

# Town of Needham Solar Photovoltaic Project

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Recommendation from the  
Solar Energy Exploratory Committee  
to the Board of Selectmen



October 29, 2013

# Solar Photovoltaic Economics

## *Economic Market Drivers*

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- ❖ The current cost to develop Solar Photovoltaics (PV) is too high to be cost competitive with traditional forms of energy generation. As a result, Federal and State incentives have been established to induce renewable energy development to foster green energy production, reduce dependence on foreign oil and reduce greenhouse gas emissions.
- ❖ Legislative and regulatory incentives provide targeted economic benefits to support the economic commercialization of renewable energy generation, particularly Solar Photovoltaics.
- ❖ **Key Environmental Driver** - Solar renewable energy certificates (SRECs)
  - ❑ Worth up to 7 times the value of a traditional, non-solar renewable energy credit and serves as a revenue stream to offset capital and financing costs for the developer.
- ❖ **Key Financial Driver** - Net metering credits
  - ❑ Generation delivered to NStar in excess of any on-site, behind the meter, consumption.
  - ❑ Net metering is the monetized value of the generation produced by the systems and delivered to NStar for the benefit of the Town.



# Solar Photovoltaics Economics

## *Net Metering System of Assurance – NStar Cap Allocations*

❖ As of October 16, 2013.

Queue	CAP (MW AC)	Currently Interconnected (MW AC)	Reserved Cap Allocations (MW AC)	Pending Cap Allocations (MW AC)	Capacity Available (MW AC)
NStar Public Sector Queue	149.34	36.53	73.97	6.31	<b>32.53</b>
NStar Private Sector Queue	149.34	48.79	12.63	9.69	78.24



# Solar Photovoltaic Procurement

## Results

- ❖ 11 proposals received, 4 firms shortlisted for interviews based on published evaluation criteria.

	Ameresco	Brightfields	Citizens	SouthernSky
<b>EVALUATION CATEGORY - NON PRICE PROPOSAL</b>				
Approach and Schedule	0.2	0.2	0.15	0.2
Respondent Qualifications and Experience	0.85	0.80	0.75	0.55
Performance Record of Respondent and its affiliates, subsidiaries or partners	0.6	0.6	0.75	0.6
Project Understanding	0.65	0.65	0.7	0.55
Overall system plan and optimization of site	0.6	1	0.8	0.8
Education and outreach	0.2	0.2	0.05	0.05
Financing plan	1	0.9	1	0.8
<b>Total weighted points for Non-Price</b>	<b>4.1</b>	<b>4.35</b>	<b>4.2</b>	<b>3.55</b>
<b>EVALUATION CATEGORY - PRICE PROPOSAL</b>				
Overall Price - 2MW	2.25	3.0	2.25	3.0
Overall Price - Optimized Project	0.6	0.9	0.8	0.9
Other Economic Benefit - Demo, LCD Panels	0.15	0.25	0.2	0.15
<b>Total weighted points for Price</b>	<b>3</b>	<b>4.15</b>	<b>3.25</b>	<b>4.05</b>
<b>Weighted Points</b>				
<b>TOTAL NON-PRICE AND PRICE POINTS</b>	<b>7.1</b>	<b>8.5</b>	<b>7.45</b>	<b>7.60</b>
<b>SEEC RANKING</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>2</b>

# Procurement Results-Qualifications

## *Top Ranked Firm – Brightfields Development*

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- ❖ Local Wellesley-based firm
  - ❑ Parent company, Renova has significant experience on owning, operating and constructing assets on landfills/brownfields
  - ❑ Brightfields has significant experience installing solar photovoltaics on landfills, brownfields and Federal superfunds, including the Scituate, MA landfill
  - ❑ Brightfields Development, subsidiary of Renova Partners LLC, privately-held, founded in 2009 and 2001 respectively
- ❖ Strong team with diverse domain expertise and knowledge of RTS
  - ❑ Advanced Solar Products, founded in 1991, privately-held, NJ headquartered with local offices in Medford and Pelham, MA
  - ❑ Weston & Sampson, privately-held MA headquartered firm, current consultant to Needham on landfill monitoring and operations
- ❖ Committed financial backing by Morgan Stanley
- ❖ Optimized project sized at 3.7 MW DC generating approximately 5,100,000 kWh/yr



