PUBLIC COMMENTS RECEIVED for Commercial Industrial Development Subdistrict allowed uses - grid scale solar energy generation facilities

Maine Land Use Planning Commission
Maine Department of Agriculture, Conservation and Forestry

Comment Period Start Date: November 16, 2017

Public Comment Deadline: December 15, 2017

Commenters:

1.	Jeremy Payne	Maine Renewable Energy Association
2.	Mathew Manahan	Pierce Atwood LLP
3.	Dylan Voorhees	Natural Resources Council of Maine
4.	Robert Wood	The Nature Conservancy
5.	Stephen McGrath	Governor's Energy Office
6.	Juliet Browne	Verrill Dana LLP
7.	Eliza Donoghue	Maine Audubon

Rebuttal Comments:

8.	Dylan Voorhees	Natural Resources Council of Maine

MREA
Maine Renewable Energy Association

December 14, 2017

Ben Godsoe
22 State House Station
18 Elkins Lane, Harlow Building
Augusta, Maine 04333-0022

RE: Chapter 10, Commercial Industrial Development Subdistrict allowed uses – grid scale solar energy generation facilities

Dear Mr. Godsoe,

Thank you for the opportunity to comment on the proposed rules for solar energy generation facilities in the Land Use Planning Commission's (LUPC) jurisdiction.

We applaud the initiative the Commission is undertaking to proactively create solar energy rules, and agree it is a worthy effort. As you know, the state – and rural Maine in particular – greatly needs new investment and employment opportunities. That need is precisely why it is critical that the outcome of this rulemaking is a reasonable and predictable process for residents of the unorganized territories (UT), solar energy facility applicants, and other interested parties. Solar is a much different land use than most other types of development, and similar to forestry and other types of agricultural uses, solar is a temporary use. Most solar projects are required to be decommissioned after their useful life, and because solar projects require little to no concrete, decommissioning results in a fully restored property. Further, solar projects are fantastic neighbors as they place no strain on local government services.

We understand that the goal of the proposed rules is to facilitate making grid scale solar energy generation an allowed use in the Commercial Industrial Development Subdistrict (D-CI), but we believe the rules should also recognize that properly sited solar farms are compatible with residential and rural uses. We believe the Commission should apply the same compatibility standards for all LUPC subdistricts, not just for projects proposed for the D-CI Subdistrict.

With respect to several of the specific proposed additions to the rule, proposed new subsection A(2)(b)(2)(c) in Section 10.21 requires that the proposed point of interconnection with the electric transmission system must be within one mile, unless the petitioner demonstrates that a location up to three miles away is compatible with current land uses and does not expand the pattern of development beyond already developed areas. It would be more appropriate to provide an opportunity for an applicant to demonstrate that there is no other reasonably viable alternative that is closer to the proposed point of interconnection, and not to otherwise set a distance limitation on the point of interconnection. As drafted, the one mile distance is far too short and arbitrary. Even when transmission lines are adjacent to a solar project site, the

appropriate point of interconnection to the system from an electrical perspective can be at a much greater distance. In other words, just because a project might be further than three miles from the point of interconnection, it is not safe to assume that it is also the same distance from developed areas. At a minimum, the rule should allow the project's interconnection point to be within ten miles.

Proposed new subsection A(2)(b)(2)(e) in Section 10.21 would detrimentally impact private property rights and the ability to monetize value in one's land. We believe private landowners should have the ability to use their land as they see fit (within reason) regardless of the potential presence of "prime agricultural soils." Further, we fail to see how a solar project negatively impacts any soils anywhere. Notably, the Maine Department of Environmental Protection (DEP) does not consider solar array areas to be new impervious surfaces. DEP recognizes that solar arrays have an extraordinarily limited impact, and we suggest LUPC's proposed rules be consistent with DEP. Further, many solar energy project landowners are farmers, and we have found that by putting a portion of their land into solar energy production, this enables farmers to continue farming on their remaining property and stave off the pressure of more impactful residential and commercial developments.

There is remarkably limited noise generated by the operation of a solar farm. The project's inverters and step-up transformer fans can and do make small amounts of sound; however, a study (attached) completed for a proposed solar project in Vermont by Tech Environmental[1] indicated that sound levels at nearby residences would be between 24.1 and 36.8 dBA – i.e., the decibel levels are very low and will not be noticeable at nearby homes or businesses. Again, DEP's assessment of these sound levels is instructive, as it has found the noise to be at very low levels and of limited duration.

We are unaware of any peer-reviewed data showing negatively impacted property values of land, homes, or businesses being directly attributable to the mere presence of a solar project. If Commission staff is in possession of such data we would welcome the chance to review and comment on it. As you may know, the challenge with determining the cause of declining property values is that there is a litany of potential causes (e.g., quality of schools, other types of development, job opportunities, and real estate market conditions at any given time). Thus, making any categorical or implied statements about solar farms negatively impacting property values is unfounded and misleading.

There are a handful of Maine municipalities that have their own solar ordinances that LUPC may find instructive. We would suggest examining those put in place in Fairfield, Farmington, Sanford, and Winslow (see attachments) – these communities have struck an appropriate balance between providing a robust regulatory review of any solar developments, and ensuring their community remains open for business. Thank for your time and consideration.

Sincerely,

Jeremy N. Payne
Executive Director

[1] Acoustic Analysis by Krebs and Lansing Consulting Engineers for Coolidge Solar I, LLC, Ludlow, Vermont – December 8, 2015.

Exhibit Petitioner IAJ-4

ACOUSTIC ANALYSIS

COOLIDGE SOLAR I, LLC
Barker Road
Ludlow, Vermont

Prepared for:

Ranger Solar
40 Lafayett Street
Yarmouth, Maine 04096

Prepared by:
Ian. A. Jewkes, PE 7200, LLS 639
Krebs and Lansing Consulting Engineers, Inc.
164 Main Street
Colchester, Vermont 05446
802-878-0375

December 8, 2015

TABLE OF CONTENTS:

EXECUTIVE SUMMAY:

This acoustic study has been completed to estimate the noise generated by the proposed project improvements. The Coolidge Solar I, LLC project is on an 88.5 acre site located north and south of Barker Road on the east side of Ludlow at the Cavendish town line.

The nearest neighboring residence is located west of the project and south of Barker Road. Based on the manufactures specifications and the geometric layout of the project equipment, the noise levels generated by the proposed project at the nearest neighboring residence are estimated to be 37 dBA (daytime) 31 dBa (nighttime).

METHODOLOGY:

The sound pressure (in dBa) changes with distance were calculated using the following damping equation:

Noise Level Changes with Distance

$Lb = La - 20 \times \text{Log10}\ (Db/Da)$

Where:

Lb = Noise level at new distance

La = Noise level at original distance

Db = New distance from source of noise

Da = Original distance from source of noise

The combined sound pressure from the project sources, inverters and transformers, were calculated as follows:

Equivalent sound pressure level for multiple discrete (incoherent) noise sources:

$LT = 10 \times \text{Log10}\ [10\text{^}(L1/10) + 10\text{^}(L2/10) + \ldots. + 10\text{^}(Ln/10)$

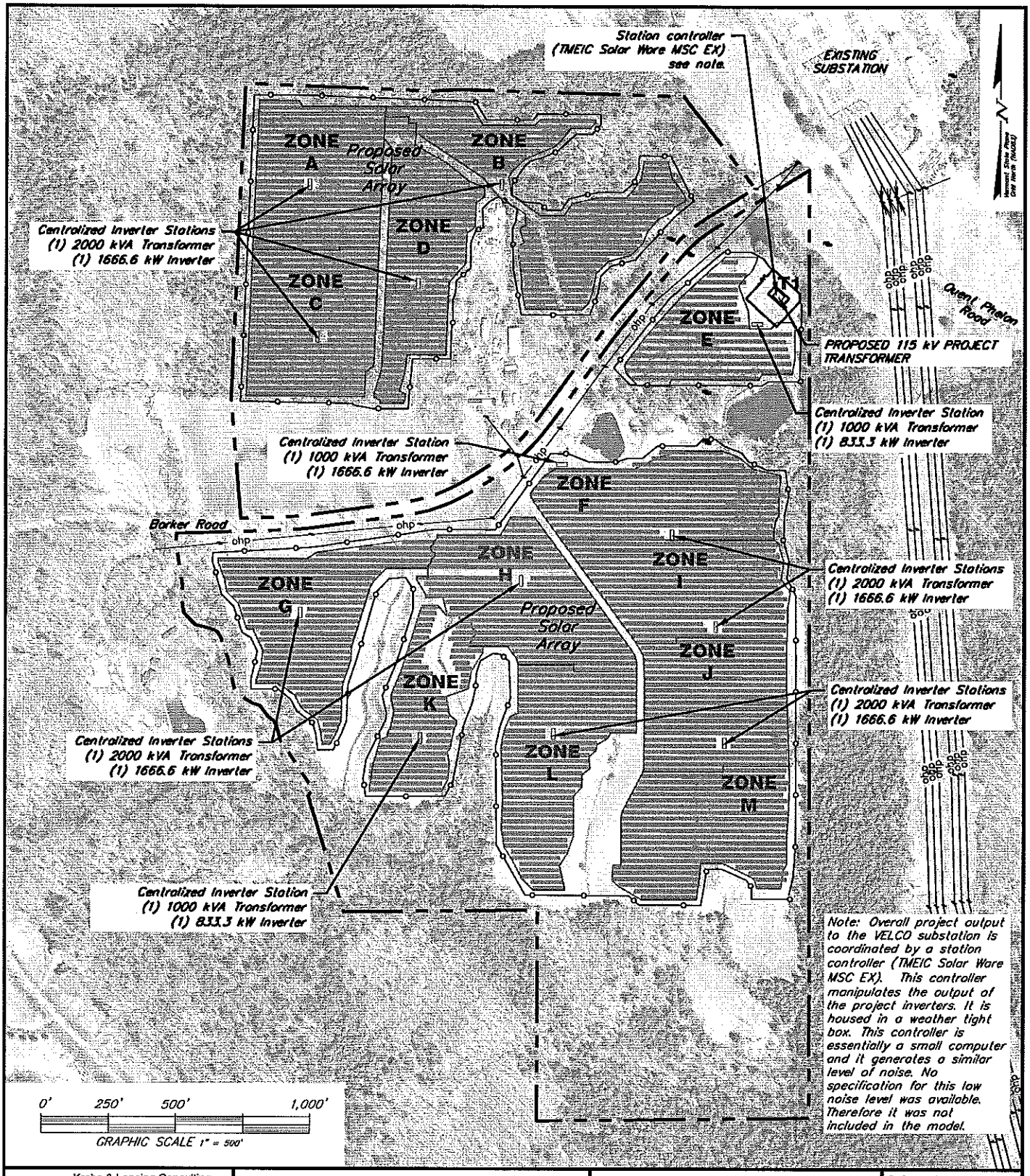
Where:

LT = Total noise level of all equipment

Ln = Noise level for each piece of equipment

No adjustments were applied for attenuation of these values due to obstruction by project equipment, vegetation, or terrain. No adjustments for ambient background noise were applied. Since these adjustments would lower the estimated sound values, the estimates stated will be conservative and avoid underestimation of the sound levels produced by the project equipment observed after the project is in operation.

The sound pressure estimates were calculated for both daytime and nighttime conditions at the property lines and at the neighboring residences.



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RANGER SOLAR

Project Layout and Equipment Plan

Basic Sound Level Estimates for Noise Produced by Transformers and Inverters

Project: Coolidge Solar I, LLC

Location: Barker Road, Ludlow, Vermont

Source Data:

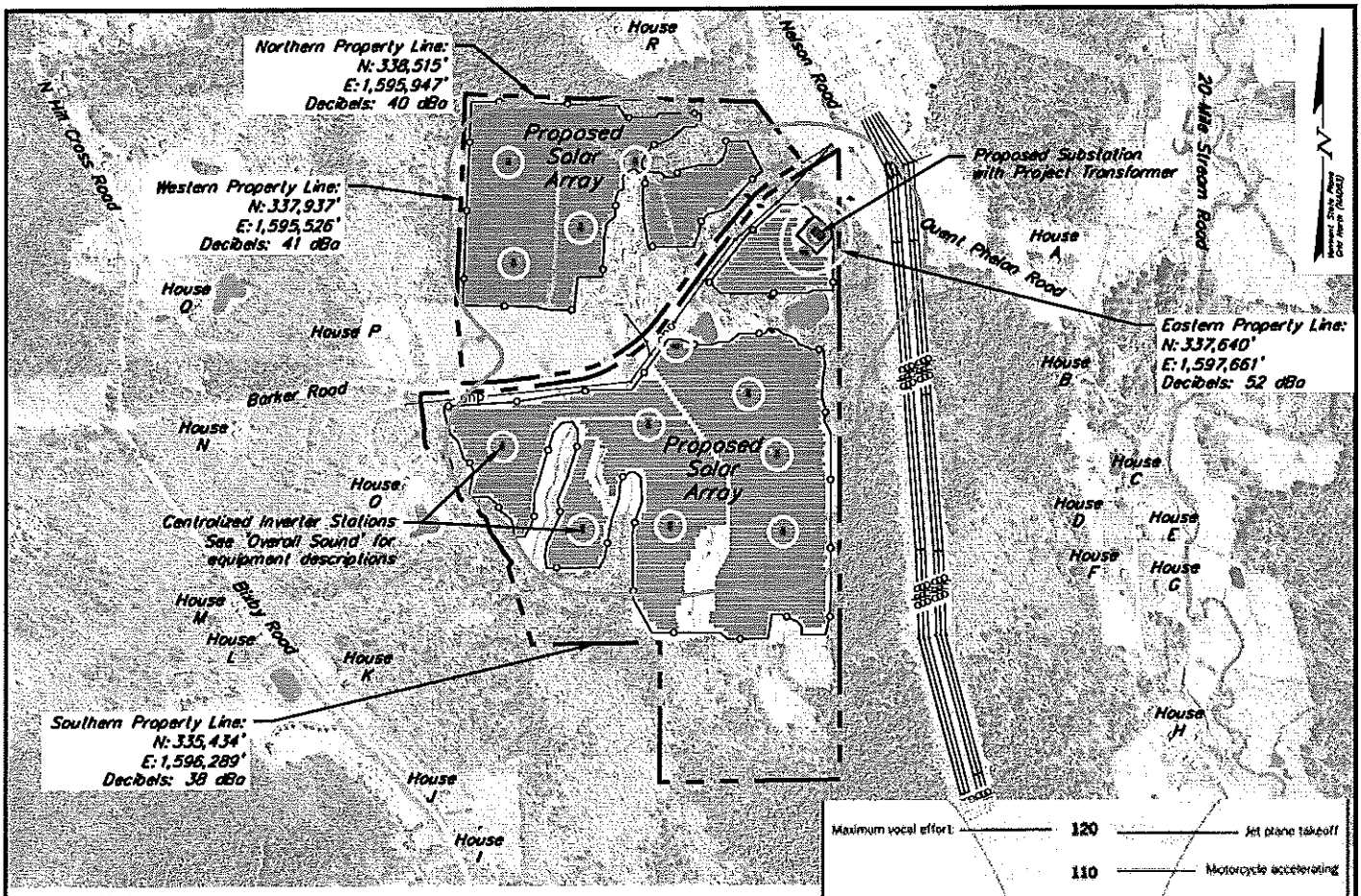
Plan ID: Overall Sound

Scale: 1" = 500'

