Harmony ENERGY WORKS

10 Gale Rd
Hampton, NH 03842
603-926-3366
www.harmonyenergyworks.com

Barrington Town Hall
Paul Panish, Energy Committee Chair
4 Signature Drive
Barrington, NH 03825

January 30, 2024

RFP Turnkey Proposal – Town Hall Solar Installation

Paul Panish & Energy Committee,

Harmony Energy Works is pleased to present the attached package for a turnkey 43.12 kW DC roof-mounted, grid-tied solar photovoltaic solar array consisting of 88 American-made Silfab Solar SIL-490 HN 490 watt solar modules, 88 SolarEdge P505 power optimizers, 4 SolarEdge SE10000H-US inverters and IronRidge racking. The system is designed to produce 47,511 kWh per year. Data sheets are included in this RFP response.

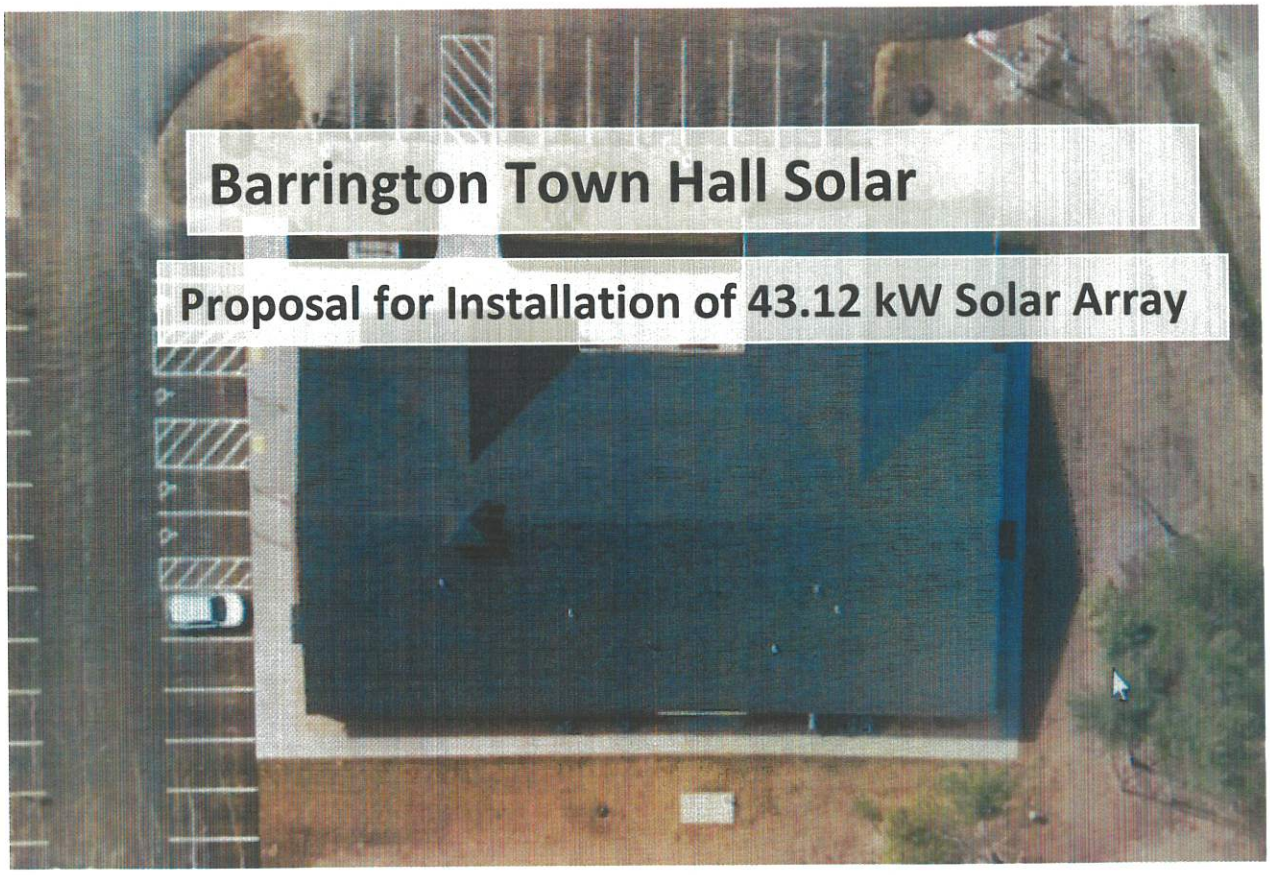
All design, installation, and maintenance will be done in-house by Harmony Energy Works (Harmony) employees. No employees are associated with or have any relationship with any of the Select Board or Energy Committee and there is no known conflict of interest.

Work on design, interconnection, permitting, and material acquisition will begin immediately upon selection and actual installation will commence in early spring of 2024, depending on weather and access to the site. Harmony certifies that it will be able to complete the array with its current workload.

Silfab Solar panels have a 30 year linear performance guarantee with a ≥82.6% performance at the end of year 30. The SolarEdge inverters include a 25 year extended warranty.

The SolarEdge monitoring platform provides on-line, module-level monitoring of each solar module and optimizer and auto-reporting of REC (Renewable Energy Credit) data.

George Horrocks, President
Harmony Energy Works Incorporated
NABCEP PV Installer #032611-147
george.horrocks@harmonyenergyworks.com
O: 603-926-3366 M:603-512-3377
Tax ID #45-2542993



EXECUTIVE SUMMARY & PROPOSAL

RESPONSE TO REQUEST FOR QUOTE FOR A SOLAR ARRAY
FOR THE BARRINGTON TOWN HALL.
SUBMITTED: 1/30/2024

Harmony Energy Works Incorporated
George Horrocks, President
10 Gale Road
Hampton, NH 03842
603-926-3366
www.harmonyenergyworks.com

Scope of Solar Project

Objectives/General

A premier team of renewable energy project designers and installers, Harmony Energy Works Incorporated, a Hampton, NH-based solar design and installation company, proposes the following:

- To design and construct a **43.12 kW DC roof-mount solar array** on the property of the Barrington Town Hall, Inc. on 4 Signature Drive, Barrington, N.H. 03825. The proposed system will be turnkey state-of-the-art, grid-tied system designed to offset electricity costs for the Barrington Town Hall.

Harmony Energy Works has been installling solar arrays for commercial, government, and residential solar projects in New Hampshire, Maine, and Massachusetts for over 14 years. Harmony Energy Works' in-house engineers design, install, and maintain all of its solar installations. Located just 40 miles from the site, Harmony is perfectly situated to provide any required array maintenance or educational support.

