

GRAND HAVEN BOARD OF LIGHT AND POWER

RENEWABLE ENERGY PLAN U-16613

NOVEMBER 2017

- Based on this Renewable Energy Plan (REP) the Grand Haven Board of Light & Power (City) will have the required Renewable Energy Credits (RECs) for the REP time period of 2017-2029 thereby complying with PA 342.
- The primary source of RECs is participation in the Michigan Public Power Agency (MPPA) Granger, North American Natural Resources (NANR), Beebe 1b, and Pegasus Projects. These projects will utilize landfill gas and wind for electric power generation from a variety of locations in Michigan and possibly in neighboring states.
- The City will have excess RECs to sell during various time periods throughout the REP planning period. Selling of RECs represents a source of income to the City which will reduce overall power supply costs. The cost per REC will be determined to a large extent by market forces once the Michigan REC market is designed and implemented. This REP assumes the sale of some of the excess RECs keeping the balance in reserve.
- The City generally produces enough energy through their coal plant to supply their needs and therefore rarely needs to purchase energy. This leads to calculating an incremental cost based on the operating cost of their coal plant plus the forecasted cost of capacity.
- The City will not exceed the renewable energy surcharge caps specified in PA 342.
- The City will comply with Section 45 of PA 342 which refers to methods of notification to customers charges, if any, for costs associated with its REP.

GRAND HAVEN

2017 RENEWABLE ENERGY PLAN SUMMARY

Row #		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
1	Sales and Requirement Calculation														
2	Method: Weather Normalized of 3 Year Average		Same as 2015	Same as 2015	3 Year Average	3 Year Average	3 Year Average	3 Year Average	3 Year Average	3 Year Average	3 Year Average	3 Year Average	3 Year Average	3 Year Average	3 Year Average
3	If Selected Weather Normalized:														
4	Current Year Sales to Retail Customers														
5	Current Year Weather Normalization Factor														
6	Current Year Weather Normalized Sales (Row # 4 * 5)														
7	If Selected 3 Year Average:														
8	Current Year Retail Sales to Retail Customers	300,586	299,868	311,179	316,895	320,643	323,697	326,502	329,204	331,859	334,483	337,080	339,639	342,159	344,635
9	3 Year Average of Retail Sales				303,878	309,314	316,239	320,412	323,614	326,468	329,188	331,849	334,474	337,067	339,626
10	RPS Required Energy Credits (for 2017 and 2018 enter the same amount as 2015 requirement in MIRECS, for 2019 and 2020 enter 12.5% of row 6 or 9, for 2021 enter 15% of row 6 or 9)		28,481	28,481	37,985	38,664	47,436	48,062	48,542	48,970	49,378	49,777	50,171	50,560	50,944
11	Energy Credits														
12	Energy Credit Beginning Balance		17,335	14,716	20,738	26,201	22,772	18,717	14,182	9,323	3,951	(1,819)	(7,983)	(14,416)	(21,353)
13	Energy Credits Obtained Through Generation/BOT		-	-	-	-	-	-	-	-	-	-	-	-	-
14	Energy Credits Obtained Through PPA		25,674	25,862	44,007	44,127	44,007	44,007	44,007	44,111	44,007	44,007	44,007	44,127	44,007
15	Energy Credits Obtained Through REC Purchases		-	-	-	-	-	-	-	-	-	-	-	-	-
16	Plus: Energy Credits Obtained (Row 13 + 14 + 15)		25,674	25,862	44,007	44,127	44,007	44,007	44,007	44,111	44,007	44,007	44,007	44,127	44,007
17	Less: Energy Credits Sold		-	-	-	-	-	-	-	-	-	-	-	-	-
18	Available Energy Credits (Row 12 + 16 - 17)		43,009	40,578	64,745	70,328	66,779	62,724	58,188	53,433	47,958	42,188	36,024	29,711	22,654
19	Compliance Requirement (Row 10)		28,481	28,481	37,985	38,664	47,436	48,062	48,542	48,970	49,378	49,777	50,171	50,560	50,944
20	Less: Energy Credit Expiration		0	0	0	0	0	0	0	0	0	0	0	0	0
21	Energy Credit Ending Balance (Row 18 - 19 - 20)		14,528	12,097	26,760	31,664	19,343	14,662	9,646	4,463	(1,420)	(7,589)	(14,147)	(20,849)	(28,290)
22	Revenue Requirement														
23	Cost of Renewable Energy Generation/BOT		0	0	0	0	0	0	0	0	0	0	0	0	0
24	Cost of Renewable Energy PPA		\$ 2,243,950	\$ 2,332,717	\$ 3,189,526	\$ 3,270,164	\$ 3,334,800	\$ 3,409,950	\$ 3,486,777	\$ 3,575,212	\$ 3,645,983	\$ 3,728,369	\$ 3,812,700	\$ 3,909,825	\$ 3,987,479
25	Cost of Renewable Energy Credit Purchases		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
26	Costs of Administration of Renewable Energy Plan		\$ 14,888.53	\$ 14,888.53	\$ 14,888.53	\$ 14,888.53	\$ 14,888.53	\$ 14,888.53	\$ 14,888.53	\$ 14,888.53	\$ 14,888.53	\$ 14,888.53	\$ 14,888.53	\$ 14,888.53	\$ 14,888.53
27	Less: Revenue obtained from Renewable Energy Sales (non-retail)		0	0	0	0	0	0	0	0	0	0	0	0	0
28	Total Revenue Requirement for Renewable Energy Plan (Row 23 + 24 + 25 + 26 - 27)		\$ 2,258,838	\$ 2,347,606	\$ 3,204,415	\$ 3,285,052	\$ 3,349,688	\$ 3,424,838	\$ 3,501,666	\$ 3,590,100	\$ 3,660,872	\$ 3,743,257	\$ 3,827,588	\$ 3,924,714	\$ 4,002,367
29	Cost Recovery														
30	Forecasted Transfer Price per MWH		\$ 93.36	\$ 96.25	\$ 89.20	\$ 91.76	\$ 94.71	\$ 110.22	\$ 102.48	\$ 106.65	\$ 108.68	\$ 111.75	\$ 115.46	\$ 120.69	\$ 124.79
31	MWH of Renewable Energy		25,674	25,862	44,007	44,127	44,007	44,007	44,007	44,127	44,007	44,007	44,007	44,127	44,007
32	Amount Recovered Through the PSCR (Row 30 * 31)		\$ 2,397,071	\$ 2,489,333	\$ 3,925,432	\$ 4,048,994	\$ 4,167,925	\$ 4,850,352	\$ 4,509,906	\$ 4,706,271	\$ 4,782,531	\$ 4,917,597	\$ 5,081,080	\$ 5,325,553	\$ 5,491,474
33	Incremental Cost of Compliance (Row 28 - 32)		\$ (138,232)	\$ (141,728)	\$ (721,017)	\$ (763,941)	\$ (818,236)	\$ (1,425,514)	\$ (1,008,240)	\$ (1,116,170)	\$ (1,121,659)	\$ (1,174,339)	\$ (1,253,492)	\$ (1,400,839)	\$ (1,489,107)
34	Non-Volumetric Surcharge Meter (or customer) Forecast														
35	Residential		12,171	12,630	12,862	13,014	13,138	13,252	13,362	13,470	13,576	13,681	13,785	13,888	13,988
36	Secondary		1,797	1,865	1,899	1,921	1,940	1,956	1,973	1,988	2,004	2,020	2,035	2,050	2,065
37	Primary		144	150	153	154	156	157	159	160	161	162	164	165	166
38	Total (Row 35 + 36 + 37)		14,112	14,645	14,914	15,090	15,234	15,366	15,493	15,618	15,741	15,863	15,984	16,103	16,219
39	Planned Surcharge Revenue														
40	Residential		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
41	Secondary		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
42	Primary		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
43	Total (Row 40 + 41 + 42)		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
44	Year End Regulatory Liability Balance														
45	Current Year Regulatory Liability Balance (Row 43 - 33)		\$ 138,232.38	\$ 141,727.65	\$ 721,017.35	\$ 763,941.30	\$ 818,236.48	\$ 1,425,514.10	\$ 1,008,240.43	\$ 1,116,170.37	\$ 1,121,659.18	\$ 1,174,339.37	\$ 1,253,491.55	\$ 1,400,838.75	\$ 1,489,107.28
46	Forecasted Ending Balance Prior to Current Year Interest (Row 48 for prior year + Row 45 of current year)		\$ 455,737.73	\$ 314,465.82	\$ (406,237.06)	\$ (1,170,584.60)	\$ (1,989,991.66)	\$ (3,417,495.75)	\$ (4,429,153.68)	\$ (5,549,753.20)	\$ (6,676,962.13)	\$ (7,857,978.47)	\$ (9,119,328.00)	\$ (10,529,286.08)	\$ (12,028,922.65)
47	Carrying Charges (short-term interest)		\$ 455.74	\$ 314.47	\$ (406.24)	\$ (1,170.58)	\$ (1,989.99)	\$ (3,417.50)	\$ (4,429.15)	\$ (5,549.75)	\$ (6,676.96)	\$ (7,857.98)	\$ (9,119.33)	\$ (10,529.29)	\$ (12,028.92)
48	Total Balance (Row 46 + 47)		\$ 593,970.12	\$ 456,193.47	\$ 314,780.28	\$ (406,643.30)	\$ (1,171,755.18)	\$ (1,991,981.65)	\$ (3,420,913.24)	\$ (4,433,582.83)	\$ (5,555,302.96)	\$ (6,683,639.09)	\$ (7,865,836.45)	\$ (9,128,447.33)	\$ (10,539,815.37)