# Procurement Results - Pricing

## *Top Ranked Firm – Brightfields Development*

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- ❖ Strong financial offer at rate less than NStar base distribution price
- ❖ No annual escalator for twenty years
- ❖ Conservative pricing assumptions on incentives for Solar Renewable Energy Credits and NStar Interconnection costs
- ❖ Purchase price at term expiration – fair market value
  - expected to be \$0 (after consideration for salvage value)
- ❖ Decommissioning Assurance costs supported by a bond or escrow in the amount of \$100,000
- ❖ Guarantee of 90% of the annual expected generation



# Procurement Results–Other Benefits

## *Top Ranked Firm – Brightfields Development*

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- ❖ Other Services and Offers:
  - Roof-mounted solar photovoltaic installation on the Salt Shed at the same pricing offer with no annual escalators
    - ◆ 91 kW system, generating approximately 122,000 kWh/yr
  - Highly comprehensive educational and outreach programs including:
    - ◆ Customized solar and renewable energy curriculum support
    - ◆ Customized online monitoring systems for grades K-6 and 7-12
    - ◆ Modeled after successful Town of Scituate program
  - Kiosk and other monitoring systems in public Town buildings and the RTS



# Solar Photovoltaic Project

## *Next Steps*

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### ❖ Considerations:

- ❑ Project layouts are preliminary subject to technical, environmental and regulatory review.
- ❑ Design details will be finalized post award and contract execution during the extensive development and permitting process.
- ❑ Reasonable assumptions were used in developing project sizing, regulatory incentive impacts, NStar interconnection costs and project pricing.
  - ◆ Regulatory incentives and interconnection costs in excess of the base assumptions may be passed through to the Town on a \$/kWh basis.
- ❑ Town conducted scenarios analysis to determine impact of overall economic benefit to the Town under varying escalators for net metering.





