024	462.6980505	588.4292515	-75.20204806
14	2025	554.9184589	519.9919047	
15	2026	515.8811775	491.8576995	
16	2027	605.0229029	557.7504588	
17	2028	547.942218	593.5395947	
18	2029	660.4333477	612.8448669	
19	2030	651.6395843	649.4797005	
20	2031	722.0241858	682.1183087	
21	2032	766.3991169	711.5017195	
22	2033	781.7630796	727.1542033	
23	2034	805.1910708	758.8209563	
24	2035	829.8780753	838.5774654	
25	2036	859.5045317	821.2238084	
26	2037	881.0737026	965.8352374	
27	2038	892.7483284	865.00852	
28	2039	950.5570429	1025.103403	
29	2040	784.9166629	851.78639	
30	2041	993.6688233	1077.869914	
31	2042	793.1395256	885.9850258	
32	2043	979.6320627	976.7562674	
33	2044	519.0243806	528.4657329	

	A	B	C
1		CGS Continued	CGS 5 Year Out
2	2013	4.628675544	4.628675544
3	2014	10.93735149	10.93735149
4	2015	18.33980218	15.46720432
5	2016	23.24093902	18.03784732
6	2017	29.506332	20.94483793
7	2018	31.91307952	21.13511759
8	2019	38.1514182	24.19526764
9	2020	41.5158027	29.97830245
10	2021	45.1961578	35.62087084
11	2022	47.8790514	41.13144911
12	2023	51.41242288	47.50823315
13	2024	53.95166495	53.95428052
14	2025	57.57915362	57.58176919
15	2026	60.21029414	60.2129097
16	2027	64.11551771	64.11813328
17	2028	66.96418343	66.966799
18	2029	71.21920151	71.22181708
19	2030	74.34536844	74.347984
20	2031	79.05314905	79.05576461
21	2032	82.54449276	82.54710833
22	2033	83.23083913	83.2334547
23	2034	80.91420146	80.91681702
24	2035	79.68120806	82.55642149
25	2036	79.49868723	84.70439449
26	2037	76.21589913	84.78000876
27	2038	76.32259997	87.10317747
28	2039	72.96691297	86.92567909
29	2040	71.86932169	83.4094375
30	2041	69.58140494	79.15930747
31	2042	66.89851135	73.6487292
32	2043	63.36513987	67.27194517
33	2044	60.8258978	60.8258978


Nominal Revenue Requirement
CC Range
CC Exp (CO2 Cost)
CGS Continued
$ (Millions)
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047


Nominal Cash Flows
$ Millions
1600
1400
1200
1000
800
600
400
200
0
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038
2039
2040
2041
2042
2043
2044
CC Range
CC Exp
CGS Continued
CGS 5-Year Out


Nominal Cash Flows
$ Millions
1200
1000
800
600
400
200
0
-200
2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044
Continued
5-year
CGS Out

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1		VOM $000	Vfuel $000	Total Vcost $000	Nom Gas (1.6% Inf) $/mmBtu	MWh	Vcost ($/MWh)	Implied HR ("Implied" from the cash spent annually on variable fuel)	Implied HR ("Implied" from the cash spent annually on variable fuel and O&M)					Real Gas (2008 $)		% Change in GDP			Nominal G
2	2008													$ 7.68		N/A	1.00		$ 7.68
3	2009													$ 3.43		2.2%	1.02		$ 3.51
4	2010													$ 4.04		1.3%	1.04		$ 4.18
5	2011													$ 4.30		0.8%	1.04		$ 4.49
6	2012													$ 2.39		1.3%	1.06		$ 2.53
7	2013													$ 3.39		1.4%	1.07		$ 3.64
8	2014													$ 3.80		1.7%	1.09		$ 4.14
9	2015													$ 3.89		1.8%	1.11		$ 4.32
10	2016													$ 3.93		1.8%	1.13		$ 4.44
11	2017													$ 3.94		1.8%	1.15		$ 4.53
12	2018	$ 18,988	$ 298,199	$ 317,188	$4.56	9,121,788	$32.69	7.164	7.620					$ 3.90		1.8%	1.17		$ 4.56
13	2019	$ 19,338	$ 312,586	$ 331,924	$4.78	9,121,788	$34.27	7.164	7.607					$ 4.01		1.8%	1.19		$ 4.78
14	2020	$ 19,683	$ 325,806	$ 345,489	$4.99	9,121,788	$35.72	7.164	7.597					$ 4.11		1.8%	1.21		$ 4.99
15	2021	$ 20,037	$ 342,867	$ 362,903	$5.25	9,121,788	$37.59	7.164	7.583					$ 4.25		1.8%	1.24		$ 5.25
16	2022	$ 20,410	$ 346,136	$ 366,545	$5.30	9,121,788	$37.95	7.164	7.587					$ 4.21		1.9%	1.26		$ 5.30
17	2023	$ 20,783	$ 356,924	$ 377,707	$5.46	9,121,788	$39.13	7.164	7.581					$ 4.26		1.8%	1.28		$ 5.46
18	2024	$ 21,161	$ 365,575	$ 386,735	$5.59	9,121,788	$40.08	7.164	7.579					$ 4.29		1.8%	1.30		$ 5.59
19	2025	$ 21,543	$ 378,636	$ 400,179	$5.79	9,121,788	$41.51	7.164	7.572					$ 4.36		1.8%	1.33		$ 5.79
20	2026	$ 21,929	$ 403,413	$ 425,342	$6.17	9,121,788	$44.23	7.164	7.554					$ 4.57		1.8%	1.35		$ 6.17
21	2027	$ 22,326	$ 411,464	$ 433,790	$6.30	9,121,788	$45.11	7.164	7.553					$ 4.57		1.8%	1.38		$ 6.30
22	2028	$ 22,736	$ 425,106	$ 447,843	$6.51	9,121,788	$46.60	7.164	7.547					$ 4.64		1.8%	1.40		$ 6.51
23	2029	$ 23,163	$ 438,334	$ 461,497	$6.71	9,121,788	$48.05	7.164	7.543					$ 4.70		1.9%	1.43		$ 6.71
24	2030	$ 23,593	$ 456,479	$ 480,071	$6.99	9,121,788	$50.04	7.164	7.534					$ 4.80		1.9%	1.45		$ 6.99
25	2031	$ 24,036	$ 465,058	$ 489,094	$7.12	9,121,788	$50.98	7.164	7.534					$ 4.80		1.9%	1.48		$ 7.12
26	2032	$ 24,488	$ 473,798	$ 498,286	$7.25	9,121,788	$51.94	7.164	7.534					$ 4.80		1.9%	1.51		$ 7.25
27	2033	$ 24,948	$ 482,702	$ 507,651	$7.39	9,121,788	$52.92	7.164	7.534					$ 4.80		1.9%	1.54		$ 7.39
28	2034	$ 25,417	$ 491,774	$ 517,191	$7.53	9,121,788	$53.91	7.164	7.534					$ 4.80		1.9%	1.57		$ 7.53
29	2035	$ 25,895	$ 501,017	$ 526,911	$7.67	9,121,788	$54.93	7.164	7.534					$ 4.80		1.9%	1.60		$ 7.67
30	2036	$ 26,381	$ 510,433	$ 536,814	$7.81	9,121,788	$55.96	7.164	7.534					$ 4.80		1.9%	1.63		$ 7.81
31	2037	$ 26,877	$ 520,026	$ 546,903	$7.96	9,121,788	$57.01	7.164	7.534					$ 4.80		1.9%	1.66		$ 7.96
32	2038	$ 27,382	$ 529,799	$ 557,181	$8.11	9,121,788	$58.08	7.164	7.534					$ 4.80		1.9%	1.69		$ 8.11
33	2039	$ 27,897	$ 539,756	$ 567,653	$8.26	9,121,788	$59.17	7.164	7.534					$ 4.80		1.9%	1.72		$ 8.26
34	2040	$ 28,421	$ 549,900	$ 578,321	$8.41	9,121,788	$60.28	7.164	7.534					$ 4.80		1.9%	1.75		$ 8.41
35	2041	$ 28,955	$ 560,235	$ 589,190	$8.57	9,121,788	$61.42	7.164	7.534					$ 4.80		1.9%	1.79		$ 8.57
36	2042	$ 29,499	$ 570,764	$ 600,263	$8.73	9,121,788	$62.57	7.164	7.534					$ 4.80		1.9%	1.82		$ 8.73
37	2043	$ 30,054	$ 581,491	$ 611,545	$8.90	9,121,788	$63.75	7.164	7.534					$ 4.80		1.9%	1.85		$ 8.90
38	2044	$ 31,194	$ 603,553	$ 634,747	$9.07	9,121,788	$66.17	7.299	7.676					$ 4.80		1.9%	1.89		$ 9.07
39	2045	$ 31,780	$ 614,896	$ 646,677	$9.24	9,121,788	$67.41	7.299	7.676					$ 4.80		1.9%	1.92		$ 9.24

	A	B	C
1	Month	Peak	Off_peak
2	2012_01	25.56991	22.77311
3	2012_02	22.80932	20.72189
4	2012_03	18.62127	16.7709
5	2012_04	14.92899	13.27256
6	2012_05	15.16094	11.88317
7	2012_06	16.07048	12.5422
8	2012_07	22.85914	20.28922
9	2012_08	24.78927	21.58817
10	2012_09	24.22419	20.80943
11	2012_10	22.91153	20.89963
12	2012_11	25.51016	24.09008
13	2012_12	29.57571	27.04583
14	2013_01	29.78195	25.78526
15	2013_02	27.33589	24.42666
16	2013_03	24.54964	22.11636
17	2013_04	23.81376	20.66763
18	2013_05	22.07616	17.521
19	2013_06	24.35071	19.47982
20	2013_07	28.33267	24.89129
21	2013_08	31.11918	26.86318
22	2013_09	30.842	26.6294
23	2013_10	29.53697	26.72632
24	2013_11	31.30759	28.92425
25	2013_12	34.80969	31.33094
26	2014_01	34.55931	29.46621
27	2014_02	33.12195	29.17814
28	2014_03	29.38802	25.94354
29	2014_04	27.07444	22.89642
30	2014_05	23.57951	17.73427
31	2014_06	24.90692	19.33495
32	2014_07	31.14627	27.31936
33	2014_08	33.35708	28.83992
34	2014_09	33.36069	28.8969
35	2014_10	32.54627	28.93631
36	2014_11	33.85418	31.31988
37	2014_12	37.14529	32.93989
38	2015_01	36.41781	30.45405
39	2015_02	34.4472	29.81518
40	2015_03	30.61994	26.61421
41	2015_04	25.78876	21.40801
42	2015_05	22.97397	16.71657
43	2015_06	25.91411	19.7397
44	2015_07	32.12219	28.41993
45	2015_08	35.92592	31.10364
46	2015_09	35.68441	31.1114

	A	B	C
47	2015_10	34.43792	30.68377
48	2015_11	34.6742	32.53659
49	2015_12	37.66594	34.03436
50	2016_01	37.08405	31.07168
51	2016_02	34.85503	30.33339
52	2016_03	32.41681	28.55609
53	2016_04	28.95527	23.79523
54	2016_05	24.83788	18.06227
55	2016_06	26.70754	20.36808
56	2016_07	32.72196	28.93132
57	2016_08	36.11332	31.35586
58	2016_09	36.14229	31.38141
59	2016_10	35.29529	31.71307
60	2016_11	37.35586	34.31607
61	2016_12	40.27419	36.05194
62	2017_01	41.34399	34.18874
63	2017_02	39.64004	34.13943
64	2017_03	34.17165	29.5192
65	2017_04	29.61728	24.43588
66	2017_05	25.96215	17.90931
67	2017_06	27.40271	20.67291
68	2017_07	33.79117	29.81611
69	2017_08	37.77081	32.47106
70	2017_09	37.85046	32.68886
71	2017_10	36.16149	32.20651
72	2017_11	36.74172	33.60879
73	2017_12	38.53146	34.62822
74	2018_01	40.34882	33.05349
75	2018_02	39.33628	33.84246
76	2018_03	33.51997	29.09925
77	2018_04	30.00892	24.87515
78	2018_05	26.19439	18.78278
79	2018_06	28.1444	21.55447
80	2018_07	34.52185	30.58199
81	2018_08	39.00691	33.78411
82	2018_09	38.89564	33.30949
83	2018_10	39.4861	34.55837
84	2018_11	38.94636	35.53714
85	2018_12	41.56358	37.24418
86	2019_01	43.0067	35.19282
87	2019_02	41.64005	35.28779
88	2019_03	35.56301	30.38988
89	2019_04	31.42652	25.30888
90	2019_05	27.13948	19.27209
91	2019_06	28.73752	21.80039
92	2019_07	35.36727	31.40983

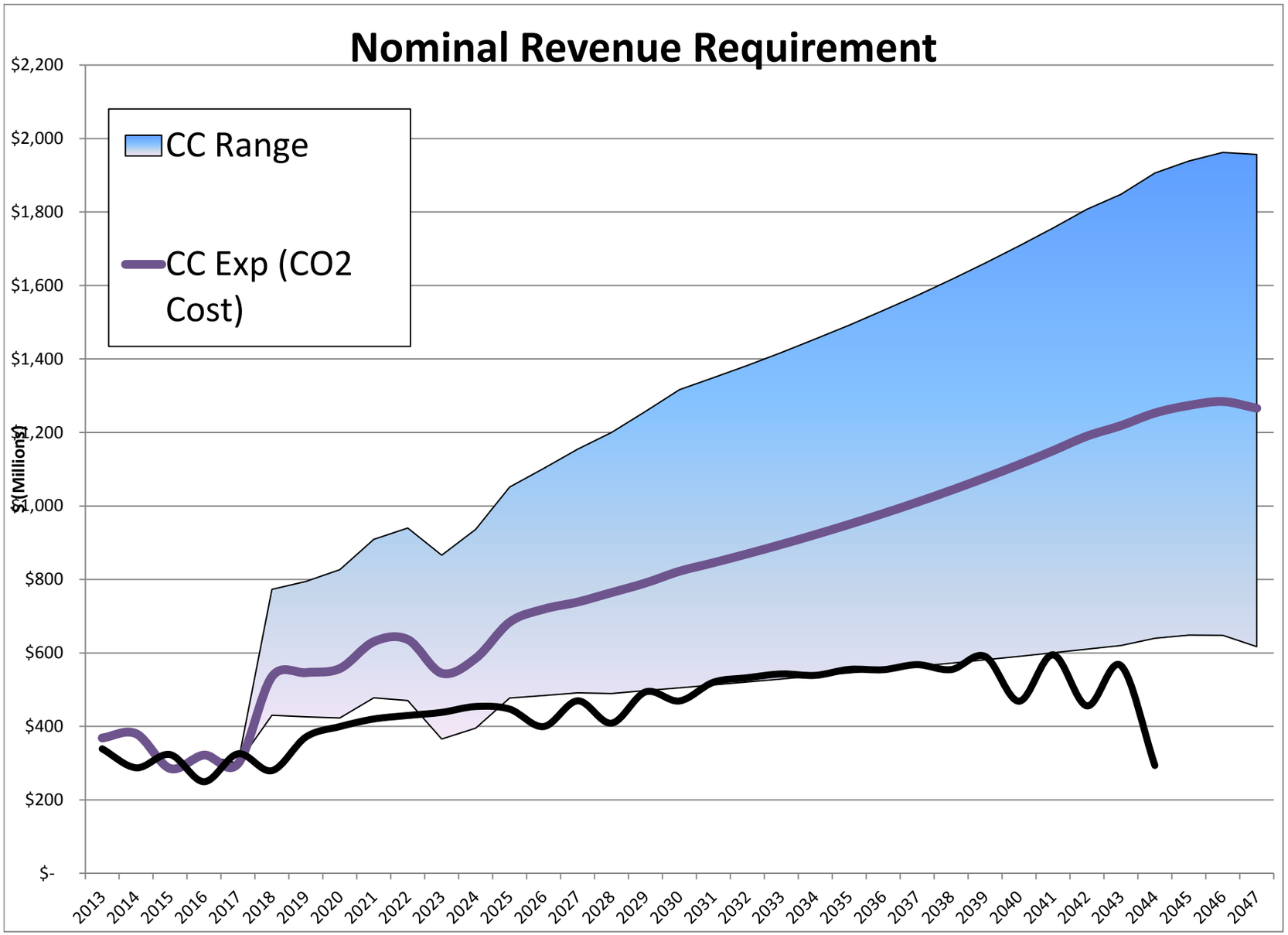
	A	B	C
93	2019_08	39.81393	34.25068
94	2019_09	40.77705	34.48111
95	2019_10	41.24591	35.83846
96	2019_11	40.58612	36.46609
97	2019_12	44.40277	39.24562
98	2020_01	44.621	36.3241
99	2020_02	40.66879	34.30813
100	2020_03	36.98067	31.53639
101	2020_04	32.55149	26.23196
102	2020_05	28.17905	20.01509
103	2020_06	30.30588	22.55465
104	2020_07	36.19472	31.33207
105	2020_08	40.84951	34.56215
106	2020_09	41.84203	35.29914
107	2020_10	41.09139	35.16436
108	2020_11	41.68517	37.02466
109	2020_12	45.2905	39.67273
110	2021_01	47.1056	37.54261
111	2021_02	44.42298	37.04377
112	2021_03	37.71631	31.42114
113	2021_04	32.20911	25.39048
114	2021_05	28.12172	19.85935
115	2021_06	31.66936	23.50501
116	2021_07	38.08837	32.66387
117	2021_08	43.04	36.26804
118	2021_09	43.14087	36.49724
119	2021_10	42.39948	36.38215
120	2021_11	43.86045	37.93203
121	2021_12	48.09326	42.19385