GRAND HAVEN

2017 RENEWABLE ENERGY CREDIT SUMMARY

	2017		2018		2019		2020		2021		2022		2023		2024		2025		2026		2027		2028		2029			
	RECs	Percent	RECs	Percent	RECs	Percent	RECs	Percent	RECs	Percent	RECs	Percent	RECs	Percent	RECs	Percent	RECs	Percent	RECs	Percent	RECs	Percent	RECs	Percent	RECs	Percent		
Technology Mix																												
Wind	6,271	24.43%	5,992	23.17%	24,137	54.85%	24,203	54.85%	24,137	54.85%	24,137	54.85%	24,137	54.85%	24,186	54.83%	24,137	54.85%	24,137	54.85%	24,137	54.85%	24,203	54.85%	24,137	54.85%		
Solar	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Biomass	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Steam	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Geothermal	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Municipal Solid Waste	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Landfill Gas	19,403	75.57%	19,870	76.83%	19,870	45.15%	19,925	45.15%	19,870	45.15%	19,870	45.15%	19,870	45.15%	19,925	45.17%	19,870	45.15%	19,870	45.15%	19,870	45.15%	19,925	45.15%	19,870	45.15%		
Hydroelectric	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Incentive	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Other	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Totals	25,674	100.00%	25,862	100.00%	44,007	100.00%	44,127	100.00%	44,007	100.00%	44,007	100.00%	44,007	100.00%	44,111	100.00%	44,007	100.00%	44,007	100.00%	44,007	100.00%	44,127	100.00%	44,007	100.00%		
Program Type																												
PURPA																												
Net Metering																												
Feed-In Tariffs																												
Community Solar																												
Other	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	PPA	
Total																												

*RECs generated and obtained during the year less RECs sold or expired.

GRAND HAVEN

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Used for Compliance in...

LFG Entitlement	16.26%
Beebe 1b Entitlement	7.31%
Pegasus Wind Entitlement	9.67%

Baseline RECs	2012	2013	2014	2015	2016
-	5,347	9,074	13,953	28,481	28,481

Total Credits		Yearly Addition		Required		Current Surplus (Deficiency)		Year-End Surplus (Deficiency)		Expired or Sold	
2012	13,473	2012	13,473	2012	5,347	2012	-	2012	8,126	2012	-
2013	31,881	2013	18,408	2013	9,074	2013	-	2013	17,460	2013	-
2014	52,150	2014	20,269	2014	13,953	2014	-	2014	23,776	2014	-
2015	78,862	2015	26,712	2015	28,481	2015	28,656	2015	22,007	2015	-
2016	105,478	2016	26,616	2016	28,481	2016	-	2016	20,142	2016	-
2017	131,152	2017	25,674	2017	28,481	2017	-	2017	17,335	2017	-
2018	157,014	2018	25,862	2018	28,481	2018	-	2018	14,716	2018	-
2019	201,021	2019	44,007	2019	37,985	2019	-	2019	20,738	2019	-
2020	245,148	2020	44,127	2020	38,664	2020	-	2020	26,201	2020	-
2021	289,155	2021	44,007	2021	47,436	2021	-	2021	22,772	2021	-
2022	333,162	2022	44,007	2022	48,062	2022	-	2022	18,717	2022	-
2023	377,169	2023	44,007	2023	48,542	2023	-	2023	14,182	2023	-
2024	421,280	2024	44,111	2024	48,970	2024	-	2024	9,323	2024	-
2025	465,286	2025	44,007	2025	49,378	2025	-	2025	3,951	2025	-
2026	509,293	2026	44,007	2026	49,777	2026	-	2026	(1,819)	2026	-
2027	553,300	2027	44,007	2027	50,171	2027	-	2027	(7,983)	2027	-
2028	597,427	2028	44,127	2028	50,560	2028	-	2028	(14,416)	2028	-
2029	641,434	2029	44,007	2029	50,944	2029	-	2029	(21,353)	2029	-

2016	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Total	
3-Year Avg Sales													284,808	
Baseline RECs													-	
Required REC's													28,481	
Brent Run #1	184	156	99	94	99	91	82	92	88	91	89	92	1,257	
iRECs	15	15	10	9	9	9	6	9	8	8	8	9	115	
Brent Run West	71	63	70	67	67	68	70	66	68	69	64	70	813	
iRECs	6	5	7	6	6	6	6	6	7	6	6	6	73	
Brent Run #3	336	326	453	435	447	424	432	425	355	409	502	538	5,082	
iRECs	29	30	45	40	40	42	36	42	32	38	45	48	467	
Grand Blanc	408	387	418	418	438	402	438	444	412	427	426	433	5,051	
iRECs	34	37	41	39	39	39	37	43	38	38	38	40	463	
Orchard Hills	344	331	341	316	326	296	310	319	294	340	348	360	3,925	
iRECs	62	54	34	29	29	28	26	30	28	30	32	32	414	
Venice Park	190	176	180	177	176	169	181	190	220	182	171	179	2,191	
iRECs	17	17	18	17	16	16	16	18	21	16	16	16	204	
Beebe 1b	761	709	555	473	479	421	373	239	477	503	701	870	6,561	
Current Vintage	2,457	2,306	2,271	2,120	2,171	2,011	2,013	1,923	2,048	2,157	2,446	2,693	26,616	
Used for Compliance in 2016	2,457	2,306	1,711											6,474
Expired/Sold RECs													-	
Current Surplus			560	2,120	2,171	2,011	2,013	1,923	2,048	2,157	2,446	2,693	20,142	

