CENTRAL VERMONT REGIONAL PLANNING COMMISSION
Project Review Committee
Thursday August 22, 2019
4:00 – 6:00 pm

Central Vermont Regional Planning Commission Conference Room
29 Main Street, Suite #4, Montpelier, VT 05602

Approved Minutes

Project Review Committee Members:

☒	Lee Cattaneo, Orange Commissioner
☐	John Brabant, Calais Commissioner
☒	Jerry D'Amico, Roxbury Commissioner (Alternate Seat)
☒	Peter Carbee, Washington Commissioner
☒	Janet Shatney, Barre City Commissioner
☒	Bob Wernecke, Berlin Commissioner

Staff: Clare Rock, Zach Maia
Guest: Derek Moretz, Encore Renewable Energy

Call to Order

Janet Shatney called the meeting to order at 4:02 pm.

Adjustments to the Agenda

None.

Public Comments

None.

Act 250 / Section 248 Applications & Projects of Substantial Regional Impact

a) Presentation by Encore Renewable Energy

Derek Moretz introduced the project and referred to the information contained within the 45-day Notice (attached). VPPSA (VT Public Power Supply Authority) and Northfield Electric Department determined the size, and then choose Encore to develop it.

Other municipal sites considered included the town well site, but the water department didn't want to host the project of this size plus a portion of the property was located within the floodplain. The Cheney Site was also considered but based upon public sentiment from a public meeting, this was not a widely supported site.

Northfield Electric Department (NED) is seeking to meet the State's Energy targets; NED isn't as saturated by renewable power as GMP. Discussion about storage, NED isn't interested at this time, nor is it a necessity. Cattaneo expressed frustration by pressure on residential users to include storage but no requirement for the large renewable generators. Cattaeno also believes the regional plan should be amended to consider the impacts and I implications of planning for storage close to the site of generation, especially with larger (i.e. no residential projects.)

Regarding capacity compared to demand, the size of the project was tailored to the size of Northfield's need. All power would go to Northfield users in NED service area. Encore is doing some other projects with some other municipal electric departments. They are not net metered projects. Development of the project would result in a net benefit to the rate payers.

The survey on wildlife impacts has been completed but the report hasn't been completed. Wetlands have been delineated. There will be a fence.

The project would comply with 50ft riparian and wetlands buffer. Encore has completed a wetland determination. And no trees will be taken down.

The Committee discussed the impacts and who the project impacts. The CVRPC SRI criteria was reviewed. While the project is quite large, it only really impacts Northfield: it is located within Northfield, the energy produced would only go to Northfield users. It is not located within a forested area, rather it's located at the edge, so it's not impacting a regional resource (i.e. not in the forest block.) Committee members also reviewed and referenced Laura Hill Eubank email which was distributed by staff (also attached.) Committee also discussed the location of the project and weather it was in conformance with the character of the area/regional planning area. As the project is located adjacent to the developed village area the committee agreed the siting of the project would not negatively impact the character of the rural area compared to a hypothetical site which might be located miles from a settled area/in the middle of a forest. The project will not be very visible from RT 12.

J D'Amico stated his longtime friendship/acquaintance with the landowner and will be recusing himself form the vote.

Motion made by Wernecke, the project is not a project of substantial regional impact, seconded by P Carbee, all in favor, with one recusal. Motion carried.

Motion made by L Cattaneo, the project review committee has looked at a proposed project which doesn't provide storage and storage isn't a part of our regional plan, yet CVRPC was presented information by the State about the importance of storage and CVRPC should revise our Regional Plan to include and address storage and transmission, seconded by P Carbee. All in favor. Motion carried.

b) Review Project Review Summery Sheet – no discussion

Annual Election of Officers

Motion by B Wernecke to nominate Janet Shatney for Chair, and Lee Cattaneo for Vice Chair, seconded by J D Amico, all in favor. Motion carried.

Approve July 26, 2019 meeting minutes

Motion by L Cattaneo approve the July 25, 2019 minutes, seconded by B Wernecke all in favor. Motion carried.

Adjournment

Motion by B Wernecke to adjourn the Project Review Committee at 4:55pm, seconded by P Carbee, all in favor. Motion carried.

From:	Laura Hill-Eubanks
To:	Clare Rock
Cc:	Shatney Janet
Subject:	Re: Project Review Committee packet attached
Date:	Wednesday, August 21, 2019 3:26:34 PM
Attachments:	19-08-22 PRC packet.pdf

Hi Clare & Janet -

Thanks for sending this. I'm considering attending the meeting, but I have other obligations tomorrow, so may not get there. The Northfield Planning Commission reviewed the Bone Hill solar project notice at its last meeting and will provide comments to the PUC. The NPC generally supports the project, as it moves the town toward its goal of reducing use of fossil fuels. However, we also noted that the developers should prevent or minimize impacts to natural resources in the area, which seem to include a stream at the southern boundary of the project. This may require a buffer zone depending on the distance to the site.

Also, in reading the PRC packet, I looked at the policies that are listed as relating to Rural Planning Areas, and I think they may need some clarification (just generally speaking, as far as policies go in reviewing these types of projects). There is one additional policy that is included in that section of the Regional Plan, but not in the packet as far as I can tell. At page 2-28 of the Regional Plan, Policy #4 states: *Development that diminishes the rural character of the area as defined by local and regional plans is discouraged.* It looks as though this policy should be added to the RP policies listed in the packet.