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC
1	Group.1	Peak	Off_peak											NetGen	Peak	Off-Peak	PeakShare	OPShare	Av. Price				Peak	OP	PeakSHare	OPShare	AvPrice	NetGen	
2	2012_01	25.56991	22.77311										FY13	8,442	26.68328	23.36801	0.666667	0.333333	25.57819				31.4643	26.9166641	0.666667	0.333333	29.94842	8,254	247,179,403
3	2012_02	22.80932	20.72189							13.90868	0.139087	3.557589	FY14	9,517	30.51237	26.3826	0.666667	0.333333	29.13578	277,281,257.92			32.94726	28.3397023	0.666667	0.333333	31.41141	9,799	307,786,329
4	2012_03	18.62127	16.7709							4.440015	0.0444	1.293633	FY15	8,254	31.95334	27.38156	0.666667	0.333333	30.42941	251,149,283.39			34.67006	29.5512617	0.666667	0.333333	32.96379	8,668	285,722,909
5	2012_04	14.92899	13.27256							3.548793	0.035488	1.079877	FY16	9,799	33.05102	28.42584	0.666667	0.333333	31.50929	308,745,418.33			34.86666	29.7189313	0.666667	0.333333	33.15075	9,772	323,941,833
6	2012_05	15.16094	11.88317							5.68962	0.056896	1.792759	FY17	8,668	35.03963	29.82688	0.666667	0.333333	33.30205	288,654,834.02			36.66114	31.0222609	0.666667	0.333333	34.78152	8,668	301,478,530
7	2012_06	16.07048	12.5422							0.273315	0.002733	0.09102	FY18	9,772	35.11766	29.94389	0.666667	0.333333	33.39307	326,309,719.40									
8	2012_07	22.85914	20.28922	25.14818	22.05992					4.950947	0.049509	1.653273	FY19	8,668	36.95563	31.22776	0.666667	0.333333	35.04634	303,773,979.26									
9	2012_08	24.78927	21.58817							3.083331	0.030833	1.080595	FY20	9,799	38.20233	31.97615	0.666667	0.333333	36.12694	353,991,663.19									
10	2012_09	24.22419	20.80943							2.971489	0.029715	1.073508	FY21	8,668	39.46511	32.6711	0.666667	0.333333	37.20044										
11	2012_10	22.91153	20.89963										FY22	9,772					39.00467										
12	2012_11	25.51016	24.09008										FY23	8,668					40.89639										
13	2012_12	29.57571	27.04583										FY24	9,969					42.87987										
14	2013_01	29.78195	25.78526										FY25	8,819					44.95954										
15	2013_02	27.33589	24.42666										FY26	9,942					47.14008										
16	2013_03	24.54964	22.11636										FY27	8,819					49.42637										
17	2013_04	23.81376	20.66763										FY28	9,969					51.82355										
18	2013_05	22.07616	17.521										FY29	8,819					54.33699										
19	2013_06	24.35071	19.47982										FY30	9,942					56.97234										
20	2013_07	28.33267	24.89129	29.88152	25.82658								FY31	8,819					59.7355										
21	2013_08	31.11918	26.86318										FY32	9,969					62.63267										
22	2013_09	30.842	26.6294										FY33	8,819					65.67035										
23	2013_10	29.53697	26.72632										FY34	9,942					68.85536										
24	2013_11	31.30759	28.92425										FY35	8,819					72.19485										
25	2013_12	34.80969	31.33094										FY36	9,969					75.6963										
26	2014_01	34.55931	29.46621										FY37	8,819					79.36757										
27	2014_02	33.12195	29.17814										FY38	9,942					83.2169										
28	2014_03	29.38802	25.94354										FY39	8,819					87.25292										
29	2014_04	27.07444	22.89642										FY40	9,969					91.48468										
30	2014_05	23.57951	17.73427										FY41	8,819					95.92169										
31	2014_06	24.90692	19.33495										FY42	9,942					100.5739										
32	2014_07	31.14627	27.31936	31.4643	26.91666								FY43	4,971															
33	2014_08	33.35708	28.83992																$144.93										
34	2014_09	33.36069	28.8969																$32.65										
35	2014_10	32.54627	28.93631																										
36	2014_11	33.85418	31.31988																										
37	2014_12	37.14529	32.93989																										
38	2015_01	36.41781	30.45405																										
39	2015_02	34.4472	29.81518																										
40	2015_03	30.61994	26.61421																										
41	2015_04	25.78876	21.40801																										
42	2015_05	22.97397	16.71657																										
43	2015_06	25.91411	19.7397																										
44	2015_07	32.12219	28.41993	32.94726	28.3397																								
45	2015_08	35.92592	31.10364																										
46	2015_09	35.68441	31.1114																										
47	2015_10	34.43792	30.68377																										
48	2015_11	34.6742	32.53659																										
49	2015_12	37.66594	34.03436																										
50	2016_01	37.08405	31.07168																										
51	2016_02	34.85503	30.33339																										
52	2016_03	32.41681	28.55609																										
53	2016_04	28.95527	23.79523																										
54	2016_05	24.83788	18.06227																										
55	2016_06	26.70754	20.36808																										
56	2016_07	32.72196	28.93132	34.67006	29.55126																								
57	2016_08	36.11332	31.35586																										
58	2016_09	36.14229	31.38141																										
59	2016_10	35.29529	31.71307																										
60	2016_11	37.35586	34.31607																										
61	2016_12	40.27419	36.05194																										

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC
62	2017_01	41.34399	34.18874																										
63	2017_02	39.64004	34.13943																										
64	2017_03	34.17165	29.5192																										
65	2017_04	29.61728	24.43588																										
66	2017_05	25.96215	17.90931																										
67	2017_06	27.40271	20.67291																										
68	2017_07	33.79117	29.81611	34.86666	29.71893																								
69	2017_08	37.77081	32.47106																										
70	2017_09	37.85046	32.68886																										
71	2017_10	36.16149	32.20651																										
72	2017_11	36.74172	33.60879																										
73	2017_12	38.53146	34.62822																										
74	2018_01	40.34882	33.05349																										
75	2018_02	39.33628	33.84246																										
76	2018_03	33.51997	29.09925																										
77	2018_04	30.00892	24.87515																										
78	2018_05	26.19439	18.78278																										
79	2018_06	28.1444	21.55447																										
80	2018_07	34.52185	30.58199	36.66114	31.02226																								
81	2018_08	39.00691	33.78411																										
82	2018_09	38.89564	33.30949																										
83	2018_10	39.4861	34.55837																										
84	2018_11	38.94636	35.53714																										
85	2018_12	41.56358	37.24418																										
86	2019_01	43.0067	35.19282																										
87	2019_02	41.64005	35.28779																										
88	2019_03	35.56301	30.38988																										
89	2019_04	31.42652	25.30888																										
90	2019_05	27.13948	19.27209																										
91	2019_06	28.73752	21.80039																										
92	2019_07	35.36727	31.40983	37.95833	31.88851																								
93	2019_08	39.81393	34.25068																										
94	2019_09	40.77705	34.48111																										
95	2019_10	41.24591	35.83846																										
96	2019_11	40.58612	36.46609																										
97	2019_12	44.40277	39.24562																										
98	2020_01	44.621	36.3241																										
99	2020_02	40.66879	34.30813																										
100	2020_03	36.98067	31.53639																										
101	2020_04	32.55149	26.23196																										
102	2020_05	28.17905	20.01509																										
103	2020_06	30.30588	22.55465																										
104	2020_07	36.19472	31.33207	39.01653	32.31812																								
105	2020_08	40.84951	34.56215																										
106	2020_09	41.84203	35.29914																										
107	2020_10	41.09139	35.16436																										
108	2020_11	41.68517	37.02466																										
109	2020_12	45.2905	39.67273																										
110	2021_01	47.1056	37.54261																										
111	2021_02	44.42298	37.04377																										
112	2021_03	37.71631	31.42114																										
113	2021_04	32.20911	25.39048																										
114	2021_05	28.12172	19.85935																										
115	2021_06	31.66936	23.50501																										
116	2021_07	38.08837	32.66387	43.10374	36.98953																								
117	2021_08	43.04	36.26804																										
118	2021_09	43.14087	36.49724																										
119	2021_10	42.39948	36.38215	44.78439	38.83601																								
120	2021_11	43.86045	37.93203																										
121	2021_12	48.09326	42.19385																										
122																													

	A	B	C	E	F	H	I	K	L	N	O	P	Q	U	V	W	X
1	***Draft***																
2		CC Low	MWH	CC Exp (No CO2)	MWH	CC Exp (Yes CO2)	MWH	CC High	MWH	Continued	5-year		Termination				
3	2013	368	8,473,920	368	8,473,920	368	8,473,920	368	8,473,920	339	339	8,474	368	Scenario	Levelized Costs ($/MWh Real)	NPV of Revenue Requirement ($M)	Difference from Continued CGS ($M)
4	2014	380	9,516,864	380	9,516,864	380	9,516,864	380	9,516,864	287	292	9,517	380	Continued CGS Operation	$45.80	$7,419	$0
5	2015	285	8,291,405	285	8,291,405	285	8,291,405	285	8,291,405	323	555	8,291	31	Five-Year CGS Outage with Replacement Power	$52.30	$8,471	$1,053
6	2016	322	9,798,552	322	9,798,552	322	9,798,552	322	9,798,552	250	569	9,799	(10)	CGS Shutdown with Replacement CC's (No CO2 Cost)	$59.73	$9,973	$2,554
7	2017	299	8,700,900	299	8,700,900	299	8,700,900	299	8,700,900	325	553	8,701	(39)	CGS Shutdown with Replacement CC's (CO2 Cost)	$76.88	$12,837	$5,419
8	2018	430	9,121,788	453	9,121,788	536	9,121,788	773	9,121,788	280	614	9,772	(8)	CC Low	$50.88	$8,496	$1,078
9	2019	426	9,121,788	458	9,121,788	546	9,121,788	795	9,121,788	371	627	8,701	(19)	CC High	$113.62	$18,972	$11,553
10	2020	423	9,121,788	463	9,121,788	558	9,121,788	827	9,121,788	400	423	9,799	(28)				
11	2021	478	9,121,788	530	9,121,788	631	9,121,788	909	9,121,788	420	374	8,701	20				
12	2022	470	9,121,788	529	9,121,788	636	9,121,788	940	9,121,788	430	419	9,772	14				
13	2023	366	9,121,788	429	9,121,788	545	9,121,788	866	9,121,788	438	398	8,701	(98)				
14	2024	395	9,121,788	462	9,121,788	585	9,121,788	936	9,121,788	454	480	9,969	(75)				
15	2025	477	9,121,788	552	9,121,788	684	9,121,788	1,052	9,121,788	447	416	8,852					
16	2026	484	9,121,788	578	9,121,788	719	9,121,788	1,102	9,121,788	400	387	9,942					
17	2027	491	9,121,788	588	9,121,788	738	9,121,788	1,155	9,121,788	470	430	8,852					
18	2028	490	9,121,788	603	9,121,788	764	9,121,788	1,200	9,121,788	409	450	9,969					
19	2029	497	9,121,788	618	9,121,788	790	9,121,788	1,257	9,121,788	494	456	8,852					
20	2030	505	9,121,788	638	9,121,788	822	9,121,788	1,316	9,121,788	469	474	9,942					
21	2031	513	9,121,788	649	9,121,788	845	9,121,788	1,349	9,121,788	520	489	8,852					
22	2032	521	9,121,788	659	9,121,788	870	9,121,788	1,383	9,121,788	532	500	9,969					
23	2033	529	9,121,788	670	9,121,788	895	9,121,788	1,418	9,121,788	543	502	8,852					
24	2034	537	9,121,788	681	9,121,788	922	9,121,788	1,454	9,121,788	539	514	9,942					
25	2035	546	9,121,788	692	9,121,788	950	9,121,788	1,492	9,121,788	555	558	8,852					
26	2036	554	9,121,788	703	9,121,788	979	9,121,788	1,532	9,121,788	554	536	9,969					
27	2037	563	9,121,788	715	9,121,788	1,010	9,121,788	1,573	9,121,788	568	619	8,852					
28	2038	572	9,121,788	727	9,121,788	1,043	9,121,788	1,616	9,121,788	555	544	9,942					
29	2039	581	9,121,788	739	9,121,788	1,077	9,121,788	1,661	9,121,788	591	633	8,852					
30	2040	591	9,121,788	751	9,121,788	1,113	9,121,788	1,708	9,121,788	469	517	9,969					
31	2041	600	9,121,788	764	9,121,788	1,150	9,121,788	1,757	9,121,788	595	642	8,852					
32	2042	610	9,121,788	777	9,121,788	1,190	9,121,788	1,808	9,121,788	456	518	9,942					
33	2043	620	9,121,788	790	9,121,788	1,219	9,121,788	1,848	9,121,788	565	560	8,852					
34	2044	640	9,121,788	816	9,121,788	1,253	9,121,788	1,906	9,121,788	294	298	4,984					
35	2045	649	9,121,788	828	9,121,788	1,274	9,121,788	1,939	9,121,788								
36	2046	648	9,121,788	831	9,121,788	1,284	9,121,788	1,962	9,121,788	$7,418.80	$8,471.46	161,967.62					
37	2047	617	9,121,788	804	9,121,788	1,266	9,121,788	1,957	9,121,788								
38										$45.80	$52.30						
39		$8,496.39	166,979,190.19	$9,972.98	166,979,190.19	$12,837.39	166,979,190.19	$18,971.78	166,979,190.19								
40																	
41		$50.88		$59.73		$76.88		$113.62		$ 41.34	$ 49.48						
42																	
43																	
44		CC Low	CC Range	CC Exp (CO2 Cost)	CGS Continued												
45	2013	$ 368	$ -	$ 368	$ 339												
46	2014	$ 380	$ -	$ 380	$ 287												
47	2015	$ 285	$ -	$ 285	$ 323												
48	2016	$ 322	$ -	$ 322	$ 250												
49	2017	$ 299	$ -	$ 299	$ 325												
50	2018	$ 430	$ 343	$ 536	$ 280												
51	2019	$ 426	$ 369	$ 546	$ 371												
52	2020	$ 423	$ 404	$ 558	$ 400												
53	2021	$ 478	$ 432	$ 631	$ 420												
54	2022	$ 470	$ 470	$ 636	$ 430												
55	2023	$ 366	$ 500	$ 545	$ 438												
56	2024	$ 395	$ 541	$ 585	$ 454												
57	2025	$ 477	$ 574	$ 684	$ 447												
58	2026	$ 484	$ 618	$ 719	$ 400												
59	2027	$ 491	$ 663	$ 738	$ 470												
60	2028	$ 490	$ 711	$ 764	$ 409												
61	2029	$ 497	$ 760	$ 790	$ 494												
62	2030	$ 505	$ 811	$ 822	$ 469												
63	2031	$ 513	$ 836	$ 845	$ 520												

	A	B	C	E	F	H	I	K	L	N	O	P	Q	U	V	W	X
64	2032	$ 521	$ 862	$ 870	$ 532												
65	2033	$ 529	$ 889	$ 895	$ 543												
66	2034	$ 537	$ 917	$ 922	$ 539												
67	2035	$ 546	$ 946	$ 950	$ 555												
68	2036	$ 554	$ 977	$ 979	$ 554												
69	2037	$ 563	$ 1,010	$ 1,010	$ 568												
70	2038	$ 572	$ 1,044	$ 1,043	$ 555												
71	2039	$ 581	$ 1,080	$ 1,077	$ 591												
72	2040	$ 591	$ 1,117	$ 1,113	$ 469												
73	2041	$ 600	$ 1,156	$ 1,150	$ 595												
74	2042	$ 610	$ 1,198	$ 1,190	$ 456												
75	2043	$ 620	$ 1,228	$ 1,219	$ 565												
76	2044	$ 640	$ 1,267	$ 1,253	$ 294												
77	2045	$ 649	$ 1,290	$ 1,274													
78	2046	$ 648	$ 1,315	$ 1,284													
79	2047	$ 617	$ 1,339	$ 1,266													


Nominal Revenue Requirement
CC Range
CC Exp (CO2 Cost)
$(Millions)
$2,200
$2,000
$1,800
$1,600
$1,400
$1,200
$1,000
$800
$600
$400
$200
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2047

$/METRIC TON CO2 Real

	Real	Nominal
2013	$ 16.65	$ 16.65
2014	$ 17.65	$ 17.93
2015	$ 18.53	$ 19.13
2016	$ 19.46	$ 20.41
2017	$ 20.43	$ 21.77
2018	$ 21.45	$ 23.23
2019	$ 22.53	$ 24.78
2020	$ 23.65	$ 26.43
2021	$ 24.84	$ 28.20
2022	$ 26.08	$ 30.08
2023	$ 27.38	$ 32.09
2024	$ 28.75	$ 34.23
2025	$ 30.19	$ 36.52
2026	$ 31.70	$ 38.96
2027	$ 33.28	$ 41.56
2028	$ 34.95	$ 44.34
2029	$ 36.69	$ 47.30
2030	$ 38.53	$ 50.46
2031	$ 40.45	$ 53.83
2032	$ 42.48	$ 57.43
2033	$ 44.60	$ 61.27
2034	$ 46.83	$ 65.36
2035	$ 49.17	$ 69.72

Natural Gas Prices - Real

	High	Low	Medium
2012	$ 2.70	$ 2.40	$ 2.57
2013	$ 3.70	$ 2.60	$ 3.34
2014	$ 5.30	$ 3.40	$ 3.75
2015	$ 5.80	$ 3.70	$ 4.01
2016	$ 6.30	$ 3.70	$ 4.14
2017	$ 6.80	$ 3.60	$ 4.29
2018	$ 7.00	$ 3.60	$ 4.43
2019	$ 7.20	$ 3.60	$ 4.56
2020	$ 7.50	$ 3.60	$ 4.65
2021	$ 7.70	$ 3.60	$ 4.75
2022	$ 7.90	$ 3.50	$ 4.82
2023	$ 8.10	$ 3.50	$ 4.91
2024	$ 8.40	$ 3.50	$ 4.96
2025	$ 8.60	$ 3.50	$ 4.98
2026	$ 8.90	$ 3.50	$ 5.03
2027	$ 9.20	$ 3.50	$ 5.07
2028	$ 9.40	$ 3.40	$ 5.09
2029	$ 9.70	$ 3.40	$ 5.14
2030	$ 10.00	$ 3.40	$ 5.17

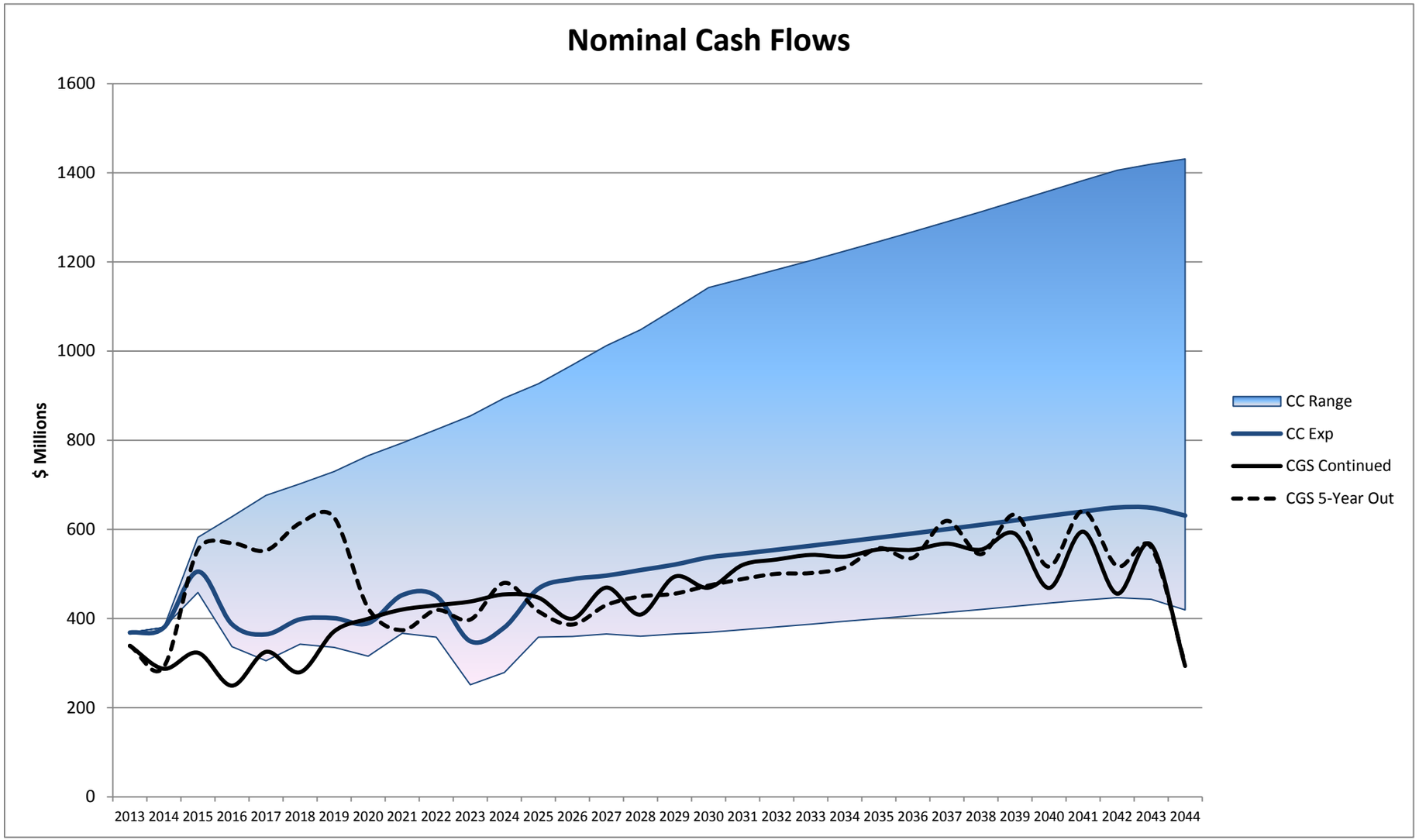
Natural Gas Prices - Nominal

	High	Low	Medium
2012	$ 2.72	$ 2.42	$ 2.59
2013	$ 3.79	$ 2.66	$ 3.42
2014	$ 5.51	$ 3.54	$ 3.90
2015	$ 6.13	$ 3.91	$ 4.24
2016	$ 6.77	$ 3.97	$ 4.45
2017	$ 7.42	$ 3.93	$ 4.68
2018	$ 7.76	$ 3.99	$ 4.91
2019	$ 8.11	$ 4.06	$ 5.14
2020	$ 8.59	$ 4.12	$ 5.32
2021	$ 8.96	$ 4.19	$ 5.52
2022	$ 9.34	$ 4.14	$ 5.70
2023	$ 9.73	$ 4.20	$ 5.90
2024	$ 10.25	$ 4.27	$ 6.05
2025	$ 10.66	$ 4.34	$ 6.18
2026	$ 11.21	$ 4.41	$ 6.34
2027	$ 11.78	$ 4.48	$ 6.49
2028	$ 12.23	$ 4.42	$ 6.63
2029	$ 12.82	$ 4.49	$ 6.79
2030	$ 13.43	$ 4.57	$ 6.95

