

1 **BEFORE THE NEW HAMPSHIRE**
2 **PUBLIC UTILITIES COMMISSION**

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6 **DOCKET NO. DE 19-197**

7
8 **DEVELOPMENT OF A STATEWIDE, MULTI-USE ONLINE ENERGY DATA**
9 **PLATFORM**
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14 **DIRECT TESTIMONY OF**
15 **MICHAEL MURRAY**
16 **ON BEHALF OF MISSION:DATA COALITION**

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28 **August 17, 2020**
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1

I. **INTRODUCTION**

2 **Q. PLEASE STATE YOUR NAME, TITLE AND BUSINESS ADDRESS.**

3 A. My name is Michael Murray. I am the President of Mission:data Coalition
4 (“Mission:data”). My business address is 1752 NW Market Street #1513, Seattle, WA
5 98107.

6 **Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL BACKGROUND AND**
7 **YOUR RELEVANT PROFESSIONAL EXPERIENCE.**

8 A. I co-founded Mission:data in 2013 and have led our efforts to intervene at public
9 utility commissions on issues of data access, data privacy, advanced meters and the
10 benefits of electronic access to energy usage data. In 2013 I intervened at the California
11 Public Utilities Commission to successfully institute the first state-wide implementation
12 of Green Button Connect My Data among the state’s electric investor-owned utilities
13 (IOUs). Since then, I have intervened in 15 states and the District of Columbia to bring
14 the lessons learned from California’s experience to other states.

15 I have authored publications and presented at conferences on the value of
16 energy data “portability,” a term I define in greater detail below. In 2019, I published two
17 major reports, one titled “Energy Data Portability,” which discusses lessons learned
18 from flawed exchanges of customer energy data, and “3rd Parties And Beyond,” which
19 discusses technical and policy solutions to sharing energy data with numerous third
20 party entities authorized by a customer. I have presented at dozens of conferences on

1 state developments in energy data access, such as the National Association of
2 Regulatory Utility Commissioners' summer and winter meetings. In 2012, I presented at
3 the White House with former Secretary of Energy Steven Chu and former U.S. Chief
4 Technology Officer Aneesh Chopra on Green Button.

5 I began my career in 2004 as co-founder and CEO of Lucid, an energy
6 management software company for commercial buildings, where I grew the company
7 from zero to 40 employees and raised \$10 million in venture capital. Lucid offers a
8 cloud-based service that analyzes real-time meter data from thousands of commercial
9 buildings across North America to support energy efficiency. Lucid's customers include
10 over 350 organizations, eight of the eight Ivy League universities and others. I hold two
11 U.S. patents relating to energy data collection, sharing and analysis, #8,176,095 and
12 #8,375,068. I earned a B.A. with highest honors from Oberlin College in 2004.

13 **Q. IS THIS THE FIRST TIME YOU HAVE TESTIFIED BEFORE THE NEW**
14 **HAMPSHIRE PUBLIC UTILITIES COMMISSION?**

15 A. Yes, it is.

16 **Q. IN WHAT OTHER STATES HAVE YOU TESTIFIED BEFORE A PUBLIC**
17 **UTILITY REGULATOR?**

18 A. I have testified before the commissions of California, Colorado, Georgia, New
19 York, North Carolina, Ohio and Texas.

1 **Q. ON WHOSE BEHALF ARE YOU FILING THIS TESTIMONY?**

2 A. I am filing this testimony on behalf of Mission:data, an intervenor in this case.

3 **Q. WHAT IS THE MISSION:DATA COALITION?**

4 A. Mission:data Coalition is a national coalition of approximately 30 technology
5 companies delivering data-enabled distributed energy resources (“DERs”) for
6 residential, commercial and industrial customers. Our members – with sales in excess
7 of \$1 billion per year – have developed innovative services leveraging meter data and
8 utility bill data that help customers reduce their bills. Our companies are focused on
9 bringing energy efficiency solutions to a national market, and to realize that objective, it
10 is vital that we empower consumers with convenient access to their own energy data in
11 a consistent manner from state to state. Mission:data works with industry and
12 policymakers to advance customers’ ability to quickly and conveniently share their
13 energy-related data with energy management companies of their choice.

14 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

15 A. There are two purposes to my testimony. First, as the New Hampshire
16 Commission (“Commission”) considers a state-wide, multi-use energy data platform
17 pursuant to Senate Bill 284 (“SB 284”), I want to ensure that New Hampshire’s decision-
18 making is informed by important lessons from other jurisdictions. As perhaps the only
19 intervenor in this docket with experience working across 15 states on the topics of data
20 access and data privacy, I bring a unique perspective from which New Hampshire can

1 benefit. Second, based on that experience, I present a detailed, 14-part proposal for a
2 state-wide energy data-sharing platform that comprehensively addresses technical
3 functionality, privacy, change management, governance, and cost estimates from other
4 jurisdictions. A summary of my proposal is provided in Appendix A.

5

6 **II. BACKGROUND & CONTEXT**

7 **A. NATION-WIDE MOVEMENT TOWARD DATA PORTABILITY**

8 **Q. WHAT IS DATA PORTABILITY?**

9 A. Data portability refers to the ability of a consumer to seamlessly move or “port”
10 his or her data held by one corporation to another service provider. The driver behind
11 data portability is twofold: a desire to encourage competitive markets by using the
12 internet, and to prevent formation of “data monopolies” in the information economy.
13 Whereas the phrase “data access” pertains to a customer obtaining his or her own
14 information from a utility – such as through a utility’s web portal – portability refers to the
15 *direct* transfer of customer-specific data from the utility to a third party directly, without
16 passing through the hands of the customer. The transfer of customer data is initiated
17 upon the consent of the customer.

1 **Q. IN WHAT SECTORS IS DATA PORTABILITY BEING ADOPTED?**

2 A. Data portability is being adopted in the U.S. and around the world in sectors
3 including banking, healthcare, social media and energy. In the U.S., several federal and
4 state laws promote data portability. For example, in banking, the Gramm-Leach-Bliley
5 Act promotes the sharing of personal financial information among banks upon the
6 request of a customer. In healthcare, the Health Insurance Portability and Accountability
7 Act similarly enables the sharing of medical information between healthcare providers
8 and insurance companies. In social media, the Data Transfer Project is an initiative led
9 by Google, Facebook, Microsoft, Twitter and Apple to allow individuals to move their
10 online data between different platforms, without the need for users to download and re-
11 upload data. In addition, several bills are being discussed on Capitol Hill that would
12 enhance data portability, such as the Augmenting Compatibility and Competition by
13 Enabling Service Switching (ACCESS) Act¹ and the Access to Consumer Energy
14 Information Act (E-Access).²

15 In the utility sector, data portability has been mandated in five (5) states:
16 California, Colorado, Illinois, New York and Texas. It is enabled by the standard known
17 as Green Button Connect My Data, which I describe below.

¹ *Augmenting Compatibility and Competition by Enabling Service Switching (ACCESS) Act*, S. 3456, 116th Congress, 2d Session (2020).

² *Access to Consumer Energy Information Act (E-Access)*, H.R. 5796, 116th Congress, 2d Session (2020).

1 **Q. WHAT IS GREEN BUTTON CONNECT MY DATA?**

2 A. Green Button Connect My Data (“GBC”) is a technical standard, ratified by the
3 ANSI-accredited North American Energy Standards Board (“NAESB”), for sharing
4 customer usage, cost, and other related data. The standard was developed by the
5 National Institute of Standards and Technology (“NIST”), the Smart Grid Interoperability
6 Panel and industry over several years. GBC has its roots in the American Recovery and
7 Reinvestment Act of 2009, which directed the Federal Communications Commission to
8 develop a national broadband plan to include digital strategies for “energy
9 independence and efficiency.” Goal #6 of the National Broadband Plan states, “To
10 ensure that America leads in the clean energy economy, every American should be able
11 to use broadband to track and manage their real-time energy consumption.”³

12 With GBC, a utility provides an application programming interface (“API”) for
13 machine-to-machine communication that third party developers of energy management
14 software can, with customer authorization, automatically and securely retrieve energy
15 data. These authorizations are valid for an agreed upon time and can be revoked at any
16 time by the consumer. The data received can then be accessed and analyzed by the
17 third party, using web-based software tools or mobile device applications.

³ Federal Communications Commission (2010). “Connecting America: The National Broadband Plan,” p. xiv-xv. <https://transition.fcc.gov/national-broadband-plan/national-broadband-plan.pdf>.

1 **Q. WHERE HAS GREEN BUTTON CONNECT MY DATA BEEN IMPLEMENTED?**

2 A. GBC has been deployed by numerous investor-owned utilities, both gas and
3 electric. California's electric investor-owned utilities; Commonwealth Edison and
4 Ameren in Illinois; Pepco in Washington, D.C.; Consolidated Edison (both gas and
5 electric) in New York; and the Texas utilities in the Electric Reliability Council of Texas
6 ("ERCOT") market have all implemented GBC. GBC deployments are underway at
7 other utilities in Colorado, Michigan and New York. Of the approximately 90 million
8 electric smart meters in the U.S., over 36 million currently have, or will soon have,
9 portable data via the GBC standard.

10 **Q. WHAT IS GREEN BUTTON DOWNLOAD MY DATA?**

11 A. Green Button Download My Data is merely one component of the broader GBC
12 standard: a file format for capturing a customer's *usage* data, such electricity use in
13 kilowatt-hours, or natural gas use in therms. The format of Download My Data is XML.
14 For a customer to use Download My Data, he or she must log in to their utility's website
15 and find a "Download My Data" link. Once the file is downloaded, he or she can then
16 upload it to a third party service, such as the website of rooftop solar installer or energy
17 auditor. However, Download My Data is not considered "portability" as defined above
18 because the data must pass through the customer's hands.

1 **Q. WHAT METHODS EXIST TODAY FOR NEW HAMPSHIRE CUSTOMERS TO**
2 **ACCESS THEIR ENERGY-RELATED DATA?**

3 A. According to the joint utilities of New Hampshire – Liberty Utilities, Unitil and
4 Eversource (together, the “JUNH”) – each provides customers with access to monthly
5 usage and billing data through their respective websites. It appears that all Unitil
6 customers and a small number of Liberty customers have access to interval usage data,
7 such as electric usage every 30 minutes or 60 minutes, available the next day on their
8 websites.⁴ Unitil and Eversource also provide Green Button Download My Data for their
9 electric customers.

10 **Q. WHAT METHODS EXIST TODAY FOR NEW HAMPSHIRE CUSTOMERS TO**
11 **DIRECT THEIR UTILITY TO SHARE ENERGY-RELATED DATA WITH THIRD**
12 **PARTIES?**

13 A. To my knowledge, there is only one method available in New Hampshire by
14 which customer-authorized third parties can electronically receive customer data from a
15 utility: With electronic data interchange (“EDI”), which is only available to licensed retail
16 suppliers.

⁴ Docket No. DE 19-197. *Docket Scoping Comments of Public Service Company of New Hampshire d/b/a/ Eversource Energy; Unitil Energy Systems, Inc.; and Granite State Electric Corp. d/b/a/ Liberty Utilities.* March 11, 2020 at 3-4.

1 **Q. ARE THOSE METHODS FOR CUSTOMERS TO ACCESS AND SHARE THEIR**
2 **ENERGY DATA ADEQUATE IN YOUR VIEW?**

3 A. No. First, Green Button Download My Data is not true portability, as described
4 above. Most energy management applications require continuous, ongoing access to
5 customer energy data, such as billing and usage data. It is not realistic to expect
6 modern customers to log in every day to their utility's website, download their data, and
7 upload it into an energy management application.

8 Second, EDI is only available to licensed retail suppliers. This is inadequate
9 because entrepreneurs and innovators that make energy management software and
10 other DERs are not able to directly and easily access their customers' energy data,
11 rendering it difficult or impossible to offer cost-effective DER products and services in
12 New Hampshire.

13 **Q. WHAT IS "CREDENTIAL-SHARING"?**

14 A. Credential-sharing refers to a customer sharing his or her username and
15 password to a utility's website with a third party, so that the third party can automatically
16 log in to the utility and efficiently gather certain information on behalf of the customer.

1 **Q. WHY IS CREDENTIAL-SHARING USED, AND HOW WIDESPREAD IS IT?**

2 A. Many DER providers routinely ask prospective customers to provide their utility's
3 website credentials in order to quickly gather information necessary for qualifying that
4 customer for certain offerings, such as rooftop solar or an energy efficiency product.
5 When a DER provider's salesperson asks a prospective customer, "How much energy
6 did you use last year?" the fastest and cheapest way to answer that question today is
7 often with credential-sharing. Commercial building owners in particular use credential-
8 sharing extensively to collect their electricity, natural gas and water usage data from
9 multiple locations. For commercial building owners, the alternative to credential-sharing
10 is manually transcribing hundreds or thousands of bills, a process that can be quite
11 expensive for large enterprises. It's difficult to know how widespread credential-sharing
12 is, but in my experience, it can be quite common across the U.S.

