

**STATE OF VERMONT
PUBLIC UTILITY COMMISSION**

Case No. ____

Petition of Murphy Road Energy Storage, LLC
for a certificate of public good pursuant to
30 V.S.A. §§ 231 and 248(j) for a 5 MW battery
storage facility off Murphy Road in Bennington, Vermont.

**PREFILED TESTIMONY AND DECLARATION OF
TAEGEN KOPFLER
ON BEHALF OF
MURPHY ROAD ENERGY STORAGE, LLC**

This document and supporting exhibits have been filed ePUC

Summary of Testimony

Ms. Kopfler's testimony provides an overview of the Petitioner's plans to install and operate a 5 MW battery storage system in Bennington, Vermont (Project). It also describes the proposed Project's compliance with certain criteria set forth or incorporated by reference in 30 V.S.A. § 248: orderly development of the region (§ 248(b)(1)); need (§ 248(b)(2)); system stability and reliability (§ 248(b)(3)); economic benefit to the State and its citizens (§ 248(b)(4)); public health and safety, air pollution, use of natural resources, greenhouse gas impacts (§ 248(b)(5)); transportation systems (10 V.S.A. § 6086(a)(5)); educational services (10 V.S.A. § 6086(a)(6)); municipal services (10 V.S.A. § 6086(a)(7)); historic sites (10 V.S.A. § 6086(a)(8)); development affecting public investments (10 V.S.A. § 6086(a)(9)(K)); least-cost integrated resource plan (§ 248(b)(6)); compliance with electric energy plan (§ 248(b)(7)); impact on Vermont utilities and customers (§ 248(b)(10)); and decommissioning plan and fund (Public Utility Commission Rule 5.900). Kopfler's testimony will also address the Petitioner's request for a CPG pursuant to 30 V.S.A. § 231 to own and operate the Project with *de minimis* regulation.

EXHIBIT LIST

Exhibit MRES-TK-1	Resume of T. Kopfler
Exhibit MRES-TK-2	Site Plan and USGS Map
Exhibit MRES-TK-3	Equipment Specifications
Exhibit MRES-TK-4	Comments on 45-day notice
Exhibit MRES-TK-5	Facilities Report, System Impact Study, and One-Line Diagram

Exhibit MRES-TK-6	Acoustic Analysis
Exhibit MRES-TK-7	Above and Below Ground Historic Sites Memos
Exhibit MRES-TK-8	Decommissioning Plan and Fund, Form of Surety Bond
Exhibit MRES-TK-9	Petitioner's Articles of Organization

Introduction

Q1. Please state your name, current employer, business address, and position.

A1. My name is Taegen Kopfler, and I am currently a Project Manager at Encore Renewable Energy (Encore), a Vermont limited liability company in good standing with the State of Vermont. My business address is 50 Lakeside Ave, Suite 110, Burlington, Vermont. As a certified B-Corp, Encore is a leading integrated clean energy project development company with a focus on commercial, industrial, and community-scale solar PV systems for Vermont towns, schools, businesses, and landowners. We also assist a variety of clients in navigating complex technical, financial, and regulatory matters through various stages of development. Encore is assisting Murphy Road Energy Storage, LLC (“MRES” or “Petitioner”) with the proposed Project.

Q2. Please describe your educational background and work experience.

A2. I have worked at Encore since 2022 where I have been developing approximately 76 MW of commercial-scale and community solar and 10 MW of storage assets in Vermont and Illinois. Prior to this role, I was a middle school science teacher at a private school in New York City. My undergraduate degree is from Middlebury College in Physics with a minor in French. My resume is attached as Exhibit MRES-TK-1.

1 Q3. Who is the Petitioner and what is their address?

2 A3. As stated above, the Petitioner is MRES. The Petitioner's mailing address is 50 Lakeside
3 Ave, Suite 110, Burlington, Vermont 05401. The Petitioner is a Vermont limited liability
4 company in good standing. Encore is a Vermont limited liability company in good standing
5 and is the sole member of MRES.

6
7 Q4. Have you testified previously before the Public Utility Commission ("Commission" or
8 "PUC")?

9 A4. Yes. I have provided testimony in Case No. 25-0895-PET, Case No. 24-1683-PET, and
10 Case No. 24-1898-PET, all proposed solar generation projects.

11
12 Q5. What is the purpose of your testimony?

13 A5. My testimony supports the Petitioner's Petition for a Certificate of Public Good (CPG)
14 pursuant to 30 V.S.A § 248(j) with respect to the proposal to install and operate a 5 MW¹
15 battery storage facility at 419 Murphy Road, Bennington, Vermont (the "Property"), next
16 to an existing 500 kW solar facility (the "Project"). My testimony (1) identifies the Section
17 248 criteria I will address; (2) introduces the other witnesses offering testimony in support
18 of the Project; (3) justifies application of the Section 248(j) procedures; (4) provides an
19 overview of the proposed Project, the proposed schedule for Project completion, and timing
20 of needed CPG approvals; (5) supports the Project's compliance with various Section 248

¹ The actual project size is 4.999 MW, but for simplicity purposes, the Section 248 materials use 5 MW.

1 criteria; and (6) supports issuance of a Section 231 CPG to Murphy Road Energy Storage,
2 LLC to own and operate the Project.

3
4 I address the following Section 248 criteria and those Act 250 criteria given due
5 consideration in the Section 248 analysis: orderly development of the region (§ 248(b)(1));
6 need (§ 248(b)(2)); system stability and reliability (§ 248(b)(3)); economic benefit to the
7 State and its citizens (§ 248(b)(4)); public health and safety, air pollution, use of natural
8 resources, greenhouse gas impacts (§ 248(b)(5)); transportation systems (10 V.S.A. §
9 6086(a)(5)); educational services (10 V.S.A. § 6086(a)(6)); municipal services (10 V.S.A.
10 § 6086(a)(7)); historic sites (10 V.S.A. § 6086(a)(8)); development affecting public
11 investments (10 V.S.A. § 6086(a)(9)(K)); least-cost integrated resource plan (§ 248(b)(6));
12 compliance with electric energy plan (§ 248(b)(7)); impact on Vermont utilities and
13 customers (§ 248(b)(10)); and decommissioning plan and fund (Public Utility Commission
14 Rule 5.900). I will also address the Petitioner's request for a CPG pursuant to 30 V.S.A. §
15 231 to own and operate the Project.

