

BEFORE THE  
VERMONT PUBLIC UTILITY COMMISSION

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Petition of GLOBALFOUNDRIES U.S. 2  
LLC for a Certificate of Public Good,  
pursuant to 30 V.S.A. § 231 to operate a  
Self-Managed Utility

Case No. 21-1107-PET

Petition of Green Mountain Power  
Corporation for approval to modify  
service territory pursuant to 30 V.S.A. §  
249

Case No. 21-1109-PET

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DIRECT TESTIMONY OF ASA S. HOPKINS  
ON BEHALF OF  
CONSERVATION LAW FOUNDATION

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June 25, 2021

**Summary of Testimony**

Dr. Hopkins’s testimony addresses the impact of the proposed GlobalFoundries “self-managed utility” on the general good of the state and Vermont’s energy policy, with particular focus on the impact on environmental soundness and greenhouse gas emissions mitigation. He also addresses the definition of a “self-managed utility” and retail sales and the suitability of GlobalFoundries as a fair partner for Vermont’s regulatory community. He quantifies the financial and environmental impact of the proposed changes, including the need for additional scenarios to assess the impact on other Green Mountain Power ratepayers. He concludes that GlobalFoundries has not met the burden to show that the petition is in the general good of the state. Alternatively, he recommends actions that the Public Utility Commission should take to mitigate some of the impacts, if the Commission has the authority and determines that GF and GMP meet applicable statutory requirements necessary to approve the self-managed utility concept.

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1 DIRECT TESTIMONY OF ASA S. HOPKINS  
2 ON BEHALF OF  
3 CONSERVATION LAW FOUNDATION

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4 **I. INTRODUCTION AND QUALIFICATIONS**

5 **Q1. Please state your name, business address, and position.**

6 **A1.** My name is Asa S. Hopkins. My business address is 485 Massachusetts  
7 Ave., Suite 3, Cambridge, Massachusetts 02139. I am a Vice President at  
8 Synapse Energy Economics, Inc.

9 **Q2. Please describe Synapse Energy Economics.**

10 **A2.** Synapse Energy Economics is a research and consulting firm specializing  
11 in energy industry regulation, planning, and analysis. Synapse works for a  
12 variety of clients, with an emphasis on consumer advocates, regulatory  
13 commissions, and environmental advocates.

14 **Q3. Please describe your education and professional experience before**  
15 **beginning your current position at Synapse Energy Economics.**

16 **A3.** Before joining Synapse Energy Economics in 2017, I was the Director of  
17 Energy Policy and Planning at the Vermont Public Service Department  
18 from 2011 to 2016. In that role, I was the director of regulated utility  
19 planning for the state's public advocate office, and the director of the state  
20 energy office. I served on the Board of Directors of the National  
21 Association of State Energy Officials. Prior to my work in Vermont, I was  
22 an AAAS Science and Technology Policy Fellow at the U.S. Department  
23 of Energy (DOE), where I worked in the Office of the Undersecretary for  
24 Science to develop the first DOE Quadrennial Technology Review. Prior  
25 to my time at the U.S. DOE, I was a postdoctoral fellow at Lawrence  
26 Berkeley National Laboratory, working on appliance energy efficiency

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1 standards. I earned my PhD and Master's degrees in Physics from the  
2 California Institute of Technology and my Bachelor of Science degree in  
3 physics from Haverford College. My resume is attached as Exhibit CLF-  
4 ASH-1.

5 **Q4. On whose behalf are you testifying in this case?**

6 **A4.** I am testifying on behalf of the Conservation Law Foundation.

7 **Q5. Have you testified previously before the Vermont Public Utility**  
8 **Commission?**

9 **A5.** Yes, in dockets 7815, 7770, 7833, 7862, 8311, 7970, 8525, 8600, 8684,  
10 8586 and 8685, and 17-1247-NMP.

11 **Q6. What is the purpose of your testimony?**

12 **A6.** The purpose of my testimony is to assess the impact of the petitioners'  
13 proposals on the general good of the state, with particular focus on  
14 consistency with the objectives of Vermont's state energy policy and the  
15 impacts on environmental soundness and greenhouse gas (GHG) emission  
16 mitigation. I also address the self-managed utility (SMU) concept,  
17 including whether GlobalFoundries (GF) is well suited to meet its own  
18 definition of that concept and the regulatory expectations of any utility.  
19 And finally, I critique the ratepayer impact modeling that Green Mountain  
20 Power (GMP) has presented.

21 **Q7. On what information have you relied in preparing your testimony?**

22 **A7.** I have reviewed GF and GMP's petitions, exhibits and testimony, as well  
23 as discovery questions issued, and responses received, from the  
24 Commission, the Department of Public Service, and All-Earth

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1 Renewables. I have also relied upon the information in the exhibits I  
2 present. My conclusions and recommendations may change in the event  
3 that GF or GMP file additional information, such as rebuttal testimony or  
4 additional information in response to the initial discovery requests.

5 **Q8. How is your testimony organized?**

6 **A8.** In Section II, I begin with a summary of my conclusions and  
7 recommendations. In Section III, I then address the self-managed utility  
8 concept and GF's suitability as a fair regulatory partner. In Section IV, I  
9 address the impacts of the proposed actions on Vermont's energy policy.  
10 In Sections V through VIII, I address GHG emissions, the impact on  
11 ratepayers, and the impact on Vermont's economic vitality, respectively.

12 **Q9. Are you sponsoring any exhibits to your testimony?**

13 **A9.** Yes. I am sponsoring 7 exhibits:

- 14 1. Exhibit CLF-ASH-1 is my resume.
  - 15 2. Exhibit CLF-ASH-2 is testimony supplied by Paul Zabriskie to the  
16 Vermont Legislature regarding home weatherization assistance, which  
17 includes a document provided by the Vermont Department of Health  
18 entitled "Weatherization + Health in Vermont."
  - 19 3. Exhibit CLF-ASH-3 contains three webpages from the U.S.  
20 Environmental Protection Agency (EPA) regarding GHG emissions  
21 from GF's New York and Vermont facilities.
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- 1                   4. Exhibit CLF-ASH-4 is a March 4, 2021, article from AnandTech  
2                   entitled “GlobalFoundries to Invest \$1.4 B in Expansion, Potential  
3                   Earlier IPO.”
- 4                   5. Exhibit CLF-ASH-5 is an April 2, 2021, article from CNBC entitled  
5                   “CEO of largest U.S. chip foundry explains why semiconductor  
6                   shortage could last through 2022.”
- 7                   6. Exhibit CLF-ASH-6 is an April 9, 2021, article from Tom’s Hardware  
8                   entitled “GlobalFoundries Owner Eyes \$20 Billion Valuation for  
9                   IPO.”
- 10                  7. Exhibit CLF-ASH-7 is a May 27, 2021, article from Data Center  
11                  Dynamics entitled “GlobalFoundries turns to Morgan Stanley for IPO,  
12                  could value chip company at \$30bn.”

13           **II.           SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS**

14           **Q10.       Please summarize your primary conclusions.**

15           **A10.       My primary conclusions are summarized as follows:**

- 16           1. If the Commission has the authority to grant GF and GMP’s petitions  
17           and determines that the proposed actions meet the applicable statutory  
18           criteria, the proposed actions by GF and GMP would negatively  
19           impact Vermont’s environmental soundness and sustainability by  
20           reducing the amount of renewable energy and energy transformation  
21           required under the Renewable Energy Standard (RES).
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- 1                   2. The proposed actions would harm low-income Vermonters whose  
2                   access to weatherization services would be reduced, while also  
3                   reducing the ability of the Public Utility Commission and Public  
4                   Service Department to complete their missions.
  