13 **Q. WHAT IS YOUR VIEW ON CREDENTIAL-SHARING?**

14 A. Credential-sharing is inferior to the state-wide energy data platform envisaged in
15 this docket. I do not believe it is inherently bad; credential-sharing is useful and
16 necessary between family members, or when a business contracts with a third party to
17 manage and pay their bills. But there could be unintended consequences, because
18 those login credentials could in theory be compromised and subsequently used for
19 purposes not authorized by the customer.

1 If New Hampshire adopts my recommendations, then the resulting platform will be
2 far superior to the practice of credential-sharing. One positive byproduct is that third
3 parties will no longer receive a competitive advantage from credential-sharing. This
4 levels the playing field for DER providers.

5

6 **B. DIGITAL PLATFORM REGULATION**

7 **Q. WHAT IS DIGITAL PLATFORM REGULATION?**

8 A. Digital platform regulation is a new way of thinking about government intervention
9 in digital sectors of the economy in order to promote competition and bolster consumer
10 protections. Recent attention to the power of large technology firms such as Facebook
11 and Apple has led to academic scholarship on how best to regulate digital platforms as
12 well as actions from government all around the world, including the U.S., focused on
13 curbing abuses of market power.

14 Data portability is one critical part of modern digital platform regulation. There are
15 other important elements as well, including non-discrimination; supporting equal access
16 to technical information about the platform; preventing platform operators from
17 duplicating functionality provided by others; ensuring due process rights for platform
18 users; protecting consumer privacy; and preventing inappropriate or anti-competitive

1 terms of use.⁵ New laws such as Europe’s General Data Protection Regulation
2 (“GDPR”), Australia’s Consumer Data Right (“CDR”), and California’s Consumer Privacy
3 Act (“CCPA”) all attempt to incorporate many of these elements, as do the
4 aforementioned bills recently introduced in Congress.

5 **Q. WHAT BEST PRACTICES FROM DIGITAL PLATFORM REGULATION DO**
6 **YOU INCORPORATE INTO YOUR TESTIMONY?**

7 A. I have incorporated several. In addition to data portability and ensuring informed
8 consent, I make recommendations for New Hampshire such as an online tool for
9 continuously tracking technical issues and ensuring high performance; Commission-
10 approved terms of use between utilities and third parties that are non-discriminatory;
11 and an easy process for customers to view and revoke access to any third parties they
12 have authorized. I believe all of these elements are important in order for the
13 Commission to be an effective digital platform regulator.

14 After presenting cost-benefit analyses below, I make fourteen (14) specific
15 proposals. The first ten proposals are based upon our report, “Energy Data: Unlocking
16 Innovation With Smart Policy,” which describes ten elements of a comprehensive data

⁵ See, e.g., *Tending the Garden: How to Ensure that App Stores Put Users First*. Bergmayer, John for Public Knowledge. June 2020. Available at <https://www.publicknowledge.org/blog/software-platforms-benefit-by-empowering-developers-and-putting-users-first/>.

1 portability policy.⁶ Then I discuss four other proposals that incorporate best practices
2 from data portability efforts in other jurisdictions, including liability topics; governance
3 and change management; cost recovery; and aggregated data. My recommendations
4 are summarized in Appendix A.

5 **III. COST-BENEFIT ANALYSIS**

6 **Q. PLEASE DESCRIBE YOUR APPROACH TO COST-BENEFIT ANALYSIS OF A**
7 **STATE-WIDE ENERGY DATA PLATFORM.**

8 A. Several other jurisdictions have proposed data-sharing platforms similar to the
9 concept outlined in SB 284, and I present those costs and benefits below. Some costs
10 and benefits are actual, while others are projected, because states such as Ohio and
11 North Carolina have not yet granted approval for their utilities to build a platform. While
12 the examples below are not identical to what I propose for New Hampshire, they are
13 nevertheless similar and provide a basis for comparing and assessing the probable
14 costs and benefits of the platform as I have proposed.

⁶ *Energy Data: Unlocking Innovation With Smart Policy*. Mission:data Coalition and Advanced Energy Management Alliance. Michael Murray, Laura Kier and Bob King, P.E. December, 2017. Available at <http://www.missiondata.io/s/Energy-data-unlocking-innovation-with-smart-policy.pdf>.

1 **Q. WHAT OTHER JURISDICTIONS HAVE ASSESSED THE COSTS AND/OR**
2 **BENEFITS OF GREEN BUTTON CONNECT MY DATA?**

3 A. The jurisdictions that have completed an assessment of the costs and/or benefits
4 of GBC, or systems similar to GBC, include California, Colorado, Ohio, New York, North
5 Carolina, Texas, and Ontario, Canada.

6 **Q. WHAT BENEFITS WERE ESTIMATED IN THOSE JURISDICTIONS?**

7 A. Three jurisdictions estimated benefits. AEP Ohio estimated 1.1% to 2.5% energy
8 savings,⁷ and Duke Energy estimated 1% to 5% energy savings.⁸ Perhaps the most
9 detailed analysis of benefits was done for the Ontario, Canada government by Dunskey
10 Energy Consulting in 2017. It estimated 2% to 10% electricity and natural gas savings
11 for residential customers who participated in data-driven energy savings offerings, and
12 2% to 10% electricity and natural gas savings for non-residential customers participating
13 in an energy savings offering.⁹ The adoption of energy savings offerings enabled by
14 GBC were forecasted according to a product diffusion model in which various efficiency

⁷ AEP Ohio cost-benefit analysis. Workpaper provided in gridSMART collaborative, June, 2018. Available at <http://murraym.fastmail.fm/AEP%20Ohio%20-%20June%202018%20-%20GB%20CMD%20Cost-Benefit%20Analysis.pdf>

⁸ Duke Energy cost-benefit analysis. April 12, 2019, as required by North Carolina Utilities Commission order dated March 7th, 2018 in Docket No. E-100 Sub 147, available at <http://murraym.fastmail.fm/Duke%20Energy%20GreenButton%20Position%20and%20CBA%20Corrected%204-12-19.pdf>

⁹ *Ontario Green Button Cost-Benefit Analysis Report (hereafter "Ontario Report")*. Prepared for the Ontario, Canada Ministry of Energy by Dunskey Energy Consulting. October, 2017 at 30. Available at <https://www.ontarioenergyreport.ca/pdfs/Green%20Button%20Cost-Benefit%20Analysis%20Report%20FINAL.PDF>

1 services saw increasing uptake over time, such as behavioral conservation approaches
2 growing gradually from 0% adoption to 4% over ten years, and operational efficiencies
3 in commercial buildings assisted by data-driven energy management services would
4 rise from 0% to 25% market penetration over ten years.¹⁰ In addition, other financial
5 benefits beyond reduced utility bills were found. Large commercial customers were
6 estimated to see a CAD\$180 benefit per customer per year in avoided cost as a result
7 of easy access to benchmarking and portfolio energy analysis. Similarly, small
8 commercial customers were estimated to see a CAD\$198 benefit per customer per year
9 in avoided costs.¹¹

10 In addition to quantitative estimates, Ontario considered qualitative benefits of
11 GBC. These included real but hard-to-measure values, such as greater innovation from
12 demand-side management programs; economic development benefits from DER
13 deployment; and increased customer satisfaction.

14 **Q. WHAT COSTS WERE ESTIMATED (OR INCURRED) IN VARIOUS**
15 **JURISDICTIONS?**

16 A. Since 2012, some utilities have developed GBC systems, or systems similar to
17 GBC, and their actual costs are reported below. Others have developed cost estimates
18 for similar data-sharing IT systems but have not yet implemented them: Duke Energy, in
19 North Carolina; AEP, in Ohio; National Grid, in New York; the government of Ontario,

¹⁰ *Ontario Report* at 33-34.

¹¹ *Ontario Report* at 28.

1 Canada for all of its electric and gas utilities; and Xcel Energy, in Colorado. The table
2 below is listed chronologically in the order in which costs were estimated.
3

	Year	Initial (one-time) cost	Annual cost	\$ / electric meter
Texas TDSPs ¹²	2012	unclear ¹³	\$9,282,000	\$1.22/yr
Pacific Gas & Electric ¹⁴	2013	\$19,400,000	unclear	\$3.83
Southern California Edison ¹⁵	2013	\$7,588,000	\$1,512,000	\$1.51
Xcel Energy (CO) ¹⁶	2015	\$2,000,000	unclear	\$1.26
Consolidated Edison (NY) ¹⁷	2016	\$9,009,000	\$1,195,000	\$2.54
Ontario, Canada (low) ¹⁸	2017	CAD\$4.69 million over 5 years		\$0.98
Ontario, Canada (high)	2017	CAD\$8.96 million over 5 years		\$1.87
AEP Ohio ¹⁹	2018	\$900,000	\$75,000	\$0.60
Duke Energy (NC) ²⁰	2019	\$850,000	\$52,000	\$0.25
National Grid (NY) ²¹	2020	\$3,000,000	unclear	\$1.77

1 *Table 1: GBC cost estimates, 2012-2020.*

¹² Texas Transmission and Distribution Service Providers (TDSPs), which operate in the competitive areas of Texas. This includes Oncor, Centerpoint, AEP Texas and Texas New Mexico Power (TNMP).

¹³ Texas TDSPs report only the annual cost of Smart Meter Texas, which is administered by IBM. See Project No. 49730, *Compliance Filing of Oncor regarding Smart Meter Texas’s project budget for 2020*. January 31, 2020.

¹⁴ California Public Utilities Commission. Decision D.13-09-025, September 23, 2013 (hereafter “California Decision”) at 2. Available at <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M077/K191/77191980.PDF>.

¹⁵ *Id.*

¹⁶ Price quote as given from Opower/Oracle to Xcel via email dated October 12, 2015, as quoted in Exhibit No. Mission:data-2, *Prepared Rebuttal Testimony of Michael Murray on Behalf of the Mission:data Coalition*. California Public Utilities Commission. Application (A.18-11-005) of Southern California Gas Company to Establish a Demand Response Program. April 26, 2019 at Bates 51-52.

¹⁷ Consolidated Edison, *Customer Engagement Plan*. Slides presented at Stakeholder Collaboration Meeting July 15, 2016 at 21.

¹⁸ Low and high estimates of direct costs estimated over a 5-year period. *Ontario Report*, Tables 39-40 at 60.

¹⁹ AEP Ohio presentation dated June, 2018 to the gridSMART Collaborative working group pursuant to Case No. 13-1939-EL-RDR. Footnote 7 *infra*.

²⁰ Footnote 8 *infra*.

²¹ Niagara Mohawk Power Corporation d/b/a National Grid. *Fiscal Year 2021 Information Technology Capital Investment Plan Report*. New York Public Service Commission, Case Nos. 17-E-0238 and 17-G-0239. April 10, 2020 at Attachment 1, p. 2.

1 **Q. PLEASE EXPLAIN AEP OHIO’S COST ESTIMATE.**

2 A. As part of a settlement in Case No. 13-1939-EL-RDR approved by the Public
3 Utilities Commission of Ohio (“PUCO”), AEP agreed to “monitor the implementation
4 costs and associated customer benefits of Green Button Connect.” In 2018, AEP
5 provided a cost estimate of GBC to a PUCO working group. The cost reported was
6 \$750,000 for initial IT investment plus \$150,000 for a sandbox test environment, making
7 the total initial cost \$900,000. An annual cost of \$75,000 was estimated for ongoing
8 support. AEP Ohio provides electricity to 1.5 million customers in Ohio and its advanced
9 meter deployment is underway.

10 It is unclear exactly what technical features are included or excluded from the
11 price estimate, as additional information from AEP was not provided. However, AEP
12 understood how GBC functions and what GBC is intended to achieve – namely, the
13 exchange of customer energy information with authorized third parties – based upon
14 discussions in a working group that met regularly throughout 2018 as was ordered by
15 the PUCO.

16 **Q. PLEASE EXPLAIN DUKE ENERGY’S COST ESTIMATE.**

17 A. Pursuant to a 2018 North Carolina Utilities Commission order, Duke Energy was
18 required to hold stakeholder meetings to discuss data access topics.²² At a stakeholder

²² State of North Carolina Utilities Commission. Docket No. E-100, Sub 147. *Order Accepting DNC’s and DEC’s SGTP Updates, Requiring Additional Information From DEP, and Directing DEC and DEP to Convene a Meeting Regarding Access to Customer Usage Data.* March 7,

1 meeting dated April 12, 2019, Duke Energy provided a cost estimate to implement GBC.
2 In addition to offering customer-facing capabilities as required by the GBC technical
3 standard, Duke Energy includes in its estimate certain IT system features including
4 “customer information system extract, transform load (ETL) protocols” and “integration
5 with customer portals, meter data, external testing and validation.” The up-front cost to
6 develop GBC is \$850,000, with annual maintenance costs of \$52,000. Duke Energy
7 operating companies, Duke Energy Carolinas and Duke Energy Progress, together
8 serve approximately 3.4 million electric customers with advanced meters in North
9 Carolina.

