



DE11-180

August 15, 2011

Debra A. Howland
Executive Director and Secretary
NH Public Utilities Commission
21 S. Fruit Street, Suite 10
Concord, NH 03301



Re: Application submission for customer-sited renewable energy source eligibility

Dear Ms. Howland:

Please find an original application for Class II Renewable Energy Credit (REC) eligibility for our 60kW solar array located at 5 Andrews Lane in East Kingston, New Hampshire. This application is filed by Revolution Energy LLC, owner of the solar array located at East Kingston Elementary School. Revolution Energy LLC are seeking Class II REC generation eligibility pursuant with New Hampshire Admin Code Puc 2500 rules.

This application is being delivered via mail and electronic copies can be made available upon request.

Thank you.

Sincerely,

Clayton R. Mitchell, Esq PhD
Revolution Energy LLC
2 Washington Street Suite 206
Dover NH 03820

-
21. Email address: michaeljturcotte@turncyclesolutions.com
22. The ISO-New England asset identification number, if applicable: 14710 or N/A:
23. The GIS facility code, if applicable: NON33454 or N/A:
24. If Class I, please identify type of source below:
 solar hot water heating, wind generation and/or other generation _____
If other type of generation, provide a description. (Attach as "Exhibit A")
25. A list and description of the equipment used at the facility, including the meter and, if applicable, the inverter (Attach as "Exhibit B")
26. A copy of the interconnection agreement pursuant to Puc 307.06, if applicable, between the applicant and the distribution utility. (Attach as "Exhibit C" or N/A)
27. A signed attestation by the owner/applicant that the project is installed and operating in conformance with any applicable building codes. (Attach as "Exhibit D" or N/A)
28. For an installation with electric output, documentation of the applicable distribution utility's approval of the installation. (Attach as "Exhibit E" or N/A)
29. This application and all future correspondence should be sent to:
Ms. Debra A. Howland
Executive Director and Secretary
State of New Hampshire
Public Utilities Commission
21 S. Fruit St, Suite 10
Concord, NH 03301-2429

30. Preparer's Information:

Name: Jon Spencer

Title: Project Manager

Address: (1) 2 Washington Street

(2) Suite 206

(3) _____

Dover

(City)

NH

(State)

3820

(Zip Code)

Preparer's Signature: _____

Jon Spencer

Date: _____

8/15/11

I attest that this project has been installed and is operating in conformance with any applicable building and electrical codes:

Owner's Signature: _____

[Signature]

Date: _____

8/8/11

Notary's Signature: _____

[Signature]

Date: _____

8/8/11

Dorothy E Sheridan
Notary Public, State of New Hampshire
My Commission Expires Jan. 27, 2015

Exhibit B – List and description of equipment used at the facility, including meter and, if applicable, the inverter

Inverter – Specification sheet included

Solectria Renewables, Model: PVI – 95

Nameplate rating – 95 kW, 95 kVAr, 480 volts, Three phase

National Standards – UL-1741, IEEE Std 1547, IEEE 62.41

Solar Panels – Specification sheet included

Evergreen Solar, ESA-215 watt

Utility grade meter as required and installed by Unitil

COMMERCIAL INVERTERS

PVI 60KW
PVI 82KW
PVI 95KW

FEATURES

- Fully-integrated design
- Transformer Isolated
- 208 VAC, 240 VAC, 480 VAC or 600 VAC
- MODBUS communications
- User-interactive LCD display

OPTIONS

- Fused subcombiners
- Forward facing disconnects
- Stainless steel enclosure
- Web-based monitoring
- Sub-array monitoring

OPTIONS FOR UTILITIES

- Low voltage ride through
- VAR support
- Controlled ramp rate
- Remote power control



COMMERCIAL INVERTERS

The most fully customizable line of commercial grid-tied PV inverters available today, the PVI 60KW, PVI 82KW, and PVI 95KW series of Solectria Renewables inverters has been utilized in projects ranging from 50kW to multi-megawatt solar farms. This series of inverters is capable of operating at 208 VAC, 240 VAC, 480 VAC, and 600 VAC and comes standard with AC and DC disconnects, isolation transformer, LCD display and monitoring gateway. Options include an integrated fused subcombiner, forward facing disconnects, stainless steel enclosure and web-based monitoring. AC voltage and frequency settings may be customized according to utility specifications.



