



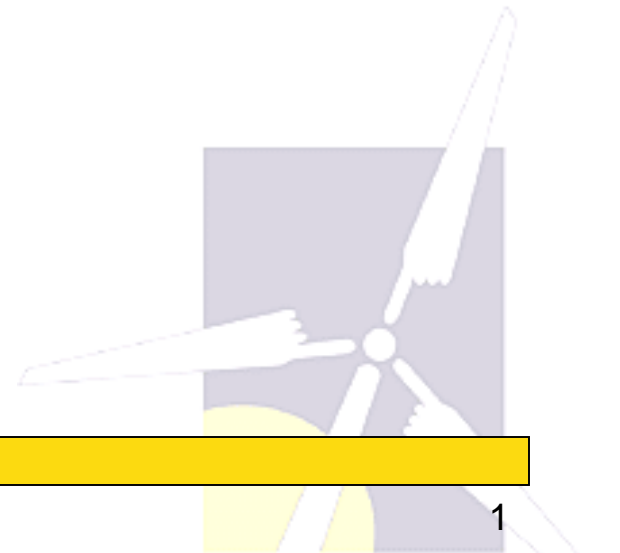
**Rhode Island
Renewable Energy Growth Program:
*1st Revision to Proposed
2015 Ceiling Price Recommendations***

November 20, 2014
Sustainable Energy Advantage, LLC
&
Meister Consultants Group, Inc.





SUMMARY RESULTS





Draft Proposed Ceiling Prices, 2015 REG Program (1)

Technology	System Size	2015 Proposed CP w/ ITC 15 year Tariff Duration	2015 Proposed CP w/o ITC (or 10% ITC) 15 year Tariff Duration	2015 Proposed CP w/ ITC 20 year Tariff Duration	2015 Proposed CP w/o ITC (or 10% ITC) 20 year Tariff Duration
Small Solar I, Host -Owned	1 to 10 kW	41.05 39.70	53.00 55.70	37.65 36.50	48.15 50.55
Small Solar I, Third-Party Owned	1 to 10 kW	N/A 34.05	N/A 43.40	30.75 29.35	36.00 37.25

Technology	System Size	2015 Proposed CP w/ ITC 20 year Tariff Duration	2015 Proposed CP w 10% ITC 20 year Tariff Duration
Small Solar II,	10 to 25 kW	33.55 31.95	38.65 39.55
Medium Solar	26-250 kW	26.75 28.05	32.05 34.70
Commercial Solar	251 -999 kW	21.45 21.95	25.15 25.55
Large Solar	1-5 MW	17.20 18.20	19.85 20.75

Initial CPs are shown in Blue.
Draft Revised CPs are in Red.

Draft Proposed Ceiling Prices, 2015 REG Program (2)

Technology	System Size	2015 Proposed CP w/ ITC ILO PTC 20 year Tariff Duration	2015 Proposed CP w PTC 20 year Tariff Duration	2015 Proposed CP w/o PTC or ITC 20 year Tariff Duration
Wind I,	1.5 to 2.99 MW	18.00 17.30	22.10 19.75	24.85 22.75
Wind II	3-5 MW	17.50 17.00	21.50 19.35	24.15 22.35

Technology	System Size	2015 Proposed CP w/ PTC 20 year Tariff Duration	2015 Proposed CP w/o PTC 20 year Tariff Duration
Anaerobic Digestion I	150 to 500 kW	20.65 18.65	20.80 20.15
Anaerobic Digestion II	501 kW to 1 MW	20.65 18.65	20.80 20.15
Hydro I	10 -250 kW	20.55 18.65	22.00 20.20
Hydro II	251 kW -1 MW	19.25 18.65	20.70 20.20

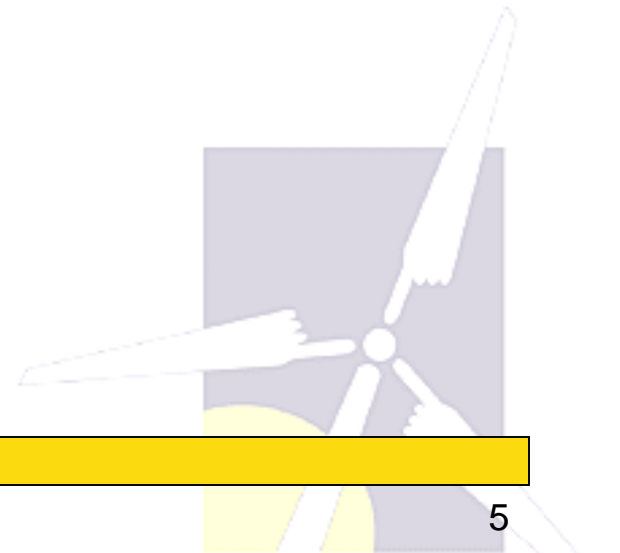
Initial CPs are shown in Blue.
Draft Revised CPs are in Red.