10 **Q. PLEASE EXPLAIN XCEL ENERGY’S COST ESTIMATE.**

11 A. In Docket No. 16A-0588E before the Colorado Public Utilities Commission, Xcel
12 Energy disclosed that its estimated cost to develop GBC is \$1.6 million to \$2.0 million.
13 No information was given on annual or recurring costs. The initial development included
14 registering third parties, authenticating third parties, allowing customer authorization and
15 de-authorization, developing application programming interfaces (“APIs”) to serve usage
16 data as well as billing data, creating a separate role for third parties to securely access
17 Xcel’s IT systems and offering a sandbox environment for testing. In a settlement
18 agreement approved by the Colorado Commission in 2017, Xcel Energy was granted
19 approval to spend up to \$2.0 million developing GBC. Xcel Energy serves electricity and

1 natural gas to 1.5 million customers in Colorado, and its advanced meter deployment for
2 electric meters is underway.

3 **Q. PLEASE EXPLAIN NATIONAL GRID'S COST ESTIMATE.**

4 A. Several orders from New York's Commission have required utilities pursuing
5 advanced metering infrastructure ("AMI") to provide GBC.²³ National Grid's AMI plans
6 have not yet been approved, but the New York Commission subsequently required
7 utilities to "expedite" their GBC implementations, even prior to AMI deployment.²⁴
8 National Grid notified the New York Commission it would spend up to \$3 million on
9 capital expenses associated with GBC, to be implemented by March 31, 2021.²⁵

10 While the precise features of National Grid's GBC platform have not been
11 announced, the New York Commission has specified the minimum amount of customer
12 energy data types to be provided. That list includes: (i) electric and gas usage history for
13 at least 12 months; (ii) service address; (iii) account number(s); (iv) meter number(s); (v)
14 rate class and subclass; and other information such as what incentives the customer

²³ See, e.g., Case 16-M-0411. New York Public Service Commission. *Order Adopting Distributed System Implementation Plan Guidance*. April 20, 2016.

²⁴ Case 18-M-0084. New York Public Service Commission. *Order Adopting Accelerated Energy Efficiency Targets*. December 13, 2018.

²⁵ Footnote 21 *infra*.

1 might receive and information necessary for participation in New York Independent
2 System Operator (“NYISO”) wholesale markets.²⁶

3 **Q. WHAT ARE THE KEY DIFFERENCES BETWEEN THE COSTS YOU CITE**
4 **AND THE PLATFORM YOU PROPOSE FOR NEW HAMPSHIRE?**

5 A. Some reported costs are up-front while others are a mix of up-front and ongoing
6 expenses. As a result, it is difficult to compare costs on an “apples to apples” basis
7 because the reported costs and software features are not categorized identically.
8 Another difference is that I propose an online issue-tracking system that reports on key
9 performance metrics of the platform’s operation. I explain why this is important in
10 Section IV(J) below.

11 **Q. HOW MUCH WOULD THAT COST?**

12 A. I do not have an exact estimate of the cost of an online issue-tracking system for
13 New Hampshire utilities. However, several reference points to costs from other
14 jurisdictions and software systems are known, and I believe this cost to be quite
15 modest.

16 In California, the electric investor-owned utilities were required to post
17 continuously-updated performance metrics of their data-sharing platforms on a website.
18 These metrics include things like the average authorization web page’s load time, the

²⁶ Case 15-M-0180. New York Public Service Commission. *Order Establishing Oversight Framework and Uniform Business Practices for Distributed Energy Resource Suppliers*. October 19, 2017 at Appendix A, p. 8-9.

1 time spent to complete an authorization on the utility’s website, and how long it takes for
2 data to be delivered after a completed authorization is received. Pacific Gas & Electric’s
3 (“PG&E”) implementation costs were \$430,600;²⁷ Southern California Edison’s (“SCE”)
4 were \$470,137;²⁸ and San Diego Gas & Electric’s (“SDG&E”) were \$0.²⁹ SDG&E’s
5 implementation had no cost because SDG&E was already using Google Analytics for its
6 website, and the tool could be easily adapted.

7 In my experience as a software executive, I can say that PG&E’s and SCE’s
8 costs for tracking performance metrics could have been lowered substantially if tracking
9 were designed into their GBC platforms from the beginning. As I cited previously,
10 PG&E’s and SCE’s GBC platforms were approved in 2013, whereas the tracking
11 metrics were not required until 2017. Generally speaking, the costs of software
12 implementation are significantly reduced when a complete set of requirements is known
13 up front.

14 In addition, there are numerous web-based issue-tracking systems that are
15 commercially available at a low cost. Providers such as Zendesk, Salesforce and others
16 have fully-functional and secure “help desk” software that costs only a few hundred

²⁷ Advice Letter 5190-E-A. Pacific Gas & Electric. *Supplemental Request for Approval of Proposal and Cost Recovery for Click-Through Performance Metrics pursuant to Resolution E-4868*. August 6, 2018.

²⁸ Advice Letter 3867-E. Southern California Edison. *Proposal and Funding Request for Development of Performance Metrics Website, Pursuant to Resolution E-4868*. September 20, 2018.

²⁹ Advice Letter 3153-E. San Diego Gas & Electric. *SDG&E’s Approach to Address Click-Through Performance Requirements Outlined in Resolution E-4868*. November 22, 2017.

1 dollars per month. For these reasons, I believe the costs of my recommendation for a
2 performance-tracking system will be very modest.

3 **Q. IN NEW HAMPSHIRE, PLEASE COMPARE THE APPROXIMATE COSTS AND**
4 **BENEFITS OF YOUR PROPOSAL.**

5 A. Based on the table above, the approximate up-front cost to New Hampshire
6 utilities of developing a GBC platform would be in the range of \$0.25 to \$3.83 per
7 customer. However, I think it is both wise and appropriate for the Commission to
8 exclude from consideration the above cost estimates from 2016 and earlier. This is
9 because software offerings, and the Green Button standard generally, have significantly
10 matured over time. When Texas utilities contracted with IBM in 2012 to develop Smart
11 Meter Texas, nothing like it had ever been built before, and as a result, an entirely
12 custom-built software system was constructed, and IBM has been compensated for
13 taking that large risk. Similarly, when California utilities were ordered to implement GBC
14 in 2013, the GBC standard was barely finalized and no off-the-shelf GBC software
15 products existed at that time. Today, however, several vendors offer GBC software, and
16 the scope of work that utilities confront is much better known. As a result, I believe the
17 range of \$0.25 to \$1.87, based on cost estimates from 2017-2020, is more appropriate
18 and realistic for New Hampshire.

19 Of course, it is essential that costs not be considered alone; costs must be
20 compared with the benefits that would result from a state-wide data-sharing platform. In
21 comparing costs and benefits together, Ontario has the most detailed analysis of which I

1 am aware. Ontario calculated benefit-to-cost ratios of 3.2 to 4.4 depending on various
2 scenarios and timeframes. These ratios are impressive and demonstrate that significant
3 benefits of GBC can be realized by New Hampshire ratepayers, net of costs. Of course,
4 reaping these benefits is dependent upon careful implementation by the state's utilities
5 and resolution of several important policy issues by the Commission that I describe
6 below.

7 **IV. PROPOSAL FOR A STATE-WIDE ENERGY DATA PLATFORM**

8 **Q. PLEASE PROVIDE AN OVERVIEW OF YOUR PROPOSAL FOR A STATE-**
9 **WIDE DATA PLATFORM.**

10 A. Mission:data's proposal follows the same order of the 10 topic areas described in
11 my white paper, "Energy Data: Unlocking Innovation With Smart Policy,"³⁰ plus four
12 additional elements, which are labeled #11 through #14, that discuss utility liability;
13 governance and change management; cost recovery; and aggregated data.

14 **A. #1: DATA TYPES**

15 **Q. PLEASE DESCRIBE PROPOSAL #1 REGARDING DATA TYPES.**

16 A. I recommend that the following customer information be made available via GBC
17 with customer permission to DERs of the customer's choosing:

³⁰ Footnote 6 *infra*.

- 1 1. Historical energy usage (kWh of electricity and therms of gas) over 24-48
- 2 months, at whatever time interval collected by the meter³¹
- 3 2. Ongoing energy usage (kWh of electricity and therms of gas), available as
- 4 quickly as possible after being collected, with the “quality” of reading marked
- 5 3. Historical and ongoing line items on bills (and associated quantities) over 24-48
- 6 months
- 7 4. Account number(s)
- 8 5. Meter number(s), if applicable
- 9 6. Premise address(es)
- 10 7. What rate the customer is on (by meter or premise, if applicable)
- 11 8. Any information necessary to determine eligibility for, or participate in, a demand
- 12 response, energy efficiency or renewable energy program

13 **Q. WHY DO YOU RECOMMEND THIS SET OF INFORMATION?**

14 A. Over the past decade, in my experience as a cleantech entrepreneur, leading
15 Mission:data, and working with our members in the industry, the information above has
16 been shown to be very important to a wide variety of DERs. It has also been the case
17 that the lack of such information in certain utilities’ implementations of GBC has led to
18 serious problems. For example, Commonwealth Edison, in Illinois, does not provide #6
19 (premise addresses) in their GBC system. This has been identified as a blocker for
20 energy management firms serving multi-site commercial customers, because it is
21 impossible to determine *where* the energy is being used without the premise address.

³¹ As much precision as possible (i.e., decimal places) should be provided on both kWh and therm measurements.

1 **Q. WHY DO YOU RECOMMEND 24-48 MONTHS OF HISTORICAL USAGE**
2 **INFORMATION?**

3 A. Many energy efficiency applications require historic monthly bills through at least
4 two “heating seasons” in order to accurately assess energy savings after some retrofit
5 has occurred. 24 months at minimum ensures that seasonal and meteorological effects
6 can be properly accounted for.

7 **Q. WHAT DO YOU MEAN BY THE “QUALITY” OF THE ENERGY USAGE**
8 **READING?**

9 A. Quality refers to the reading of kilowatt-hours, or therms of gas, as it passes
10 through each utility’s validation, editing and estimation (“VEE”) process. If an un-VEE’d
11 reading can be provided more quickly to DERs but at a lower quality, then I recommend
12 that it be provided, and then updated later as more “finalized” readings are processed,
13 because the timely provision of information is extremely helpful to energy management
14 applications even if the value is less trustworthy.

15 I also note that California addressed this issue by requiring its utilities to denote
16 the quality of each reading as it changes over time. This is accomplished using the
17 “quality” flag in the GBC standard.

18 **Q. WHAT DO YOU MEAN BY #8?**

19 A. This refers to any information that may be necessary for a DER provider to
20 assess a customer’s eligibility for a particular energy efficiency, demand response or

1 renewable energy program, as those programs evolve over time. For example, this
2 include customer-specific information necessary to participate in ISO-New England
3 markets, or information about the customer's rate that makes a particular customer
4 ineligible for certain efficiency programs. I note that other utilities across the U.S.
5 provide similar information electronically to third parties: Consolidated Edison in New
6 York provides "ICAP" tags that are necessary for participation in NYISO markets, and
7 the California utilities provide pricing nodes and sub-load aggregation points so that
8 customers can be registered to participate in wholesale markets at the California
9 Independent System Operator.

10 **Q. PLEASE DESCRIBE THE IMPLICATIONS IF UTILITIES DO NOT PROVIDE**
11 **ELECTRONIC BILLING HISTORY AS YOU HAVE RECOMMENDED.**

12 A. Without standardized, machine-readable access to historical billing data,
13 customers will not be able to access new services that depend upon streamlined, zero-
14 cost electronic accessibility, including, but not limited to: cost analysis software,
15 automated bill audits that search for overcharges, financial benchmarking services
16 against peers, and even certain financial products that allow customers to borrow
17 money for efficiency improvements. It will also be difficult for customers to know
18 whether investments they have made in energy efficiency ("EE") are paying off,
19 because EE firms cannot easily access the customer's bills.

20 For commercial customers, including multifamily property owners, the lack of
21 software-readable billing histories means that many such customers turn to the market

1 and pay for bill digitization services. An industry in its own right, bill digitization serves
2 the needs of many multi-site building owners or managers who must capture,
3 understand, benchmark and ultimately pay dozens, hundreds or even thousands of bills
4 from different utilities across the U.S. every month. The inclusion of 24-48 months of
5 historical billing data, as well as ongoing bills as they are generated, via GBC would
6 significantly benefit these customers by avoiding the costs of bill digitization services
7 and significantly reducing the time needed to process billing data.

8 While larger enterprises can afford bill digitization services to manage their utility
9 expenses and track energy usage, these types of services are prohibitively expensive
10 for smaller customers such as nonprofit low-income housing organizations, small
11 businesses, and individual owners and tenants. These customers cannot afford bill
12 digitization and instead often use inefficient, paper-based processes. For these
13 customers, access to detailed, machine-readable bill data means that it will become
14 easier to monitor and pay their bills, save money, access new services and track their
15 carbon footprint.

