Meeting Minutes
Millis Public Library Trustees
January 27, 2018

The meeting was called to order at 11:30 a.m. at the Millis Public Library.

Present were Maria Neville, Jennifer Farrar and Wendy Barry, Chairperson ("The Trustees").

The Trustees met to discuss the proposal of the solar installation plan proposed by Town of Millis representative Bob Weiss, Energy Manager, on 1/17/18. The Trustees reviewed the clarification and answers that Mr. Weiss sent in furtherance of the 1/17/18 meeting (see attached Exhibit A).

After the dicussion it was motioned and seconded that the support of the installation of the solar panels, proposed by the Town of MIllis be approved by the Trustees.

APPROVAL OF LIBRARY SOLAR INSTALLATION PLAN

Whereas: the Trustees were presented with a proposal on January 17, 2018, by Bob Weiss, Energy Manager, on behalf of the Town of Millis which is attached hereto as Exhibt B. ("The Proposal");

Whereas: The Proposal will incur no costs to the Millis Public Library;

Whereas: The Proposal has the support of the Town of Millis Energy Committee; and

Whereas: Installation of solar panels marries with the Library's LEED Certified Green Building status and The Town of Millis' Green Community mission.

Now Therefore be it:

Resolved: That the Trustees of the Millis Public Library hereby approve and support the installation of solar panels on the MIllis Public Library Roof, in accordance with The Proposal with the following conditions:

1) The Library is not financially or otherwise responsible for the installation, maintenance or repairs related to the proposed solar system;
2) The Library is not financially or otherwise responsible for any damage resulting from the installation mantenaince or repairs of the proposed solar system to Library property and facilities;
3) The Millis Public Library, represented by the Library Director, is included in the discussions when finalizing the agreement with the vendor, including but not limited to scheduling of installation, and equipment placement; and

4) The Proposal attached hereto is approved by the Board of Selectman of Millis, Town Consel of Millis, and has the support of the Town Administrator of Millis.

There being no further business, the meeting was adjourned at 12:00 p.m.

A True Record.

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Jennifer Farrar
Acting Secretary

EXHIBIT A

Wendy Barry January 18, 2018 at 8:05 AM

Solar Proposal

To: Wendy Barry, rweiss@millis.net, Maria Neville, Jennifer Farrar

Bob,

Thanks for the informative meeting last evening on the proposal to "solarize" the Library. We support the idea of solarization for our building and the Town in general. As Trustees for the Library our main concern is to ensure the Library continues to provide services to the Millis community and our building is not adversely affected, to this end, we have some further questions before we can support the proposal.

- We know where the panels will be installed, what other equipment will be installed as part of the system, size and where will it need to be placed within or on the Library building or grounds?
- What is the proposed implementation/installation timeline and needs for access internal and external to the building, including noise and other anticipated disruption of regular Library services?
- The Trustees would like assurance that all related/required Town departments/committees/inspectors have reviewed and approved the project and foresee no damage to the Library building as a result. For example, placement of any related equipment within the Library electrical room or elsewhere in the building has been approved by the building inspector, the Town "facilities manager" has approved the installation on the roof, Permanent Building Committee has approved, etc.
- The Trustees would like assurance that Town Council will have reviewed and approved the contract to protect the Town/Library adequately should any damage occur to the Library facilities.

We look forward to your response.

Thanks,

Wendy Barry

Chairperson

Millis Library Board of Trustees

Robert Weiss January 23, 2018 at 11:59 AM

RE: Solar Proposal Details

To: Wendy Barry, mneville@minlib.net, Jennifer Farrar, Cc: Michael Guzinski

Wendy, et al,
Here are the responses from Solect Energy to the other two questions that the Trustees had regarding the solar installation.
Please let me know if this satisfies your questions and if it does, what is the next step for the Library Trustees to recommend the installation to the Board of Selectmen?