Built for the real world

SPECIFICATIONS		PVI 60KW	PVI 82KW	PVI 95KW
DC Input				
Absolute Maximum Input Voltage			600 VDC	
MPPT Input Voltage Range			312-500 VDC	
MPPT Input Voltage Range - Low Voltage Option			296-500 VDC	
Maximum Operating Input Current		201 A	278 A	320 A
Maximum Operating Input Current - Low Voltage Option		212 A	293 A	337 A
AC Output				
Nominal Output Voltage		208, 240, 480 or 600 VAC, 3-Ph		
AC Voltage Range (Standard)		-12%/+10%		
Continuous Output Power		60 kW	82 kW	95 kW
Continuous Output Current	208 VAC	167 A	228 A	264 A
	240 VAC	145 A	198 A	229 A
	480 VAC	73 A	100 A	115 A
	600 VAC	58 A	80 A	92 A
Maximum Backfeed Current		0 A		
Nominal Output Frequency		60 Hz		
Output Frequency Range		59.3-60.5 Hz		
Power Factor		Unity, >0.99		
Total Harmonic Distortion (THD)		<3%		
Efficiency				
Peak Efficiency	208/240 VAC	95.7%	95.6%	95.3%
	480/600 VAC	96.5%	96.5%	96.5%
CEC Efficiency	208 VAC	94.0%	94.5%	94.5%
	480 VAC	95.5%	95.5%	95.5%
Tare Loss	208 VAC	4 W		
	240 VAC	4 W		
	480 VAC	5 W		
	600 VAC	7 W		
Subcombiner Options				
		2-8 positions, 40-275 A		
Temperature				
Ambient Temperature Range (full power)		-13°F to +122°F (-25°C to +50°C)		
Storage Temperature Range		-13°F to +122°F (-25°C to +50°C)		
Relative Humidity (non-condensing)		5-95%		
Monitoring Options				
Web-based Monitoring (Inverter Direct)		SolrenView		
Revenue Grade Monitoring		External		
Sub-Array Monitoring (SolZone)		2-8 zones		
Cellular Communication		SolrenView AIR		
Third Party Compatibility		Standard via MODBUS		
Testing & Certifications				
Safety Listings & Certifications		UL 1741/IEEE 1547, IEEE 1547.1, IEEE 62.41.2, IEEE 62.45, IEEE C37.90.2, CSA C22.2#107.1, FCC part 15 B		
Testing Agency		ETL		
Warranty				
Standard		5 year		
Optional		10, 15, 20 year; extended service agreement; uptime guarantee		
Enclosure				
Transformer		Standard, fully-integrated (internal)		
AC/DC Disconnects		Standard, fully-integrated		
Dimensions 208/240 VAC (H x W x D)		76 in. x 56 in. x 29.3 in. (1930 mm x 1422 mm x 744 mm)		
Dimensions 480/600 VAC (H x W x D)		76 in. x 54 in. x 25.3 in. (1930 mm x 1372 mm x 643 mm)		
Weight		1526 lbs (694 kg)	1615 lbs (734 kg)	1748 lbs (794 kg)
Enclosure Rating		NEMA 3R		
Enclosure Finish		Polyester powder coated steel; Optional stainless steel		



ES-A fa2-SERIES

photovoltaic panels

evergreensolar

205, 210 & 215 W

NOW CERTIFIED FOR COASTAL INSTALLATIONS

MORE electricity

Our ES-A series panels have the best power tolerance in the industry (-0/+5W) and consistently deliver more electricity than competitors in field tests.

GUARANTEED POWER¹

The minimum guaranteed power is the nameplate so you never get less power than you paid for.

INDEPENDENTLY VERIFIED POWER²

Four independent test labs regularly check panel power so you get the power we promise.