A small sample of our nearby commercial and government projects includes the following:


Applecrest Farm Orchards


Drug Enforcement Agency


Port City Air (Pease)


Storage King


Derryfield School


Warner Water District


Maine Drilling & Blasting


Insurcomm


Brochu Nurseries


Town of Warner


Memories Ice Cream


Squamscot Beverages

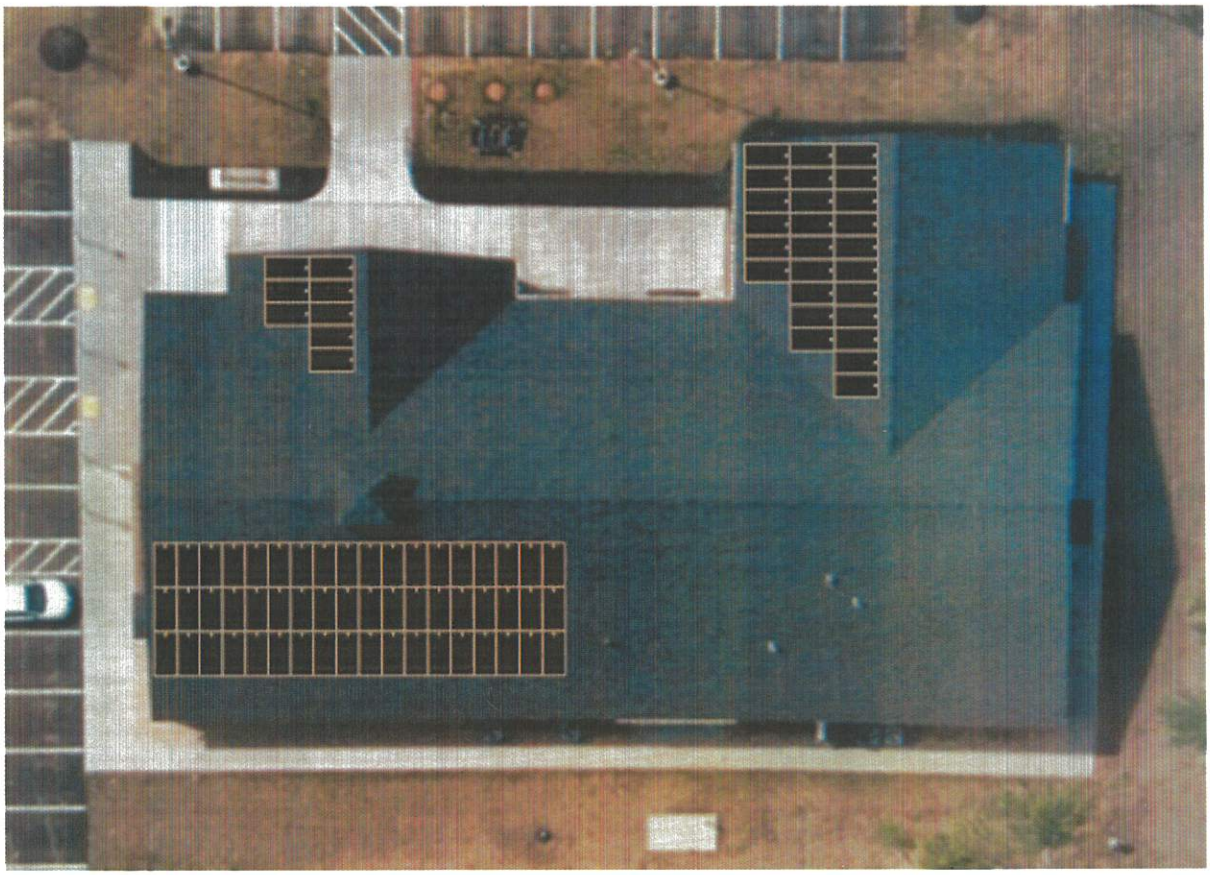
Benefits of Working with Harmony Energy Works

- Because Harmony Energy Works (Harmony) is the leading solar PV installer of commercial systems in the area, you get the most knowledgeable partner in PV engineering design, grid interconnections, best practices workmanship, and a most thorough understanding of financial incentives.
- Only **American-made solar modules** will be used in your installation, assuring you of the highest quality and efficiency. Likewise, in the long term, your 30-year warranty will be dependable and bankable.
- Not only are solar panels installed in your system by us American-made, ARRA compliant, but they are all "plus-tolerance". Many foreign manufacturers specify their modules as having a plus or minus 5% tolerance. That means that while you paid for a 490W module, its' power on Day 1 could be as low as 465W - and still meet their specification. With the solar modules we install, you can always trust that they will produce their nameplate power or up to 24.5W more when your system is turned on.
- Harmony implements quality by design. There are significant architectural advantages for you with our use of DC-DC optimizers, located at each solar panel:
    - You are able to monitor your array's production at the module level. You know how every module is producing – at any moment.
    - If there is a problem due to lowered or lost production, you can easily identify the malfunctioning module immediately and without guesswork. By comparison, with a string inverter, you may not even notice that one or more solar panels are not working correctly until numerous simultaneous problems reveal a significant loss of power.
    - Temporary or partial shading due to clouds or snow cover does not affect the performance of other modules in a string, as it does with older types of inverters. On average, you can expect to harvest between 6% and 12% more power each year than you would with a string inverter.
- Because we adhere to higher design standards, your array will produce more power. For example, the National Electrical Code, suggests – but does not require – wiring voltage drops of no more than 5%. Consequently, many solar designers and electricians do not upsize their wires appropriately for longer wire lengths. Harmony designs with a maximum combined DC and AC loss due to voltage drop of less than 2%, which means the power produced by your array arrives at your meter and is not lost on the way there.
- Interconnection and incentive rules are constantly changing. We understand the implications of those rule changes better than anyone, and we know how to navigate those rules on your behalf. There are considerable financial opportunities that may be missed if those implications are not correctly understood. In particular, this regards RECs, rebates, grants, virtual or group net metering, etc.

System Description

This **43.12 kW (DC) (40 kW AC)** array will be installed on the grounds of the Barrington Town Hall on 4 Signature Drive, Barrington. This array is designed to produce approximately 47,511 kWh/yr, offsetting the consumption of the Barrington Town Hall.

The **43.12 kW roof-mounted array** will be located as shown below.



Racking – The IronRidge roof-mount racking system, manufactured in the US, is designed to meet the heavy local snow load requirements of 70 lb/ft^2.

PV Modules – Silfab Solar premium mono-crystalline silicon modules are manufactured and assembled in the US and are ARRA-compliant. The total array consists of 88 **Silfab Solar SIL-490 HN**, 490-watt modules. Silfab Solar modules are 'plus-tolerance', meaning that they deliver power equal to or up to 24.5W in excess of their nameplate rating. Silfab Solar panels come with a 25 year product warranty and 30 year linear performance warranty.

Inverter – Four 10 kW SolarEdge SE10000H-US Inverter will be installed near the grid connection. Coupled with SolarEdge module-level DC optimizers, they offer conversion efficiency approximately **6%** better than any string or central inverters. SolarEdge is the world leader in the DC optimizer market and meets the NEC Rapid Shutdown requirement.