Historical Ceiling Prices, 2014 Program Year

Tech., class (kW)	2014 CP <u>w/ITC/PTC,</u> <u>No Bonus</u>	2014 CP <u>No ITC/PTC, No</u> <u>Bonus</u>
Solar, 501-3,000	23.50	N/A
Solar, 201-500	27.30	N/A
Solar, 50-200	27.10	N/A
Wind, 1,000-3,000	17.50	20.55
Wind, 50-999	16.20	19.95
AD, 50-3,000	18.55	19.55
Hydro, 50-1,000	17.90	18.85



PROPERTY TAX ASSUMPTIONS





PROPERTY TAX ASSUMPTIONS (1)

- Property Tax Data from the 39 cities and towns in Rhode Island was reviewed by SEA
 - a) Outlier data from three cities and towns (North Kingston, Smithfield and Westerly), was removed at the request of the DG Board.
- Using this data, SEA determined an Average Mill Rate for the different ceiling price classes:
 - a) The “**Private Property**” Mill Rate was used for all classes.
 - b) For Small Solar I & II, as well as Hydropower, a **straight average** of the Mill Rates was used to determine ceiling prices.
 - c) For all other classes, a **weighted average** was used, with weighting based on total MW of past DG projects installed in each municipality.

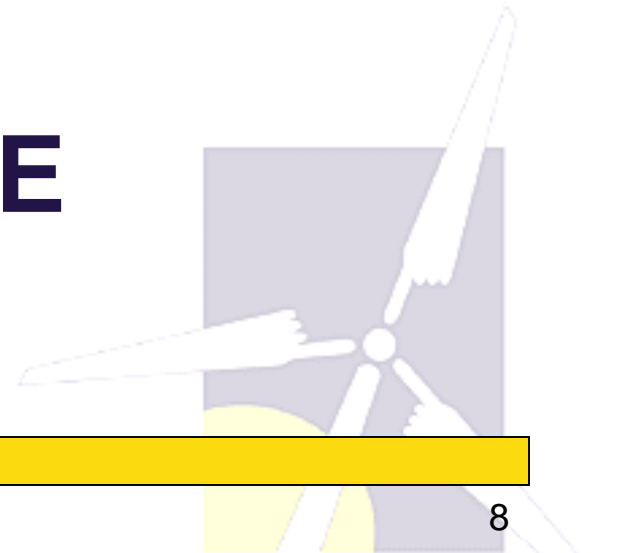


PROPERTY TAX ASSUMPTIONS (2)

- Using the Average Mill Rate determined above, total annual Property Tax payments were determined for each class of projects
- The Tax Basis for each class was assumed to be:
 - a) For Small Solar I & II, **50%** of the system's Installed Cost (excluding Interconnection Cost).
 - b) For all other classes, **80%** of the system's Installed Cost (excluding Interconnection Cost).
 - c) Note: For Ceiling Prices presented on 10/20/2014, the Basis was assumed to be **95%** of the system's Installed Cost.
- Tax Basis was assumed to decline for all projects by 5% annually, to a floor of 30%.



SOLAR CEILING PRICE ASSUMPTIONS





Proposed Installed Cost*

Class	Small Solar I (1-10 kW)	Small Solar II (11-25 kW)	Medium Solar (26-250 kW)	Commercial Solar (251-1,000 kW)	Large Solar (1-5 MW)
Value	\$4,281	\$4,216	\$3,305 \$3,566	\$2,676	\$2,151
Source	Average of REF Data	Average of REF Data	Average of REF and DG Pilot Bid Data	Average of DG Pilot Bid Data	Average of DG Pilot Bid Data

- Cost data is in \$/kW of Installed Capacity, DC


*Including Interconnection Costs



Production and Capital Costs Assumptions

Modeled Parameters

		Small Solar I, Host (1-10 kW)	Small Solar I TPO (1-10 kW)	Small Solar II (11-25 kW)	Medium Solar (26-250 kW)	Commercial Solar (251-1,000 kW)	Large Solar (1-5 MW)
Nameplate Capacity	kW	5		25	140	500	1500
Annual Degradation	%	0.5%					
Cost Excluding Interconnection	\$/kW	\$4,250		\$4,185	\$3,274 \$3,535	\$2,590	\$1,996
Interconnection	\$/kW	\$31				\$86	\$155



Ongoing Cost Assumptions

Modeled Parameters

		Small Solar I, Host (1-10 kW)	Small Solar I TPO (1-10 kW)	Small Solar II (11-25 kW)	Medium Solar (26-250 kW)	Commercial Solar (251-1,000 kW)	Large Solar (1-5 MW)
Fixed O&M Expense, Yr 1	\$/kW-yr		\$15.00 \$10.00		\$15.00 \$12.50	\$15.00	\$15.00
O&M Cost Inflation	%	2%					
Insurance, Yr 1 (% of Total Cost)	%	0.00%		0.25%			
Management Yr 1	\$/yr	\$0		\$250	\$500	\$3,300	\$10,000
Land Lease	\$/yr	\$0		\$417	\$1,500	\$6,000* w/ 2% esc. \$10,000	\$18,000* w/ 2% esc. \$30,000