16 In addition, organizations such as property owners with a nation-wide presence
17 want to perform analysis for properties across states, utility companies, and types of
18 tariffs. While these categories can be interpreted from bills, it is difficult and unreliable
19 as utility companies use different names for types of usage and charges. Including
20 billing information in standardized categorizations will eliminate guesswork and
21 decrease the time and resources spent on analysis. Moreover, the bill digitization
22 process can introduce inaccuracies, because optical character recognition (“OCR”) and

1 other techniques performed to extract data from printed bills and bill images are not
2 always perfect. Customers would benefit by having accurate representation of their bills
3 available from the JUNH in an electronic, automated fashion via GBC.

4 **Q. DO ANY OTHER UTILITIES ACROSS THE U.S. PROVIDE BILLING**
5 **HISTORIES TO THIRD PARTIES IN AN AUTOMATED FASHION?**

6 A. Yes. The California utilities – Pacific Gas & Electric (“PG&E”), Southern
7 California Edison (“SCE”) and San Diego Gas & Electric (“SDG&E”) provide billing
8 histories electronically.

9

10 **B. #2: STANDARDS AND IMPLEMENTATION ARCHITECTURE**

11 **Q. PLEASE DESCRIBE PROPOSAL #2 REGARDING STANDARDS AND**
12 **IMPLEMENTATION ARCHITECTURE.**

13 A. I propose that the JUNH be required to provide GBC to all customer types,
14 including natural gas customers. GBC should include the “Retail Customer” portion of
15 the GBC standard that includes information such as billing history, account numbers,
16 etc. GBC implementations should be certified as compliant with the latest version of the
17 standard every two years. Finally, the implementation of GBC should be harmonized
18 across New Hampshire. This means that a third party can receive information through a
19 single API regardless of which utility is providing the data, and also that a customer

1 served by multiple utilities can grant their authorization once, without having to
2 individually grant authorizations at each utility that serves them.

3 **Q. WHAT DO YOU MEAN BY “RETAIL CUSTOMER”?**

4 A. That refers to a portion of the GBC standard that captures customer information.
5 Originally, in approximately 2013, GBC included only energy usage data. The Retail
6 Customer schema, based off of the International Electrotechnical Commission’s
7 Common Information Model (“CIM”), is a standard format for capturing customer-
8 specific information such as premise addresses, account numbers, etc. It was officially
9 incorporated into the GBC standard in April, 2019.

10 **Q. WHAT IS CERTIFICATION, AND WHY IS THAT IMPORTANT?**

11 A. Certification is necessary because it helps ensure interoperability between New
12 Hampshire’s electric and gas utilities and third party users of the platform. One of the
13 key lessons learned from California’s and New York’s GBC implementations is that,
14 despite claims by utilities that they follow the GBC standard, the truth is that each one is
15 somewhat unique. Neither PG&E’s, SCE’s, SDG&E’s or Consolidated Edison’s
16 implementations has been certified as compliant by the non-profit Green Button
17 Alliance. The result is that third parties must develop bespoke software for each utility.
18 Although there are similarities among existing GBC platforms, the differences are large
19 enough that third parties incur significant and unnecessary costs in order to

1 accommodate each utility's technical idiosyncrasies. This issue can be largely
2 eliminated by requiring certification.

3 I also note that certification is valuable for the Commission's oversight functions.
4 Instead of relying on a utility's claims – and spending Commission time and resources
5 adjudicating third parties' counter-claims that the GBC platform *doesn't* adhere to the
6 GBC standard – the Commission can efficiently and effectively ensure accountability of
7 the utilities' implementation of GBC by requiring periodic proof of certification.

8 A vibrant, competitive national marketplace for DERs is developing to take
9 advantage of consumers having access to their own energy usage data and the ability
10 to share that data with energy management providers. In the past, many energy
11 efficiency solutions have been implemented in individual utilities' territories to
12 accommodate utilities' idiosyncrasies. With over 3,000 utilities across the country, an
13 approach that focuses on unique solutions for individual utilities results in a balkanized,
14 fragmented market that fails to take advantage of the economies of scale enabled by
15 software and inexpensive computing power. By requiring GBC certification, New
16 Hampshire customers would have access to a broader range of cost-effective DER
17 products and services, simply because the barriers to market entry in New Hampshire
18 would be reduced as a result of standardization.

19 Finally, certification is expressly required by SB 284, which modified RSA 378:53
20 to read:

21 Certification. The platform established under RSA 378:51 shall be
22 certified by the Green Button Alliance and support the Energy Service

1 Provider Interface of the North American Energy Standards Board and the
2 Green Button "Connect My Data" initiative of the Green Button Alliance.

3 **Q. PLEASE FURTHER DESCRIBE YOUR PROPOSAL FOR HARMONIZING THE**
4 **DATA PLATFORM STATE-WIDE.**

5 A. Not only is it important that utilities in New Hampshire adhere to the standard, but
6 it is also important that the information provided (subject to a customer's authorization)
7 is accessible through a single point or API. This ensures that customers in New
8 Hampshire's smaller utilities are not "left out" of the DER market. DER providers incur
9 costs on a per-API basis for managing the ongoing data flow, maintenance,
10 accommodating security or functional updates over time, etc. Three separate GBC
11 APIs, one for each electric utility in New Hampshire, means in practice that many, if not
12 most, DER providers will decline to serve a small customer base that has significant
13 ongoing maintenance costs. A single API server for New Hampshire will solve this
14 problem of accessibility by ensuring one "point of entry" state-wide. Note that the
15 underlying customer data need not be transferred from each utility and stored
16 separately in a centralized repository; rather, the API provides a "gateway" into the
17 customer data that is already stored and maintained by each utility individually, even if it
18 appears from the third party's point of view that the customer data is centralized.

19 Also, it is important to have a streamlined and consistent authorization
20 experience state-wide, one in which customers can grant an authorization at their utility
21 in a single transaction instead of multiple transactions, and one in which Eversource's
22 customer experience is consistent with Liberty's and Unitil's. One of the other lessons

1 learned from energy data-sharing systems is that the customer experience of granting
2 an authorization must be simple, streamlined, and made available to customers in a
3 manner in which they are familiar. The Smart Meter Texas (“SMT”) platform
4 experienced this problem directly. In Texas, consumers are familiar with their retail
5 energy provider (“REP”) because they receive monthly bills from REPs. Many
6 consumers have already established online accounts at their REP’s website.³²
7 However, REPs’ websites were not integrated with SMT, and so it was impossible for a
8 customer to authorize data-sharing from a REP’s website. Instead, consumers needed
9 to be educated about creating another account – along with username and password --
10 at www.smartmetertexas.com in order to authorize data-sharing. Consumers were not
11 familiar with SMT and did not trust SMT because they had never interacted with it
12 before, unlike their REP. This, combined with other user experience problems that I
13 address more fully below, resulted in slow consumer uptake at SMT. In New
14 Hampshire, if a customer is served by one electric utility and a second gas utility, he or
15 she would be able to complete a single authorization on *either* utility’s website and have
16 his or her electricity and natural gas information transferred to a third party. Not only is
17 this more convenient, but it would, for example, enable providers of electric heat pumps
18 to quickly assess a customer’s cost-saving potential across both fuels.

19 For the reasons stated above, I propose that the JUNH offer a single, “virtual”
20 API for third parties to receive customer data, regardless of the utility from which it

³² The JUNH estimate that 20%-30% of customers “participate in electronic billing,” which may be a similar to the percentage of customers with online accounts. Footnote #4 *infra*.

1 originates. I also propose that the JUNH offer a single authorization capability for
2 customers who are served by multiple utilities. I note my proposal is consistent with the
3 JUNH’s “virtualization” proposal given at the May 28, 2020 Technical Session, as well
4 as the Office of the Consumer Advocate’s (“OCA”) use case CORE-06, “Statewide
5 Index.”³³ I further note that my proposals are consistent with SB 284, which requires the
6 Commission to require the statewide, multi-use, energy data platform to “adhere to a
7 common statewide logical data model that defines the relationships among the various
8 categories of data included in the platform” (RSA 378:51(I)(d)) and to consider
9 “standards for...integrity and uniformity of the logical data model” (RSA 378:51(II)(b)).

10 **Q. IS GREEN BUTTON CONNECT MY DATA CONSISTENT WITH NEW**
11 **HAMPSHIRE LAW?**

12 A. Yes. Although I am not a lawyer, I note that GBC requires consent of the
13 customer prior to divulging any customer-specific information. Therefore, GBC complies
14 with RSA 363:38(I), which states:

15 No service provider shall: (a) Share, disclose, or otherwise make
16 accessible to any third party a customer's individual customer data, except
17 as provided in paragraph V ***or upon the express consent of the***
18 ***customer*** [emphasis added].

19 If a utility does not receive consent of the customer, then under RSA 363:38 utilities
20 may only use customer information for a “primary purpose,” which includes providing

³³ Office of the Consumer Advocate, *Master Use Case: SB284 As A Centralized Platform – Phase 1*. April 3, 2020 at 27-30.

1 electric or gas service, meeting system or operational needs, or developing new tariffs
2 or programs. These limitations on the use of customer information for a “primary
3 purpose” would not apply to GBC because the utility receives the express consent of
4 the customer.

5 Furthermore, I note that GBC’s consent-driven structure satisfies SB 284, which
6 modified RSA 378:51 to require that the data-sharing platform “Allow for sharing of
7 individual customer data consistent with the opt-in requirements for third-party access
8 specified in RSA 363:38.”

9

10 **C. #3: ELIGIBILITY CRITERIA OF THIRD PARTIES**

11 **Q. PLEASE DESCRIBE PROPOSAL #3 REGARDING ELIGIBILITY CRITERIA.**

12 A. Cybersecurity and customer privacy are extremely important. One of the first
13 consumer protections I propose is a set of eligibility criteria for third party DERs who
14 wish to use the state-wide platform. It is important that these eligibility criteria be
15 reasonable, objectively evaluated, and non-discriminatory, for reasons I explain below.
16 The eligibility requirements I propose address SB 284, specifically RSA 378:52(II),
17 which reads:

18 Utilities shall... (II) Require, as a condition of accessing the online energy
19 data platform, that a third party complete a qualification and registration
20 process to ensure that any customer data downloaded from the platform
21 remains in a safe, secure environment according to data privacy
22 standards established by the commission.

1 **Q. WHAT ARE THE ELIGIBILITY CRITERIA YOU PROPOSE?**

2 A. I propose that third parties must: (1) provide their contact information to the
3 JUNH, including federal tax identification number; (2) demonstrate technical
4 interoperability with the platform; (3) accept certain terms and conditions, as described
5 below, including adherence to the U.S. Department of Energy's DataGuard privacy
6 standard ("DataGuard"); and (4) not be on the Commission's list of "banned" or
7 prohibited third parties.

8 **Q. ARE THESE REQUIREMENTS SIMILAR TO OTHER STATES'**
9 **REQUIREMENTS?**

10 A. Yes. They are modeled after rules in California, which underwent a
11 comprehensive proceeding on this topic in 2012-2013.³⁴ I added one requirement on top
12 of California's: that third parties must adhere to the DataGuard standard.

13 **Q. WHAT IS DATAGUARD?**

14 A. DataGuard is a privacy standard developed by the U.S. Department of Energy,
15 with input from electric utilities and other stakeholders. DataGuard incorporates privacy
16 and security requirements in five areas: (1) customer notice and awareness; (2)
17 customer choice and consent; (3) how a customer can access and correct data about
18 them; (4) data integrity and security, including a cyber security risk management
19 program; and (5) requirements for enforcement and redress. It is enforceable by the

³⁴ California Decision. Footnote 14 *infra*.

1 Federal Trade Commission, which has the authority to sanction firms for
2 misrepresenting their privacy practices and procedures, which constitutes a “deceptive
3 and misleading trade practice.”

4 **Q. WHY DO YOU PROPOSE THAT THIRD PARTIES MUST BECOME**
5 **SIGNATORIES TO DATAGUARD?**

6 A. Because DataGuard provides a thoughtful, comprehensive, enforceable standard
7 for third parties to maintain the privacy and security of data they receive from utilities. It
8 is a reasonable balance between, on one hand, having no privacy requirements of third
9 parties, and having excessive requirements on the other.

10 **Q. DO YOU PROPOSE A FINANCIAL ELIGIBILITY REQUIREMENT?**

11 A. No. SB 284 requires the Commission to consider “financial security standards or
12 other mechanisms to assure compliance with privacy standards by third parties,” but I
13 do not believe financial requirements – such as posting a surety bond – are necessary.

14 **Q. WHY IS THAT?**

15 A. There are several reasons. First, no other jurisdiction in the U.S. has required a
16 financial security of a third party recipient of customer energy data. While bonding is
17 relatively common for retail electric suppliers and wholesale market participants, it has
18 never been required of firms who receive customer energy data. New Hampshire would
19 be out of step among the states in this respect.

1 Second, I believe that the punishment of being “banned” from the state of New
2 Hampshire is sufficient to coerce third parties from violating customers’ privacy. Being
3 banned from a state is a “death sentence” for an energy management company.
4 California has had their policy in place for nearly seven years, and it has worked well.
5 To my knowledge no third party has been banned in California, indicating that the threat
6 of termination is an effective deterrent.