Date: 12/08/15

DRAWN BY: HKW

CHECKED BY: GTD

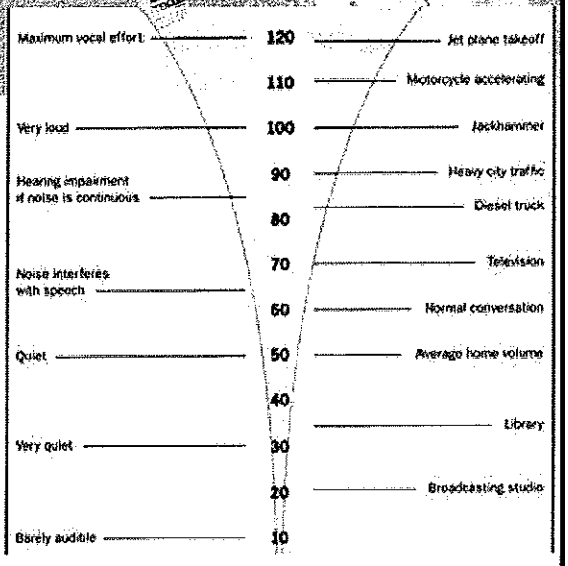


Notes:

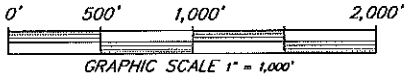
1. TMEIC specifies that the TMEIC 1,666.6 kW Samurai Inverters generate a sound pressure of 67 dBa at a distance of 3 meters from the unit (manufacturer specification). Sound levels for the TMEIC 833.3 kW Samurai Inverters were assumed to be the same as the larger TMEIC 1,666.6 kW Samurai Inverters. Sound levels for the Cooper 1000 kVA Pad Mounted Transformers, and Cooper 2000 kVA Pad Mounted Transformers are a maximum of 58 dBA and 61 dBA, respectively (manufacturer specification). For modeling purposes the louder 61 dBA was used for all Cooper Transformers. Sound levels for the 115 kV (550 kV BIL) 20000 kVA Step Up Transformer is a maximum of 74 dBa (NEMA maximum for device type). For modeling purposes these maximum sound levels were used under the conservative assumption that the sound level was measured at a distance of 3 meters. All inverters and transformers were modeled to be producing the maximum noise level with all equipment running simultaneously.

2. Other decibel ranges were derived using the following distance damping equation [L2 = L1 −20 Log(d1/d2)]. This damping equation was the only factor considered in decibel range attenuation estimates. Elevation, ambient noise, vegetation, angle of solar array and other structures which would further effect the attenuation of sound levels were not considered in this study. Sound levels depicted are for (11) TMEIC 1,666.6 kW Samurai Inverters, (2) TMEIC 833.3 kW Samurai Inverters, the (11) Cooper 2000 kVA Pad Mounted Transformers, the (2) Cooper 1000 kVA Pad Mounted Transformers, and the (1) 115 kV (550 kV BIL) 20000 kVA Step Up Transformer operating simultaneously at maximum noise level. See additional calculation information on Sound 2A and Sound 3A. Overall project output to the VELCO substation is coordinated by a station controller (TMEIC Solar Ware MSC EX). This controller manipulates the output of the project inverters. It is housed in a weather tight box. This controller is essentially a small computer and it generates a similar level of noise. No specification for this low noise level was available. Therefore it was not included in the model.

3. Sound levels reported do not account for any background noise. Local background noise may exceed sound created by project equipment.



Decibel Breakdown Compared to Everyday Noises



Legend:
- 80 dBa range
- 70 dBa range
- 60 dBa range
- 50 dBa range
- 40 dBa range

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RANGER SOLAR

DAYTIME - FULL OPERATION SOUND LEVEL PLAN

Basic Sound Level Estimates for Noise Produced by Transformers and Inverters

Project: Coolidge Solar I, LLC

Location: Barker Road, Ludlow, Vermont

Source Data:
Chart found at www.soundinstitute.com/article_detail.cfm/10/95

Plan ID: Sound 1A

Scale: 1" = 1000'

Date: 12/08/15

DRAWN BY: HKW

CHECKED BY: GTD

Revision Date:

RANGER SOLAR - COOLIDGE PROJECT - DAYTIME- Barker Road, Ludlow, Vermont

Sound Source #		Easting (feet)	Northing (feet)	Noise Level (dBa @ 3 Meters)
TMEIC Samurai Inverter 1666.6 kW	A	1,595,792.37	338,142.23	67
TMEIC Samurai Inverter 1666.6 kW	B	1,596,510.43	338,141.81	67
TMEIC Samurai Inverter 1666.6 kW	C	1,595,822.49	337,571.56	67
TMEIC Samurai Inverter 1666.6 kW	D	1,596,199.50	337,772.29	67
TMEIC Samurai Inverter 833.3 kW	E	1,597,478.13	337,632.81	67
TMEIC Samurai Inverter 1666.6 kW	F	1,596,747.37	337,107.12	67
TMEIC Samurai Inverter 1666.6 kW	G	1,595,760.56	336,540.77	67
TMEIC Samurai Inverter 1666.6 kW	H	1,596,587.23	336,660.92	67
TMEIC Samurai Inverter 1666.6 kW	I	1,597,152.12	336,833.07	67
TMEIC Samurai Inverter 1666.6 kW	J	1,597,315.33	336,489.31	67
TMEIC Samurai Inverter 833.3 kW	K	1,596,210.38	336,071.23	67
TMEIC Samurai Inverter 1666.6 kW	L	1,596,708.62	336,088.68	67
TMEIC Samurai Inverter 1666.6 kW	M	1,597,348.88	336,055.03	67
2000 kVA Pad Mounted Transformer	A	1,595,792.41	338,162.23	61
2000 kVA Pad Mounted Transformer	B	1,596,510.47	338,161.81	61
2000 kVA Pad Mounted Transformer	C	1,595,822.53	337,591.56	61
2000 kVA Pad Mounted Transformer	D	1,596,199.54	337,792.29	61
1000 kVA Pad Mounted Transformer	E	1,597,458.13	337,632.85	61
2000 kVA Pad Mounted Transformer	F	1,596,727.37	337,107.16	61
2000 kVA Pad Mounted Transformer	G	1,595,760.60	336,560.77	61
2000 kVA Pad Mounted Transformer	H	1,596,587.27	336,680.92	61
2000 kVA Pad Mounted Transformer	I	1,597,152.16	336,853.07	61
2000 kVA Pad Mounted Transformer	J	1,597,315.37	336,509.31	61
1000 kVA Pad Mounted Transformer	K	1,596,210.41	336,091.23	61
2000 kVA Pad Mounted Transformer	L	1,596,708.66	336,108.68	61
2000 kVA Pad Mounted Transformer	M	1,597,348.92	336,075.03	61
115 kV (550dV BIL) 20000 kVA Transformer	SUB	1,597,547.29	337,738.56	75

TMEIC documents that the TMEIC 1,666.6 kW Samurai Inverters generate a sound pressure of 67 dBa at a distance of 3 meters from the unit (manufacturer specification). Sound levels for the TMEIC 833.3 kW Samurai Inverters were undocumented. For modeling purposes the maximum sound level was conservatively estimated to be equal to that of the larger Samurai Inverters.

Cooper Power Systems documents that the 2000 kVA Pad Mounted Transformers produce a sound level of 61 dBA. Distance not documented, therefore used conservative assumption that this was at 3 meters.

For modeling purposes the maximum sound level for all transformers was conservatively estimated to be equal to that of the 2000 kVA transformers.

NEMA documents that the 20,000 kVA "Step Up Transformer" produces a sound level of 74 to 75 dBa. Distance not documented, therefore used conservative assumption that this was at 3 meters.

Note: Overall project output to the VELCO substation is coordinated by a station controller (TMEIC Solar Ware MSC EX). This controller manipulates the output of the project inverters. It is housed in a weather tight box. This controller is essentially a small computer and it generates a similar level of noise. No specification for this low noise level was available. Therefore it was not included in the model.

Formulas used for Calculations

Adding of Noise Levels

$L_T = 10 \times \text{Log}_{10} (10^{L1/10} + 10^{L1/10} + ... + 10^{Ln/10})$

Where:

L_T = Total noise level of all equipment

Ln = Noise level for each piece of equipment

Noise Level Changes with Distance

Lb = La - 20 x Log10 (Db/Da)

Where:

Lb = Noise level at new distance

La = Noise level at original distance

Db = New distance from source of noise

Da = Original distance from source of noise

		1.5 meter	3 meter	
TMEIC Samurai Inverter 1,666.6 kW		73.000	66.979	

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RANGER SOLAR

DAYTIME - FULL OPERATION EQUIPMENT SUMMARY

Basic Sound Level Estimates for Noise Produced by Transformers and Inverters

DRAWN BY: HKW | CHECKED BY: GTD

Project: Coolidge Solar I, LLC

Location: Barker Road, Ludlow, Vermont

Source Data:

Revision Date:

Sound 2A

Scale: N/A

Date: 12/08/15

Points of Interest were chosen based on close proximity to the proposed project.

Points of Interest		Easting (feet)	Northing (feet)	Estimated Noise Level Based on Project Components (Sound Pressure, dBa)
Northern Property Line		1,595,946.56	338,514.91	40
Eastern Property Line		1,597,660.95	337,640.20	52
Southern Property Line		1,596,289.31	335,434.12	38
Western Property Line		1,595,525.64	337,937.33	41
House A		1,598,813.53	337,572.28	36
House B		1,599,006.21	336,922.08	35
House C		1,599,252.16	336,309.47	33
House D		1,599,179.22	336,209.33	33
House E		1,599,345.03	336,074.67	32
House F		1,599,268.75	335,835.36	32
House G		1,599,446.30	335,748.76	32
House H		1,599,547.53	334,852.19	30
House I		1,595,656.27	334,387.09	32
House J		1,595,480.39	334,586.21	32
House K		1,594,899.20	335,208.94	33
House L		1,594,425.31	335,483.80	32
House M		1,594,308.32	335,609.17	32
House N		1,594,290.10	336,587.72	33
House O		1,595,226.48	336,322.53	37
House P		1,595,052.31	337,172.74	37
House Q		1,594,095.16	337,318.31	33
House R		1,596,419.20	338,840.62	38

Existing residence that is the nearest to the proposed solar array, "House O".