2017	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Total
3-Year Avg Sales													284,808
Baseline RECs													-
Required REC's													28,481
Brent Run #1	94	82	93	89	91	91	91	89	90	92	89	92	1,086
Brent Run West	69	62	64	67	70	58	70	68	69	68	66	68	800
Brent Run #3	538	468	518	496	527	509	499	490	493	515	498	515	6,065
Grand Blanc	329	377	423	441	445	432	382	376	376	436	421	436	4,873
Orchard Hills	357	318	354	333	350	334	358	344	312	348	337	348	4,093
Venice Park	178	168	197	236	359	174	169	184	194	211	204	211	2,486
Beebe 1b	540	708	685	702	662	571	296	295	300	509	492	509	6,271
Current Vintage	2,107	2,183	2,334	2,364	2,504	2,169	1,865	1,847	1,834	2,179	2,109	2,179	25,674
Expired/Sold RECs													-

2018	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Total
3-Year Avg Sales													284,808
Baseline RECs													-
Required REC's													28,481
Brent Run #1	87	79	87	84	87	84	87	87	84	87	84	87	1,026
Brent Run West	65	59	65	63	65	63	65	65	63	65	63	65	769
Brent Run #3	523	472	523	506	523	506	523	523	506	523	506	523	6,153
Grand Blanc	436	393	436	421	436	421	436	436	421	436	421	436	5,128
Orchard Hills	348	315	348	337	348	337	348	348	337	348	337	348	4,102
Venice Park	229	207	229	221	229	221	229	229	221	229	221	229	2,692
Beebe 1b	509	460	509	492	509	492	509	509	492	509	492	509	5,992
Pegasus Wind	-	-	-	-	-	-	-	-	-	-	-	-	-
Current Vintage	2,197	1,984	2,197	2,126	2,197	2,126	2,197	2,197	2,126	2,197	2,126	2,197	25,862
Expired/Sold RECs													-

2019	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Total
3-Year Avg Sales													303,878
Baseline RECs													-

Required REC's												37,985	
Brent Run #1	87	79	87	84	87	84	87	87	84	87	84	87	1,026
Brent Run West	65	59	65	63	65	63	65	65	63	65	63	65	769
Brent Run #3	523	472	523	506	523	506	523	523	506	523	506	523	6,153
Grand Blanc	436	393	436	421	436	421	436	436	421	436	421	436	5,128
Orchard Hills	348	315	348	337	348	337	348	348	337	348	337	348	4,102
Venice Park	229	207	229	221	229	221	229	229	221	229	221	229	2,692
Beebe 1b	509	460	509	492	509	492	509	509	492	509	492	509	5,992
Pegasus Wind	1,541	1,392	1,541	1,491	1,541	1,491	1,541	1,541	1,491	1,541	1,491	1,541	18,145
Current Vintage	3,738	3,376	3,738	3,617	3,738	3,617	3,738	3,738	3,617	3,738	3,617	3,738	44,007
Expired/Sold RECs	-	-	-	-	-	-	-	-	-	-	-	-	-

2020	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Total
3-Year Avg Sales													309,314
Baseline RECs													-
Required REC's													38,664
Brent Run #1	87	81	87	84	87	84	87	87	84	87	84	87	1,028
Brent Run West	65	61	65	63	65	63	65	65	63	65	63	65	771
Brent Run #3	523	489	523	506	523	506	523	523	506	523	506	523	6,170
Grand Blanc	436	407	436	421	436	421	436	436	421	436	421	436	5,142
Orchard Hills	348	326	348	337	348	337	348	348	337	348	337	348	4,113
Venice Park	229	214	229	221	229	221	229	229	221	229	221	229	2,699
Beebe 1b	509	476	509	492	509	492	509	509	492	509	492	509	6,008
Pegasus Wind	1,541	1,442	1,541	1,491	1,541	1,491	1,541	1,541	1,491	1,541	1,491	1,541	18,194
Current Vintage	3,738	3,496	3,738	3,617	3,738	3,617	3,738	3,738	3,617	3,738	3,617	3,738	44,127
Expired/Sold RECs	-	-	-	-	-	-	-	-	-	-	-	-	-

2021	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Total
3-Year Avg Sales													316,239
Baseline RECs													-
Required REC's													47,436
Brent Run #1	87	79	87	84	87	84	87	87	84	87	84	87	1,026
Brent Run West	65	59	65	63	65	63	65	65	63	65	63	65	769
Brent Run #3	523	472	523	506	523	506	523	523	506	523	506	523	6,153
Grand Blanc	436	393	436	421	436	421	436	436	421	436	421	436	5,128
Orchard Hills	348	315	348	337	348	337	348	348	337	348	337	348	4,102
Venice Park	229	207	229	221	229	221	229	229	221	229	221	229	2,692
Beebe 1b	509	460	509	492	509	492	509	509	492	509	492	509	5,992
Pegasus Wind	1,541	1,392	1,541	1,491	1,541	1,491	1,541	1,541	1,491	1,541	1,491	1,541	18,145
Current Vintage	3,738	3,376	3,738	3,617	3,738	3,617	3,738	3,738	3,617	3,738	3,617	3,738	44,007
Expired/Sold RECs	-	-	-	-	-	-	-	-	-	-	-	-	-

2022	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Total
3-Year Avg Sales													320,412
Baseline RECs													-
Required REC's													48,062
Brent Run #1	87	79	87	84	87	84	87	87	84	87	84	87	1,026
Brent Run West	65	59	65	63	65	63	65	65	63	65	63	65	769
Brent Run #3	523	472	523	506	523	506	523	523	506	523	506	523	6,153
Grand Blanc	436	393	436	421	436	421	436	436	421	436	421	436	5,128
Orchard Hills	348	315	348	337	348	337	348	348	337	348	337	348	4,102
Venice Park	229	207	229	221	229	221	229	229	221	229	221	229	2,692
Beebe 1b	509	460	509	492	509	492	509	509	492	509	492	509	5,992
Pegasus Wind	1,541	1,392	1,541	1,491	1,541	1,491	1,541	1,541	1,491	1,541	1,491	1,541	18,145
Current Vintage	3,738	3,376	3,738	3,617	3,738	3,617	3,738	3,738	3,617	3,738	3,617	3,738	44,007
Expired/Sold RECs	-	-	-	-	-	-	-	-	-	-	-	-	-

2023	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Total
3-Year Avg Sales													323,614
Baseline RECs													-
Required REC's													48,542
Brent Run #1	87	79	87	84	87	84	87	87	84	87	84	87	1,026
Brent Run West	65	59	65	63	65	63	65	65	63	65	63	65	769
Brent Run #3	523	472	523	506	523	506	523	523	506	523	506	523	6,153
Grand Blanc	436	393	436	421	436	421	436	436	421	436	421	436	5,128
Orchard Hills	348	315	348	337	348	337	348	348	337	348	337	348	4,102
Venice Park	229	207	229	221	229	221	229	229	221	229	221	229	2,692
Beebe 1b	509	460	509	492	509	492	509	509	492	509	492	509	5,992
Pegasus Wind	1,541	1,392	1,541	1,491	1,541	1,491	1,541	1,541	1,491	1,541	1,491	1,541	18,145
Current Vintage	3,738	3,376	3,738	3,617	3,738	3,617	3,738	3,738	3,617	3,738	3,617	3,738	44,007
Expired/Sold RECs	-	-	-	-	-	-	-	-	-	-	-	-	-