7 Third, an onerous financial security requirement might not be effective, because
8 it would likely encourage credential-sharing. Why would a third party incur a cost – i.e.,
9 satisfying a financial commitment – when it could simply evade that requirement
10 altogether by asking for the customer’s username and password to the utility’s website
11 instead?

12

13 **D. #4: TERMS OF USE**

14 **Q. PLEASE DESCRIBE PROPOSAL #4 REGARDING TERMS OF USE.**

15 A. There can and should be terms of use between the JUNH and a third party user
16 of the platform. In addition to incorporating DataGuard, as described above, into these
17 terms of use, I propose that the Commission, in its final order in this docket, create a
18 new proceeding to establish binding terms of use. These terms of use should meet the
19 following requirements. They should (1) be reasonable and appropriate, balancing the
20 interests of third parties using the platform and customer privacy and security; (2) be
21 open and non-discriminatory, meaning that any third party agreeing to the terms and

1 conditions is entitled to receive customer data upon customer consent; (3) permit third
2 parties to use information technology (“IT”) vendors to interact with the platform on their
3 platform; and (4) should not be changed or modified by utilities unless ordered by the
4 Commission.

5 **Q. WHY DO YOU PROPOSE A NEW PROCEEDING?**

6 A. Experience from other states, such as California, Illinois and New York, is that
7 the lack of direction from those state commissions regarding the terms of use led to
8 those state’s utilities introducing terms without commission oversight that were unfair,
9 onerous or in conflict with commission orders. It is not adequate for the Commission to
10 merely order that a data-sharing platform be built; the Commission must also dictate the
11 *terms* under which that platform is used by third parties. Failure of the Commission to
12 specify these terms will likely result in delays, unnecessary litigation and business
13 uncertainty for third parties that will significantly dampen utilization of the platform from
14 the beginning.

15 In California, for example, the commission approved tariffed services for each
16 utility’s GBC platform. However, despite terms and conditions being codified in the
17 tariffs, each utility then introduced their own terms and conditions, on top of the tariff,
18 without commission approval. These terms and conditions require third parties to
19 divulge sensitive and proprietary business information to utilities without good cause;
20 permit utilities to unilaterally modify the terms at any time and without notice; and even
21 permit utilities to terminate a third party’s access at the whim of a utility without cause, in

1 clear conflict with commission orders. One California utility quietly imposed new terms
2 for all third parties over the Christmas holiday in 2019, with third parties coming back
3 from vacation to discover that they were now subject to new terms that, among things,
4 required an unlimited indemnity of the utility, even if the utility had acted negligently. The
5 California utilities' extrajudicial GBC terms and conditions are currently being
6 investigated by commission staff.

7 In Illinois, Commonwealth Edison ("ComEd") also has a tariffed service for its
8 GBC platform. However, ComEd then required, without commission approval, third
9 parties to sign a non-disclosure agreement. The non-disclosure agreement was overly
10 strict and conflicted with the applicable tariff because it prevented third parties from
11 using a contracted IT vendor to interact with the utility's GBC platform on the third
12 party's behalf. Strict non-disclosure agreements can contravene the intentions of
13 customers by prohibiting the sharing of information with third parties who use IT
14 outsourcing, regardless of whether the third party and IT vendor have reasonable
15 safeguards against privacy and security breaches.³⁵

16 In New York, several years after the commission required GBC, the utilities
17 unilaterally imposed a 15+ page set of terms and conditions on third parties. The terms,
18 which conflicted with commission orders, imposed anti-competitive provisions such as
19 prohibiting third parties from making "derivations" of data, essentially hand-cuffing third

³⁵ Mission:data addressed the issue of overly-restrictive non-disclosure agreements in *Scoping Comments of Mission:data Coalition*. Docket No. DE 19-197, March 11, 2020 at 16-17.

1 parties in the development of innovative data-driven energy management solutions.³⁶
2 After two years of litigation, the terms and conditions were eventually modified and
3 approved by the commission.³⁷

4 **Q. WHAT DO YOU MEAN BY “OPEN AND NON-DISCRIMINATORY”?**

5 A. I mean that the Commission should approve terms that make the platform usable
6 by any entity that meets the requirements, and that utilities are prohibited from treating
7 third parties differently. For example, non-discrimination would prevent a utility from
8 providing “full” access to the platform to one entity, while “crippling” its functionality for
9 another entity, simply because the latter entity was viewed as a competitor to the
10 monopoly utility or, perhaps, had criticized the utility in a public venue. This
11 discriminatory practice is known as “crippling” and has occurred in the technology sector
12 before.

13 **Q. WHY DO YOU PROPOSE A PROHIBITION ON UTILITIES UNILATERALLY**
14 **MODIFYING THE TERMS AND CONDITIONS?**

15 A. In my experience, if utilities are permitted to invent their own terms and
16 conditions or to modify them at any time, such modifications have been one-sided,
17 unbalanced and unnecessarily harmful to third party DERs. In my view, the Commission

³⁶ *Response of Mission:data Coalition to the Commission’s February 20, 2019 Notice Soliciting Comments.* New York Public Service Commission. Docket Nos. 18-M-0376, 18-M-0084, 16-M-0411 and 15-M-0180. April 30, 2019 at 12-13.

³⁷ *Order Establishing Minimum Cybersecurity and Privacy Protections and Making Other Findings.* New York Public Service Commission. Docket No. 18-M-0376. October 17, 2019.

1 should not ignore the terms and conditions, because doing so amounts to an unjust
2 delegation of the Commission's authority to utilities, who will not benignly serve the
3 greater public interest without meaningful oversight. Just as the Commission defines the
4 boundaries of monopoly services in telecommunications, or specifies under what
5 conditions a rooftop solar array may interconnect with the distribution grid, the
6 Commission must similarly define the terms of "digital interconnection" as between
7 monopoly utilities and third parties accessing the platform.

8

9 **E. #5: AUTHORIZATION LANGUAGE AND FORMAT**

10 **Q. PLEASE DESCRIBE PROPOSAL #5 REGARDING AUTHORIZATION**
11 **LANGUAGE AND FORMAT.**

12 A. "Authorization language and format" refer to what is presented to the customer at
13 the time of granting an authorization to share his or her energy-related information.
14 Based on lessons learned from California and other jurisdictions, I propose a
15 standardized authorization language and format that provides an important consumer
16 protection and is consistent across New Hampshire. Specifically, I propose that the
17 JUNH submit to the Commission for approval authorization "screens" that: (i) succinctly
18 describe the information to be shared; (ii) display the third party's name and the purpose
19 for which it seeks customer information; (iii) use icons and clickable links in order to hide
20 larger blocks of text from the initial presentation, while making larger blocks of text
21 accessible should a customer want to learn more; and (iv) are consistent with the

1 examples below. Parties should have the opportunity to comment on the JUNH's
2 submission. I also propose that the Commission, upon approving the JUNH's proposed
3 authorization "screens," enter a finding that the JUNH's proposed authorization
4 language and format satisfies RSA 363:38 Section I (a)'s requirement for obtaining
5 "express consent" of the customer.

6

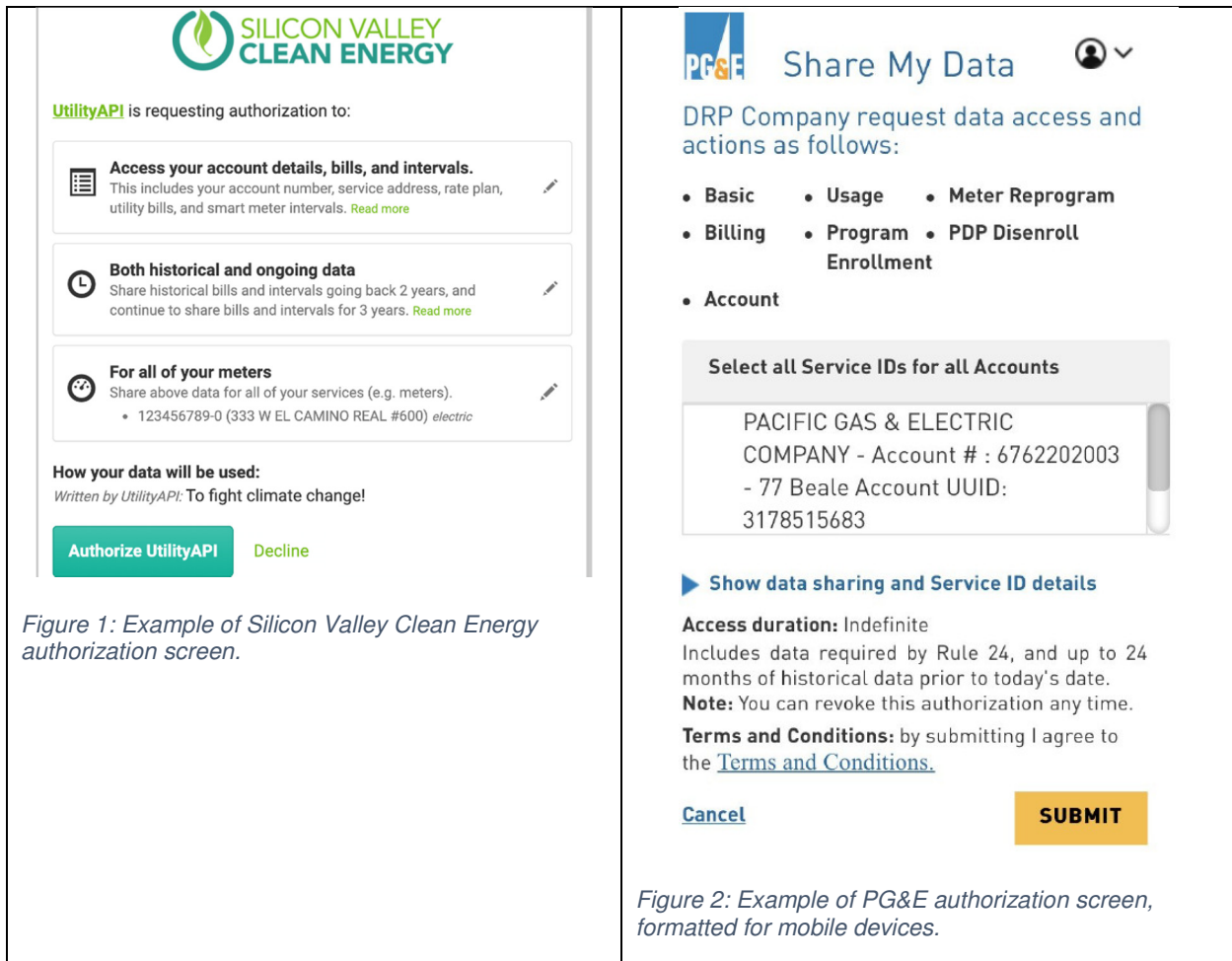


Figure 1: Example of Silicon Valley Clean Energy authorization screen.

Figure 2: Example of PG&E authorization screen, formatted for mobile devices.

7

1 **Q. WHY DO YOU MAKE THIS PROPOSAL?**

2 A. In my experience, other state commissions have focused somewhat myopically
3 on a data authorization “form,” which is envisaged as a piece of paper. Since regulatory
4 attorneys and commissions are familiar with paper forms, but are, generally speaking,
5 less familiar with online authorization processes, commission approvals of paper
6 authorization forms have tended to cause numerous downstream problems when
7 attempting to make the paper form electronic – i.e., to appear on the utility’s web page.
8 For example, a web-based authorization, such as the one I propose, involves
9 separating the authentication process (i.e., identity verification) from the authorization,
10 whereas a paper form combines the two. Forcing a paper form into a web-based
11 context makes the website difficult for customers to use and requires customers to input
12 unnecessary information. Utilities in California were very reluctant to make
13 commonsense user experience improvements to a web page that originated as a paper
14 authorization form for fear that departure from the “look” and “feel” of a commission-
15 approved paper form introduces legal liabilities.

16 My objective in proposing an authorization language and format is to ensure that the
17 customer is informed, the customer freely makes a choice to proceed with an
18 authorization, and that the authorization process in New Hampshire is consistent with
19 best practices on the web. For example, iconography and layering of information should
20 be used to make the authorization quickly understood by customers without resorting
21 solely to comprehension of “legalistic” language, and the authorization experience

1 should be optimized for devices of different size, including tablets and mobile phones,
2 as further described below.

3 Finally, it is important for the Commission to ultimately enter a finding that the
4 JUNH's authorization language and format comply with RSA 363:38 Section I(a)
5 because legal certainty for the JUNH is critical to providing a user-friendly interface that
6 meets customers' digital expectations. The lack of legal certainty for the JUNH could
7 easily lead to poor outcomes for the platform.