Rural Planning Area Policy #4 then goes on to list the principles in the 1st two bullets, as you have them under "Provide direction on development principles to be used…" The remainder of the bullets in the packet list seem to be separate policies in the Regional Plan however (see policies #5-9 in that section), and not part of the "Provide direction on development principles" section in policy #4. Perhaps they should be listed as separate policies.

Thanks very much - if you have any questions, please feel free to contact me.
Laura

Laura Hill-Eubanks
2364 Route 12A
Northfield, VT 05663
802-485-6277

On Aug 20, 2019, at 3:48 PM, Clare Rock <rock@cvregion.com> wrote:

Hello Project Review Committee,

Please find attached the packet for Thursday afternoon. If you would like a hard copy for pick up, please let me know.

Clare

Clare Rock, CFM
Senior Planner
Central Vermont Regional Planning Commission
29 Main Street, Suite 4, Montpelier, Vermont 05602
Phone: (802) 229-0389 / Email: rock@cvregion.com
Web: centralvtplanning.org

encore
RENEWABLE ENERGY®

JUL 22 2019

July 16th, 2019

Town of Northfield Selectboard
Town of Northfield Planning Commission
Central Vermont Regional Planning Commission

Re: **ER Bone Hill Solar, LLC's 45-Day Notice to Persons and Entities Entitled to Notice Pursuant to Public Utility Commission Rule 5.402(A), for a Proposed 1.25MW Solar Array to be located off Route 12 in Northfield, VT.**

Dear Sir or Madam:

ER Bone Hill Solar, LLC (the "Applicant"), is pleased to provide you with this 45-Day notice in advance of filing a petition for a Certificate of Public Good with the Vermont Public Utility Commission ("Commission" or "PUC"), for a 1.25MW solar electric generation facility to be known as the "Bone Hill Solar Farm" (the "Project"). The Applicant will build and operate the Project under a Purchase Power Agreement with Vermont Public Power Supply Authority (VPPSA) to address Northfield Electric Department's ("NED") need for additional generation capacity within one of its load centers. Moreover, NED will use this Project to meet its renewable resource requirements contained in the State of Vermont Renewable Energy Standard. The Applicant proposes to construct the Project on private property located off Route 12 in Northfield, Vermont (the "Site"). This notice is provided in accordance with 30 VSA § 248, Vermont Statutes Annotated ("Section 248"), Public Utility Commission Rule 5.402.

Pursuant to Commission Rule 5.402, the following letter includes information sufficient to understand the overall Project including the location of the facility, a description of the proposed Project, construction plans and equipment to be used. This letter also describes the rights of the noticed parties to comment on the Project plans and participate in the Section 248 review process.

This letter contains descriptions of the following:

I. 30 V.S.A. § 248 Process Information;
II. Project Description;
III. Site Selection and Consideration of Alternatives
IV. Construction and Transportation
V. Preliminary Assessment of Environmental and Aesthetic Impacts;
VI. Project Benefits;
VII. Expected Filing Date.

Included as attachments to this letter are:

I. Location Map / Preliminary Site Plan
II. Preliminary Natural Resources Map
II. Representative Equipment Specifications

I. 30 V.S.A. Section 248 Petition and Notice

The state permitting process for electric generation facilities requires the Applicant to provide notice to certain entities and persons 45-days prior to a formal filing with the PUC. These include:

- The affected municipal legislative bodies;
- The affected municipal and regional planning commissions; and
- The Public Utility Commission.

The Applicant has also provided this 45 day notice to:

- The Department of Public Service
- The Agency of Natural Resources

Per Commission Rule 5.402(A), the municipal and regional planning commissions shall make recommendations, if any, at least seven (7) days prior to the intended filing date, which filing date is expected to be 45 days from the date of this notice.

Affected municipal and regional planning commissions may also provide revised recommendations within 45 days of the date on which the Applicant files its petition with the Commission, if the petition contains new or more detailed information that was not previously included in the original filing with the municipal and regional planning commissions pursuant to Section 248(f).

Recommendations made to the Commission pursuant to Section 248(f), or the lack of such recommendations, shall not preclude municipal or regional planning commissions from presenting evidence during technical hearings if granted party status.

Please send all recommendations during this 45-Day notice period to:

Vermont Public Utility Commission
c/o Clerk of the Commission
112 State Street
Montpelier, VT 05620-2701

AND

Encore Renewable Energy
Attn: Phillip D. Foy
110 Main Street
Second Floor, Suite 2E
Burlington, VT 05401
Tel: (802) 861-3023
phillip@encorerenewableenergy.com

For additional information regarding this process, including your commission's right to participate in the Public Utility Commission proceeding, please refer to the "Citizen's Guide to the Vermont Public Utility Commission's Section 248 Process," which can be found at

http://puc.vermont.gov/document/citizens-guide-vermont-public-service-Commissions-section-248-process.

II. Project Description

The Applicant is proposing a 1.25MW solar project on private property located off of Route 12 in Northfield, Vermont. The array will occupy roughly 6 acres of the greater 80 acre parcel. The electricity generated by this Project will flow to NED's electric grid for the benefit of NED ratepayers.