* \$1,500/acre; ~8 acres per MW (NREL)



Financing Assumptions

Modeled Parameters

		Small Solar I Host (1-10 kW)	Small Solar I TPO (1-10 kW)	Small Solar II (11-25 kW)	Medium Solar (26-250 kW)	Commercial Solar (251- 1,000 kW)	Large Solar (1-5 MW)
% Debt	%	0%	50% / 60%*				
Debt Term	yrs	N/A	18				
Interest Rate on Term Debt	%	N/A	6.0%			6.0% 5.5%	6.0% 5.0%
Lender's Fee (% of total borrowing)	%	N/A	2.25%				
Required Minimum Annual DSCR		N/A	1.00				
Required Average DSCR		N/A	1.35				
Target After-Tax Equity IRR	%	8%	10%			8% / 7.5%* 7%	
Decommissioning	\$	Assumed funded through salvage value of materials.					

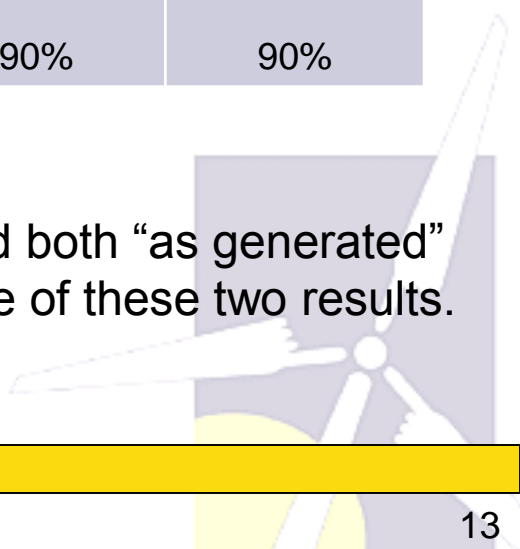
* with/without ITC



Incentives

- Fed. Investment Tax Credit (ITC) assumed available:
 - At 30% for all solar projects operational on or before 12/31/2016.
 - At 10% for commercially-owned projects on-line beginning 1/1/2017
 - At 0% for homeowner-owned projects on-line beginning 1/1/2017
- ITC Monetization %:

Category	Res. 5 kW	Res./Com. 25 kW	140 kW	500 kW	1,500 kW
%	75% 100%	75% 100%	90% 100%	90%	90%

- Ceiling prices evaluated without Bonus Depreciation
 - Benefit of Net Operating Loss at state level assessed both “as generated” and “carried-forward”. Proposed CPs are an average of these two results.
 - No federal, state, local or other grants assumed.
- 



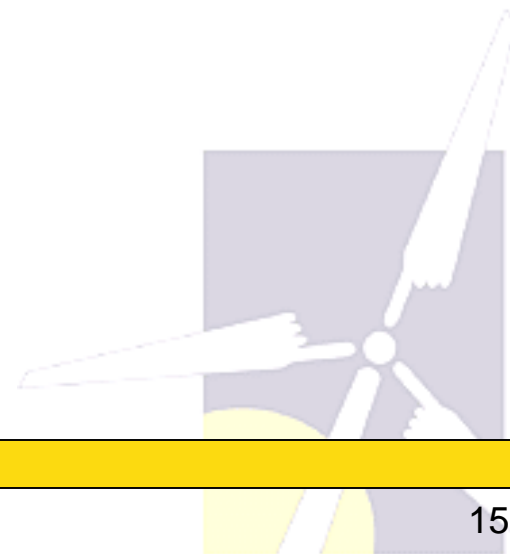
Additional Assumptions

- COD achieved in 2015
- Project Useful Life: 25 years
- 0.5%/yr production degradation
- Debt Service Coverage Ratio Target: 1.35X
- Interconn. Costs depreciated on 15-year MACRS schedule
- All other project costs:
 - 96% depreciated on 5-year MACRS
 - 2% depreciated on 15-year MACRS
 - 2% not depreciable
- Income Tax rates*:
 - Federal: Commercial 35%;
 - State: Commercial 9%
- *Assumed NEPOOL Membership costs either covered by NGRID as lead participant, or spread over many installations and therefore negligible*
- Market value of production (assumed revenue) post-contract = 90% of sum of **solar-weighted** energy and capacity price forecasts from 2013 Avoided Energy Supply Cost Study and \$5/REC (next slide)

* Commercial tax rates applied to small solar systems so as not to disadvantage 3rd-party ownership or small commercial host-owned systems.