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RANGER SOLAR

DAYTIME - FULL OPERATION
CALCULATED SOUND PRESSURES

Basic Sound Level Estimates for Noise Produced by Transformers and Inverters

Project: Coolidge Solar I, LLC

Location: Barker Road, Ludlow, Vermont

Source Data:

Sound 3A

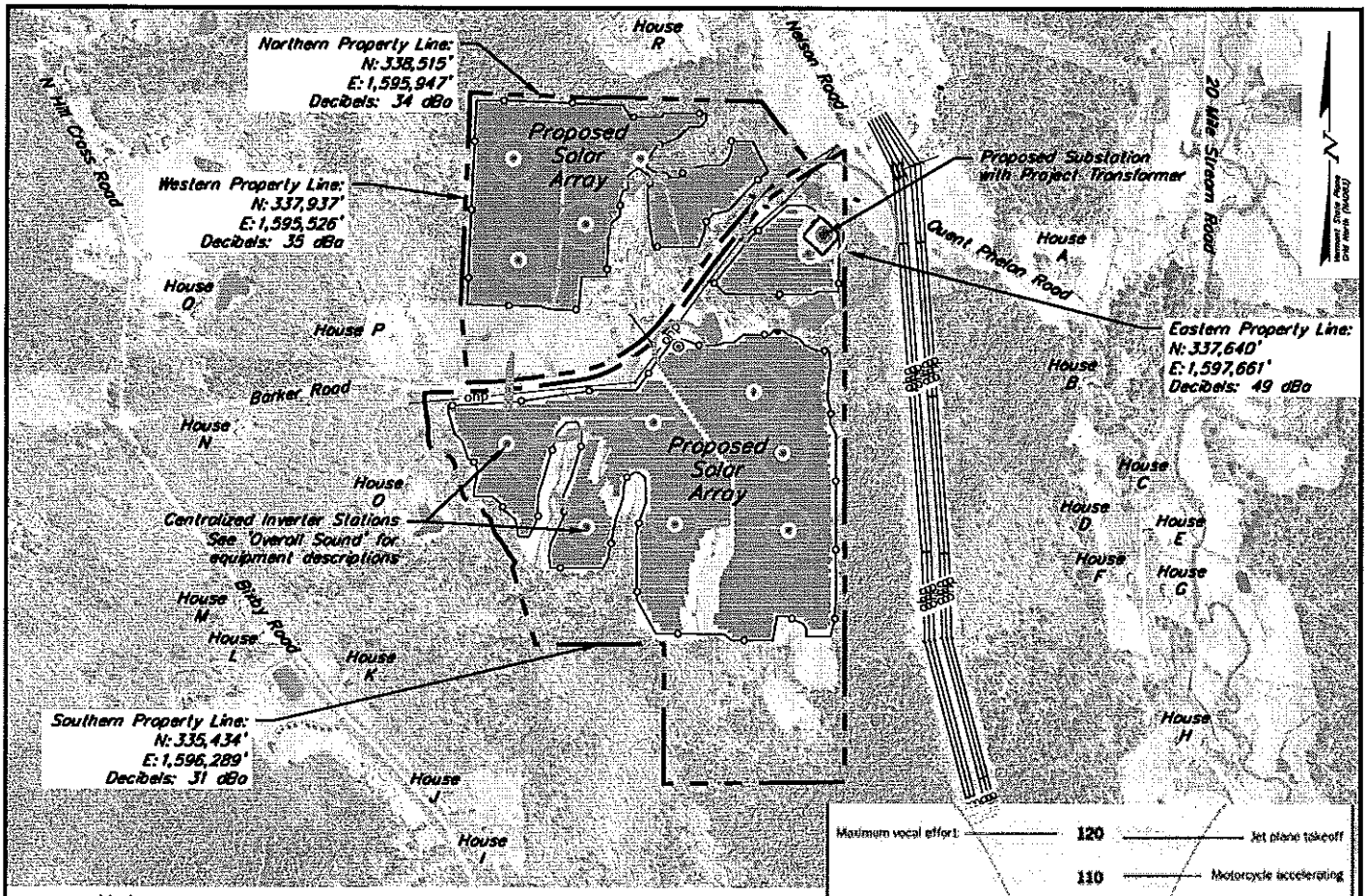
Scale: N/A

Date: 12/08/15

DRAWN BY: HKW

CHECKED BY: CTD

Revision Date:

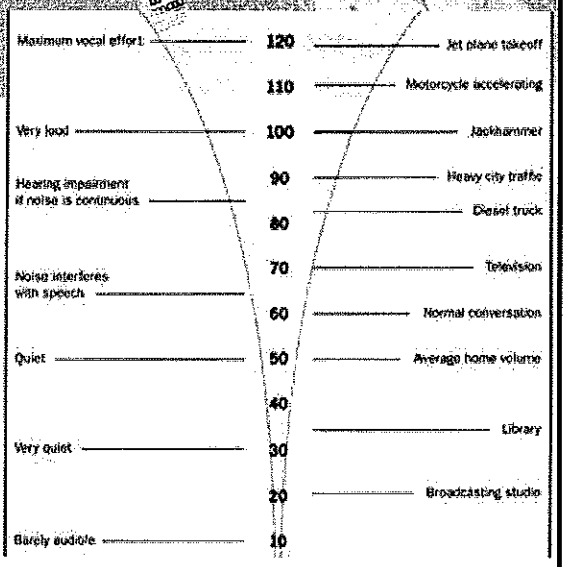


Notes:

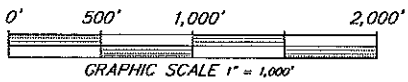
1. *At night the only device in the inverters that can produce noise is a small computer. The noise level is reportedly nominal. No noise information for this state was available. Therefore the inverters were modeled as producing no noise at night. Nighttime Sound levels for the Cooper 1000 kVA Pad Mounted Transformers, and Cooper 2000 kVA Pad Mounted Transformers are a maximum of 58 dBA and 61 dBA, respectively (manufacturer specification). For modeling purposes the louder 61 dBA was used for all Cooper Transformers. Nighttime sound level for the 115 kV (550 kV BIL) 20000 kVA Step Up Transformer is a maximum of 72 dBa (NEMA maximum for device type), transformer energized but not loaded with power. For modeling purposes these maximum sound levels were used under the conservative assumption that the sound level was measured at a distance of 3 meters. All inverters and transformers were modeled to be producing the maximum noise level with all equipment running simultaneously.*

2. *Other decibel ranges were derived using the following distance damping equation [L2 = L1 −20 Log(d1/d2)]. This damping equation was the only factor considered in decibel range attenuation estimates. Elevation, ambient noise, vegetation, angle of solar array and other structures which would further effect the attenuation of sound levels were not considered in this study. Sound levels depicted are for (11) TMEIC 1,666.6 kW Samurai Inverters, (2) TMEIC 833.3 kW Samurai Inverters, the (11) Cooper 2000 kVA Pad Mounted Transformers, the (2) Cooper 1000 kVA Pad Mounted Transformers, and the (1) 115 kV (550 kV BIL) 20000 kVA Step Up Transformer operating simultaneously at maximum nighttime noise level. See additional calculation information on Sound 2B and Sound 3B. Overall project output to the VELCO substation is coordinated by a station controller (TMEIC Solar Ware MSC EX). This controller manipulates the output of the project inverters. It is housed in a weather tight box. This controller is essentially a small computer and it generates a similar level of noise. No specification for this low noise level was available. Therefore it was not included in the model.*

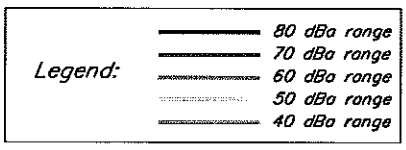
3. *Sound levels reported do not account for any background noise. Local background noise may exceed sound created by project equipment.*



Decibel Breakdown Compared to Everyday Noises



GRAPHIC SCALE 1" = 1,000'



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RANGER SOLAR

NIGHTTIME SOUND LEVEL PLAN

Basic Sound Level Estimates for Noise Produced by Transformers and Inverters

Project: Coolidge Solar I, LLC

Location: Barker Road, Ludlow, Vermont

Source Data:
Chart found at www.soundinstitute.com/article_detail.cfm/10/95

Plan ID: Sound 1B

Scale: 1" = 1000'

Date: 12/08/15

DRAWN BY: HKW

CHECKED BY: GTD

Revision Date:

RANGER SOLAR - COOLIDGE PROJECT - NIGHTTIME- Barker Road, Ludlow, Vermont

Sound Source #		Easting (feet)	Northing (feet)	Noise Level (dBa @ 3 Meters)
TMEIC Samurai Inverter 1666.6 kW	A	1,595,792.37	338,142.23	0
TMEIC Samurai Inverter 1666.6 kW	B	1,596,510.43	338,141.81	0
TMEIC Samurai Inverter 1666.6 kW	C	1,595,822.49	337,571.56	0
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2000 kVA Pad Mounted Transformer	M	1,597,348.92	336,075.03	61
115 kV (550dV BIL) 20000 kVA Transformer	SUB	1,597,547.29	337,738.56	72

At night the only device in the inverters that can produce noise is a small computer. The noise level is reportedly nominal. No noise information for this state was available. Therefore the inverters were modeled as producing no noise at night.

Cooper Power Systems documents that the 2000 kVA Pad Mounted Transformers produce a sound level of 61 dBA. Distance not documented, therefore used conservative assumption that this was at 3 meters.

For modeling purposes the maximum sound level for all transformers was conservatively estimated to be equal to that of the 2000 kVA transformers.

NEMA documents that the 20,000 kVA "Step Up Transformer" produces a sound level of 71 to 72 dBa when the transformer is energized but not loaded with power. Distance not documented, therefore used conservative assumption that this was at 3 meters.

Note: Overall project output to the VELCO substation is coordinated by a station controller (TMEIC Solar Ware MSC EX). This controller manipulates the output of the project inverters. It is housed in a weather tight box. This controller is essentially a small computer and it generates a similar level of noise. No specification for this low noise level was available. Therefore it was not included in the model.

Formulas used for Calculations

Adding of Noise Levels

$L_T = 10 \times \text{Log}_{10} (10^{L1/10} + 10^{L1/10} + ... + 10^{Ln/10})$

Where:

L_T = Total noise level of all equipment

Ln = Noise level for each piece of equipment

Noise Level Changes with Distance

$Lb = La - 20 \times \text{Log}10 (Db/Da)$

Where:

Lb = Noise level at new distance

La = Noise level at original distance

Db = New distance from source of noise

Da = Original distance from source of noise

Krebs & Lansing Consulting Engineers, Inc.
164 Main Street, Suite 201
Colchester, VT 05446
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F: (802) 878-9618
email@krebsandlansing.com

RANGER SOLAR

NIGHTTIME EQUIPMENT SUMMARY

Basic Sound Level Estimates for Noise Produced by Transformers and Inverters

DRAWN BY: HKW

CHECKED BY: GTD

Project: Coolidge Solar I, LLC

Location: Barker Road, Ludlow, Vermont

Source Data:

Revision Date:

Sound 2B

Scale: N/A

Date: 12/08/15

Points of Interest were chosen based on close proximity to the proposed project.

Points of Interest		Easting (feet)	Northing (feet)	Estimated Noise Level Based on Project Components (Sound Pressure, dBa)
Northern Property Line		1,595,946.56	338,514.91	34
Eastern Property Line		1,597,660.95	337,640.20	49
Southern Property Line		1,596,289.31	335,434.12	31
Western Property Line		1,595,525.64	337,937.33	35
House A		1,598,813.53	337,572.28	32
House B		1,599,006.21	336,922.08	30
House C		1,599,252.16	336,309.47	28
House D		1,599,179.22	336,209.33	28
House E		1,599,345.03	336,074.67	27
House F		1,599,268.75	335,835.36	27
House G		1,599,446.30	335,748.76	26
House H		1,599,547.53	334,852.19	25
House I		1,595,656.27	334,387.09	26
House J		1,595,480.39	334,586.21	26
House K		1,594,899.20	335,208.94	27
House L		1,594,425.31	335,483.80	26
House M		1,594,308.32	335,609.17	26
House N		1,594,290.10	336,587.72	27
House O		1,595,226.48	336,322.53	31
House P		1,595,052.31	337,172.74	30
House Q		1,594,095.16	337,318.31	26
House R		1,596,419.20	338,840.62	32
House S		1,596,564.20	337,230.69	38

Existing residence that is the nearest to the proposed solar array, "House O".

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RANGER SOLAR

NIGHTTIME CALCULATED SOUND PRESSURES

Basic Sound Level Estimates for Noise Produced by Transformers and Inverters

Project: Coolidge Solar I, LLC

Location: Barker Road, Ludlow, Vermont

Source Data:

DRAWN BY: HKW

CHECKED BY: GTD

Revision Date:

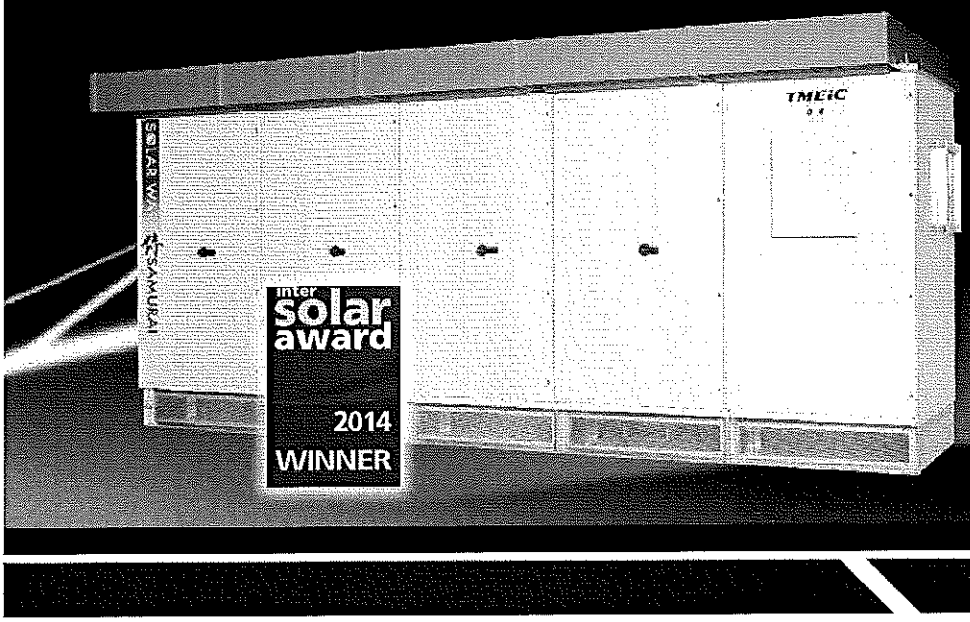
Sound 3B

Scale: N/A

Date: 12/08/15

TMEiC

SOLAR WARE® SAMURAI



- Advanced Hybrid Cooling
- Maximum 99% efficiency
- Patented multilevel Inverter system
- High voltage MPPT window: up to 950V
- NEMA3R Outdoor Enclosure