8 **F. #6: STREAMLINED USER EXPERIENCE**

9 **Q. WHY IS A STREAMLINED USER EXPERIENCE IMPORTANT?**

10 A. A poor user experience has been an "Achilles heel" in other jurisdictions that
11 pursued data-sharing platforms. California and Texas both struggled for several years
12 with poor user experiences that inhibited the utilization of their data-sharing platforms. In
13 California, making energy information electronically accessible, convenient, and
14 "portable" to third party energy management firms has been a saga that began in 2009
15 and has only recently begun to address poor customer experiences. Specifically,
16 arguments over what constitutes a legally enforceable electronic signature of a
17 customer on a data-sharing authorization form led to several years of inferior customer
18 experiences as utilities tried to make their websites as similar to a hardcopy paper form
19 as possible.³⁸ Ultimately, the California commission ordered a streamlined, "click-

³⁸ See, e.g., *Opening Brief of Comverge, Inc., Cpower, EnerNOC, Inc., EnergyHub, and Johnson Controls, Inc. on Phase Two Intermediate Implementation Step*. California Public

1 through” website authorization process in which electronic signatures are accepted and
2 “the click-through process shall begin and end on the third-party demand response
3 provider’s website.”³⁹ California also ordered a stakeholder group to develop detailed
4 technical recommendations and best practices for the authorization process, some of
5 which have been implemented by California utilities.⁴⁰ By failing to address user
6 experience from the beginning, California experienced many years of delayed benefits
7 to consumers, unnecessary litigation, and additional costs associated with re-building IT
8 systems.

9 Similarly, in Texas, user experience guidelines were not established up front for
10 SMT. As a result, the authorization experience required customers to complete an
11 onerous 10-step process that was more akin to rolling over a 401(k) than executing a
12 simple online transaction.⁴¹

13 The negative impacts of a poor customer experience are neither minor nor
14 hypothetical. The demand response firm EnergyHub quantified the impact of

Utilities Commission, Application A14-06-001 et al. April 1, 2016 at 6-9. Available at
<https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M161/K671/161671282.PDF>.

³⁹ California Public Utilities Commission. Ordering Paragraph 1 of Decision D.16-06-008 dated
June 6, 2016. Available at
<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M163/K294/163294060.PDF>.

⁴⁰ California Public Utilities Commission. *Status Report Ordered by the Assigned
Commissioner’s Office During Discussions at the October 5, 2017 Click-Through Workshop*.
October 12, 2016, filed in Application Nos. 14-06-001, 14-06-002 and 14-06-003.

⁴¹ SPEER. *Comments of the Southcentral Partnership for Energy Efficiency as a Resource in
Response to a Request for Comment on Questions Filed in Project 46204*. Public Utility
Commission of Texas. Project No. 46204, March 27, 2017 at 5. Available at
http://interchange.puc.texas.gov/Documents/46204_16_934223.PDF.

1 streamlining the online process for customers signing up for their service. EnergyHub
2 found dramatically different rates of consumer participation– 3% vs. 42% – among
3 eligible customers when the enrollment forms were electronic, dramatically simplified
4 and consumers could instantly sign up.⁴² EnergyHub and other innovative companies
5 rely on a streamlined process for their customers to share energy usage data, as well
6 as to enroll in certain utility programs. Usability considerations can impact customer
7 utilization rates by literally an order of magnitude.

8 In my experience as a software entrepreneur, it is easy for any IT manager to be
9 overwhelmed by technical requirements and implementation challenges in a large-scale
10 project and lose sight of the end customer’s experience. The frequent results are all too
11 familiar: hard-to-use online forms, unnecessary additional steps to complete a task, etc.
12 User experience considerations are paramount because the benefits from GBC won’t
13 be realized if customers can’t easily interact with the system and authorize the third
14 party service provider of their choice. I note that Amazon.com is famous for its “1 click”
15 purchase button – the ultimate in simplicity. Customers are more likely to follow through
16 with an online transaction – whether buying a product from an online retailer, or an
17 energy management service – if the fewest number of “clicks” is required. This lesson of
18 simplicity should be taken to heart so that the maximum amount of users can take
19 advantage of new technological offerings.

⁴² *Optimizing the demand response program enrollment process*. White paper by EnergyHub, Inc. dated April, 2016. Available at <https://www.energyhub.com/optimizing-demand-response-enrollment>.

1 **Q. PLEASE DESCRIBE YOUR PROPOSAL FOR A STREAMLINED USER**
2 **EXPERIENCE.**

3 A. The JUNH should provide a streamlined online sharing process that (1) adheres
4 to OAuth 2.0 and best practices; (2) requires the minimum number of “clicks” of a
5 customer; (3) supports alternative methods of authenticating customers who do not
6 have, or do not want, an online account with the utility; and (4) is no more onerous for
7 customers than the process a utility requires for a similar online transaction. My
8 proposal ensures the resulting platform in New Hampshire will “provide a user-friendly
9 interface,” as required by RSA 378:51(I)(c), which was modified by SB 284.

10 **Q. WHAT IS OAUTH 2.0?**

11 A. OAuth 2.0 is a standard incorporated into the GBC standard that enables a
12 customer to use their online credentials for one service to securely grant authorization
13 to another. It is used widely on the internet by firms such as Microsoft, Facebook,
14 Google, Twitter, PayPal, and many others.

15 **Q. WHAT ARE OAUTH 2.0 BEST PRACTICES?**

16 A. One is to make the authorization web page a single “screen,” with the contents
17 concisely summarized as shown in Figures 1 and 2 above. Another is to permit third
18 parties to specify a “scope” of authorization that they require. Authorization scope refers
19 to the types of customer data and time periods presented to the customer. A third party
20 might, for example, require at least 12 months of historical usage data in order to run its

1 algorithms that identify wasted energy during heating and cooling cycles. Therefore,
2 giving a customer the ability to change the historical period from 12 months to 1 month
3 would render the product inoperable.

4 **Q. WHAT DO YOU MEAN BY “REQUIRE THE MINIMUM NUMBER OF ‘CLICKS’**
5 **OF THE CUSTOMER”?**

6 A. I mean that the customer should not be directed through a maze of web pages
7 requiring entry of unnecessary information such as customer name, address, account
8 number, etc. and other information the utility already knows. Once a customer has
9 authenticated their identity on the utility’s website – a process I discuss further below –
10 the customer should be able to simply click “authorize” and complete the transaction
11 with a single mouse click.

12 **Q. WHAT DO YOU PROPOSE REGARDING AUTHENTICATION?**

13 A. Authentication is the online process of establishing that a customer is who they
14 claim to be. I propose that utilities support alternative methods of authenticating
15 customers for those who do not have, or do not want, an online utility account. In this
16 scenario, the utility can ask for the customer account number and other identifying
17 information. But the customer would not have to create an online account, which is a
18 barrier for many people who already have hundreds of online accounts for different
19 services and do not wish to create new ones. See the example below. Customers can

1 sign in if they have already created a username and password, or they can login on a
2 “one time access” basis.

The screenshot shows a login interface with two main options: "SIGN IN" and "ONE TIME ACCESS". The "ONE TIME ACCESS" option is highlighted in blue. Below this, there are radio buttons for "Residential" (selected) and "Business". The "Residential" path includes fields for "ACCOUNT NUMBER" (with a hint: "Enter a valid 11-digit account number [e.g., 1234567890-2]"), "LAST 4 DIGITS OF SOCIAL SECURITY NUMBER", and a "SIGN IN" button. The "Business" path is separated by a horizontal line with "OR" in the center and includes fields for "LAST NAME" (with a hint: "Do not include apostrophes, hyphens or special characters."), "ZIP CODE OF SERVICE ADDRESS", and "LAST 4 DIGITS OF SOCIAL SECURITY NUMBER".

3

4

Table 2: Example of "alternate authentication" from PG&E.

5 **Q. WHY IS AN ALTERNATE METHOD OF AUTHENTICATION IMPORTANT?**

6 A. Barriers associated with not having an online account, and customers being disinclined
7 to create one, have been obstacles in other jurisdictions to customers enacting their right to
8 share their information with a non-utility entity.⁴³

⁴³ Footnote 37 *infra* at 9.

1 **Q. PLEASE DESCRIBE YOUR LAST PROPOSAL.**

2 A. I propose the Commission adopt a “no more onerous” standard for GBC
3 authorization processes in New Hampshire. What this means is that utilities are
4 forbidden from making a data-sharing authorization process more onerous than that of a
5 similar transaction on the utility’s website. Experience from California was that one utility
6 made it exceptionally easy for customers to pay their bills online with a minimum
7 number of steps, but took the opposite approach to sharing customer data and created
8 a labyrinthine maze. This asymmetry manifested itself in multiple unnecessary
9 webpages and personal information that had to be entered for no legitimate purpose.
10 Litigation in California led to the establishment of the “no more onerous” requirement in
11 2017.⁴⁴

12 **G. #7: TOOLS AND INFORMATION FOR THIRD PARTIES**

13 **Q. PLEASE DESCRIBE PROPOSAL #7 REGARDING TOOLS AND**
14 **INFORMATION FOR THIRD PARTIES.**

15 A. I propose that the utilities be required to provide (1) an online technical support
16 ticketing system for third parties who have questions or detect errors in the platform; (2)
17 a testing environment and a production environment to assist with on-boarding third

⁴⁴ California Public Utilities Commission. *Resolution E-4868*. Issued August 25, 2017, Ordering Paragraph 2 at 98. Available at <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M194/K746/194746364.PDF>.

1 parties; (3) publicly-available, web-based methods for third parties to register and to
2 provide thorough technical documentation, including API samples, updated at least
3 monthly; and (4) the ability for a third party to register multiple times with the JUNH to
4 accommodate different products or services from the same entity.

5 **Q. WHY IS AN ONLINE TECHNICAL SUPPORT TICKETING SYSTEM**
6 **IMPORTANT?**

7 A. In my experience, utilities in California, Illinois and New York began offering GBC
8 without any kind of technical support system, resulting in excessive delays in registering
9 third parties and resolving technical issues. Several third parties have reported to me
10 that they felt as though they were “guinea pigs” in using these utilities’ untested GBC
11 platforms that were prone to bugs, glitches and defects.⁴⁵ Furthermore, attempting to
12 resolve these issues with a utility strictly by email was difficult due to utility non-
13 responsiveness and the lack of traceability for each reported issue. Rather than denying
14 that any technical problems will ever exist – an unrealistic claim for any IT system –
15 New Hampshire utilities should *expect* technical issues to occur and should institute a
16 plan and process for resolving those issues efficiently. An online ticketing system,
17 coupled with prompt responses from utilities, will ensure at the outset that the platform
18 is positioned for successful use by third party DER providers.

⁴⁵ See, e.g., *Energy Data Portability: Assessing Utility Performance and Preventing ‘Evil Nudges.’* Mission:data Coalition. January, 2019. Available at <http://www.missiondata.io/s/Energy-Data-Portability.pdf>.

1 **Q. WHY IS A TESTING ENVIRONMENT AND PRODUCTION ENVIRONMENT**
2 **FOR THIRD PARTIES IMPORTANT?**

3 A. A testing environment is a fully-functional IT system that is a replica of the real,
4 “production” GBC platform, except the testing environment does not contain actual
5 customer data. A testing environment allows third parties to develop and test their
6 software applications in a safe, contained environment prior to using the production
7 system. The utilities should provide a testing environment because it is an expected and
8 necessary practice associated with any IT platform that is used by third parties.

9 **Q. WHY IS PUBLICLY-AVAILABLE DOCUMENTATION AND THIRD PARTY**
10 **REGISTRATION IMPORTANT?**

11 A. The GBC platform will be more accessible and useful to third parties if they can
12 determine the technical and business requirements on a publicly-available website,
13 rather than having to inquire with a utility. Software developers expect documentation to
14 be online because that is the practice of all major technology platforms, such as PayPal,
15 Google, Microsoft, etc.

16 **Q. WHY IS IT IMPORTANT FOR A THIRD PARTY TO BE ABLE TO REGISTER**
17 **MULTIPLE TIMES WITH THE JUNH?**

18 A. A third party may want to provide multiple products or services, each with their
19 own requirements to which a customer must agree. For example, one firm may offer a
20 residential energy management product and a commercial building demand response

1 product, each of which is marketed differently. The best way to accommodate
2 substantially different product offerings is with multiple registrations. Of course, the
3 utilities and the Commission can still track such an entity, and take enforcement actions
4 against such an entity, because they share a common tax identification number.

5

6 **H. #8: REVOCATION OF A DATA-SHARING AUTHORIZATION**

7 **Q. PLEASE DEFINE REVOCATION.**

8 A. Revocation refers to ending a data-sharing authorization for a particular
9 customer. It should not be confused with “third party termination,” by which I refer to the
10 termination of a third party’s registration with the JUNH, ending all authorizations
11 pertaining to that third party. I discuss termination in Section I below.

12 **Q. PLEASE DESCRIBE PROPOSAL #8 REGARDING REVOCATION.**

13 A. My proposal contains three parts: (1) Any customer should be able to quickly and
14 easily view, manage and revoke their authorizations at any time on a utility’s website;
15 (2) A third party may revoke an authorization, such as cases in which the third party
16 discontinues a product or service; and (3) A utility may not revoke any authorization
17 except by order of the Commission.