ANTI-REFLECTIVE GLASS

Delivering 2-3% more electricity compared to panels with standard glass.

TEMPERATURE RATINGS OVER 90%³

Maintaining up to 4% higher output than most other crystalline silicon panels under hot conditions.

HIGH RANKINGS IN FIELD TESTS⁴

Long-term Photon and TÜV field tests prove Evergreen panels produce more electricity (kWh/kW).

LESS impact

String Ribbon® panels have the smallest carbon footprint and fastest energy payback of any silicon-based solar panel ever made.

SMALLEST CARBON FOOTPRINT⁵

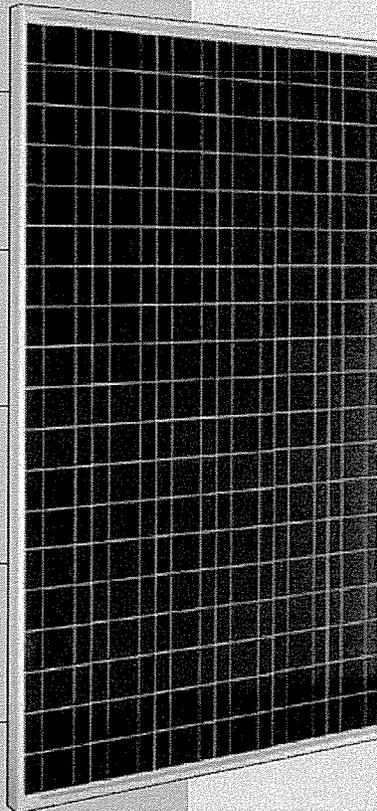
Our String Ribbon® wafers are made with a fraction of the emissions resulting from making conventional silicon panels.

12-MONTH ENERGY PAYBACK⁵

Our panels begin generating truly clean electricity faster than any other silicon-based panel on the market.

100% CARDBOARD FREE REUSABLE PACKAGING

Reduces disposal costs and on-site manpower while eliminating tons of landfill.



¹ Guaranteed upon initial delivery of the panel to the customer, maximum power up to 4.99 W above nameplate rating; ² Evergreen power testers calibrated by taking the straight average of test data from NREL, TÜV Rheinland PTL, TÜV Rheinland Cologne and Fraunhofer ISE; ³ Based on comparing PTC/STC ratings of major competing multi-crystalline silicon panel brands published by the California Energy Commission in May 2009; ⁴ 2008 Module Tests conducted by Photon and published in Photon International February 2009, TÜV Rheinland tests run from April to September 2008

⁵ Evaluation completed by the Energy Research Foundation of the Netherlands (ECN), May 2009

STRING RIBBON® SOLAR PANELS OFFERING EXCEPTIONAL PERFORMANCE AND INDUSTRY-LEADING ENVIRONMENTAL CREDENTIALS. IN SHORT, MORE ELECTRICITY AND LESS IMPACT.

All Evergreen panels come with a 10 year workmanship and 25 year limited power warranty. For full details see the Evergreen Solar Limited Warranty available upon request or online. This product is certified to IEC 61215 Ed.2, IEC 61730 Class A, IEC 61701 (salt mist corrosion), cUL 1703, UL 4703, UL Fire Safety Class C, FSEC standards and UK MCS certificate # BBA 0046. String Ribbon is a registered trademark of Evergreen Solar, Inc. Evergreen Solar's wafer manufacturing technology is patented in the United States and other countries. Copyright © Evergreen Solar, Inc 2011.