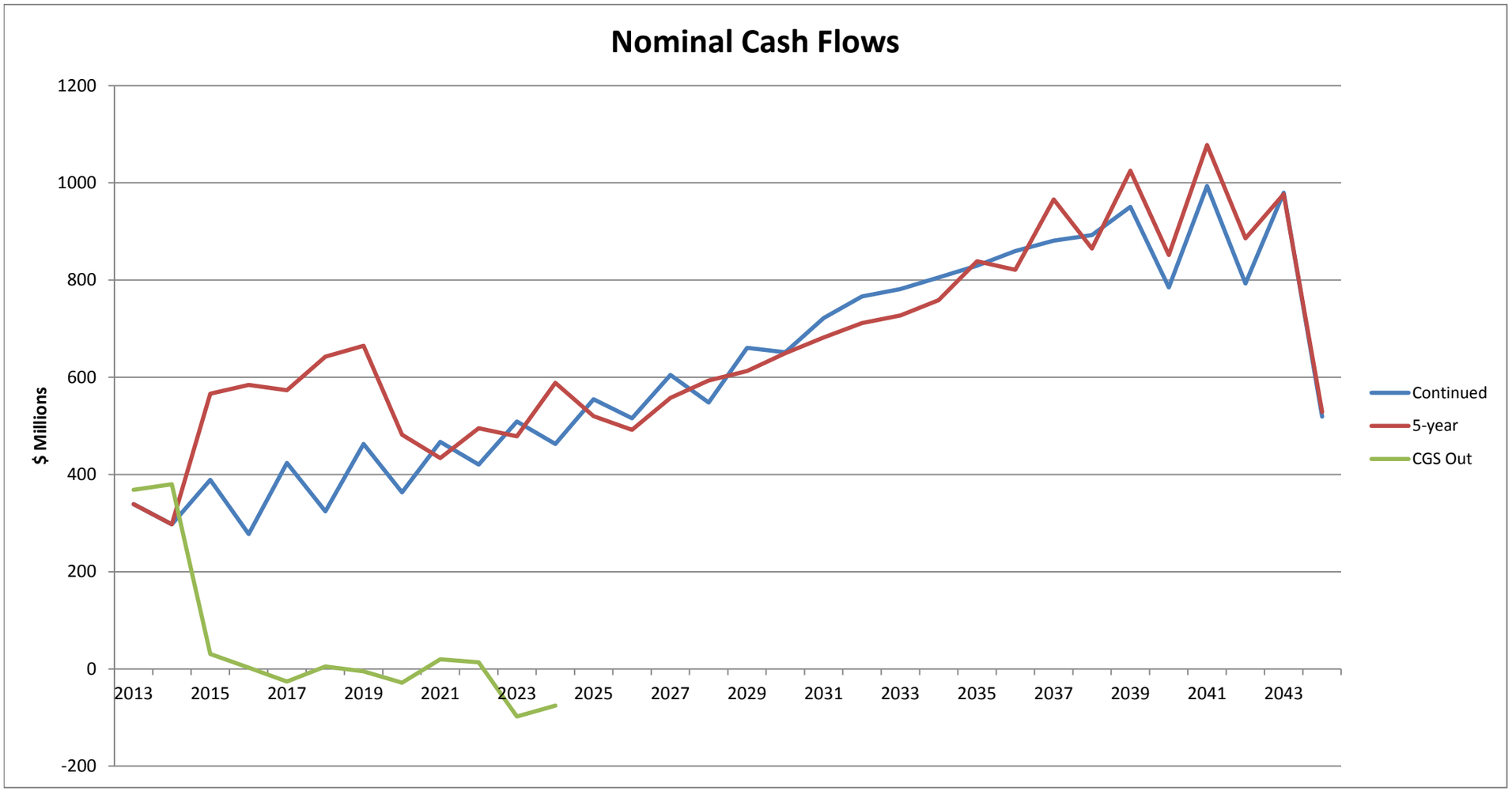
Flat Annual Electricity Prices

	With GGS Operating	Without CGS Operating
2012	$ 20.84	$ 20.84
2013	$ 26.66	$ 26.66
2014	$ 29.34	$ 29.34
2015	$ 29.66	$ 30.29
2016	$ 30.02	$ 31.53
2017	$ 31.21	$ 32.67
2018	$ 31.80	$ 33.55
2019	$ 33.48	$ 34.94
2020	$ 34.55	$ 35.62
2021	$ 37.10	$ 37.10
2022	$ 39.54	$ 39.54
2023	$ 42.46	$ 42.46
2024	$ 47.41	$ 47.41
2025	$ 49.31	$ 49.31
2026	$ 54.53	$ 54.53
2027	$ 58.89	$ 58.89
2028	$ 60.33	$ 60.33
2029	$ 65.16	$ 65.16
2030	$ 73.95	$ 73.95

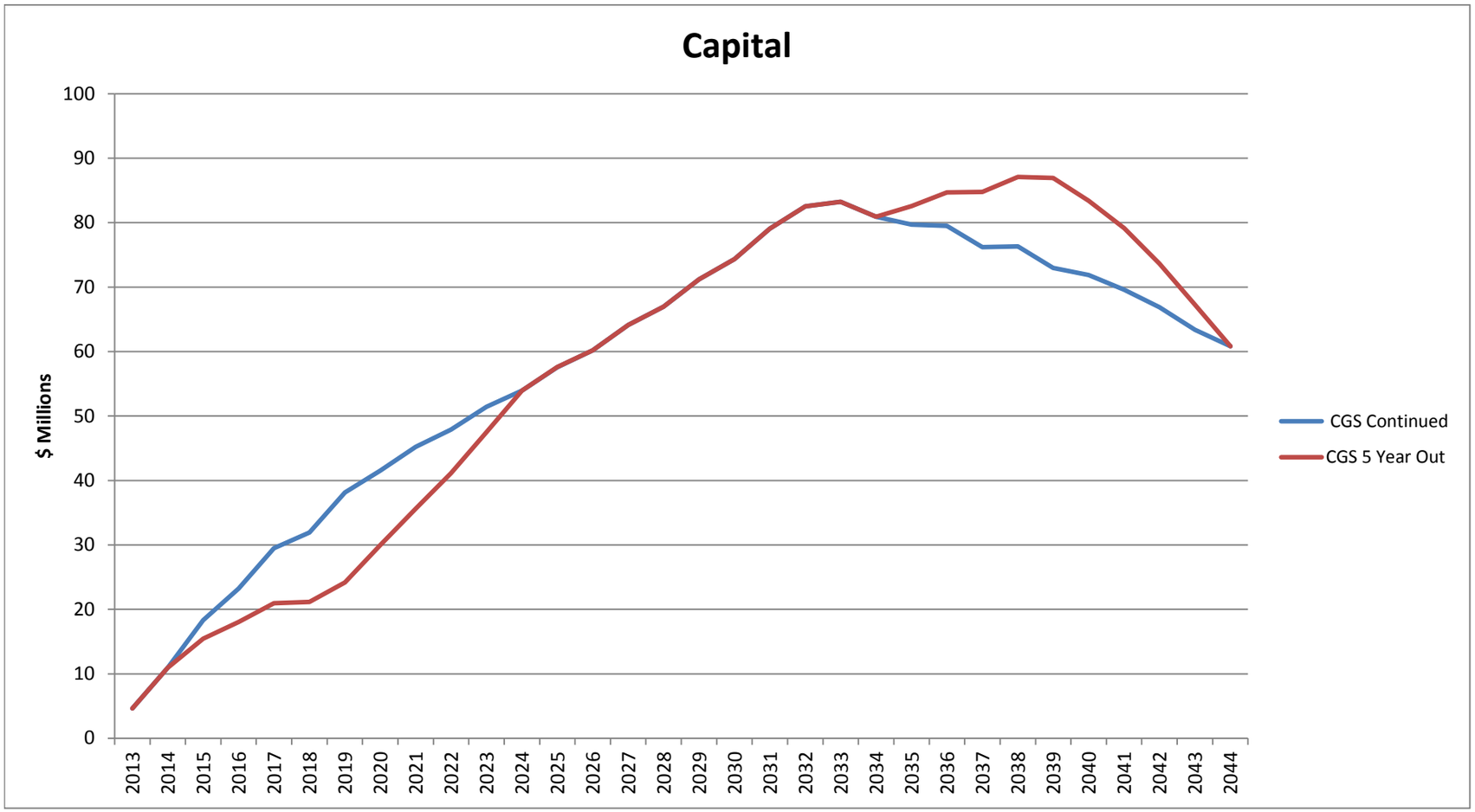
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	V	X	Z	AB
1		CC Low	CC Range	CC Exp		CC Low	CC Range	CC Exp	Continued	5-year	New Scenario					70	89				32840			
2	2013				2013	368.479	0	368.479	338.9287	338.9287	308.2869		308.2869	368.479										
3	2014				2014	380.0495	0	380.04952	287.3517	292.0339	241.4341		241.4341	380.0495				Amt from c	amt from tx					
4	2015	427.4484	154.6661	441.3868	2015	458.454	123.6605	505.23237	323.2973	554.6379	412.5554		412.5554	505.2324	2016	384.6573	451.1908959	66.53356	32.84	99.37356	582.1145	123.6605	538.0724	181.9351
5	2016	433.4672	194.8489	450.9911	2016	336.8515	291.4645	387.21545	249.5002	569.2201	350.8922	99.373555	251.5187	287.8419	2017	390.5804	458.4587594	67.87835	32.84	100.7184	628.316	291.4645	420.0554	137.7153
6	2017	432.0526	244.0772	458.2781	2017	305.6083	370.5215	364.6739	325.3668	552.8063	342.0093	100.71835	241.2909	263.9555	2018	393.3557	461.7113351	68.35561	32.84	101.1956	676.1298	370.5215	397.5139	39.30708
7	2018	438.4102	264.0653	461.5289	2018	342.3831	360.0924	398.34178	279.6183	614.0871	348.1033	101.19561	246.9077	297.1462	2019	406.1085	477.6411416	71.53264	32.84	104.3726	702.4755	360.0924	431.1818	118.7235
8	2019	444.9454	284.7478	477.52	2019	335.4182	394.275	400.83281	371.1391	626.5888	407.7485	104.37264	303.3759	296.4602	2020	417.9122	492.3690122	74.45683	32.84	107.2968	729.6932	394.275	433.6728	29.6937
9	2020	451.38	313.9707	492.3035	2020	315.741	449.6097	389.50451	399.5007	423.487	417.3498	107.29683	310.0529	282.2077	2021	432.8064	511.0176138	78.21126	32.84	111.0513	765.3507	449.6097	422.3445	-9.99616
10	2021	457.9964	336.0078	511.0269	2021	366.6972	427.307	452.56774	420.2129	373.9132	307.0398	111.05126	195.9885	341.5165	2022	436.8225	515.8182975	78.99579	32.84	111.8358	794.0042	427.307	485.4077	32.3548
11	2022	456.6305	367.3108	515.8316	2022	358.4237	465.5176	450.46476	429.687	419.1159	341.1745	111.83579	229.3387	338.629	2023	446.8107	528.2123817	81.4017	32.84	114.2417	823.9413	465.5176	483.3048	20.77778
12	2023	463.4519	391.0208	528.2679	2023	251.483	602.9898	349.13892	438.221	397.722	424.2282	114.2417	309.9865	234.8972	2024	455.122	538.4698844	83.34784	32.84	116.1878	854.4728	602.9898	381.9789	-89.0821
13	2024	470.3692	424.0972	538.5566	2024	278.9793	615.4871	380.00667	454.1575	479.9336	437.0154	116.18784	320.8276	263.8188	2025	466.9573	553.2032746	86.24598	32.84	119.086	894.4664	615.4871	412.8467	-74.1508
14	2025	477.3793	449.3955	553.3433	2025	358.2933	568.4815	467.09735	446.9708	416.3292	460.694	119.08598	341.608	348.0114	2026	488.109	579.7800008	91.67097	32.84	124.511	926.7749	568.4815	499.9373	20.12659
15	2026	484.4288	484.3356	580.0328	2026	359.9179	608.8466	488.36185	399.538	386.5744	455.5218	124.51097	331.0109	363.8509	2027	496.0242	589.5160682	93.49186	32.84	126.3319	968.7645	608.8466	521.2018	88.82384
16	2027	491.7127	520.5147	589.7963	2027	365.3809	646.8465	496.30442	469.5512	430.3155	463.4644	126.33186	337.1326	369.9726	2028	508.4328	604.9540797	96.52123	32.84	129.3612	1012.227	646.8465	529.1444	26.75321
17	2028	489.9283	557.975	605.2896	2028	360.5671	687.3362	508.76839	408.8624	449.5211	475.9284	129.36123	346.5672	379.4072	2029	520.5785	620.0431681	99.46468	32.84	132.3047	1047.903	687.3362	541.6084	99.90601
18	2029	497.57	596.859	620.4313	2029	365.2653	729.1636	520.96665	493.8547	455.6216	488.1266	132.30468	355.822	388.662	2030	536.6452	640.1142519	103.469	32.84	136.309	1094.429	729.1636	553.8066	27.11196
19	2030	505.2806	636.8915	640.5798	2030	368.9716	773.2006	537.11083	469.2646	473.9938	504.2708	136.30902	367.9618	400.8018	2031	545.1674	650.5809964	105.4136	32.84	138.2536	1142.172	773.2006	569.9508	67.84626
20	2031	513.2329	648.8612	651.075	2031	374.9793	787.1148	545.66138	520.2093	488.675	512.8214	138.2536	374.5678	407.4078	2032	553.8518	661.2465018	107.3947	32.84	140.2347	1162.094	787.1148	578.5014	25.45213
21	2032	521.3368	661.0558	661.7694	2032	381.102	801.2906	554.37466	532.4485	500.3683	521.5347	140.23473	381.2999	414.1399	2033	562.7014	672.1145034	109.4131	32.84	142.2531	1182.393	801.2906	587.2147	21.9262
22	2033	529.5949	673.4796	672.6668	2033	387.3418	815.7327	563.25372	542.7278	501.9884	530.4137	142.2531	388.1606	421.0006	2034	571.7194	683.1888069	111.4694	32.84	144.3094	1203.075	815.7327	596.0937	20.52594
23	2034	538.0103	686.1369	683.7711	2034	393.7009	830.4463	572.30168	538.9378	514.2329	539.4617	144.30939	395.1523	427.9923	2035	580.909	694.4732897	113.5643	32.84	146.4043	1224.147	830.4463	605.1417	33.36389
24	2035	546.5859	699.0321	695.086	2035	400.1815	845.4365	581.52171	555.2008	557.8495	548.6817	146.40434	402.2774	435.1174	2036	590.2732	705.9719017	115.6987	32.84	148.5387	1245.618	845.4365	614.3617	26.32091
25	2036	555.3246	712.1696	706.6157	2036	406.786	860.7083	590.91705	554.32	536.2765	558.077	148.53865	409.5384	442.3784	2037	599.8156	717.6886673	117.8731	32.84	150.7131	1267.494	860.7083	623.757	36.59703
26	2037	564.2296	725.5541	718.3641	2037	413.5166	876.2672	600.49099	568.0372	619.1326	567.651	150.71308	416.9379	449.7779	2038	609.5393	729.6276864	120.0884	32.84	152.9284	1289.784	876.2672	633.331	32.45377
27	2038	573.304	739.1901	730.3353	2038	420.3757	892.1184	610.24689	554.6164	544.3201	577.4069	152.92837	424.4785	457.3185	2039	619.4478	741.793136	122.3453	32.84	155.1853	1312.494	892.1184	643.0869	55.63045
28	2039	582.551	753.0823	742.5335	2039	427.3657	908.2676	620.18817	590.5163	633.2205	587.3482	155.1853	432.1629	465.0029	2040	629.5446	754.1892718	124.6446	32.84	157.4846	1335.633	908.2676	653.0282	29.67183
29	2040	591.9738	767.2356	754.963	2040	434.4892	924.7203	630.31831	468.5427	516.5012	597.4783	157.48464	439.9937	472.8337	2041	639.8332	766.820429	126.9872	32.84	159.8272	1359.209	924.7203	663.1583	161.7756
30	2041	600.8932	781.655	766.9455	2041	441.066	941.4822	639.95831	594.926	641.5941	607.1183	159.8272	447.2911	480.1311	2042	649.6326	779.0063461	129.3738	32.84	162.2138	1382.548	941.4822	672.7983	45.03227
31	2042	609.2611	796.3453	778.4342	2042	447.0473	958.5591	649.06039	455.8151	517.6948	616.2204	162.21378	454.0066	486.8466	2043	658.8882	790.6933757	131.8052	32.84	164.6452	1405.606	958.5591	681.9004	193.2453
32	2043	607.9549	811.3117	780.3074	2043	443.3096	975.9569	648.50216	565.4694	560.2566	615.6622	164.64522	451.0169	483.8569	2044	669.6012	806.4072268	136.806	32.84	169.646	1419.267	975.9569	681.3422	83.03273
33	2044	588.9201	842.0937	767.8118	2044	419.2741	1011.74	631.00581	293.6094	297.5575	598.1658	169.64603	428.5198	461.3598	2045	640.7802	780.1573508	139.3772	32.84	172.2172	1431.014	1011.74	663.8458	337.3964
34																								
35								$3,524.19																
36								$39.95																
37																								


Nominal Cash Flows
$ Millions
1600
1400
1200
1000
800
600
400
200
0
2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044
CC Range
CC Exp
CGS Continued
CGS 5-Year Out

	Continued	5-year	CGS Out
2013	338.9287	338.9287	368.479
2014	297.4952	297.4952	380.0495
2015	389.2676	566.2448	31.00561
2016	277.4482	584.1631	2.757936
2017	424.0007	573.3524	-25.7259
2018	324.0195	642.2507	5.168489
2019	462.8863	664.8163	-5.15459
2020	363.2777	482.1327	-28.3422
2021	467.1921	433.6546	19.75214
2022	420.477	495.1695	13.62897
2023	508.9947	478.6808	-97.7273
2024	462.6981	588.4293	-75.202
2025	554.9185	519.9919	
2026	515.8812	491.8577	
2027	605.0229	557.7505	
2028	547.9422	593.5396	
2029	660.4333	612.8449	
2030	651.6396	649.4797	
2031	722.0242	682.1183	
2032	766.3991	711.5017	
2033	781.7631	727.1542	
2034	805.1911	758.821	
2035	829.8781	838.5775	
2036	859.5045	821.2238	
2037	881.0737	965.8352	
2038	892.7483	865.0085	
2039	950.557	1025.103	
2040	784.9167	851.7864	
2041	993.6688	1077.87	
2042	793.1395	885.985	
2043	979.6321	976.7563	
2044	519.0244	528.4657	


Nominal Cash Flows
$ Millions
1200
1000
800
600
400
200
0
-200
2013
2015
2017
2019
2021
2023
2025
2027
2029
2031
2033
2035
2037
2039
2041
2043
Continued
5-year
CGS Out

	CGS Contir	CGS 5 Year Out
2013	4.628676	4.628676
2014	10.93735	10.93735
2015	18.3398	15.4672
2016	23.24094	18.03785
2017	29.50633	20.94484
2018	31.91308	21.13512
2019	38.15142	24.19527
2020	41.5158	29.9783
2021	45.19616	35.62087
2022	47.87905	41.13145
2023	51.41242	47.50823
2024	53.95166	53.95428
2025	57.57915	57.58177
2026	60.21029	60.21291
2027	64.11552	64.11813
2028	66.96418	66.9668
2029	71.2192	71.22182
2030	74.34537	74.34798
2031	79.05315	79.05576
2032	82.54449	82.54711
2033	83.23084	83.23345
2034	80.9142	80.91682
2035	79.68121	82.55642
2036	79.49869	84.70439
2037	76.2159	84.78001
2038	76.3226	87.10318
2039	72.96691	86.92568
2040	71.86932	83.40944
2041	69.5814	79.15931
2042	66.89851	73.64873
2043	63.36514	67.27195
2044	60.8259	60.8259