Award Winning Central Inverters for the Solar Industry

- Advanced multilevel inverter - 56% of switching loss reduction
- Maximized and optimized efficiency at high load
- Wide MPPT range allowing for best in class DC/AC Ratios
- Flexible DC-input configuration to meet complex array configuration

Grid Connection Features

TMEIC developed the grid connection features working with Japanese power companies. All of TMEIC's utility scale inverters include the latest interconnection technology. These features include:

- Power factor control
- Reactive/Active power control
- TMEIC's proprietary anti-islanding technique utilizes a slip mode frequency shift method
- Advanced Fault Ride Through Features

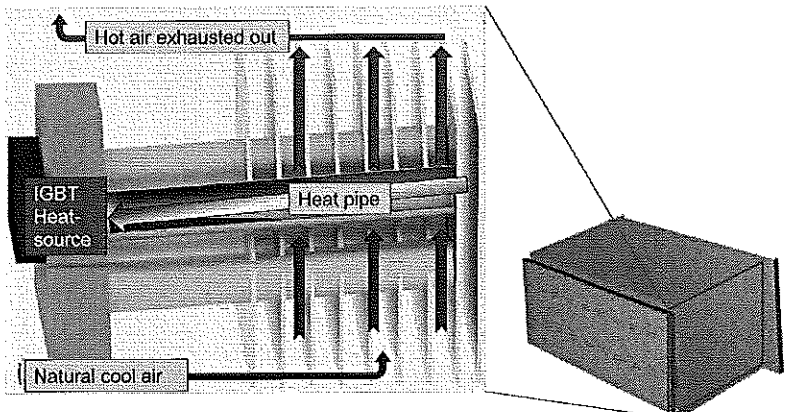
NEW Advanced Hybrid Cooling System

The first heat pipe air-cooled PV inverter

Utilizing TMEIC heat pipe technology, the inverter runs without fan operation up to 50% load. Heat-pipe cooling significantly simplifies thermal management, because it uses fewer parts and only a slow-speed fan with a heat pipe heat sink. TMEIC's advanced hybrid cooling solution is:

- Simple & Robust
- Offers High Reliability
- Significantly reduces O&M costs

The Fan-less mode runs when the inverter is below 50% load @ 50°C. Natural convection provides necessary cooling. Cool air enters from the bottom, flows through the heat pipe, and hot air is exhausted from the top.



Fan-less Mode

C US Canada United States

SPECIFICATIONS

Type		PVL-L0833GR	PVL-L1833GRQ	PVL-L1833GRM
Output side (AC)	Rated Power	833 kW	1667 kW	1833 kW
	Rated Voltage (3-phase)	418V +10%, -12%*	418V +10%, -12%	418V +10%, -12%
	Rated Frequency	60/50 Hz (+0.5 Hz, -0.7 Hz)	60/50 Hz (+0.5 Hz, -0.7 Hz)	60/50 Hz (+0.5 Hz, -0.7 Hz)
	Power Factor Range	0.91 Lead/Lag	0.91 Lead/Lag	0.91 Lead/Lag
	Maximum Current	1438 Arms @368Vac/88%	2877 Arms@368 Vac/88 %	2762 Arms@418 Vac
	Max. Efficiency	99%***	99%	99%***
	CEC Efficiency	98.5%***	98.5%	98.5%***
Input side (DC)	Maximum Voltage	1000 Vdc		
	MPPT Operation Range	605 Vdc ~ 950 Vdc**		
Environ. Conditions	Enclosure Protection Ratings	NEMA3R		
	Installation	Outdoor		
	Amb. Temp. Range	-20° ~ 55° C (-4° ~ 131° F); Derate from 50°-55° C		
	Maximum Altitude	2000 m (contact TMEIC for ratings above 2000 m)		
Protective Functions	Input (DC) Side	Ground Fault, DC Reverse Current, Over Voltage, Over Current		
	Grid (AC) Side	Anti-islanding, Over/Under Voltage, Over/Under Frequency, Over Current		
	Grid Assistance	Reactive/Active Power Control, Power Factor Control, Fault Ride Through (optional)		
User Interface	User Interface	LCD (3.8 inch, QVGA) with Touch-Screen		
	Communication	Modbus/TCP		
Fault Analysis		Fault Event Log, Waveform Acquisition via memory card		
Compliance		UL1741/CSA; 107.1/IEEE1547; UL1741/CSA; EC standard		
Cooling Method		Advanced Hybrid Cooling		
Standard Number of Inputs		1		
Standard Control Power Supply		Control Power Supply from Inverter output & Capacitor backup circuit (3 sec. compensation)		
Weight		7940 lbs (3600kg)	11,500 lbs (5200 kg)	11,500 lbs (5200 kg)
Dimensions (H x W x D)		92 x 118 x 46 inch (2286 x 3000 x 1150 mm)	92 x 197 x 46 inch (2286 x 5000 x 1150 mm)	92 x 197 x 46 inch (2286 x 5000 x 1150 mm)
Floor Space		5,348 sq. in. (3.45m²)	8,914 sq. in. (5.75 m²)	8,914 sq. in. (5.75 m²)
Color		Cabinet: Sand White #Dic583, Roof:Gray #Munsel N4.5		

Notes:

* Full power available @ 418V and above. Derate required below nominal voltage.

** Transition from constant DC voltage mode to MPPT mode occurs between 595V and 605V.

*** Pending under certification test.

TOSHIBA MITSUBISHI-ELECTRIC INDUSTRIAL SYSTEMS CORPORATION
Power Electronics Systems Division, Photovoltaic System Center
Email: info-pv@tmeic.co.jp • www.tmeic.co.jp

TMEiC

P-1307-D
Revised September 2014

Three-phase pad-mounted compartmental type transformer

General

At Eaton's Cooper Power Systems, we are constantly striving to introduce new innovations to the transformer industry, bringing you the highest quality, most reliable transformers. Eaton's Cooper Power Systems Transformer Products are ISO 9001 compliant, emphasizing process improvement in all phases of design, manufacture, and testing. In order to drive this innovation, we have invested both time and money in the Thomas A. Edison Technical Center, our premier research facility in Franksville, Wisconsin. Headquarters for the Systems Engineering Group of Eaton's Cooper Power Systems, such revolutionary products as distribution-class UltraSIL™ Polymer-Housed Evolution™ surge arresters and Envirotemp™ FR3™ fluid have been developed at our Franksville lab.

With transformer sizes ranging from 45 kVA to 12 MVA and high voltages ranging from 2400 V to 46 kV, Eaton's Cooper Power Systems has you covered. From fabrication of the tanks and cabinets to winding of the cores and coils, to production of arresters, switches, tap changers, expulsion fuses, current limit fuses, bushings (live and dead) and molded rubber goods, Eaton's Cooper Power Systems does it all. Eaton's Cooper Power Systems transformers are available with electrical grade mineral oil or Envirotemp™ FR3™ fluid, a less-flammable and bio-degradable fluid. Electrical codes recognize the advantages of using Envirotemp™ FR3™ fluid both indoors and outdoors for fire sensitive applications. The bio-based fluid meets Occupational Safety and Health Administration (OSHA) and Section 450.23 NEC Requirements.

Cooper Power Systems
by EATON

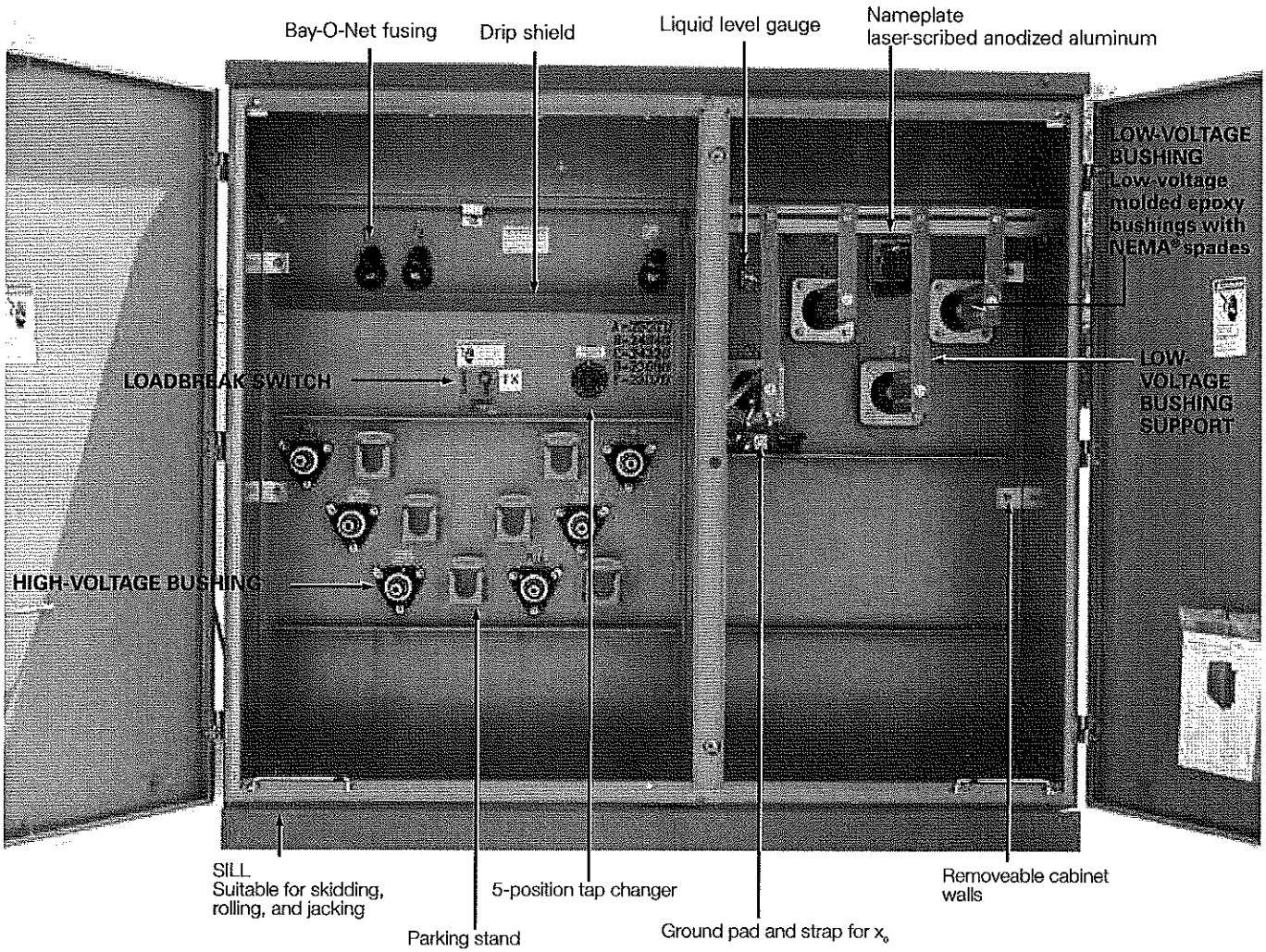


Figure 1. Three-phase pad-mounted compartmental type transformer.

Table 1. Product Scope

Type	Three Phase, 50 or 60 Hz, 65 °C Rise (55 °C, 55/65 °C), 65/75 °C, 75 °C
Fluid Type	Mineral oil or Envirotemp™ FR3™ fluid
Coil Configuration	2-winding or 4-winding or 3-winding (Low-High-Low), 3-winding (Low-Low-High)
Size	45 – 12,000 kVA
Primary Voltage	2,400 – 46,000 V
Secondary Voltage	208Y/120 V to 14,400 V
Specialty Designs	Inverter/Rectifier Bridge
	K-Factor (up to K-19)
	Vacuum Fault Interrupter (VFI)
	UL® Listed & Labeled and Classified
	Factory Mutual (FM) Approved®
	Solar/Wind Designs
	Differential Protection
	Seismic Applications (including OSHPD)
	Hardened Data Center

Table 2. Three-Phase Ratings

Three-Phase 50 or 60 Hz
kVA Available[1] 45, 75, 112.5, 150, 225, 300, 500, 750, 1000, 1500, 2000, 2500, 3000, 3750, 5000, 7500, 10000, 12000

[1]Transformers are available in the standard ratings and configurations shown or can be customized to meet specific needs.