ELECTRICAL characteristics

Standard Test Conditions (STC)¹

	ES-A-205 -fa2*	ES-A-210 -fa2*	ES-A-215 -fa2*	
P_{mp}^2	205	210	215	W
$P_{tolerance}$	-0/+4.99 (-0/+2.5)	-0/+4.99 (-0/+2.5)	-0/+4.99 (-0/+2.5)	W (%)
$P_{mp,max}$	209.99	214.99	219.99	W
$P_{mp,min}$	205.00	210.00	215.00	W
η_{min}	13.1	13.4	13.7	%
V_{mp}	18.2	18.3	18.4	V
I_{mp}	11.27	11.48	11.69	A
V_{oc}	22.7	22.8	22.9	V
I_{sc}	11.93	12.11	12.30	A

Nominal Operating Cell Temperature Conditions (NOCT)³

T_{NOCT}	45.4	45.4	45.4	°C
P_{max}	150.1	153.8	157.4	W
V_{mp}	16.6	16.7	16.8	V
I_{mp}	9.04	9.21	9.37	A
V_{oc}	21.0	21.1	21.2	V
I_{sc}	9.57	9.76	9.95	A

Low Irradiance

The typical relative reduction of module efficiency at an irradiance of 200W/m² both at 25°C cell temperature and spectrum AM 1.5 is 0%.

Temperature Coefficients

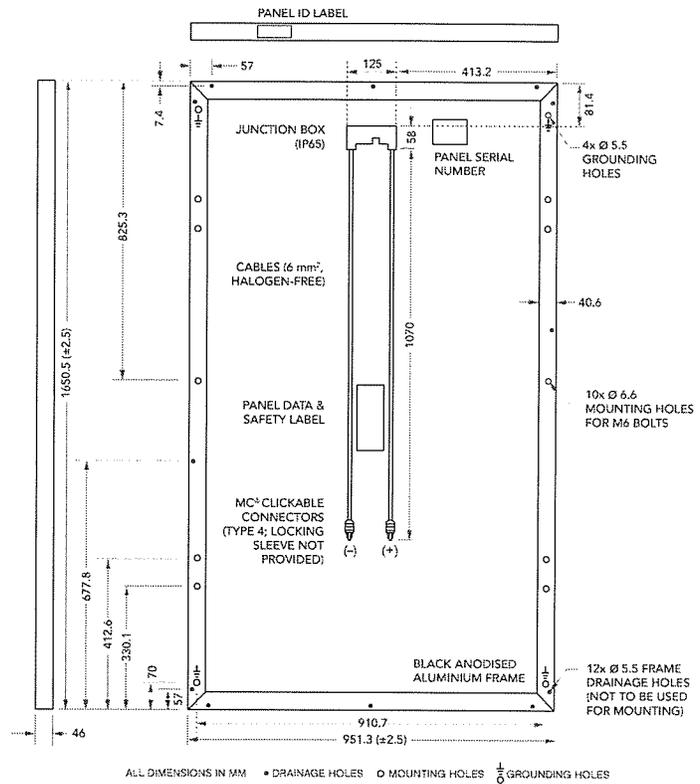
γP_{mp}	-0.43	%/°C
βV_{mp}	-0.40	%/°C
αI_{mp}	-0.03	%/°C
βV_{oc}	-0.31	%/°C
αI_{sc}	+0.05	%/°C

System Design

Maximum Reverse Current ⁴	20 A
Maximum DC System Voltage (TÜV)	1000 V

¹ 1000 W/m², 25°C cell temperature, AM 1.5 spectrum; ² Maximum power point or rated power; 3 800 W/m², 20°C ambient temperature, 1 m/s wind speed, AM 1.5 spectrum; ⁴ Also known as Series Fuse Rating; ⁵ Cell color may vary due to our unique manufacturing process but does not affect the performance of the panel; ⁶ Per IEC 61215. When using Mounting Method A (offset mounting) with rails 330mm (+/-20mm) from each short side of the panel as described in the Mounting Guide for this product; ⁷ Per IEC 61215; * 1-framed, a low voltage, 2-matt blue (textured) cells and silver anodised frame

MECHANICAL specifications



External Dimensions	1650.5 x 951.3 x 46 mm
Weight	18.8 kg
Solar Cells ⁵	114 Multi-Crystalline Silicon String Ribbon [®] Cells
Frame	Silver Anodised Aluminium—Doubled Walled
Front Cover	Anti-Reflective Tempered Solar Glass 3.2 mm Thickness
Encapsulant / Back Cover	EVA / TPE
Maximum Certified Snow Load ⁶	5.4 kPa
Maximum Combined Wind & Snow Load ⁶	3.6 kPa
Hailstone Impact Test ⁷	Ø 25mm ice ball at 23 m/s (83 km/h)

Product packaged 28 per pallet and tested to International Safe Transit Association (ISTA) Standard 2B. All specifications in this product information sheet conform to EN 50380. See the Evergreen Solar Safety, Installation and Operation Manual, Mounting Guide and Inverter Selection Guide for further information on approved installation and use of this product.

