

**STATE OF VERMONT
PUBLIC SERVICE BOARD**

PSB Docket No. _____

BDE Grand Isle Solar LLC's)
Petition for a Certificate of Public Good)
in accordance with 30 V.S.A. § 248)
regarding a proposed 5 MW ground-mounted)
solar array to be located at 109 Allen Road in the)
Town of Grand Isle, Vermont.)

**PREFILED TESTIMONY OF
CRAIG KIENY
ON BEHALF OF
VERMONT ELECTRIC COOPERATIVE, INC. IN SUPPORT OF BDE GRAND ISLE
SOLAR LLC**

Summary of Testimony

Craig Kieny's testimony addresses 30 V.S.A. § 248(b)(2) (need) and (b)(4) (economic benefit).

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I. Introduction

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- Q1. Please state your name, current employer, business address, and position.
- A1. My name is Craig Kieny, and I am Senior Power Resources Planner for Vermont Electric Cooperative, Inc. (VEC). My business address is 42 Wescom Road, Johnson, Vermont.
- Q2. Please summarize your education, training and professional experience.
- A2. I received a Bachelor of Science Degree in Electrical Engineering from the University of Vermont in 1984. In 1988, I received a Master's of Business Administration, also from the University of Vermont. After receiving my MBA, I worked for the Burlington Electric Department (BED) for ten years. When I left BED in 1998, I was the Manager of Engineering, Planning and Rates.
- Q3. Have you previously testified before the Vermont Public Service Board?
- A3. Yes. I have testified before the Public Service Board (PSB or the Board) in numerous

1 dockets on behalf of BED, VEC and Citizens Communications Company.

2
3 Q4. What is the purpose of your testimony?

4 A4. My testimony supports BDE Grand Isle Solar LLC's (Petitioner) Petition for a Certificate
5 of Public Good (CPG) pursuant to 30 V.S.A § 248 to own, operate, and construct a 5
6 MW AC ground mounted solar electric generation facility on the existing agricultural
7 fields at 109 Allen Road in the Town of Grand Isle, Vermont (the Project). As explained
8 below, VEC and the Petitioner have entered into a power purchase agreement (PPA) for a
9 30-year term whereby VEC will be entitled to all of the Project's output and is
10 guaranteed 80% of expected output (based on the number of panels and anticipated solar
11 patterns). If the annual output is below 80% of the expected output, VEC will receive a
12 financial settlement from the Petitioner to make it financially indifferent. VEC will
13 purchase all output above 80% of the expected output at the contract price. The contract
14 price as reflected in the term sheet Exhibit BDE-CK-1 is very favorable when compared
15 to the subsidized price that VEC currently pays to net-metering customers and when
16 compared to other similar projects (I refer to the Project PPA as the "BDE PPA"). (VEC
17 previously submitted the term sheet to the PSB prior to executing the PPA, as required by
18 Board Rule 5.202.) VEC would use this Project as a cost-competitive contribution to its
19 distributed renewable generation requirements under 30 V.S.A. 8005, as amended in
20 2015 by Act 56.

21
22 I address the following Section 248 criteria: (b)(2) (need) and (b)(4) (economic benefit).

1 **II. Section 248 Criteria**

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

3 [Section 248(b)(2)]

4 Q5. Why does VEC need the Project?

5 A5. VEC needs the Project because its output (to be sold to VEC under the BDE PPA) will be
6 necessary to meet the requirements in Act 56. Specifically, in Act 56, the Legislature
7 imposed a Renewable Energy Standard (RES) requirement on Vermont utilities to
8 encourage the development of new, small-scale (5 MW or less) distributed renewable
9 generation (so called “Tier 2 resources”). The Legislature articulated the purposes of Tier
10 2 as follows:

11 This subsection establishes a distributed renewable generation category for
12 the RES. This category encourages the use of distributed generation to
13 support the reliability of the State’s electric system; reduce line losses;
14 contribute to avoiding or deferring improvements to that system
15 necessitated by transmission or distribution constraints; and diversify the
16 size and type of resources connected to that system. This category requires
17 the use of renewable energy for these purposes to reduce environmental
18 and health impacts from air emissions that would result from using other
19 forms of generation.
20

21 The BDE PPA will constitute a cost-competitive Tier 2 resource. VEC will retain any
22 renewable energy certificates as needed to satisfy the Act 56 distributed renewable
23 generation requirements and utilize any excess by either banking them for Tier 2
24 compliance in a future year, applying them to VEC’s Tier 3 requirements or selling them
25 to reduce VEC’s members net costs. I have analyzed VEC’s current and projected
26 resources under various assumptions as to future load requirements. In any case, VEC
27 will need the BDE PPA.