Table 3. Audible Sound Levels

Self-Cooled, Two Winding kVA Rating	NEMA® TR-1 Average Decibels (dB)
45-500	56
501-700	57
701-1000	58
1001-1500	60
1501-2000	61
2001-2500	62
2501-3000	63
3001-4000	64
4001-5000	65
5001-6000	66
6001-7500	67
7501-12000	68

Table 4. Insulation Test Levels

KV Class	Induced Test 180 or 400 Hz 7200 Cycle	kV BIL Distribution	Applied Test 60 Hz (kV)
1.2	TWICE RATED VOLTAGE	30	10
2.5		45	15
5		60	19
8.7		75	26
15		95	34
25 (grd Y Only)		125	40
25		150	50
34.5 (grd Y Only)		125	40
34.5		150	70
46		200	95

Table 5. Temperature Rise Ratings 0-3300 Feet (0-1000 meters)

	Standard	Optional
Unit Rating (Temperature Rise Winding)	65 °C	55 °C, 55/65 °C, 75 °C
Ambient Temperature Max	40 °C	50 °C
Ambient Temperature 24 Hour Average	30 °C	40 °C
Temperature Rise Hotspot	80 °C	65 °C

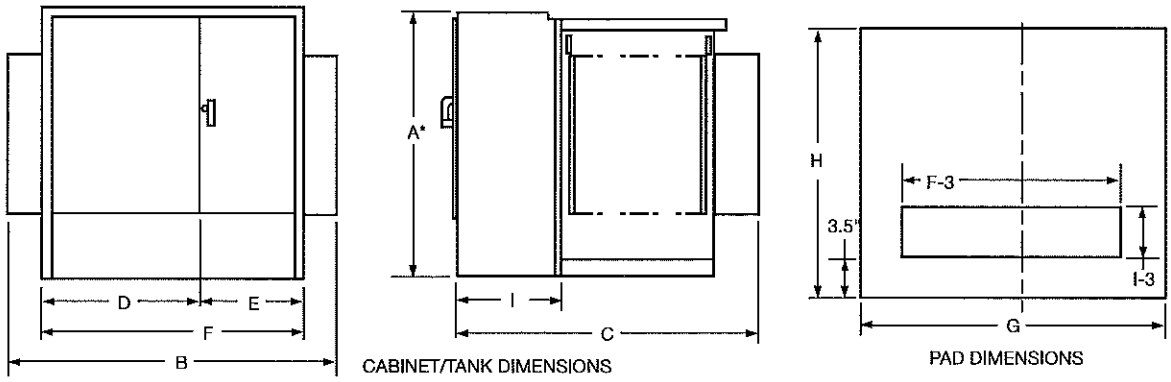


Figure 2. Transformer and pad dimensions.

* Add 9" for Bay-O-Net fusing.

Table 6. Fluid-filled—aluminum windings 55/65 °C Rise[1]

65° Rise	DEAD-FRONT—LOOP OR RADIAL FEED—BAY-O-NET FUSING OIL FILLED—ALUMINUM WINDINGS										
	OUTLINE DIMENSIONS (in.)									Gallons of	Approx. Total
kVA Rating	A*	B	C	D	E	F	G	H	I	Fluid	Weight (lbs.)
45	50	68	39	42	26	68	72	43	20	110	2,100
75	50	68	39	42	26	68	72	43	20	115	2,250
112.5	50	68	49	42	26	68	72	53	20	120	2,350
150	50	68	49	42	26	68	72	53	20	125	2,700
225	50	72	51	42	30	72	76	55	20	140	3,150
300	50	72	51	42	30	72	76	55	20	160	3,650
500	50	89	53	42	30	72	93	57	20	190	4,650
750	64	89	57	42	30	72	93	61	20	270	6,500
1000	64	89	59	42	30	72	93	63	20	350	8,200
1500	73	89	86	42	30	72	93	90	24	410	10,300
2000	73	72	87	42	30	72	76	91	24	490	12,500
2500	73	72	99	42	30	72	76	103	24	530	14,500
3000	73	84	99	46	37	84	88	103	24	620	16,700
3750	84	85	108	47	38	85	88	112	24	660	19,300
5000	84	96	108	48	48	96	100	112	24	930	25,000
7500	94	102	122	54	48	102	100	126	24	1,580	41,900

1 Weights, gallons of fluid, and dimensions are for reference only and not for construction. Please contact Eaton's Cooper Power Systems for exact dimensions.

* Add 9" for Bay-O-Net fusing.

Table 7. Fluid-Filled—Copper Windings 55/65 °C Rise[1]

65° Rise	DEAD-FRONT—LOOP OR RADIAL FEED—BAY-O-NET FUSING OIL FILLED—COPPER WINDINGS										
	OUTLINE DIMENSIONS (in.)									Gallons of	Approx. Total
kVA Rating	A*	B	C	D	E	F	G	H	I	Fluid	Weight (lbs.)
45	50	64	39	34	30	64	69	43	20	110	2,100
75	50	64	39	34	30	64	69	43	20	115	2,350
112.5	50	64	49	34	30	64	69	53	20	115	2,500
150	50	64	49	34	30	64	69	53	20	120	2,700
225	50	64	51	34	30	64	73	55	20	140	3,250
300	50	64	51	34	30	64	75	55	20	160	3,800
500	50	81	53	34	30	64	85	57	20	200	4,800
750	64	89	57	42	30	72	93	61	20	255	6,500
1000	64	89	59	42	30	72	93	63	20	300	7,800
1500	73	89	86	42	30	72	93	90	24	410	10,300
2000	73	72	87	42	30	72	76	91	24	420	11,600
2500	73	72	99	42	30	72	76	103	24	500	14,000
3000	73	84	99	46	37	84	88	103	24	720	18,700
3750	84	85	108	47	38	85	88	112	24	800	20,500
5000	84	96	108	48	48	96	100	112	24	850	25,000
7500	94	102	122	54	48	102	100	126	24	1,620	46,900

[1] Weights, gallons of fluid, and dimensions are for reference only and not for construction. Please contact Eaton's Cooper Power Systems for exact dimensions.

* Add 9" for Bay-O-Net fusing.

K. Solar Energy Systems

1. Purpose:

It is the purpose of these performance standards to enable the Town to: regulate the permitting of residential, commercial, and industrial solar energy systems; be informed of the placement of residential and commercial solar energy systems; preserve and protect public health and safety; allow for the orderly development of land; and protect property values in the Town of Farmington.

2. Classification:

a. Private Residential Solar Energy Systems (PRSES): An area of land or other area used for a solar collection system principally used to capture solar energy, convert it to electrical energy or thermal power, and supply electrical or thermal power, primarily or solely for on-site residential use, and consisting of one or more free-standing, ground mounted, solar arrays or modules, or solar related equipment, intended to primarily reduce on-site consumption of utility power and/or fuels. Solar arrays or modules that are flush-mounted on the roofs or walls of private residences shall not be subject to PRSES performance standards or permit requirements for same. PRSES can be up to 2,000 square feet in surface area, with a rated nameplate capacity of up to 20kW.

b. Commercial Solar Energy Systems (CSES): An area of land or other area used by a business for a solar collection system principally used to capture solar energy, convert it to electrical energy or thermal power, and supply electrical or thermal power, primarily or solely for on-site commercial use, and consisting of one or more free-standing, ground or roof mounted, solar arrays or modules, or solar related equipment, intended to primarily reduce on-site consumption of utility power and/or fuels. CSES can be up to 20,000 square feet in surface area, with a rated nameplate capacity of up to 250 kW.

c. Industrial Solar Energy Systems (ISES): An area of land or other area used by a property owner and/or corporate entity for a solar collection system principally used to capture solar energy, convert it to electrical energy or thermal power, and supply electrical or thermal power, primarily or solely for off-site utility grid use, and consisting of one or more free-standing, ground-mounted, solar arrays or modules, or solar related equipment, intended to primarily reduce off-site consumption of utility power and/or fuels. ISES are a minimum of 20,000 square feet in surface area, and can be up to 800 acres in surface area, and there is no limit on the rated nameplate capacity of an ISES.

3. Permits Required

a. No person shall construct a PRSES, CSES, or ISES without obtaining a permit from the Code Enforcement Officer (CEO) or Planning Board as follows:

1.) For PRSES, approval by the CEO is required for the construction and/or expansion of all such solar energy systems.

2.) For CSES and ISES, approval by the Planning Board is required for the construction and/or expansion of all such solar energy systems.

4. Application Procedure

a. Applications for PRSES, CSES, and ISES permits shall be filed on forms provided by the Code Enforcement Office and must include the following information:

1.) Name of owner and operator of the solar energy system, and owner of property.

2.) Location of proposed solar energy system, including map/lot number, and street address. Plot plan identifying location of the solar energy system on the property and physical dimensions of the property.

3.) Location of any public road or right-of-way that is contiguous with the property.

4.) Location of overhead utility lines.

b. CSES and ISES permit applications will also require the following supplemental information:

1.) Solar system specifications, including manufacturer and model.

2.) Array/module design and site plans.

3.) Certification that layout, design, and installation conform to and comply with all applicable industry standards, such as the National Electrical Code (NEC)(NFPA-70), the American National Standards Institute (ANSI), the Underwriter's Laboratories (UL), the American Society for Testing & Materials (ASTM), the Institute of Electric & Electronic Engineers (IEEE), the Solar Rating & Certification Corporation (SRCC), the Electrical Testing Laboratory (ETL), and other similar certifying organizations, the Federal Aviation Administration (FAA), the Maine Uniform Building & Energy Code (MUBEC), fire and life-safety codes (NFPA 1 & 101), and any other standards applicable to solar energy systems. The manufacturer specifications for the key components of the solar energy system shall be submitted with the application.

4. Notice to the Abutters

Abutting property owners shall be notified by certified mail, by the Town, at least fifteen (15) days prior to initial Planning Board or CEO consideration. The cost of notification shall be borne by the applicant. The notice shall indicate the time, date and place of Planning Board or CEO consideration, if applicable. Public hearings may be called at the discretion of the Planning Board or CEO. If a public hearing is scheduled, a notice of such shall be published in a newspaper of general circulation in the municipality at least fifteen (15) days prior to the hearing and shall include the date, time and place of the hearing. The cost of advertising shall be borne by the applicant.

5. Onsite Visit

All applicants shall facilitate onsite visits by the CEO and/or the Planning Board as requested.

6. Standards for PRSES Permits

a. A permit for a new PRSES, including all components that comprise the system, shall be granted only in a zoning district in which such a facility is allowed (per §11-8.9.D - Table of Uses).

b. All PRSES shall be setback from abutting property lines, utility lines, and/or public roads or right-of-way by a distance no less than the standard structural setback distance applicable in the zoning district where the system is to be installed. Best Engineering Practices shall be utilized in determining the optimal placement within the above requirements.

c. All PRSES, whether ground or building mounted, shall comply with the structural height restrictions applicable in the zoning district where the system is to be installed. Best Engineering Practices shall be utilized in determining the optimal placement.

d. All ground-mounted electrical and control equipment for PRSES shall be labeled and secured to prevent unauthorized access.

e. All PRSES shall not exceed 50 dB(A), as measured at the closest property line.

f. All PRSES shall be installed so as not to cause any wire or wireless communication signal disturbance.

g. The owner of a roof-mounted PRSES shall provide evidence certified by a TPI that the roof structure is capable of supporting the additional load of the PRSES.

h. All PRSES shall be situated to eliminate concentrated glare onto abutting structures and roadways.

i. The owner of a PRSES shall be required to remove all components if it hasn't produced power for a period of twelve (12) consecutive months, unless otherwise waived by the CEO or the Planning Board.

7. Standards for CSES and ISES Permits

a. A permit for a PSES or ISES, including all components that comprise the system, shall be granted only in a zoning district in which such a facility is allowed (per §11-8.9.D - Table of Uses), and only upon proof of right, title, or interest, such as ownership, easement, lease, or purchase option for the location being considered.

b. A site location map shall be provided which shows the boundaries of the proposed facility, property boundary lines, contiguous properties under the total or partial control of the applicant, scenic resources or historic sites within one mile of the proposed development, and any significant wildlife habitat (per MeDEP under the Site Location of Development Act and/or the Natural Resource Protection Act) which may be impacted.

c. There shall be written evidence in the form of letter copies that all applicable State regulatory agencies with jurisdiction over the project have been notified of the pending application and the location of all system components covered by the application.

d. All PSES and ISES panel arrays and/or modules shall be setback from abutting property boundaries by a distance of 75'. In no case may the setback be less than the required setback distance in the zoning district, shoreland area, or floodplain where the system is to be installed. Best Engineering Practices shall be utilized in determining the optimal placement within the above requirements.

e. All CSES and ISES, whether ground or building mounted, shall comply with the structural height restrictions in the applicable zoning district.

f. The application shall include a description of the proposed CSES or ISES facility to include all non-proprietary manufacturer's specifications for the solar panels, components, controls, and other equipment, sound emission levels, normal and emergency operational shutdown procedures, the number and individual ratings of panels in the array and/or modules, and the aggregate generating capacity of the total system. A description of all associated facilities shall also be included.

g. To the greatest practical extent, CSES and ISES shall possess a manufactured finish appropriate to and compatible with the surroundings, with reflective characteristics that minimize negative visual impacts. The Planning Board may require photos of the existing proposed site from various locations and similar photos from the same locations with the system superimposed to aid in evaluating the visual impact, and will take into consideration the limitations of available manufactured finishes.

h. All ground-mounted electrical and control equipment for CSES and ISES shall be fenced and labeled or secured to prevent unauthorized access. The solar array and/or modules shall be designed and installed to prevent access by the public, and access to same shall be through a locked gate.

i. To the greatest practical extent, all electrical wires and utility connections for CSES and ISES shall be installed underground, except for transformers and controls. The Planning Board will take into consideration prohibitive costs and site limitations in making their determination.

j. Exterior lighting for CSES and ISES shall be limited to that required for safety and operational purposes, and shall meet the performance standards for same in §11-8.11.F.

k. All signs, other than the manufacturer's or installer's identification, appropriate warning signs, or owner identification on a solar panel array and/or modules, building, or other structure associated with a CSES and ISES shall be prohibited. No CSES or ISES shall have any signage, or writing or pictures that may be construed as advertising placed on it at any time.

l. The CSES or ISES applicant shall certify that they will comply with the utility notification requirements contained in Maine law and accompanying regulations through the Maine Public Utility Commission, unless the applicant intends, and so states on the application, that the system will not be connected to the electricity grid.

m. All CSES and ISES shall not exceed 60 dB(A), as measured at the property line.

n. The installation of a CSES or ISES shall be appropriate to the surroundings and shall be located according to Best Engineering Practices. The application shall include site line, photographic and, if applicable, screening information to aid the Planning Board in evaluation of the environmental and visual impact of the construction and operation of the system. The system site shall also be enclosed within an eight (8) foot tall fence with locking gate.

o. All CSES and ISES shall be installed so as not to cause any wire or wireless communication signal disturbance.

p. Ground-mounted CSES and ISES shall be screened from view by any abutting residential property, using vegetation, topography, or fencing.

q. The owner of a roof-mounted CSES or EISES shall provide evidence certified by a TPI that the roof structure is capable of supporting the additional load of the system.

r. All CSES and ISES shall be situated to eliminate concentrated glare onto abutting structures and roadways.

s. Decommissioning of the entire facility will begin if twelve consecutive months of no generation occurs at the facility.