WIND






Capacity Factor Assumptions

Modeled Parameters

Size Class	Proposed CF for 2015
Wind I	21.00% 23.00%
Wind II	21.00% 23.00%



Ongoing Cost Assumptions

Modeled Parameters

		Wind I	Wind II
Fixed O&M Expense, Yr 1	\$/kW-yr	\$20.00	
O&M Cost Inflation	%	2%	
Insurance, Yr 1 (% of Total Cost)	%	0.60%	
Management Yr 1	\$/yr	\$15,000 Included in fixed O&M	
Land Lease	\$/yr	\$45,000* w/ 2% esc. \$30,000	\$90,000* w/ 2% esc. \$60,000

* \$1,500/acre; 30 acres per turbine. More land may be required, but parallel use may also be possible.

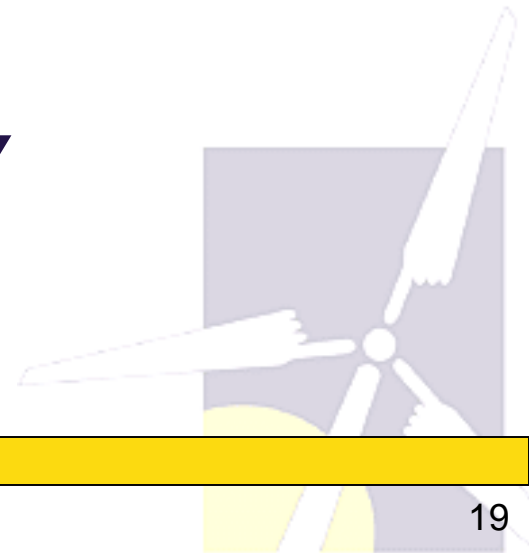


Incentives

- Current Production Tax Credit (PTC) available to projects under construction as of 12/31/2013.
 - Qualifying projects may elect the PTC or ITC in lieu thereof
- Ceiling prices evaluated without Bonus Depreciation
- Ceiling prices evaluated assuming **80%** ~~70%~~ monetization of ITC, or **90%** ~~100%~~ monetization of PTC.
- Benefit of Net Operating Loss at state level assessed both “as generated” and “carried-forward.” Proposed ceiling prices are an average of these two results.
- No federal, state, local or other grants assumed.



WIND CF SENSITIVITY ANALYSIS

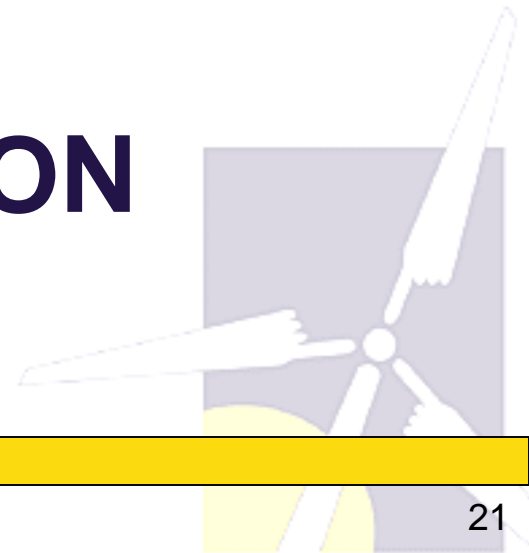


Effect of Changes to CF on Ceiling Prices

Technology	System Size	2015 Proposed CP w/ ITC ILO PTC 20 year Tariff Duration	2015 Proposed CP w PTC 20 year Tariff Duration	2015 Proposed CP w/o PTC or ITC 20 year Tariff Duration
Wind I, 21%	1.5 to 2.99 MW	18.00	22.10	24.85
Wind I, 20%	1.5 to 2.99 MW	18.90 (+5.00%)	23.40 (+5.88%)	26.05 (+4.83%)
Wind I, 23%	1.5 to 2.99 MW	16.45 (-8.6%)	20.00 (-9.5%)	22.7 (-8.7%)
Wind II, 21%	3-5 MW	17.50	21.50	24.15
Wind II, 20%	3-5 MW	18.40 (+5.14%)	22.65 (+5.35%)	25.35 (+4.97%)
Wind II, 23%	3-5 MW	16.00 (-8.6%)	19.35 (-10.00%)	22.05 (-8.7%)



ANAEROBIC DIGESTION





FINANCING ASSUMPTIONS

Modeled Parameters

		Anaerobic Digestion I	Anaerobic Digestion II
% Debt (% of hard costs) (mortgage-style amort.)	%	60% / 70%*	
Debt Term	<i>years</i>	18	
Interest Rate on Term Debt	%	6.5%	7%
Lender's Fee (% of total borrowing)	%	0%	
Required Minimum Annual DSCR	<i>Ratio</i>	1.00	
Required Average DSCR	<i>Ratio</i>	1.50	
Target After-Tax Equity IRR	%	11%	
Other Closing Costs	\$	Included in total cost.	
Reserve Requirement	\$	\$0	

