

**THE STATE OF NEW HAMPSHIRE**  
**BEFORE THE**  
**PUBLIC UTILITIES COMMISISON**  
**DE 19-197**

**Electric and Natural Gas Utilities**

**Development of a Statewide, Multi-use Online Energy Data Platform**

Testimony of Clifton C. Below

On behalf of  
City of Lebanon, NH &  
Local Government Coalition (“LGC”)

August 17, 2020

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**I. Introduction and Qualifications**

1 **Q. Please state your name, business address and position relative to this docket.**

2 A. My name is Clifton C. Below and my personal office address is 1 Court Street, Suite 300,  
3 Lebanon, NH 03766. The City's business address is 51 N. Park St, Lebanon, NH 03766. I am a  
4 Lebanon City Councilor, Assistant Mayor, and Chair of the Lebanon Energy Advisory  
5 Committee created by the Council. I am authorized by the City Manager and Council to  
6 represent the City in this proceeding on a volunteer basis.

7 **Q. Have you previously testified before this Commission?**

8 A. Yes, I provided pre-filed direct and rebuttal testimony and live testimony in DE 16-576  
9 concerning alternative net metering tariffs. I provided pre-filed and live testimony in DE 17-189  
10 concerning Liberty's battery storage and time-of-use rate pilot and I also provided pre-filed  
11 testimony in DE 19-064, Liberty's recent distribution rate case, all on behalf of the City of  
12 Lebanon.

13 **Q. Please describe your relevant experience and expertise regarding electric utilities.**

14 A. A detailed background statement can be found at p.66 of my testimony attachments in  
15 DE 19-067 found under tab 43<sup>1</sup>. I will only highlight a few keys elements of my background  
16 here. During my tenure as a State Representative from 1992-1998 I served on the House  
17 Science, Technology, and Energy Committee where I was heavily involved in energy and  
18 regulatory legislation. As Chair of the Policy Principles, Social and Environmental Issues  
19 Subcommittee of the Retail Wheeling and Restructuring Study Committee in 1995 I facilitated  
20 a consensus building legislative and stakeholder process that resulted in recommended

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<sup>1</sup> [https://www.puc.nh.gov/Regulatory/Docketbk/2019/19-064/TESTIMONY/19-064\\_2019-12-10\\_COL\\_ATT\\_TESTIMONY\\_FILED\\_12-09-19.PDF](https://www.puc.nh.gov/Regulatory/Docketbk/2019/19-064/TESTIMONY/19-064_2019-12-10_COL_ATT_TESTIMONY_FILED_12-09-19.PDF).

1 “Restructuring Policy Principles” that became the core of NH’s Electric Utility Restructuring  
2 statute, RSA 374-F, that was enacted to restructure and guide the future regulation of electric  
3 utilities in NH . In 1998 I was elected to the NH Senate, serving on the energy and utility  
4 policy committees throughout my six-year tenure. From 1997-2004 I served on the Advisory  
5 Council on Energy of the National Conference of State Legislatures (NCSL), including 3 years  
6 as Chair, which advised NCSL staff on emerging energy issues that may need the attention of  
7 state legislatures. I also served on the Energy & Electric Utilities Committee, Assembly on  
8 Federal Issues of NCSL where, as Chair in 2000-2001, I facilitated a consensus based  
9 comprehensive update of NCSL’s National Energy Policy. I testified on behalf of NCSL  
10 before the United States Senate Committee on Energy and Natural Resources on “Electric  
11 Industry Restructuring,” focusing on transmission and jurisdictional issues. I also served as a  
12 member of the National Council on Electricity Policy Steering Committee from 2001-2004,  
13 which was a policy collaborative with NARUC, NGA, and NASEO.