The Site location, array footprint, and approximate property boundaries are shown in the preliminary site plan attached as Exhibit 1. Some modest tree clearing is proposed for the Project, however existing topography as well as vegetation outside of the fenceline assist in screening the project. Route 12 abuts the Project to the north, and the project has limited visibility from the road or surrounding properties. In summary, the Project will consist of:

- Approximately 4,800 solar panels installed on fixed, ground-mounted racking systems across 7 acres of the Site:
  - Coated with non-reflective glazing;
  - Sloped at a fixed angle between 20-30 degrees; and
  - Approximately 8-9 feet off the ground at their highest point.
- A network of string inverters dispersed across the array connected with underground cables installed in protective conduit;
- A 7-8 ft agricultural style perimeter fence;
- Temporary laydown area for delivery and short-term storage of materials; and
- An approximate 1,000ft extension of 3-phase power to the Site for interconnection into NED's grid, from the existing feeder on Route 12.

III. Site Selection and Consideration of Alternatives

The Applicant's ability to locate renewable energy projects in NED's service territory is constrained due to the utility's relatively limited 3-phase grid access, its preferred location for projects within NED's load center, topography, environmental resources, population dispersion, and a scarcity of developable land that meets all of these criteria.

After extensive consultation with the community regarding the Cheney Field site, the Bone Hill site was deemed a preferred alternative. After considering other possible locations for a project of this type, the Applicant, along with VPPSA and NED, selected the Site to address those constraints and criteria listed above. Once the Site was selected, the Applicant worked with its consultants and local stakeholders to configure the Project in a way that would maximize the potential energy generation benefits while minimizing environmental and aesthetic impacts. The Applicant will continue working with all stakeholders prior to filing the CPG petition and thereafter to address remaining concerns.

IV. Construction & Transportation

The Applicant proposes to deliver materials for the Project via truck via Route 12 and other state and local roads, which are accustomed to the type of traffic representative of the proposed daily delivery of materials. Deliveries will be made to a temporary construction staging area on the Site, located off the existing access drive. Most all transportation activity will occur during the construction phase, which would last between three and five months.

The Project is not expected to require oversize or overweight deliveries. Access to and from the Site will be restricted by perimeter fencing in order to secure the Site and prevent the public from entering the facility. All equipment associated with the Project will be installed in accordance with all applicable regulations and electrical codes.

V. Preliminary Impact Assessment

i. Aesthetics

In preparation for this 45-Day Notice, the Applicant engaged T.J. Boyle Associates of Burlington, Vermont to perform a preliminary review of potential aesthetic impacts resulting from the Project. It appears that public views of the Project will be limited; the Project is located away from nearby roads and takes advantage of surrounding vegetation to screen most potential visibility. The Project is proposed within an existing field and would be setback approximately 1,700 feet from Vermont Route 12, which is west of the Project. A combination of landform and dense woods will likely screen potential visibility from locations north, east, and south of the Project site. Some limited visibility is likely from Route 12 immediately west of the array, and slightly north. Views that may be possible, will be short in duration, distant, will only have visibility of limited portions of the Project. Since public visibility is anticipated to be low, landscape mitigation plantings are not specified for the Project at this time. However, the Applicant will work with the community and nearby neighbors to assess the need for landscape plantings in coordination with the full aesthetic analysis. Any proposed plantings or other mitigation strategies would be detailed in a final landscape mitigation plan, including specific plant species, locations and sizes, to be prepared by TJ Boyle.

Overall, preliminary findings by TJ Boyle indicated that the Project would not result in undue impacts to the aesthetic and scenic and natural beauty of the area. The Applicant will continue to work with Northfield, abutting property owners, and T.J. Boyle Associates in order to address any potential aesthetic impacts. The Applicant will file the complete TJ Boyle aesthetic report, final mitigation measures where further warranted with the complete petition.

ii. Environmental

The Applicant has engaged VHB, Inc. to perform preliminary due diligence as well as detailed natural resource assessments and delineations, including both database and field surveys. Results of those studies will be provided in the final petition.

Given that the project is located within an existing maintained field, the likelihood of impacts to certain natural resources is unlikely. The Project will also make use of existing access features to the extent feasible, further minimizing the likelihood of impact. VHB will conduct natural resource

assessments, and impact analyses (where applicable) will be completed for criteria considered under Section 248 and as relevant to any necessary collateral environmental permitting.

The Applicant will consult with state and federal agency staff as necessary pending results of detailed natural resource studies, which will inform Project design to avoid resources where possible and/or secure necessary permits, reviews, and approvals.

VI. Project Benefits

The Project is being developed under a Power Purchase Agreement with VPPSA for the benefit of NED, resulting in a long term (25 year) stably priced renewable power resource for its ratepayers. Locating the Project within NED's service territory also reduces some costs associated with importing power from outside NED's territory.

Finally, the Project will help NED meet its obligations for the purchase of locally generated renewable energy under Vermont's Renewable Energy Standard. Under this legislative mandate, the penalty for not meeting this requirement would result in burdensome cost to NED ratepayers. Further analysis of cost and benefits will be included in the final petition.

VII. Conclusion

The Project is not expected to result in undue adverse impacts to the applicable criteria. The Applicant looks forward to submitting the full Section 248 petition package, which will contain all of the information required by the PUC to evaluate the merits of the Project for potential award of a Certificate of Public Good, and inform others of the Project's impacts and value.

The Applicant intends to file a Section 248 Petition and supporting materials with the PUC soon after the expiration of the 45 day notice period, which is expected to be no sooner than August 30, 2019.