- We know where the panels will be installed, what other equipment will be installed as part of the system, size and where will it need to be placed within or on the Library building or grounds? (The panels and inverters will be mounted on the roof. The only other major component, not on the roof, will be the utility disconnect switch mounted on the outside wall near the incoming electric service location. The switch is a typical grey electrical box approx 36 inches by 18 inches.)
- What is the proposed implementation/installation timeline and needs for access internal and external to the building, including noise and other anticipated disruption of regular Library services? (The racking, panels and inverters are roof mounted. The actual placement of these items will take 4-5 days. This can be done on weekends if you prefer. The electrical wiring of the panels and the connections to the grid will take another 2-3 weeks. This is done during normal business hours. Noise impacts for solar installs are minimal. The majority of the install activity will be on the roof. We will need access to the main electric room for 3-5 days throughout the install process. Start to finish the install process on site will be approx 6 weeks. We will need to park a lull, and place a dumpster and portable toilet.)

Thanks,
Bob

From: Robert Weiss [mailto:rweiss@millis.net]
Sent: Thursday, January 18, 2018 10:41 AM
To: 'Wendy Barry' <wendybarry@comcast.net>; 'mneville@minlib.net' <mneville@minlib.net>; 'Jennifer Farrar' <jennifer_w@comcast.net>
Cc: 'Michael Guzinski' <mguzinski@millis.net>
Subject: RE: Solar Proposal

Wendy,
Thanks for getting this to me so quickly.

Generally, your first two concerns should be answered by Solect and the third could be included in the PPA agreement. I would be happy to include MPL in our discussions with Town counsel and will send the new library director a draft of the document so she can review the appropriate sections. Placement of the system's components, meters, inverters, etc. will be specified in the developer's plans, allowing the building department and the Town's electrical inspector, and fire chief if needed, to fully inspect and approve the project ahead of the installation, as well as during and after construction. The Selectmen's Office will receive a copy of the plans, also, and we can share those with you.
I will send your concerns onto Brian Herr at Solect Energy and follow up with you after he gets back to me.

Thanks, again,
Bob

See More from Wendy Barry

EXHIBIT B

HelioScope — Annual Production Report produced by Chris Steele

Design 1 Millis Library, 961 Main Street Millis MA

Report

Project Name	Millis Library
Project Address	961 Main Street Millis MA
Prepared By	Chris Steele csteele@solectinc.com

solectenergy
Smart Solar. Smart Business.

System Metrics

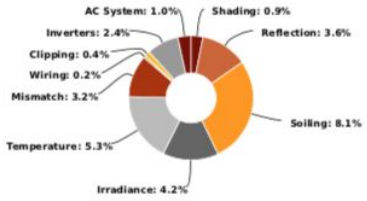
Design	Design 1
Module DC Nameplate	115.2 kW
Inverter AC Nameplate	98.8 kW Load Ratio: 1.17
Annual Production	120.9 MWh
Performance Ratio	74.7%
kWh/kWp	1,049.1
Weather Dataset	TMY, 10km grid (42.15,-71.35), NREL (prospector)
Simulator Version	66635f87cf-2057fb166f-39fda081a4-58846b297f

Project Location

Monthly Production

Month	GHI (kWh/m²)	POA (kWh/m²)	Shaded (kWh/m²)	Nameplate (kWh)	Grid (kWh)
January	59.0	69.0	67.3	5,586.7	5,031.8
February	79.5	86.2	84.8	6,612.7	5,954.6
March	113.8	115.8	114.8	11,579.1	10,185.8
April	151.3	147.0	146.2	15,614.8	13,290.0
May	163.3	151.6	151.0	16,113.0	13,522.2
June	171.2	158.2	157.6	16,831.9	13,718.6
July	184.2	171.0	170.4	18,211.7	14,864.1
August	158.6	151.4	150.6	16,077.1	13,175.3
September	133.2	133.6	132.6	14,142.7	11,696.6
October	89.0	93.9	92.7	9,839.1	8,354.2
November	60.0	67.5	66.1	6,972.8	6,030.1
December	50.0	59.5	57.7	5,753.7	5,032.1