Capital
$ Millions
100
90
80
70
60
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2013
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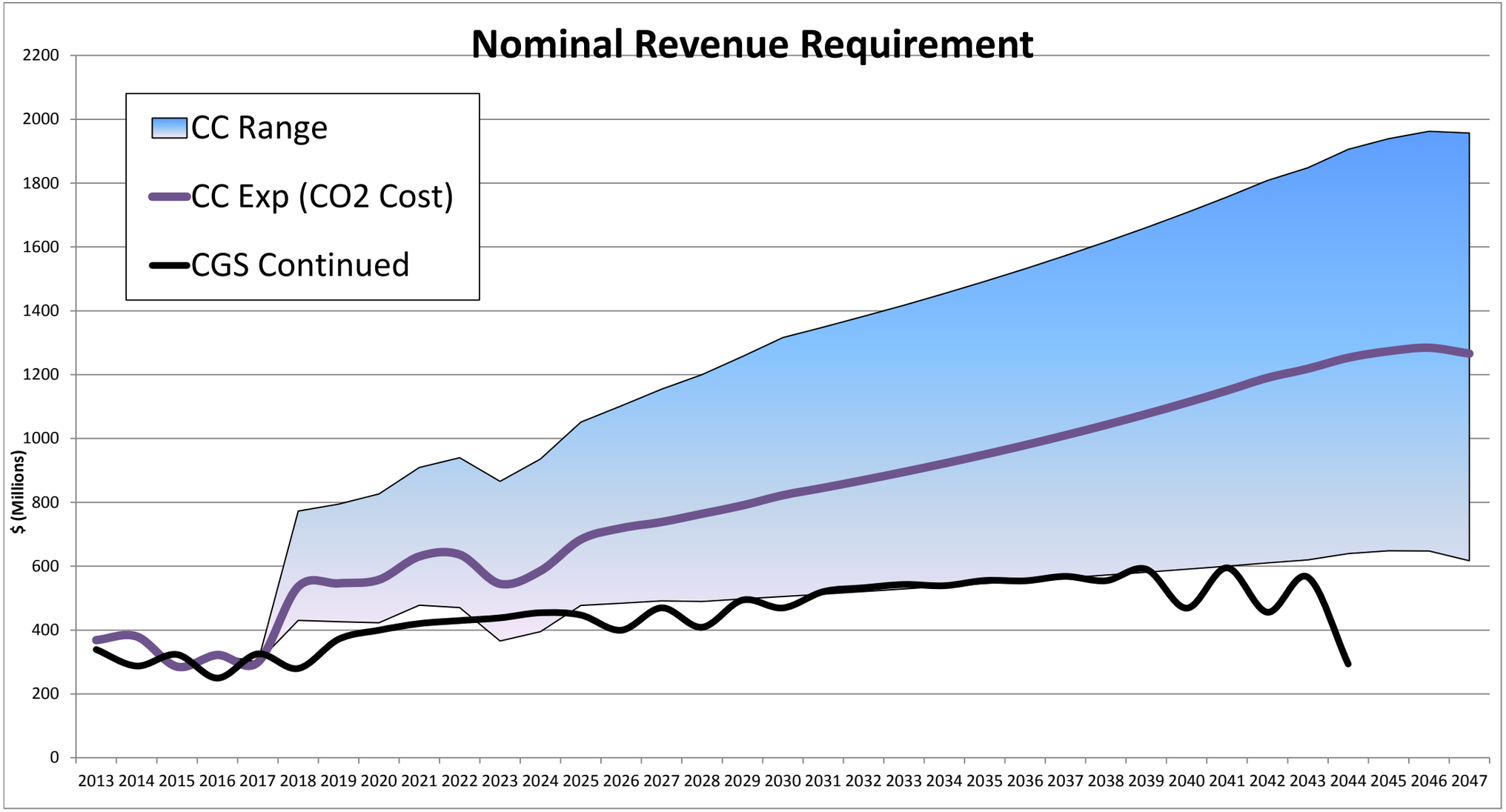
CGS Continued
CGS 5 Year Out

	A	B	C	E	F	H	I	K	L	N	O	P	Q	R	S	T	U	V	W	X
1		CC Low	MWH	CC Exp (No CO2)	MWH	CC Exp (Yes CO2)	MWH	CC High	MWH	Continued	5-year		Termination							
2	2013	368.48	8,473,920	368.48	8,473,920	368.48	8,473,920	368.48	8,473,920	338.93	338.93	8473.92	368.479				Scenario	Levelized Costs ($/MWh Real)	NPV of Revenue Requirement ($M)	Difference from Continued CGS ($M)
3	2014	380.05	9,516,864	380.05	9,516,864	380.05	9,516,864	380.05	9,516,864	287.35	292.03	9516.864	380.0495237				Continued CGS Operation	$45.80	$7,419	$0
4	2015	285.37	8,291,405	285.37	8,291,405	285.37	8,291,405	285.37	8,291,405	323.30	554.64	8291.4048	31.00560575				Five-Year CGS Outage with Replacement Power	$52.30	$8,471	$1,053
5	2016	321.92	9,798,552	321.92	9,798,552	321.92	9,798,552	321.92	9,798,552	249.50	569.22	9798.552	-9.715140125				CGS Shutdown with Replacement CC's (No CO2 Cost)	$59.73	$9,973	$2,554
6	2017	298.85	8,700,900	298.85	8,700,900	298.85	8,700,900	298.85	8,700,900	325.37	552.81	8700.9	-38.63553348				CGS Shutdown with Replacement CC's (CO2 Cost)	$76.88	$12,837	$5,419
7	2018	430.31	9,121,788	453.08	9,121,788	535.60	9,121,788	772.95	9,121,788	279.62	614.09	9771.78	-8.192981538				CC Low	$50.88	$8,496	$1,078
8	2019	425.99	9,121,788	458.08	9,121,788	546.31	9,121,788	794.72	9,121,788	371.14	626.59	8700.9	-18.98370926				CC High	$113.62	$18,972	$11,553
9	2020	423.01	9,121,788	463.32	9,121,788	557.62	9,121,788	826.59	9,121,788	399.50	423.49	9798.552	-28.34218547							
10	2021	477.66	9,121,788	529.90	9,121,788	630.69	9,121,788	909.44	9,121,788	420.21	373.91	8700.9	19.75213555							
11	2022	470.23	9,121,788	528.55	9,121,788	636.35	9,121,788	939.86	9,121,788	429.69	419.12	9771.78	13.62897353							
12	2023	365.63	9,121,788	429.48	9,121,788	544.74	9,121,788	866.07	9,121,788	438.22	397.72	8700.9	-97.72726043							
13	2024	395.01	9,121,788	462.18	9,121,788	585.40	9,121,788	936.00	9,121,788	454.16	479.93	9968.9616	-75.20204806							
14	2025	477.16	9,121,788	551.99	9,121,788	683.71	9,121,788	1051.57	9,121,788	446.97	416.33	8852.22								
15	2026	484.15	9,121,788	578.32	9,121,788	719.10	9,121,788	1102.03	9,121,788	399.54	386.57	9941.724								
16	2027	491.36	9,121,788	587.98	9,121,788	738.48	9,121,788	1154.61	9,121,788	469.55	430.32	8852.22								
17	2028	489.65	9,121,788	603.29	9,121,788	764.22	9,121,788	1200.23	9,121,788	408.86	449.52	9968.9616								
18	2029	497.22	9,121,788	618.25	9,121,788	790.39	9,121,788	1257.32	9,121,788	493.85	455.62	8852.22								
19	2030	504.86	9,121,788	638.14	9,121,788	822.25	9,121,788	1316.36	9,121,788	469.26	473.99	9941.724								
20	2031	512.75	9,121,788	648.53	9,121,788	845.48	9,121,788	1348.87	9,121,788	520.21	488.68	8852.22								
21	2032	520.78	9,121,788	659.11	9,121,788	869.79	9,121,788	1382.65	9,121,788	532.45	500.37	9968.9616								
22	2033	528.96	9,121,788	669.90	9,121,788	895.27	9,121,788	1417.76	9,121,788	542.73	501.99	8852.22								
23	2034	537.30	9,121,788	680.89	9,121,788	921.98	9,121,788	1454.29	9,121,788	538.94	514.23	9941.724								
24	2035	545.80	9,121,788	692.09	9,121,788	949.99	9,121,788	1492.30	9,121,788	555.20	557.85	8852.22								
25	2036	554.46	9,121,788	703.50	9,121,788	979.38	9,121,788	1531.89	9,121,788	554.32	536.28	9968.9616								
26	2037	563.29	9,121,788	715.12	9,121,788	1010.25	9,121,788	1573.14	9,121,788	568.04	619.13	8852.22								
27	2038	572.28	9,121,788	726.97	9,121,788	1042.67	9,121,788	1616.14	9,121,788	554.62	544.32	9941.724								
28	2039	581.45	9,121,788	739.04	9,121,788	1076.76	9,121,788	1661.01	9,121,788	590.52	633.22	8852.22								
29	2040	590.79	9,121,788	751.35	9,121,788	1112.61	9,121,788	1707.84	9,121,788	468.54	516.50	9968.9616								
30	2041	600.31	9,121,788	763.88	9,121,788	1150.34	9,121,788	1756.76	9,121,788	594.93	641.59	8852.22								
31	2042	610.00	9,121,788	776.65	9,121,788	1190.06	9,121,788	1807.87	9,121,788	455.82	517.69	9941.724								
32	2043	619.89	9,121,788	789.67	9,121,788	1218.76	9,121,788	1848.18	9,121,788	565.47	560.26	8852.22								
33	2044	639.64	9,121,788	815.86	9,121,788	1253.02	9,121,788	1906.32	9,121,788	293.61	297.56	4984.4808								
34	2045	648.64	9,121,788	828.17	9,121,788	1273.54	9,121,788	1939.13	9,121,788											
35	2046	647.64	9,121,788	830.54	9,121,788	1284.29	9,121,788	1962.38	9,121,788	$7,418.80	$8,471.46	161,967.62								
36	2047	617.35	9,121,788	803.70	9,121,788	1265.97	9,121,788	1956.80	9,121,788											
37										$45.80	$52.30									
38		$8,496.39	166,979,190.19	$9,972.98	166,979,190.19	$12,837.39	166,979,190.19	$18,971.78	##########											
39																				
40		$50.88		$59.73		$76.88		$113.62		41.34	49.48									
41																				
42																				
43		CC Low	CC Range	CC Exp (CO2 Cost)	CGS Continued															
44	2013	368.479	0.00	368.479	338.9286755															
45	2014	380.049524	0.00	380.0495237	287.3516619															
46	2015	285.367968	0.00	285.3679684	323.2972695															
47	2016	321.91721	0.00	321.9172101	249.5001847															
48	2017	298.846947	0.00	298.8469465	325.3668197															
49	2018	430.31087	342.64	535.5954429	279.6183067															
50	2019	425.994338	368.73	546.3148427	371.1391117															
51	2020	423.010314	403.58	557.6166753	399.5006609															
52	2021	477.659326	431.78	630.6872443	420.2129445															
53	2022	470.230124	469.63	636.3472514	429.6869835															
54	2023	365.632801	500.44	544.7384996	438.2210021															
55	2024	395.01204	540.99	585.4025477	454.1574731															
56	2025	477.16011	574.41	683.7137383	446.9707552															
57	2026	484.145239	617.89	719.1040337	399.5380068															
58	2027	491.362759	663.25	738.4839713	469.5512129															
59	2028	489.648768	710.58	764.2178396	408.8623742															
60	2029	497.222176	760.10	790.3941425	493.8546838															
61	2030	504.863973	811.49	822.2517434	469.2645641															
62	2031	512.745466	836.12	845.4765841	520.2092525															
63	2032	520.777184	861.87	869.7940005	532.4484574															
64	2033	528.961951	888.80	895.2701312	542.7277807															
65	2034	537.302643	916.98	921.9755383	538.9377891															
66	2035	545.80219	946.50	949.9855118	555.200801															
67	2036	554.463578	977.42	979.3803959	554.3200143															
68	2037	563.289848	1009.85	1010.245938	568.0372213															

	A	B	C	E	F	H	I	K	L	N	O	P	Q	R	S	T	U	V	W	X
69	2038	572.2841	1043.86	1042.673661	554.6164406															
70	2039	581.44949	1079.56	1076.761263	590.5163433															
71	2040	590.789234	1117.05	1112.613044	468.5426623															
72	2041	600.30661	1156.45	1150.340362	594.926043															
73	2042	610.004956	1197.87	1190.06212	455.8150614															
74	2043	619.887673	1228.30	1218.761943	565.4694303															
75	2044	639.635849	1266.68	1253.016087	293.6093833															
76	2045	648.635806	1290.49	1273.543841																
77	2046	647.63525	1314.74	1284.287733																
78	2047	617.352536	1339.45	1265.970191																
79																				
80																				


Nominal Revenue Requirement
CC Range
CC Exp (CO2 Cost)
CGS Continued
$ (Millions)
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047

Northwest Power Planning Council
MicroFin Version 15.0.1

USING MicroFin

MICROFIN is used to estimate the annual and levelized lifetime costs of electricity production from power generating projects.

MicroFin must be saved as an Excel 2007 Macro-enabled Workbook (.xlsm). Open MicroFin and the Excel add-in Scenario.xla.

Case values are stored and retrieved using "Scenario.XLA". With MicroFin and Scenario.xla open, the command "Scenario Manager" will be displayed in Menu Commands section of the Add-ins ribbon. Clicking on Scenario Manager when viewing the Project, Fuel, Finance, Escalation or Emissions worksheets will display a dialog box with which you can retreive data, forecasts and assumptions for various plant types, fuels and supporting information.

A case is structured by selecting the appropriate cases from the individual input datasheets, using Scenario Manager. The data input sheets include **Project** (plant technical and cost information and summary display of results), **Fuel** (Fuel prices), **Financing** (Financing assumptions), **Escalation** (Various non-fuel escalation series), **Transmission** and **Emissions**. Any value in blue font can be modified and the results displayed on the output data section of the Project datasheet will be immediately recalculated. Values in blue font on a non-blue fill are not stored in Scenario Manager and must be entered by the user.

MICROFIN calculates fixed, variable and total energy costs for up to three types of project developers. Calculations and annual and levelized results are found on the three developer type worksheets (Public, IOU and Independent). Levelized lifecycle cost values are brought forward to the Project worksheet.

The "Base Year for Dollars" cell on the Project worksheet controls the year dollars for constant year dollar results. Year dollar adjustments are calculated using the GDP price deflator column on the Escalation worksheet.

Notes:

1. Property tax and insurance during the development and construction periods is included in reported capital cost.

2. Expenditures are assumed to be made at the end-of-year.

3. Debt interest and equity return is assumed to accumulate during the development and construction periods.

4. Development, construction and operating period loans are assumed to originate at the beginning of the respective periods.
5. Construction and fixed operating costs are adjusted for real escalation (technical improvement and other effects reflected in the escalation indices of the ESCALATION worksheet) to the first year of construction ("Vintage" Escalation).
6. Tax-exempt financing is assumed to be by annual sales of serial bonds with uniform principal and interest service beginning one year following the sale date. Principal and interest payments prior to operation are covered by subsequent issues.
7. Investor-owned utility financing assumes constant depreciation over the financial life of the project.

8. Independent developer financing is assumed to be by debt and equity structured with constant capital service (principal plus return).

9. Property tax and insurance are calculated on depreciated value of total cash expended (sum of annual payouts during development and construction period, mixed year dollars).

10. All capital investment is treated as depreciable (In practice, land, inventory, startup costs and equity-funded AFUDC are not depreciable).

Issues:
Levelized fixed O&M continue to escalate slightly following 2030 + construction period.
Levelixed capital cost for IPP & Public escalate following 2030 + construction period.
Calculation of deferred taxes for IOU case with investment tax credit appears to be in error (110408).
Seeing slight changes in busbar cost with different transmission selections

Enhancements:
Base year for PTC.
Optional Pass-through vs. Normalization of tax credits
Option for selecting % of capacity served w/fixed fuel supply.
Allow input of fixed fuel cost heat rate base value for normalization (Currently fixed at 10,000 Btu/kWh). Must be consistent with FUELMOD assumption.