In order to facilitate and ensure appropriate removal of the energy generation equipment of a CSES or ISES when it reaches the end of its useful life, or if the applicant ceases operation of the facility, applicants are required to file a decommissioning plan which details the means by which decommissioning will be accomplished. This plan must include a description of implementing the decommissioning, a description of the work required, a cost estimate for decommissioning, a schedule for contributions to its decommissioning fund, and a demonstration of financial assurance.

In the event of a force majeure or other event which results in the absence of electrical generation for twelve months, by the end of the twelfth month of non-operation the applicant must demonstrate to the Town that the project will be substantially operational and producing electricity within twenty-four months of the force majeure or other event. If such a demonstration is not made to the Town's satisfaction, the decommissioning must be initiated eighteen months after the force majeure or other event. The Town considers a force majeure to mean fire, earthquake, flood, tornado, or other acts of God and natural disasters, and war, civil strife or other similar violence.

The applicant will provide financial assurance for the decommissioning costs in the form of a performance bond or surety bond, ~~or letter of credit, or other acceptable form of financial assurance~~ for the total cost of decommissioning.

The applicant will have the financial assurance mechanism in place prior to construction and will re-evaluate the decommissioning cost and financial assurance at the end of years five, ten and fifteen. Every five years after the start of construction, updated proof of acceptable financial assurance must be submitted to the Town for review. Proof of acceptable financial assurance will be required prior to the start of commercial operation.

8. Permit Fees.

Application for a PRSES shall be accompanied by a fee of fifty ($50.00) dollars. An application for a CSES or ISES permit shall be accompanied by a fee of five-hundred ($500.00) dollars.

9. Expiration of Approval

All PRSES, CSES, and ISES approvals shall expire within one (1) year of the date of issuance unless work thereunder is commenced. Normally, if work is not completed within two (2) years from the date of issuance, a new application must be made (See 11.). The CEO shall make determinations regarding commencement and completion. All CSES and ISES approvals shall expire upon decommissioning (See 7.s.).

10. Extension of Approval

PRSES, CSES, and ISES approvals may be extended for one (1) year from the date of issuance by the CEO for projects not commencing within one (1) year of initial Board approval. Written extension requests must be submitted to the CEO at least forty-five (45) days before the one (1) year expiration. Proposal approvals which are granted a one (1) year extension from the date of issuance shall also have their completion date extended by one (1) year.

Before extending an approval, the CEO must determine that extenuating circumstances beyond the control of the applicant exist. Extenuating circumstances may include but are not limited to: procurement of financing; legal issues; availability of materials; availability of qualified contractors; and adverse weather conditions.

11. Extension of Completion Date

The CEO may extend the completion date of a commenced approved project by one (1) year beyond the allotted two (2) years.

In determining this extension the CEO shall consider factors such as, but not limited to: financial hardship; legal difficulties; site condition problems; contract delay; disruption in supply of labor and/or materials; or personal issues.

12. Exemptions.

All solar energy systems constructed prior to the effective date of these performance standards (XX-XX-XXXX) shall not be required to meet the terms and conditions of same. Any physical modification that expands a PRSES, CSES, or ISES, whether or not existing prior to the effective date of these performance standards, shall require approval. Routine maintenance or replacements do not require a permit.

CHAPTER 280 ZONING

Article II. Definitions

...

§ 280-2-2. Definitions

...

SOLAR ENERGY SYSTEMS A solar collection system used to capture, convert, and supply electrical energy or thermal power, and consisting of one (1) or more freestanding, ground, roof, or wall mounted, solar arrays or modules, or solar related equipment, intended to reduce consumption of utility and/or fuel-generated power.

1. Residential Solar System (RSS): Intended for residential uses, a RSS may be up to two-thousand (2,000) square feet in surface area with a rated nameplate capacity of up to twenty (20) kilowatts (kW).
2. Commercial Solar System (CSS): Intended for a multifamily dwelling, multifamily dwelling above the ground floor of mixed use developments, mobile home park, convalescent, rest, or nursing home, residential care or congregate care facility, institutional use, recreational use, commercial or industrial use, a CSS may be up to twenty (20,000) square feet in surface area with a rated nameplate capacity of up to two-hundred-fifty (250) kilowatts (kW).
3. Utility Solar Systems (USS): Intended for off-site utility grid use, an USS is larger than twenty-thousand (20,000) square feet in surface area with no limit on the rated nameplate capacity.

...

Article XV. Performance Standards

§ 280-15-12. Solar Energy Systems.

280-15-12.1 Purpose. The purpose of these provisions is to regulate solar energy systems, allow the City to be informed of the placement of solar energy systems, preserve and protect public health and safety, allow for orderly development of land, and protect property values.

280-15-12.2 Standards.

280-15-12.2.1 A Residential Solar System (RSS) shall:

280-15-12.2.1.1 Comply with the setback and height requirements of the zoning district in which the system is to be installed.

280-15-12.2.1.2 Comply with the provisions of all applicable requirements of the City's building, electrical, fire, and other health safety and technical codes, including but not limited to **Chapters 90: Building Construction** and **128: Fire Prevention**.

280-15-12.2.1.3 Be installed so as not to cause any wire or wireless communication signal disturbance.

280-15-12.2.1.4 Be sited to prevent glare onto abutting properties, structures, and roadways.

280-15-12.2.1.5 Be removed if it has not produced power for a period of twelve (12) consecutive months.

280-15-12.2.2 A Commercial Solar System (CSS) and Utility Solar System (USS) shall:

280-15-12.2.2.1 Comply with the requirements of **Article XVI: Site Plan Review**.

280-15-12.2.2.2 Comply with the setback and height requirements of the zoning district in which the system is to be installed.

280-15-12.2.2.3 Comply with the provisions of all applicable requirements of the City's building, electrical, fire, and other health safety and technical codes, including but not limited to **Chapters 90: Building Construction** and **128: Fire Prevention**.

280-15-12.2.2.4 Comply with the Industrial Performance Standards specified in **§ 280-15-3**.

280-15-12.2.2.5 Secure all ground-mounted electrical and control equipment to prevent unauthorized access. The ground-mounted facility shall be enclosed within a minimum seveneight (78) foot tall fence with locking gate and knox box to provide emergency access. The type of fence shall be appropriate for security, screening, and/or other purposes and shall be similar to and/or compatible with the style of fences used within one-thousand (1,000) feet of the property boundary.

280-15-12.2.2.6 Install all electrical wires and utility connections, except for transformers and controls, underground to the greatest practical extent. The Planning Board shall consider prohibitive costs and site limitations if asked to waive this standard.

280-15-12.2.2.7 Limit exterior lighting to that required for safety and operational purposes.

280-15-12.2.2.8 All signs shall meet the specifications of § 280-14-13.

280-15-12.2.2.9 Be appropriate to the surroundings and minimize environmental and visual impacts on adjoining properties, including:

280-15-12.2.2.9.1 Screening ground-mounted installations from view by abutting residential properties, using vegetation, topography, and/or fencing.

280-15-12.2.2.9.2 Using a manufactured finish appropriate to and compatible with the surroundings, with reflective characteristics that minimize negative visual impacts to the greatest practical extent.

280-15-12.2.2.10 Be removed if it has not produced power for a period of twelve (12) consecutive months. In the event of a natural disaster, act of violence, or other event which results in the absence of electrical generation for twelve (12) months, by the end of the twelfth (12^{th}) month of nonoperation the applicant shall demonstrate to the City that the project shall be substantially operational and producing electricity within twenty-four (24) months of the event. If such a demonstration is not made to the City's satisfaction, the decommissioning shall be initiated eighteen (18) months after the event.

280-15-12.2.2.11 A performance guarantee in compliance with **Article XVII** shall be provided prior to initiating construction. The performance guarantee shall provide adequate funds to cover the total cost of decommissioning. Every five (5) years after the start of construction, updated proof of the cost of decommissioning shall be submitted to the City Engineer. If the amount of the current performance guarantee is inadequate to cover the total cost of decommissioning, the applicant shall provide a new performance guarantee in an amount which is adequate to cover the total cost of decommissioning.

...

§ 280-16-3 Site plan approval required.

280-16-3.1 Site plan approval shall be required for any of the following:

...

280-16-3.1.3 The construction or expansion of a ground-mounted Commercial or Utility Solar System.

280-16-3.1.4 Existing buildings:

280-16.3.1.~~3~~4.1 The change in use of an existing building from one (1) use that is permitted with site plan review or conditional to another use that is permitted with site plan review or conditional use that does not involve a building or structure.

280-16-3.1.~~3~~4.1.1 The new use requires more off-street parking in accordance with this chapter than the previous use; or

280-16-3.1.~~3~~4.1.2 Changes in site development are proposed, including but not limited to traffic movement into and through the site, the amount, layout, and location of parking, or provisions for stormwater drainage, lighting, or buffering of adjacent uses.

280-16-3.1.~~3~~4.2 A change in occupancy of an existing building or use that replaces one (1) use that is permitted with site plan review or conditional with another use that is permitted with site plan review or conditional that does not increase the parking requirement or result in changes to site development shall not require site plan review.

280-16-3.1.~~4~~5 The change in use of an existing building or structure from permitted to permitted with site plan review or conditional.

280-16-3.-1.-~~5~~6 The construction or expansion of parking areas to serve a permitted with site plan review or conditional use involving an area of more than two-thousand (2,000) square feet in any three (3)-year period.

280-16-3.-~~2~~4 The creation of a private way.

280-16-3.-~~3~~2 This section does not apply to the construction or modification of single-family or two (2)-family homes, the placement of manufactured housing on individual lots, agriculture, forest management and timber harvesting activities, or any permitted use that is identified in this chapter.

280-16-3.3-~~4~~3 No land, building or structure shall be used or occupied and no building permit, sign permit, plumbing permit, or certificate of occupancy shall be issued for a development within the scope of this chapter unless and until a final plan of the development has been approved in accordance with the procedures set forth below.

§ 280-16-4 Classification of projects.

Projects subject to site plan review shall be divided into two (2) classes: major developments and minor developments.

280-16-4.1 Major development. A major development shall be any project which requires site plan approval and which meets any one (1) of the following criteria. In addition, the Site Plan Review Committee may, by formal vote, reclassify a minor development to a major development if it finds, because of the scale or complexity of the proposal, that it has implications similar to projects defined as major developments.

...

280-16-4.1.6 Involves the construction or expansion of thirty-thousand (30,000) square feet or more of a ground-mounted Commercial or Utility Solar System.

...

280-16-4.2 Minor development. Any project which requires site plan approval and is not classified as a major development shall be a minor development ~~in one of the following five (5) categories~~):

...

280-16-6.7.2.4.11 Supplemental information for a solar energy system.

280-16-6.7.2.4.11.1 A site location map which shows scenic resources, historic sites, and/or significant wildlife habitat, identified by state regulatory agencies, within one (1) mile of the proposed development.

280-16-6.7.2.4.11.2 Description of proposed and associated facilities, including manufacturer and model and all nonproprietary manufacturer's specifications for solar panels, key components, controls, and other equipment, sound emission levels, normal and emergency operational shutdown procedures, number and individual ratings of panels in the array and/or modules, and aggregate generating capacity of the total system.

280-16-6.7.2.4.11.3 Array/module design.

280-16-6.7.2.4.11.4 Written evidence that all applicable state regulatory agencies with jurisdiction over the project have been notified of the pending application.

280-16-6.7.2.4.11.5 Certification that the facility shall comply with utility notification requirements, required by Maine law and accompanying regulations, unless the applicant indicates it will not be connected to the electricity grid.

280-16-6.7.2.4.11.6 Site line, photographic and, if applicable, screening information to help evaluate environmental and visual impact of construction and operation of the facility.

280-16-6.7.2.4.11.7 A plan which describes how decommissioning will be undertaken, the work required, how solid waste shall be disposed of in compliance with state and local regulations, a cost estimate for decommissioning and a schedule of contributions to its decommissioning fund, and demonstration of the applicant's financial capacity to complete the decommissioning as proposed. The applicant shall also provide examples of other projects of similar size and describe the amount of surety which was required.

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December 15, 2017

VIA email: Benjamin.Godsoe@maine.gov

Benjamin Godsoe
Maine Land Use Planning Commission
22 State House Station
Augusta, ME 04333-0022

Re: Chapter 10, Commercial Industrial Development Subdistrict Allowed Uses – Grid Scale Solar Energy Generation Facilities

Dear Mr. Godsoe:

On behalf of NextEra Energy Resources, LLC (NEER), this letter provides comments on the Commission's November 15, 2017 proposed amendment to Chapter 10, Land Use Districts and Standards, to allow development of grid-scale solar energy generation facilities in the Commercial Industrial Development Subdistrict (D-CI).