16
17 Witness Adam Crary will address: 30 V.S.A. § 248(b)(8) and 10 V.S.A. § 1424a(d)
18 outstanding resource waters; 30 V.S.A. § 248(b)(5) natural environment with due
19 consideration given to 10 V.S.A. § 6086(a)(1) water and air pollution; 10 V.S.A. §
20 6086(a)(1)(A) headwaters; 10 V.S.A. § 6086(a)(1)(C) water conservation; 10 V.S.A. §
21 6086(a)(1)(D) floodways; 10 V.S.A. § 6086(a)(1)(E) streams; 10 V.S.A. § 6086(a)(1)(F)
22 shorelines; 10 V.S.A. § 6086(a)(1)(G) wetlands; 10 V.S.A. § 6086(a)(2) & (3) water

1 supply; and; 10 V.S.A. § 6086(a)(8) rare and irreplaceable natural areas, necessary wildlife
2 habitat, and endangered species.

3
4 Witness Andrew Mills will address: Section 248(b)(5) 10 V.S.A. § 6086(a)(1)(B) waste
5 disposal, 10 V.S.A. § 6086(a)(4) soil erosion, and 10 V.S.A. § 6086(a)(9)(B) primary
6 agricultural soils.

7
8 Witness Jeremy Owens will address: the Project's compliance with orderly development
9 of the region (30 V.S.A. § 248(b)(1)) and its impact on the aesthetics and scenic beauty of
10 the surrounding area (30 V.S.A. § 248(b)(5)).

11
12 As set forth below, the Project will require Green Mountain Power (GMP) to upgrade a
13 portion of an existing electric distribution line. The Petitioner takes responsibility for
14 ensuring that GMP constructs the interconnection upgrades consistent with the proposed
15 distribution line upgrade plans attached to Exhibit MRES-AC-2 and recommended best
16 practices identified in the prefiled testimony of Adam Crary.

17
18 Q6. Why has the Petitioner filed this Petition under subsection (j) of Section 248?

19 A6. The Project is limited in size and scope, it raises no significant issues with respect to the
20 substantive criteria of Section 248, and the Petitioner believes that the public interest is
21 satisfied by the procedures authorized under Section 248(j). The Project is proposed to be
22 located adjacent to the existing solar facility. The Project would be set back approximately

1 507 feet south of Murphy Road and 677 feet away from the nearest residence. Most
2 visibility would be screened by surrounding landform and mature vegetation. The Project's
3 relatively small footprint and colocation with an existing solar energy generation facility
4 that has already been found to comply with Section 248 criteria result in a project with
5 extremely limited impacts under the so-called "Act 250" environmental and land use
6 criteria as established by the expert reports submitted herein. The impacts on
7 environmental and land use criteria would be *de minimis*, again due to the Project's limited
8 footprint and profile. The Project does not raise a significant issue with respect to the other
9 criteria given the Project's limited scope and the region's need to add battery storage to the
10 electrical grid.

11 **Project Description and Overview**

12 Q7. Please generally describe the proposed Project.

13 A7. The Petitioner proposes to install and operate the Project on an approximately 0.37-acre
14 fenced-in portion of a 51-acre parcel of land with 2.14 acres of total Project disturbance,
15 including access drive improvements on the property on tax parcel ID 04013000
16 (Property). The Project is located adjacent to the existing 500 kW solar facility that
17 received a CPG in case number 16-0049-NMP on November 17, 2016. The Project's
18 colocation takes advantage of siting adjacent to another project that has demonstrated
19 compliance with the site-specific criteria of Section 248. Please see the site plan as Exhibit
20 MRES-TK-2 along with a USGS map.

21
22 The Petitioner has rights to lease from the landowner the portions of the host Property

1 necessary for the Project. The electricity stored and discharged by this facility will flow to
2 Green Mountain Power's (GMP) electric grid. The Project is set back approximately 507
3 feet from Murphy Road, and 677 feet from the nearest residence. In summary, the Project
4 will consist of:

- 5 • Thirty-two battery storage units, or "blocks," installed within a fenced area which will
6 occupy approximately 0.37 acre of the Project site. Each battery block is approximately
7 7.5 feet wide by seven feet deep by ten feet high mounted on a six inch concrete slab,
8 enclosed within its own purpose-built container that will be painted green. The thirty-two
9 blocks will be arranged in two sections, with sixteen blocks making up each section (two
10 rows of eight blocks per section). The blocks connect to each other through buses. Each
11 section will be approximately sixteen feet wide by sixty feet long and approximately ten
12 feet high.
- 13 • An additional four battery blocks are proposed to be installed in a single row approximately
14 ten years from now as part of "augmentation" as shown on the site plan. The AC size of
15 the Project will not change with this augmentation and they would be installed within the
16 Project footprint, immediately to the east of the two larger sections.

17 The Project will also include:

- 18 • An approximate 16,000-square-foot crushed stone pad upon which the battery enclosures,
19 inverters, and transformers would be sited within a perimeter fence;
- 20 • Two pad-mounted transformer skids, each with a 3,100-kVA transformer and each with
21 two inverters, with secondary oil containment providing 110% of the equipment oil
22 volume with freeboard for five inches of rain;

- 1 • A smaller, 500 kVA, pad-mounted auxiliary transformer and three 167 kVA pole-
2 mounted transformers;
- 3 • Approximately 500 feet of agricultural-style perimeter exclusion fence, eight feet in
4 height;
- 5 • Temporary storage areas for delivery and short-term storage of materials;
- 6 • Widening, re-aligning, and improving approximately 250 linear feet of an existing access
7 driveway to provide access to the Project, including some temporary widening to
8 facilitate vehicle access during construction; and
- 9 • Extending the existing access road approximately 435 feet with varying widths from 16
10 feet to 20 feet, including turnaround areas.