Equipment Warranties

- Racking – 25-yr
- Solar Panels – 25 yr manufacturing, 30-yr linear production warranty
- Inverters – Optimizers: 25-yr; Inverters: 25-yr Extended Warranty (included)

Forms and Permits

- Our Master Electrician will obtain the Electrical Permit. This typically takes two weeks.
- Eversource – Harmony will submit the Interconnection Agreement required for grid-tie-in. Eversource typically has a minimum 12-14 week delay in processing. In addition, a new 3-phase transformer may be required at the array site. The delay will not be known until submission of the Work Request submission.
- RECs – Harmony provides an online monitoring capability with reporting down to the module level. REC information is automatically reported to NEPOOL by SolarEdge. Harmony will arrange for Knollwood to purchase the RECs

Projected Output (PVWatts)

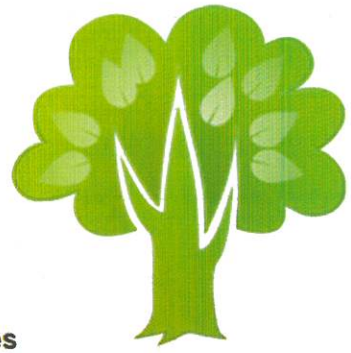
Output production projections are based on 30-year averages of the NREL weather reporting stations. PVWatts output projections are shown below for the site and total 47,511 KWh/yr.

Azimuth	105°	195°	
Section Size (kW)	28.42	14.7	43.12
January (kWh)	1517	1161	2679
February (kWh)	1994	1364	3358
March (kWh)	2888	1748	4636
April (kWh)	3132	1693	4825
May (kWh)	3074	1691	4765
June (kWh)	3269	1674	4943
July (kWh)	3532	1869	5401
August (kWh)	3130	1707	4837
September (kWh)	2497	1546	4043
October (kWh)	2059	1297	3357
November (kWh)	1347	1029	2377
December (kWh)	1282	1010	2292
Total (kWh)	29722	17790	47511

Environmental Return on Investment

System Specifications

Type of Panel	Silfab	490
Number of Panels		88
Total Array Size		**43.12 KW DC**



25-year Environmental Return on Investment

Lbs of CO_2 - the leading greenhouse gas	**1,937,166 lbs**
Lbs of Nitrous Oxide-smog, health effects	**2,911 lbs**
Lbs of SO_2 - causes acid rain	**8,947 lbs**
or Equivalent to planting acres of trees	**270 acres**

Pricing

The total installed base cost for the **43.12 kW (DC)** Solar PV System is **$124,617**, before incentives. The expected payback with incentives and the offset of electricity cost is less than 5 years.

Pricing includes all components, labor, shipping, and preparation of permits. Not included is the utility service upgrade, if any, required at the site.

On notification that your rebates have been approved, a deposit of 65% is due to order materials. The remainder will be due only after installation completion and final inspection. The entire amount of the contract will be due before the incentives are paid to you.

Harmony Energy Works will work with the customer to obtain all incentives and rebates available. The Direct Pay Program – part of the Inflation Reduction Act - will yield a 30% cash payment. The current NH Dept. of Energy C&I Rebate is $.20/W, which is an $8,000 cash rebate.

Because the array produces clean, carbon-free electrical power, it qualifies to earn Solar Renewable Energy Credits (RECs). Over the past 5 years, the price of RECs has fluctuated between $16 and $65 each. The proposed array is expected to earn approximately 47 RECs annually, worth about $1645 each year. Payment for RECs earned is made quarterly, based on actual production and is paid by your designated Aggregator. Harmony will assist you in setting up your SREC account upon installation of your system.

System Cost		$ 124,617
NH Commercial Energy Rebate		(8,000)
Federal Tax Credit (Direct Pay)	30%	(37,385)
Federal Depreciation basis, MACRS (over 6 years)*		
SRECs (over 10 years @ $35/ea/yr)		(16,450)
Net Cost/(Profit) after tax credit, grant, and depreciation benefits		$ 62,782

Cost Per Watt $2.89 — Savings 125%
Net Metering Rate Eversource $0.2860 — 1st Year - $ 13,588
Expected Annual Electrical Energy Cost Increase * 2.5%

	Yr1	Yr2	Yr3	Yr4	Yr5	Yr6	Yr7	Yr8	Yr9	Yr10
Installation Cost	(124,617)	0	0	0	0	0	0	0	0	0
NH C&I Rebate	8,000	0	0	0	0	0	0	0	0	0
USDA REAP Grant	0	0	0	0	0	0	0	0	0	0
Federal Tax Credit	37,385	0	0	0	0	0	0	0	0	0
SRECs	1,645	1,645	1,645	1,645	1,645	1,645	1,645	1,645	1,645	1,645
Utility Net Metering	13,588	13,928	14,276	14,633	14,999	15,374	15,758	16,152	16,556	16,970
Accum. ROI	($63,999)	($48,426)	($32,504)	($16,226)	$417	$17,436	$34,839	$52,637	$70,838	$89,452

In our discussions of your project's financing, the Community Development Finance Authority (CDFA) – who we have partnered with on numerous projects – has indicated that the rate for your town would likely be between 5 ½ - 6 ½%.

Thank you for the opportunity to provide you with a proposal for this exciting project. We always enjoy partnering with progressive towns in NH to deploy and promote the use of Solar Energy. We look forward to working with you to provide you with a state of the art Solar PV System.

By signing and returning this proposal with your down payment, you agree to the terms and conditions herein and order the work to proceed.

Sincerely,

George Horrocks

George Horrocks
President, Harmony Energy Works

//George Horrocks// 1/30/2024	
George Horrocks, President Date Harmony Energy Works	Representative Date Town of Barrington

APPENDIX

AUTHORIZATION TO RELEASE INFORMATION

The undersigned hereby authorizes the Town of Barrington to obtain information regarding its performance on other contracts, agreements or other business arrangements, its business reputation, and any other matters pertinent to the evaluation and selection of a successful proposer in response to its Request for a Barrington Town Hall Municipal Photovoltaic Installation.

The undersigned hereby releases, acquits, and forever discharges the Town of Barrington, its Administrators, employees, governing Board members, and agents from any and all liability whatsoever, including all claims, demands and causes of action of every nature and kind affecting the undersigned that it may have or ever claim to have relating to information, data, opinions, and references obtained by the Town of Barrington in the evaluation and selection of a successful proposer in response to its Request for a Barrington Town Hall Municipal Photovoltaic Installation.

The undersigned hereby authorizes representatives of the Town of Barrington to contact any and all of the persons, entities, and references that are, directly or indirectly, listed submitted, or referenced in the undersigned's proposal submitted in response to its Request for a Barrington Town Hall Municipal Photovoltaic Installation.