NEER supports the proposal to allow grid-scale solar energy generation facilities in the D-CI subdistrict upon issuance of a permit, but believes the proposed rule is too restrictive in several respects (which are explained in the comment letter filed by the Maine Renewable Energy Association). NEER's overriding concern, though, and the reason for submitting this separate comment letter, is the proposed rule's limitation of grid-scale solar energy generation facilities to the D-CI subdistrict, thereby requiring applicants for grid-scale solar generation facilities to petition for rezoning of land proposed for such a facility, if not already located in the D-CI subdistrict. Grid-scale solar generation facilities are not the type of intensive commercial or industrial development that is incompatible with residential development that is contemplated by the D-CI subdistrict.[1] Rather, grid-scale solar generation facilities are much less intensive than typical commercial and industrial facilities, so they should not be limited to the D-CI subdistrict.

NEER believes that the proposed rule should be modified to allow grid-scale solar energy generation facilities in additional appropriate subdistricts as a special exception upon issuance of a permit, because it is unnecessary to require rezoning of land when that land is already located in a subdistrict in which grid-scale solar generation facilities can be

[1] For example, the following uses are allowed with a permit in the D-CI subdistrict:
- Any commercial and industrial uses;
- Land application of septage, sludge and other residuals, and related storage and composting activities and structures;
- Mineral extraction including the use of mineral processing equipment and associated structural development;
- Level E intensive recreational lodging facilities; and
- Solid waste disposal.

All these uses are significantly more intensive than grid-scale solar generation facilities.

compatible uses. Specifically, NEER believes that grid-scale solar energy generation facilities also should be allowed as a special exception, with additional specifically applicable special exception standards, in at least the following subdistricts: General Development (D-GN), Rural Business Development (D-RB), Residential Development (D-RS), and General Management (M-GN).

NEER proposes that in these subdistricts the current special exception standards that include, at a minimum, the requirement that the use can be buffered from those other uses within the subdistrict with which it is incompatible (but also include additional requirements in several of these subdistricts), should apply. In addition, an applicant for a grid-scale solar energy generation facility by special exception could be required to show that the proposed facility:

a) Is accessible from a public road by a legal right of access that would allow construction, operation, maintenance, and decommissioning of the facility;
b) Is located as close as practicable to the proposed point of interconnection with the existing transmission grid and no other area suitable for the facility and closer to a point of interconnection is reasonably available to the applicant, unless the applicant demonstrates that another location would result in a project location that is compatible with current land uses and does not expand the pattern of development beyond already developed areas;
c) Limits exterior lighting to that required for safety and operational purposes;
d) Screens ground-mounted installations from view by abutting residential properties, using vegetation, topography, and/or fencing;
e) Uses a manufactured finish appropriate to and compatible with the surroundings, with reflective characteristics that minimize negative visual impacts to the greatest practical extent; and
f) Will be removed if it has not produced power for a period of twelve (12) consecutive months. In the event of a natural disaster, act of violence, or other event which results in the absence of electrical generation for twelve (12) months, by the end of the twelfth (12th) month of nonoperation the applicant could be required to demonstrate that the project will be substantially operational and producing electricity within twenty-four (24) months of the event.

NEER believes these additional special exception standards will ensure that any proposed grid-scale solar energy generation facility will be compatible with existing uses in any of these subdistricts, and would be appropriate uses in those subdistricts. Grid-scale solar energy generation facilities, when properly designed, constructed, and operated, are non-intensive land uses that do not have significant impacts on the use and enjoyment of neighboring properties. Further, they are significantly less intensive and intrusive than other uses that are allowed by special exception in these subdistricts, such as the following:

- General Development (D-GN):
  - Auto service stations or repair garages;
  - Light industrial uses and other commercial uses having a gross floor area of more than 2,500 square feet; and
  - Stores, commercial recreational uses not including recreational lodging facilities, and entertainment or eating establishments having a gross floor area of more than 2,500 square feet.
- Rural Business Development (D-RB):
  - Category 3 commercial or industrial rural businesses, including larger scale commercial facilities for manufacturing and assembly plants, contracting and construction businesses, automobile service and repair, and similar types of businesses such as saw mills.

- Residential Development (D-RS):
  - Marinas;
  - Multi-family dwellings;
  - Commercial and private trailered ramps, and public trailered ramps.
- General Management (M-GN):
  - Level D recreational lodging facilities, which are defined as having moderate to high impacts on existing resources within the development site and surrounding areas. The standards for these facilities are designed to allow larger-scale development while conserving the natural resource and recreation values of the development site and surrounding areas.

In addition to being less intensive than these special exception uses, grid-scale solar generation facilities are also consistent with the articulated purposes of these subdistricts:

- General Development (D-GN): "It is the Commission's intent to promote these areas as future growth centers in order to encourage the location of compatible developments near each other and to minimize the impact of such development upon incompatible uses and upon public services and facilities. Thus the Commission's purpose is to encourage the general concentration of new development, and thereby avoid the fiscal and visual costs of sprawl, and to provide a continuing sense of community in settled areas."
- Rural Business Development (D-RB): "The purpose of the D-RB is to encourage an appropriate range of business development in rural areas, and locate development in or at the edge of existing development and in concentrated areas along appropriate portions of major transportation corridors. The locations for development are selected to maintain the rural character of the region and avoid significant visual, natural resource, and fiscal impacts of unplanned growth."
- Residential Development (D-RS): "The purpose of the D-RS subdistrict is to set aside certain areas for residential and other appropriate uses so as to provide for residential activities apart from areas of commercial development."
- General Management (M-GN): "The purpose of the M-GN subdistrict is to permit forestry and agricultural management activities to occur with minimal interferences from unrelated development in areas where the Commission finds that the resource protection afforded by protection subdistricts is not required." Grid-scale solar generation facilities are entirely compatible, and in fact provide support for, forestry and agricultural management activities.

In short, in addition to allowing grid-scale solar generation facilities in the D-CI subdistrict, and providing a mechanism to rezone land to the D-CI subdistrict for that purpose, the Commission also should allow grid scale solar generation facilities as a special exception, with the additional special exception standards suggested above, in at least the General Development (D-GN), Rural Business Development (D-RB), Residential Development (D-RS), and General Management (M-GN) subdistricts. This would avoid the need to rezone properties in these subdistricts to D-CI, if the proposed facility can meet the special exception criteria. Of course, any such facility also would need to obtain a Site Law permit from the DEP, further ensuring that impacts will be minimized.

Allowing grid-scale solar generation facilities in these subdistricts will encourage the development of carbon-free, renewable resources consistent with State of Maine energy goals and will provide landowners the ability to diversify their income in a way that is compatible with their existing uses.

++++++++++++++

I have not included in this letter detailed comments on the D-CI rezoning proposal contained in the draft rule, because the Maine Renewable Energy Association (MREA) is providing those comments. NEER joins in and supports MREA's comments.

Thank you for your consideration of these comments, and please let me know if you have questions about any of these comments or would like to discuss them.

Sincerely,

Matthew D. Manahan

cc: Aaron Svedlow, NextEra Energy, LLC
Liz Peyton, NextEra Energy, LLC
Jeremy Payne, MREA

Natural Resources Council of Maine
3 Wade Street • Augusta, Maine 04330 • (207) 622-3101 • Fax: (207) 622-4343 • www.nrcm.org

Maine Land Use Planning Commission

NRCM Comments on Proposed Grid-Scale Solar Rules

December 15, 2017

On behalf of our 20,000 members and supporters, the Natural Resources Council of Maine (NRCM) appreciates the opportunity to comment on the rule changes regarding solar energy development proposed by the Land Use Planning Commission (Commission). We appreciate that the Commission has taken a proactive approach to considering where large or "grid-scale" solar farms might best be located. Solar power is a relatively new topic for the Commission, but solar technology has arrived in big way and it is likely there will be other important rule changes to consider in the future.

Solar power offers substantial environmental, economic and energy security benefits that Maine has fallen behind on capturing. Like many other renewable energy resources, Maine is blessed with abundant solar energy potential, and rapid changes in solar technology have made grid-scale solar one of the cheapest forms of new generation.[1] Like other non-combustion energy sources such as wind or hydro, solar power requires substantial upfront investment after which the panels generate clean, reliable power for decades. (Unlike wind and hydro, solar resources are theoretically available equally on every parcel of land, giving it significantly greater siting versatility. Furthermore, the times of day and year when solar panels produce power are also the times when our electricity grid is most in need and utilizing the most costly sources of power, which means cost-savings benefits for all electricity consumers.) For these reasons and others, having a fair, transparent, and predictable siting and permitting framework for large solar is especially important and beneficial.

Solar power has one of the lowest levels of environmental impacts of energy generation commercially available today. Nonetheless grid-scale solar farms should still be sited to protect the core values of the jurisdiction. Most importantly, they should be located near existing compatible development and solar farms' siting versatility should make this feasible. In adopting these rules, the Commission will have to wrestle with the fact that there is no existing development quite like solar farms in the jurisdiction, making it somewhat harder to evaluate

[1] See for example: Lazard's Levelized Cost of Energy Analysis 11.0. November 2, 2017. Available at: https://www.lazard.com/perspective/levelized-cost-of-energy-2017

compatibility. Grid scale solar farms are likely to require tens or hundreds of acres to be clear of large vegetation for the life of the project, which has a variety of adverse ecological impacts on the forest ecosystem. On the other hand, they may require almost no new impervious surfaces. In many states, sheep graze the land under commercial solar farms. Solar farms do not require major road improvements, generate virtually no traffic, and require few public services. They are neither highly visible over distances nor noisy.

In Vermont, which has more solar per capita than anywhere else in our region, relatively large solar farms exist alongside schools, farms and residential neighborhoods. It may be that solar is widely compatible with most other forms of development. Thus there may not be any long-term reason to limit solar to one type of development zone, but the D-CI is a reasonable starting place.

Section 10.21 A.2.b.(2) has some useful siting parameters but should be amended in a few ways to better balance the nature of solar farms with the goal of locating development near other development.

First, we do not believe solar farms must categorically be "separated from compact residential development" or located "away from village centers" as proposed in Section 10.21 A.2.b.(2)(a). We agree that ensuring sufficient space for residential growth near existing centers is a good requirement, but believe there will be cases where solar can be located relatively near residential centers without crowding out residential development. The proposed 75 megawatt solar farm near Farmington (currently undergoing Site Law review by the Maine Department of Environmental Protection) is one example. Therefore the language might better read:

> (a) Located with sufficient space to allow for future residential growth near existing development centers;

Second, we believe Section 10.21 A.2.b.(2)(c) should be amended to focus less on co-location with transmission lines and more on siting close to existing development patterns generally. Due to their long, linear nature, transmission lines extend across parts of the jurisdiction which are not generally appropriate for other development, including solar farms. On the other hand, solar farms may be compatible with a variety of types of existing development and should not expand those patterns. We recommend the language be amended to read:

> (c) Located within one mile of existing, compatible development, provided that it does not require the development of more than three miles of new transmission line in undeveloped areas.

Finally, on an unrelated technical note, we suggest the definition of Grid-scale Solar Energy Generation Facility be adjusted slightly. We understand that the Commission is seeking to exclude solar facilities which provide power for use on site. That is reasonable. However the use of the phrase "utility use through the electricity grid" may be confusing. (In Maine, utilities don't "use" power, they only transmit it, for example; and onsite generation may still make use of the electrical grid.) This language could be amended as follows:

> **Grid-scale Solar Energy Generation Facility.** A Solar Energy System that is primarily or solely intended to generate electricity for commercial sale for off-site use, occupies an area of 1 or more acres, and has a nameplate capacity of more than 250 Kilowatts.

Thank you for the opportunity to provide comments on these rules.

Respectfully,

Dylan Voorhees
Clean Energy Director

The Nature Conservancy
Protecting nature. Preserving life.™

December 15, 2017

Ben Godsoe
22 State House Station
18 Elkins Lane, Harlow Building
Augusta, Maine 04333-0022

Dear Mr. Godsoe:

On behalf of The Nature Conservancy in Maine, thank you for the opportunity to comment on the proposed revisions to the Land Use Planning Commission's Chapter 10 rules regarding grid-scale solar energy generation facilities.

The Nature Conservancy is a global conservation organization dedicated to conserving the lands and waters on which all life depends. Guided by science, we create innovative, on-the-ground solutions to our world's toughest challenges so that nature and people can thrive together. Working in more than 65 countries, we use a collaborative approach that engages local communities, governments, the private sector, and other partners. The Nature Conservancy has been working in Maine for more than 60 years and is the 12th largest landowner in the state. We are working with partners across sectors to conserve the future of Maine's forests, restore Maine's rivers and streams, ensure sustainable fisheries in the Gulf of Maine, and support Maine's transition to a low-carbon economy. Moreover, the Conservancy owns some 215,000 acres in the Unorganized Territory (UT), the majority of which is managed for sustainable forest products and all of which is open for a wide variety of public access opportunities, including hunting, fishing and hiking.

The Commission's effort to establish a regulatory framework for grid-scale solar facilities in the UT is critically important. Meeting demand for clean energy in Maine and neighboring states will require tens of thousands of megawatts of new solar nameplate capacity, and a portion of this capacity is likely to be located in the UT. Ensuring well-sited solar facilities promises to reduce land-use conflict, minimize habitat fragmentation and protect important natural resources while providing adequate acreage to develop a robust low-carbon energy supply.

As a rule of thumb, The Nature Conservancy believes it should be no harder for a solar facility to be permitted than for any other energy generation facility to be permitted. Under existing Chapter 10 rules and the Commission's 2010 Comprehensive Land Use Plan (CLUP), development of standalone energy generation facilities in the UT, such as biomass and fossil fuel

power plants, typically entails rezoning to a Commercial Industrial Development (D-CI) subdistrict. Chapter 10 is currently silent on grid-scale solar facilities. Absent revisions, it is presumed that a grid-scale solar farm located in the Commission's jurisdiction would—like a biomass or fossil fuel power plant—petition to rezone as D-CI, and would be required to meet the criteria currently established in Chapter 10, including proximity to existing compatible development (adjacency).