We look forward to receiving any input or suggestions you may have as we move through the Section 248 process. If you have any questions you may direct them to the Applicant by phone at 802-861-3023 or by email at phillip@encorerenewableenergy.com.

Sincerely,

Phillip D. Foy
General Counsel
Encore Renewable Energy

Attachment 1 – Preliminary Site Plan
Attachment 2 – Preliminary Natural Resources Map
Attachment 3 – Representative Equipment Specifications

Copy to:

Vermont Public Utility Commission
112 State Street
Montpelier, Vermont 05620-2701

Department of Public Service
Commissioner June Tierney
112 State Street - Third Floor
Montpelier, Vermont 05620-2601

Department of Public Service
James Porter, Director for Public Advocacy
112 State Street - Third Floor
Montpelier, Vermont 05620-2601

Agency of Natural Resources
Secretary's Office
1 National Life Drive, Davis 2
Montpelier, Vermont 05620-3901

Northfield Electric Department
51 S Main St,
Northfield, VT 05663

Central Vermont Regional Planning Commission
29 Main Street, Suite 4,
Montpelier, VT 05602.

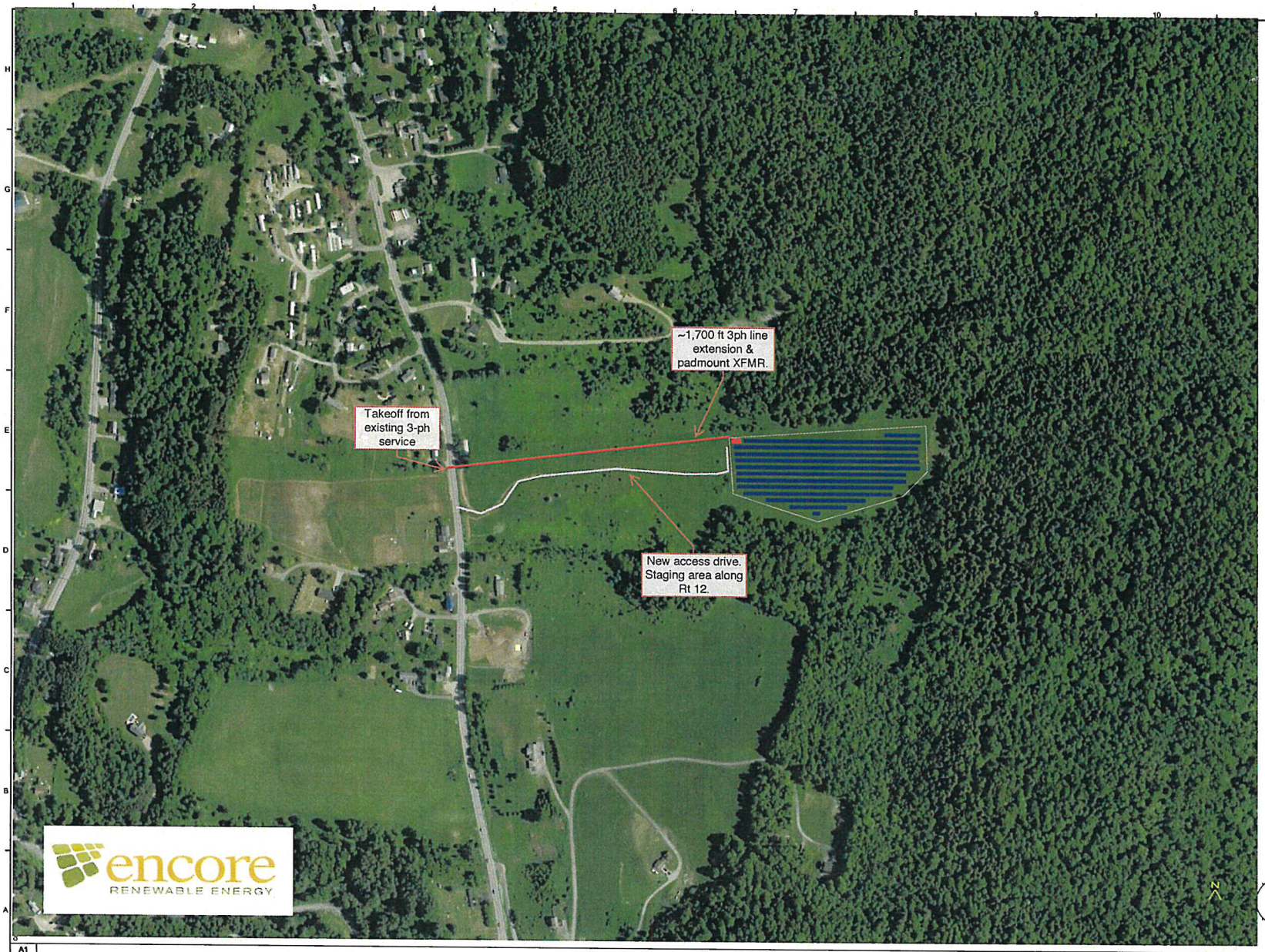
Town of Northfield
c/o K. David Maxwell
51 South Main Street
Northfield, Vermont 05663

Town of Northfield Planning Commission
Laura Hill-Eubanks
51 South Main Street
Northfield, Vermont 05663