Northwest Power Planning Council

MicroFin Version 15.0.1

RECORD OF REVISIONS

	Date	Version	Revision
7	3/24/1998	13A	Added provision for separate discount rates for each developer type. Changed version to MF13.
8	9/13/1998	13B	Changed PPYR to PPYR-CP for calculation of heat rate escalation index (ESCALATION) to correctly scale project heat rate to escalation series.
9	9/21/1998	13C	Expanded and formatted revision record into consistent format. Saved auxilliary worksheets and macros for calculating AURORA annual alpha vector input. Added notes block to fuel and escalation worksheets.
10	10/22/1998	13C	Preliminary. Expanded YOL macro to record costs in $/kW/yr for screening curve analysis (Unregulated only). Deleted fixed cost summary from Summary sheet.
11	1/29/1999	13D	Revised AAV calculation worksheets and macro to calculate weighted average values across the three developer types.
12	8/17/1999	13D	Added preliminary feature for flexible simulation of renewables production credit (IOU & IPP only).
13	8/10/2000	13E	Added column for annual fixed nominal unit cost ($/kW) to cash flow tables.
14	1/12/2000	13E	Added "STUDY" variable to record case in headings.
15	1/7/2002	13E	Removed GDP deflators on Escalation worksheet from Scenario Manager changing cell group.
16	1/29/2002	13F	Substituted Scenario Manager for Tools:Scenarios on Project worksheet.
17		13F	Added comment blocks on Project worksheet.
18		13F	Added shaping, interconnection & wheeling and byproduct credit variable cost line items on Project worksheet.
19		13F	Deleted Fuel:Project consistency check and associated variable.
20	2/8/2002	13F	Added "NOTES" section to Fuels worksheet.
21	2/8/2002	13F	Deleted "Summary" worksheet.
22	5/9/2002	13G	Consolidated Fuel Commodity and Fuel Transportation inputs, calculations and outputs into Fuel fixed and Fuel variable
23	6/12/2002		Shifted property tax and insurance costs to fixed O&M in summary displays.
24	6/26/2002		Added first and last service eligibility years, eligible period and incentive rate to COU renewable incentive option.
25	7/2/2002		Revised so capital and fixed O&M costs are based on initial year of construction (YCB) vintage.
26	7/10/2002		Added fixed interconnection and wheeling component. Transferred FIXCST to ICALC as sum of fixed O&M inputs.
27	7/12/2002		Added variables controls and logic to calculate results at grid.
28	7/23/2002	13G.1	Corrected application of Debt Fee in calculation of Unregulated all in capital costs.
29	8/16/2002	13G.2	Added option to select incremental or rolled-in (constant) fixed fuel costs.
30	8/16/2002	13G.3	Corrected addition of variable credits (was added, now subtracted).
31	8/23/2002	13G.4	Corrected reference for LVROM2 (was nominal, now real).
32	9/10/2002	13G.5	Removed grid costs from O&M escalator calculations.
33	10/17/2003	13G.6	Added Zone 17 (Malin) to AURORA Calcs and AAV Output worksheets.
34	10/17/2003	13G.6	Cleaned up calculation of AURORA outputs.
35	12/18/2003	13G.6	Corrected calculation of fee on long-term debt for independent developer (Cells H10 and E146, Unregulated) (minor effect on
36	12/18/2003	13G.6	Added all-in capital cost reporting for all developer types.
37	12/29/2003	13G.6	Corrected calculation of all-in costs (incorrect sponsor reference on Public and Private worksheets).
38	12/29/2003	13G.6	Revised calculation of all-in costs so as not to default to "n/a" with zero percent sponsorship.
39	12/29/2003	13G.6	Corrected transfer of levelized fixed O&M costs to summary table on Private worksheet.
40	12/30/2003	13G.6	Restored missing FXOM formula in Public worksheet summary of output.
41	12/30/2003	13G.6	Corrected calculation of levelized property tax and insurance for fixed cost summary on Private worksheet.
42	12/30/2003	13G.6	Reformatted summary data section of Public, Private and Unregulated worksheets.
43	12/30/2003	13G.6	Added levelized fixed cost report to Project worksheet.
44	12/30/2003	13G.6	Deleted unused FOM & VOM variables (AURORA calcs worksheet).
45	1/6/2004	13G.6	Corrected cell references in YOL and CF macros.
46	1/14/2004	13G.6	Upgraded sensitivity analyses macros.
47	8/23/2004	13G.6	Revised SW5 (Incremental vs Rolled-in fixed fuel) to Marginal, YOL or year of choice options.
48	5/12/2005	13G.6	Added Special Inputs worksheet.
49	5/17/2005	13G.6	Moved entry for dollar base year to Project worksheet. Independent of project scenarios.
50	6/14/2005	13G.6	Corrected error in first year variable O&M equation on Public Worksheet.
51	6/14/2005	13G.6	Corrected error in portfolio risk model variable fuel calculation on Regulated Worksheet.
52	10/20/2005	13G.6	Separated "Using MICROFIN" and "Revisions" worksheets
53	2/21/2006	13G.6	Corrected redundant application of transmission loss in IPP calculation worksheet.
54	2/23/2006	13G.6	Added annual energy series to IPP calculation sheet; replaced ENERGY3 variable.
55	5/17/2006	13G.6	Updated Implicit GDP price deflator.
56	6/23/2006	13G.7	Provided for separate debt and equity terms.
57	5/25/2007	13G.8	Corrected error in calculation of IOU return on equity.
58	5/31/2007	13G.8	Updated GDP Implicit Price Deflator. Used average annual indices.
59	10/2/2007	13G.8	Removed "FALSE" component from VLOOKUP functions referencing Special Variable Cost Series sheet to eliminate error results when last year of service exceeds range of SVCS values.
60	12/21/2007	13G.9	Added escalation series for vintaging capacity factors.
61	12/21/2007	13G.9	Updated Escalatio L107 Annual Average to 2005-24.
62	12/21/2007	13G.9	Corrected double-counting of transmission losses in IOU PV nominal cost calculation (debt & equity columns)
63	1/4/2008	13G.9	Removed "Data Input Worksheets Selected" and "Developer Mix" sections from Public, IOU and IPP worksheets.
64	1/4/2008	13G.9	Reformatted Public, IOU and IPP worksheets.
65	2/1/2008	13G.9	Reformatted Special Variable Cost worksheet to accommodate additional data series.
66	5/8/2008	13G.9	TAXDEP - Added list of current (2007) class lives and MACRS recovery periods.
67	5/27/2008	13G.9	Added Vintage Heat Rate (HRV) to drop-down output list for service year macro.
68	5/27/2008	13G.9	Added weighted levelized capital, fixed O&M and fixed fuel to drop-down output list for service year macro.
69	10/31/2008	14.1.0	Added automatic indexing to price and technology vintage years
70	10/31/2008	14.1.0	Added index year as a control variable to ESCALATION worksheet (Arbitrary, does not affect vintage values).
71	11/4/2008	14.1.0	Added Emission cost input datasheet.
72	11/4/2008	14.1.0	Corrected IOU calculations to eliminate spuroius residual cash flows for year YOL-1.
73	11/4/2008	14.1.0	Added emission cost calculations to Public, IOU and IPP worksheets, carried forward to Summary.
74	11/4/2008	14.1.0	Revised format of Project worksheet, adjusted Macros to run with revised format.
75	11/4/2008	14.1.0	Added CO2 factor to the Fuel worksheet.
76	11/4/2008	14.1.0	Removed formula references to Special Variable Cost worksheet from variable fuel calculations (Public, IOU & IPP).
77	11/4/2008	14.1.0	Corrected calculation of general inflation of O&M costs on Public worksheet.
78	11/4/2008	14.1.0	Corrected calculation of unit fixed costs in IOU worksheet to remove transmission loss component.
79	11/4/2008	14.1.0	Restored calculation of total variable cost (real) in IPP worksheet.

	A	B	C
80	11/4/2008	14.1.0	Substituted use of historical and forecast inflation indices for INFL variable for cash flow calculations.
81	11/12/2008	14.1.0	Added Transmission input worksheet
82	11/12/2008	14.1.0	Removed Special Variable Cost worksheet
83	11/12/2008	14.1.0	Added transmission cost & loss calculations to Public, IOU and IPP worksheets, carried forward to Summary.
84	11/12/2008	14.1.0	Deleted Busbar/Grid control. Busbar costs now subtotaled and carried forward to Control & Project worksheet.
85	11/12/2008	14.1.0	Renamed Project worksheet Control & Project worksheet. Corrected Macros accordingly.
86	11/13/2008	14.1.0	Corrected calculation of fixed transmission costs (IPP).
87	11/13/2008	14.1.0	Corrected error introduced into calculation of total plant cost (IPP).
88	11/13/2008	14.1.0	Corrected erroneous inflation calculation for fixed O&M (Public) (had been indexed to fuel price base year).
89	11/13/2008	14.1.1	Corrected Scenario "changing cells" on Emissions worksheet.
90	11/13/2008	14.1.1	Corrected error check for consistency of development and construction period with cash flow period entries..
91	11/13/2008	14.1.1	Removed cashfolw "PCF" variable definitions (no longer in use)
92	11/13/2008	14.1.1	Changed range on Fuel worksheet from 1984 - 2050 to 2000 - 2070.
93	11/13/2008	14.1.1	Deleted calculation of average escalation rates on Fuel worksheet.
94	11/20/2008	14.1.2	Added hyperlinks to switch between input data worksheets.
95	12/4/2008	14.1.3	Added calculation of annual unit revenue requirement to Public, IOU & IPP worksheets.
96	12/4/2008	14.1.3	Added calculation of real escalation of transmission costs to Public, IOU & IPP worksheets.
97	12/4/2008	14.1.3	Added fixed transmission escalation input matrix to Transmission worksheet.
98	12/17/2008	14.1.4	Added control for CO2 separation efficiency to Project worksheet. Not currently in SCENARIO memory.
99	1/2/2009	14.1.5	Corrected IOU debt and equity balance calculations for year YOL-1 (calculations unaffected).
100	1/6/2009	14.2.1	Complete revision of AURORA Calcs, TSAnn Vectors and associated macro
101	1/7/2009	14.2.2	Revised AURORA Calcs macro to write underscores in lieu of dashes in vactor ID names.
102	1/7/2009	14.2.2	Corrected calculation of loss adjustment on AURORA Calcs.
103	1/26/2009	14.2.3	Revised CO2 separation efficiency for storage in Scenario Manager. Updated all resource types.
104	1/27/2009	14.2.3	Added sequestration cost column to Emissions worksheet
105	1/27/2009	14.2.3	Added sequestration cost calculation to Public, IOU and IPP worksheets
106	2/4/2009	14.2.4	Added separate display of Property tax and Insurance and Other Fixed O&M Costs to Public, IOU, IPP and Control and Summary worksheets. (to support calculation of Portfolio Risk Model input values).
107	2/4/2009	14.2.4	Corrected double-counting error for cost of losses in IOU and IPP worksheets
108	2/4/2009	14.2.4	Corrected calculation of all-in costs to yield costs at busbar.
109	3/20/2009	14.2.4	Deleted unused variables AVEDEP1, FOM1 - FOM11, TLFC2 and TCIYOL1.
110	3/20/2009	14.2.4	Corrected title of Column AK on WS Public.
111	4/20/2009	14.2.5	Added display of total construction payout and AFUDC in $/kW to IOU worksheet.
112	4/21/2009	14.2.5	Changed Consumer-owned utility terminology to "Municipal/PUD" to prevent confusion w/Coops.
113	4/21/2009	14.2.6	Revised REPI & PTC inputs from $/kW to $/MW values.
114	11/10/2009	14.2.6	Omitted separate entry of General Inflation on WS Financing. General Inflation now calculated from GDP serices on WS Escalation and displayed for information only on WS Financing.
115	12/30/2009	14.2.7	Entered missing formula in IPP!AJ71 for calculating levelized fixed transmission cost.
116	12/30/2009	14.2.7	Corrected formula in Public!E44 referencing levelized fixed transmission cost.
117	5/24/2010	14.2.8	Corrected column heading @ Public!AK10:AK12
118	5/24/2010	14.2.8	Corrected error (present since 14.1.1) in calculating first year annual bond sales @ Public!I13
119	5/24/2010	14.2.8	Corrected error in escalating REPI payment @ Public!AE13:AE70, and PTC payment at IOU!S13:S67 and IPP!AC13:AC67 (s/b ESC lookup col. 16; was ESC col. 14).
120	5/24/2010	14.2.8	Corrected errors in calculating reporting year all-in capital cost @ IOU!F91 and IPP!(s/b ESC lookup col. 16; was ESC col. 14).
121	5/24/2010	14.2.8	Reversed position of as-expended and reporting year capital investment values for consistency w/Control & Project & IPP worksheets..
122	5/24/2010	14.2.8	Removed "For Info" calculation of input variables in reporting year dollar values.
123	6/1/2010	14.2.9	Modified calculation of weighted values on Control & Project to display "n/a" when sponsor total does not equal 100%..
124	6/1/2010	14.2.9	Corrected Array definition leading to error in YOL and CF macros (Control & Project).
125	6/30/2010	14.2.10	Removed IOU AFUDC display from Control & Project (AFUDC is included in All-in costs; AFUDC available on IOU
126	6/30/2010	14.2.10	Simplified formula for calculating IOU vintage capital cost w/debt financing fee (IOU!F9).
127	7/14/2010	14.2.11	Corrected calculation of 2010-2029 average rates on Escalation.
128	9/25/2010	15.0.0	Converted to Excel 2007 Macro-enabled workbook. Updated "Using MicroFin". Purged unused Names.
129	10/29/2010	15.0.1	Repaired WtdLevCstR formula in ICALC matrix.

AURORA TS ANNUAL VECTORS OUTPUT DATA SHEET

Case: 2x100 MW Intercooled GT

Date & Time: 7/7/05 0:00

ID	Use	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Coal steam_HR_PNWE	N/A (Btu/kWh, HHV) 03/28/12	9222	9222	9222	9222	9222	9222	9175	9130	9084	9039	8993	8948	8904	8859	8815	8771	8727	8683	8640	8597	8554	8511
Coal steam_Cap_PNWE	N/A (MW) 03/28/12	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406
Coal steam_FOR_PNWE	N/A (%) 03/28/12	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Coal steam_FOM_PNWE	6PFinal Cap+FxOM+FxTr @ POD (2012$/MW-wk) 03/28/12	2187	2174	2175	2164	2139	2104	2174	2557	2888	2870	2649	2526	2486	2480	2465	2449	2434	2419	2402	2385	2370	2354
Coal steam_FOM1_PNWE	N/A (2012$/MW-wk) 03/28/12	554	553	556	555	552	545	535	527	557	584	633	685	751	750	747	744	757	754	767	763	760	759
Coal steam_VOM_PNWE	6PFinal VrOM+VrTr @ POD, no CO2 (2012$/MWh) 03/28/12	6.71	6.70	6.73	6.73	6.68	6.60	6.51	6.44	6.44	6.41	6.42	6.47	6.50	6.53	6.53	6.54	6.54	6.55	6.55	6.55	6.55	6.56

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7	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**
8	8468	8426	8384	8342	8300	8259	8259	8259	8259	8259	8259	8259	8259	8259	8259	8259	8259	8259	8259
9	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406	193406
10	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
11	2337	2321	2305	2289	2275	2259	2243	2227	2211	2195	2190	2184	2179	2174	2169	2164	2159	2154	2149
12	757	756	755	754	753	752	755	758	761	761	761	762	762	763	764	764	765	766	767
13	6.56	6.56	6.57	6.57	6.58	6.58	6.59	6.59	6.59	6.60	6.60	6.61	6.61	6.62	6.62	6.63	6.63	6.64	6.65
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MicroFin Version 15.0.1

Advanced Combined-cycle

AURORA INPUT DATA CALCULATION

Accounting for transmission losses incurred by remotely-located resources for consistency of costs, energy, fuel burn and emissions for remote & local resources:
- Point-of-Delivery is defined as the Load-Resource Area wholesale transaction hub.
- Capacity: Derated to point of delivery for correct energy availability from remote thermal resources.
- Heat rate: Derated to Point-of-delivery to ensure correct fuel burn & emissions
- Capacity factor (Energy-limited resources): Plant (busbar).
- Costs: Increased to match capacity derating at Point-of-Delivery (except System Integration costs).
- System integration costs (Currently melded with variable transmission costs). Not derated (representing integration at PoD).

Cost and elevation indices of the power plant location should be used for remote resources.
Input variables are in blue on blue; values transferred to macro are shaded gray.
Set TOOLS:OPTIONS:CALCULATION to Automatic.
Cost indices (U.S. states) from USACE EM 1110-2-1304 Appendix, Table A-3, Mar 2008. Canadian and Mexican indices set to 1.00.
Elevation adjustment indices from GT_PERF_DATA 010209

CASE SETUP & MACRO CONTROL

Links to Data Input Tables	Recommended	Selected	Select Area	Cell Link
Project	Advanced Combined-cycle	1x1 Advanced CC 390 MW Baseload + 25 MW DF (6P Draft)		
Fuel	Natural gas	BPA 8_24_12	PNWE	1
Financing	30-yr ATCOC	ATCOC 30-yr service life - No ITC or PTC		
Escalation	Combined-cycle (Zero for DF)	Combined-cycle		
Transmission & Integration	Thermal Point-to-Point	Main grid Point-to-Point: Thermal resource		
Emission Cost	Mean CO2 - 6th Plan Final	RP 2012 Futures Price		

		"Use" will read:	
Vector ID	CT		Y
Heat Rate Vector "Use" column entry	N/A	N/A (Btu/kWh, HHV) 06/05/14	N
Capacity Vector "Use" column entry	N/A	N/A (MW) 06/05/14	
Capacity Factor Vector "Use" column entry	N/A	N/A (%) 06/05/14	
Fixed O&M Vector "Use" column entry	6PFinal Cap+FxOM+FxTr @ POD	6PFinal Cap+FxOM+FxTr @ POD (2012$/MW-wk) 06/05/14	
Fixed O&M Mod 1 Vector "Use" column entry	N/A	N/A (2012$/MW-wk) 06/05/14	
Variable O&M Vector "Use" column entry	6PFinal VrOM+VrTr @ POD, no CO2	6PFinal VrOM+VrTr @ POD, no CO2 (2012$/MWh) 06/05/14	
Report Capacity factor as Forced Outage Rate (Y/N)	Y	Use for wind and other energy-limited resources.	1
Include fixed fuel cost in Fixed O&M Mod1? (Y/N)	Y		
Include emissions in variable cost? (Y/N)	N	Normally "N" (Emission cost is separately calculated in AURORA as a function of fuel burn.)	
Exclude Point-to-Point delivery losses? (Y/N)	Y	Normally "Y" to normalize costs and capacity to LRA trading hubs to match AURORA demand.	
Default Point-to-Point delivery losses (%)	1.9%	6th Plan Default value is 1.9%	
Use PoD energy for Variable T&I? (Y/N)	Y	Normally "Y", assumes all variable T&I costs are for integration and integration occurs at PoD.	
Apply regional cost indices (Y/N)	N	Normally "N" for long-term analyses	
Cost index of MICROFIN data	1.05	PNW weighted average is 1.05	
Apply elevation adjustment? (Y/N)	N	Wind capacity factor includes elevation effects	
Current service year	2016	Set on Control & Project	
Current date & time	6/5/14 7:54		
Price year dollars	2006	Set on Control & Project	

CALCULATE BASE VARIABLES

	Input Values	Adjusted for line loss assumptions	
Installed Capacity (MW)	1,170	1,192	Subject to line losses and elevation
Capacity Factor (%)	89.0%	90.7%	Insensitive to line losses and elevation (capacity determines energy capability)
Heat Rate (Btu/kWh)	7236	7374	Subject to line losses; not subject to elevation adjustment
Levelized Fixed Costs ($/kW/yr):			
Capital	$52.50	$51.52	Subject to line losses and elevation
Non-fuel O&M	$12.57	$12.34	Subject to line losses and elevation
Fuel	$35.99	$35.32	Not subject to elevation adjustment or regional cost index
Transmission	$0.00	$0.00	Subject to line losses and elevation
Non-fuel Variable Costs ($/MWh):			
Variable O&M	$1.88	$1.85	Subject to line losses
Emissions	$11.92	$11.70	Subject to line losses
Transmission & Integration	$0.00	$0.00	Line loss adjustment is optional
Weighted Gross Revenue Tax Rate (%)		0.0%	

Base TSAnn "Fixed O&M" (Sbj to Elev Adj)	$63.86	($/kW/yr)	$1,224	($/MW-wk)
Base TSAnn "Fixed O&M" (n/Sbj to Elev Adj)	$0.00	($/kW/yr)	$0	($/MW-wk)
Base TS Ann "Fixed O&M Mod1" (n/sbj to Elev Adj)	$35.32	($/kW/yr)	$677	($/MW-wk)
Base TS Ann "Variable O&M" (n/sbj to Elev adj)	$1.85	($/MWh)	$1.85	($/MWh)

LOAD-RESOURCE AREA LOOKUPS & CALCULATED COSTS

LRA	Cost Indices	Elevation Adjustment	PoD Capacity (kW)	"Fixed O&M" ($/MW-wk)	"Variable O&M" ($/MWh)
PNWE	1.08	0.98	1192230	$1,224	$1.85
CAN	1.18	1.00	1192230	$1,224	$1.85
CAS	1.18	0.99	1192230	$1,224	$1.85
BC	1.00	1.00	1192230	$1,224	$1.85
IDS	0.97	0.90	1192230	$1,224	$1.85
MT	0.96	0.82	1192230	$1,224	$1.85
WY	0.91	0.79	1192230	$1,224	$1.85
CO	0.98	0.83	1192230	$1,224	$1.85
NM	0.94	0.83	1192230	$1,224	$1.85
AZ	0.95	0.96	1192230	$1,224	$1.85
UT	0.94	0.86	1192230	$1,224	$1.85
NVN	1.09	0.85	1192230	$1,224	$1.85
AB	1.00	0.88	1192230	$1,224	$1.85
BCN	1.00	1.00	1192230	$1,224	$1.85
NVS	1.09	0.93	1192230	$1,224	$1.85
PNWW	1.08	0.99	1192230	$1,224	$1.85
All	("All" completes drop-down list)				

Calculate Resource Portfolio Model Inputs

Bold values transferred to RPM input data sheet

Peak rating	1,170
Baseload rating	450
Elevation adjustment	1

	Base	Baseload Only	Elev Only	Baseload + Elev
Total Investment, YOL, (2012 $/kW)	$1,083.40	$0.00	$0.00	**$0.00**
Overnight Capital	$908	$2,361.33	$908.21	**$2,361.33**
Capital	$52.50	$136.51	$52.50	**$136.51**
Property tax & Insurance	$1.69	$4.39	$1.69	**$4.39**
Other fixed O&M	$12.57	$32.69	$12.57	**$32.69**
Fuel	$35.99	$93.57	$35.99	$93.57
Subtotal busbar cost	$102.75	$267.15	$102.75	$267.15
Transmission	$0.00	$0.00	$0.00	$0.00
Cost of Losses (derating)	$0.00	$0.00	$0.00	$0.00
Gross Rev Tax (fixed portion)	$0.00	$0.00	$0.00	$0.00
Total (2012$)	$102.75	$267.15	$102.75	$267.15
Capital	$6.73	$0.00	$0.00	$0.00
O&M - Fixed	$1.83	$0.00	$0.00	$0.00
O&M - Variable	$1.88	$0.00	$0.00	**$0.00**
Fuel - Fixed	$4.62	$0.00	$0.00	$0.00
Fuel - Variable	$33.03	$0.00	$0.00	$0.00
Emissions	$11.92	$0.00	$0.00	$0.00
Subtotal busbar cost	$60.01	$0.00	$0.00	$0.00
Transmission - Fixed	$0.00	$0.00	$0.00	$0.00
T&I -Variable	$0.00	$0.00	$0.00	**$0.00**
Cost of losses	$0.00	$0.00	$0.00	$0.00
Gross Rev Tax	$0.00	$0.00	$0.00	$0.00
Total delivered cost (2006$)	$60.01	$0.00	$0.00	$0.00
Total (nominal dollars)	$73.66	$0.00	$0.00	$0.00