The undersigned further authorizes any and all persons or entities to provide information, data, and opinions with regard to the undersigned's performance under any contract, agreement, or other business arrangement, the undersigned's ability to perform, the undersigned's business reputation, and any other matter pertinent to the evaluation of the undersigned. The undersigned hereby releases, acquits, and forever discharges any such person or entity, their officers, directors, employees and agents from any and all liability whatsoever, including all claims, demands and causes of action of every nature and kind affecting the undersigned that may have or ever claim to have relating to the evaluation and selection of a successful proposer in response to its Request for a Barrington Town Hall Municipal Photovoltaic Installation.

A photocopy of this signed Authorization is as valid as the original.

George Horrocks

Digitally signed by George Horrocks
DN: cn=George Horrocks, o=Harmony Energy Works, ou, email=george.horrocks@harmonyenergyworks.com, c=US
Date: 2024.01.30 16:45:28 -05'00'

Signature

01/30/2024

Date

Harmony Energy Works Incorporated

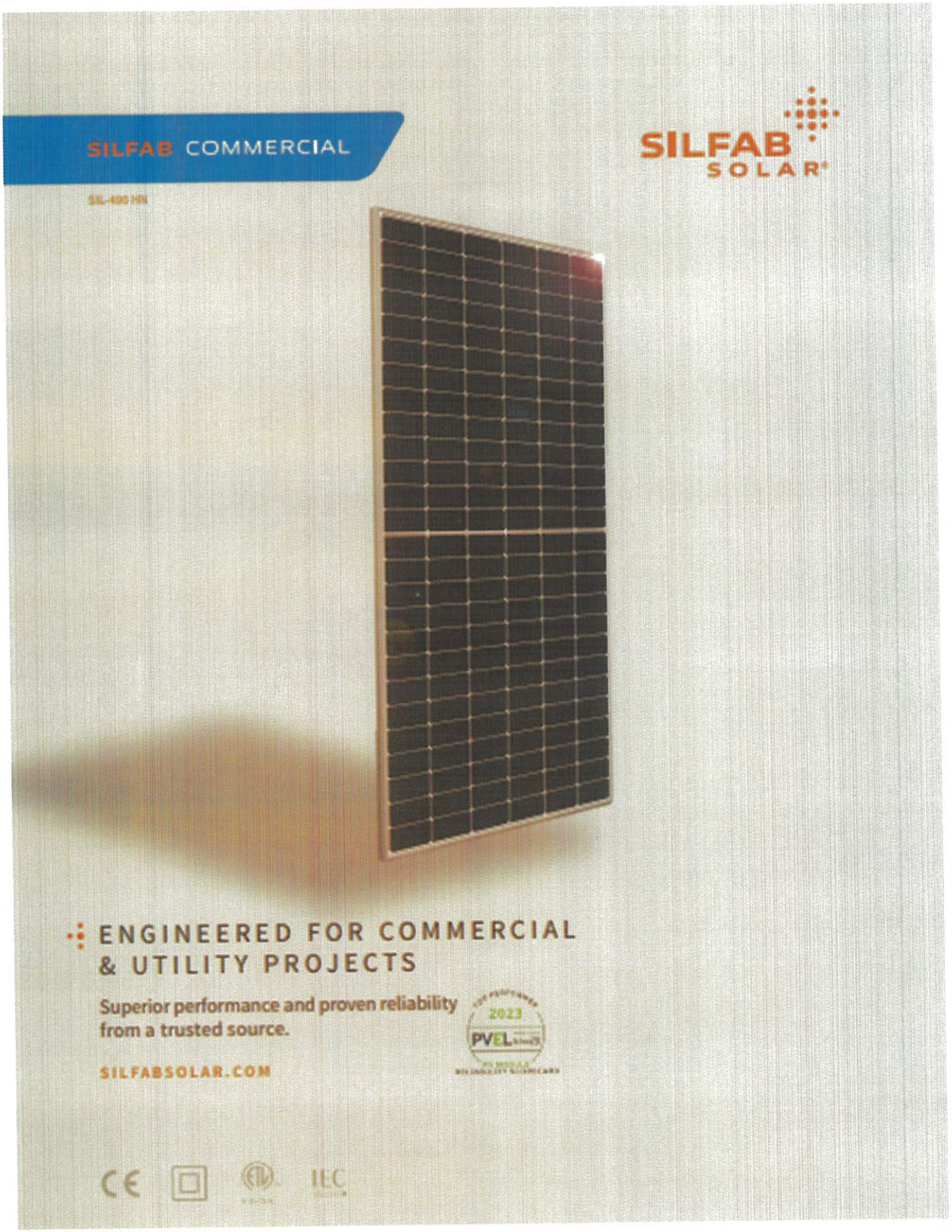
Company

George Horrocks

Name

President

Title


SILFAB COMMERCIAL
SILFAB SOLAR
ENGINEERED FOR COMMERCIAL & UTILITY PROJECTS
Superior performance and proven reliability from a trusted source.
2023
PVEL
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ELECTRICAL SPECIFICATIONS		490 HN	
Test Conditions		STC	NOCT
Module Power (Pmax)	Wp	490	362
Maximum power voltage (Vpmax)	V	45.23	41.61
Maximum power current (Ipmax)	A	10.83	8.69
Open circuit voltage (Voc)	V	53.96	49.64
Short circuit current (Isc)	A	11.36	9.12
Module efficiency	%	20.9%	19.3%
Maximum system voltage (VDC)	V	1500	
Series fuse rating	A	20	
Power Tolerance	Wp	0 to +10	

Measurement conditions: STC 1000 W/m² • AM 1.5 • Temperature 25 °C • NOCT 800 W/m² • AM 1.5 • Measurement uncertainty ≤ 3%
Sun simulator calibration reference modules from Fraunhofer Institute. Electrical characteristics may vary by ±5% and power by 0 to +10W.

MECHANICAL PROPERTIES / COMPONENTS	METRIC	IMPERIAL
Module weight	25.8kg ±0.2kg	56.9lbs ±0.4lbs
Dimensions (H x L x D)	2263 mm x 1037 mm x 35 mm	89 in x 40.8 in x 1.37 in
Maximum surface load (wind/snow)*	2400 Pa rear load / 5400 Pa front load	50.1 lb/ft² rear load / 112.8 lb/ft² front load
Hail impact resistance	ø 25 mm at 83 km/h	ø 1 in at 51.6 mph
Cells	156 Half cells - Si mono PERC 9 busbar - 83 x 166 mm	156 Half cells- Si mono PERC 9 busbar - 3.26 x 6.53 in
Glass	3.2 mm high transmittance, tempered, DSM antireflective coating	0.126 in high transmittance, tempered, DSM antireflective coating
Cables and connectors (refer to installation manual)	1350 mm, ø 5.7 mm, MC4 from Staubli	53.15 in, ø 0.22 in (12AWG), MC4 from Staubli
Backsheet	High durability, superior hydrolysis and UV resistance, multi-layer dielectric film, fluorine-free PV white backsheet	
Frame	Anodized Aluminum (Silver)	
Bypass diodes	3 diodes-30SQ045T (45V max DC blocking voltage, 30A max forward rectified current)	
Junction Box	UL 3730 Certified, IEC 62790 Certified, IP68 rated	