The intent of the proposed revisions is to provide flexibility for solar facilities. Specifically, the revisions would allow the adjacency principle to be waived when certain criteria are met, including proximity to transmission infrastructure. We applaud the Commission for working to provide flexibility for clean energy generation facilities while preserving the spirit of the adjacency rule. In general, the proposed changes to Chapter 10 appear designed to encourage clean energy development while minimizing energy sprawl and habitat fragmentation and we appreciate this intent.

We offer several changes to the proposed revisions to further encourage clean energy development while maintaining appropriate safeguards:

1. In Section 10.21(A)(2)(b)(2), specify that grid-scale solar facilities must still meet the "no undue adverse impact" criteria for adoption or amendment of land use district boundaries (Ch. 10 Section 10.08).
2. Clarify that grid-scale solar facilities may be located in or near residential and general development zones (D-RS and D-GN subdistricts). Under the existing Chapter 10 rule, a new D-CI subdistrict must be located one road mile from another D-CI subdistrict. It is unclear in the proposed revisions whether this provision would be waived entirely when a solar facility meets the five listed criteria in Section 10.21(A)(2)(b)(2), or if only the "one road mile" portion would be waived. We believe grid-scale solar facilities can be appropriately sited next to residential or general development; elsewhere in Maine, solar developers are beginning to demonstrate that large arrays (e.g., 10-20 MW) can be appropriately sited near town centers. The Chapter 10 rules should be clear that this approach is accepted in the UT as well.
3. Consider providing more flexibility regarding proximity to transmission interconnection. We appreciate the intent of the 1-3 mile rule in Section 10.21(A)(2)(b)(2)(c) and believe it will serve the public's interest in many cases. However, there are likely to be cases in which a proposed facility is farther than 1-3 miles from the point of grid interconnection but is more consistent with existing uses and resource values, on balance, than another proposed facility closer to the point of interconnection. The onus should be on developers to show that the proposed facility farther than 1-3 miles from the point of interconnection is the best alternative.
4. Delete Section 10.21(A)(2)(b)(2)(e) or amend the agricultural soil requirement. Depending on how the terms is defined, requiring avoidance of "prime agricultural soils" could significantly narrow the possible range of affordable grid-scale solar sites. While the goal of this provision is laudable, the Department of Environmental Protection permitting process—along with the role played by the private sector in keeping prime agricultural land used for agriculture—will likely be sufficient to protect key natural resources associated with agricultural lands.

5. Add language to require review by or consultation with relevant state agencies (e.g., Department of Inland Fisheries and Wildlife and/or Maine Natural Areas Program) for developments proposed within Focus Areas of Statewide Ecological Significance as identified by the State Wildlife Action Plan.
6. We also encourage the Commission to further revise the Chapter10 rules to explicitly state that ground-mounted solar arrays smaller than 250 KW are an allowed use within D-RS and D-GN subdistricts. The rules are currently silent on this point, which could hinder growth of small-scale ground-mounted solar in residential and general development subdistricts.

Finally, we would like to note that the reversion clause at the end of Section 10.21(A)(2)(b)(2) is well stated. We offer no revisions there.

Thank you again for the opportunity to offer comments on the proposed revisions to the Commission's Chapter 10 rules. We appreciate the Commission's efforts to develop reasonable guidelines to govern the development of an important home-grown clean energy resource.

Sincerely,

Rob Wood
Policy Associate

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PAUL R. LEPAGE
GOVERNOR

STEVEN MCGRATH
DIRECTOR OF GOVERNOR'S
ENERGY OFFICE

Nicholas Livesay
Executive Director
Land Use Planning Commission
22 State House Station
Augusta, Maine 04333

December 13, 2017

Dear Executive Director Livesay,

I write to provide comment on the petition to amend Chapter 10 Land Use Districts and Standards to allow development of grid-scale solar energy arrays with a permit in the Commercial Industrial Development Subdistrict.

The Governor's positon on protecting the tourism industry in western Maine is consistent. About 40 million visitors come into the state every year to enjoy our lakes, mountains, and scenic vistas. Siting grid-scale solar facilities in western Maine will adversely affect our tourism industry by changing the experience tourists enjoy. Any impact will be permanent, and will be devastating to Maine's economy.

Additionally the Governor opposes above market contracts for any generator of electricity, as they make our uncompetitive electricity costs even worse. High electricity costs are a burden on Maine's homeowners and Industry.

Sincerely Yours,

Steven G. McGrath
Director of Governor's Energy Office

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December 15, 2017

Via E-Mail
Ben Godsoe
Maine Land Use Planning Commission
22 State House Station
18 Elkins Lane, Harlow Building
Augusta, Maine 04333-0022

RE: Chapter 10, Commercial Industrial Development Subdistrict Rulemaking for Grid-Scale Solar Energy

Dear Mr. Godsoe:

Thank you for the opportunity to comment on the Commission's Chapter 10 rulemaking related to grid-scale solar energy development.

I appreciate the Commission's thoughtful work to develop an appropriate permitting regime for grid-scale solar energy, which is a relatively recent form of development that was not believed to be economically feasible when the Comprehensive Land Use Plan (CLUP) was last amended in 2010. These comments address two aspects of the draft rule that have the potential to limit grid-scale solar development in otherwise appropriate locations.

First, the presumption that the solar facility must be within one mile (three upon an additional showing) of the point of interconnection with the electrical grid is not necessary to ensure that the redistricting is consistent with the location of development provisions of the CLUP, including the adjacency principle. Although the CLUP states that the Commission has "generally interpreted adjacency to mean that most rezoning for development should be no more than one mile by road from existing, compatible development," the CLUP also recognizes that "there are certain instances in which a greater or lesser distance may be appropriate in measuring distances to existing developments." CLUP at 62 and n.2. The CLUP also recognizes proximity to organized towns as a guiding principle in locating new development. CLUP at 62.

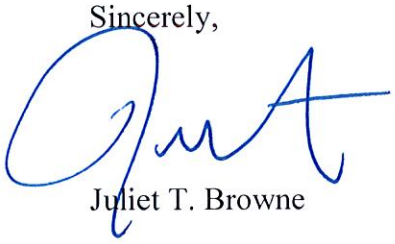
Solar generation is a particularly low-impact form of development that is compatible with a rural, undeveloped landscape. Additionally, transmission lines are an allowed use in almost every subdistrict and therefore may be constructed without any requirement to rezone the underlying area. A presumption that a solar facility located within six miles of the point of interconnection or six miles from an organized town satisfies the location of development

requirement is a more practicable approach that reflects the unique and limited impact that solar facilities have on the landscape. Additionally, as drafted, the rule simply establishes a presumption that the redistricting is consistent with the portions of the CLUP related to location of development, and therefore the Commission retains the flexibility to reach a contrary conclusion based on site-specific considerations. This application of the adjacency principle is also consistent with the Commission's ongoing review of the adjacency principle and the acknowledged need to implement a more flexible approach.

Second, the requirement that the solar facility not be located in an area of prime agricultural soils absent a showing that no reasonable alternative location is available to the petitioner will unnecessarily limit the siting of such facilities. Projects are built on posts that are driven into the ground, which minimizes the area of soil disturbance. Additionally, grasses and forbs, including pollinators, are generally planted around the arrays of a project so the majority of a solar site is still growing a plant community. As a result, there is no loss of valuable agricultural soils. Importantly, landowners should retain the flexibility to use their land for solar generation even if prime agricultural soils are present. This provision of the draft rule elevates agricultural uses over other low impact uses even if agricultural use may not be economic or otherwise available to the landowner. Because solar development will not permanently impact the soils or prevent future agricultural use of the area, this provision could be deleted.

Thank you for consideration of these comments.

Sincerely,



Juliet T. Browne

MAINE AUDUBON

Ben Godsoe
22 State House Station
18 Elkins Lane, Harlow Building
Augusta, Maine 04333-0022

December 15, 2017

Dear Mr. Godsoe:

Thank you for the opportunity to submit comments on the petition to amend Chapter 10 Land Use Districts and Standards to allow development of grid-scale solar energy generation facilities with a permit in the Commercial Industrial Development Subdistrict (D-CI). We offer the following comments:

(1) **Amend Section 10.21,A,2,b,2,c in a manner that encourages grid-scale solar development near to existing, compatible development.** As written, the proposed rule appears to encourage development anywhere within one mile (and no more than three miles) of existing transmission lines. Transmission lines are very long and extend through parts of the jurisdiction that are not appropriate for development. We recommend amending the language to encourage grid-scale solar development near to existing, compatible development, the implication being that transmission lines alone do not amount to existing, compatible development.

(2) **Add language requiring review by relevant agencies when development is proposed in areas with species or habitats of particular significance.** Specifically, when development is proposed in areas containing species identified by state or federal agencies as Endangered, Threatened or Special Concern.

We'd also like to bring to the Commission's attention a project that Maine Audubon (MA) is working on that might inform this rulemaking and future rulemakings related to renewable energy infrastructure development. Specifically, MA is compiling and developing relevant information about the potential impacts of renewable energy development on Maine's wildlife and open spaces. As the Commission is well aware, Maine's energy landscape is poised for rapid growth. As agencies, developers, and the public consider an ever-increasing list of proposals, they will need information to guide siting and ensure that Maine's transition to a cleaner energy future also protects the important ecological, recreational, and scenic values of our state's undeveloped landscapes. We look forward to sharing our results with the Land Use Planning Commission as appropriate.

Sincerely,

Eliza Donoghue, Esq.
Senior Policy & Advocacy Specialist

Natural Resources Council of Maine
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Maine Land Use Planning Commission

NRCM Rebuttal Comments on Proposed Grid-Scale Solar Rules

December 27, 2017

On behalf of our 20,000 members and supporters, the Natural Resources Council of Maine (NRCM) appreciates the opportunity to provide some rebuttal comment on the rule changes regarding solar energy development proposed by the Land Use Planning Commission (Commission). We were pleased to see some common themes and direction among the comments submitted by parties on December 15. However there are two points that we wish to respond to, adding additional comment beyond our original comments.

First, NextEra recommended that Commission rules make grid scale solar an allowable use in any development subdistrict and the general forestry management subdistrict. As we stated in our original comments, we believe solar farms are likely to be generally compatible with many forms of development and could be ultimately be appropriate for other development zones, including residential. As such, NRCM would not object to amendments allowing grid-scale solar as an allowed use in some of the development subdistricts proposed by NextEra i.e. D-RB, D-RS, and D-GN. Additionally, we support the requirements proposed by NextEra as special exceptions requirements except for (b). Instead of NextEra's proposed (b), we believe that the language we proposed in our initial comments for section (c):

"(c) Located within one mile of existing, compatible development, provided that it does not require the development of more than three miles of new transmission line in undeveloped areas"

more appropriately balances the desire to facilitate the development of solar power with the need to protect the principle values of the jurisdiction.

However, we do not support making grid-scale solar an allowable use everywhere in the M-GN at this time. Grid-scale solar development is not akin to forest management (nor recreational lodging facilities that are necessarily located near less developed recreational and natural resources.) As the Commission is aware, M-GN makes up the vast majority of the jurisdiction, and allowing solar farms nearly everywhere across the jurisdiction misses the opportunity solar provides to locate this clean generation resource consistent with good land use practices.

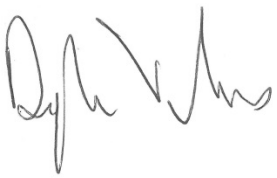
Second, we do not support the idea that grid-scale solar farms could be located 6-10 miles from a point of interconnection, as proposed by Maine Renewable Energy Association and Juliet Browne, absent other considerations. As we stated originally, distance from a point of interconnection is not the best or most appropriate measure of whether a solar farm is located in accordance with good land use planning practices. The appropriate measure is proximity to other forms of compatible existing development, for which we are willing to accept a relatively broad definition. Even though solar farms obviously need a point of interconnection, existing transmission lines are not the appropriate reference development as they are allowed in almost every subdistrict and have a long, linear profile that may cut broadly across otherwise un-developed areas.

Put in another way, NRCM does not generally care whether a solar farm's point of interconnection is one mile away or 15 miles away from the solar farm. What matters is whether the solar farm inappropriately extends the pattern of development by being located more than one mile from any existing compatible development and whether the interconnection requires lengthy new transmission lines (we suggest a limit of 3 miles) through *undeveloped areas*.

Finally, we found comments by the Governor's Energy Office puzzling and astonishingly anti-development. The comments suggest than any form of development which "changes the experience tourists enjoy" would "be devastating to Maine's economy." Transmission lines, landfills, business parks, and manufacturing facilities like paper mills can all negatively affect the experience tourists enjoy. NRCM strongly agrees that we must carefully consider and balance development which might have an adverse impact on natural and recreational resources. (This is not limited to "western Maine".) However, many forms of development can not only enhance rural economies without undue adverse impacts, and some—such as solar farms—can ultimately help protect those resources in the long term by providing clean energy that reduces air, water, and climate pollution. For that reason, it is appropriate, as the Commission has done, to use the tools of planning and zoning—followed by permitting for individual projects—to ensure that development proposals do no not have undue adverse impacts.

Thank you for the opportunity to provide additional comments on these rules.

Respectfully,



Dylan Voorhees
Clean Energy Director