* with/without ITC



SUPPLEMENTAL REVENUE ASSUMPTIONS

Modeled Parameters

		Anaerobic Digestion I	Anaerobic Digestion II
Tipping Fee	<i>\$/ton</i>	\$20 \$25	
Quantity Received Each Year	<i>tons per year</i>	10,000	22,308
Digestate (if merchantable for additional revenue)	<i>\$/gallon</i>		\$0

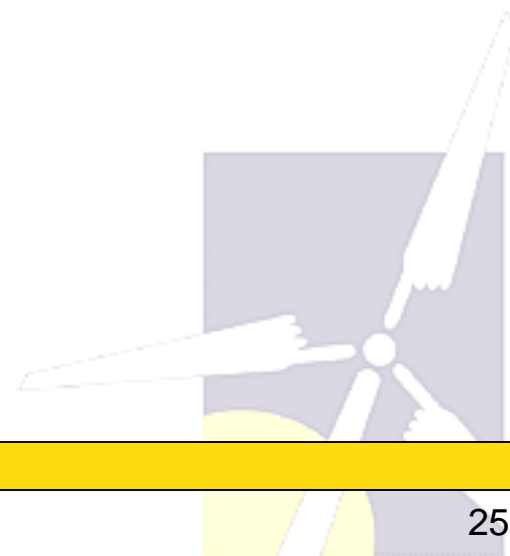


Incentives

- Current Production Tax Credit (PTC) available to projects under construction as of 12/31/2013.
 - Anaerobic digesters eligible for 50% of face value
 - Ceiling prices calculated both with and without PTC extension.
- Ceiling prices evaluated without Bonus Depreciation
- Ceiling prices evaluated assuming **90%** full monetization of federal PTC
- Benefit of Net Operating Loss at state level assessed both “as generated” and “carried-forward.” Proposed ceiling prices are an average of these two results.
- No federal, state, local or other grants assumed.



HYDRO





Production and Capital Cost Assumptions

Modeled Parameters

		Hydro I	Hydro II
Nameplate Capacity	kW	150	500
Annual Degradation	%	0.0%	
Cost Excluding Interconnection	\$/kW	\$4,500 \$4,000	\$4,200 \$4,000
Interconnection	\$/kW	\$100	



ONGOING EXPENSES

Modeled Parameters

		Hydro I	Hydro II
Fixed O&M Expense, Yr 1	\$/kW-yr	\$13.00	
Variable O&M	¢/kWh	2.00	
O&M Cost Inflation	%	3%	
Insurance, Yr 1 (% of Total Cost)	%	0.50%	
Management Yr 1	\$/yr	\$5,000	\$15,000
Land Lease	\$/yr	\$3,000 w/ 2% esc. \$2,500	\$10,000 w/ 2% esc.
Royalties	%	3.5%	



Incentives

- Current Production Tax Credit (PTC) available to projects under construction as of 12/31/2013.
 - Hydro is eligible for 50% of face value
 - Ceiling prices calculated both with and without PTC extension.
- Ceiling prices evaluated without Bonus Depreciation
- Ceiling prices evaluated assuming **90%** full monetization of federal PTC
- Benefit of Net Operating Loss at state level assessed both “as generated” and “carried-forward.” Proposed ceiling prices are an average of these two results.
- No federal, state, local or other grants assumed.



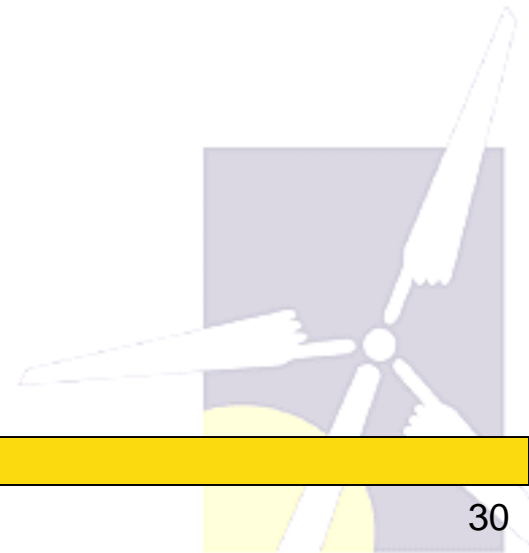
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APPENDIX





