

**STATE OF VERMONT
PUBLIC SERVICE BOARD**

Petition of Green Mountain Power)
Corporation for a Certificate of Public)
Good, pursuant to 30 V.S.A. § 248(j),)
For authority to build a solar generation)
Unit at its Berlin #5 Facility in Berlin,)
Vermont.)

Docket No. _____

**PREFILED TESTIMONY OF
JOSH P. CASTONGUAY
ON BEHALF OF
PETITIONER**

January 8, 2010

The purpose of the prefiled testimony of Mr. Castonguay is to describe Green Mountain Power Corporation's request for a Certificate of Public Good for the proposed project to build a solar generation unit on its property in Berlin, Vermont.

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PREFILED TESTIMONY OF JOSH CASTONGUAY
ON BEHALF OF
GREEN MOUNTAIN POWER CORPORATION

1. Q. Please state your name, employer, and current position.

A. My name is Josh Castonguay and I am employed by Green Mountain Power Corporation (“GMP” or the “Company”) as Field Operations Lead.

2. Q. Please state briefly your education background and business experience.

A. I have been employed by GMP since 2003 working in engineering until 2009, and then moving into field operations. I graduated from University of Maine in 2003 with a Bachelor of Science in Electrical Engineering Technology.

3. Q. What is the purpose of your testimony?

A. The purpose of my testimony is to describe GMP’s request for a Certificate of Public Good (“CPG”) for the proposed project to build a solar generation unit (the “Project”).

4. Q. Please describe the location of the Project.

A. The Project will be located in the Town of Berlin, Vermont at GMP’s property located off of Dog River Road, as shown on the USGS Topological map labeled

1 Exhibit__[JPC-1]. The property has been used for industrial purposes, for at least
2 the past 50 years. Because of the GMP lot's industrial character, the Project will
3 not have an impact on prime agricultural soils. Aerial photos of the proposed
4 project site that clearly mark existing structures (existing fuel tanks, gas turbine
5 generator, substations etc.) as well as significant natural and manmade features
6 may be found at Exhibit__[JPC-2] and Exhibit__[JFP-1].

7 5. Q. Please describe the Project.

8 A. The Project entails the new construction of a Solar PV system, to be built on
9 GMP's existing property located off Dog River Road in Berlin, Vermont. The
10 proposed PV system consists of a fixed, ground-mounted array of solar panels,
11 made up of 952 modules. The power rating per module is 210 watts (DC), and
12 the total anticipated Project output is 199,920 watts at standard test conditions.
13 Because the generates electricity from sunlight GMP estimates that the Project's
14 capacity factor will be 13.7%. Two inverters will convert the DC electricity from
15 the solar array to AC electricity, which will be stepped up in voltage to 12,470kV
16 phase – phase, through a three phase bank of distribution transformers. The
17 output AC voltage of the inverters is 480V phase – phase. The inverters and other
18 protection equipment will be located inside of a small utility shed. A photo of a
19 shed similar to the one that will be constructed is attached as Exhibit__[JPC -3].
20 At full output, GMP estimates that the Project will produce enough power to serve
21 100 average homes. An overall Project site plan may be found at Exhibit__[JPC-

1 4]. The site plan shows existing and proposed Project features as well as existing
2 elements of the natural environment.

3 6. Q. Please describe the Project footprint.

4 A. The solar array modules will cover approximately one (1) acre of land. The
5 inverter shed will be approximately 10 feet by 14 feet and will be located across
6 the driveway from the solar array. The inverter shed will be outside the
7 approximately one (1) acre covered by the solar array modules. See
8 Exhibit__[JPC – 3].

9 7. Q. What type of solar generation equipment is being proposed for the Project?

10 A. Alteris Renewables will be engineering, procuring and constructing the solar
11 array. The PV Modules will be SunTech STP-200, 200-watt modules. The
12 mounting equipment will be SunLink Ballast Ground Mount System. The
13 inverters will be two (2) Satcon PVS-100, 100kW inverters. The inverters will be
14 located inside the inverter shed.