2024	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Total
3-Year Avg Sales													326,468
Baseline RECs													-
Required REC's													48,970
Brent Run #1	87	81	87	84	87	84	87	87	84	87	84	87	1,028
Brent Run West	65	61	65	63	65	63	65	65	63	65	63	65	771
Brent Run #3	523	489	523	506	523	506	523	523	506	523	506	523	6,170
Grand Blanc	436	407	436	421	436	421	436	436	421	436	421	436	5,142
Orchard Hills	348	326	348	337	348	337	348	348	337	348	337	348	4,113
Venice Park	229	214	229	221	229	221	229	229	221	229	221	229	2,699
Beebe 1b	509	460	509	492	509	492	509	509	492	509	492	509	5,992
Pegasus Wind	1,541	1,442	1,541	1,491	1,541	1,491	1,541	1,541	1,491	1,541	1,491	1,541	18,194

Current Vintage	3,738	3,480	3,738	3,617	3,738	3,617	3,738	3,738	3,617	3,738	3,617	3,738	44,111
Expired/Sold RECs	-	-	-	-	-	-	-	-	-	-	-	-	-

2025	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25	Total
3-Year Avg Sales													329,188
Baseline RECs													-
Required REC's													49,378
Brent Run #1	87	79	87	84	87	84	87	87	84	87	84	87	1,026
Brent Run West	65	59	65	63	65	63	65	65	63	65	63	65	769
Brent Run #3	523	472	523	506	523	506	523	523	506	523	506	523	6,153
Grand Blanc	436	393	436	421	436	421	436	436	421	436	421	436	5,128
Orchard Hills	348	315	348	337	348	337	348	348	337	348	337	348	4,102
Venice Park	229	207	229	221	229	221	229	229	221	229	221	229	2,692
Beebe 1b	509	460	509	492	509	492	509	509	492	509	492	509	5,992
Pegasus Wind	1,541	1,392	1,541	1,491	1,541	1,491	1,541	1,541	1,491	1,541	1,491	1,541	18,145
Current Vintage	3,738	3,376	3,738	3,617	3,738	3,617	3,738	3,738	3,617	3,738	3,617	3,738	44,007
Expired/Sold RECs	-	-	-	-	-	-	-	-	-	-	-	-	-

2026	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Aug-26	Sep-26	Oct-26	Nov-26	Dec-26	Total
3-Year Avg Sales													331,849
Baseline RECs													-
Required REC's													49,777
Brent Run #1	87	79	87	84	87	84	87	87	84	87	84	87	1,026
Brent Run West	65	59	65	63	65	63	65	65	63	65	63	65	769
Brent Run #3	523	472	523	506	523	506	523	523	506	523	506	523	6,153
Grand Blanc	436	393	436	421	436	421	436	436	421	436	421	436	5,128
Orchard Hills	348	315	348	337	348	337	348	348	337	348	337	348	4,102
Venice Park	229	207	229	221	229	221	229	229	221	229	221	229	2,692
Beebe 1b	509	460	509	492	509	492	509	509	492	509	492	509	5,992
Pegasus Wind	1,541	1,392	1,541	1,491	1,541	1,491	1,541	1,541	1,491	1,541	1,491	1,541	18,145
Current Vintage	3,738	3,376	3,738	3,617	3,738	3,617	3,738	3,738	3,617	3,738	3,617	3,738	44,007
Expired/Sold RECs	-	-	-	-	-	-	-	-	-	-	-	-	-

2027	Jan-27	Feb-27	Mar-27	Apr-27	May-27	Jun-27	Jul-27	Aug-27	Sep-27	Oct-27	Nov-27	Dec-27	Total
3-Year Avg Sales													334,474
Baseline RECs													-
Required REC's													50,171
Brent Run #1	87	79	87	84	87	84	87	87	84	87	84	87	1,026
Brent Run West	65	59	65	63	65	63	65	65	63	65	63	65	769
Brent Run #3	523	472	523	506	523	506	523	523	506	523	506	523	6,153
Grand Blanc	436	393	436	421	436	421	436	436	421	436	421	436	5,128
Orchard Hills	348	315	348	337	348	337	348	348	337	348	337	348	4,102
Venice Park	229	207	229	221	229	221	229	229	221	229	221	229	2,692
Beebe 1b	509	460	509	492	509	492	509	509	492	509	492	509	5,992
Pegasus Wind	1,541	1,392	1,541	1,491	1,541	1,491	1,541	1,541	1,491	1,541	1,491	1,541	18,145
Current Vintage	3,738	3,376	3,738	3,617	3,738	3,617	3,738	3,738	3,617	3,738	3,617	3,738	44,007
Expired/Sold RECs	-	-	-	-	-	-	-	-	-	-	-	-	-

2028	Jan-28	Feb-28	Mar-28	Apr-28	May-28	Jun-28	Jul-28	Aug-28	Sep-28	Oct-28	Nov-28	Dec-28	Total
3-Year Avg Sales													337,067
Baseline RECs													-
Required REC's													50,560
Brent Run #1	87	81	87	84	87	84	87	87	84	87	84	87	1,028
Brent Run West	65	61	65	63	65	63	65	65	63	65	63	65	771
Brent Run #3	523	489	523	506	523	506	523	523	506	523	506	523	6,170
Grand Blanc	436	407	436	421	436	421	436	436	421	436	421	436	5,142
Orchard Hills	348	326	348	337	348	337	348	348	337	348	337	348	4,113
Venice Park	229	214	229	221	229	221	229	229	221	229	221	229	2,699
Beebe 1b	509	476	509	492	509	492	509	509	492	509	492	509	6,008
Pegasus Wind	1,541	1,442	1,541	1,491	1,541	1,491	1,541	1,541	1,491	1,541	1,491	1,541	18,194
Current Vintage	3,738	3,496	3,738	3,617	3,738	3,617	3,738	3,738	3,617	3,738	3,617	3,738	44,127
Expired/Sold RECs	-	-	-	-	-	-	-	-	-	-	-	-	-

2029	Jan-29	Feb-29	Mar-29	Apr-29	May-29	Jun-29	Jul-29	Aug-29	Sep-29	Oct-29	Nov-29	Dec-29	Total
3-Year Avg Sales													339,626
Baseline RECs													-
Required REC's													50,944
Brent Run #1	87	79	87	84	87	84	87	87	84	87	84	87	1,026
Brent Run West	65	59	65	63	65	63	65	65	63	65	63	65	769
Brent Run #3	523	472	523	506	523	506	523	523	506	523	506	523	6,153
Grand Blanc	436	393	436	421	436	421	436	436	421	436	421	436	5,128
Orchard Hills	348	315	348	337	348	337	348	348	337	348	337	348	4,102
Venice Park	229	207	229	221	229	221	229	229	221	229	221	229	2,692
Beebe 1b	509	460	509	492	509	492	509	509	492	509	492	509	5,992
Pegasus Wind	1,541	1,392	1,541	1,491	1,541	1,491	1,541	1,541	1,491	1,541	1,491	1,541	18,145
Current Vintage	3,738	3,376	3,738	3,617	3,738	3,617	3,738	3,738	3,617	3,738	3,617	3,738	44,007
Expired/Sold RECs	-	-	-	-	-	-	-	-	-	-	-	-	-

GRAND HAVEN

GRANGER (LFG)