**BRIGHTFIELDS DEVELOPMENT OFFER - NET METERING ESCALATING AT 0%/YR**

		Illustrative Annual Costs to the Town		Illustrative Benefits to the Town							
				Net Metering		Revenue Sources		Annual Net Benefits			
Year	Generation in kWh (Degrade at 0.5%/yr)	Vendor Rate with Lease & PILOT (\$/kWh) (Escalate at 0%/yr)	Illustrative Vendor Cost	Ave. NStar Net Metering Rate (\$/kWh) (Escalate at 0%/yr)	Total Net Metering Credit Value	Base Lease Revenue (Escalate at 0%)	Illustrative PILOT Revenue (Escalate at 0%) [1]	Financial Benefit from Net Metering Only	Financial Benefits from Lease and PILOT	Total Project Benefits (NM + Lease + PILOT)	Total Benefit per kilowatt-hr
	A	B	C = A*B	D	E = A*D	F	G	H = E-C	I = F+G	J = H+I	K = J/A
1	5,224,576	\$0.0700	\$365,720	\$0.16337	\$853,515	\$50,000	\$93,600	\$487,795	\$143,600	\$631,394	\$0.1209
2	5,198,453	\$0.0700	\$363,892	\$0.16337	\$849,248	\$50,000	\$93,600	\$485,356	\$143,600	\$628,955	\$0.1210
3	5,172,461	\$0.0700	\$362,072	\$0.16337	\$845,001	\$50,000	\$93,600	\$482,929	\$143,600	\$626,529	\$0.1211
4	5,146,599	\$0.0700	\$360,262	\$0.16337	\$840,776	\$50,000	\$93,600	\$480,514	\$143,600	\$624,114	\$0.1213
5	5,120,866	\$0.0700	\$358,461	\$0.16337	\$836,572	\$50,000	\$93,600	\$478,112	\$143,600	\$621,711	\$0.1214
6	5,095,261	\$0.0700	\$356,668	\$0.16337	\$832,390	\$50,000	\$93,600	\$475,721	\$143,600	\$619,321	\$0.1215
7	5,069,785	\$0.0700	\$354,885	\$0.16337	\$828,228	\$50,000	\$93,600	\$473,343	\$143,600	\$616,942	\$0.1217
8	5,044,436	\$0.0700	\$353,111	\$0.16337	\$824,086	\$50,000	\$93,600	\$470,976	\$143,600	\$614,576	\$0.1218
9	5,019,214	\$0.0700	\$351,345	\$0.16337	\$819,966	\$50,000	\$93,600	\$468,621	\$143,600	\$612,221	\$0.1220
10	4,994,118	\$0.0700	\$349,588	\$0.16337	\$815,866	\$50,000	\$93,600	\$466,278	\$143,600	\$609,878	\$0.1221
11	4,969,147	\$0.0700	\$347,840	\$0.16337	\$811,787	\$50,000	\$93,600	\$463,947	\$143,600	\$607,546	\$0.1223
12	4,944,301	\$0.0700	\$346,101	\$0.16337	\$807,728	\$50,000	\$93,600	\$461,627	\$143,600	\$605,226	\$0.1224
13	4,919,580	\$0.0700	\$344,371	\$0.16337	\$803,689	\$50,000	\$93,600	\$459,319	\$143,600	\$602,918	\$0.1226
14	4,894,982	\$0.0700	\$342,649	\$0.16337	\$799,671	\$50,000	\$93,600	\$457,022	\$143,600	\$600,622	\$0.1227
15	4,870,507	\$0.0700	\$340,935	\$0.16337	\$795,672	\$50,000	\$93,600	\$454,737	\$143,600	\$598,337	\$0.1228
16	4,846,155	\$0.0700	\$339,231	\$0.16337	\$791,694	\$50,000	\$93,600	\$452,463	\$143,600	\$596,063	\$0.1230
17	4,821,924	\$0.0700	\$337,535	\$0.16337	\$787,736	\$50,000	\$93,600	\$450,201	\$143,600	\$593,801	\$0.1231
18	4,797,814	\$0.0700	\$335,847	\$0.16337	\$783,797	\$50,000	\$93,600	\$447,950	\$143,600	\$591,550	\$0.1233
19	4,773,825	\$0.0700	\$334,168	\$0.16337	\$779,878	\$50,000	\$93,600	\$445,710	\$143,600	\$589,310	\$0.1234
20	4,749,956	\$0.0700	\$332,497	\$0.16337	\$775,979	\$50,000	\$93,600	\$443,482	\$143,600	\$587,081	\$0.1236
Total	99,673,959		\$6,977,177		\$16,283,279	\$1,000,000	\$1,871,992	\$9,306,102	\$2,871,992	\$12,178,094	
<b>Assumptions:</b>					<b>Net Metering Assumptions:</b>						
0.0%	Vendor generation annual price escalator				\$0.07426	Basic Service					
0.0%	Net Metering annual price escalator				\$0.08911	Delivery Charges					
0.5%	Annual system degradation				\$0.16337	Total Current Rate for A9 Tariff - No demand meter					
[1]	PILOT calculated by Beacon based on DOR revenue model										

# Impact of Net Metering

## *On Annual Electricity Costs*

- ❖ Assumptions:
  - *Optimized project at 3.7 MW DC (3.27 MW AC) for more than 5.2 million kilowatt-hours*

Town Budget for Electricity Fiscal Year 2013	1 <sup>st</sup> Year Credits from Net Metering to Town	1 <sup>st</sup> Year PILOT Revenue to Town	1 <sup>st</sup> Year Revenue from Lease Payment to Town	Net Annual Electricity Costs (1)	Percent Electricity Cost Reduction from Optimized Solar PV at the RTS (1)
\$1,775,524	\$487,795	\$93,600	\$50,000	\$1,144,129	35.6%

**Note (1): Illustrative benefits on savings if all the net metering benefits accrued to off-set town electricity costs.**



# Risk Analysis

## *Time is of the Essence*

Risk	Probability	Discussion
Net Metering Cap Reached	Med-High	Public Net Metering cap may be reached by early 2014. Private Net Metering cap available, but project will need to be downsized to under 1 MW AC.
SREC Program Changes	Medium	New program guidelines under review; minimal changes expected. Pricing assumes program guidelines proposed by DOER in August 2013.
Solvency of Developer	Low -Med	Provisions in the contract for assignment, buy-out and decommissioning assurance. Backed by a significant financial partner.
Electricity Rate Drop	Low	The average cost of electricity has steadily increased over the past century. Scenario analysis conducted to assess risk.
Investment Tax Credits Change	Low	Tax incentives have a sunset provision known to developers .
Damage – Acts of God	Low	Developers will be required to have sufficient insurance and decommissioning assurance.



# Thank You

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Solar Energy Exploratory Committee,

Town Staff

and

Owner's Agent, Beacon Integrated Solutions