14 In late 2005 I was appointed to serve as a NHPUC Commissioner with my tenure  
15 ending in February 2012. During that time, I served on the FERC-NARUC Smart Grid and  
16 Demand Response Collaborative, 2008-2011, and on the Electric Power Research Institute  
17 (EPRI) Advisory Council, 2009-2011 and its Energy Efficiency/Smart Grid Public Advisory  
18 Group, 2008-2010. I also served in a variety of other capacities, including as a Vice Chair of  
19 NARUC’s Energy Resources and Environment Committee, as a member and Co-Chair of the  
20 NEEP Steering Committee for the Regional Evaluation, Measurement & Verification (EM&V)  
21 Forum, and as President of NECPUC. Through my involvement in NCSL, NARUC,  
22 NECPUC, ISO New England stakeholder processes and particularly with EPRI I was fortunate  
23 to enjoy numerous deep dives into emerging issues in the electric utility industry at the

1 intersection of technology, science, policy, markets, and regulation, including grid  
2 modernization, smart rates, market design, energy efficient technologies, and distributed  
3 energy resource issues.

4 **II. Overview of Testimony**

5 **Q. For whom are you testifying?**

6 A. While I represent the City of Lebanon in this proceeding, Staff recommended and the  
7 Commission ordered in its April 17, 2020 Secretarial Letter granting interventions that the City  
8 Lebanon, Town of Hanover, Kat McGhee, Patricia Martin, and Community Choice Partners,  
9 Inc.(Samuel Golding) consolidate our interventions. We have dubbed ourselves the “Local  
10 Government Coalition” as two of the parties represent NH municipalities and the others are, to  
11 varying degrees, representative of community and local public interests.

12 **Q. Would you describe your participation in this proceeding to date?**

13 A. I actively participated in all or nearly all of the 8 or 9 technical sessions held thus far, as  
14 well as numerous side conversations with various intervenors and utilities. I assisted in  
15 preparing scoping comments filed as tab 27 in the DE 19-197 docket book on behalf of the  
16 City of Lebanon, and in the development of the use cases, also known as stakeholder  
17 requirements. as filed in tab 34. I also assisted with preparing responses to the Joint Utilities  
18 Comments on that document, filed as tab 47.

19 **Q. Would you summarize your testimony?**

20 A. Yes. My testimony puts the testimony of others LGC members and advisors in context  
21 and helps to fill in the blanks on the myriad of issues that need to be addressed in this  
22 proceeding. I would note that almost all the work being done by the LGC in this proceeding is

1 being done on a volunteer basis (in our “spare time”), so we have not been as comprehensive,  
2 thorough, or coordinated as ideally we might be. Our testimony focuses on the following:

- 3 • The needs, vision, and use cases that this data platform should support.
- 4 • The optimal process and methods for developing the data platform, to achieve a high  
5 level of functionality and value for stakeholders and the evolution of the distribution  
6 grid and electricity system generally, while managing costs to a reasonable level.
- 7 • The need for a governance system that gives stakeholders a meaningful voice and place  
8 at the table as the data platform is developed and evolves over time.
- 9 • Some characterization of potential costs and benefits of the energy data platform,  
10 whether a cost/benefit analysis is a requirement of this proceeding, and suggestions for  
11 containing costs.
- 12 • Other issues in RSA 378:51-52 that the Commission needs to consider.

13 The testimony of other witnesses for the Local Government Coalition is summarized as follows.

14 **April Salas**, Sustainability Director for the Town of Hanover, describes Hanover’s  
15 experience in working to obtain community energy data in the past to highlight the costly and  
16 burdensome nature of the current status of electric data access in New Hampshire, and to explain  
17 why Hanover and other municipalities need better and timely access to community level energy data  
18 with an ability to regularly refresh and update the data as a foundational issue to support community  
19 energy and climate goals.

20 **Kat McGhee**, as a longtime software program manager, focuses her testimony on the  
21 insights and approaches she sees as necessary in order to successfully launch the software  
22 aspects of this data platform project. She describes five areas of energy data hub concepts for  
23 software project methodology where the LGC and some other stakeholders seemed to be in

1 general agreement with the joint utilities during pre-testimony discussions. These broad  
2 concepts for software project methodology encompass: 1) use of a logical data model standard,  
3 incorporation of 2) individual utility customer data, and 3) aggregated and anonymized data, 4)  
4 an extensible architecture and 5) use of agile software development methods. She also addresses  
5 issues around statutory requirements and governance.