1 **Q. WHY ARE THESE ELEMENTS IMPORTANT?**

2 A. First, it is important to put customers in full control of their data by giving them the
3 power to revoke access at any time. Many customers are familiar with these type of
4 revocation methods on various websites, for example sharing Google calendars with
5 friends or family, or logging into PayPal to discontinue a recurring payment.

6 Second, it is important for a third party to be able to revoke an authorization in
7 situations where a customer is unreachable or unresponsive, or the third party wishes to
8 discontinue a product or service. This issue first arose in California where more than
9 100,000 households are sharing their energy usage data with a competitive demand
10 response provider. Demand response providers needed the ability to revoke an
11 authorization if the customer was no longer providing demand response but was also
12 not responding to requests to log in to the utility's website and revoke the authorization
13 himself or herself. Product sunset scenarios also make it wise for third parties to have
14 the ability to revoke.

15 Third, a utility should not be permitted to unilaterally revoke an authorization. If a
16 utility were able to revoke an authorization, there is no guarantee that a third party
17 would be afforded due process prior to losing access to a customer's information. This
18 could be extremely costly and disruptive to DER providers who have contracted with a
19 customer to provide an energy management service. If a customer were providing
20 demand response ("DR") services to the wholesale market, for example, an arbitrary
21 disruption by the utility could endanger financial settlement, causing harm to both the
22 DR provider and the customer. Granting utilities the ability to revoke authorizations for

1 any reason is akin to establishing a policy of “shoot first, ask questions later.” The result
2 would be a high risk of business interruption and potential contractual violations with
3 customers and/or ISO-New England. For this reason, utilities should be prohibited from
4 revoking authorizations except under a Commission’s order.

5

6 **I. #9: ENFORCEMENT**

7 **Q. PLEASE DESCRIBE PROPOSAL #9 REGARDING ENFORCEMENT.**

8 A. My proposal for enforcement against “bad actors” using the GBC platform is as
9 follows. A utility may submit a complaint to the Commission alleging that a third party
10 breached customer privacy or the law in some manner, provided that the utility (i) has a
11 reasonable suspicion of wrongdoing by the third party and (ii) provides simultaneous
12 notice to the third party. Commission Staff (“Staff”) will then have a 21-day period to
13 gather information and decide upon a remedy, including, but not limited to, revocation of
14 authorizations granted by the affected customer, a suspension of all data transmission
15 for all customers, or permanent placement on a Commission-maintained list of ineligible
16 third parties. Staff may, at its discretion, grant additional 21-day extensions. During this
17 21-day period (and any extensions), the utility will continue to transmit customer
18 information as authorized by the customer. If the matter is not resolved during this
19 period, a utility may petition the Commission to move the third party to the list of
20 ineligible data recipients. The utilities will continue transmission of data until

1 Commission action resolves the matter. If a utility acts in this way, it bears no liability for
2 misuse of customer energy information by the third party.

3 **Q. WHAT IS THE BASIS OF YOUR PROPOSAL?**

4 A. I am proposing the substance of California's approach to enforcement because
5 California has perhaps the most thorough enforcement policy of any state, whereas
6 other jurisdictions have not formalized their policies. Following the enactment of Senate
7 Bill 17 (Padilla) in 2009 and Senate Bill 1476 (Padilla) in 2010, the California
8 commission undertook one of the most comprehensive rulemakings on privacy in the
9 country. Decision D.11-07-056 (2011) established thoughtful and detailed privacy
10 requirements on energy-related data for utilities and customer-authorized third parties of
11 all types. Subsequently, the California Decision outlined an enforcement process based
12 upon over a year of discussions and reports by utilities, DERs, consumer advocates and
13 privacy advocates. I believe it represents an ideal balance between utilities' concerns
14 over their liability, privacy concerns of consumers, and due process rights for third
15 parties.

16 Specifically, the California proposal takes termination of a third party's access out
17 of the utilities' hands and gives it to the Commission. This is a critical feature because,
18 in my experience, utilities are incentivized to limit their liability by shutting off access to a
19 third party at the slightest hint of potential wrongdoing, no matter how speculative or
20 unfounded an allegation may be. This "trigger-happy" behavior would necessarily result
21 in poor outcomes for ratepayers because few third parties would be willing to invest the

1 time and resources to use the GBC platform in New Hampshire if access could be
2 withdrawn at the proverbial drop of a hat. Moreover, removing a utility's right to
3 terminate a third party prevents utilities from engaging in anti-competitive or
4 discriminatory behavior against third parties. It is appropriate for the Commission to take
5 steps to prevent anti-competitive behavior in the utilities' operation of the GBC platform
6 because discriminatory treatment is becoming common among digital platform
7 operators in other sectors.⁴⁶ My proposal ensures that "bad actors" may be punished by
8 being made ineligible to receive any data from a Commission-regulated utility in New
9 Hampshire. At the same time, it ensures that third parties have due process rights
10 before the Commission prior to any termination, preventing the utilities from becoming
11 "judge, jury and executioner" to a third party who may be falsely accused of violating
12 customer privacy.

13 **Q. DOES YOUR ENFORCEMENT PROPOSAL REQUIRE THE COMMISSION TO**
14 **HAVE JURISDICTION OVER THIRD PARTIES?**

15 A. No. Although I am not a lawyer, I have experience with many states considering
16 their jurisdiction over third parties that receive customer energy information from utilities.
17 Some state commissions, like New York's, do have jurisdiction over third parties; some

⁴⁶ See, e.g., Congressional hearings on July 29, 2020, in which Representatives Lucy McBath (D-GA) and Val Butler Demings (D-FL) questioned Apple CEO Tim Cook about Apple's controversial move to remove certain apps from its app store. Apple quietly reinstated certain apps after news broke that federal officials were stepping up antitrust scrutiny on Apple. "Apple Backs Off Crackdown on Parental-Control Apps." *New York Times*. June 3, 2019. Available at <https://www.nytimes.com/2019/06/03/technology/apple-parental-control-apps.html>.

1 clearly do not; and for many it is unclear. The eligibility criteria for third parties I have
2 proposed, along with the process for removing a third party from the list of eligible data
3 recipients, are Commission directives *to utilities*. Requiring a utility to provide
4 information, or stop providing information, to a third party does not in my view require
5 Commission jurisdiction over third parties.
6

7 **J. #10: ACCOUNTABILITY OF PLATFORM OPERATIONS**

8 **Q. PLEASE DESCRIBE PROPOSAL #9 REGARDING ACCOUNTABILITY.**

9 A. I propose that the JUNH be held accountable for operating the GBC platform at a
10 high level of performance, according to certain metrics. Traditionally, accountability of
11 investor-owned utilities is addressed through prudence review and the threat of cost
12 disallowance. However, prudence review during rate cases introduces delays of several
13 years between when an imprudent act occurs and when the punishment is doled out.
14 Such delays are inherently problematic for online platforms, where a failure to function
15 properly for a few days or weeks could be disastrous; prudence review one or two years
16 after such an event occurs is too long a cycle for cost disallowance to be an optimal or
17 effective coercive device. I propose a new approach to digital platform regulation with
18 continuous, publicly-accessible, web-based reporting of certain performance metrics,
19 coupled with a service level agreement (“SLA”) by which the JUNH contractually

1 guarantees the availability and performance of the GBC platform according to
2 reasonable, industry-standard metrics.

3 **Q. WHY IS CONTINUOUS, WEB-BASED REPORTING OF PERFORMANCE**
4 **METRICS IMPORTANT?**

5 A. First, it is normal and expected in the technology industry that digital platform
6 operators will continuously report on their “uptime” – the percentage of time that a
7 platform is online and fully functional. Uptime is a common metric of online platform
8 availability.

9 Second, continuous reporting is important because poor performance with no
10 reporting was a lesson learned from other jurisdictions. In Texas, for instance, when
11 third party access functionality was first released in April, 2015, SMT inexplicably went
12 offline for a period of two weeks, with no accountability.⁴⁷ It was difficult for parties, and
13 the commission, to assess SMT’s uptime because, at the time, SMT’s operators did not
14 provide any metrics. The Texas commission later approved monthly reporting metrics.
15 In California, I previously described how poor performance and a lack of operational
16 metrics led the commission requiring the state’s utilities with GBC platforms to report
17 ongoing performance on a publicly-accessible website. The California commission
18 reasoned that “A webpage or dashboard would allow the Commission, members of the

⁴⁷ *Comments of the Mission:data Coalition in Response to Staff’s Request for Comments Regarding the Smart Meter Texas Web Portal Dated March 21st, 2016*. Public Utility Commission of Texas, Docket No. 42786. April 1, 2016.

1 public, and third-party demand response providers to effectively monitor the
2 performance” of the utilities’ data-sharing platforms.⁴⁸

3 Second, there are other metrics besides uptime that are important in assessing
4 overall performance. I propose the following:

- 5 • Number of customers and web page views
- 6 • Number and type of errors generated
- 7 • Data delivery times (in seconds) – how long does it take after an authorization is
8 received by the utilities to initiate transfer of the requested information?
- 9 • Web page loading times (in milliseconds)

10 The above metrics should be viewable and sortable on a publicly-available website by
11 time period, customer screen size and browser type so that a third party can easily
12 diagnose problems.

13 **Q. WHAT IS A SERVICE LEVEL AGREEMENT?**

14 A. A service level agreement is a contractual guarantee from an online platform
15 provider that ensures a high level of performance. SLAs frequently cover uptime, defect
16 acknowledgment times and defect resolution times.

⁴⁸ California Public Utilities Commission. *Resolution E-4868*. Issued August 25, 2017 at 56.
Available at
<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M194/K746/194746364.PDF>.

1 **Q. WHAT COMPONENTS OF A SERVICE LEVEL AGREEMENT DO YOU**
2 **PROPOSE?**

3 A. First, I propose a 99.5% uptime guarantee. Uptime requirements are widely used
4 across the country, according to best practices guides written by IBM,⁴⁹ Microsoft⁵⁰ and
5 Cisco.⁵¹ Uptime should be calculated on a calendar month basis by taking the time the
6 system was fully available divided by the total time over that period. I propose excluding
7 from the uptime calculation scheduled maintenance windows. Scheduled maintenance
8 windows should not exceed 6 hours per month. To be considered a valid scheduled
9 maintenance window, it should be announced with at least seven (7) days notice via
10 email to registered third parties and a publicly-available email listserve, and posted
11 prominently to a publicly-accessible website.

12 Second, I propose timeframes by which utilities will acknowledge and resolve
13 reported bugs or defects in the platform. Using the issue-tracking system I described
14 previously, third parties can submit “tickets” and the utilities should respond within the
15 specified timeframe depending upon the issue’s severity.

16

⁴⁹ *Service Level Agreements on IP Networks*. Proceedings of the IEEE 92(9), October, 2004. Verma, Dinesh C. IBM T. J. Watson Research Center, Yorktown Heights, NY, at 1382-1388.

⁵⁰ *Service Level Management*. Microsoft Solution Accelerator, April 25, 2008. Available at <https://technet.microsoft.com/en-us/library/cc543312.aspx>.

⁵¹ *Service Level Management: Best Practices Whitepaper*. Cisco Systems, Inc., October 4, 2005. Document ID 15117. Available at <https://www.cisco.com/c/en/us/support/docs/availability/high-availability/15117-sla.html>.

<i>Issue severity</i>	<i>Acknowledgment time</i>	<i>Updates</i>	<i>Resolution time</i>
Mild defect (non-critical functionality not available, but a workaround exists)	2 business days	Every 2 business days	5 business days
Moderate defect (some functionality not operable, no workaround exists)	1 business day	Every 1 business day	4 business days
Severe defect (critical functionality not available or operating in a materially degraded manner, no workaround exists)	Same business day	Every 1 business day	2-3 business days

1 *Table 3: Service level agreement parameters regarding defect acknowledgment and resolution times.*

2 Third, I propose that data delivery times – the amount of time between when a
3 customer clicks the “authorize” button and the third party begins receiving data – should
4 be no longer than 90 seconds. This ensures that the GBC platform is just as timely as
5 credential-sharing, thereby eliminating the incentive for third parties to pursue
6 credential-sharing, as I described previously. The California commission determined
7 that “speedy data delivery is necessary to ensure a positive customer experience.”⁵²
8 Data delivery within 90 seconds also ensures that certain “in the moment” use cases
9 are supported, such as instantly getting a price quote for rooftop solar without having to
10 wait several business days for the solar installer to receive the requisite data from the
11 utility.

⁵² Footnote 47 *infra* at 50-51.

1 **Q. WHY DO YOU BELIEVE THESE GUARANTEES ARE APPROPRIATE?**

2 A. In my experience as a software executive, I was routinely required by customers
3 to sign SLAs very similar to the above. It is also routine for utilities to require SLAs of
4 their vendors that provide software or cloud-based services. Given that a non-operable
5 platform cannot provide benefits to New Hampshire ratepayers, I believe these
6 requirements are both reasonable and appropriate.