			2016	2017	2018	2019	2020	2021	2022	2023	2024
CAPACITY FACTOR			0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
NET GENERATION	MWh	***	15,705	16,917	17,178	17,178	17,225	17,178	17,178	17,178	17,225
CAPACITY	MW	***	2.049	2.179	2.179	2.179	2.179	2.179	2.179	2.179	2.179
RENEWABLE ENERGY CREDITS											
BASE GENERATION	RECS		15,705	16,917	17,178	17,178	17,225	17,178	17,178	17,178	17,225
ON-PEAK & MICH INCENT RECS	RECS	***	2,057	1,812	1,837	1,632	1,636	1,632	1,632	1,632	1,636
TOTAL	RECS		17,762	18,729	19,015	18,810	18,861	18,810	18,810	18,810	18,861
FORECASTED TRANSFER PRICE PER MWH	\$/MWh		\$ 103.00	\$ 105.00	\$ 108.00	\$ 113.00	\$ 117.00	\$ 122.00	\$ 158.00	\$ 134.00	\$ 141.00
GRANGER UNIT COST	\$/ MWh		\$ 91.39	\$ 93.67	\$ 96.01	\$ 98.41	\$ 100.87	\$ 103.40	\$ 105.98	\$ 108.63	\$ 111.35
O & M	\$/ MWh										
ADMIN	\$/ MWh		\$ 0.82	\$ 0.84	\$ 0.86	\$ 0.89	\$ 0.91	\$ 0.93	\$ 0.95	\$ 0.98	\$ 1.00
WDS CHARGES	\$/ MWh		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
INCREMENTAL UNIT COST	\$/ REC		\$ 92.21	\$ 94.51	\$ 96.88	\$ 99.30	\$ 101.78	\$ 104.33	\$ 106.93	\$ 109.61	\$ 112.35
TOTAL INCREMENTAL COST	\$		\$ 1,448,168.81	\$ 1,598,919.29	\$ 1,664,162.10	\$ 1,705,766.15	\$ 1,753,200.47	\$ 1,792,120.57	\$ 1,836,923.58	\$ 1,882,846.67	\$ 1,935,205.28
WITH PILOT (PAYMENT IN LIEU OF TAXES)	\$	1.05	\$ 1,520,577.25	\$ 1,678,865.26	\$ 1,747,370.21	\$ 1,791,054.46	\$ 1,840,860.50	\$ 1,881,726.59	\$ 1,928,769.76	\$ 1,976,989.00	\$ 2,031,965.55
INTERCONNECTION COSTS	\$	***	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
WITH PILOT	\$	1.05	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
GRANGER ENERGY COST	\$		1,520,577	1,678,865	1,747,370	1,791,054	1,840,860	1,881,727	1,928,770	1,976,989	2,031,966
GRANGER INTERCONN COST	\$		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
GRANGER TOTAL COST	\$		\$ 1,520,577	\$ 1,678,865	\$ 1,747,370	\$ 1,791,054	\$ 1,840,860	\$ 1,881,727	\$ 1,928,770	\$ 1,976,989	\$ 2,031,966
GRANGER TOTAL COST	\$/ MWh		\$ 96.82	\$ 99.24	\$ 101.72	\$ 104.26	\$ 106.87	\$ 109.54	\$ 112.28	\$ 115.09	\$ 117.96

GRAND HAVEN

GRANGER (LFG)

			2025	2026	2027	2028	2029
CAPACITY FACTOR			0.79	0.79	0.79	0.79	0.79
NET GENERATION	MWh	***	17,178	17,178	17,178	17,225	17,178
CAPACITY	MW	***	2.179	2.179	2.179	2.179	2.179
RENEWABLE ENERGY CREDITS							
BASE GENERATION	RECS		17,178	17,178	17,178	17,225	17,178
ON-PEAK & HIGH INCENT RECS	RECS	***	1,632	1,632	1,632	1,636	1,632
TOTAL	RECS		18,810	18,810	18,810	18,861	18,810
FORECASTED TRANSFER PRICE PER MWH	\$/MWh		\$ 143.00	\$ 148.00	\$ 154.00	\$ 164.00	\$ 171.00
GRANGER UNIT COST	\$/ MWh		\$ 114.13	\$ 116.98	\$ 119.91	\$ 122.90	\$ 125.98
O & M	\$/ MWh						
ADMIN	\$/ MWh		\$ 1.03	\$ 1.05	\$ 1.08	\$ 1.11	\$ 1.13
WDS CHARGES	\$/ MWh		\$ -	\$ -	\$ -	\$ -	\$ -
INCREMENTAL UNIT COST	\$/ REC		\$ 115.16	\$ 118.03	\$ 120.99	\$ 124.01	\$ 127.11
TOTAL INCREMENTAL COST	\$		\$ 1,978,165.78	\$ 2,027,619.93	\$ 2,078,310.43	\$ 2,136,104.54	\$ 2,183,524.89
WITH PILOT (PAYMENT IN LIEU OF TAXES)	\$	1.05	\$ 2,077,074.07	\$ 2,129,000.92	\$ 2,182,225.95	\$ 2,242,909.76	\$ 2,292,701.14
INTERCONNECTION COSTS	\$	***	\$ -	\$ -	\$ -	\$ -	\$ -
WITH PILOT	\$	1.05	\$ -	\$ -	\$ -	\$ -	\$ -
GRANGER ENERGY COST	\$		2,077,074	2,129,001	2,182,226	2,242,910	2,292,701
GRANGER INTERCONN COST	\$		\$ -	\$ -	\$ -	\$ -	\$ -
GRANGER TOTAL COST	\$		\$ 2,077,074	\$ 2,129,001	\$ 2,182,226	\$ 2,242,910	\$ 2,292,701
GRANGER TOTAL COST	\$/ MWh		\$ 120.91	\$ 123.94	\$ 127.04	\$ 130.21	\$ 133.47

GRAND HAVEN

BEEBE 1B (WIND)