6 **Samuel Golding of Community Choice Partners** provides context regarding the new  
7 Community Power Aggregation market that will soon launch in New Hampshire, along with  
8 relevant insights regarding how fully restructured markets rely on market frameworks for  
9 governance and operations in practice, such that the Commission may make an informed  
10 decision in this docket, particularly in regard to how best to structure governance of the statewide  
11 data platform to align with electric utility restructuring mandates under RSA 374-F. His analysis  
12 includes an evaluation of the state of the retail electricity market in New Hampshire.

13 **Dr. Amro Farid**, technical advisor to the City of Lebanon and the Local Government  
14 Coalition, testifies that a shared integrated grid is the leading industrial concept for New  
15 Hampshire to achieve its legislative objectives and that such a shared integrated grid cannot be  
16 achieved without a data platform as a foundational element that engages the participation and  
17 communication of grid stakeholders. He identifies the broad and diverse categories of  
18 stakeholders that he expects will use a fully and properly developed platform and summarize the  
19 stakeholder requirements and use cases of the Local Government Coalition. He testifies that  
20 such a data platform, if developed following the best practices of software systems engineering,  
21 is technically feasible, commercially viable, and very much in the best interest of the New  
22 Hampshire public. He recommends best practices for the governance, development, design, and  
23 implementation of a multi-use, online, energy data platform.

1       **III. Detailed Discussion of Issues**

2       **ISSUES:**

3       **Q. Does RSA 378:52-54 require the PUC, Utilities, or other stakeholder to undertake a**  
4       **benefit/cost analysis to determine if development and implementation of a multi-use, state-**  
5       **wide data platform is in the public interest?**

6       A. No. The plain language and findings clause of Chapter 386, NH Laws of 2019  
7       indicates that there is a rebuttable presumption that development of such a data platform is in  
8       the public interest. RSA 378:51, I states that the “commission shall require electric and natural  
9       gas utilities to establish and jointly operate a statewide, multi-use, online energy data platform”  
10      and goes on to enumerate matters that the Commission should determine in this adjudicated  
11      proceeding. An overall cost-benefit analysis and determination that the data platform is for the  
12      public good is not one of them. The findings clause of SB 284 clearly indicated that the  
13      legislature finds development of such a platform to be a foundational matter for needed  
14      progress in multiple policies and proceedings. The language of RSA 378:51, II provides an  
15      escape, an opportunity for a party to rebut the presumption that proceeding with  
16      implementation of the data platform is in the public interest, but the party putting forth that  
17      concern would have the burden to show that “the cost of the platform to be recovered from  
18      customers is unreasonable and not in the public interest.”

19      **Q. Do you have a view on standards for data accuracy?**

20      A. Yes. While requiring the use of validated revenue grade meter data is appropriate for  
21      all revenue related purposes and many other use cases, there are use cases and applications  
22      where access to raw meter data on near real-time basis – that is as it is collected to the extent  
23      available or meter like data from other sources that may not be revenue grade – would be

1 useful and have value to customers and third parties. The important thing is to make the nature  
2 and source of the data properly identified and disclosed so the user of the data can understand  
3 any limitations or inaccuracies that might be inherent in the raw or non-revenue grade data.

4 **Q. Do you have a view on standards for data retention?**

5 A. Yes. Although there are FERC standards that apply to utility operations under federal  
6 jurisdiction that may help inform retention policies for state jurisdictional retail meters and  
7 distribution utility operations, they should not be assumed to be generally applicable to this  
8 data platform for state jurisdictional utility operations and metering, nor to third party sources  
9 of data that might available through the platform. Furthermore, informed customer choice  
10 should help drive requirements on third parties when customers choose to share their data with  
11 them, or even to release it publicly where it can exist in perpetuity. If a customer wants their  
12 individual customer data to be warehoused by a vendor indefinitely, they should be able to do  
13 so.<sup>2</sup> Just as one example, there might be value to a municipality to be able to go back and  
14 review 10 or 20 years' worth of consumption or DG production data.