Due to continuous innovation, research and product improvement, the specifications in this product information sheet are subject to change without notice. No rights can be derived from this product information sheet and Evergreen Solar assumes no liability whatsoever connected to or resulting from the use of any information contained herein. MC[®] is a registered trademark of Multi-Contact AG.

PARTNER

ELECTRICAL EQUIPMENT
CHECK WITH YOUR INSTALLER

ES-A_205_210_215_fa2_EN; effective February 1st 2011

SM-0128 -RevA

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sales@evergreensolar.com

Exhibit C – Copy of interconnection agreement pursuant to Puc 307.06, if applicable, between the applicant and the distribution utility



8/10/2011

Mr. Clay Mitchell
Revolution Energy, LLC
Dover, NH 03820

Re: East Kingston Elementary School – PV interconnection

Dear Clay,

This letter is to notify you that we tested the customer owned 60 kW generator located at the East Kingston Elementary School 5 Andrews Lane East Kingston, NH 03827.

Unitil replaced the existing revenue meter with a net meter on May 10th, 2011. Since that date, this account has been authorized to interconnect their 60 kW PV system with the Unitil electrical distribution system.

This approval to interconnect also constitutes our interconnection agreement and incorporates herein the requirements and specifications of our interconnection application and NH PUC Rules 900.

Should you have any questions at any time, please contact me at 294-5123 or by email at Noonis@unitil.com

Sincerely,

A handwritten signature in black ink that reads "Tim Noonis". The signature is written in a cursive style with a long horizontal stroke extending to the right.

Tim Noonis
Sr. Business Development Executive
Unitil Energy Systems

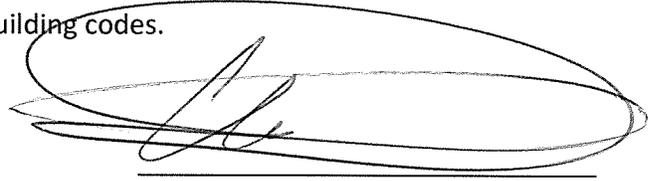
Corporate Office

6 Liberty Lane West
Hampton, NH 03842-1720

Phone: 603-772-0775
www.unitil.com

Exhibit D – Signed attestation by the owner that the project is installed and operating in conformance with any applicable building codes.

The solar array at 5 Andrews Lane in East Kingston, New Hampshire has been installed and is operating in conformance with any applicable building codes.

A handwritten signature in black ink, appearing to read 'Clay Mitchell', is written over a horizontal line. The signature is enclosed within a large, hand-drawn oval.

Clay Mitchell, Esq, PhD

Principal, Revolution Energy

Exhibit E – Documentation of applicable distribution utility’s approval of the installation



5/11/2011

Mr. Clay Mitchell
Revolution Energy, LLC
Dover, NH 03820

Dear Clay,

This letter is to notify you that we have tested the customer owned generator and the inverter system at the following address: 5 Andrews Lane
East Kingston, NH 03827

We have replaced the existing meter with a "net meter" and you are now authorized to energize your 60 kW PV system and interconnect to the Unitil electric system.

Please call me with any questions or concerns at 603-294-5123 or by email at noonis@unitil.com.

Respectfully yours,

A handwritten signature in black ink, appearing to read "Tim Noonis", written over a horizontal line.

Tim Noonis
Sr. Business Development Executive

Corporate Office

6 Liberty Lane West
Hampton, NH 03842-1720

Phone: 603-772-0775
www.unitil.com