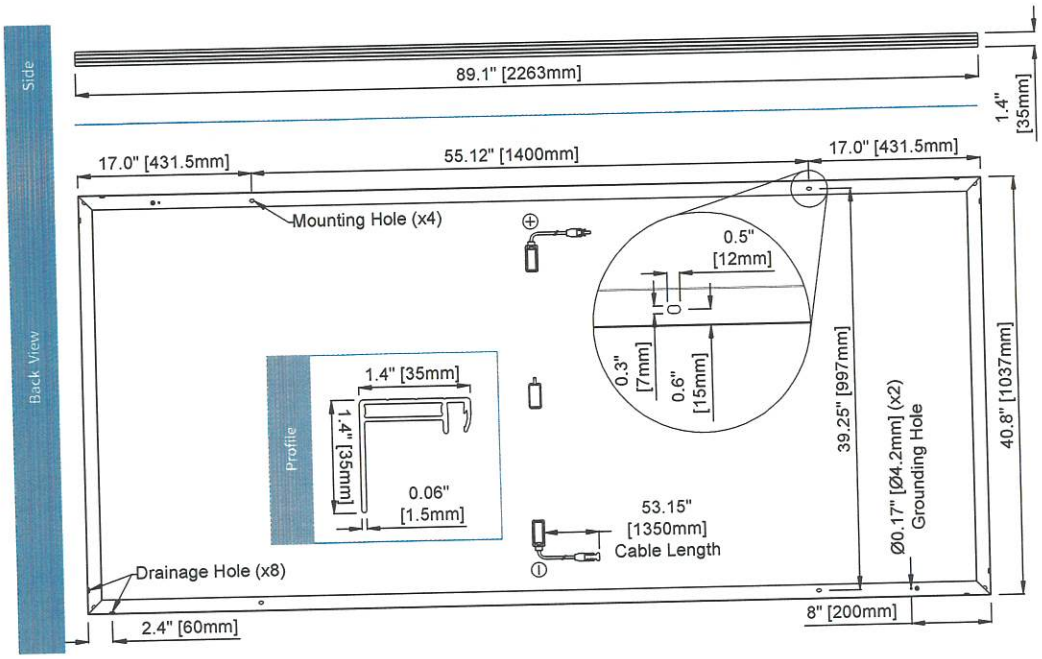
TEMPERATURE RATINGS	
Temperature Coefficient Isc	+0.064 %/°C
Temperature Coefficient Voc	-0.28 %/°C
Temperature Coefficient Pmax	-0.36 %/°C
NOCT (± 2°C)	45 °C
Operating temperature	-40/+85 °C

WARRANTIES	
Module product workmanship warranty	25 years**
Linear power performance guarantee	30 years
	≥ 97.1% end 1st yr ≥ 91.6% end 12th yr ≥ 85.1% end 25th yr ≥ 82.6% end 30th yr

CERTIFICATIONS	
Product	ULC ORD C1703, UL1703, CEC listed, UL 61215-1/-2, UL 61730-1/-2, IEC 61215-1/-2. IEC 61730-1/-2, CSA C22.2#61730-1/-2, IEC 62716 Ammonia Corrosion; IEC61701:2011 Salt Mist Corrosion Certifed, UL Fire Rating: Type 1
Factory	ISO9001:2015

SHIPPING SPECS	
Modules Per Pallet:	31
Pallets Per Truck	23
Modules Per Truck	713

* ⚠ Warning. Read the Safety and Installation Manual for mounting specifications and before handling, installing and operating modules.
** 12 year extendable to 25 years subject to registration and conditions outlined under "Warranty" at silfabsolar.com
PAN files generated from 3rd party performance data are available for download at: silfabsolar.com/downloads



SILFAB SOLAR INC.

800 Cornwall Ave
Bellingham WA 98225 USA
T +1 360.569.4733
info@silfabsolar.com
SILFABSOLAR.COM

1770 Port Drive
Burlington WA 98233 USA
T +1 360.569.4733

240 Courtneypark Drive East
Mississauga ON L5T 2Y3 Canada
T +1 905.255.2501
F +1 905.696.0267

Power Optimizer

For North America

P400 / P401 / P485 / P505

POWER OPTIMIZER

25 YEAR WARRANTY

PV power optimization at the module level

- Specifically designed to work with SolarEdge inverters
- High efficiency with module-level MPPT, for maximized system energy production and revenue, and fast project ROI
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch losses, from manufacturing tolerance to partial shading
- Flexible system design for maximum space utilization
- Fast installation with a single bolt
- Next generation maintenance with module-level monitoring
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)
- Module-level voltage shutdown for installer and firefighter safety

solaredge

/ Power Optimizer

For North America

P400 / P401 / P485 / P505

Optimizer model (typical module compatibility)	P400 (for 72 & 96-cell modules)	P401 (for high power 60 and 72-cell modules)	P485 (for high-voltage modules)	P505 (for higher current modules)	
INPUT					
Rated Input DC Power[1]	400	430	485	505	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	80	60	125[2]	83[2]	Vdc
MPPT Operating Range	8 – 80	8 – 60	12.5 – 105	12.5 – 83	Vdc
Maximum Short Circuit Current (Isc)	10.1	12.5	11	14	Adc
Maximum Efficiency	99.5				%
Weighted Efficiency	98.8				%
Overvoltage Category	II				
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREDGE INVERTER)					
Maximum Output Current	15				Adc
Maximum Output Voltage	60		80		Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREDGE INVERTER OR INVERTER OFF)					
Safety Output Voltage per Power Optimizer	1 ± 0.1				Vdc
STANDARD COMPLIANCE					
EMC	FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3				
Safety	IEC62109-1 (class II safety), UL1741, NEC/PVRSS				
Material	UL94 V-0, UV Resistant				
RoHS	Yes				
INSTALLATION SPECIFICATIONS					
Maximum Allowed System Voltage	1000				Vdc
Compatible inverters	All SolarEdge Single Phase and Three Phase inverters				
Dimensions (W x L x H)	129 x 153 x 33.5 / 5.1 x 6 x 1.3	129 x 153 x 29.5 / 5.1 x 6 x 1.16	129 x 159 x 49.5 / 5.1 x 6.3 x 1.9	129 x 162 x 59 / 5.1 x 6.4 x 2.3	mm / in
Weight (including cables)	750 / 1.7	655 / 1.5	845 / 1.9	1064 / 2.3	gr / lb
Input Connector	MC4[3]				
Input Wire Length[4]	0.16 / 0.5				m / ft
Output Wire Type / Connector	Double Insulated / MC4				
Output Wire Length	1.2 / 3.9				m / ft
Operating Temperature Range[5]	-40 to +85 / -40 to +185				°C / °F
Protection Rating	IP68 / NEMA6P				
Relative Humidity	0 – 100				%

(1) The rated power of the module at STC will not exceed the optimizer Rated Input DC Power. Modules with up to +5% power tolerance are allowed.
(2) NEC 2017 requires that the maximum input voltage not be more than 80V.
(3) For other connector types please contact SolarEdge.
(4) Longer input wire lengths are available for use. For 0.9m input wire length order P401-xxxLxxx.
(5) For ambient temperatures above +85°C / +185°F power de-rating is applied. Refer to the Power Optimizers Temperature De-Rating Technical Note for more details.