11

12 From the transformers, the electricity travels underground to a new utility pole with a utility
13 meter (this new pole will be the point of common coupling for the Project), then the
14 electricity connects overhead to a pole-mounted utility recloser (one new pole). The new
15 line continues overhead to a pole with three 167 kVA pole-mounted transformers (this new
16 pole will provide auxiliary power to the Project), and then the electricity continues
17 overhead to a new riser pole. The new line then goes underground to cross the existing
18 GMP transmission corridor before reaching a new riser pole. Then a new overhead electric
19 line continues south along the next two new poles before connecting with the existing
20 utility pole (the proposed point of interconnection) along Murphy Road. In sum, there are
21 a total of seven new wooden above-ground poles that are approximately 35-45 feet above
22 ground. The total amount of line extension is approximately 655 feet, with 429 feet

1 overhead and 226 feet underground.

2
3 GMP will own the new above-ground electric line. The Petitioner will own and control
4 the underground primary line from the transformers to the new utility pole with a utility
5 meter, whereas GMP will own the underground primary line that crosses the GMP
6 transmission easement. The Petitioner will register with Dig Safe and comply with 30
7 V.S.A. Chapter 86 and Commission Rule 3.800.

8
9 With respect to GMP's interconnection upgrade, the new overhead line will then continue
10 on the existing GMP distribution service on Murphy Road, where GMP will upgrade
11 approximately 2,600 feet of existing three-phase service extending to the east to
12 accommodate the interconnection. Specifically, while minor changes may modify the final
13 design, the current plan is for GMP to replace fourteen existing poles, remove one pole,
14 and add two new poles within the existing corridor. The GMP reconductoring work is
15 shown on the natural resource map attached to the prefiled testimony of Adam Crary in
16 Exhibit MRES-AC-2. Petitioner will own the transformers, whereas GMP will own the
17 above referenced overhead line extension on the Project property and the associated poles
18 and equipment on those poles. The new poles and the new electrical equipment are
19 required by GMP, as explained under the system stability and reliability criterion below.

20
21 As discussed more fully in my testimony on the Project's compliance with Section
22 248(b)(2), the Project is being developed as a competitive supplier of energy storage

1 services and electricity in multiple regional wholesale markets where additional energy
2 storage and timely discharge is needed. The Petitioner is also in conversation with GMP
3 about a possible Energy Storage Services Agreement under which GMP might purchase
4 services from the Project.

5
6 Q8. Please generally describe the site plan and specific Project equipment.

7 A8. Please see Exhibit MRES-TK-2 for a site plan, Exhibit MRES-TK-3 for typical equipment
8 specifications for the Project, and Exhibit MRES-TK-6 for the one-line diagram. The final
9 site design and equipment selection will occur post-permit issuance, however such design
10 will be substantially the same as shown in Exhibit MRES-TK-2.

11
12 The battery energy storage system contains lithium-ion batteries that serve as the Project's
13 energy storage component. The batteries are configured in modules that are placed in
14 racks. Each module, comprising multiple cells in series, features a Module-Level Battery
15 Management System (BMS) responsible for aggregating cell data for transmission to the
16 Battery Control Unit (BCU). Racks consist of multiple modules in series, and they are
17 equipped with Rack-Level BMS units that collate data from the Module-Level BMS. The
18 battery system, which consists of multiple racks in parallel, employs a System-Level BMS
19 tasked with collecting and processing data from Rack-Level BMS units. The System-Level
20 BMS ensures proper subsystem operation, interfacing with the Energy Management
21 System (EMS) to relay status, warnings, alarms, and execute basic commands such as
22 shutdown directives. The EMS oversees all Power Conversion Systems or Inverters (PCS)

1 and DC Blocks, and ensures that the batteries are always operated within bounds of system
2 requirements.

3
4 The battery storage unit is connected, via underground power and control conduits, to a
5 PCS in the form of four 1-MW utility-grade storage inverters. The inverters are specifically
6 designed for energy storage applications, being a bidirectional energy conversion device
7 that can both charge and discharge the batteries. Charging is achieved by rectifying
8 alternating current from the grid and converting to direct current used to charge the
9 batteries. Discharging is achieved by inverting direct current from the batteries to grid-
10 conditioned alternating current for export to the grid. The inverter is also managed by the
11 single platform controller EMS system. The inverters are connected via underground AC
12 conduits, to two 3100 KVA step transformers that allow connection to the NB-G73 12.47
13 kV feeder.

14
15 Q9. How will Petitioner and other authorized personnel access the Project?

16 A9. The Petitioner will access the Property via the access drive indicated on the site plan,
17 Exhibit MRES-TK-2. The Petitioner will widen, re-align, and improve approximately 250
18 linear feet of the existing access drive, and extend the existing access drive approximately
19 435 feet with varying widths, from 16 to 20 feet. This access drive is proposed to serve
20 both the ER Paper Mill Village Solar project and the Murphy Road Energy Storage Project.

21

1 Q10. Will the Project involve any tree clearing?

2 A10. The Project will require approximately 2,340 square feet of tree clearing. Limited tree
3 clearing will be necessary along the tree line to the north of the Project to remove hazard
4 trees that may be capable of falling on the Project, and to provide for improvements
5 necessary for stormwater treatment features. More information on the environmental
6 impacts of tree clearing is described in Mr. Crary's testimony and his accompanying
7 natural resources report.

8
9 Q11. Does the Petitioner propose to install a fence? If so, please describe the fence.

10 A11. Yes. The Petitioner proposes to install an eight-foot-high perimeter fence around the
11 Project. The perimeter fencing would restrict access to and from the Project to secure the
12 Project and prevent the public from entering the array. The Petitioner will install a secured
13 gate where the fence meets the access drive. The Petitioner, GMP, and first responders will
14 be provided with access through the gate. The southern fence line of the Project will be
15 installed with a tan or other earth-tone acoustic blanket (sound dampening fabric) to
16 increase the attenuation of any sounds associated with Project equipment. Exhibit MRES-
17 TK-8 (acoustic analysis) provides a representative sample of the type of acoustic blanket
18 that the Petitioner plans to install on the Project's southern fence line.

19
20 Q12. Is the Petitioner proposing a lighting plan for the Project?

21 A12. No, the Petitioner does not require lighting for any aspect of the Project and thus does not
22 propose a lighting plan for the Project.

1
2 Q13. Will the Project require grading?

3 A13. Yes. The Project will require earthwork to install the access drive, underground conduit,
4 necessary equipment pads for transformers and battery storage equipment, and associated
5 stormwater treatment improvements. Grading will be required to create the levelled
6 footprint area of the Project, approximately 0.37 acres inside the Project fence. The total
7 area of potential earth disturbance is 93,290 square feet.