1 More specifically, I have prepared four exhibits showing my analysis. The starting point
2 for all four exhibits is a forecast of VEC's energy needs prepared by La Capra
3 Associates, LLC (LCA) as part of VEC's 2015 Integrated Resource Plan, which was filed
4 with the Board on November 16, 2015. LCA prepared three 20-year forecasts (a Base
5 Case, High Load Case, and Low Load Case) covering January 2015 – December 2034.
6 The methodologies and assumptions used by LCA are fully explained in the IRP and
7 incorporated by reference.

8
9 Starting with LCA's forecast, I calculated the minimum Tier 2 resources which VEC
10 would need to acquire between 2017 and 2032. Act 56 requires that at least 1% of each
11 utility's annual retail sales be served from Tier 2 resources beginning in 2017, increasing
12 by 0.6% each year until reaching 10% of annual retail sales by 2032.

13
14 In addition to the Tier 2 renewable energy requirement, Act 56 also requires each utility
15 to implement energy transformation projects to offset an equivalent of 2% of its annual
16 retail sales in 2017 increasing by 0.6% each year until reaching 12% in 2032. In
17 evaluating the need for the BDE PPA, I assumed that VEC would meet its Tier 3
18 requirements using residential Air Source Heat Pumps and I increased the load forecast to
19 reflect the additional retail load.

20
21 With our Tier 2 minimum requirements in place (with and without Tier 3 adjustments to
22 load), I plotted our existing and pending for resources that would meet those minimums.

1 These resources include the CMES-Alburgh 1 MW solar project (Docket 8439) to be
2 constructed this year and the Standard Offer solar and wind projects which have been
3 accepted after the latest auction process.

4
5 Finally I added the BDE PPA to the Tier 2 resource mix. The four exhibits are as
6 follows:

7 BDE-CK-2 Tier 2 Minimum MWh Requirements vs. Resources, not including BDE
8 PPA or Tier 3 load increase.

9
10 BDE-CK-3 Tier 2 Minimum MWh Requirements vs. Resources, not including BDE
11 PPA but including Tier 3 load increase.

12
13 BDE-CK-4 Tier 2 Minimum MWh Requirements vs. Resources, including BDE PPA
14 but not including Tier 3 load increase.

15
16 BDE-CK-5 Tier 2 Minimum MWh Requirements vs. Resources, including BDE PPA
17 and including Tier 3 load increase.

18
19 Exhibits BDE-CK-2 and BDE-CK-3 show that VEC will experience a shortfall in
20 meeting its Tier 2 obligation beginning in 2018, with the open position increasing
21 dramatically as the Tier 2 obligation grows over time.

22
23 Exhibits BDE-CK-4 and BDE-CK-5 show that the BDE PPA will satisfy VEC's Tier 2
24 obligation until 2023 and continue to provide a Tier 2 resource over its 30-year term.

25
26 Q6. It appears that between 2017 and 2023, VEC will exceed its Tier 2 minimum obligation.

27 Is there value to VEC of the excess during those years?

1 A6. Yes. Excess in the early years helps to mitigate risks associated with: (1) shortfalls in
2 meeting Tier 3 requirements; (2) failure of Standard Offer resources in queue to come on
3 line; and (3) development and cost uncertainties of future solar facilities with the
4 reduction in the investment tax credit in 2017. In addition, if those risks do not
5 materialize, then VEC can bank excess Tier 2 resources to be used against future
6 requirements or sell the RECs from excess generation in the Class 1 REC market.

7
8 Specifically, under Act 56, Tier 2 generation in excess of the utility's minimum
9 obligation may be used to satisfy the utility's Tier 3 energy transformation requirement.
10 Being excess in Tier 2 in the early years of Act 56 gives VEC additional time as it ramps
11 up its Tier 3 programs and works with the state and other utilities to set the rules for
12 counting carbon offsets toward Tier 3 goals. Tier 3 is a new business model for VEC and
13 the other Vermont utilities, and it may take some time – and a few false starts – to
14 develop a successful program. Excess due to the BDE PPA will help mitigate risks in
15 achieving Tier 3 requirements.