  - 5                   3. Vermont's GHG emissions would likely increase by more than  
6                   110,000 metric tons per year in 2027 and further increase to more than  
7                   130,000 metric tons per year in 2032 and after, relative to a case where  
8                   GF remains a GMP customer or otherwise complies with the RES. At  
9                   a social cost of emissions equal to \$100 per ton of CO<sub>2</sub>, aligned with  
10                  the value used in Vermont's energy efficiency cost-effectiveness  
11                  screening, this implies a social cost of \$11 million in 2027 rising to  
12                  \$13 million per year in 2032 and after.
  
  - 13                  4. The negative financial impact of the proposed actions on GMP  
14                  ratepayers would be substantially larger than projected by GMP.
  
  - 15                  5. GF's argument that the proposed actions are required to maintain the  
16                  state's economic vitality is overstated. GF is a smaller contributor to  
17                  the state's economy than is implied by GF witness Dr. Woolf. In  
18                  addition, GF's industry is in a state of rapid growth that would make it  
19                  unlikely that GF would close an operating facility.
  
  - 20                  6. The proposed actions would harm economic vitality by reducing the  
21                  amount of distributed generation that Vermont would host.
  
  - 22                  7. GF has not convincingly shown that it would not be a retail electric  
23                  utility if it were granted its own service territory.
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1                   8. GF has not met its burden to show that its self-managed utility petition  
2                   would be in the general good of the state for at least two reasons. First,  
3                   the proposed petition would harm state energy policy. Second, in this  
4                   proceeding GF has not shown the forthright and transparent behavior  
5                   expected of a regulated utility as a fair partner.

6                   **Q11. Please summarize your primary recommendations.**

7                   **A11.** First, if the Commission has the authority to establish an SMU, I  
8                   recommend that the Commission find that GF has not met its burden to  
9                   show that its self-managed utility petition would be in the general good of  
10                  the state or that GF should be exempt from the statutes that establish  
11                  requirements on retail electric utilities.

12                  In the event that the Commission has the authority and decides that GF  
13                  meets statutory criteria, I recommend that the Commission require that GF  
14                  take a series of actions to maintain benefits to low-income Vermonters,  
15                  state agencies, the state’s environmental soundness and sustainability, and  
16                  the state’s distributed generation policies, in order for the proposed actions  
17                  to be consistent with state energy policy and the general good of the state:

- 18                  1. GF should be required to contribute to low-income weatherization  
19                  programs and to Vermont’s regulatory agencies, to at least the degree  
20                  that it would have if it had remained a GMP customer.
- 21                  2. GF should be required to mitigate GHG emissions, through its own or  
22                  GMP’s programs, to at least the degree that it would have through Tier  
23                  1 and Tier 3 of the RES if it had remained a GMP customer.
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1                   3. GF should be required to procure or produce an amount of Tier 2-  
2                   eligible renewable energy credits (REC) equivalent to the RES  
3                   requirements for its load. GF should also be required to comply with  
4                   future state laws and regulations pertaining to GHG emissions  
5                   reductions and renewable and clean energy.

6                   I further recommend that GMP and the Commission make explicit how the  
7                   proposed Transition Fee and power purchase agreement (PPA) will be treated in  
8                   future rate proceedings to ensure that the benefits of these funds flow to GMP  
9                   ratepayers rather than GMP shareholders.

10               **III.           THE SELF-MANAGED UTILITY CONCEPT**

11               **Q12.           GF has proposed that it would house a self-managed utility (SMU) in**  
12               **one of its corporate divisions. What is an SMU?**

13               **A12.**        I am not aware of any statutory definition of this term or concept in  
14               Vermont law. GF appears to define the term as a corporate division inside  
15               GF that would serve only GF’s own distribution network and supply only  
16               GF’s own load through the region’s wholesale power market. (GF  
17               Petition, paragraphs 5 and 25)

18               **Q13.           If its petition were granted, would GF meet that definition of SMU?**

19               **A13.**        No, I do not believe it would. GF would supply load to businesses other  
20               than itself, namely the tenant businesses within the Essex facility.  
21               Therefore, it would not “supply only its own load.” (GF Petition,  
22               paragraph 5)

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1       **Q14.       Does GF engage in the retail sale of electricity to its tenants?**

2       **A14.**       GF claims it does not. If it did, it may be in violation of the law, because  
3       GMP has an exclusive franchise to serve that territory as a retail utility.

4       **Q15.       How would GF’s relationship with its tenants be any different from**  
5       **any other Vermont landlord’s relationship with tenants who are not**  
6       **separately metered and billed by the local utility?**

7       **A15.**       Today, GF is no different. However, if GF becomes a utility, the  
8       relationship changes. I’m not aware of any other Vermont business that  
9       has an electric utility as its landlord. (And if there were such a tenant, the  
10      electric utility could clearly meter and bill it, because all relevant Vermont  
11      utilities are retail utilities.)

12      **Q16.       Do you believe that, if GF becomes an SMU, GF’s power supply to its**  
13      **tenants should be considered to be a retail sale in the same sense that**  
14      **Vermont’s existing electric distribution utilities engage in such sales to**  
15      **their customers?**

16      **A16.**       Yes, I do. To reach this conclusion I have considered two cases:

17      First, I considered the case of ASK-IntTag, LLC. According to  
18      A.CLF.GF.2(e), ASK-IntTag’s electric consumption is monitored and its  
19      lease payments are adjusted based on its electric consumption. A financial  
20      transaction between a utility and another business in which the charges by  
21      the utility vary based on the other firm’s electric consumption is  
22      financially and functionally equivalent to a retail electric sale by the  
23      utility. Full evaluation of this relationship would require details of the  
24      arrangement between GF and ASK-IntTag, which GF withheld when it  
25      was requested.

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1 Second, I considered the question of claims regarding the environmental  
2 impact and sourcing of power supply. Today, any firm served by GMP can  
3 make environmental claims related to the power supply and renewable  
4 energy credits retired by GMP. Even tenants of a landlord who pays the  
5 electric bills, such as Marvell as a GF tenant, can make such claims,  
6 because it is clear what their power supply is and what their relationship to  
7 the utility is. In the event that GF becomes an SMU, it is unclear what  
8 claims GF tenants could make about their power supply. If these firms are  
9 not retail customers of GF, they would have no rights to information about  
10 its power supply. For example, GF could acquire renewable energy for its  
11 own purposes (to “serve its own load” as an SMU) and not allow its  
12 tenants to make equivalent claims, and GF’s tenants would have no  
13 recourse to the Public Utility Commission. These firms would benefit  
14 from the branding and public perception of Vermont associated with the  
15 RES but would be unable to support claims that they are served by the  
16 legally required amounts of renewable energy. These challenges and  
17 uncertainty are resolved if it is simply recognized that these firms are, in  
18 fact, retail customers of GF as a utility.

19 **IV. REGULATORY BEHAVIOR OF VERMONT UTILITIES**

20 **Q17. Does Vermont practice and precedent provide guidance regarding**  
21 **expected regulatory behavior from entities regulated by the Public**  
22 **Utility Commission?**

23 **A17.** Yes. In particular, the Commission often looks to several criteria when  
24 evaluating the “general good” standard under 30 VSA § 231. One of those  
25 criteria is business reputation—which is often stated as whether the owner,  
26 manager or operator will be a “fair partner” for Vermont. In my  
27 experience, behavior related to the regulatory process is a key component

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1 of the consideration regarding whether a firm seeking a Certificate of  
2 Public Good (CPG) is a “fair partner.”

3 **Q18. Is the regulatory behavior expected of a utility different from that of a**  
4 **customer?**

5 **A18.** Yes. Customers do not require a CPG under 30 V.S.A. § 231. When  
6 customers are parties to proceedings, as GF has been in the past, they are  
7 granted party status in order to represent their own interest, rather than the  
8 interest of the general good of the state. Utilities are affected with the  
9 public interest, and have a relationship with the regulatory process of  
10 indefinite length and repeat engagement. For companies with a CPG,  
11 including utilities, fair engagement with the regulatory process thereby  
12 requires a level of forthrightness and transparency beyond that expected of  
13 a customer. As the Commission stated in its final order of March 28, 2014,  
14 in Docket 7862, “Companies authorized to conduct business within the  
15 State are expected to comply with regulatory requirements, meet any  
16 commitments they make to the Board, the Department and other entities,  
17 and present accurate information.” (citation omitted)

18 **Q19. Should a “self-managed” utility also be held to the same standard for**  
19 **regulatory behavior as any other Vermont utility?**

20 **A19.** Yes.