8
9 Q14. Will the Project require installation of any components containing oil?

10 A14. Yes. The Project includes two 3,100 kVA pad-mounted transformers that use a
11 biodegradable dielectric fluid. The Site Plan (Exhibit MRES-TK-2) shows the location of
12 the proposed transformers and Exhibit MRES-TK-3 includes transformer specifications.
13 The containment system will be sufficient to hold a minimum of 110% of the transformer
14 coolant plus five inches of freeboard. The Project will also include a smaller, 500 kVA
15 pad-mounted auxiliary transformer and three 167 kVA pole-mounted transformers. For
16 additional information on oil containment, please see Andrew Mills' testimony regarding
17 waste disposal.

18
19 Q15. Please explain the proposed construction process and schedule.

20 A15. The Petitioner hopes to have the Project in service by December 2026. To meet this date,
21 procurement would need to begin by February 2026, which cannot occur until the CPG is
22 issued, and construction would commence in June 2026. Construction activities, which

1 will span over a 3–6-month duration, primarily include: (1) preparation of the site and
2 installation of the staging area; (2) installation of battery units; and (3) installation of the
3 transformers, controls equipment, and network upgrades. Many of these tasks can be
4 performed concurrently over the 3–6-month schedule; however, they are dependent on
5 weather and other variables.

6
7 Construction activities and related deliveries will be limited to 7:00 A.M.–7:00 P.M. on
8 weekdays, 8:00 A.M.–5:00 P.M. on Saturdays, and no construction on Sundays or state or
9 federal holidays.

10
11 Q16. What are the Project’s operation and maintenance activities?

12 A16. Once the Project is fully commissioned, operations and maintenance activities will be
13 minimal. The Petitioner will perform routine system maintenance one to two times per
14 quarter, which will consist of vegetation management, and mechanical and electrical
15 inspections. The operator will remotely monitor operations, and in the event of a system
16 malfunction, personnel will visit the site for troubleshooting or repairs. The Petitioner may
17 schedule one extended maintenance period per year, which may be seven days in duration.

18
19 Q17. Please summarize all community outreach efforts undertaken by the Petitioner in advance
20 of filing its petition.

21 A17. The Petitioner provided the 45-day notice to the entities identified in Commission Rule
22 5.402(A)(1) on September 6, 2024 (Case No. 24-2864-AN). The Petitioner met with the

1 Town of Bennington Energy Committee on October 2, 2024 and the Town of Bennington
2 Planning Commission on November 14, 2024. The intent of both outreach efforts was to
3 present the Project and solicit feedback.
4

5 Q18. Please summarize all comments received in the 45-day advance notice period, written
6 comments and oral comments made at any public hearings, and the Petitioner's response
7 to any such comments.

8 A18. Please see Exhibit MRES-TK-4 for written comments that the Petitioner received. On
9 September 16, 2024, the Bennington Planning Commission filed written questions and
10 comments with the Commission in Case No. 24-2864-AN. The questions covered the
11 topics of the Project's aesthetic impacts, the Walloomsac River and its associated river
12 corridor and floodplain, the Project's noise impact, the Project's construction hours, and
13 how trucks will access the Project site. To address the Bennington Planning Commission's
14 comment about the Project's aesthetics, at the above-referenced in-person meeting, the
15 Petitioner presented a photo simulation of the Project and asked the Planning Commission
16 if they had a color preference for the battery enclosure (out of three earth-tone color
17 options). The Planning Commission requested additional photo simulations so they could
18 evaluate the various color options, and the Petitioner followed up on January 6, 2025 with
19 these additional photo simulations. The Planning Commission determined on January 9,
20 2025 that they preferred the green color for the battery enclosure, which the Petitioner will
21 accommodate in the Project design. Please see Jeremy Owens' testimony for a review of
22 the Project's aesthetics impacts and Exhibit MRES-JO-2 to see the photo simulations.

1 Please see Adam Crary's testimony for information specific to how the Walloomsac River
2 and its associated river corridor and floodplain will be protected from contamination in the
3 event of equipment failure, fire, or natural disaster. Please see my response to Q.27-28 for
4 information on the Project's noise impacts, and please see my response to Q.31 for
5 information on the route that trucks will take to access the site. The Planning Commission
6 requested that the Petitioner limit construction to Monday–Friday, 7–6 PM, and on
7 Saturday from 9 AM–3 PM, which would shorten the normal construction hours typically
8 allowed by the Public Utility Commission as set forth in Q.15 above. The Petitioner cannot
9 agree to limit the construction hours as the Planning Commission recommends because to
10 maintain costs and complete Project construction in a timely and efficient manner, it needs
11 to construct the Project within the time frames established by the Commission. During
12 construction, it takes time to get started and close for the day so every hour matters,
13 especially given the short construction season. This Project parcel presents no unique
14 characteristics that would necessitate a shorter construction period; the Project is set back
15 507 feet from Murphy Road and 677 feet from the nearest residence.

16
17 On September 30, 2024 the Agency of Agriculture, Food & Markets (AAFM) filed written
18 comments. Please see Andrew Mills' testimony for a summary and response to these
19 comments.

20
21 On October 7, 2024, the Agency of Natural Resources filed written comments. Please see
22 Adam Crary's testimony for a summary and response to these comments.

Section 248 Criteria

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

Q19. Please identify what portion of this criterion you address.

A19. I responded to comments made by the Town and RPC as they relate to the Town and Regional Plans, and the Petitioner has given due consideration to the recommendations set forth by the municipal and regional planning commissions (the municipal legislative bodies) as set forth above. Witness Jeremy Owens addresses the applicable Town and Regional Plans.

Need for Present and Future Demand for Service
(30 V.S.A. § 248 (b)(2))

Q20. What need for present and future demand for service does this Project fulfill?