Natural Resources Board
District 4 Environmental Commission
111 West Street
Essex Junction, VT 05452

Department of Historic Preservation
Laura V. Trieschmann
One National Life Drive
Deane C. Davis Building, 6th Floor
Montpelier, VT 05620-0501

Agency of Agriculture and Food Markets
Secretary Anson Tebbetts
116 State Street
Montpelier, Vt 05620-2901



encore
RENEWABLE ENERGY
Leaders in Distributed Energy Generation.
110 Main Street, Suite 2E
Burlington, VT 05401
802-861-3023
www.encorerenewableenergy.com

PROFESSIONAL SEAL

ENGINEER'S SEAL APPLIES TO DESIGN OF STRUCTURAL COMPONENTS ONLY

ER Bone Hill Solar LLC
Concept Site Plan
1,680 kWDC / 1,250 kWAC

RELEASE RECORD

DATE	DESCRIPTION
1 01/24/2019	Concept MARK

PROJECT INFORMATION

TITLE & ADDRESS:
Northfield, VT

ER PROJECT No.:

DRAWN BY: PWM | REVIEWED BY:

SHEET TITLE:
Concept

SHEET No.:
P-102

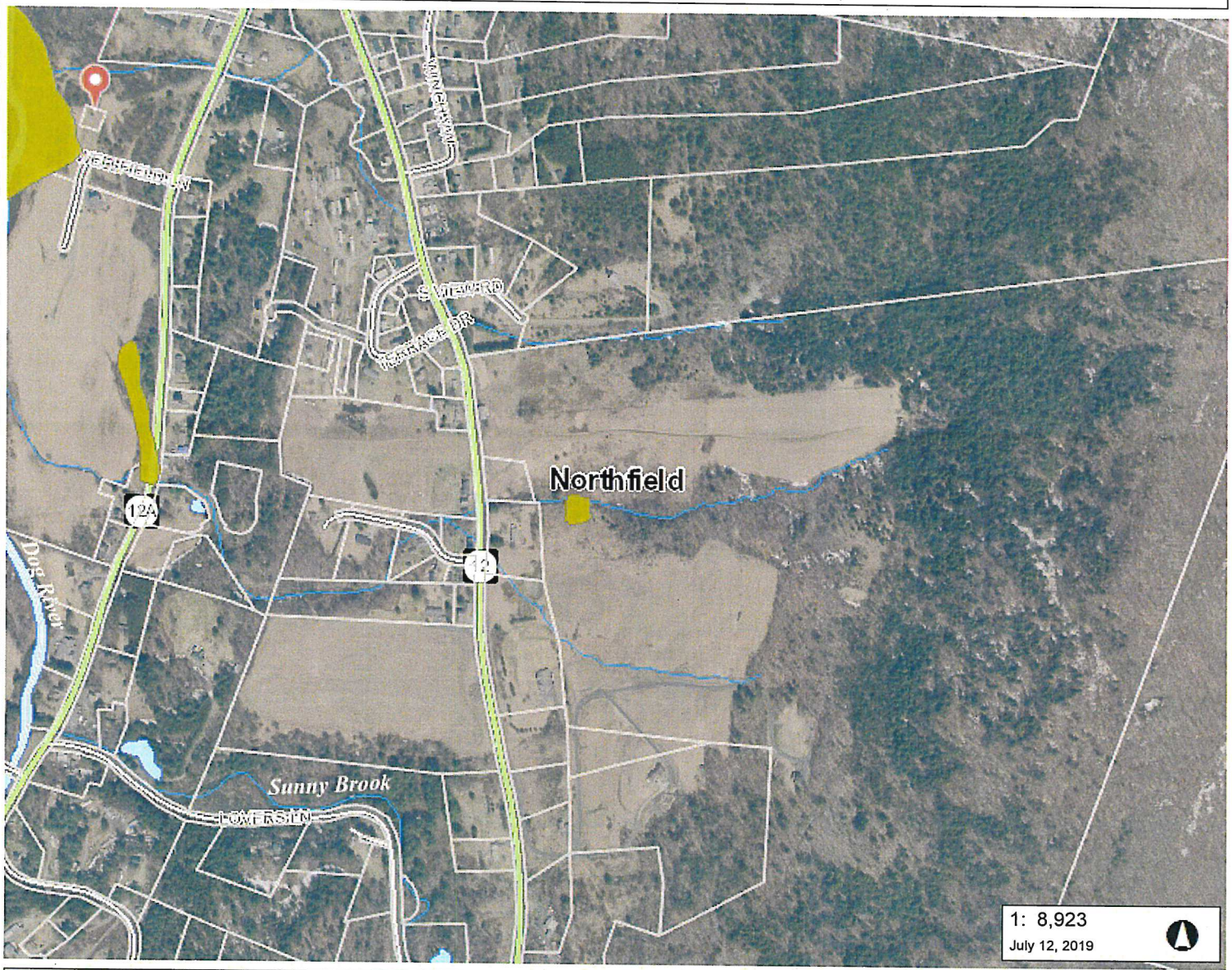
A1
SCALE: NA

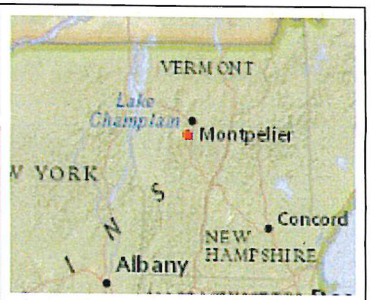
VERMONT

ER Bone Hill Solar :: Prelim NR Map

Vermont Agency of Natural Resources

vermont.gov





LEGEND

- Priority Waters List (Streams a
  - Part B (impaired TMDL not requirec
  - Part D (impaired with approved TMI
  - Part E (altered exotic species)
  - Part F (altered flow regulation)
- Priority Waters List (Lakes and
  - Part B (impaired TMDL not requirec
  - Part D (impaired with approved TMI
  - Part E (altered exotic species)
  - Part F (altered flow regulation)
- Wetland - VSWI
  - Class 1 Wetland
  - Class 2 Wetland
  - Buffer
- Wetlands Advisory Layer
- Invasive Plant Atlas
  - Acer platanoides
  - Berberis thunbergii
  - Euonymus alatus
- Rare Threatened Endangered
  - Threatened or Endangered
  - Rare
- Parcels (standardized)
- Parcels (non-standardized)
- Roads
  - Interstate
  - Principal Arterial

NOTES

Map created using ANR's Natural Resources Atlas

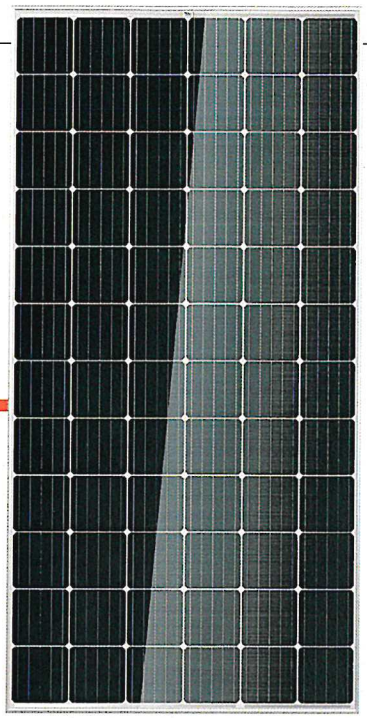
453.0 0 226.00 453.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 744 Ft. 1cm = 89 Meters