15 8. Q. What type of foundation will be built to support the Project?

16 A. The array will be on a ballast ground mount system, which means that there will
17 be no foundations placed in the ground. The ballast ground mount system uses
18 concrete ballast to weigh down the PV Modules, without the need for foundations.
19 Because this style of installation does not require below grade foundations, a
20 cross section of the site will not convey any additional information, however, a
21 typical ballast mount elevation view can be found at Exhibit__[JPC-5]. The
22 inverter shed will sit on a concrete slab.

1 9. Q. How will the Project interconnect with Green Mountain Power's distribution
2 system?

3 A. The output from the solar panels flows to the inverters which convert the DC
4 voltage from the solar modules to 480V AC. The 480V AC three phase is then
5 stepped up to the distribution voltage of 12,470/7,200V through a three phase
6 bank of overhead pole mounted transformers. This will interconnect with GMP's
7 12,470V distribution system located along Dog River Road. The transformers
8 will be 12,470/7,200V primary, 480V secondary and will be rated at 75kVA
9 individually, for a total bank capacity of 225kVA. In order to provide three phase
10 at the Project location, it will be necessary to add two additional phases to the
11 existing 12.5kV single phase line from Route 12, along Dog River Road, to the
12 Project location. An overall map of the distribution line to be upgraded can be
13 found at Exhibit__[JPC-6]. All existing poles are of adequate class and height, so
14 there will not be the need for any new poles, an increase in pole height or use of
15 new distribution right-of-way.

16
17 10. Q. How much will the Project cost?

18 A. The Project is estimated to cost \$1.3 million, broken down in the following
19 manner:

- 20 • Solar Equipment & Labor: \$1.165 million
- 21 • Permitting & GMP Labor: \$75,000
- 22 • Site work, Inverter Shed, Misc: \$32,000

- Distribution Upgrade: \$28,000

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11. Q. What is the proposed time frame for completing the Project?
- A. Green Mountain Power and its contractor Alteris Renewables hope to break ground in the spring of 2010, and complete the Project by end of summer of 2010.
12. Q. Please explain how the Project complies with each of the §248(b) criteria.
- A. Following is a listing of each of the §248(b) criteria with a description in each numbered paragraph of how the Project complies with the criteria specified.

Orderly Development of the Region
[30 V.S.A. §248(b)(1)]

The Project will not unduly interfere with the orderly development of the region. The Project is located entirely on private property owned by GMP. The surrounding property is dedicated to industrial uses including power generation and transmission. A large nearby propane distribution center uses the railroad running through GMP’s property. The Project is close to the Montpelier Water Pollution Control Plant and Montpelier Department of Public Works. Both Local and Regional plans were reviewed and the project was not out of compliance with these plans. A detailed review was performed by Jim Palmer and is discussed at Exhibit__[JFP – 1](Aesthetic Analysis Report) at pages 3 and 4. The Berlin Town Plan specifically refers to encouraging the development of alternative energy as follows:

“Encourage alternative energy resources such as wind and solar...”

Page 27, of the Berlin Town Plan may be found as Exhibit__[JPC – 9]. Furthermore, the Central Vermont Regional Plan also speaks directly to the implementation of solar-power as a “...tremendous potential for providing clean, reliable and safe energy, even in Vermont’s climate.” This can be found on page 3-10 of the Central Vermont Regional Plan, which is

1 attached as Exhibit__[JPC – 10]. Also attached as Exhibit__[JPC – 11] and Exhibit__[JPC -12]
2 are signed 45-day waiver letters from both the Berlin Planning Commission as well as the
3 Central Vermont Regional Planning Commission, respectively. The Berlin Planning
4 Commission states in their letter “In general, the Planning Commission supports the project as
5 being consistent with the Town Plan and does not anticipate that this project will negatively
6 impact the orderly patterns of development in Berlin.”