A20. The Petitioner plans to develop the Project as a front-of-the-meter (FTM) energy storage system operating as a merchant plant participating in ISO New England (ISO-NE) regional wholesale markets, specifically the Frequency Regulation Market, the Real-Time Energy Market, and the recently expanded Day-Ahead Energy Market. Per ISO-NE:

[w]ith increasing amounts of intermittent energy sources joining New England's resource mix, the need to balance a more complex electricity grid has emerged. For example, with solar and wind now dominating the queue of proposed energy projects in New England, the region will need flexible resources to meet fluctuations in supply and demand that occur throughout the day. In the past decade, emerging technologies, such as

1 batteries, have brought the region efficient energy storage in smaller,
2 modular packages to help balance intermittency.²
3

4 Project participation in the competitive Frequency Regulation Market will help enable
5 ISO-NE to meet the need to keep a steady, regulated flow of energy on the grid at all
6 times, a critical function for regional system safety and reliability for customers.
7

8 Project participation in the competitive Real-Time Energy Market will help meet grid
9 operators' needs for cost-effective resources that "can be immediately dispatched...to
10 meet regional power demand and ensure grid stability, versus some power plants which
11 require ramp-up time."³
12

13 Project participation in the competitive Day-Ahead Energy Market will help ISO-NE
14 cost-effectively and proactively meet the need for grid system stability when the power
15 system experiences sudden shifts in demand or unexpected reductions in supply.
16

17 The Project will be enrolled as an Alternative Technology Regulation Resource (ATTR),
18 a special designation in ISO-NE that enables non-traditional assets like batteries to
19 participate in the Regulation Market. As an ATTR, the Project will also participate in

² Batteries as Energy Storage, ISO-NE <https://www.iso-ne.com/about/where-we-are-going/batteries-as-energy-storage>.

³ Batteries as Energy Storage, ISO-NE <https://www.iso-ne.com/about/where-we-are-going/batteries-as-energy-storage>.

1 Regulation Energy Management (REM), which facilitates continuous regulation service
2 while maintaining state-of-charge (SOC) neutrality over time.
3

4 In the Frequency Regulation Market, the Project will earn revenue from a combination of
5 capacity payments, which compensate for the amount of regulation capacity made
6 available, and performance payments, which are based on the resource's speed and
7 accuracy in following ISO-NE's automatic generation control (AGC) signal. As an
8 ATTR operating under REM, the Project will also receive energy compensation to offset
9 the net energy injected or withdrawn due to regulation activity. This service favors high-
10 performing resources with rapid response times—characteristics that battery systems like
11 the Project inherently possess.
12

13 Project participation in the Real-Time and Day-Ahead Energy Markets involves charging
14 the battery during periods of low locational marginal prices (LMPs), such as overnight or
15 during midday solar oversupply, and discharging during periods of high prices, typically
16 aligned with peak demand hours or grid stress events. Successful arbitrage relies on
17 accurate forecasting of market prices and optimal scheduling of charging and discharging
18 cycles. The ability to co-optimize between arbitrage and regulation services—while
19 carefully managing SOC—will be key to the Project's competitive pricing in the
20 marketplace.
21

1 Operationally, the Project will maintain sufficient SOC flexibility to respond to both
2 energy price signals and regulation dispatch requirements. Through its participation in
3 REM, the Project will automatically rebalance its SOC during regulation service,
4 reducing the need for manual intervention. Degradation management will also be a core
5 consideration, with dispatch strategies designed to account for excessive cycling and its
6 impact on Project battery life.

7
8 Petitioner will contract with an experienced service provider to provide the robust
9 forecasting tools, data-driven bidding strategies, and accurate dispatch necessary for
10 successful merchant operation. Included in this service provider's scope of
11 responsibilities will be adherence to GMP's and ISO-NE's technical and regulatory
12 requirements, including telemetry, metering, and security compliance.

13
14 Through successful competitive participation in regional wholesale markets as described
15 above, the Project will deliver critical services that directly support ISO-NE's operational
16 reliability and market efficiency. By participating in frequency regulation as an ATTR,
17 the Project will help stabilize grid frequency in real time, responding instantly to
18 imbalances between supply and demand. Its ability to rapidly inject or absorb energy
19 enhances system flexibility and reduces reliance on slower, less efficient fossil-based
20 resources. Through energy arbitrage, the Project will contribute to price smoothing by
21 charging during periods of surplus generation and discharging during times of high
22 demand, effectively shifting load and mitigating price spikes. Together, these services

1 will help alleviate grid congestion, improve overall system stability, and reduce price
2 volatility for ratepayers. In doing so, the Project plays a valuable role in accelerating the
3 transition to a cleaner, more resilient, and economically efficient grid.

4
5 The Commission has previously explained that a project that benefits the entire New
6 England Power Pool could satisfy the need criterion:

7 “the general good of the state” standard includes a recognition of
8 the value to Vermont of the benefits to the entire New England
9 Power Pool, from which Vermont purchases much of its power and
10 upon which Vermont depends for reliability.⁴
11

12 As explained above, this battery Project will contribute to meeting the regional need for
13 flexible resources to meet fluctuations in supply and demand that occur throughout the
14 day.

15
16 Q21. 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 A21. Yes. The Project is a form of load management as discussed above and will be deployed
20 competitively in response to recurring and demonstrated need for such services at the
21 regional level. The Petitioner is not a regulated distribution utility and is not required to
22 provide energy efficiency or load management services.

⁴ *Petition of Coolidge Solar I, LLC, for a CPG for a 20 MW solar facility*, Doc. No. 8685, page 15 (Order of 3/23/17).

Q22. Is the Project being financed with any ratepayer funds?

A22. No. The Project is not owned by a Vermont utility; Petitioner is developing the Project in a merchant capacity to participate in competitive regional markets without the use of any utility's ratepayers' funds.

System Stability and Reliability
(30 V.S.A. § 248(b)(3))

Q23. Will the Project adversely affect system stability and reliability?

A23. No. The Petitioner filed a complete application for interconnection pursuant to Commission Rule 5.500 on October 24, 2023, and a non-material modification to the application on January 18, 2025. GMP commissioned a System Impact Study (SIS) and an Addendum Study subsequently incorporated therein, to evaluate potential impacts of the Project to the grid. GMP also issued a Facilities Report. As shown in Exhibit MRES-TK-5, the Facilities Report concluded that the Project would not result in undue adverse impacts to the system provided that the measures identified in the conclusion of the Facilities Report are implemented prior to the Project's interconnection. The Facilities Report identified the following upgrades that are necessary to interconnect the Project to the GMP NB-G73 circuit:

- Upgrade of approximately 2,600 feet of 1/0 AAC and ASCR to 336 ACSR and space cable.⁵
- Replacement of approximately poles along Murphy Road to accommodate the larger conductor.