21 **Q20. Has GF shown itself to be a fair partner for the Commission and**  
22 **other parties in this proceeding?**

23 **A20.** No. Being a fair partner requires that a utility be forthright and transparent  
24 in filings and responses to data requests by both state agencies and other  
25 parties so that the Commission and public can accurately assess whether a

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1 CPG is in fact in the general good of the state. GF has thus far chosen not  
2 to be forthright and transparent in this proceeding.

3 1. GF's petition did not provide critical information, such as the specific  
4 statutes that GF proposes to be subject to as an SMU, thereby  
5 requiring the Commission and other parties to issue data requests to  
6 complete the foundational record in this proceeding.

7 2. GF rents space in its Essex facility to ASK-IntTag LLC, New England  
8 Federal Credit Union, Garnet EMS, Marvell, and IBM but has  
9 withheld requested information about how much electricity those  
10 companies use or how they will acquire and pay for their electricity if  
11 the Commission grants GF's petition. See Interrogatory A.CLF.GF.2  
12 & Document Request A.CLF.GF.16.

13 3. GF chose to withhold documents substantiating why it is choosing to  
14 house the SMU in a division of GF rather than creating a new entity.  
15 Such information would provide clarity regarding whether the transfer  
16 of energy from one entity (i.e., the SMU) to another entity (i.e., GF)  
17 would constitute a "retail" transaction that would undermine GF's  
18 desire to be exempt from "retail utility" regulations. See Document  
19 Request A.CLF.GF.3(a) and (b).

20 4. GF withheld information about its operational costs and related topics  
21 from Interrogatory A.CLF.GF.12, which would have allowed the  
22 Commission to put GF's electricity costs in their full and appropriate  
23 context.

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- 1                   5. GF withheld information about economic value added by the Essex  
2                   facility, which is important to assessing the economic aspects of 30  
3                   V.S.A. § 202a. See Interrogatory A.CLF.GF.13.
- 4                   6. GF withheld significant information about the products produced at  
5                   the Essex Facility, including its costs and associated considerations per  
6                   node, which would illuminate whether information provided to the  
7                   Department of Public Service in response to discovery is in fact  
8                   relevant to the Essex facility. See Interrogatory A.CLF.GF.21.
- 9                   7. GF did not answer the Department of Public Service’s question  
10                  regarding “whether the capacity utilization of GF’s Vermont facility  
11                  has increased or decreased over the past five years.” See  
12                  A.PSD.GF.19(c). GF’s answer discusses demand for products in  
13                  general, but not the capacity utilization of the Essex facility.
- 14                 8. GF did not provide information about the pollutants produced or  
15                 emitted from its Essex facility, in the context of GF’s global  
16                 operations. This information is needed to assess how the Essex facility  
17                 compares with its peers and whether GF is producing greater relative  
18                 pollution in Vermont than in other jurisdictions. See Interrogatory  
19                 A.CLF.GF.15.
- 20                 9. GF did not provide the electric “emissions factor” used or show how it  
21                 calculates Scope 2 emissions at the Essex facility. See Interrogatory  
22                 A.CLF.GF.16(b). GF also did not fully answer the Department of  
23                 Public Service’s question regarding how its Scope 2 emissions are  
24                 calculated. See A.PSD.GF.14.
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1 10. GF did not provide GHG emissions data for the Malta and East  
2 Fishkill facilities, which may provide insight into where GF will  
3 choose to source its energy from and its corresponding Scope 2  
4 emissions for the Essex facility. See Interrogatory A.CLF.GF.17. GF  
5 also did not produce documents describing where the New York  
6 facilities source their energy. See Document Request A.CLF.GF.8.

7 11. GF did not produce any documents substantiating that it actually does  
8 plan to cease investments in the Essex facility or abandon the Essex  
9 facility if the Petition is denied (a prominent claim in its Petition).  
10 See Document Request A.CLF.GF.9.

11 **V. IMPACT OF THE PROPOSED ACTIONS ON VERMONT'S**  
12 **ENERGY POLICY**

13 **Q21. What is Vermont's energy policy?**

14 **A21.** Vermont's energy policy is codified in section 202a of Title 30. The  
15 policy sets objectives of adequate, reliable, secure, and sustainable energy;  
16 emphasizes affordability and economic vitality, the efficient use of energy  
17 resources, and cost-effective demand-side management; and states the  
18 supplies should be environmentally sound. Section 202a also emphasizes  
19 that Vermont's energy service needs be in accordance with the principles  
20 of GHG emission reductions, and requires that those needs be met in a  
21 manner that will achieve the GHG reduction requirements statutorily  
22 mandated in 10 V.S.A. section 578. The required GHG reductions are:

- 23 • 26 percent below 2005 levels by 2025  
24 • 40 percent below 1990 levels by 2030  
25 • 80 percent below 1990 levels by 2050
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1 This policy has been implemented throughout Title 30, including in  
2 Chapter 89, where the legislature has established a number of renewable  
3 energy programs. Most particularly, the RES requires that Vermont's  
4 electric supply be comprised of an increasing portion of renewable  
5 resources, including a portion from within Vermont, and that electric  
6 utilities take actions to reduce the use of fossil fuels in the state. Together,  
7 the RES provisions advance the state policy objectives of sustainability,  
8 affordability and economic vitality, efficient use of energy, and  
9 environmental soundness. The RES is one of the primary provisions that  
10 reduces emissions toward the levels required by 10 V.S.A. section 578.  
11 Beginning in 2017, the Vermont RES required utilities to procure  
12 renewable energy and execute energy transformation projects.  
13 Specifically, they must:

- 14 • meet 59 percent of sales with renewable energy by 2020, increasing by  
15 4 percent every 3 years to 75 percent by 2032;
- 16 • meet 2.8 percent of sales with distributed generation in 2020,  
17 increasing by 0.6 percent every year to 10 percent by 2032; and
- 18 • meet 4 percent of sales with energy transformation projects in 2020,  
19 increasing by two-thirds of a percent each year to 12 percent by 2032.<sup>1</sup>

20 **Q22. Why does Vermont's energy policy matter in this case?**

21 **A22.** GF has requested that the Commission rule that its petition under 30  
22 V.S.A. § 231 is in the general good of the state. Actions that would be  
23 contrary to state energy policy would not be in the general good of the  
24 state.

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<sup>1</sup> 30 V.S.A. § 8002-8005.

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1       **Q23.       Does Vermont’s energy policy apply to just a portion of the electricity**  
2       **used in the state?**

3       **A23.**       No. There is no discussion in Vermont law of limiting the general precepts  
4       of Vermont’s energy policy to be pursued only through a portion of the  
5       electric use in the state. Therefore, no portion of the state, or portion if its  
6       energy use—such as the GF Essex facility and its electric consumption—  
7       should be exempt or relieved from supporting that policy.