15 **Q. Do you have a view on standards for data availability?**

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<sup>2</sup> For example, I have installed 3 revenue grade secondary meters on my home PV system production feed into my panel, my interface with the distribution grid, and the common area load at the commercial building I manage. The meter data is pushed to secure cloud based storage every second or two (once per minute is the default setting). From my phone I can view all the electricity characteristics at these 3 points in near real time (within seconds). The most recent 1,000 reads are stored and then the data is compiled into 15-minute intervals and securely stored in the cloud for the life of my meter, or until I delete it, at no additional cost. The vendor provides users with API options to share the data, including preconfigured options to link it several different third parties, one of which, PV Output is a site where the data can be shared publicly with other PV producers around the world. Links related to these options that are commercially available today are as follows: <https://documents.ekmmetering.com/api-docs/?shell#introduction>, <https://www.ekmmetering.com/pages/pv-output>, <https://www.ekmmetering.com/pages/wattvision>, <https://www.wattvision.com/>, <https://www.dexma.com/>, <https://lucidconnects.com/>. I have managed to write an API script myself that allowed me to download years' worth of PV production data at hourly intervals and convert it to an Excel file.

1 A. Yes, most data should be available at same interval as it is sourced with near real time  
2 access to raw meter data and system data where needed to support particular use cases and  
3 applications. For energy management, situational awareness, demand response, load  
4 curtailment, battery dispatch, & other innovative applications, including supporting  
5 development of a retail/distribution system level transactive energy systems<sup>3</sup> near real-time  
6 access to certain data may be of considerable value and importance.

7 **Q. Do you have a view on standards for data privacy?**

8 A. Yes. As a starting point the protections of RSA 363:38 must be observed where  
9 applicable. However many forms of data that may be available through the platform may not  
10 qualify as “individual customer data” (ICD) as defined in RSA 362:37, I and as referenced at  
11 various points in RSA 378:51-52. Not all data requires the same level of privacy and  
12 protection - some purely public data might be available through the platform, while other data,  
13 such as some system data, might merit a degree of protection somewhere between that afforded  
14 under RSA 363:38 and fully public data that has no privacy protections. Paraphrased, ICD is  
15 defined in RSA 363:37, I as data about the quantity, characteristics, or time of consumption of  
16 electricity, natural gas, or water, or related services, along with other information that, singly  
17 or in combination that would allow someone to identify a specific customer, or associate such  
18 data with any one individual customer. So data that has been effectively anonymized or  
19 aggregated such that that it cannot be associated or attributed any one individual customer,  
20 should not need the level of protection required for ICD

21 **Q. Do you have a view on standards for data aggregation & anonymization?**

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<sup>3</sup> For an overview of transactive energy please see <https://www.nist.gov/engineering-laboratory/smart-grid/hot-topics/transactive-energy-overview> and this Pacific Northwest National Laboratory site: <https://www.pnnl.gov/building-grid-integration>

1 A. Yes. Regarding the needs for the development of municipal and county aggregations  
2 pursuant to RSA 53-E, also called community power aggregations (CPAs), it would be most  
3 appropriate to look to rulemaking for CPAs, as that is likely to occur, along with the needs for  
4 data access, prior to implementation of a data platform. Aggregation standards need to take  
5 into account their practical implications

6 **Q. Do you have a view on security and the requirements for platform access?**

7 A. Yes, obviously cybersecurity and secure access to the platform are important. However  
8 qualifications requirements for registration to access the data platform should be  
9 commensurate with the level of access sought and authorized. For example, the owner of a one  
10 or a few multi-tenant building who wants aggregated load data for their whole building in  
11 order to benchmark it with Portfolio Manager, should not need the same level of security  
12 screening as a large corporate competitive energy supplier. NDAs should not be required for  
13 users who do not seek access to any ICD or otherwise sensitive or confidential data.

14 **Q. Do you have any ideas on cost controlling strategies?**

15 A. Yes, one thought is don't reinvent the wheel if it's not necessary. As Dr. Farid points  
16 out, there may be parties that already have developed software that could be adapted to be the  
17 core of an energy data hub, such as mPrest, Kavala Analytics at an affordable price. There are  
18 other parties to the proceeding that may have products that should be considered. Another  
19 product that has a cybersecure data sharing platform is the open source Volttron software<sup>4</sup>  
20 developed with funding from the US Department of Energy. There may be grants there are  
21 available, including, depending on the outcome of the election in November, possibly new

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<sup>4</sup> <https://volttron.org/>

1 federal funding in 2021 for economic recovery, that like ARRA grants for “shovel ready”  
2 projects.

3 **Q. Does that conclude your testimony?**

4 A. Yes it does.