⁵ Some of the plans submitted with this filing show the upgrade being approximately 2, 200 feet, but the exact length will not be known until final plans are designed.

- Remove existing 65T fuses and install a Viper-ST electronic near Line 822 Pole 1 Tag 544201.
- Install a three-phase, pole-mounted electronic recloser, to be located at the point of common coupling (PCC).
- Install, test, and commission a supervisory control and data acquisition (SCADA) system and interface this system with the electronic recloser.
- Install a three-phase, four-wire, 15 kV-class bi-directional pad-mounted metering package, to be located at the PCC.
- Establish a reclose block protection scheme for the NB-G73 circuit breaker.
- Install and commission the new protection equipment for the NB-G73 substation breaker.

The Petitioner will enter into an interconnection agreement with GMP prior to construction and will pay for all required upgrades to interconnect the Project, which will be implemented prior to operation. As the upgrades will be completed prior to interconnection of the Project, the Project will not have an undue adverse impact on system stability or reliability.

Economic Benefit to the State and Its Residents

(30 V.S.A. § 248(b)(4))

Q24. In what ways will the Project provide economic benefit to the State of Vermont and its residents?

A24. The Project will provide a number of economic benefits to Vermont and its residents. These benefits include employment opportunities and municipal and state tax payments. Local contractors will be employed for the construction phase of the Project and local professionals, including engineers, consultants, and attorneys have been hired for design and permitting services. The Project will generate municipal property tax revenue for the Town of Bennington, and State tax revenue for the Education fund. Additional electricians and workers will be needed during Project construction, as well as during the ongoing

1 maintenance and operation of the Project. The Project's construction phase will also likely
2 contribute to local economic activity via lodging, meals, and other ancillary purchases
3 made by contractors.

4
5 **Public Health and Safety**
6 (30 V.S.A. § 248(b)(5))

7 Q25. Will the Project have any adverse effects on the health, safety, or welfare of the public or
8 adjoining landowners?

9 A25. No. The Project will not adversely impact public health and safety for the following
10 reasons: (1), all work will be performed in accordance with the National Electrical Safety
11 Code, the National Electric Code, and NFPA Standard 855; (2), an existing perimeter fence
12 around the site will ensure security with appropriate electrical warning signs; and (3), the
13 Project will not exceed acceptable sound thresholds at nearby residences. The Petitioner
14 will confer with appropriate representatives of the local fire department regarding fire
15 safety protocols and best practices in relation to the Project after construction is complete
16 and prior to operation.

17
18 **Air Pollution and Greenhouse Gases**
19 (30 V.S.A. § 248(b)(5))
20

21 Q26. Will this Project result in undue adverse effect on air quality?

22 A26. No, during construction, the Project will not involve any industrial/manufacturing
23 emissions, nor any excessive dust, smoke, or odors. Other than minor temporary vehicle

1 emissions during construction, the Project will not emit greenhouse gases or other air
2 pollutants.

3
4 Q27. Please explain any potential noise impacts from the Project.

5 A27. Petitioner has hired sound experts RSG to estimate sound emissions from the electrical
6 equipment that will generate noise, and model sound propagation to assess levels at the
7 closest residences and property lines. Please see RSG's sound assessment at Exhibit
8 MRES-TK-6. While only thirty-two DC blocks and four inverters will be installed initially,
9 the sound model accounted for an additional four DC blocks and one inverter for future
10 augmentation that will be installed in approximately ten years. RSG concluded that the
11 Project's highest modeled sound pressure level at the closest residence (which is
12 approximately 200 meters south of the Project) is 40 dBA (exterior) (daytime and
13 nighttime) so long as the Petitioner installs a sound absorption blanket to the interior
14 surface of the fence line as detailed in the RSG report. The Petitioner agrees to install a
15 sound absorption blanket in this manner.

16
17 Q28. Will the noise produced by the proposed Project create an undue adverse effect?

18 A28. No, the noise levels calculated at the nearest residence will be below both the maximum
19 limits of 45 dBA (exterior) and 30 dBA (interior) as required by the Commission in similar
20 cases.

21
22
23

Use of Natural Resources

(30 V.S.A. § 248(b)(5))

Q29. Will the Project require use of natural resources?

A29. No. The Project will not require any natural resources beyond limited gravel, concrete, and crushed stone for the surface of the equipment area, and for the surface of the extended access drive to the Project site.

Transportation Systems / Traffic

(10 V.S.A. § 6086(a)(5))

Q31. Will the Project cause unreasonable congestion or unsafe conditions with respect to use of the highways, waterways, railways, airports or airways, or other means of transportation existing or proposed?

A31. No. The Petitioner proposes to deliver materials to the Project site via Murphy Road and other state and local roads, which are accustomed to the type of traffic representative of the proposed daily material delivery. The Petitioner expects to use Vermont Route 9, then Austin Hill Road, and then onto Murphy Road. The Project is not expected to require oversize or overweight deliveries. The Project will not require road closures or lane shutdowns for extended periods of time. No other long-term interruptions or impacts to highways or local roads are anticipated. There will be no impacts to railway transportation. The Project will require a curb cut permit because the access drive will need to be

1 temporarily widened to facilitate vehicle turning during construction, as indicated on the
2 site plan, Exhibit MRES-TK-2.

3
4 **Educational Services**
5 (10 V.S.A. § 6086(a)(6))

6 Q32. What impact will the Project have on educational and municipal services?

7 A32. The Project will not have an adverse impact on educational services as it will not add
8 students to the area.

9 **Municipal Services**
10 (10 V.S.A. § 6086(a)(7))

11 Q33. Will the Project need municipal services, including any special police, fire, or rescue
12 services that will place an unreasonable burden on the ability of the local government to
13 provide municipal or governmental services, or would any training be required?

14 Q33. No. The Project will not require any municipal water or sewer services, new roadway
15 acceptance or maintenance by the Town, nor require any fire or police services beyond
16 those typically required of other businesses.

17
18 Q34. Will the first responders have access to the Project site in the event of an emergency?

19 A34. Yes, the Petitioner will provide first responders access to the Project site in the event of an
20 emergency. A lockable disconnect switch will allow shutdown of the Project in case of
21 fire or other emergency. Following construction and prior to operation, Petitioner will

1 coordinate with the local fire department to provide them with protocols and best practices
2 to be followed in relation to the Project.