8       **Q24.       How would GF and GMP’s proposals in this case impact Vermont’s**  
9       **energy policy?**

10       **A24.**       GF has expressed concern that its contribution to the state’s economic  
11       vitality is endangered by its current and expected electric costs. The  
12       Commission is being asked to weigh that alleged impact against the  
13       impacts of GF’s proposal on other aspects of the state’s energy policy. The  
14       primary way in which GF’s proposal, if granted, would impact the  
15       sustainability and environmental soundness objectives of state energy  
16       policy would be through reduced RES obligations on GMP, combined  
17       with GF’s freedom to purchase electricity from high emissions sources  
18       once the PPA with GMP is over. The PPA between GMP and GF would  
19       continue the RES impacts for GF’s load, in effect, for four years.  
20       However, after 2026 the renewable energy and fossil fuel reduction sought  
21       under the RES would end. GMP sales associated with the GF account total  
22       8 percent of the state’s total electricity consumption,<sup>2</sup> so the benefits from  
23       the RES would be reduced by about 8 percent after 2026. While GF could,  
24       in theory, procure renewable electricity, it would not be required to  
25       comply with the RES as a “self-managed utility” under its current

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<sup>2</sup> Petition of GLOBALFOUNDRIES U.S. 2 LLC for a Certificate of Public Good Pursuant to 30 V.S.A. §  
231 to Operate a Self-Managed Utility, paragraph 4, page 2.

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1           proposal. Purchasing and retiring RECs would increase GF’s electricity  
2           costs (which the company has shown no interest in). GF has offered no  
3           assurance that it would purchase anything other than the least-cost  
4           electricity available.

5           **Q25.       Where GF procures its own electricity in New York, does it procure**  
6           **more renewable electricity than it is required to by law?**

7           **A25.**       GF states that its electricity supplier complies with New York’s renewable  
8           energy policies (Admission A.CLF.GF.1), but declined to provide any  
9           information to identify or describe the sources of power that the Malta and  
10          East Fishkill facilities use (Document Request A.CLF.GF.8). Therefore,  
11          the limited evidence available in this proceeding indicates that GF likely  
12          does not procure more renewable electricity than required by law for its  
13          New York facilities.

14          **Q26.       Would the proposed actions impact Vermont’s Fuel Tax to support**  
15          **low-income weatherization?**

16          **A26.**       GMP currently pays 0.5 percent of the value of its retail sales in Fuel Tax  
17          to support low-income weatherization programs. At the current rates, if  
18          GF ceased being a retail customer, GMP would pay \$180,500 less in Fuel  
19          Tax per year (0.5 percent of \$36.1 million). This would reduce the number  
20          of low-income Vermont homes weatherized each year by about 21.<sup>3</sup>  
21          According to the Vermont Department of Health, the health and economic  
22          benefit from low-income weatherization is nearly three times greater than  
23          the cost, when measured over 10 years (Exhibit CLF-ASH-2), so the GF  
24          self-managed utility would reduce economic and health benefits from  
25          weatherization by more than \$5 million over a decade. Vermont missed its

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<sup>3</sup> The average cost per home weatherized is \$8,500; see Exhibit CLF-ASH-2.

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1 statutory objective under 10 V.S.A. § 581 to weatherize 80,000 homes by  
2 2020 (Exhibit CLF-ASH-2). Reducing funds for weatherization would be  
3 contrary to state policy and unfairly increase the burden on low-income  
4 Vermonters. As a condition of any approval that the Commission may  
5 grant, GF should contribute to the weatherization program an amount  
6 comparable to the Fuel Tax it would have otherwise paid as a GMP  
7 customer.

8 **Q27. Would the proposed actions impact the ability of Vermont’s**  
9 **regulatory agencies to complete their missions?**

10 **A27.** Yes. GF proposes to negotiate a lower payment in lieu of the gross  
11 receipts tax that funds those important agencies, rather than simply paying  
12 an amount equivalent to its current contributions. Those agencies complete  
13 important work in the public interest that is not necessarily in proportion  
14 to the amount contributed by different utilities. Reducing funding for these  
15 shared services to Vermonters would harm these agencies’ ability to  
16 complete their missions.

17 **VI. IMPACT OF THE PROPOSED ACTIONS ON GLOBAL CLIMATE**  
18 **CHANGE AND VERMONT’S GLOBAL WARMING**  
19 **REQUIREMENTS**

20 **Q28. What would be the impact of the GF and GMP proposals on**  
21 **emissions of greenhouse gases?**

22 **A28.** Emissions would most likely increase after the end of the four-year  
23 transitional PPA with GMP. In its petition, GF states that its “power  
24 supply portfolio will maintain the characteristics of the GMP portfolio as a  
25 whole, including GMP’s compliance with Vermont’s Renewable Energy

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1 Standard” during the PPA period, but GF does not make a similar  
2 commitment for the time following the PPA period.

3 **Q29. Why would electricity-related GHG emissions likely increase**  
4 **following the transitional PPA period?**

5 **A29.** After the transitional PPA period, GF argues that it would operate as a  
6 self-managed utility and not be a retail provider of electricity. GF argues  
7 that it would not be statutorily required to procure sufficient RECs to meet  
8 the state’s goals because Vermont’s RES only applies to “retail” electricity  
9 providers.<sup>4</sup> If approved as proposed, GF could procure entirely fossil  
10 electricity to meet its load, thereby increasing Vermont’s emissions.  
11 Purchasing and retiring any RECs beyond what is strictly required would  
12 be contrary to GF’s focus on the lowest cost power supply, and would also  
13 be contrary to the limited evidence provided regarding GF’s electricity  
14 purchasing behavior in New York.

15 **Q30. By how much could Vermont’s emissions increase if GF has no**  
16 **obligations under the RES?**

17 **A30.** According to Vermont’s current GHG inventory methods, the RES lowers  
18 Vermont’s emissions through two mechanisms: Tier 1 and Tier 3. Retiring  
19 Tier 1 RECs lowers emissions by allowing Vermont to verify that  
20 electricity serving Vermont’s load came from renewable sources, as  
21 defined by Vermont law. Electricity not attributed to a particular source  
22 (i.e., not associated with a REC) is assigned the environmental attributes,  
23 including emissions, of the regional “residual mix” of fossil generation  
24 and other sources. In 2019, this value was 723 pounds of CO<sub>2</sub>/MWh.<sup>5</sup> Tier

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<sup>4</sup> 30 V.S.A. § 8004.

<sup>5</sup> NEPOOL GIS Residual Emissions Report. Q1 2019 to Q4 2019.

<https://www1.nepoolgis.com/myModule/rpt/ssrs.asp?rn=111&r=%2FPROD%2FNEPOOLGIS%2FPubli>

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1           3 RECs lower emissions by reducing the use of fossil fuels through energy  
2           transformation projects, such as heat pumps, weatherization, electric  
3           vehicles, or other energy efficiency measures. If GF's load is removed  
4           from the load used to calculate GMP's Tier 1 and Tier 3 REC  
5           obligations, and GF has no equivalent obligation, then emissions could  
6           increase following the PPA period.

7           If we assume that GF has a continued load of about 400,000 MWh per  
8           year (as assumed by GMP in developing Exhibit GMP-SRA-2), then the  
9           cumulative reduction in the number of RECs required under Tier 1  
10          between now and 2032 would be about 1.8 million MWh. (If GF's load  
11          increased, this number would also increase.) As shown in Figure 1, if  
12          GMP's load falls with GF's departure to be an SMU, GMP would not  
13          have to increase the number of RECs it retires under Tier 1 between 2027  
14          and 2031, with only a marginal further increase in renewable energy in  
15          2032. If GF were served by the regional residual mix from 2019 (as the  
16          best available full-year proxy for the residual mix for GF load in later  
17          years), then state emissions would increase by a total of 88,000 metric tons  
18          in 2027, rising to almost 100,000 metric tons in 2032 and each year after.  
19          At a social value of \$100 per ton of CO<sub>2</sub>, as used in Vermont's energy  
20          efficiency cost-effectiveness screening, the cost imposed by these  
21          emissions would be \$8.8 million in 2027, rising each year to almost \$10  
22          million in 2032 and each year beyond.