			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
NETGENERATION	MWh	***	6,551	6,271	5,992	5,992	6,008	5,992	5,992	5,992	6,008	5,992	5,992	5,992	6,008	5,992
CAPACITY	MW	***	2,280	2,280	2,280	2,280	2,280	2,280	2,280	2,280	2,280	2,280	2,280	2,280	2,280	2,280
RENEWABLE ENERGY CREDITS																
BASE GENERATION	RECS		6,551	6,271	5,992	5,992	6,008	5,992	5,992	5,992	6,008	5,992	5,992	5,992	6,008	5,992
ON-PEAK & MICH INCENT RECS	RECS	***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	RECS		6,551	6,271	5,992	5,992	6,008	5,992	5,992	5,992	6,008	5,992	5,992	5,992	6,008	5,992
FORECASTED TRANSFER PRICE PER MWH	\$/MWh		\$ 70.40	\$ 71.99	\$ 73.89	\$ 74.08	\$ 74.01	\$ 76.66	\$ 78.49	\$ 79.94	\$ 80.91	\$ 82.80	\$ 85.33	\$ 86.98	\$ 88.69	\$ 90.41
BEEBE 1B UNIT COST	\$/ MWh		\$ 47.12	\$ 48.30	\$ 49.51	\$ 50.74	\$ 52.01	\$ 53.31	\$ 54.65	\$ 56.01	\$ 57.41	\$ 58.85	\$ 60.32	\$ 61.83	\$ 63.37	\$ 64.96
O & M	\$/ MWh															
ADMIN	\$/ MWh		\$ 0.42	\$ 0.43	\$ 0.45	\$ 0.46	\$ 0.47	\$ 0.48	\$ 0.49	\$ 0.50	\$ 0.52	\$ 0.53	\$ 0.54	\$ 0.56	\$ 0.57	\$ 0.58
WDS CHARGES	\$/ MWh		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
INCREMENTAL UNIT COST	\$/ REC		\$ 47.54	\$ 48.73	\$ 49.96	\$ 51.20	\$ 52.48	\$ 53.79	\$ 55.14	\$ 56.51	\$ 57.93	\$ 59.38	\$ 60.86	\$ 62.39	\$ 63.94	\$ 65.54
TOTAL INCREMENTAL COST	\$		\$ 311,482	\$ 305,624	\$ 299,326	\$ 306,762	\$ 315,302	\$ 322,300	\$ 330,401	\$ 338,623	\$ 348,038	\$ 355,793	\$ 364,681	\$ 373,810	\$ 384,170	\$ 392,733
WITH PILOT (PAYMENT IN LIEU OF TAXES)	\$	1.05	\$ 327,056	\$ 320,905	\$ 314,292	\$ 322,100	\$ 331,067	\$ 338,415	\$ 346,921	\$ 355,555	\$ 365,440	\$ 373,583	\$ 382,915	\$ 392,500	\$ 403,378	\$ 412,370
INTERCONNECTION COSTS	\$	***	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
WITH PILOT	\$	1.05	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
BEEBE 1B ENERGY COST	\$		327,056	320,905	314,292	322,100	331,067	338,415	346,921	355,555	365,440	373,583	382,915	392,500	403,378	412,370
BEEBE 1B INTERCONNECTION COST	\$		-	-	-	-	-	-	-	-	-	-	-	-	-	-
BEEBE 1B TOTAL COST	\$		327,056	320,905	314,292	322,100	331,067	338,415	346,921	355,555	365,440	373,583	382,915	392,500	403,378	412,370
BEEBE 1B TOTAL COST	\$/ MWh		\$ 49.92	\$ 51.17	\$ 52.45	\$ 53.76	\$ 55.10	\$ 56.48	\$ 57.90	\$ 59.34	\$ 60.82	\$ 62.35	\$ 63.91	\$ 65.51	\$ 67.14	\$ 68.82

FOOTNOTES:

GENERAL NOTE:

BUILD / PPA: ALTHOUGH INTERCONNECTION COSTS MAY BE INCURRED AT SOME SITES, THE ASSETS ARE OWNED BY THE DEVELOPER AND NOT THE CITIES. THEREFORE, ALL COSTS AND RECS ARE ALLOCATED TO "PPA" RATHER THAN "BUILD."

GRAND HAVEN

PEGASUS (WIND)

			2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
NETGENERATION	MWh	***	-	18,145	18,194	18,145	18,145	18,145	18,194	18,145	18,145	18,145	18,194	18,145
CAPACITY	MW	***	6.092	6.092	6.092	6.092	6.092	6.092	6.092	6.092	6.092	6.092	6.092	6.092
RENEWABLE ENERGY CREDITS														
BASE GENERATION	RECS		-	18,145	18,194	18,145	18,145	18,145	18,194	18,145	18,145	18,145	18,194	18,145
ON-PEAK & MICH INCENT RECS	RECS	***	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	RECS		-	18,145	18,194	18,145	18,145	18,145	18,194	18,145	18,145	18,145	18,194	18,145
FORECASTED TRANSFER PRICE PER MWH	\$/MWh		\$ 74.18	\$ 73.97	\$ 76.04	\$ 77.15	\$ 79.58	\$ 82.61	\$ 85.22	\$ 87.02	\$ 88.46	\$ 90.72	\$ 92.77	\$ 94.88
PEGASUS UNIT COST	\$/ MWh		\$ 41.54	\$ 41.54	\$ 42.16	\$ 42.80	\$ 43.44	\$ 44.09	\$ 44.75	\$ 45.42	\$ 46.10	\$ 46.79	\$ 47.50	\$ 48.21
O & M	\$/ MWh													
ADMIN	\$/ MWh		\$ 0.37	\$ 0.37	\$ 0.38	\$ 0.39	\$ 0.39	\$ 0.40	\$ 0.40	\$ 0.41	\$ 0.41	\$ 0.42	\$ 0.43	\$ 0.43
WDS CHARGES	\$/ MWh		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
INCREMENTAL UNIT COST	\$/ REC		\$ 41.91	\$ 41.91	\$ 42.54	\$ 43.19	\$ 43.83	\$ 44.49	\$ 45.15	\$ 45.83	\$ 46.51	\$ 47.21	\$ 47.93	\$ 48.64
TOTAL INCREMENTAL COST	\$		\$ -	\$ 760,515	\$ 773,981	\$ 783,583	\$ 795,300	\$ 807,200	\$ 821,528	\$ 831,550	\$ 843,999	\$ 856,632	\$ 872,013	\$ 882,629
WITH PILOT (PAYMENT IN LIEU OF TAXES)	\$	1.05	\$ -	\$ 798,541	\$ 812,680	\$ 822,762	\$ 835,065	\$ 847,560	\$ 862,605	\$ 873,127	\$ 886,199	\$ 899,464	\$ 915,614	\$ 926,761
INTERCONNECTION COSTS	\$	***	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
WITH PILOT	\$	1.05	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PEGASUS ENERGY COST	\$		-	798,541	812,680	822,762	835,065	847,560	862,605	873,127	886,199	899,464	915,614	926,761
PEGAUS INTERCONNECTION COST	\$		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PEGASUS TOTAL COST	\$		\$ -	\$ 798,541	\$ 812,680	\$ 822,762	\$ 835,065	\$ 847,560	\$ 862,605	\$ 873,127	\$ 886,199	\$ 899,464	\$ 915,614	\$ 926,761
PEGASUS TOTAL COST	\$/ MWh		#DIV/0!	\$ 44.01	\$ 44.67	\$ 45.34	\$ 46.02	\$ 46.71	\$ 47.41	\$ 48.12	\$ 48.84	\$ 49.57	\$ 50.32	\$ 51.08