3 **Historical and Archeological Sites**
4 (30 V.S.A. § 248(b)(5) 10 V.S.A. § 6086(a)(8))

5 Q36. Will this Project have an undue adverse effect on below-ground or above-ground historic
6 sites?

7 A36. No. No above-ground historic sites will be adversely impacted by the Project. The
8 Petitioner consulted with T.J. Boyle Associates who conducted a historic structures review
9 for the Project by using GIS viewshed analysis, conducting a field investigation, and
10 consulting data from the Vermont Division for Historic Preservation's Online Resource
11 Center for the Town of Bennington. TJBA has determined that the Project will not have
12 an adverse effect on above-ground historic resources because of the lack of extensive
13 Project visibility and because no nearby historic resources would have visibility of the
14 Project. Please see Exhibit MRES-TK-7.

15
16 Regarding below-ground historic sites, Petitioner has discussed the site with the Vermont
17 Division for Historic Preservation ("VDHP") and has completed a Phase I Site
18 Identification Survey on the Project site. UVM Cap's initial Phase I survey identified an
19 archaeological site where the Project was proposed. The Petitioner thus reconfigured the
20 Project to completely avoid this site by shifting the Project further southwest. VDHP
21 requested the Petitioner to perform additional survey work in the new Project area to
22 confirm that no historic sites are present. UVM Cap surveyed the area where the Project

1 is now proposed and it found no further sites. UVM Cap recommended that Project plans
2 should clearly delimit a protective buffer for the sensitive site VT-BE-0602 to ensure its
3 preservation before and after construction. The Petitioner has done so on the site plans,
4 Exhibit MRES-TK-2. Therefore, the Project will have no impact on below-ground historic
5 sites. Please see Exhibit MRES-TK-7 for the Archeological Memo.

6
7 **Development Affecting Public Investments**

8 (10 V.S.A. § 6086(a)(9)(K))

9 Q37. Will the Project unnecessarily or unreasonably endanger any public or quasi-public
10 investment in the facility, service, or lands, or materially jeopardize or interfere with the
11 function, efficiency, or safety of, or the public's use or enjoyment of or access to, the
12 facility, service, or lands?

13 A37. No. The nearby existing public investment is Murphy Road, and the Project will not
14 interfere with the public's use of it.

15 **Compliance with Least-Cost Integrated Resource Plan**

16 (30 V.S.A. § 248(b)(6))
17

18 Q38. Does the Petition need to comply with this criterion?

19 A38. No. The Petitioner is not a regulated utility, and the Commission has not required non-
20 utilities to have a least-cost integrated resource plan. Therefore, this criterion is
21 inapplicable.

22

23

Compliance with Vermont Electric Energy Plan

(30 V.S.A. § 248(b)(7))

Q39. Is the Project consistent with the 2022 Comprehensive Energy Plan (CEP)?

A39. Yes. The CEP recognizes the importance of energy storage technology because it helps manage peaks, time-shift demand and supply, and smooth renewables integration, and provides frequency regulation and other grid support, and—if properly configured—provides resilience during grid outages. See CEP pages 60 and 70. The Project complies with the CEP as it is an energy storage facility that can shave electricity demand peaks, support grid voltage to provide backup power, and “firm” the output of intermittent renewables. The Petitioner has requested a 202(f) determination from the Department of Public Service.

Impact on Vermont Utilities and Customers

(30 V.S.A. § 248(b)(10))

Q40. Can existing or planned transmission facilities serve the Project without creating an undue adverse effect on Vermont utilities, customers, or existing transmission facilities?

A40. Yes. The Project does not require new transmission facilities to be built. The Project will not have an undue adverse impact on Vermont utilities or their customers provided that the recommendations in the Facilities Report and GMP Addendum are implemented. In addition, the Petitioner is aware of the draft energy storage rule section 9.403 dated May 21, 2024 in 21-3883-RULE, which sets forth the respective duties of retail electricity providers and energy storage facility owners and operators. The Petitioner will

1 comply with the duties assigned to an owner and operative of an energy storage facility
2 as set forth below:

- 3 • The operations of an energy storage facility or an energy storage aggregation must be
4 coordinated with the host distribution utility. This coordination includes:
 - 5 ○ Operating an energy storage facility or an energy storage aggregation in a
6 manner consistent with the limitations and operating orders established by the
7 distribution utility.
 - 8 ○ Operating an energy storage facility or an energy storage aggregation in a
9 manner that accounts for any known limitations of the distribution system and
10 ensures reliability and system stability.
 - 11 ○ Entering into applicable coordination agreements with the host distribution
12 utility.
 - 13 ○ An energy storage facility or an energy storage aggregation must follow the
14 metering and telemetry requirements of the host distribution utility.

15
16 **Commission Rule 5.900 Decommissioning Plan and Fund**

17 Q41. Will the Project be decommissioned at the end of its useful life, with various system
18 components disposed of?

19 A41. Yes. At the end of the Project's useful life, the Petitioner will assess whether: (1) it is
20 financially viable to continue to operate the Project as is or (2) any changes could be made
21 to the Project to allow its continued operation, and seek appropriate amendment to its CPG;
22 or (3) the Project should be decommissioned. In any event, the Petitioner will remove the

1 Project once it is no longer in service and restore the site to its condition prior to installation
2 of the Project to the greatest extent practicable as required under Commission Rule
3 5.904(B).

4
5 The Petitioner has developed a Decommissioning Plan that would apply when the
6 Petitioner decommissions the Project. Under the Decommissioning Plan, the Project will
7 be dismantled, and the facilities, wiring, and other equipment will be removed and disposed
8 of in compliance with all applicable waste regulations. Any negatively impacted lands will
9 be restored, with primary agricultural soil stockpiles replaced as described in Mr. Mills's
10 testimony, and the site will be left in a safe, clean condition and allowed to return to natural
11 conditions on its own. Please see Exhibit MRES-TK-8 for the Project's decommissioning
12 plan.

13
14 Q42. Has the Petitioner proposed a decommissioning fund?