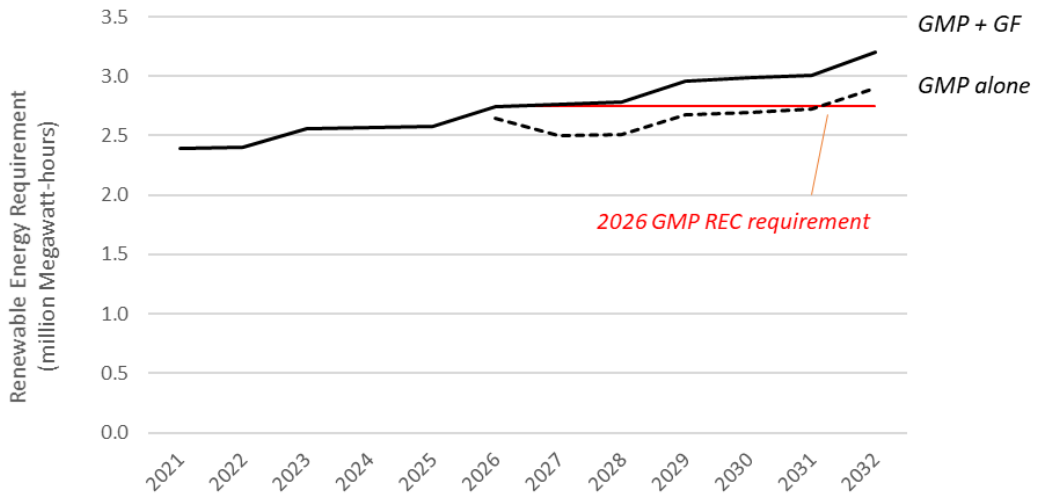
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c%2FNEPOOL\_Residual\_Mix&apxReportTitle=NEPOOL%20Residual%20Mix. I used 2019 data because RECs can continue to change ownership for some months after the end of a calendar year, before final assignments of attribute ownership can be made. This means that 2020 data may not yet be fixed. The 2020 value as of June 25, 2021 is 736 pounds per MWh, so the change from using this data would be minor.

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Figure 1. Tier 1 REC requirements for GMP with and without GF



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Between October 1, 2026, and the end of 2032, GMP’s Tier 3 requirements would be reduced by about 256,000 MWh-equivalents (assuming GF’s load stays flat at 400,000 MWh per year). This corresponds to a total CO<sub>2</sub> emission increase of almost 166,000 metric tons by the end of 2032, beginning with 22,450 metric tons in 2027 and rising to more than 31,000 metric tons in 2032 and each year after. The social cost imposed by these emissions would exceed \$3 million per year by 2032, and each year after.

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Assuming Vermont meets its requirement to reduce CO<sub>2</sub> emissions to 5.19 million metric tons per year by 2030,<sup>6</sup> the increase in emissions if GF’s load were to be exempted from the RES (due to both Tier 1 and Tier 3 REC impacts) would be equivalent to 2.3 percent of the state’s emissions in 2030. To meet the requirements of the Vermont Global Warming

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<sup>6</sup> Vermont Department of Environmental Conservation, 2021 Vermont Greenhouse Gas Emissions Inventory and Forecast: 1990 – 2017, Prepared by the Air Quality and Climate Division. [https://dec.vermont.gov/sites/dec/files/aqc/climate-change/documents/\\_Vermont\\_Greenhouse\\_Gas\\_Emissions\\_Inventory\\_Update\\_1990-2017\\_Final.pdf](https://dec.vermont.gov/sites/dec/files/aqc/climate-change/documents/_Vermont_Greenhouse_Gas_Emissions_Inventory_Update_1990-2017_Final.pdf), page 8.

1 Solutions Act (GWSA), Vermonters would have to take substantial  
2 additional other actions in order to compensate for GF’s lower  
3 contributions.

4 **Q31. Green Mountain Power has stated its intention to eliminate carbon**  
5 **emissions from its power supply by 2030. What impact does this**  
6 **commitment have on your calculation of the electric sector GHG**  
7 **impacts of GF leaving GMP’s service?**

8 **A31.** My calculation compares the emissions if GMP complies with the RES  
9 but does not exceed its obligations. GMP states in A.CLF.GMP.1.8 that it  
10 has “its own goal to achieve 100% renewable energy by 2030 and is  
11 presently on a course to exceed existing Tier 1 obligations.” In the event  
12 that GMP would have surpassed the requirements of the RES between  
13 2026 and 2032 for the power supplied to GF, the emissions increase from  
14 GF being served instead by fossil fuel power sources would be even  
15 greater than I have estimated.

16 **Q32. GF states that it would file a plan in 2026 for its procurement of**  
17 **renewable energy. Why is that insufficient to assure the Commission**  
18 **that GHGs would not increase?**

19 **A32.** GF’s only obligation, as proposed, would be to file a plan. The plan could  
20 state “GF will procure only fossil fuel energy, with no RECs” and GF  
21 would be in compliance with its proposed condition. The Commission and  
22 stakeholders would have no recourse to revoke GF’s CPG as a self-  
23 managed utility due to the insufficiency of the plan, or even to require a  
24 more substantive or consistent plan. This stands in contrast to the legally  
25 binding nature of the GWSA, in which failure of the state to meet its  
26 objectives could be met with citizen legal action.

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1           **Q33.       What about non-electric emissions? Does GF’s plan address them?**

2           **A33.**       GF does not discuss how its non-electric emissions may increase or  
3                       decrease over time. GF commits to eventually file its future plans for  
4                       GHG reduction measures, but makes no commitments about the extent of  
5                       non-electric GHG emissions, which together amounted to more than 97  
6                       percent of the facility’s emissions in 2020 (see A.PSD.GF.14).

7           **Q34.       Will GF have to take substantial actions outside of its electric supply**  
8                       **in order to mitigate its GHG emissions consistent with the Global**  
9                       **Warming Solutions Act?**

10          **A34.**       The GWSA requires that Vermont’s GHG emissions fall to 1.73 million  
11                       metric tons per year, or less, by 2050, and any remaining emissions must  
12                       be fully offset to reach net zero. While it would be possible for GF’s  
13                       emissions to fit entirely within the remaining allowed emissions in 2050,  
14                       state decarbonization strategies generally seek to include in the 20 percent  
15                       of emissions remaining in 2050, that would be eligible to be “netted” out,  
16                       emissions from those sources for which straightforward emission  
17                       reduction strategies do not exist. As GF’s New York facilities  
18                       demonstrate, substantial reductions are possible relative to the current  
19                       level of emissions of the Essex facility. Therefore, GF should not plan that  
20                       its emissions will fit into that 20 percent, and GF should therefore be  
21                       planning to reduce or eliminate its on-site emissions.

22                       In 2019, nearly 83 percent of GF’s Essex Facility on-site emissions came  
23                       from semiconductor manufacturing, primarily for “Chemical Vapor  
24                       Deposition (CVD) chamber cleans, etch processes, and heat transfer  
25                       fluids” (Exhibit CFL-ASH-3 and Interrogatory A.CLF.GF.7). The  
26                       remaining on-site emissions came from stationary combustion of fuel oil,  
27                       natural gas, and propane.

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1           **Q35.       Is GF capable of reducing its process emissions?**

2           **A35.**       Yes. In fact, the Vermont GF facility is an outlier among GF’s facilities.  
3                   GF’s New York facilities have substantially lower process emissions than  
4                   its Vermont facility (see Exhibit CLF-ASH-3). The New York facilities  
5                   use low-emission gases in Chemical Vapor Deposition chamber cleaning  
6                   coupled with near-universal use of point-of-use abatement equipment for  
7                   perfluorinated compound-using processes to reduce losses of these  
8                   chemicals. In response to discovery on whether these technologies could  
9                   be deployed in Vermont, GF said “These are, generally, the process  
10                  emission reduction opportunities available at the Vermont facility.  
11                  GlobalFoundries has already begun to implement these options at the  
12                  facility, and it is exploring the feasibility of further implementation. ‘Near  
13                  universal point-of-use abatement equipment’ is not feasible for a facility  
14                  not originally designed for it; it is only potentially feasible for select  
15                  equipment.” (See Interrogatory A.CLF.GF.18). Under GF’s proposal, it  
16                  would not be required to make any such implementations and would have  
17                  the discretion to choose not to do so.