PV System Design Using a SolarEdge Inverter[6]		SolarEdge Home Wave Single Phase	Single phase	Three Phase for 208V grid	Three Phase for 277/480V grid	
Minimum String Length (Power Optimizers)	P400, P401	8		10	18	
	P485, P505	6		8	14	
Maximum String Length (Power Optimizers)		25		25	50	
Maximum Power per String		5700[7] (6000 with SE7600-US – SE11400-US)	5250[7]	6000[8]	12750[9]	W
Parallel Strings of Different Lengths or Orientations		Yes				

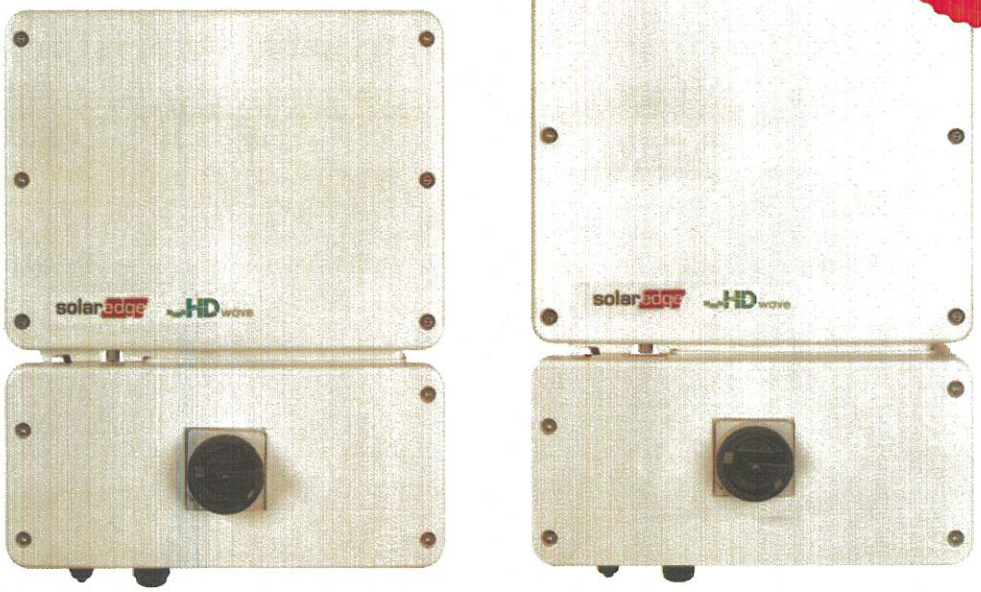
(6) It is not allowed to mix P485/P505 with P400/P401 in one string.
(7) A string with more than 30 optimizers does not meet NEC rapid shutdown requirements, safety voltage will be above the 30V requirement.
(8) For the 208V grid, it is allowed to install up to 6,500W per string when the maximum power difference between each string is 1,000W.
(9) For 277/480V grid: it is allowed to install up to 15,000W per string when the maximum power difference between each string is 2,0000.

SolarEdge Home Wave Inverter
For North America

SE3800H-US / SE5000H-US / SE6000H-US /
SE7600H-US / SE10000H-US / SE11400H-US

INVERTERS

12-25 YEAR WARRANTY



Optimized installation with HD-Wave technology

- Specifically designed to work with power optimizers
- Record-breaking 99% weighted efficiency
- Quick and easy inverter commissioning directly from a smartphone using SolarEdge SetApp
- Fixed voltage inverter for longer strings
- Integrated arc fault protection and rapid shutdown for NEC 2014-2023 per articles 690.11 and 690.12
- UL1741 SA certified, for CPUC Rule 21 grid compliance
- Small, lightweight, and easy to install both outdoors or indoors
- Built-in module-level monitoring
- Optional: Faster installations with built-in consumption metering (1% accuracy) and production revenue grade metering (0.5% accuracy, ANSI C12.20)

solaredge

SolarEdge Home Wave Inverter

For North America

SE3800H-US / SE5000H-US / SE6000H-US/ SE7600H-US / SE10000H-US / SE11400H-US

Applicable to inverters with part number	SEXXXXH-XXXXXBXX4					SE11400H-XXXXXBXX5	
	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
ADDITIONAL FEATURES							
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), wireless SolarEdge Home Network (optional)[3], Wi-Fi (optional), Cellular (optional)						
Revenue Grade Metering, ANSI C12.20	Optional[4]						
Consumption Metering							
Inverter Commissioning	With the SetApp mobile application using Built-in Wi-Fi Access Point for Local Connection						
Rapid Shutdown - NEC 2014-2023 per articles 690.11 and 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect						
STANDARD COMPLIANCE							
Safety	UL1741, UL1741 SA, UL1741 SB, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07						
Grid Connection Standards	IEEE1547-2018, Rule 21, Rule 14 (HI), CSA C22.3 No. 9						
Emissions	FCC Part 15 Class B						
INSTALLATION SPECIFICATIONS							
AC Output Conduit Size / AWG Range	1" Maximum / 14 – 6 AWG				1" Maximum / 14 – 4 AWG		
DC Input Conduit Size / # of Strings / AWG Range	1" Maximum / 1 – 2 strings / 14 – 6 AWG				1" Maximum / 1 – 3 strings / 14 – 6 AWG		
Dimensions with Safety Switch (H x W x D)	17.7 x 14.6 x 6.8 / 450 x 370 x 174				21.06 x 14.6 x 7.3 / 535 x 370 x 185	21.06 x 14.6 x 8.2 / 535 x 370 x 208[5]	in / mm
Weight with Safety Switch	22 / 10	25.1 / 11.4	26.2 / 11.9		38.8 / 17.6	44.9 / 20.4[5]	lb / kg
Noise	< 25			<50			dBA
Cooling	Natural Convection						
Operating Temperature Range	-40 to +140 / -40 to +60[6]						°F / °C
Protection Rating	NEMA 4X (Inverter with Safety Switch)						