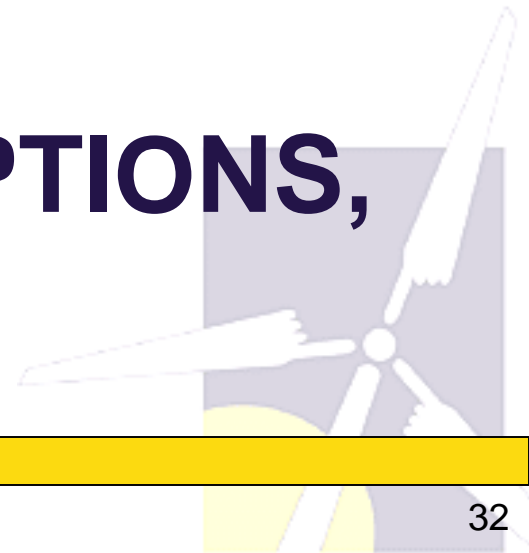
Ceiling Price Categories

Eligible Technology	System Size for CP Development	Eligible System Size Range	Tariff Length
Small Solar I*	5 kW	1 to 10 kW	15 and 20 Years Options
Small Solar II	25 kW	11 to 25 kW	20 Years
Medium Solar	140 kW	26 to 250 kW	20 Years
Commercial Solar	500 kW	251 to 999 kW	20 Years
Large Solar	1.5 MW	1 to 5 MW	20 Years
Wind I	1.65 MW	1.5 to 2.99 MW	20 Years
Wind II	3.3 MW	3 to 5 MW	20 Years
Anaerobic Digestion I	325 kW	150 to 500 kW	20 Years
Anaerobic Digestion II	750 kW	501 kW to 1 MW	20 Years
Small Scale Hydropower I	150 kW	10 to 250 kW	20 Years
Small Scale Hydropower II	500 kW	251 to 1 MW	20 Years

* The Small Solar I (5 kW) category will be used to evaluate both residential and small business installations. Residential installations will be evaluated under both homeowner and third-party ownership.



ADDITIONAL ASSUMPTIONS, SOLAR





Capacity Factor Research & Assumptions

Modeled Parameters

Size Class	PV Watts CF	SAM	Proposed CF for 2015*
1-10	15.21%	10.5%	13.49%
11-25	15.21%	14.71%	13.79%
25-250	15.21%	15.19%	13.49%
251-1,000	15.21%	15.23%	13.59%
1,001-5,000	15.21%	15.25%	14.18%

**Based on Massachusetts system performance database multiplied by 1.0224 correction factor for RI insolation*

No Change



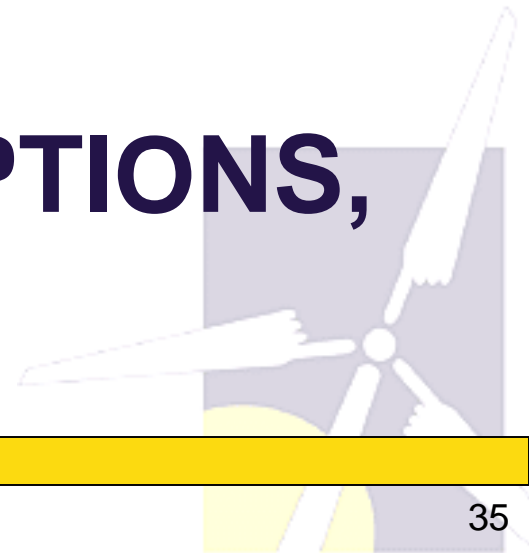
Additional Assumptions: Forecast of Market Value of Production

<u>Project Year</u>	<u>Calendar Year</u>	<u>Time-of-Production Weighted Market Value of Production (incl. energy, capacity & RECs) (cents/kWh)</u>
16	2029	12.13
17	2030	12.53
18	2031	12.94
19	2032	13.36
20	2033	13.79
21	2034	14.24
22	2035	14.7
23	2036	15.18
24	2037	15.67
25	2038	16.17

No Change



ADDITIONAL ASSUMPTIONS, WIND





Production and Capital Cost Assumptions

Modeled Parameters

		Wind I	Wind II
Nameplate Capacity	kW	1,650	3,300
Annual Degradation	%	0.0%	
Generation Equipment	\$/kW	\$3,500	\$3,400
Interconnection	\$/kW	\$107	\$136

No Change





Financing Assumptions

Modeled Parameters

		Wind I	Wind II
% Debt	%	70%	
Debt Term	yrs	18	
Interest Rate on Term Debt	%	6.5%	
Lender's Fee (% of total borrowing)	%	2.25%	
Required Minimum Annual DSCR		1.00	
Required Average DSCR		1.45	
Target After-Tax Equity IRR	%	11%	
Decommissioning	\$	Assumed funded through salvage value of materials.	