18           **Q36.       Does GF account for its emissions in a way that is consistent with the**  
19           **state GHG inventory?**

20           **A36.**       GF has not provided the requested information required to verify that its  
21                   accounting for electric sector emissions is consistent with the state GHG  
22                   inventory. GF’s accounting of its process chemical emissions is consistent  
23                   with the Vermont GHG Inventory.

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1       **Q37.       What would the reductions in GMP’s Tier 1 and Tier 3 actions**  
2       **resulting from the proposed SMU separation mean for the rest of**  
3       **Vermonters?**

4       **A37.**       Emissions reductions are required by the GWSA, so Vermonters will  
5       ultimately bear the cost to produce the reductions. If GF stayed a GMP  
6       customer, then GF would have paid for some of these reductions under  
7       Tier 1 and Tier 3 of the RES. But under GF’s proposal, Vermonters will  
8       have to pay, through some means, for the emission reductions that GF  
9       would have otherwise helped to achieve. For example, at GMP’s current  
10      average cost for Tier 3 credits of \$26 per MWh-equivalent,<sup>7</sup> replacing the  
11      lost Tier 3 reduction from GF’s load with additional fossil fuel use  
12      reduction would cost Vermonters an additional \$6.6 million between now  
13      and 2032. While the cost of Tier 1 RECs is uncertain, if they were to cost  
14      an average of \$5 per MWh, replacing the lost Tier 1 renewable energy  
15      would cost Vermonters an additional \$8.8 million between now and 2032.

16      **Q38.       What recommendations do you have for the Commission regarding**  
17      **the impact of GF’s proposal on Vermont’s GHG emissions?**

18      **A38.**       If the Commission has the authority to approve GF’s proposed self-  
19      managed utility concept, and GF meets the statutory criteria, the  
20      Commission should require GF to make Vermonters whole for the lost  
21      emission reductions associated with Tier 1 and Tier 3. For example, GF  
22      could pay for GMP to acquire Tier 3 fossil fuel savings equivalent to what  
23      would have been required had GF stayed as a GMP customer, or GF could  
24      reduce comparable or greater emissions in its Essex facility. The  
25      Commission should require GF to reduce its emissions (or procure  
26      verifiable emission reductions from other Vermont sources), report those

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<sup>7</sup> Green Mountain Power, *GMP 2021 Renewable Energy Standard Tier III Annual Plan, Updated February 1, 2021*, available at <https://epuc.vermont.gov/?q=downloadfile/461711/153224>.

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1 reductions, and be at risk of having its CPG revoked if it fails to meet its  
2 performance requirements.

3 **VII. IMPACT OF THE PROPOSED ACTIONS ON RATEPAYERS**

4 **Q39. How would the proposed action impact GMP ratepayers, financially?**

5 **A39.** GMP ratepayers will pay more because GF will not be contributing to the  
6 shared elements of GMP's cost of service (that is, those cost elements  
7 beyond the wholesale energy, capacity, and transmission costs that would  
8 be reduced by GF's separation from GMP).

9 **Q40. What is the cost of service for GMP to serve GF?**

10 **A40.** GMP's 2018 cost of service study (Attachment RTP.CLF.GMP.12.1)  
11 calculates the cost to serve GF (Rate 70) as about \$39.8 million per year.

12 **Q41. Does GF pay this full cost of service?**

13 **A41.** No. It pays about \$35.4 million per year (see Exhibit GMP-SRA-2).

14 **Q42. Who makes up the difference between GMP's cost to serve GF and**  
15 **the amount that GF pays?**

16 **A42.** GMP's other ratepayers, who pay rates that are about 0.7 percent higher  
17 than they would otherwise be in order to fund GF's subsidy.

18 **Q43. When developing scenarios to share with the Commission, what did**  
19 **GMP assume regarding the subsidy from GMP's other ratepayers?**

20 **A43.** In the only case considered in which GF remained a GMP customer,  
21 Scenario 1, Mr. Anderson assumed that the subsidy would increase  
22 without end, to the point that GF does not even cover its own energy,

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1 transmission, and capacity costs by 2031. This is the scenario to which  
2 Mr. Anderson compared the rate impact of his other scenarios.

3 **Q44. According to Mr. Anderson, what is the difference for non-GF**  
4 **ratepayers between GMP’s Scenario 1 and the SMU case (Scenario**  
5 **3)?**

6 **A44.** The difference is relatively small, ranging from an increase of 0.4 percent  
7 in 2027 to a decrease of 0.25 percent in 2033.

8 **Q45. Is Mr. Anderson’s Scenario 1 the most reasonable case to consider for**  
9 **a case in which GF remains a GMP customer?**

10 **A45.** No. For example, a case in which the subsidy for GF paid by other  
11 ratepayers is kept constant, rather than increasing without end, would be a  
12 more reasonable assumption. In fact, that case is more consistent than  
13 Scenario 1 with Mr. Anderson’s claim that “for purposes of modeling a  
14 likely future scenario for comparison, we assumed that GF would continue  
15 to seek and receive cost adjustments similar in level to what it currently  
16 receives” (Direct Testimony of Scott R. Anderson, page 5, lines 10-12).

17 **Q46. If a constant-subsidy case were taken as the baseline for comparison,**  
18 **what would be the rate impact of the proposal presented in the GMP**  
19 **and GF petitions?**

20 **A46.** If the “Difference in Revenue and Costs” for serving GF remains fixed,  
21 rather than falling due to an increasing subsidy, non-GF ratepayers would  
22 be \$7.9 million per year better off by 2033, so their rate could be 1.2  
23 percent lower than in Mr. Anderson’s Scenario 1. The SMU case  
24 (Scenario 3) would have rates that are about 1 percent higher for non-GF  
25 ratepayers in 2033 than the constant-subsidy case. The worst year for  
26 ratepayers in Scenario 2, in which GF suddenly departs the state at the end

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1 of fiscal year 2022, shows a 1.4 percent rate increase, which is only a  
2 marginally higher rate impact than the worst year for ratepayers in the  
3 SMU case (when compared with the constant-subsidy case), which shows  
4 about a 1 percent rate increase.

5 **Q47. How likely is Scenario 2, in which GF would simply close the facility**  
6 **rather than remain a GMP customer?**

7 **A47.** The Essex facility is unlikely to close in the near term. GF has chosen not  
8 to provide any documentary evidence that it has actually considered  
9 closing, selling, or ceasing investment in the Essex facility. In Document  
10 Request Q.CLF.GF.9, GF was asked to provide any such evidence and it  
11 chose not to do so. Meanwhile, in A.DPS.GF.19, GF states that demand  
12 for products from the Essex facility have grown rapidly and are expected  
13 to continue at a high level. I address further the business and economic  
14 position of the facility later in my testimony.

15 **Q48. Did GMP consider more than the three scenarios presented in Exhibit**  
16 **GMP-SRA-2?**

17 **A48.** Apparently not. When asked for any analysis of scenarios that GMP  
18 developed that were not included in that Exhibit, GMP did not produce  
19 any documents or analysis.

20 **Q49. Should GMP have evaluated more than three scenarios?**

21 **A49.** Yes. As Mr. Anderson states on page 3, lines 14-16 of his Prefiled Direct  
22 Testimony, “[m]any permutations of scenarios were possible where the  
23 timing and magnitude of a GF departure, retail revenue from GF, and  
24 avoidable costs could all vary.” Given the claimed importance of the  
25 future of GF to GMP and the state, GMP should have evaluated more than

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1 the three presented scenarios in order to understand the scale and timing of  
2 risks to its power supply portfolio and ratepayers.