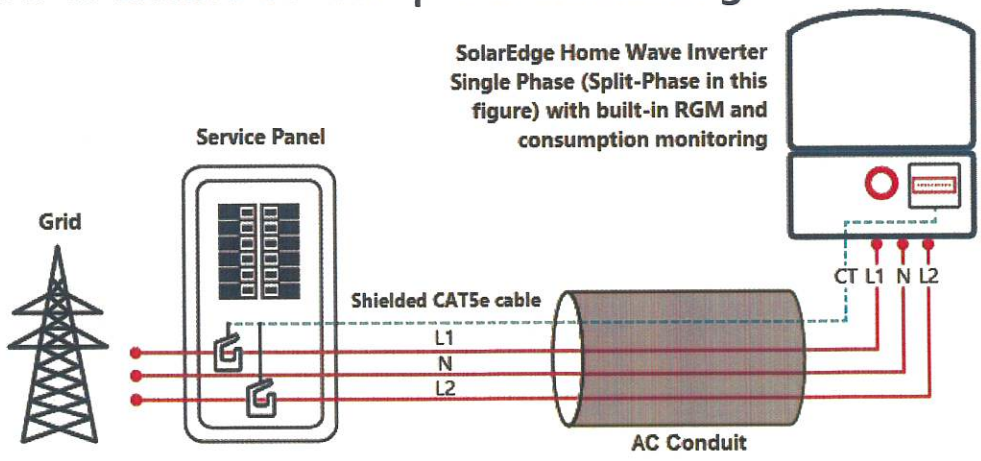
(3) For more information, refer to the SolarEdge Home Network datasheet

(4) Inverter with Revenue Grade Production and Consumption Meter P/N: SExxxxH-US000BEI4. For consumption metering, current transformers should be ordered separately: SEACT0750-200NA-20 or SEACT0750-400NA-20. 20 units per box.

(5) SE11400H-USxxxBxx**5** is the updated PN, though SE11400H-USxxxBxx**4** will still be available. All specifications are similar for both models, **EXCLUDING** the weight and dimensions [HxWxD]; The weight and dimensions of SE11400H-USxxxBxx**4** are 17.6 [kg] and 21.06-14.6-7.3 / 535-370-185 [in/mm], accordingly.

(6) Full power up to at least 50°C / 122°F; for power de-rating information refer to the Temperature De-rating Technical Note for North America.

How to Enable Consumption Monitoring



By simply wiring current transformers through the inverter's existing AC conduits and connecting them to the service panel, homeowners will gain full insight into their household energy usage helping them to avoid high electricity bills.

Certifications

Licensing

Harmony Energy Works is properly licensed and in good standing with the State of New Hampshire Secretary of State.

- Business License ID number: 652414
  Letter of Good Standing with Secretary of State provided upon request.
- Following the Awarding of the contract, and prior to initiation of construction, Harmony Energy Works will provide OSHA 10-hr Certificates for all designated installation workers.

Insurance

- Harmony's General Liability and Workmen's Compensation insurance certifications are available upon request.

Operations and Maintenance

In the event of a problem being detected, Harmony Energy Work's headquarters is 40 miles from the arrays. This allows for quick response times in dealing with any issues that may arise, as well as easy maintenance trips, and regular visual inspections. The PV system will be closely monitored for performance. In the event of a malfunction or degradation beyond expectation, we will inspect all components, evaluate for functionality, and repair or replace parts determined to be problematic.

Operation and Maintenance Manuals and As-Built Drawings

Upon completion of the installation, operation and maintenance manuals and as-built drawings, as well as an electronic copy of each, will be provided. Data sheets for the main equipment being used (modules and inverters) are attached.

System Monitoring

In addition to providing revenue-grade production meters, we will be installing an online monitoring system (for both Web and smartphone access) which tracks hourly, daily, and annually production to the individual module level. The monitoring system automatically alerts the installer, and other designees, in the event of an error, a failure, or a reduction in power.

Work Site

All materials are to be purchased by Harmony prior to being installed. All installation instructions shall be followed in accordance with manufacturer's requirements. Harmony will protect any and all areas, surfaces, grounds and surrounding areas. Any damage occurring as a result of Harmony negligence will be repaired or replaced by Harmony. No drugs, alcohol, or smoking of any kind will be permitted on work site grounds.

Special Provisions

Harmony will procure all necessary permits, interconnection agreements, and will not transfer this contract, if awarded. Harmony will be responsible for all construction equipment on site and will not hold the customer accountable for lost or stolen tools or equipment.

Safety

Safety to all involved (contractors, employees, pedestrians, etc.) is of the utmost importance. Harmony will utilize all possible means to prevent any injuries, including the placement of signs, barricades, ropes, and warning devices. Harmony will comply with all laws, EPA, State and OSHA regulations that apply.

Contractor/Installer Qualifications

Harmony Energy Works Project Team

Harmony Energy Works is a privately held Hampton-based solar company that designs, installs, and maintains commercial, government, and residential solar projects in three New England States – New Hampshire, Massachusetts, and Maine. Harmony is an authorized dealer for Solar World modules and is unique in that we are the only solar company in NH that exclusively sells American-made solar products – modules, inverters, and balance of system components. Its president, George Horrocks, is one of only 9 NABCEP nationally certified professional solar PV installers in the state.

George Horrocks: Harmony Energy Works, *President*
George Horrocks is an electrical engineer (BSEE) with more than 35 years of experience. He is one of only nine NABCEP (# 032611-147) nationally-certified Solar PV Installation Professionals in the state of New Hampshire. Mr. Horrocks has been Principal Design Engineer and Project Manager for well over 100 solar photovoltaic projects totaling over 6500KW – residential and commercial – and was responsible for engineering design, procurement, and project management of those solar PV installations. Prior to founding Harmony Energy Works, he has had a successful engineering career in a number of startup companies as Engineering Manager at Bedford Computer Corporation, VP of Hardware Engineering at Computek, Senior Technical Staff at Hendrix Advanced Systems Technology (Hastech), Director of Engineering at Intertext, and President of Sparrow Information.

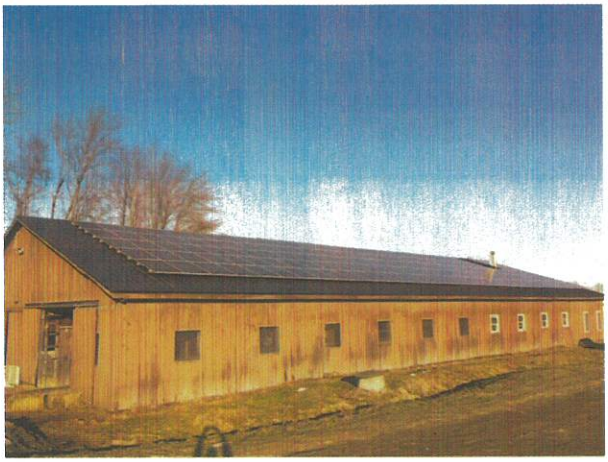
Mr. Horrocks is a member of IEEE (Institute of Electronic and Electrical Engineers) and ASES (American Solar Energy Society) professional organizations, NH Green Alliance, NHSEA (NH Sustainable Energy Association) and a board member of the community-based solar organization, SEAREI (Seacoast Area Renewable Energy Initiative).