No Change



Additional Assumptions

- Commercial operation achieved in 2015
- Project Useful Life: 20 years
- Average Debt Service Coverage Ratio Target: 1.45X
- Interconnection Costs depreciated on 15-year MACRS schedule
- All other project costs:
 - 96% depreciated on 5-year MACRS
 - 2% depreciated on 15-year MACRS
 - 2% not depreciable
- Federal Income Tax rate 35%; State rate 9%



No Change

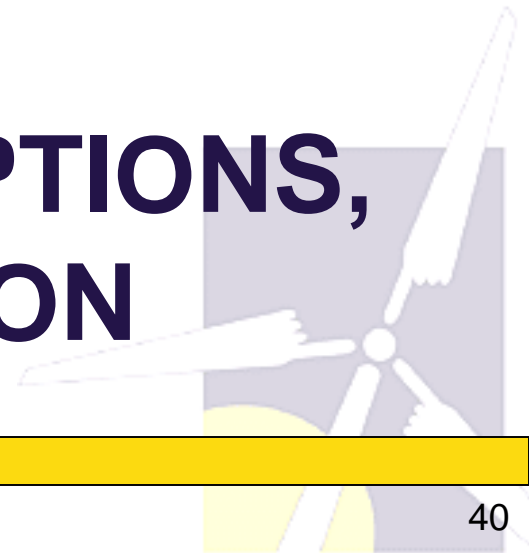


Additional Cost Data From MassCEC

Project Name	COD	Capacity (kW)	Total Cost (\$)	Total Cost (\$/kW)
DOC Gardner	4/1/2013	3,300	9,000,000	\$2,727
Varian Semiconductor	12/6/2012	2,500	7,763,615.18	\$3,105
Camelot Wind	12/1/2012	1,500	4,351,547	\$2,901
Kingston Community Wind	5/18/2012	2,000	Not Reported	N/A
Fairhaven	5/2/2012	3,000	Not Reported	N/A
Lightolier	4/20/2012	2,000	4,478,500	\$2,239



ADDITIONAL ASSUMPTIONS, ANAEROBIC DIGESTION





PROJECT PERFORMANCE ASSUMPTIONS

Modeled Parameters

		Anaerobic Digestion I	Anaerobic Digestion II
Generator Nameplate Capacity	<i>kW</i>	325	725
Biogas Consumption per Day	<i>cubic feet/day</i>	120,066	267,840
Energy Content per Cubic Foot	<i>BTU/cubic foot</i>	600	
Heat Rate	<i>BTU/kWh</i>	8,928	
Availability	<i>%</i>	92%	
Station Service (Parasitic Load)	<i>%</i>	15%	
Annual Production Degradation	<i>%</i>	0%	
Project Useful Life	<i>years</i>	20	

No Change



CAPITAL, INTERCONNECTION AND O&M COSTS

Modeled Parameters

		Anaerobic Digestion I	Anaerobic Digestion II
Generation Equipment	\$/kW		\$10,000
Interconnection Costs	\$/kW		\$275
Fixed O&M Expense	\$/kW-yr		\$550
Variable O&M Expense	¢/kWh		2.00
O&M Cost Inflation	%		2%

No Change



ONGOING EXPENSE ASSUMPTIONS

Modeled Parameters

		Anaerobic Digestion I	Anaerobic Digestion II
Insurance, Yr 1 (% of Total Cost)	%	1.0%	
Project Management Yr 1	\$/yr	\$33,621	\$75,000
Water & Sewer Expenses	\$/yr	\$0	
Digestate Disposal Cost (if handled as an expense)	\$/ton	\$0.00	
Land Lease	\$/yr	\$15,690	\$35,000

No Change



Additional Assumptions

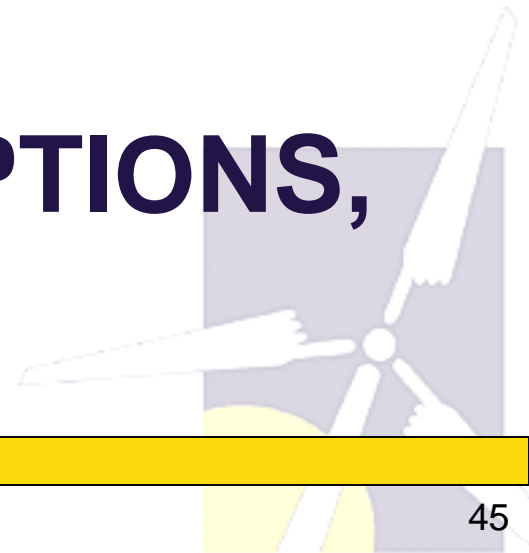
- Commercial operation achieved in 2015
- Project Useful Life: 20 years
- Average Debt Service Coverage Ratio Target: 1.50X
- Interconnection Costs depreciated on 15-year MACRS schedule
- All other project costs:
 - 96% depreciated on 5-year MACRS
 - 2% depreciated on 15-year MACRS
 - 2% not depreciable
- Federal Income Tax rate 35%; State rate 9%



No Change



ADDITIONAL ASSUMPTIONS, HYDRO





Production and Capital Cost Assumptions

Modeled Parameters

Size Class	Proposed CF for 2015
Hydro I	40.00%
Hydro II	40.00%

No Change



FINANCING ASSUMPTIONS

Modeled Parameters

		Hydro I	Hydro II
% Debt	%	50%	
Debt Term	yrs	18	
Interest Rate on Term Debt	%	6.5%	
Lender's Fee (% of total borrowing)	%	2.25%	
Required Minimum Annual DSCR		1.00	
Required Average DSCR		1.45	
Target After-Tax Equity IRR	%	11%	
Reserve Requirement	\$	\$0	