3 **Q50. What are the impacts of GMP's lack of analysis on this proceeding?**

4 **A50.** By choosing to present only three scenarios, and selecting an unrealistic  
5 Scenario 1 for comparison, GMP has not presented a full and complete  
6 assessment of the potential ratepayer impacts associated with the GF and  
7 GMP proposal. Therefore, the Commission and public do not have  
8 sufficient information to judge the costs and risks associated with the  
9 proposal.

10 **Q51. How could the proposed Memorandum of Understanding impact**  
11 **GMP shareholders, financially?**

12 **A51.** GMP's shareholders could see a windfall from the Transition Fee and PPA  
13 payments. The treatment of those funds, from a ratemaking perspective,  
14 depends on how the Commission establishes a rate plan for GMP after the  
15 end of its current multi-year rate plan. GMP's current plan ends near the  
16 time that GF would become a "self-managed utility," and the successor  
17 plan has not been established. In theory, if the Commission were to allow  
18 GMP to realize the payments as an increase in revenue after rates had been  
19 established, GMP's shareholders could retain the payments rather than  
20 passing them through to ratepayers.

21 **Q52. Should GMP shareholders see a windfall from the proposed actions?**

22 **A52.** No. GMP shareholders should earn a fair return on their invested capital.  
23 The proposed actions have little impact on GMP's rate base, because the

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1 proposed asset transfers are on the order of one million dollars<sup>8</sup> out of a  
2 \$1.4 billion rate base, and therefore should have no appreciable effect on  
3 GMP's profits.

4 **Q53. Has GMP proposed to use the transition funds for any purpose other**  
5 **than offsetting rate revenue, such as increased profits?**

6 **A53.** No, it has not. However, it has also not made an explicit commitment to  
7 use the funds for the benefit of non-GF ratepayers in all future rate  
8 proceedings.

9 **Q54. How should GMP or the Commission address this uncertainty?**

10 **A54.** GMP could clarify this uncertainty by explicitly committing to treat the  
11 Transition Fee and any net income from the PPA as offsets to rate  
12 revenue, and forswear any windfall return for its shareholders.  
13 Alternatively, if the Commission has the authority to approve the self-  
14 managed utility approach, and GF meets the statutory criteria, the  
15 Commission has the opportunity to provide this clarity and set formal  
16 expectations for GMP and all stakeholders as to how these funds will be  
17 used. If GF were to make other commitments in this docket, such as  
18 regarding contributions to emission reductions or other aspects of state  
19 energy policy, as I recommend, GMP and the Commission should also be  
20 explicit about how any related funds will be used, and how they will be  
21 treated for ratemaking purposes. The Commission should act to be sure  
22 that any such funds protect ratepayers and advance state energy policy.

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<sup>8</sup> Attachment Q.PUC.GMP.1.5

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1 **VIII. IMPACT OF THE PROPOSED ACTIONS ON VERMONT'S**  
2 **ECONOMIC VITALITY**

3 **Q55. What are the ways in which the proposed actions would impact**  
4 **Vermont's economic vitality?**

5 **A55.** GF claims that the proposed actions are essential for GF's Vermont  
6 facility to remain operational. Therefore, GF implies potential economic  
7 harm from the closure of the plant, depending on the outcome of this  
8 docket. In addition, GF's departure from GMP and resulting reduction in  
9 Tier 2 obligations would impact the pace of distributed generation  
10 deployment in the state, and the associated economic benefits of that  
11 development.

12 **Q56. Can we be sure that the GF facility would close if this petition were**  
13 **not granted?**

14 **A56.** No. First, as I discussed above, GF has failed to provide any evidence that  
15 it has actually considered closing the Essex facility. Semiconductor  
16 fabrication facilities are incredibly valuable and in growing demand. The  
17 federal government is considering a multi-billion-dollar support package  
18 for domestic semiconductor manufacturing, included as more than one-  
19 fifth of the funding in the \$250 billion U.S. Innovation and Competition  
20 Act, which passed the U.S. Senate on June 8, 2021.<sup>9</sup> As evidence of the  
21 strong demand, GF is also considering building an additional  
22 semiconductor fabrication facility in New York (Exhibit CLF-ASH-4).  
23 Continued strong global demand for semiconductors would make an  
24 existing semiconductor fabrication facility, such as the Essex facility with

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<sup>9</sup> See Franck, Thomas, "Senate passes \$250 billion bipartisan tech and manufacturing bill aimed at countering China," CNBC. Accessed at <https://www.cnbc.com/2021/06/08/senate-passes-bipartisan-tech-and-manufacturing-bill-aimed-at-china.html> on June 24, 2021.

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1 its trained and skilled workforce, an attractive business. If GF did decide  
2 in the future to shift its business away from the Vermont facility, prudent  
3 business management would seek to sell the facility rather than simply to  
4 close it. The Commission should evaluate the GF and GMP proposal in  
5 the context of the Essex facility remaining active (whether owned by GF  
6 or not), and not assume that the facility would close absent approval of the  
7 proposal as submitted.

8 **Q57. What portion of the cost of operating the GF facility is electricity?**

9 **A57.** Electricity represents a small cost. Mr. Rieder claims that electricity  
10 represents “nearly fifty percent of the operational cost of the site to  
11 support manufacturing.” This means that “the operational cost of the site  
12 to support manufacturing” must have a total cost of about \$75 million per  
13 year.<sup>10</sup> However, GF refused in response to discovery to provide the  
14 context necessary to understand this category of costs. GF states that the  
15 category includes “labor” and yet states that the wages for all of its  
16 employees approach \$200 million per year (which is much greater than  
17 \$75 million, and therefore only a portion of “labor” costs must be included  
18 in the “operational cost of the site to support manufacturing”). GF further  
19 refused to provide information regarding the facilities’ total costs, the  
20 value of its inputs, or its value added. As a result, neither I nor the  
21 Commission can assess what portion of the total costs of the Vermont GF  
22 facility are actually represented by electricity, aside from knowing that the  
23 portion appears to be much smaller than the “half” that Mr. Reider  
24 implies.

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<sup>10</sup> Calculated by slightly more than doubling GF’s electricity cost of \$36 million.

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1       **Q58.       What impact does electricity cost have on the selling price of the**  
2       **Vermont facility’s products?**

3       **A58.**       The impact is small. GF’s annual electricity costs of \$36.1 million should  
4       be placed in the context of the \$1.3 billion in annual product value  
5       produced by the plant in 2019. Electricity costs amount to less than 2.8  
6       percent of the value of products sold.

7       **Q59.       What impact would the proposed actions have on GF’s cost to**  
8       **produce its products?**

9       **A59.**       The cost of energy is small compared to the other dynamics that shape the  
10      semiconductor market in which the GF facility competes, and the relative  
11      cost of different approaches to energy supply is even smaller. The  
12      proposed actions would not reduce GF’s electricity costs to zero. If the  
13      proposed actions saved GF \$6 million per year, GF could reduce the  
14      potential selling price of the plant’s products by less than one-half of one  
15      percent, or GF could increase profits to shareholders if the competitive  
16      supply-demand balance in the semiconductor industry allowed GF not to  
17      lower prices. In the current tight semiconductor market, which has led GF  
18      to accelerate its planned initial public offering and increase its proposed  
19      valuation by 50 percent, or \$10 billion, it is likely that savings would  
20      accrue to shareholders. (See Exhibits CLF-ASH-5, CLF-ASH-6, and CLF-  
21      ASH-7 regarding the semiconductor market and GF’s IPO.) Nonetheless,  
22      these small changes in potential selling price are less than one fiftieth of  
23      GF’s self-reported changes in the average selling price for semiconductor  
24      products of more than 30 percent over 10 years.<sup>11</sup>

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<sup>11</sup> See the figure provided in A.PSD.GF.20. Note that GF has not provided any evidence that the specific selling price trajectory shown in this exhibit reflects the selling prices for products produced at the Vermont or New York facilities.