GRAND HAVEN

INCREMENTAL COST FOR NEW RECS

			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
DISCOUNT RATE	(a)		8.98%														
TERM FOR DISCOUNTING			14														
MARKET VALUE OF RECS	(b)	\$	1.10	\$ 1.13	\$ 1.16	\$ 1.18	\$ 1.21	\$ 1.24	\$ 1.28	\$ 1.31	\$ 1.34	\$ 1.37	\$ 1.41	\$ 1.44	\$ 1.48	\$ 1.52	\$ 1.55
GRANGER INCREMENTAL REVENUE REQUIREMENTS																	
GRANGER COST	\$	\$	1,506,942	\$ 1,520,577	\$ 1,678,865	\$ 1,747,370	\$ 1,791,054	\$ 1,840,860	\$ 1,881,727	\$ 1,928,770	\$ 1,976,989	\$ 2,031,966	\$ 2,077,074	\$ 2,129,001	\$ 2,182,226	\$ 2,242,910	\$ 2,292,701
GRANGER RECS	NO.		15,728	15,705	16,917	17,178	17,178	17,225	17,178	17,178	17,178	17,225	17,178	17,178	17,178	17,225	17,178
	\$/MWH	(c)	\$ 100.00	\$ 103.00	\$ 105.00	\$ 108.00	\$ 113.00	\$ 117.00	\$ 122.00	\$ 158.00	\$ 134.00	\$ 141.00	\$ 143.00	\$ 148.00	\$ 154.00	\$ 164.00	\$ 171.00
FORECASTED TRANSFER PRICE PER MWH (SUGGESTED)	\$	\$	1,572,769	\$ 1,617,651	\$ 1,776,317	\$ 1,855,240	\$ 1,941,131	\$ 2,015,350	\$ 2,095,734	\$ 2,714,147	\$ 2,301,872	\$ 2,428,755	\$ 2,456,475	\$ 2,542,366	\$ 2,645,435	\$ 2,824,934	\$ 2,937,463
AMOUNT RECOVERED THROUGH PSCR WHICH EQUALS																	
TRANSFER PRICE X VOLUME OF ENERGY (SUGGESTED)	\$	\$	(65,827)	\$ (97,074)	\$ (97,451)	\$ (107,870)	\$ (150,076)	\$ (174,489)	\$ (214,007)	\$ (785,377)	\$ (324,883)	\$ (396,789)	\$ (379,401)	\$ (413,365)	\$ (463,209)	\$ (582,025)	\$ (644,762)
TOTAL INCREMENTAL COST OF COMPLIANCE																	
NANR INCREMENTAL REVENUE REQUIREMENTS																	
NANR COST	\$	\$	200,445	\$ 210,041	\$ 244,179	\$ 271,055	\$ 277,831	\$ 285,557	\$ 291,896	\$ 299,194	\$ 306,673	\$ 315,201	\$ 322,199	\$ 330,254	\$ 338,510	\$ 347,923	\$ 355,647
NANR RECS	NO.		2,144	2,192	2,486	2,692	2,692	2,699	2,692	2,692	2,692	2,699	2,692	2,692	2,692	2,699	2,692
	\$/MWH	(c)	\$ 43.05	\$ 65.24	\$ 68.10	\$ 71.08	\$ 73.65	\$ 76.11	\$ 79.12	\$ 82.44	\$ 85.48	\$ 89.22	\$ 93.23	\$ 96.16	\$ 99.69	\$ 103.67	\$ 107.99
FORECASTED TRANSFER PRICE PER MWH (SUGGESTED)	\$	\$	92,301	\$ 142,987	\$ 169,292	\$ 191,356	\$ 198,262	\$ 205,469	\$ 212,992	\$ 221,950	\$ 230,112	\$ 240,860	\$ 250,979	\$ 258,866	\$ 268,387	\$ 279,849	\$ 290,719
AMOUNT RECOVERED THROUGH PSCR WHICH EQUALS																	
TRANSFER PRICE X VOLUME OF ENERGY (SUGGESTED)	\$	\$	108,143	\$ 67,054	\$ 74,887	\$ 79,698	\$ 79,569	\$ 80,088	\$ 78,904	\$ 77,244	\$ 76,561	\$ 74,342	\$ 71,220	\$ 71,388	\$ 70,123	\$ 68,074	\$ 64,928
TOTAL INCREMENTAL COST OF COMPLIANCE																	
BEEBE 1B INCREMENTAL REVENUE REQUIREMENTS																	
BEEBE 1B COST	\$	\$	330,264	\$ 327,056	\$ 320,905	\$ 314,292	\$ 322,100	\$ 331,067	\$ 338,415	\$ 346,921	\$ 355,555	\$ 365,440	\$ 373,583	\$ 382,915	\$ 392,500	\$ 403,378	\$ 412,370
BEEBE 1B RECS	NO.		6,781	6,551	6,271	5,992	5,992	6,008	5,992	5,992	5,992	6,008	5,992	5,992	5,992	6,008	5,992
	\$/MWH	(c)	\$ 70.09	\$ 70.40	\$ 71.99	\$ 73.89	\$ 74.08	\$ 74.01	\$ 76.66	\$ 78.49	\$ 79.94	\$ 80.91	\$ 82.80	\$ 85.33	\$ 86.98	\$ 88.69	\$ 90.41
FORECASTED TRANSFER PRICE PER MWH (SUGGESTED)	\$	\$	475,293	\$ 461,220	\$ 451,462	\$ 442,737	\$ 443,876	\$ 444,671	\$ 459,334	\$ 470,300	\$ 478,988	\$ 486,128	\$ 496,124	\$ 511,284	\$ 521,170	\$ 532,872	\$ 541,722
AMOUNT RECOVERED THROUGH PSCR WHICH EQUALS																	
TRANSFER PRICE X VOLUME OF ENERGY (SUGGESTED)	\$	\$	(145,030)	\$ (134,165)	\$ (130,557)	\$ (128,445)	\$ (121,775)	\$ (113,604)	\$ (120,920)	\$ (123,378)	\$ (123,433)	\$ (120,688)	\$ (122,541)	\$ (128,369)	\$ (128,670)	\$ (129,494)	\$ (129,353)
TOTAL INCREMENTAL COST OF COMPLIANCE																	
PEGASUS INCREMENTAL REVENUE REQUIREMENTS																	
PEGASUS COST	\$	\$	-	\$ -	\$ -	\$ -	\$ 798,541	\$ 812,680	\$ 822,762	\$ 835,065	\$ 847,560	\$ 862,605	\$ 873,127	\$ 886,199	\$ 899,464	\$ 915,614	\$ 926,761
PEGASUS RECS	NO.		-	-	-	-	18,145	18,194	18,145	18,145	18,145	18,194	18,145	18,145	18,145	18,194	18,145
	\$/MWH	(c)	\$ -	\$ -	\$ -	\$ 74.18	\$ 73.97	\$ 76.04	\$ 77.15	\$ 79.58	\$ 82.61	\$ 85.22	\$ 87.02	\$ 88.46	\$ 90.72	\$ 92.77	\$ 94.88
FORECASTED TRANSFER PRICE PER MWH (SUGGESTED)	\$	\$	-	\$ -	\$ -	\$ -	\$ 1,342,164	\$ 1,383,504	\$ 1,399,864	\$ 1,443,956	\$ 1,498,935	\$ 1,550,529	\$ 1,578,953	\$ 1,605,081	\$ 1,646,088	\$ 1,687,897	\$ 1,721,570
AMOUNT RECOVERED THROUGH PSCR WHICH EQUALS																	
TRANSFER PRICE X VOLUME OF ENERGY (SUGGESTED)	\$	\$	-	\$ -	\$ -	\$ -	\$ (543,624)	\$ (570,824)	\$ (577,102)	\$ (608,891)	\$ (651,374)	\$ (687,924)	\$ (705,825)	\$ (718,882)	\$ (746,625)	\$ (772,283)	\$ (794,809)
TOTAL INCREMENTAL COST OF COMPLIANCE																	
REC PURCHASES / SALES																	
RECS PURCHASED / (SOLD)	RECS	***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	\$/REC	(b)	\$ 1.10	\$ 1.13	\$ 1.16	\$ 1.18	\$ 1.21	\$ 1.24	\$ 1.28	\$ 1.31	\$ 1.34	\$ 1.37	\$ 1.41	\$ 1.44	\$ 1.48	\$ 1.52	\$ 1.55
REC UNIT VALUE	\$	\$	-	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL REC VALUE																	
TOTAL INCREMENTAL COST OF COMPLIANCE	\$	\$	(102,714)	\$ (164,185)	\$ (153,121)	\$ (156,616)	\$ (735,906)	\$ (778,830)	\$ (833,125)	\$ (1,440,403)	\$ (1,023,129)	\$ (1,131,059)	\$ (1,136,548)	\$ (1,189,228)	\$ (1,268,380)	\$ (1,415,727)	\$ (1,503,996)
NPV INCREMENTAL COST OF COMPLIANCE	\$ NPV	\$	(5,654,820)	\$ (6,059,909)	\$ (6,439,904)												
LEVELIZED INCREMENTAL COST OF COMPLIANCE	\$ NPV	\$	(725,449)	\$ (777,418)	\$ (826,167)												