THIS MAP IS NOT TO BE USED FOR NAVIGATION

THE TALLMAX M PLUS

FRAMED 72-CELL MODULE(1500V)



72 CELL
MONOCRYSTALLINE MODULE

340-375W
POWER OUTPUT RANGE

19.3%
MAXIMUM EFFICIENCY

0~+5W
POSITIVE POWER TOLERANCE

Founded in 1997, Trina Solar is the world's leading comprehensive solutions provider for solar energy. we believe close cooperation with our partners is critical to success. Trina Solar now distributes its PV products to over 60 countries all over the world. Trina is able to provide exceptional service to each customer in each market and supplement our innovative, reliable products with the backing of Trina as a strong, bankable partner. We are committed to building strategic, mutually beneficial collaboration with installers, developers, distributors and other partners.

Comprehensive Products And System Certificates

IEC61215/IEC61730/UL1703/IEC61701/IEC62716
ISO 9001: Quality Management System
ISO 14001: Environmental Management System
ISO14064: Greenhouse gases Emissions Verification
OHSAS 18001: Occupation Health and Safety Management System

Ideal for large scale installations

- Reduce BOS cost by connecting more modules in a string
- 1500V UL/1500V IEC certified

Maximize limited space with top-end efficiency

- Up to 193 W/m² power density
- Low thermal coefficients for greater energy production at high operating temperatures

Highly reliable due to stringent quality control

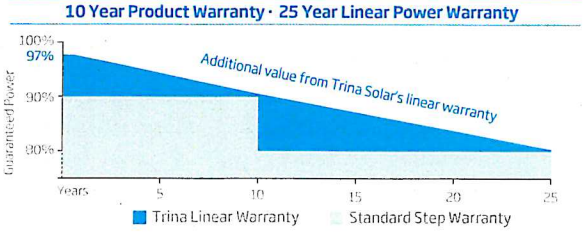
- Over 30 in-house tests (UV, TC, HF, and many more)
- In-house testing goes well beyond certification requirements
- 100% EL double inspection

Certified to withstand the most challenging environmental conditions

- 2400 Pa wind load
- 5400 Pa snow load

LINEAR PERFORMANCE WARRANTY

10 Year Product Warranty · 25 Year Linear Power Warranty



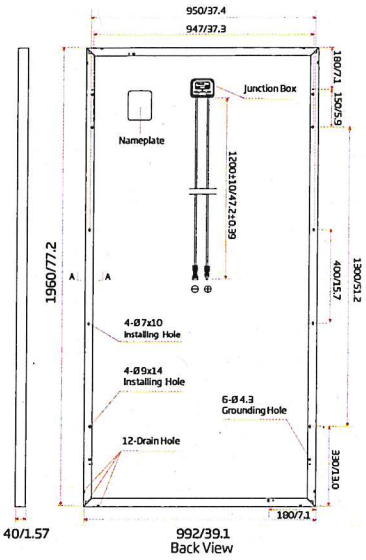
Trinasolar

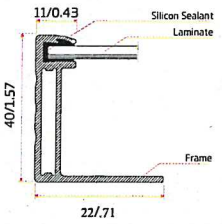
TALLMAX M PLUS

FRAMED 72-CELL MODULE(1500V)