16
17 In addition, VEC's forecast of Tier 2 resources includes Standard Offer projects which
18 have been accepted through the auction process. In the event that one or more of these
19 projects fails to come on-line, the excess due to the BDE PPA can make up for some of
20 the shortfall.

21

1 Likewise, the BDE PPA provides some hedge against the uncertainty in the solar
2 development market in 2017 – both as to the availability of additional projects and the
3 price – should the investment tax credit be reduced as currently planned.
4

5 Finally, if the excess Tier 2 resources are not needed to hedge against the risks noted
6 above, they can still provide an economic benefit to VEC and its members. Act 56
7 allows utilities to bank excess Tier 2 resources and apply them toward future annual
8 requirements. The amount of RECs that can be put in the Bank each year and how long
9 they can stay in the bank will be determined as part of the Board rule making process in
10 Docket #8550. Alternatively, excess RECs may be sold in the Class 1 REC market if it is
11 cost-effective to do so, which is also permitted under Act 56.
12

13 In sum, the excess from the BDE PPA between 2017 and 2023 provides VEC with
14 flexibility in meeting the RES, especially in the early years of implementation.
15

16 Q7. Is the Project required to meet the need for present and future demand for service which
17 could not otherwise be provided in a more cost effective manner through energy
18 conservation programs and energy efficiency measures and load management?

19 A7. Yes. VEC has incorporated energy efficiency planning and demand side management
20 effects into its load forecasts, discussed above and in its IRP. That analysis shows that
21 despite efficiency efforts, VEC will have a need for additional Tier 2 resources for the
22 Project's life.

Economic Benefit to the State
 [Section 248(b)(4)]

Q8. How will the Project benefit the State and its residents?

A8. The Project will benefit the state and its residents by securing long-term stably priced renewable energy that meets state goals at a competitive price. The 11.0¢ per kwh fixed price in the BDE PPA compares favorably with the PPA which VEC had entered into with CMES Vermont (Docket 8439), solar projects accepted in the Vermont Standard Offer program through the auction conducted in the spring of 2015, and recent contracts signed by other Vermont utilities. In addition, during the past summer, VEC issued a Request for Information (RFI) from solar development about future solar projects. This provided a centralized method for developers to pitch their projects to VEC and gave us points of comparison to evaluate the BDE PPA. VEC received ten proposals, with the lowest price being 10.3¢ for a 5 MW project and the highest being 17¢ for a 4 MW project. The quotes are summarized below, with company names redacted.

Company Name	2016 Start Date Price (\$/kWh)	2017 Start Date Price (\$/kWh)	Project Size (MW)
	\$0.1076	\$0.1295	4.990
		\$0.1440	5.000
		\$0.1180	2.500
	\$0.1190	\$0.1700	4.000
	\$0.1100	\$0.1200	5.000
	\$0.1190		1.500
	\$0.1500		0.128
	\$0.1030	\$0.1480	4.980
	\$0.1100		5.000
	\$0.1120	\$0.1168	2.000

1 The BDE pricing assumes a 2016 start-date. As the table shows, the BDE PPA is very
2 competitive compared to the offers received through the RFI. There are two offers that
3 were slightly less expensive than the BDE PPA; however, the Petitioner was able to
4 surpass these projects based on other criteria. Its location in Grand Isle is favorable, as
5 there is sufficient load and system capacity to allow VEC to handle the output of a 5 MW
6 project. The Petitioner had secured rights to the land and done preliminary
7 environmental work, thus increasing the likelihood that the Project will be built by the
8 end of 2016 and be counted toward VEC's Tier 2 requirements. In addition, VEC's staff
9 was impressed by the capability and professionalism of the Petitioner's team, again
10 providing some level of confidence that the Project would be developed successfully.

11
12 Q9. Does this conclude your testimony?

13 A9. Yes.

EXHIBIT LIST

Exhibit BDE-CK-1	Term sheet
Exhibit BDE-CK-2	Tier 2 Minimum MWh Requirements vs. Resources, not including BDE PPA or Tier 3 load increase.
Exhibit BDE-CK-3	Tier 2 Minimum MWh Requirements vs. Resources, not including BDE PPA but including Tier 3 load increase
Exhibit BDE-CK-4	Tier 2 Minimum MWh Requirements vs. Resources, including BDE PPA but not including Tier 3 load increase.
Exhibit BDE-CK-5	Tier 2 Minimum MWh Requirements vs. Resources, including BDE PPA and including Tier 3 load increase.