TOTAL ICC FOR 2017	\$ (153,121)
TOTAL TRANSFER COST FOR 2017	\$ 2,397,071
TOTAL COSTS TO COMPLY IN 2017	\$ 2,243,950
FORECAST OF TRANSFER COST FOR 2018-2029	\$ 54,296,448
FORECAST OF TOTAL EXPENDITURES FOR 2018-2029	\$ 41,683,501
FORECAST OF INCREMENTAL COST OF COMPLIANCE FOR 2018-2029	\$ (12,612,946)

FOOTNOTES:
(a) BASED ON LONG TERM MUNICIPAL DEBT RATE
(b) MPPA INTERPOLATED FROM Q4 2014 CLEAR ENERGY MARKET REPORT
(c) TRANSFER PRICES AS GIVEN BY THE 2015 MPSC STAFF TRANSFER PRICE SCHEDULE.

WEIGHTED FORECASTED TRANSFER PRICE PER MWH			\$ 90.88	\$ 93.36	\$ 96.25	\$ 89.20	\$ 91.76	\$ 94.71	\$ 110.22	\$ 102.48	\$ 106.65	\$ 108.68	\$ 111.75	\$ 115.46	\$ 120.69	\$ 124.79
GRANGER TRANSFER PRICE	\$/MWH	\$	103.00	\$ 105.00	\$ 108.00	\$ 113.00	\$ 117.00	\$ 122.00	\$ 158.00	\$ 134.00	\$ 141.00	\$ 143.00	\$ 148.00	\$ 154.00	\$ 164.00	\$ 171.00
NANR TRANSFER PRICE	\$/MWH	\$	65.24	\$ 68.10	\$ 71.08	\$ 73.65	\$ 76.11	\$ 79.12	\$ 82.44	\$ 85.48	\$ 89.22	\$ 93.23	\$ 96.16	\$ 99.69	\$ 103.67	\$ 107.99
BEEBE 1B TRANSFER PRICE	\$/MWH	\$	70.40	\$ 71.99	\$ 73.89	\$ 74.08	\$ 74.01	\$ 76.66	\$ 78.49	\$ 79.94	\$ 80.91	\$ 82.80	\$ 85.33	\$ 86.98	\$ 88.69	\$ 90.41
PEGASUS TRANSFER PRICE	\$/MWH	\$	-	\$ -	\$ 74.18	\$ 73.97	\$ 76.04	\$ 77.15	\$ 79.58	\$ 82.61	\$ 85.22	\$ 87.02	\$ 88.46	\$ 90.72	\$ 92.77	\$ 94.88
GRANGER GENERATION	MWH		15,705,349	16,917,301	17,178,146	17,178,146	17,225,210	17,178,146	17,178,146	17,178,146	17,225,210	17,178,146	17,178,146	17,178,146	17,225,210	17,178,146
NANR GENERATION	MWH		2,191,723	2,485,805	2,692,098	2,692,098	2,699,473	2,692,098	2,692,098	2,692,098	2,699,473	2,692,098	2,692,098	2,692,098	2,699,473	2,692,098
BEEBE 1B GENERATION	MWH		6,551,427	6,271,175	5,991,840	5,991,840	6,008,256	5,991,840	5,991,840	5,991,840	6,008,256	5,991,840	5,991,840	5,991,840	6,008,256	5,991,840
PEGASUS GENERATION	MWH		-	-	-	18,144,711	18,194,422	18,144,711	18,144,711	18,144,711	18,194,422	18,144,711	18,144,711	18,144,711	18,194,422	18,144,711

GRAND HAVEN

		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	
DISCOUNT RATE		8.98%															
TERM		14															
Non-Volumetric Surcharge																	
Meter (or customer) Forecast (Number)																	
Residential	No.	11,779	12,200	12,171	12,630	12,862	13,014	13,138	13,252	13,362	13,470	13,576	13,681	13,785	13,888	13,988	
Commercial	No.	1,739	1,801	1,797	1,865	1,899	1,921	1,940	1,956	1,973	1,988	2,004	2,020	2,035	2,050	2,065	
Industrial	No.	140	145	144	150	153	154	156	157	159	160	161	162	164	165	166	
Streetlights	No.	2,252	2,252	2,252	2,252	2,252	2,252	2,252	2,252	2,252	2,252	2,252	2,252	2,252	2,252	2,252	
Unmetered	No.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	No.	15,910	16,398	16,364	16,897	17,166	17,342	17,486	17,618	17,745	17,870	17,993	18,115	18,236	18,355	18,471	
Maximum Surcharge (all rate classes at caps)																	
Residential	\$ / MO	\$ 3.00	\$ 424,058	\$ 439,207	\$ 438,157	\$ 454,686	\$ 463,038	\$ 468,514	\$ 472,976	\$ 477,075	\$ 481,023	\$ 484,902	\$ 488,737	\$ 492,530	\$ 496,270	\$ 499,953	\$ 503,569
Commercial	\$ / MO	\$ 16.58	\$ 345,983	\$ 358,343	\$ 357,486	\$ 370,972	\$ 377,786	\$ 382,254	\$ 385,895	\$ 389,238	\$ 392,460	\$ 395,625	\$ 398,753	\$ 401,849	\$ 404,900	\$ 407,904	\$ 410,855
Industrial	\$ / MO	\$ 187.50	\$ 314,450	\$ 325,683	\$ 324,905	\$ 337,161	\$ 343,354	\$ 347,415	\$ 350,724	\$ 353,763	\$ 356,691	\$ 359,567	\$ 362,411	\$ 365,224	\$ 367,997	\$ 370,728	\$ 373,410
Streetlights	\$ / MO	\$ 0.60	\$ 16,214	\$ 16,214	\$ 16,214	\$ 16,214	\$ 16,214	\$ 16,214	\$ 16,214	\$ 16,214	\$ 16,214	\$ 16,214	\$ 16,214	\$ 16,214	\$ 16,214	\$ 16,214	
Unmetered	\$ / MO	\$ 0.60	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Total	\$ / MO		\$ 1,100,704	\$ 1,139,448	\$ 1,136,763	\$ 1,179,033	\$ 1,200,393	\$ 1,214,398	\$ 1,225,809	\$ 1,236,290	\$ 1,246,389	\$ 1,256,308	\$ 1,266,115	\$ 1,275,817	\$ 1,285,381	\$ 1,294,800	\$ 1,304,049
TOTAL NPV	\$ NPV		\$ 9,702,577	\$ 9,473,164	\$ 9,184,406												
TOTAL PAYMENT	\$ NPV		\$ 1,244,731	\$ 1,215,300	\$ 1,178,255												
Planned Surcharge																	
Residential	\$ / MO	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Commercial	\$ / MO	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Industrial	\$ / MO	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Streetlights	\$ / MO	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Unmetered	\$ / MO	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Total	\$ / MO	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Residential	\$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Commercial	\$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Industrial	\$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Streetlights	\$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Unmetered	\$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Total	\$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
LEVELIZED COST OF COMPLIANCE	\$ NPV		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
OVER / (UNDER) COLLECT	\$		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
NPV OF OVER / (UNDER COLLECT)			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

SURCHARGE SCALING FACTOR USING SOLVER 0.0000%