Northwest Power Planning Council

MicroFin Version 15.0.1

Advanced Combined-cycle

PROJECT DATA & SUMMARY RESULTS

Project	1x1 Advanced CC 390 MW Baseload + 25 MW DF (6P Draft)
Data source	6th Plan CC Res Assessment 012309
Record added/Latest update	Rev 012009 (Capital cost)
Special instructions	2012 earliest service (Assm permitted sites) 0 0

CASE SETUP & ERROR CHECK

Links to Data Input Tables	Recommended	Selected
Fuel	Natural gas	BPA 8_24_12
Financing	30-yr ATCOC	ATCOC 30-yr service life - No ITC or PTC
Escalation	Combined-cycle (Zero for DF)	Combined-cycle
Transmission & Integration	Thermal Point-to-Point	Main grid Point-to-Point: Thermal resource
Emission Cost	Mean CO2 - 6th Plan Final	RP 2012 Futures Price
Return to AURORA Calcs		

Reporting year (real dollar values)	2012
Year development begins (Info)	2011
Year construction begins (Info)	2013
Year of commercial operation	2016
Vintage heat rate (Btu/kWh) (Info only)	7236
Construction cash flow = 100%	OK
Development + Construction period = Cash flow period	OK
Service Year + Operating Life exceeds 2070 time series limits	OK
Sponsorship total = 100%	OK

PROJECT DATA

VINTAGE SETTINGS

Price year dollars	2006	0
Cost vintage year	2008	0
Technology vintage (HR & CF)	2008	0

DEVELOPER

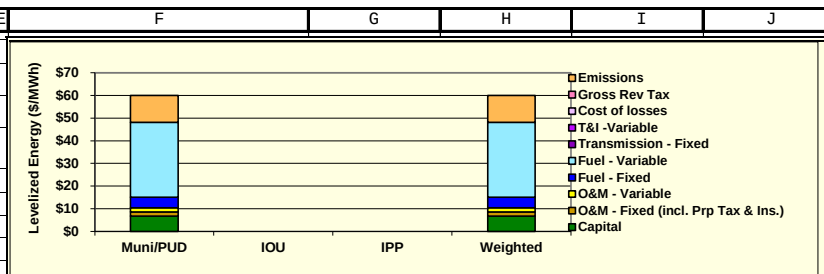
Municipal/PUD	100%	0
Investor-owned utility	0%	0
Independent power producer	0%	0

PLANT CHARACTERISTICS

Development period (years)	2	See Cash Flow for monthly values
Construction period (years)	3	See Cash Flow for monthly values
Economic life (years)	30	0
Capacity, net (MW)	1170.000	390 Baseload, 25 MW duct firing
Capacity factor	89.0%	Availability 89% (5.9% FOR, 21 annual maintenance outage)
Heat rate, HHV (Btu/kWh)	7,420	Full baseload heat rate - 6930 Incr duct firing heat rate - 9500
Capital ($/kW)	$1,120	Baseload capacity - $1160/kW Incremental DF capacity - $465/kW Net for reference unit - $1118/kW
Fixed O&M ($/kW/yr)	$14.00	Baseload - $14.00 Incr DF - $0.00
Lock in fixed fuel cost (Note 1)	YOL	New resource
Variable non-fuel O&M ($/MWh)	$1.70	Baseload - $1.70 Incr DF - $0.00
Penalties & credits ($/MWh) (Note 2)	$0.00	0
FIT recovery period (yrs)	20	2008 FIT depreciation
CO2 separation efficiency (%)	0%	0

Cash flow (%/yr) (Note 3)		
1	1.0%	0
2	2.0%	0
3	16.0%	0
4	55.0%	0
5	26.0%	0
6	0.0%	0
7	0.0%	0
8	0.0%	0
9	0.0%	0
10	0.0%	0
11		
Check Total	100.0%	

Notes:
1. "No" simulates marginal fixed cost, "YOL" locks in first year fixed cost, numeric year locks in a specific year.
2. Penalties entered as positive value; credits entered as negative value.
3. Monthly schedules used for 3-phase development sequence of the Portfolio Risk Model are appoximated here.



SUMMARY RESULTS

	Muni/PUD	IOU	IPP	Weighted	
Plant costs (busbar):					
Total Investment, YOL, (2012 $/kW)	$1,083	$0	$0	$1,083	
Total Investment, YOL, (expnd $/kW)	$1,119	$0	$0	$1,119	
Levelized Fixed Costs ($/kW/yr):					
Capital	52.50	0.00	0.00	52.50	
Property tax & Insurance	1.69	0.00	0.00	1.69	
Other fixed O&M	12.57	0.00	0.00	12.57	1.047661
Fuel	35.99	0.00	0.00	35.99	
Subtotal busbar cost	102.75	0.00	0.00	102.75	
Transmission	0.00	0.00	0.00	0.00	
Cost of Losses (derating)	0.00	0.00	0.00	0.00	
Gross Rev Tax (fixed portion)	0.00	0.00	0.00	0.00	
Total (2012$)	$102.75	0.00	$0.00	102.75	8.562503
Levelized Costs ($/MWh):					
Capital	6.73	0.00	0.00	6.73	
O&M - Fixed (incl. Prp Tax & Ins.)	1.83	0.00	0.00	1.83	
O&M - Variable	1.88	0.00	0.00	1.88	
Fuel - Fixed	4.62	0.00	0.00	4.62	
Fuel - Variable	33.03	0.00	0.00	33.03	
Emissions	11.92	0.00	0.00	11.92	
Subtotal busbar cost	60.01	0.00	0.00	60.01	
Transmission - Fixed	0.00	0.00	0.00	0.00	
T&I -Variable	0.00	0.00	0.00	0.00	
Cost of losses	0.00	0.00	0.00	0.00	
Gross Rev Tax	0.00	0.00	0.00	0.00	
Total delivered cost (2012$)	$60.01	$0.00	$0.00	$60.01	
Total (nominal dollars)	$73.66	$0.00	$0.00	$73.66	

SENSITIVITY ANALYSES MACROS

MacroOut (CF & YOL macros) $60.01

Select output value to record by selecting from dropdown at G49.

Service Year		Capacity Factor	
Enter first year of desired series.		Enter first and last capacity factors of desired series.	
YOL	WtdLevCstR $/MWh	CF (%)	WtdLevCstR $/MWh
2008	$103.89	1.0%	$2,197.79
2009	$111.01	10.9%	$236.75
2010	$114.34	20.8%	$142.47
2011	$100.34	30.7%	$109.00
2012	$96.10	40.6%	$91.85
2013	$94.82	50.5%	$81.42
2014	$94.16	60.4%	$74.41
2015	$93.62	70.3%	$69.38
2016	$93.20	80.2%	$65.59
2017	$92.77	90.1%	$62.63
2018	$92.32	100.0%	$60.26
2019	$91.88		
2020	$91.52		
2021	$91.11		
2022	$90.66		
2023	$90.27		
2024	$89.88		
2025	$89.50		
2026	$89.15		
2027	$88.76		
2028	$88.36		
2029	$87.95		
2030	$87.58		
2031	$87.19		
2032	$86.81		
2033	$86.83		
2034	$86.85		
2035	$86.87		
2036	$86.89		
2037	$86.91		

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2		MicroFin Version 15.0.1		
3		**Advanced Combined-cycle**		
4		FUEL PRICE		
5				
6	Input variables are in blue.			
7	Cases can be stored using EXCEL 4.0 Scenario Manager (blue text & background)			
8	FXFL calcs are auto-scaled for heat rate. Fixed fuel input values should be normalized to 10,000 Btu/kWh heat rate.			
9				
10	Return to Control & Project		Return to AURORA Calcs	
11	Fuel	BPA 8_24_12		
12	Date record added	Updated 3/28/12		
13	Price year	2008		
14	CO2 factor (lb/MMBtu)	117		
15	Notes	Incremental pipeline costs.		
16		2000-07 from FUELMOD5(4) 050708JK.		
17		2008-30 from FUELMOD7(2) 111709JK ave of monthly prices		
18		0		
19	Year	Fuel Fixed ($/kW/yr) (Normalize to HR = 10000 Btu/kWh (HHV) and 100% CF)	Fuel Variable ($/MMbtu)	
20	2000	31.70	3.96	
21	2001	31.70	4.23	
22	2002	31.70	2.95	
23	2003	31.70	5.03	
24	2004	31.70	5.51	
25	2005	31.70	7.26	
26	2006	31.70	6.12	
27	2007	31.70	7.28	
28	2008	33.70	7.68	
29	2009	35.74	3.43	
30	2010	38.80	4.04	
31	2011	41.87	4.30	
32	2012	45.95	2.39	
33	2013	45.95	3.39	
34	2014	45.95	3.80	
35	2015	45.95	3.89	
36	2016	46.97	3.93	
37	2017	46.97	3.94	
38	2018	47.99	3.90	
39	2019	47.99	4.01	
40	2020	47.99	4.11	
41	2021	48.14	4.25	
42	2022	48.28	4.21	
43	2023	48.43	4.26	
44	2024	48.57	4.29	
45	2025	48.72	4.36	

MicroFin Version 15.0.1

Advanced Combined-cycle

FINANCING, TAXES & DISCOUNT RATES

Input variables are in blue. This version uses a constant rate of future inflation (INFL).

Cases can be stored using EXCEL 4.0 Scenario Manager

CASE	ATCOC 30-yr service life - No ITC or PTC
NOTE	6th Plan Final
UPDATE	Muni/PUD DRate corrected 6/30/2010

Return to Control & Project

Return to AURORA Calcs

TAXES AND INCENTIVES

	Municipal/PUD	Regulated Investor-Owned Utility	Independent Power Producer
Federal Income Tax Rate (%)		35.0%	35.0%
Federal Investment Tax Credit (%)		0.0%	0.0%
Fraction of ITC Deducted From Tax Basis (%)		100.0%	100.0%
FIT Recovery Period (value from PROJECT worksheet)		20	20
Renewable Production Incentive (Muni)/Tax Credit (IOU, IPP)	N	N	N
Earliest qualifying service year	0	0	0
In-service deadline	0	0	0
Payment period (years)	0	0	0
Production incentive (2006 $/MWh)	$0.00	$0.00	$0.00
Production Tax Credit against FIT (Y); against VROM (N)		Y	Y
State Income Tax Rate (%)		5.00%	5.0%
State Investment Credit (%)		0.00%	0.0%
Gross Revenue (%)	0.00%	0.00%	0.00%
Property tax	0.00%	1.40%	1.40%
Insurance	0.25%	0.25%	0.25%

PTC Modelling: By default the PTC is credited against federal income tax. Crediting the PTC against variable O&M models the effect on plant dispatch.

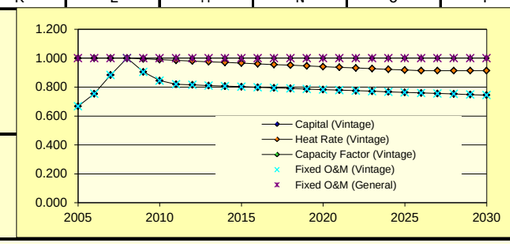
FINANCIAL ASSUMPTIONS

Debt Term (years)	30	30	15
Equity Investment (years)		30	15
DEBT FRACTION			
Regulated IOU		50%	
IPP - Development Period			0%
IPP - Construction Period			60%
IPP - Long-term			60%
DEBT INTEREST RATE (Nominal)			
Public, Regulated IOU	4.00%	7.10%	
IPP - Development Period			0.00%
IPP - Construction Period			5.80%
IPP - Long-term			7.10%
RETURN ON EQUITY (Nominal)			
Regulated IOU		10.20%	
IPP Development			13.70%
IPP Construction			13.70%
IPP Long-term			13.70%
AFTER-TAX COST OF CAPITAL (for info. only)			
Weighted After-tax Cost of Capital (real, %)	2.34%	5.52%	6.32%
Weighted After-tax Cost of Capital (nominal, %)	4.00%	7.23%	8.04%
DEBT FINANCING FEE			
Debt financing fees (% of debt placed)	2.0%	2.0%	2.0%
DISCOUNT RATE			
Real (%)	10.22%	5.50%	10.22%
Nominal (%) (for info only)	12.00%	7.21%	12.00%
GENERAL INFLATION RATE			
2010 - 2029 annual average	1.62%	Info only, From WS Escalation	

MicroFin Version 15.0.1

Advanced Combined-cycle

NON-FUEL ESCALATION



Input values are in blue.
Input values on blue field are stored in SCENARIO.xla.
Array ESC
Index base year is an arbitrary year - does not affect vintage calculations.

Escalation series: Combined-cycle
Note: GDP Deflators: 2000-08 from Bureau of Economic Analysis T 1.19; post-08 from MJ 10/9/09
Index Base Year: 2008 — Index base year does not affect calculations.

Return to Control & Project — Return to AURORA Calcs

	Annual Change (%) (during year shown)							Indices							
Year	Capital (Vintage)	Fixed O&M (Vintage)	Fixed O&M (General)	Variable O&M (Vintage)	Variable O&M (General)	Heat Rate (Vintage)	Capacity Factor (Vintage)	Capital (Vintage)	Fixed O&M (Vintage)	Fixed O&M (General)	Variable O&M (Vintage)	Variable O&M (General)	Heat Rate (Vintage)	Capacity Factor (Vintage)	GDP Price Deflator
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1984	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.638	0.638	1.000	1.000	1.000	1.000	1.000	59.97
1985	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.638	0.638	1.000	1.000	1.000	1.000	1.000	61.80
1986	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.638	0.638	1.000	1.000	1.000	1.000	1.000	63.16
1987	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.638	0.638	1.000	1.000	1.000	1.000	1.000	64.89
1988	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.638	0.638	1.000	1.000	1.000	1.000	1.000	67.10
1989	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.638	0.638	1.000	1.000	1.000	1.000	1.000	69.64
1990	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.638	0.638	1.000	1.000	1.000	1.000	1.000	72.33
1991	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.638	0.638	1.000	1.000	1.000	1.000	1.000	74.86
1992	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.638	0.638	1.000	1.000	1.000	1.000	1.000	76.58
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.638	0.638	1.000	1.000	1.000	1.000	1.000	78.35
1994	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.638	0.638	1.000	1.000	1.000	1.000	1.000	80.01
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.638	0.638	1.000	1.000	1.000	1.000	1.000	81.65
1996	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.638	0.638	1.000	1.000	1.000	1.000	1.000	83.20
1997	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.638	0.638	1.000	1.000	1.000	1.000	1.000	84.58
1998	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.638	0.638	1.000	1.000	1.000	1.000	1.000	85.52
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.638	0.638	1.000	1.000	1.000	1.000	1.000	86.76
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.638	0.638	1.000	1.000	1.000	1.000	1.000	88.65
2001	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.638	0.638	1.000	1.000	1.000	1.000	1.000	90.65
2002	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.638	0.638	1.000	1.000	1.000	1.000	1.000	92.12
2003	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.638	0.638	1.000	1.000	1.000	1.000	1.000	94.10
2004	4.7%	4.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.638	0.638	1.000	1.000	1.000	1.000	1.000	96.77
2005	12.9%	12.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.668	0.668	1.000	1.000	1.000	1.000	1.000	100.00
2006	17.1%	17.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.754	0.754	1.000	1.000	1.000	1.000	1.000	103.26
2007	13.2%	13.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.884	0.884	1.000	1.000	1.000	1.000	1.000	106.21
2008	-9.5%	-9.5%	0.0%	0.0%	0.0%	-0.5%	0.0%	1.000	1.000	1.000	1.000	1.000	1.000	1.000	108.00
2009	-6.7%	-6.7%	0.0%	0.0%	0.0%	-0.5%	0.0%	0.905	0.905	1.000	1.000	1.000	0.995	1.000	110.42
2010	-3.0%	-3.0%	0.0%	0.0%	0.0%	-0.5%	0.0%	0.845	0.845	1.000	1.000	1.000	0.990	1.000	111.88
2011	-0.5%	-0.5%	0.0%	0.0%	0.0%	-0.5%	0.0%	0.819	0.819	1.000	1.000	1.000	0.985	1.000	112.79
2012	-0.5%	-0.5%	0.0%	0.0%	0.0%	-0.5%	0.0%	0.815	0.815	1.000	1.000	1.000	0.980	1.000	114.26
2013	-0.5%	-0.5%	0.0%	0.0%	0.0%	-0.5%	0.0%	0.811	0.811	1.000	1.000	1.000	0.975	1.000	115.83
2014	-0.5%	-0.5%	0.0%	0.0%	0.0%	-0.5%	0.0%	0.807	0.807	1.000	1.000	1.000	0.970	1.000	117.80
2015	-0.5%	-0.5%	0.0%	0.0%	0.0%	-0.5%	0.0%	0.803	0.803	1.000	1.000	1.000	0.966	1.000	119.90
2016	-0.5%	-0.5%	0.0%	0.0%	0.0%	-0.5%	0.0%	0.799	0.799	1.000	1.000	1.000	0.961	1.000	122.00
2017	-0.5%	-0.5%	0.0%	0.0%	0.0%	-0.5%	0.0%	0.795	0.795	1.000	1.000	1.000	0.956	1.000	124.17
2018	-0.5%	-0.5%	0.0%	0.0%	0.0%	-0.5%	0.0%	0.791	0.791	1.000	1.000	1.000	0.951	1.000	126.44
2019	-0.5%	-0.5%	0.0%	0.0%	0.0%	-0.5%	0.0%	0.787	0.787	1.000	1.000	1.000	0.946	1.000	128.77
2020	-0.5%	-0.5%	0.0%	0.0%	0.0%	-0.5%	0.0%	0.783	0.783	1.000	1.000	1.000	0.942	1.000	131.06
2021	-0.5%	-0.5%	0.0%	0.0%	0.0%	-0.5%	0.0%	0.779	0.779	1.000	1.000	1.000	0.937	1.000	133.42
2022	-0.5%	-0.5%	0.0%	0.0%	0.0%	-0.5%	0.0%	0.775	0.775	1.000	1.000	1.000	0.932	1.000	135.90
2023	-0.5%	-0.5%	0.0%	0.0%	0.0%	-0.5%	0.0%	0.771	0.771	1.000	1.000	1.000	0.928	1.000	138.39
2024	-0.5%	-0.5%	0.0%	0.0%	0.0%	-0.5%	0.0%	0.767	0.767	1.000	1.000	1.000	0.923	1.000	140.90
2025	-0.5%	-0.5%	0.0%	0.0%	0.0%	-0.5%	0.0%	0.764	0.764	1.000	1.000	1.000	0.918	1.000	143.45
2026	-0.5%	-0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.760	0.760	1.000	1.000	1.000	0.914	1.000	146.02
2027	-0.5%	-0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.756	0.756	1.000	1.000	1.000	0.914	1.000	148.66
2028	-0.5%	-0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.752	0.752	1.000	1.000	1.000	0.914	1.000	151.39
2029	-0.5%	-0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.748	0.748	1.000	1.000	1.000	0.914	1.000	154.23

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
64	2030	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	157.10
65	2031	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	160.05
66	2032	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	163.06
67	2033	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	166.12
68	2034	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	169.24
69	2035	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	172.43
70	2036	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	175.67
71	2037	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	178.97
72	2038	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	182.33
73	2039	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	185.76
74	2040	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	189.25
75	2041	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	192.81
76	2042	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	196.43
77	2043	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	200.12
78	2043	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	203.88
79	2044	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	207.71
80	2045	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	211.62
81	2046	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	215.59
82	2047	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	219.65
83	2048	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	223.77
84	2049	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	227.98
85	2050	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	232.26
86	2051	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	236.63
87	2052	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	241.08
88	2053	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	245.61
89	2054	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	250.22
90	2055	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	254.93
91	2056	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	259.72
92	2057	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	264.60
93	2058	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	269.57
94	2059	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	274.64
95	2060	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	279.80
96	2061	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	285.06
97	2062	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	290.41
98	2063	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	295.87
99	2064	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	301.43
100	2065	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	307.10
101	2066	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	312.87
102	2067	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	318.75
103	2068	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	324.74
104	2069	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	330.84
105	2070	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.745	0.745	1.000	1.000	1.000	0.914	1.000	337.06
106																
107	2010 - 2029 annual average								-0.60%	-0.60%	0.00%	0.00%	0.00%	-0.40%	0.00%	1.62%
108	2010 - 2029 monthly averages for Regional Portfolio Model								-0.05%	-0.05%	0.00%	0.00%	0.00%	-0.03%	0.00%	0.13%
109																

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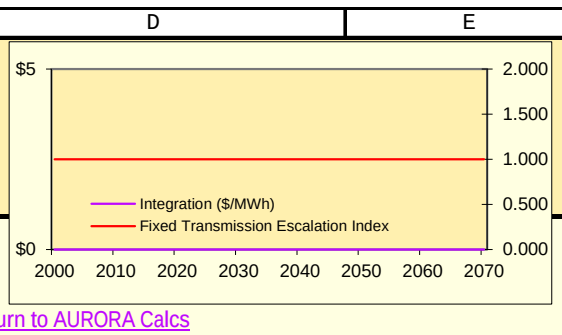
Advanced Combined-cycle

TRANSMISSION & INTEGRATION



Input variables are in blue.