David Childs, *Master Electrician*
David Childs is the Corporate Master and primary electrician for Harmony Energy Works. He has been an electrician for over 30 years. David is licensed in New Hampshire, Massachusetts, and Maine. He is a well-respected electrician in the area and has done work for many notable corporations.

Commercial Project References

Project Name: Warner Village Water District
Key Contact: Ray Martin / 603-456-2298
Location: 55 W. Joppa Rd., Warner, NH 03278
Installation Date: 6/14/2016
Total System Production: 153,732kWh
Description: 114kW Roof-mounted Solar PV Array
- 380 SolarWorld SW300 300W modules
- 5 SolarEdge SE20KUS Inverters
- Schletter Racking

Incentives / Rebates / Grants:
- NH Commercial & Industrial Solar Rebate
- Community Block Grant



Project Name: High Knoll Equestrian Center
Key Contact: Dr. Grant Myhre / 603-335-4777
Location: 100 Ten Rod Road, Rochester, NH 03867
Installation Date: 3/14/2016
Total System Production: 60.515kWh
Description: 47.88kW Roof-mounted Solar PV Array
- 171 SolarWorld SW280 280W modules
- 4 SolarEdge SE10KUS Inverters
- IronRidge Racking

Incentives / Rebates / Grants:
- NH Commercial & Industrial Solar Rebate
- Business Energy Investment Tax Credit (ITC)
- USDA Rural Energy for America Program (REAP) Grant

Project Name: Conner Bottling Works/Squamscott Beverages
Key Contact: Thomas Conner / 603-772-3376
Location: 120 Exeter Road, Newfields, NH
Installation Date: 3/1/2014
Total System Production: 54,416 kWh
Description: 43.68kW Solar PV Array
- 156 SolarWorld SW280 modules
- 4 SolarEdge SE10000AUS inverters
- Ironridge roof-, Schletter ground-mount racking systems

Incentives / Rebates / Grants:
- NH Commercial & Industrial Solar Rebate
- U.S. Treasury Section 1603 Grant
- USDA Rural Energy for America Program (REAP) Grant

Project Name: Applecrest Farm Orchards
Key Contact: Peter Wagner / 603-926-3721
Location: 133 Exeter Rd, Hampton Falls, NH 03844
Installation Date: 9/16/2012
Total System Production: 54,871.60 kWh
Description: 39.78 kW Roof-mounted Solar PV Array
- 156 SolarWorld SW255 255W modules
- 6 SMA SB7000US inverters
- IronRidge XR1000 racking w/S-5 Clamps

Incentives / Rebates / Grants:
- NH Commercial & Industrial Solar Rebate
- U.S. Treasury Section 1603 Grant
- USDA Rural Energy for America Program (REAP) Grant

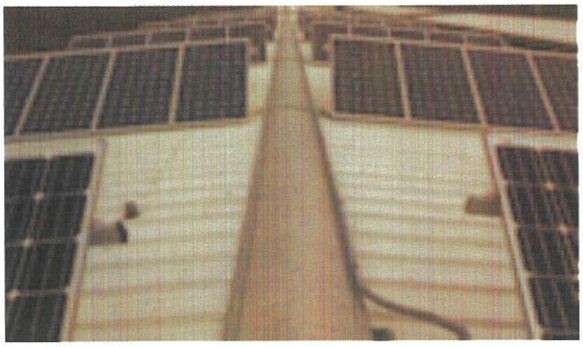
Project Name: United States Drug Enforcement Administration
Key Contact: Peter Bielagus / 603-668-7046
Location: 324 South River Road, Bedford, NH 03110
Installation Date: 2/8/2013
Total System Production: *Confidential*
Description: 12.24 kW Roof-mounted Solar PV Array
- 48 SolarWorld SW245 245W modules
- 1 Fronius 11.4-3 inverter
- Schletter Iso-Top Racking Structure

Incentives / Rebates / Grants:
- NH Commercial & Industrial Solar Rebate
- U.S. Treasury Section 1603 Grant

Project Name: Cherry Hill Apartments
Key Contact: Scott Foster / 603-659-5665
Location: 600 Bennett Way, Newmarket, NH 03857
Installation Date:
- 8/19/2013 - 6 sub-arrays
- 12/19/2013 - 2 sub-arrays

Description: 69.79 kW Roof-mounted Solar PV Array
- 6 sub-arrays
  - 82 SolarWorld SW265 265W modules
  - 82 Enphase micro-inverters
  - IronRidge XR1000 racking
- 2 sub-arrays
  - 178 SolarWorld SW270 270W modules
  - 178 Enphase micro-inverters
  - IronRidge XRS racking

Incentives / Rebates / Grants:
- NH Commercial & Industrial Solar Rebate
- Business Energy Investment Tax Credit (ITC)

	**Project Name:** Hauch Storage **Key Contact:** Katie Wood / 603-235-1869 **Location:** 2185 Woodbury Ave, Newington, NH 03801 **Installation Date:** March 4, 2013 **Total System Production:** 19,170.63 kWh **Description:** 15.3 kW Roof-mounted Solar PV Array • 60 SolarWorld SW265 265W modules • 2 SMA SB7000US inverters • IronRidge XR1000 racking **Incentives / Rebates / Grants:** • NH Commercial & Industrial Solar Rebate • Business Energy Investment Tax Credit (ITC) • USDA Rural Energy for America Program (REAP) Grant
	**Project Name:** The Derryfield School **Key Contact:** Gary Harper / 603-624-6143 **Location:** 2018 River Road, Manchester, NH 03104 **Installation Date:** 8/20/2013 **Total System Production:** 12,406.16 kWh **Description:** 19.08 kW Roof-mounted Solar PV Array • 72 SolarWorld SW265 265W modules • 2 SMA SB10000TL-US • IronRidge XR1000 racking **Incentives / Rebates / Grants:** • NH Commercial & Industrial Solar Rebate • Business Energy Investment Tax Credit (ITC)
	**Project Name:** MainStreet Properties **Key Contact:** Neil Nevins / 603-456-2700 **Location:** 16 East Main Street, Warner, NH 03278 **Installation Date:** 12/14/2011 **Total System Production:** 29,308.23 kWh **Description:** 11.52 kW Top-of-pole Solar PV Array • 48 Sharp 240UF-2 240W modules • 2 SMA SB6000US inverters • 4 DPW High Wind Version Top-of-pole racking systems **Incentives / Rebates / Grants:** • NH Commercial & Industrial Solar Rebate • U.S. Treasury Section 1603 Grant • USDA Rural Energy for America Program (REAP) Grant

For additional information please refer to: harmonyenergyworks.com

Harmony
ENERGY WORKS
✦ Hampton, NH 03842

Harmony Energy Works Incorporated
10 Gale Rd
Hampton, NH 03842

Town of Barrington

Proposals for Barrington Town Hall Solar

PV Installation

4 Signature Drive

Barrington, NH 03825