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1       **Q60.       Did Dr. Woolf overstate the economic role of the GF plant in the**  
2       **Vermont economy?**

3       **A60.**       Yes. Dr. Woolf highlights the portion of Vermont’s international exports  
4       that is reflected in the output of the GF facility. However, this is an  
5       unusual metric to use, and one that risks overstating the share of  
6       Vermont’s economy that the plant represents. First, Dr. Woolf highlights  
7       the total value of the products produced by the facility, not the value added  
8       by the facility.<sup>12</sup> By highlighting \$1.3 billion in international exports out  
9       of a state total of \$3.02 billion, he implies that the facility is a large  
10      portion of the state’s economy. However, because the material inputs and  
11      services to the facility are already quite valuable, \$1.3 billion in plant  
12      output in 2019 reflects less than about \$280 million in value added.  
13      Because GF declined to provide the actual value added by the facility, as  
14      requested, I estimated this value added based on the sum of the plant’s  
15      employees’ compensation (\$270 million in 2019), taxes (\$2.6 million in  
16      property taxes), and profits for GF’s shareholders. Assuming the truth of  
17      the claimed risk that the facility would close without a savings of just a  
18      few million dollars in electricity costs, I must also presume that the profits  
19      are small, so the value added is likely close to the sum of wages and taxes.  
20      Vermont’s 2019 total value added, which is called its gross state product,  
21      was \$34.0 billion.<sup>13</sup> Therefore, the facility only directly produces less than  
22      0.9 percent of the gross state product.

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<sup>12</sup> Value added is equal to the difference between the value of all the inputs to a firm or facility and the value of the products produced, and is generally equal to the sum of wages, taxes, and profits. Output measures only the value of the products produced, so it does not reflect whether the facility has actually added any value through its actions. Gross domestic product is the sum of all value added.

<sup>13</sup> U.S. Bureau of Economic Analysis, Total Gross Domestic Product for Vermont [VTNGSP], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/VTNGSP>, June 21, 2021.

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1       **Q61.     Dr. Woolf states that exports are important because they bring in**  
2       **money that can be used to import goods and services. What imports**  
3       **into Vermont are the \$1.3 billion in exports from the GF facility**  
4       **primarily used to purchase?**

5       **A61.**     The primary goods purchased with the \$1.3 billion in exports are the  
6       inputs to the GF facility. Because the GF facility produces only about  
7       \$280 million of value added, GF’s \$1.3 billion in exports actually renders  
8       only \$280 million that Vermonters can use to purchase imported goods  
9       and services (or, for that matter, goods and services produced in Vermont).

10      **Q62.     Does Dr. Woolf’s logic require international exports?**

11      **A62.**     No. In fact, many of Vermont’s industries export out of the state, even if  
12      they do not export internationally. For example, Vermont’s tourism and  
13      agriculture industry also bring in dollars to Vermont’s economy from  
14      outside the state. It is best to consider GF’s role in the context of  
15      Vermont’s whole economy, where it is less than 1 percent of value added,  
16      rather than give undue weight to GF’s share of the state’s international  
17      exports.

18      **Q63.     Is GF’s beneficial impact to the Vermont economy growing or falling?**

19      **A63.**     The total compensation paid by the Essex facility has been falling steadily  
20      since GF bought the plant, from almost \$285 million in 2016 to \$230  
21      million in 2020. The year-end employment at the GF facility has fallen  
22      from 2,772 in 2015 to 2,214 in 2020. Meanwhile, Vermont’s economy  
23      grew 11 percent from 2015 to 2019 before contracting in 2020 due to the

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1 COVID-19 pandemic.<sup>14</sup> Therefore I conclude that GF’s impact on the  
2 Vermont economy has been falling.

3 **Q64. How much impact on in-state renewable energy development would**  
4 **result from the proposed action?**

5 **A64.** The Tier 2 component of Vermont’s RES is associated with distributed  
6 renewable generation built in the state of Vermont. The Tier 2 component  
7 of GF’s electricity consumption in 2020 corresponded to 11 MW of  
8 distributed solar PV (assuming a 14 percent capacity factor typical of  
9 Vermont rooftop solar installations<sup>15</sup>). By 2032, the Tier 2 portion of GF’s  
10 load would represent nearly 33 MW of distributed solar PV. This means  
11 that if GF is a self-managed utility and exempt from the RES, GMP would  
12 be able to avoid procuring 33 MW of distributed solar to serve its  
13 customers by 2032, and Vermont would not see the economic benefits  
14 associated with that development.

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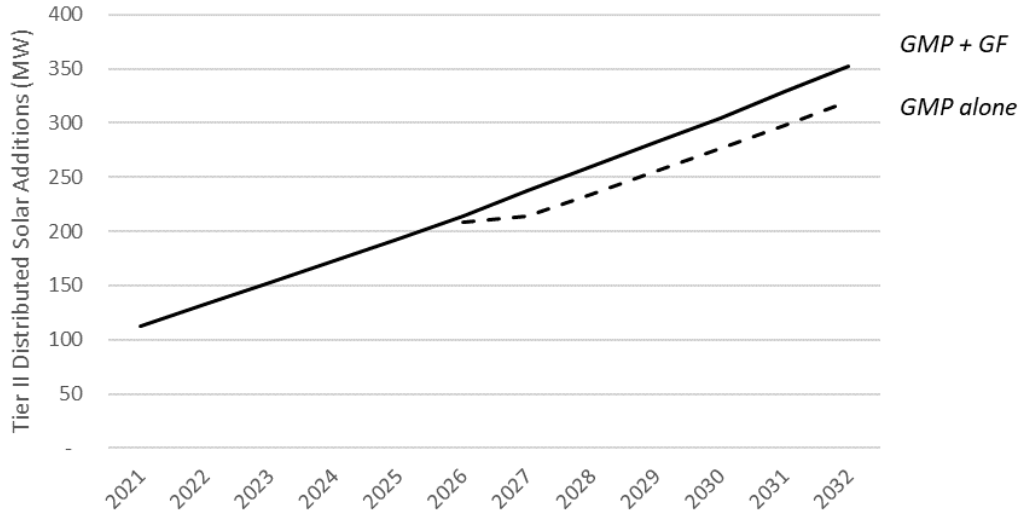
<sup>14</sup> *Ibid.*

<sup>15</sup> Calculated using the PVWatts tool from the National Renewable Energy Laboratory, available at <https://pvwatts.nrel.gov/pvwatts.php>.

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Figure 2. Tier 2 distributed solar development with and without GF as a retail customer of GMP



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3 **Q65. What should the Commission do to maintain Vermont energy policy**  
4 **regarding Tier 2?**

5 **A65.** If the Commission has the authority to approve the self-managed utility  
6 concept, and GF meets the statutory criteria, it should require GF to  
7 procure or produce and annually retire Tier 2 RECs commensurate with  
8 the RES requirements for GF's total wholesale electricity purchases.

9 **Q66. Could GF obtain Tier 2 RECs in a cost-effective manner?**

10 **A66.** Yes. The most cost-effective way to obtain Tier 2 RECs (to be in  
11 compliance with the RES through 2032) is for GF to produce solar PV on-  
12 site (e.g., on its roofs or open space) and use the power for its own  
13 purposes. This would reduce its power procurement needs from the  
14 regional grid, and also lower its capacity bill (presuming that the regional  
15 capacity peak remains in the afternoon, as it has historically been). Under  
16 its current rate structure, GF sees no immediate financial benefit from  
17 shifting load off of the regional summer peak. But as a direct market

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1 participant, its capacity bill would be directly reduced by actions, such as  
2 using PV or batteries, that tend to produce power during the peak. Note  
3 that regional transmission costs are set by monthly peaks that typically  
4 occur after dark; solar PV would require batteries to mitigate that cost.  
5 Investing in solar and batteries as a direct market participant would be in  
6 alignment with GF's focus on the lowest cost power supply, while also  
7 advancing Vermont energy policy.

8 **Q67. Does this conclude your direct testimony?**

9 **A67.** Yes, it does.

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