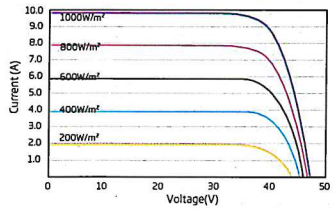
PRODUCTS	POWER RANGE
TSM-DE14A(II) STD MONO	340-350W
TSM-DE14A(II) PERC MONO	355-375W

DIMENSIONS OF PV MODULE(mm/inches)

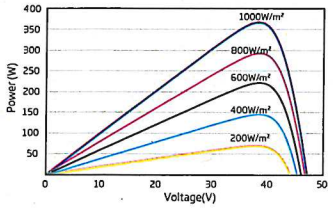




I-V CURVES OF PV MODULE(365W)



P-V CURVES OF PV MODULE(365W)



ELECTRICAL DATA (STC)

Peak Power Watts-P_{MAX} (Wp)*	340	345	350	355	360	365	370	375
Power Output Tolerance-P_{MAX} (W)	0 ~ +5							
Maximum Power Voltage-V_{MPP} (V)	38.2	38.5	38.7	38.8	39.0	39.3	39.7	40.0
Maximum Power Current-I_{MPP} (A)	8.90	8.96	9.04	9.14	9.24	9.30	9.33	9.37
Open Circuit Voltage-V_{OC} (V)	46.2	46.7	47.0	47.4	47.7	48.0	48.3	48.5
Short Circuit Current-I_{SC} (A)	9.50	9.55	9.60	9.65	9.70	9.77	9.83	9.88
Module Efficiency η_m (%)	17.5	17.7	18.0	18.3	18.5	18.8	19.0	19.3

STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
*Measuring tolerance: ±3%.

ELECTRICAL DATA (NOCT)

Maximum Power-P_{MAX} (Wp)	253	257	261	264	268	272	276	279
Maximum Power Voltage-V_{MPP} (V)	35.4	35.7	35.9	36.0	36.2	36.4	36.8	37.1
Maximum Power Current-I_{MPP} (A)	7.15	7.20	7.26	7.34	7.42	7.47	7.50	7.53
Open Circuit Voltage-V_{OC} (V)	42.9	43.4	43.7	44.1	44.3	44.6	44.9	45.1
Short Circuit Current-I_{SC} (A)	7.67	7.71	7.75	7.79	7.83	7.89	7.94	7.98

NOCT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s.

MECHANICAL DATA

Solar Cells	Monocrystalline 156.75 × 156.75 mm (6 inches)
Cell Orientation	72 cells (6 × 12)
Module Dimensions	1960 × 992 × 40 mm (77.2 × 39.1 × 1.57 inches)
Weight	22.5 kg (49.6 lb)
Glass	3.2 mm (0.13 inches), High Transmission, AR Coated Tempered Glass
Backsheet	White
Frame	Silver Anodized Aluminium Alloy
J-Box	IP 67 or IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm² (0.006 inches²), 1200 mm (47.2 inches)
Connector	Trina TS4
Fire Type	Type 1 or Type 2

TEMPERATURE RATINGS

NOCT(Nominal Operating Cell Temperature)	44°C (±2°C)
Temperature Coefficient of P_{MAX}	- 0.39%/°C
Temperature Coefficient of V_{OC}	- 0.29%/°C
Temperature Coefficient of I_{SC}	0.05%/°C

MAXIMUM RATINGS

Operational Temperature	-40~+85°C
Maximum System Voltage	1500V DC (IEC)
	1500V DC (UL)
Max Series Fuse Rating	15A (Power ≤350W)
	20A (Power ≥355W)

(DO NOT connect Fuse in Combiner Box with two or more strings in parallel connection)

WARRANTY

10 year Product Workmanship Warranty

25 year Linear Power Warranty

(Please refer to product warranty for details)

PACKAGING CONFIGURATION

Modules per box: 27 pieces

Modules per 40' container: 648 pieces

Trinasolar

CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.

Version number: TSM_EN_2018 - AUG

www.trinasolar.com

NEW

CanadianSolar

THREE PHASE STRING INVERTER 50-66 KW

CSI-50KTL-GS-FL | CSI-50KTL-GS | CSI-60KTL-GS | CSI-66KTL-GS

Canadian Solar's grid-tied, transformer-less string inverters help accelerate the use of three-phase string architecture for commercial rooftop and small ground-mount applications. An NRTL approved, cost-effective alternative to central inverters, these inverters are modular design building blocks that provide high yield and enable significant BoS cost savings. They provide up to 98.8% conversion efficiency, a wide operating range of 200-850 V_{DC}, and four MPPTs for maximum energy harvest.

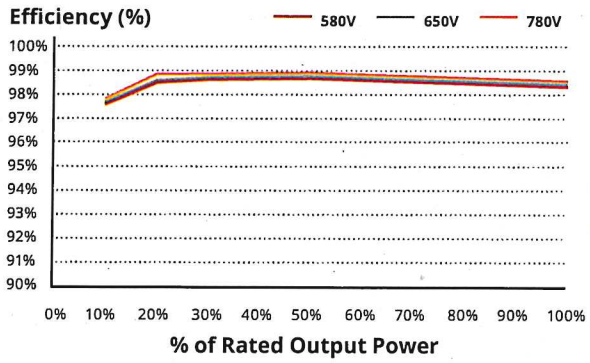
10 years **Standard warranty, extension up to 20 years**

KEY FEATURES

- Maximum efficiency of 98.8%, CEC efficiency of 98.4%
- 4 MPPTs to achieve higher system efficiency
- Transformerless design
- High switching frequency and ultra fast MPPT (<5 sec.) for maximum efficiency over a wide load range

EFFICIENCY CURVE

CSI-66KTL-GS@480 V



*For detailed information, please refer to the Installation Manual.