15 A42. Yes, the Petitioner has proposed a funding mechanism based upon an estimate of the
16 Project's decommissioning costs that does not account for equipment salvage. As required
17 by Commission Rule 5.904(B), the decommissioning cost estimate is in present-day dollars
18 and addresses the elements in that rule. Seth Goddard, a professional engineer at Krebs and
19 Lansing Consulting Engineering, prepared the estimated cost of decommissioning. The
20 Petitioner worked with Encore's in-house Engineering and EPC teams to analyze and
21 assess the validity of the estimate it received, and the Petitioner is therefore confident in
22 the accuracy of this estimate. The decommissioning fund will be in place at the time

1 construction begins and will be funded by a surety bond or other form of security such as
2 an escrow agreement or letter of credit that includes an automatic renewal provision
3 (evergreen clause) or other alternative form of financial security that equals or exceeds the
4 assurance of financial resources for decommissioning as a letter of credit. A draft surety
5 bond is included in Exhibit MRES-TK-8. Prior to commencing Project construction, the
6 Petitioner shall file and receive Commission approval of an executed surety bond or
7 alternative form of security, and will submit documentation that the surety or other issuer
8 of financial security has a rating of A or greater as set forth in the Commission's *Order*
9 *Clarifying the Meaning of "A-Rated" Status for Financial Institutions Issuing Letters of*
10 *Credit*, Case No. 24-1240-INV (4/25/24).

11 **Section 231**

12 Q43. Please generally describe the Petitioner.

13 A43. As explained earlier, the Petitioner is a Vermont limited liability company in good standing
14 with a business address of 50 Lakeside Ave, Suite 110, Burlington, Vermont 05401. The
15 Vermont Secretary of State's Office has accepted Petitioner's Articles of Organization.
16 Please see attached the Articles of Organization as Exhibit MRES-TK-9. The Petitioner is
17 a special purpose entity organized for the Project and is a subsidiary of Encore Renewable
18 Energy.

19
20 The Petitioner is not a retail distribution utility that could incur expenses to be passed on
21 to ratepayers. The Petitioner will not be providing or selling service directly to retail

1 electric customers, and electric customers in Vermont are not funding the Project's
2 construction or its operations.

3
4 Q44. Please describe the Petitioner's technical expertise to own, construct, and operate the
5 Storage system.

6 A44. The Petitioner is a wholly owned subsidiary of Encore and thus has the benefit of oversight
7 by Encore's management team with more than 10 years of experience in the renewable
8 energy sector. Encore Renewable Energy has developed, constructed, and commissioned
9 over 70 solar projects, comprising over 40 MW of generation, throughout New England.
10 Encore has successfully brought each of these projects from inception through design and
11 permitting, and into commercial operation. Encore has partnered with numerous municipal
12 electric departments and electric utility companies to connect each of these projects to the
13 electric distribution system, and Encore has partnered with numerous owners and operators
14 to provide for the successful operation of each of these projects. Recognizing Encore's
15 leadership in the industry, the Vermont Senate appointed Encore CEO Chad Farrell to
16 represent the clean energy sector on the Vermont Climate Council established by Act 153
17 of 2020, known as the Global Warming Solutions Act. The Petitioner will rely on Encore's
18 well-established expertise in renewable energy development and operation in the
19 development of the Project. The Petitioner has the necessary technical expertise to install
20 and operate the Project, based on the deep technical experience in energy generation and
21 storage systems, found within both its senior leadership and engineering teams. All
22 inspections, repairs, or technical maintenance performed on Project equipment will be

1 conducted by qualified technicians. The Petitioner will establish the necessary
2 maintenance and operational protocols to ensure that routine maintenance and unexpected
3 repairs are executed safely and promptly for the duration of the Project's lifespan.

4
5 The Petitioner will be a competitive supplier of energy storage services, and to maintain its
6 competitive advantage, it requires the ability to efficiently finance or refinance its assets,
7 and the ability to restructure its ownership or partnership affiliations.

8
9 Q45. How will the Petitioner maintain the Project?

10 A45. The Project will use cloud-based energy management software and web-based monitoring
11 and reporting systems to alert operators to any equipment failures. The Petitioner will
12 respond to any notifications of equipment malfunction, failure, or service notifications to
13 keep the project in good working condition.

14
15 Q46. Please describe the Petitioner's financial strength as it relates to the Project, including its
16 ability to obtain financing for the Project?

17 A46. The Petitioner is a wholly owned subsidiary of Encore and can secure sufficient financing
18 to support development of the Project. The Project will be a privately financed "merchant"
19 energy storage facility. The Petitioner will not seek to recover the costs of the Project
20 through charges paid by Vermont retail electric ratepayers. This arrangement ensures that
21 Vermont ratepayers will not experience any financial harm if the Project does not prove
22 successful. Additionally, the requirement that the Petitioner establish a fully funded

1 decommissioning fund before beginning preparation or construction ensures that Vermont
2 and its ratepayers will not experience financial harm if the Project is not successful.
3

4 A47. Please explain the Petitioner's experience with business regulation.

5 Q47. As explained above, the management and operational team that will work on the Project
6 are within Encore, the sole member of the Petitioner. Encore, through special purposes
7 entities, has obtained numerous certificates of public good under Section 248 for solar
8 electric generation and battery facilities in Vermont. Encore also develops renewable
9 energy projects in Maine and New York and obtains the required permits in those states.
10 Encore has not been subject to any penalties in these states.
11

12 Q48. Is the Petitioner entitled to exemption under 30 V.S.A. § 209(k)? If so, why?

13 A48. Yes. The Petitioner is a "competitive supplier of energy storage services that does not
14 serve retail customers;" therefore, under 30 V.S.A. § 209(k), the Petitioner is exempt from
15 regulation under sections 107, 108, and 109 of Title 30.
16

17 Q49. Does this conclude your testimony at this time?

18 A49. Yes.

WITNESS DECLARATION

I, Taegen Kopfler, being over 18 years of age, and competent to testify on these matters declare that on behalf of Petitioner, I prepared my prefiled testimony and exhibits in the above-captioned matter and I have the necessary expertise to testify to the same information. I declare that the testimony and exhibits that I have sponsored are true and accurate to the best of my knowledge and belief and were prepared by me or under my direct supervision. I understand that if the above statement is false, I may be subject to sanctions by the Commission pursuant to 30 V.S.A. § 30.

Dated at Burlington, Vermont, this 20th day of May, 2025.

/s/ Taegen Kopfler
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