No Change



Additional Assumptions

- Commercial operation achieved in 2016
- Project Useful Life: 30 years
- Interconnection Costs depreciated on 15-year MACRS schedule
- All other project costs:
 - 96% depreciated on 5-year MACRS
 - 2% depreciated on 15-year MACRS
 - 2% not depreciable
- Federal Income Tax rate 35%; State rate 9%
- Market value of production (assumed revenue) post-contract = 75% of sum of energy and capacity price forecasts from 2013 Avoided Energy Supply Cost Study and \$5/REC (see next slide)

No Change



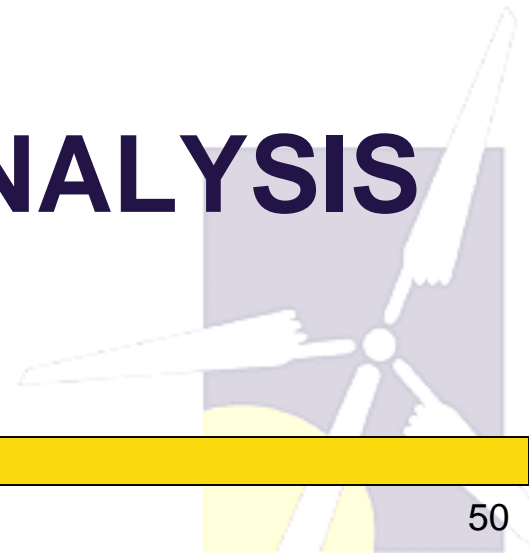
Additional Assumptions: Forecast of Market Value of Production

Project Year	Calendar Year	Market Value of Production (incl. energy, capacity & RECs) (cents/kWh)
21	2034	13.28
22	2035	13.67
23	2036	14.07
24	2037	14.49
25	2038	14.91
26	2039	15.35
27	2040	15.80
28	2041	16.26
29	2042	16.74
30	2043	17.23

No Change



COST SENSITIVITY ANALYSIS





Explanation of Sensitivity Analysis

- Somewhat comparable to a step-wise regression, which models the correlation of one variable to the result
- Specific Cost Inputs are “**Zeroed Out**” (i.e. set at \$0.00, 0%, etc.)
- Ceiling Prices are then recalculated, with all other inputs held constant
- The “Zeroed Out” Ceiling Price is then compared to the Original Ceiling price, to determine how much of the ceiling price is affected by that input
- **Note**: This is not a pure regression, as the result is somewhat based on the magnitude of the original cost. These results only relate to the specific ceiling prices discussed in this presentation, not CREST generally. However, the results are useful to understand the relative importance of certain inputs.



Solar Cost Sensitivity Analysis*

Decrease in Ceiling Price, as a % of Original

"Zeroed Out" Input:	Interconnection Cost	Property Tax	O&M Cost	Land Lease**
Small Solar I, Host-Owned, 15	0.97%	11.08% (12.06%)	4.75%	0.00%
Small Solar I, Host-Owned, 20	0.93%	10.62% (11.55%)	4.52%	0.00%
Small Solar I, Third-Party Owned - 20	1.14%	12.85% (13.82%)	5.37%	0.00%
Small Solar II	0.89%	11.33% (12.22%)	4.77%	5.37%
Medium Solar	1.12%	19.25% (20.56%)	6.17%	4.30%
Commercial Solar	3.73%	18.41% (22.14%)	7.69%	6.29%
Large Solar	8.43%	17.44% (25.29%)	9.59%	7.56%

* Versus ITC @ 30% price; Red = Change Versus Presentation on 11/20/2014 due to methodology refinement

**No Land Lease expense for Small Solar I & II, hence 0% Sensitivity



Wind & Hydro, Cost Sensitivity Analysis*

Decrease in Ceiling Price, as a % of Original

"Zeroed Out" Input:	Interconnection Cost	Property Tax	O&M Cost	Land Lease
Wind I	3.89%	11.11% (15.00%)	6.67%	9.44%
Wind II	4.86%	11.14% (16.00%)	6.86%	9.43%
Hydro I	1.70%	10.22% (12.17%)	2.43%	3.41%
Hydro II	2.08%	10.22% (12.47%)	2.60%	3.64%

*Using Wind-ITC price, Hydro-PTC Price



AD, Cost Sensitivity Analysis*

Decrease in Ceiling Price, as a % of Original

"Zeroed Out" Input:	Interconnection	Fixed O&M	Variable O&M	Project Management	Property Tax
AD I	2.42%	42.86%	19.13%	7.99%	14.77%
AD II	2.42%	42.86%	19.13%	7.99%	14.77%

*Using AD-PTC price