Sources of System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,413.2	
	POA Irradiance	1,404.6	-0.6%
	Shaded Irradiance	1,391.8	-0.9%
	Irradiance after Reflection	1,342.1	-3.6%
	Irradiance after Soiling	1,233.6	-8.1%
	Total Collector Irradiance	**1,233.4**	**0.0%**
Energy (kWh)	Nameplate	143,335.3	
	Output at Irradiance Levels	137,246.2	-4.2%
	Output at Cell Temperature Derate	130,040.5	-5.3%
	Output After Mismatch	125,850.2	-3.2%
	Optimal DC Output	125,647.2	-0.2%
	Constrained DC Output	125,133.2	-0.4%
	Inverter Output	122,076.1	-2.4%
	Energy to Grid	**120,855.4**	**-1.0%**
Temperature Metrics			
	Avg. Operating Ambient Temp		11.9 °C
	Avg. Operating Cell Temp		24.3 °C
Simulation Metrics			
	Operating Hours		4691
	Solved Hours		4691

Condition Set

Description	Condition Set 1											
Weather Dataset	TMY, 10km grid (42.15,-71.35), NREL (prospector)											
Solar Angle Location	Project Lat/Lng											
Transposition Model	Perez Model											
Temperature Model	Sandia Model											
Temperature Model Parameters	Rack Type		a		b		Temperature Delta					
	Fixed Tilt		-3.56		-0.075		3°C					
	Flush Mount		-2.81		-0.0455		0°C					
Soiling (%)	J	F	M	A	M	J	J	A	S	O	N	D
	25	30	10	5	5	5	5	5	5	5	5	10
Irradiation Variance	5%											
Cell Temperature Spread	4° C											
Module Binning Range	0% to 1.6%											
AC System Derate	1.00%											
Module Characterizations	Module							Characterization				
	"LG400N2W-A5 (Jan1,17)" (LG Electronics)							Default Characterization, PAN				
Component Characterizations	Device							Characterization				
	PVI 7600TL (240) (Solectria)							Default Characterization				

Components

Component	Name	Count
Inverters	PVI 7600TL (240) (Solectria)	13 (98.8 kW)
Home Runs	1 AWG (Aluminum)	26 (171.6 ft)
Combiners	1 input Combiner	13
Combiners	2 input Combiner	7
Combiners	3 input Combiner	6
Strings	10 AWG (Copper)	32 (1,136.4 ft)
Module	LG Electronics, "LG400N2W-A5 (Jan1,17)" (400W)	288 (115.2 kW)

Wiring Zones

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	12	9-9	Along Racking
Wiring Zone 2	12	9-9	Along Racking
Wiring Zone 3	12	9-9	Along Racking
Wiring Zone 4	12	9-9	Along Racking
Wiring Zone 5	12	9-9	Along Racking
Wiring Zone 6	12	9-9	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Flush Mount	Portrait (Vertical)	35°	152.432°	0.0 ft	1x1	45	45	18.0 kW
Field Segment 2	Flush Mount	Portrait (Vertical)	35°	152.432°	0.0 ft	1x1	27	27	10.8 kW
Field Segment 3	Flush Mount	Portrait (Vertical)	35°	241.927°	0.0 ft	1x1	63	63	25.2 kW
Field Segment 4	Flush Mount	Portrait (Vertical)	35°	61.8015884767608°	0.0 ft	1x1	90	90	36.0 kW
Field Segment 5	Flush Mount	Portrait (Vertical)	35°	107.289°	0.0 ft	1x1	45	45	18.0 kW
Field Segment 6	Fixed Tilt	Landscape (Horizontal)	10°	152.476°	1.6 ft	1x1	18	18	7.20 kW

Detailed Layout