Cases can be stored using EXCEL 4.0 Scenario Manager (blue text & background)

Escalators applies to fixed transmission costs only.

Array TxCost: B20:E91

Return to Control & Project

Return to AURORA Calcs

Case	Main grid Point-to-Point: Thermal resource	0%
Date record added	Updated 11/17/09	0
Price year	2006	2010 BPA rate schedules adjusted to 2006$ values
Transmission losses (%)	0.0%	0
Fixed transmission ($/kW/yr)	$0.00	Approximate BPA point-to-point + ASC fixed cost
Variable transmission ($/MWh)	$0.00	Approximate BPA point-to-point + ASC variable cost
Notes	0	0
Index Base Year	2008	Index base year does not affect calculations.

Year	Integration ($/MWh)	Fixed Transmission Escalation	Fixed Transmission Escalation Index
1	2	3	4
2000	0.00	0.0%	1.000
2001	0.00	0.0%	1.000
2002	0.00	0.0%	1.000
2003	0.00	0.0%	1.000
2004	0.00	0.0%	1.000
2005	0.00	0.0%	1.000
2006	0.00	0.0%	1.000
2007	0.00	0.0%	1.000
2008	0.00	0.0%	1.000
2009	0.00	0.0%	1.000
2010	0.00	0.0%	1.000
2011	0.00	0.0%	1.000
2012	0.00	0.0%	1.000
2013	0.00	0.0%	1.000
2014	0.00	0.0%	1.000
2015	0.00	0.0%	1.000
2016	0.00	0.0%	1.000
2017	0.00	0.0%	1.000
2018	0.00	0.0%	1.000
2019	0.00	0.0%	1.000
2020	0.00	0.0%	1.000
2021	0.00	0.0%	1.000
2022	0.00	0.0%	1.000
2023	0.00	0.0%	1.000
2024	0.00	0.0%	1.000
2025	0.00	0.0%	1.000
2026	0.00	0.0%	1.000
2027	0.00	0.0%	1.000
2028	0.00	0.0%	1.000
2029	0.00	0.0%	1.000
2030	0.00	0.0%	1.000
2031	0.00	0.0%	1.000
2032	0.00	0.0%	1.000
2033	0.00	0.0%	1.000
2034	0.00	0.0%	1.000
2035	0.00	0.0%	1.000
2036	0.00	0.0%	1.000
2037	0.00	0.0%	1.000
2038	0.00	0.0%	1.000
2039	0.00	0.0%	1.000
2040	0.00	0.0%	1.000
2041	0.00	0.0%	1.000
2042	0.00	0.0%	1.000
2043	0.00	0.0%	1.000
2044	0.00	0.0%	1.000
2045	0.00	0.0%	1.000
2046	0.00	0.0%	1.000
2047	0.00	0.0%	1.000
2048	0.00	0.0%	1.000
2049	0.00	0.0%	1.000
2050	0.00	0.0%	1.000
2051	0.00	0.0%	1.000
2052	0.00	0.0%	1.000
2053	0.00	0.0%	1.000
2054	0.00	0.0%	1.000
2055	0.00	0.0%	1.000
2056	0.00	0.0%	1.000
2057	0.00	0.0%	1.000
2058	0.00	0.0%	1.000
2059	0.00	0.0%	1.000
2060	0.00	0.0%	1.000
2061	0.00	0.0%	1.000
2062	0.00	0.0%	1.000
2063	0.00	0.0%	1.000
2064	0.00	0.0%	1.000
2065	0.00	0.0%	1.000
2066	0.00	0.0%	1.000
2067	0.00	0.0%	1.000
2068	0.00	0.0%	1.000
2069	0.00	0.0%	1.000
2070	0.00	0.0%	1.000

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Advanced Combined-cycle

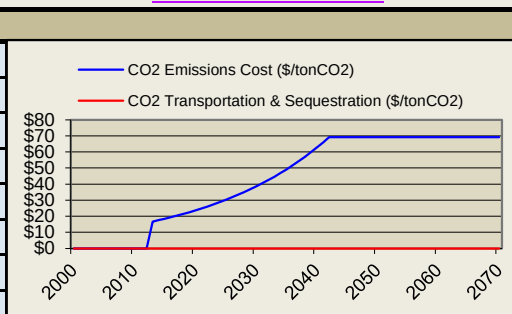
EMISSION COSTS

Input variables are in blue cells.
Cases can be stored using EXCEL 4.0 Scenario Manager (blue text & background)
Column D is not currently used (11/04/08).
Array EmCst: B20:D91

Return to Control & Project

Return to AURORA Calcs

Case	RP 2012 Futures Price
Date record added	11/07/08
Price year	2012
Units (B14 dropdown)	Metric tons (2200 lb)
Notes	0
	0
	0
	$0.00



Year	CO2 Emissions Cost ($/tonCO2)	CO2 Transportation & Sequestration ($/tonCO2)
2000	0.00	0.00
2001	0.00	0.00
2002	0.00	0.00
2003	0.00	0.00
2004	0.00	0.00
2005	0.00	0.00
2006	0.00	0.00
2007	0.00	0.00
2008	0.00	0.00
2009	0.00	0.00
2010	0.00	0.00
2011	0.00	0.00
2012	0.00	0.00
2013	16.65	0.00
2014	17.65	0.00
2015	18.53	0.00
2016	19.46	0.00
2017	20.43	0.00
2018	21.45	0.00
2019	22.53	0.00
2020	23.65	0.00
2021	24.84	0.00
2022	26.08	0.00
2023	27.38	0.00
2024	28.75	0.00
2025	30.19	0.00
2026	31.70	0.00
2027	33.28	0.00
2028	34.95	0.00
2029	36.69	0.00
2030	38.53	0.00
2031	40.45	0.00
2032	42.48	0.00
2033	44.60	0.00
2034	46.83	0.00
2035	49.17	0.00
2036	51.63	0.00
2037	54.21	0.00
2038	56.92	0.00
2039	59.77	0.00
2040	62.76	0.00
2041	65.90	0.00
2042	69.19	0.00
2043	69.19	0.00
2044	69.19	0.00
2045	69.19	0.00
2046	69.19	0.00
2047	69.19	0.00
2048	69.19	0.00
2049	69.19	0.00
2050	69.19	0.00
2051	69.19	0.00
2052	69.19	0.00
2053	69.19	0.00
2054	69.19	0.00
2055	69.19	0.00
2056	69.19	0.00
2057	69.19	0.00
2058	69.19	0.00
2059	69.19	0.00
2060	69.19	0.00
2061	69.19	0.00
2062	69.19	0.00
2063	69.19	0.00
2064	69.19	0.00
2065	69.19	0.00
2066	69.19	0.00
2067	69.19	0.00
2068	69.19	0.00
2069	69.19	0.00
2070	69.19	0.00

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TAX DEPRECIATION SCHEDULES

(MACRS, Half-year convention)

	Tax Recovery Period (Years)				
	5	7	10	15	20
1	20.00%	14.29%	10.00%	5.00%	3.75%
2	32.00%	24.49%	18.00%	9.50%	7.22%
3	19.20%	17.49%	14.40%	8.55%	6.68%
4	11.52%	12.49%	11.52%	7.70%	6.18%
5	11.52%	8.93%	9.22%	6.93%	5.71%
6	5.76%	8.92%	7.37%	6.23%	5.29%
7	0.00%	8.93%	6.55%	5.90%	4.89%
8	0.00%	4.46%	6.55%	5.90%	4.52%
9	0.00%	0.00%	6.56%	5.91%	4.46%
10	0.00%	0.00%	6.55%	5.90%	4.46%
11	0.00%	0.00%	3.28%	5.91%	4.46%
12	0.00%	0.00%	0.00%	5.90%	4.46%
13	0.00%	0.00%	0.00%	5.91%	4.46%
14	0.00%	0.00%	0.00%	5.90%	4.46%
15	0.00%	0.00%	0.00%	5.91%	4.46%
16	0.00%	0.00%	0.00%	2.95%	4.46%
17	0.00%	0.00%	0.00%	0.00%	4.46%
18	0.00%	0.00%	0.00%	0.00%	4.46%
19	0.00%	0.00%	0.00%	0.00%	4.46%
20	0.00%	0.00%	0.00%	0.00%	4.46%
21	0.00%	0.00%	0.00%	0.00%	2.23%
22	0.00%	0.00%	0.00%	0.00%	0.00%
23	0.00%	0.00%	0.00%	0.00%	0.00%
24	0.00%	0.00%	0.00%	0.00%	0.00%
25	0.00%	0.00%	0.00%	0.00%	0.00%
26	0.00%	0.00%	0.00%	0.00%	0.00%
27	0.00%	0.00%	0.00%	0.00%	0.00%
28	0.00%	0.00%	0.00%	0.00%	0.00%
29	0.00%	0.00%	0.00%	0.00%	0.00%
30	0.00%	0.00%	0.00%	0.00%	0.00%

MACRS Recovery Periods (Pub 946 2007)

(Check for exceptions for specific projects)

Asset	Class Life	Recovery Period	Note
Certain geothermal, solar and wind electrical generation		5	
Electric utility nuclear production plant	20	15	Excludes nuclear fuel
Electric utility steam production plant	28	20	Including combined-cycle and resource recovery facilities excluding chemical recovery boilers.
Electric utility hydraulic production plant	50	20	
Electric utility combustion turbine production plant	20	15	Including reciprocating engines. Excludes combined-cycle.
Steam and chemical recovery boiler systems for pulp and paper	13	7	
Industrial steam and electric generation facilities	22	15	Excludes steam and chemical recovery boiler systems for pulp and paper industry
Electrical transmission property placed into service after April 11, 2005	15		
Electrical generation assets installed on customer's premises	10	7	

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INTERMEDIATE CALCULATIONS AND DROPDOWN LISTS

Delivered capacity (MW)	CAPD	1,170.0	
Heat rate, vintaged to YCB (Btu/kWh)	HRV	7236	
Capacity factor, vintaged to YCB (%)	CFV	89.0%	
Capital cost, vintaged to YCB ($/kW)	CAPCSTV	$908	
Fixed O&M (busbar), vintaged to YCB ($/kW/yr)	FOMBV	$11.35	
Variable O&M (busbar), vintaged to YOL ($/kWh)	VOMBV	$0.0017	
Fixed Transmission ($/kW/yr)	FOMG	$0.00	
Fixed Fuel, vintaged to YCB ($/kW/yr)	FFLV	$46.97	Locked-in fixed fuel cost option. Price yr dollars
Emission units (lbs/ton)	2200		

Dropdown Lists

Emission Units (LEmUnit)

Short tons (2000 lb)
Metric tons (2200 lb)

Macro Output (Arrays AMacroOut & LMacroOut)

AllInCstR	$1,083.40
AllInCstN	$1,118.76
FOMBV	$11.35
HRV	7236
WtdLevCap	FixMe
WtdLevFxOM	FixMe
WtdLevFuel	FixMe
WtdLevFxCstCap	FixMe
WtdLevFxCstFxOM	FixMe
WtdLevFxCstFxFl	FixMe
WtdLevFxCstTot	FixMe
WtdLevEnCstVrOM	FixMe
WtdLevEnCstVrFL	FixMe
WtdLevEmm	FixMe
WtdLevCstR	$60.01

Northwest Power and Conservation Council
MicroFin Version 15.0.1

CONSUMER-OWNED UTILITY FINANCING

Advanced Combined-cycle

RESULTS

Year 2016 Levelized Cost in 2012 $/MWh:	
Capital	$6.73
Fixed O&M incl property tax & insurance	$1.83
Variable O & M	$1.88
Fuel - Fixed	$4.62
Fuel - Variable	$33.03
Emissions	$11.92
Subtotal busbar cost	$60.01
Transmission & Integration - Fixed (direct, ex. losses)	$0.00
Transmission & Integration - Variable (direct, ex. losses)	$0.00
Cost of losses	$0.00
Gross revenue tax	$0.00
Net delivered cost	$60.01
Year 2016 Levelized Cost in Nominal $/MWh:	
Capital	$8.27
Fixed O&M incl property tax & insurance	$2.24
Variable O & M	$2.31
Fuel - Fixed	$5.67
Fuel - Variable	$40.54
Emissions	$14.64
Subtotal busbar cost	$73.66
Transmission & Integration - Fixed (direct, ex. losses)	$0.00
Transmission & Integration - Variable (direct, ex. losses)	$0.00
Cost of losses	$0.00
Gross revenue tax	$0.00
Total	$73.66
Levelized Fixed Cost in 2012 $/kW/yr:	
Capital	$52.50
Property tax & insurance	$1.69
Other fixed O&M	$12.57
Fuel - Fixed	$35.99
Subtotal busbar fixed costs	$102.75
Transmission & Integration - Fixed (direct, ex. losses)	$0.00
Cost of Losses (cost of derating)	$0.00
Gross Revenue Tax	$0.00
Total	$102.75
Miscellaneous Values	
Annual energy, busbar (MWh)	9,121,788
Annual energy, delivered (MWh)	9,121,788
All-in capital cost, busbar 2012 ($/kW)	$1,083
All-in capital cost, busbar, as expended (nominal) ($/kW)	$1,119

ANNUAL CASH FLOWS, 1000$ Nominal (except as indicated)

	Cash Payouts and Debt service													Debt	Expensed Costs						
Year	Cash Expended	Annual Bond Sales	Debt Service Series 2011	Debt Service Series 2012	Debt Service Series 2013	Debt Service Series 2014	Debt Service Series 2015	Debt Service Series 2016	Debt Service Series 2017	Debt Service Series 2018	Debt Service Series 2019	Debt Service Series 2020	Assessed Value	Total Annual Debt Service	O & M Fixed	O & M Variable	Fuel Fixed	Fuel Variable	T&I Fixed	T&I Variable	Emissions
2011	11,607	-11,839	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2012	23,516	-24,684	685	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2013	190,720	-196,689	685	1,428	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2014	666,736	-693,827	685	1,428	11,375	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	320,809	-381,909	685	1,428	11,375	40,124	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	1,287,133	75,697	15,694	18,322	44,925	293,335	0	0	72,942
2017	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	1,243,501	75,697	15,973	18,648	45,724	299,308	0	0	77,951
2018	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	1,199,869	75,697	16,264	18,988	46,558	301,204	0	0	83,342
2019	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	1,156,238	75,697	16,564	19,338	47,416	315,736	0	0	89,121
2020	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	1,112,606	75,697	16,859	19,683	48,260	329,089	0	0	95,244
2021	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	1,068,974	75,697	17,162	20,037	49,128	346,321	0	0	101,804
2022	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	1,025,343	75,697	17,482	20,410	50,043	349,623	0	0	108,886
2023	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	981,711	75,697	17,801	20,783	50,958	360,520	0	0	116,418
2024	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	938,080	75,697	18,125	21,161	51,884	369,258	0	0	124,462
2025	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	894,448	75,697	18,453	21,543	52,823	382,451	0	0	133,051
2026	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	850,816	75,697	18,783	21,929	53,767	407,478	0	0	142,200
2027	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	807,185	75,697	19,123	22,326	54,743	415,609	0	0	152,018
2028	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	763,553	75,697	19,475	22,736	55,748	429,389	0	0	162,551
2029	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	719,922	75,697	19,840	23,163	56,793	442,751	0	0	173,879
2030	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	676,290	75,697	20,208	23,593	57,848	461,078	0	0	185,963
2031	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	632,658	75,697	20,588	24,036	58,935	469,743	0	0	198,931
2032	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	589,027	75,697	20,975	24,488	60,043	478,572	0	0	212,803
2033	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	545,395	75,697	21,369	24,948	61,171	487,566	0	0	227,642
2034	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	501,764	75,697	21,771	25,417	62,321	496,729	0	0	243,517
2035	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	458,132	75,697	22,180	25,895	63,492	506,065	0	0	260,498
2036	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	414,500	75,697	22,597	26,381	64,685	515,576	0	0	278,663
2037	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	370,869	75,697	23,022	26,877	65,901	525,265	0	0	298,096
2038	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	327,237	75,697	23,454	27,382	67,140	535,137	0	0	318,883
2039	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	283,605	75,697	23,895	27,897	68,401	545,194	0	0	341,120
2040	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	239,974	75,697	24,344	28,421	69,687	555,441	0	0	364,907
2041	0	0	685	1,428	11,375	40,124	22,086	0	0	0	0	0	196,342	75,697	24,802	28,955	70,997	565,879	0	0	390,354
2042	0	0	0	1,428	11,375	40,124	22,086	0	0	0	0	0	152,711	75,012	25,268	29,499	72,331	576,515	0	0	417,574
2043	0	0	0	0	11,375	40,124	22,086	0	0	0	0	0	109,079	73,584	25,743	30,054	73,690	587,349	0	0	433,417
2044	0	0	0	0	0	40,124	22,086	0	0	0	0	0	65,447	62,210	26,719	31,194	76,486	609,634	0	0	441,563
2045	0	0	0	0	0	0	22,086	0	0	0	0	0	21,816	22,086	27,221	31,780	77,924	621,091	0	0	449,862
2046	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2047	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2048	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2049	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2050	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2051	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2052	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2053	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2054	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2055	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2056	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2057	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2058	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2059	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2060	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2061	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2062	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2063	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2064	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2065	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2066	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2067	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2068	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sums	$1,331,679	($1,308,948)																			
2016 NPV														607,180	145,390	169,739	416,190	2,977,899	0	0	1,075,117
Real Levelized Cost (2012 $/MWh)														$6.73	$1.61	$1.88	$4.62	$33.03	$0.00	$0.00	$11.92
Real Levelized Fixed Cost (2012 $/kW/yr)														$52.50	$12.57		$35.99		$0.00		
2016 Nominal Levelized Cost ($/MWh)														$8.27	$1.98	$2.31	$5.67	$40.54	$0.00	$0.00	$14.64