HIGH RELIABILITY

- Advanced thermal design with fan assisted cooling
- Ground-fault detection and interruption circuit
- AFCI Integrated (per UL1699B, factory enabled option)

BROAD ADAPTIBILITY

- NEMA 4X (IP65), outdoor application
- Utility interactive controls: active power derating, reactive power control and over frequency derating
- Separable wiring box design
- Integrated DC and AC load rated disconnects
- Wide MPPT range for flexible string sizing
- 0-90 degree installation angle
- AC terminals compatible with copper and aluminum conductors (Al with bimetallic terminal)
- Supports up to 12 or 16 DC string inputs (3 or 4 per MPPT)

CANADIAN SOLAR (USA), INC. is committed to providing high quality solar products, solar system solutions and services to customers around the world. As a leading PV project developer and manufacturer of solar modules with over 27 GW deployed around the world since 2001, Canadian Solar Inc. (NASDAQ: CSIQ) is one of the most bankable solar companies worldwide.

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SYSTEM/TECHNICAL DATA

MODEL NAME	CSI-50KTL-GS-FL	CSI-50KTL-GS	CSI-60KTL-GS	CSI-66KTL-GS
DC INPUT				
Max. PV Power	64 kW (16 kW/MPPT)	75 kW (22.5 kW/MPPT)	90 kW (22.5 kW/MPPT)	90 kW (22.5 kW/MPPT)
Max. DC Input Voltage	1000 V_{DC}			
Operating DC Input Voltage Range	200-850 V_{DC}			
Start-up DC Input Voltage/Power	200 V			
Number of MPP Trackers	4			
MPPT Voltage Range	568-850 V_{DC}		526-850 V_{DC}	579-850 V_{DC}
Operating Current (Imp)	88 A (22 A per MPPT)	114 A (28.5 A per MPPT)		
Max. Input Current (Isc)	137.2 A (34.3 A per MPPT)	178 A (44.5 A per MPPT)		
Number of DC Imputs	12 (3 per MPPT)	16 (4 per MPPT)		
DC Disconnection Type	Load rated DC switch			
AC OUTPUT				
Rated AC Output Power	50 kW	50 kW	60 kW	66 kW
Max. AC Output Power	50 kW	50 kW	60 kW	66 kW
Rated Output Voltage	480 V_{AC}			
Output Voltage Range*	422.4 - 528 V_{AC}			
Grid Connection Type	3 Φ/PE			
Nominal AC Output Current @480 Vac	60.2 A		72.2 A	79.4 A
Rated Output Frequency	60 Hz			
Output Frequency Range*	59.5 - 60.5 Hz			
Power Factor	1 default (±0.8 adjustable)			
Current THD	< 3 %			
AC Disconnection Type	Load rated AC switch			
SYSTEM				
Topology	Transformerless			
Max. Efficiency	98.8 %	98.8 %	98.7 %	98.8 %
CEC Efficiency	98.4 %			
Night Consumption	< 1 W			
ENVIRONMENT				
Protection Degree	NEMA 4X			
Cooling	Natural Convection Cooling	Intelligent Redundant Cooling		
Operating Temperature Range	-13 ° F to + 140 ° F / -25 ° C to +60 ° C			
Storage Temperature Range	-40 ° F to + 158 ° F / -40 ° C to +70 ° C			
Operating Humidity	0 - 100 %			
Operating Altitude	13,123.4 ft / 4000 m			
Audible Noise	<60 dBA @ 1 m			
DISPLAY AND COMMUNICATION				
Display	LCD + LED			
Communication	Standard: RS485 (Modbus)			
MECHANICAL DATA				
Dimensions (W / H / D)	24.8 x 40.7 x 13.9 in / 630 x 1034 x 354 mm			
Weight	165 lb / 74.8 kg	172 lb / 78 kg		
Installation Angle	90 degrees from horizontal	0-90 degrees from horizontal		
DC Inputs	15 A standard			
SAFETY				
Safety and EMC Standard	UL1741-SA, UL1699B, CSA-C22.2 No. 107.1-01, IEEE1547; FCC PART 15			
Grid Standard	IEEE1547, Rule 21			
Smart-Grid Features	Voltage-Ride Thru, Frequency-Ride Thru, Soft-Start, Volt-Var, Frequency-Watt, Volt-Watt			

*The "Output Voltage Range" and "Output Frequency Range" may differ according to specific grid standard.

The specification and key features described in this datasheet may deviate slightly and are not guaranteed. Due to on-going innovation, research and product enhancement, Canadian Solar Inc. reserves the right to make any adjustment to the information described herein at any time without notice. Please always obtain the most recent version of the datasheet which shall be duly incorporated into the binding contract made by the parties governing all transactions related to the purchase and sale of the products described herein.

Caution: For professional use only. The installation and handling of PV equipment requires professional skills and should only be performed by qualified professionals. Please read the safety and installation instructions before using the product.