7 **Need for Present and Future Demand for Service**

8 [30 V.S.A. §248(b)(2)]

9 Project need is not driven by reliability or load growth concerns. Rather, it is a renewable
10 generation project intended to bring cost-effective, reliable, carbon-free energy to GMP rate
11 payers. The Vermont SPEED program requires utilities meet all load growth since the end of
12 2004 with renewable resources and the Project will assist in GMP attaining that goal. The
13 Project also contributes to the SPEED goal of generating a minimum percentage of Vermont’s
14 energy needs through renewable generation.

15 **System Stability and Reliability**

16 [30 V.S.A. §248(b)(3)]

17 The Project was reviewed by Green Mountain Power’s engineering department under PSB rule
18 5.500 and cleared the fast track screening criteria. Because the Project will be connected directly
19 to Green Mountain Power’s distribution system, and was reviewed under Rule 5.500, an ISO
20 New England Interconnection process is not required. The Project will not impose any undue or
21 adverse impact on the area electric reliability or stability.

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Economic Benefit to the State
[30 V.S.A. §248(b)(4)]

The Project will be constructed using local labor, and will take approximately 228 person-days to complete, consisting of various trades such as electricians, site work contractors, and solar equipment installers. GMP anticipates that the Project will be constructed for a cost that allows Project power to be sold at significantly less than the current SPEED Solar Standard Offer of \$0.30 / kWh. As proposed, the Company estimates that the Project will operate for \$0.17/kWh.

**Aesthetics, Historical Sites, Air and Water Purity,
The Natural Environmental, and Public Health and Safety**
[30 V.S.A. §248(b)(5); 10 V.S.A. §6086(a)(1)(B)]

The photovoltaic process converts the sun’s energy into electricity. This process does not emit pollutants into the air or the water. The Project will be located on GMP property, which is behind a locked gate, and is not easily accessible to the public. The Project will not have an undue adverse impact on aesthetics, historic sites, air and water purity, the natural environment or public health and safety, with due consideration having been given to the criteria specified in 10 V.S.A. §6086(a)(1) through (8) and (9)(K), which are discussed below. Those incorporated elements of Vermont Title 10 that are not addressed below are addressed in the prefiled testimony of GMP witnesses Palmer, Nelson and Luhman.

Waste Disposal
[10 V.S.A. §6086(a)(1)(B)]

The Project’s minimal construction waste will be disposed of in accordance with all applicable rules and regulations, in approved landfills.

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Development Affecting Public Investments
[10 V.S.A. §6086(a)(9)(K)]

The Project will not have any adverse effect on public investments, public utility facilities or public lands. The closest public investment is the Dog River Road. This Project is outside of the Dog River Road right of way, and will not affect this, or other local public investments.

Least-Cost Integrated Resource Plan
[30 V.S.A. §248(b)(6)]

The Project facilitates the development of new renewable energy resources. In the 2007 IRP at page 74, GMP has committed to meeting as much of its future energy shortfall with renewables as possible. GMP's 2007 IRP cover page and page 74 can be found as Exhibit__[JPC-7].

Compliance with Electric Energy Plan
[30 V.S.A. §248(b)(7)]

Emerging and Sustainable Energy Technologies is a topic of discussion within the Vermont Electric Plan, dated January 19, 2005. Specifically, page 5-23 of this plan states as a recommendation that “State regulators and utilities should monitor renewable technology improvements and assess cost-effectiveness and applicability for Vermont...” Since the 2005 Electric Plan was drafted, Solar PV has significantly reduced in total installed cost per kW. Also, the Vermont Legislature has enacted a requirement that Vermont utilities purchase electricity from Solar PV and other renewable technologies through the use of a Standard Offer. Green Mountain Power anticipates that the price of Project power will significantly beat the current standard offer price for electricity purchased from Standard Offer solar projects. The cover page and page 5-23 excerpt of the 2005 Electric Plan can be found at Exhibit__[JPC-8].