	AC	AD	AE	AF	AG	AH	AI	AJ	AK
1									
2									
3									
4									
5									
6									
7									
8									
9	Miscellaneous Costs & Credits					Sums & Special Model Inputs			
10									
11	Property		REPI	Cost		Revenue	Revenue	FXOM	Expended Capital
12	Tax	Insurance	(Credit)	of Losses	Gross Revenue Tax	Requirement ($x1000)	Requirement ($/MWh)	w/PTax & Ins Nominal	($1000s Real)
13	0	0	0	0	0	0	0	0	11,993
14	0	0	0	0	0	0	$0.00	0	24,684
15	0	0	0	0	0	0	$0.00	0	194,014
16	0	0	0	0	0	0	$0.00	0	672,960
17	0	0	0	0	0	0	$0.00	0	363,928
18	0	3,218	0	0	0	524,133	$57.46	63837	0
19	0	3,109	0	0	0	536,410	$58.81	64806	0
20	0	3,000	0	0	0	545,054	$59.75	65823	0
21	0	2,891	0	0	0	566,762	$62.13	66871	0
22	0	2,782	0	0	0	587,613	$64.42	67901	0
23	0	2,672	0	0	0	612,822	$67.18	68963	0
24	0	2,563	0	0	0	624,704	$68.48	70089	0
25	0	2,454	0	0	0	644,631	$70.67	71213	0
26	0	2,345	0	0	0	662,932	$72.68	72354	0
27	0	2,236	0	0	0	686,254	$75.23	73512	0
28	0	2,127	0	0	0	721,980	$79.15	74677	0
29	0	2,018	0	0	0	741,534	$81.29	75884	0
30	0	1,909	0	0	0	767,505	$84.14	77132	0
31	0	1,800	0	0	0	793,922	$87.04	78433	0
32	0	1,691	0	0	0	826,077	$90.56	79747	0
33	0	1,582	0	0	0	849,512	$93.13	81105	0
34	0	1,473	0	0	0	874,049	$95.82	82490	0
35	0	1,363	0	0	0	899,757	$98.64	83904	0
36	0	1,254	0	0	0	926,705	$101.59	85346	0
37	0	1,145	0	0	0	954,971	$104.69	86817	0
38	0	1,036	0	0	0	984,635	$107.94	88318	0
39	0	927	0	0	0	1,015,784	$111.36	89850	0
40	0	818	0	0	0	1,048,511	$114.95	91412	0
41	0	709	0	0	0	1,082,913	$118.72	93005	0
42	0	600	0	0	0	1,119,097	$122.68	94631	0
43	0	491	0	0	0	1,157,174	$126.86	96289	0
44	0	382	0	0	0	1,196,581	$131.18	97980	0
45	0	273	0	0	0	1,224,111	$134.20	99706	0
46	0	164	0	0	0	1,247,970	$136.81	103369	0
47	0	55	0	0	0	1,230,019	$134.84	105200	0
48	0	0	0	0	0	0	$0.00	0	0
49	0	0	0	0	0	0	$0.00	0	0
50	0	0	0	0	0	0	$0.00	0	0
51	0	0	0	0	0	0	$0.00	0	0
52	0	0	0	0	0	0	$0.00	0	0
53	0	0	0	0	0	0	$0.00	0	0
54	0	0	0	0	0	0	$0.00	0	0
55	0	0	0	0	0	0	$0.00	0	0
56	0	0	0	0	0	0	$0.00	0	0
57	0	0	0	0	0	0	$0.00	0	0
58	0	0	0	0	0	0	$0.00	0	0
59	0	0	0	0	0	0	$0.00	0	0
60	0	0	0	0	0	0	$0.00	0	0
61	0	0	0	0	0	0	$0.00	0	0
62	0	0	0	0	0	0	$0.00	0	0
63	0	0	0	0	0	0	$0.00	0	0
64	0	0	0	0	0	0	$0.00	0	0
65	0	0	0	0	0	0	$0.00	0	0
66	0	0	0	0	0	0	$0.00	0	0
67	0	0	0	0	0	0	$0.00	0	0
68	0	0	0	0	0	0	$0.00	0	0
69	0	0	0	0	0	0	$0.00	0	0
70	0	0	0	0	0	0	$0.00	0	0
71									
72	0	19,505	0	2016 NPV Fixed O&M w/Ptax & Ins				$369,243	
73	$0.00	$0.22	$0.00						
74	$0.00	$1.69		Fixed O&M, w/Ptax, Ins (2012 $/kW/yr)				$31.93	
75	$0.00	$0.27	$0.00	Fixed O&M, w/Ptax, Ins (2012 $/MW-wk)				$612	
76									

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
77																												
78																												
79																												
80																												
81																												
82																												
83																												

	AC	AD	AE	AF	AG	AH	AI	AJ	AK
77									
78						$5,412,701.00			
79						$13,042.65			
80									
81									
82									
83									

MicroFin Version 15.0.1

REGULATED IOU FINANCING

(Normalization Accounting)

Advanced Combined-cycle

CALCULATE TOTAL CAPITAL INVESTMENT

Vintage Capital w/Financing Fee ($/kW) 917

Year	Phase	Annual Payout	Accrued Payout	Annual IDC	Accrued Investment
Nominal ($1000)					
2011	Development	0	0	0	0
2012	Development	0	0	0	0
2013	Construction	0	0	0	0
2014	Construction	0	0	0	0
2015	Construction	0	0	0	0
2016	Operation				
2017	Operation				
2018	Operation				
2019	Operation				
2020	Operation				
Total		0		0	0
Price Year ($1000)					
2011	Development	0	0	0	0
2012	Development	0	0	0	0
2013	Construction	0	0	0	0
2014	Construction	0	0	0	0
2015	Construction	0	0	0	0
2016	Operation				
2017	Operation				
2018	Operation				
2019	Operation				
2020	Operation				
Total		0		0	0

RESULTS

Year 2016 Levelized Cost in 2012 $/MWh:	
Capital	$0.00
Fixed O&M incl property tax & insurance	$0.00
Variable O & M	$0.00
Fuel - Fixed	$0.00
Fuel - Variable	$0.00
Emissions	$0.00
Subtotal busbar cost	$0.00
Transmission & Integration - Fixed (direct, ex. losses)	$0.00
Transmission & Integration - Variable (direct, ex. losses)	$0.00
Cost of losses	$0.00
Gross revenue tax	$0.00
Net delivered cost	$0.00
Year 2016 Levelized Cost in Nominal $/MWh:	
Capital	$0.00
Fixed O&M incl property tax & insurance	$0.00
Variable O & M	$0.00
Fuel - Fixed	$0.00
Fuel - Variable	$0.00
Emissions	$0.00
Subtotal busbar cost	$0.00
Transmission & Integration - Fixed (direct, ex. losses)	$0.00
Transmission & Integration - Variable (direct, ex. losses)	$0.00
Cost of losses	$0.00
Gross revenue tax	$0.00
Net delivered cost	$0.00
Levelized Fixed Cost in 2012 $/kW/yr:	
Capital	$0.00
Property tax & insurance	$0.00
Other fixed O&M	$0.00
Fuel - Fixed	$0.00
Subtotal busbar fixed costs	$0.00
Transmission & Integration - Fixed (direct, ex. losses)	$0.00
Cost of Losses (cost of derating)	$0.00
Gross Revenue Tax	$0.00

OPERATING PERIOD REVENUE REQUIREMENTS, 1000$ Nominal (except as indicated)

	Book and Assessed Values					Debt and Equity Recovery and Service				Income Taxes							
Year	Debt Balance	Equity Balance	Book Value	Book Depreciation	Assessed Value	Debt Interest	Debt Repayment	Equity Return	Equity Repayment	Tax Depreciation	Renewable Production Tax Credit	Deferred Fed Tax	Deferred State Tax	Federal Tax	State Tax	O & M Fixed	O & M Variable
2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2037	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2038	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2039	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2040	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2041	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2042	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2043	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2044	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2045	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2046	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2047	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2048	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2049	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2050	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2051	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2052	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2053	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2054	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2055	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2056	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2057	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2058	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2059	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2060	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2061	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2062	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2063	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2064	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2065	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2066	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2067	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2068	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2069	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2016 Present Value, (BOY)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Real Levelized Cost (2012 $/MWh)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Real Levelized Fixed Cost (2012 $/kW/yr)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00					
2016 Nominal Levelized Cost ($/MWh)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00					

*

	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL
1													
2													
3													
4													
5													
6													
7													
8													
9	Expensed Costs					Miscellaneous Costs				Sums & Special Model Inputs			
10								Cost		Revenue	Revenue	FXOM	Variable Fuel
11	Fuel	Fuel	T&I	T&I	Emissions	Property	Insurance	of	Gross	Requirement	Requirement	w/PTax & Ins	(Real)
12	Fixed	Variable	Fixed	Variable		Tax		Losses	Revenue Tax	($x1000)	($/MWh)	Nominal	($/MWh)
13	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
14	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
15	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
16	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
17	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
18	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
19	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
20	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
21	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
22	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
23	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
24	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
25	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
26	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
27	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
28	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
29	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
30	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
31	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
32	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
33	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
34	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
35	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
36	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
37	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
38	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
39	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
40	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
41	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
42	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
43	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
44	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
45	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
46	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
47	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
48	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
49	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
50	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
51	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
52	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
53	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
54	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
55	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
56	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
57	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
58	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
59	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
60	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
61	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
62	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
63	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
64	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
65	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
66	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
67	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!
68													
69	0	0	0	0	0	0	0	2016 NPV Fixed O&M w/Ptax & Ins				$0	
70	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00						
71	$0.00		$0.00			$0.00	$0.00	Fixed O&M, w/Ptax, Ins (2012 $/kW/yr)				$0.00	
72	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	Fixed O&M, w/Ptax, Ins (2012 $/MW-wk)				$0	
73													
74													
75													
76													
77													

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
78	Total					$0.00																			
79																									
80	**Miscellaneous Values**																								
81	Ratebase at Initial Service (price year dollars $1000)					$0																			
82	Ratebase at Initial Service (nominal. $1000)					$0																			
83	Annual Delivered Energy (MWh)					0																			
84	AFUDC Fraction (Price year dollars)					#DIV/0!																			
85	AFUDC Fraction (Nominal)					#DIV/0!																			
86	Levelized FCR (price year dollars inc. property tax & insurance) (%)					#DIV/0!																			
87	Levelized FCR (nominal inc. property tax & insurance) (%)					#DIV/0!																			
88	Interest on Debt (real, %)					5.4%																			
89	Return on Equity (real, %)					8.4%																			
90	Weighted Cost of Capital (real, %)					6.9%																			
91	Weighted Cost of Capital (nominal, %)					8.7%																			
92	Total construction payout (As-expended $/kW)					$0																			
93	AFUDC ($/kW)					$0																			
94	All-in capital cost, busbar (2012 $/kW)					$0																			
95	All-in capital cost, busbar, as expended (nominal) ($/kW)					$0																			
96																									
97																									
98																									

	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL
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MicroFin Version 15.0.1

INDEPENDENT POWER PRODUCER

(Refinance on completion of construction)

Advanced Combined-cycle

CALCULATION OF TOTAL PLANT INVESTMENT AT COMPLETION OF CONSTRUCTION

							Development Financing				Construction Financing			
Year		Phase	Debt Fraction	Debt Interest	Equity Return	Cash Flow	Annual Payout	Accrued Payout	Annual IDC	Accrued Investment	Annual Payout	Accrued Payout	Annual IDC	Accrued Investment
Nominal ($1000)														
2011		Development	0.0%	0.0%	13.7%	1.0%	0	0	0	0	0	0	0	0
2012		Development	0.0%	0.0%	13.7%	2.0%	0	0	0	0	0	0	0	0
2013		Construction	60.0%	5.8%	13.7%	16.0%	0	0	0	0	0	0	0	0
2014		Construction	60.0%	5.8%	13.7%	55.0%	0	0	0	0	0	0	0	0
2015		Construction	60.0%	5.8%	13.7%	26.0%	0	0	0	0	0	0	0	0
2016		Long-term				0.0%	0	0	0	0	0	0	0	0
2017		Long-term				0.0%	0	0	0	0	0	0	0	0
2018		Long-term				0.0%	0	0	0	0	0	0	0	0
2019		Long-term				0.0%	0	0	0	0	0	0	0	0
2020		Long-term				0.0%	0	0	0	0	0	0	0	0
Totals (excluding fee on long-term debt - calculated at H10):											0		0	0
Price Year ($1000)														
2011		Development	0.0%	-1.6%	11.9%	1.0%	0	0	0	0	0	0	0	0
2012		Development	0.0%	-1.6%	11.9%	2.0%	0	0	0	0	0	0	0	0
2013		Construction	60.0%	4.1%	11.9%	16.0%	0	0	0	0	0	0	0	0
2014		Construction	60.0%	4.1%	11.9%	55.0%	0	0	0	0	0	0	0	0
2015		Construction	60.0%	4.1%	11.9%	26.0%	0	0	0	0	0	0	0	0
2016		Long-term				0.0%	0	0	0	0	0	0	0	0
2017		Long-term				0.0%	0	0	0	0	0	0	0	0
2018		Long-term				0.0%	0	0	0	0	0	0	0	0
2019		Long-term				0.0%	0	0	0	0	0	0	0	0
2020		Long-term				0.0%	0	0	0	0	0	0	0	0
Totals (excluding fee on long-term debt):							0				0		0	0

RESULTS

Year 2016 Levelized Cost in 2012 $/MWh:

Capital	$0.00
Fixed O&M incl property tax & insurance	$0.00
Variable O & M	$0.00
Fuel - Fixed	$0.00
Fuel - Variable	$0.00
Emissions	$0.00
Subtotal busbar cost	$0.00
Transmission & Integration - Fixed (direct, ex. losses)	$0.00
Transmission & Integration - Variable (direct, ex. losses)	$0.00
Cost of losses	$0.00
Gross revenue tax	$0.00
Net delivered cost	$0.00

Year 2016 Levelized Cost in Nominal $/MWh:

Capital	$0.00
Fixed O&M incl property tax & insurance	$0.00
Variable O & M	$0.00
Fuel - Fixed	$0.00
Fuel - Variable	$0.00
Emissions	$0.00
Subtotal busbar cost	$0.00

OPERATING PERIOD REVENUE REQUIREMENTS, 1000$ Nominal (except as indicated)

		Book and Assessed Values					Debt and Equity Recovery and Service			
Year	Energy (MWh)	Debt Balance	Equity Balance	Book Value	Book Depreciation	Assessed Value	Debt Interest	Debt Repayment	Equity Return	Equity Repayment
2015	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0
2036	0	0	0	0	0	0	0	0	0	0
2037	0	0	0	0	0	0	0	0	0	0
2038	0	0	0	0	0	0	0	0	0	0
2039	0	0	0	0	0	0	0	0	0	0
2040	0	0	0	0	0	0	0	0	0	0
2041	0	0	0	0	0	0	0	0	0	0
2042	0	0	0	0	0	0	0	0	0	0
2043	0	0	0	0	0	0	0	0	0	0
2044	0	0	0	0	0	0	0	0	0	0
2045	0	0	0	0	0	0	0	0	0	0
2046	0	0	0	0	0	0	0	0	0	0
2047	0	0	0	0	0	0	0	0	0	0
2048	0	0	0	0	0	0	0	0	0	0
2049	0	0	0	0	0	0	0	0	0	0
2050	0	0	0	0	0	0	0	0	0	0
2051	0	0	0	0	0	0	0	0	0	0
2052	0	0	0	0	0	0	0	0	0	0
2053	0	0	0	0	0	0	0	0	0	0
2054	0	0	0	0	0	0	0	0	0	0
2055	0	0	0	0	0	0	0	0	0	0
2056	0	0	0	0	0	0	0	0	0	0
2057	0	0	0	0	0	0	0	0	0	0
2058	0	0	0	0	0	0	0	0	0	0
2059	0	0	0	0	0	0	0	0	0	0
2060	0	0	0	0	0	0	0	0	0	0
2061	0	0	0	0	0	0	0	0	0	0
2062	0	0	0	0	0	0	0	0	0	0
2063	0	0	0	0	0	0	0	0	0	0
2064	0	0	0	0	0	0	0	0	0	0

	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX
1																							
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9	Income Taxes				Expensed Costs							Miscellaneous Costs				Sums & Special Model Inputs							
10		Renewable												Cost		Revenue	Revenue	FXOM	Variable Fuel				
11	Tax	Production	Federal	State	O & M	O & M	Fuel	Fuel	T&I	T&I		Property		of	Gross	Requirement	Requirement	w/PTax & Ins	(Real)				
12	Depreciation	Tax Credit	Tax	Tax	Fixed	Variable	Fixed	Variable	Fixed	Variable	Emissions	Tax	Insurance	Losses	Revenue Tax	($x1000)	($/MWh)	Nominal	($/MWh)		Dispatch Cost ($/MWh)		
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!		#DIV/0!	#DIV/0!	
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
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61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
63	Transmission & Integration - Fixed (direct, ex. losses)					$0.00											2065	0	0	0	0	0	0	0	0	0	0
64	Transmission & Integration - Variable (direct, ex. losses)					$0.00											2066	0	0	0	0	0	0	0	0	0	0
65	Cost of losses					$0.00											2067	0	0	0	0	0	0	0	0	0	0
66	Gross revenue tax					$0.00											2068	0	0	0	0	0	0	0	0	0	0
67	Net delivered cost					$0.00											2069	0	0	0	0	0	0	0	0	0	0
68																											
69	Levelized Fixed Cost in 2012 $/kW/yr:																2016 Present Value, (BOY)							0	0	0	0
70	Capital					$0.00											Real Levelized Cost (2012 $/MWh)							$0.00	$0.00	$0.00	$0.00
71	Property tax & insurance					$0.00											Real Levelized Fixed Cost (2012 $/kW/yr)							$0.00	$0.00	$0.00	$0.00
72	Other fixed O&M					$0.00											2016 Nominal Levelized Cost ($/MWh)							$0.00	$0.00	$0.00	$0.00
73	Fuel - Fixed					$0.00																					
74	Subtotal busbar fixed costs					$0.00																					
75	Transmission & Integration - Fixed (direct, ex. losses)					$0.00																					
76	Cost of Losses (cost of derating)					$0.00																					
77	Gross Revenue Tax					$0.00																					
78	Total					$0.00																					
79																											
80	**Miscellaneous Values**																										
81	Total Plant Investment, Initial Service ($1000)					$0																					
82	Annual Delivered Energy (MWh)					0																					
83	Levelized FCR (inc. property tax & insurance) (real %)					#DIV/0!																					
84	Levelized FCR (inc. property tax & insurance) (nominal %)					#DIV/0!																					
85	Weighted Cost of Capital, Development (real, %)					11.9%																					
86	Weighted Cost of Capital, Development (nominal, %)					13.7%																					
87	Weighted Cost of Capital, Construction (real, %)					7.2%																					
88	Weighted Cost of Capital, Construction (nominal, %)					9.0%																					
89	Weighted Cost of Capital, Long-term (real, %)					8.0%																					
90	Weighted Cost of Capital, Long-term (nominal, %)					9.7%																					
91	All-in capital cost, (2012 $/kW)					$0																					
92	All-in capital cost, busbar, as expended (nominal) ($/kW)					$0																					
93																											

	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX
63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!	0	#DIV/0!				
68																							
69			0	0	0	0	0	0	0	0	0	0	0	2016 NPV Fixed O&M w/Ptax & Ins				$0					
70			$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00										
71			$0.00	$0.00	$0.00		$0.00		$0.00			$0.00	$0.00	Fixed O&M, w/Ptax, Ins (2012 $/kW/yr)				$0.00					
72			$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	Fixed O&M, w/Ptax, Ins (2012 $/MW-wk)				$0					
73																							
74																							
75																$0.00							
76																$0.00							
77																							
78																							
79																							
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FY	Total O&M, Fuel and Capital	Fuel Inventory Liquidation	SUM
FY13	368.479	0	368.479
FY14	380.0495237	0	380.0495
FY15	67.058685	-36.05307925	31.00561
FY16	46.01179181	-55.72693194	-9.71514
FY17	43.03211252	-81.667646	-38.6355
FY18	44.53823646	-52.731218	-8.19298
FY19	46.09707474	-65.080784	-18.9837
FY20	31.80698157	-60.14916704	-28.3422
FY21	19.75213555	0	19.75214
FY22	13.62897353	0	13.62897
FY23	0	-97.72726043	-97.7273
FY24	0	-75.20204806	-75.202
FY25	0	0	0
FY26	0	0	0

FY	Total O&M, Fuel and Capital	Fuel Inventory Liquidation	SUM
FY13	368.479	0	368.479
FY14	380.0495237	0	380.0495
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FY22	13.62897353	0	13.62897
FY23	0	-97.72726043	-97.7273
FY24	0	-75.20204806	-75.202
FY25	0	0	0
FY26	0	0	0