7

8 **K. #11: UTILITY LIABILITY**

9 **Q. WHY SHOULD UTILITY LIABILITY BE ADDRESSED IN THIS DOCKET?**

10 A. In order for ratepayers to reap the benefits of the platform discussed in this
11 docket, it is critical that the Commission clarify the JUNH's liability under several
12 circumstances. Based on my experience over the past eight years, I believe a GBC
13 platform in New Hampshire will fail to meet its potential if liability topics are not clearly
14 and definitively addressed. For example, much of the recent litigation in New York
15 stemmed from a lack of clarity on liability. This is a theme I stated was very important to
16 resolve in New Hampshire in my February 3, 2020 presentation at the first Technical
17 Conference.

1 **Q. PLEASE DESCRIBE PROPOSAL #11 REGARDING UTILITY LIABILITY.**

2 A. First, utilities operating the platform should be liable for failure to meet
3 expectations around performance, quality and accuracy as I have proposed. Second, a
4 utility should *not* be held liable for the acts of a third party, provided that the utility (i) has
5 operated the GBC platform prudently, including encrypting the data in transit to a third
6 party and (ii) has followed the enforcement procedures described in Section I above.

7 **Q. WHY SHOULD A UTILITY'S LIABILITY BE LIMITED AS YOU DESCRIBE?**

8 A. An important distinction must be made between customer-authorized third parties
9 and *vendors* to a utility. Customer-authorized third parties are at arm's length to a utility,
10 and have no contractual relationship with a utility (other than agreement to the terms
11 and conditions for the GBC platform). Utilities cannot therefore control a third party, and
12 nor should they: It is precisely the innovation that comes from outside the structure of
13 regulated monopolies that this platform seeks to nurture in New Hampshire in order to
14 benefit ratepayers. Making utilities liable for a third party's actions thus puts the utilities
15 in the role of "policeman," which is both undesirable and unworkable.

16 Instead, I propose that a utility should only be liable for a third party's breach of
17 customer privacy if the utility fails to operate its GBC platform securely, fails to encrypt
18 customer data in transit to a customer-authorized third party, or fails to follow the
19 enforcement process outlined previously. Otherwise, I believe a utility should be
20 immunized from legal liability that stem from the acts of a customer-authorized third
21 party.

1 **Q. HAVE OTHER STATES ADOPTED THIS APPROACH TO LIABILITY?**

2 A. Yes. In California, two decisions hold a utility harmless for a customer-authorized
3 third party's acts. First, a 2011 privacy decision states: "After a secure transfer, the
4 electrical corporation shall not be responsible for the security of the covered data or its
5 use or misuse by such third party."⁵³ The commission relied in part on California's
6 consumer advocate, who argued that it is unreasonable for utilities to be liable for third
7 parties absent a contractual obligation.⁵⁴ The commission reasoned that:

8 ...other third parties may acquire consumption data (1) from the utility via
9 the "backhaul" with the consumer's authorization and pursuant to tariff
10 conditions...In these situations, In these situations, the utility is not liable
11 for the third party's use of the usage data since the usage data is not
12 provided to the third party pursuant to a contractual arrangement with the
13 utility. (This limitation on liability does not apply when a utility has acted
14 recklessly.) In these situations, the Commission will rely on a combination
15 of Commission oversight and customer education and vigilance to ensure
16 the proper treatment of the data.⁵⁵
17

18 Second, the California Decision from 2013 further refined the situations in which a utility
19 is deemed to have acted "recklessly":

20 ...[I]f a utility reasonably suspects that a third party has violated the
21 Commission's privacy rules, it will be absolved of liability under its tariffs if
22 it continues to transmit data to the authorized third party provided that the
23 utility expeditiously informs the third party and Commission's Energy

⁵³ California Public Utilities Commission. Decision D.11-07-056, *Decision Adopting Rules to Protect the Privacy and Security of the Electric Usage Data of the Customers of Pacific Gas & Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company*. July 29, 2011. Exhibit D at 9.

⁵⁴ *Id.* at 77.

⁵⁵ *Id.* at 35.

1 Division with a notice of the suspected tariff violation along with any
2 information regarding possible wrongdoing and that the utility seeks to
3 resolve the suspected tariff violations with the third party...A utility who acts
4 in this fashion will be deemed not to have made a reckless transmission of
5 data...Following this procedure absolves the utility of liability concerning the
6 continued transmission of data, ensures that the customer receives
7 empowering information, and enables the Commission to respond to
8 alleged misuses of customer information in a prompt fashion.⁵⁶
9

10 In Texas, the commission approved terms and conditions between the utilities
11 and customers. Those terms immunize the utilities from claims of damages, losses or
12 liability by customers relating to the acts of a customer-authorized third party.⁵⁷
13

14 **L. #12: GOVERNANCE AND CHANGE MANAGEMENT**

15 **Q. WHAT DO YOU PROPOSE WITH REGARD TO GOVERNANCE AND**
16 **CHANGE MANAGEMENT?**

17 A. In order for the GBC platform to improve over time and keep pace with
18 technological changes, I propose that the Commission appoint a Data Platform
19 Committee (“Committee”) comprised of two utility representatives, two DER
20 representatives, and one representative from the Office of the Consumer Advocate
21 (“OCA”). The Committee’s responsibilities are to (i) review and attempt to resolve

⁵⁶ *Id.* at 51-52.

⁵⁷ Public Utility Commission of Texas. Docket No. 47472, *Commission Staff’s Petition to Determine Requirements for Smart Meter Texas*. Exhibit DRH-SD-1 at 7-8, as approved by the PUCT April 12, 2018.

1 outstanding support tickets from the issue-tracking system; (ii) refine and approve
2 change requests, which may be submitted by any Committee member, so long as the
3 costs of implementing Committee-approved change requests shall not exceed \$250,000
4 per year. Committee-approved change requests will receive a presumption of prudence
5 in each utility's next rate case. Change requests must be for *bona fide* changes or
6 improvements to functionality or user experience, and may not include security updates
7 or other regularly-occurring or expected operations, whose costs are to be considered
8 part of the basic operation of the platform and recoverable through rates, as I explained
9 previously. The Committee will make decisions by majority vote following Roberts Rules
10 of Order, with minutes and change request forms publicly posted on the Commission's
11 website. Committee decisions may be appealed by any party at the Commission, which
12 will review the decision *de novo*.

13 **Q. WHAT REASONS DO YOU HAVE FOR YOUR PROPOSED CHANGE**
14 **REQUEST PROCESS?**

15 A. The change request processes in California and Texas have flaws that I have
16 sought to correct with my proposal. In California, a commission-approved "customer
17 data access committee" was asked to discuss and refine proposals to improve the
18 customer experience, but this committee lacked authority to approve any changes to the
19 utilities' platforms. As a result, the California committee could not accomplish very
20 much, and it was an inefficient use of stakeholders' time because the same topics are
21 now being litigated in formal proceedings before the California commission, rendering

1 the committee ineffective and its activities duplicative of formal proceedings. For new
2 Hampshire, granting the Committee certain powers to approve changes and
3 improvements to the platform, within a budget cap of \$250,000 per year, balances in a
4 more efficient manner the need to continuously improve the platform as technology
5 changes with the activities of Commission oversight.

6 In Texas, the utilities operating SMT followed two practices that became
7 problematic. The first was that any stakeholder was permitted to submit a change
8 request, leading to a large volume of requests, some of which were impractical and not
9 adequately thought through. The result was an extremely time-consuming and
10 unfocused review of each request, some of which were limited to providing benefits to a
11 particular third party and not to the state as a whole. By limiting change requests in New
12 Hampshire to those proposed by Committee members only, my proposal encourages
13 individual Committee members to fully vet and refine change requests prior to proposal
14 before the Committee, and ensures that proposed change requests provide value to
15 many platform users.

16 Second, there wasn't a defined budget for ongoing change requests in Texas. At
17 first, the Texas utilities approved change requests under the belief they would be
18 afforded cost recovery. But then the utilities reversed their policy arbitrarily and abruptly,
19 bringing all improvements to a halt. Some of these improvements were very important to
20 third parties, such as user experience improvements. My proposal eliminates the
21 capriciousness and uncertainty of platform improvement seen in Texas by giving the
22 Committee authority to approve change requests within a certain budget amount.

1 **Q. WHY DO YOU PROPOSE A CAP OF \$250,000 PER YEAR?**

2 A. In order to balance the Commission's responsibility to diligently review the
3 prudence of all costs incurred by utilities with the fact that software platforms must
4 continuously improve in order to meet technological changes and consumers' digital
5 expectations, I believe it is necessary to set an annual budget threshold under which
6 JUNH's expenditures will be presumed prudent. It is simply not practical to initiate year-
7 long administrative proceedings for relatively minor improvements. Furthermore, all
8 software products need continuous attention; making it very difficult for the JUNH to
9 receive cost recovery for normal and expected improvements over time would doom the
10 platform to failure. I believe \$250,000 is a reasonable balance of ratepayers' financial
11 concerns with the practical realities of continuously managing a successful software
12 platform.

13

14 **M. #13: COST RECOVERY AND PERFORMANCE INCENTIVES**

15 **Q. WHAT DO YOU PROPOSE FOR COST RECOVERY?**

16 A. I propose that prudently-incurred costs for administering the GBC platform should
17 be recovered from all ratepayers, and that the cost charged to customers or third parties
18 for each use of the GBC platform should be zero.

1 **Q. WHY DO YOU RECOMMEND THAT?**

2 A. First, no other jurisdiction to my knowledge charges a per-use fee for accessing a
3 data-sharing platform. State commissions in California, Colorado, Illinois, New York and
4 Texas have all determined that utilities' costs of administering customer energy data
5 sharing systems should be socialized.⁵⁸ Second, I think it is wise public policy to
6 encourage the DER market to develop in New Hampshire by not charging per-use fees.
7 And third, if the Commission were to approve charging customers or third parties a per-
8 use fee instead of socializing the costs, it would be very difficult to determine a
9 reasonable fee given that utilization rates of the platform are unknown. The fee would
10 be subject to significant fluctuations as utilization changes over time, creating business
11 uncertainty for third parties. Fourth, I note that the JUNH stated their preference for
12 recovering costs in rates across all customers, rather than in per-use fees.⁵⁹
13 For these reasons, I believe charging per-use fees would be impractical and that the
14 best approach is to collect prudently-incurred costs in rates across all customers.

⁵⁸ I am aware that some jurisdictions, such as New York, permit utilities to charge a reasonable fee for certain *aggregations* of customer data where manual effort is required to analyze or process the request. However, there is no charge for use of GBC systems in New York.

⁵⁹ Docket No. DE 19-197. *Docket Scoping Comments of Public Service Company of New Hampshire d/b/a/ Eversource Energy; Unitil Energy Systems, Inc.; and Granite State Electric Corp. d/b/a/ Liberty Utilities*. March 11, 2020 at 9.

1 **Q. WHAT DO YOU PROPOSE FOR PERFORMANCE INCENTIVES?**

2 A. I propose that the JUNH should be eligible to receive an annual performance
3 incentive of up to 25% of the GBC platform's first year costs as measured on a
4 composite of the following metrics:

- 5 1. The number of completed data-sharing authorizations
- 6 2. Time elapsed for a random sample of customers to complete a data-sharing
7 authorization with a third party
- 8 3. Average and maximum data delivery time (seconds) following customer
9 authorization (searchable timeframe)
- 10 4. GBC system availability (uptime)
- 11 5. Number and type of errors generated, if any
- 12 6. Number and type of issues raised by third parties and customers, including
13 severity, mean and max acknowledgment time, and mean and max resolution
14 time
- 15 7. Number of complaints received from third parties, including type and severity
- 16 8. Number of customers with one-time and ongoing data-sharing authorizations
- 17 9. Time to complete third party technical and administrative onboarding

18 **Q. WHAT IS THE BASIS FOR THE PERFORMANCE INCENTIVE YOU**
19 **PROPOSE?**

20 A. First, experience from other jurisdictions is that utilities' existing incentives –
21 namely, capital bias – often work against the objectives of a continuously-improving
22 software platform. Additional capital expenses do not necessarily improve software
23 platforms; and, conversely, certain operating expenses may be necessary to achieve
24 positive outcomes, such as technical support, but which utilities tend to minimize. The

1 performance incentive I propose attempts to neutralize existing incentives to the extent
2 they are perverse and direct the utilities toward measurable outcomes strongly
3 correlated with successful operation of the platform.

4 Second, performance incentives are one mechanism to eliminate a gap between
5 software deployment and software utilization. While “deployment” traditionally marks the
6 beginning of cost recovery for utilities and often the end of a utility’s risk exposure,
7 “utilization” refers to the full value of a software project being realized, something which
8 usually occurs over time and not at once. Unlike a power plant, a software platform
9 does not have a single switch to indicate whether or not it is being used. New
10 Hampshire’s compensation method should adjust for this reality. In a recent report, the
11 Regulatory Assistance Project (“RAP”) described how traditional cost-of-service
12 regulation is insufficient in tying cost recovery to specific outcomes of software
13 deployment.⁶⁰ My proposal is consistent with RAP’s recommendations by ensuring the
14 deployment of the GBC platform is not a binary event, but an ongoing process of
15 improvement.
16

⁶⁰ Littell, David *et al.* Regulatory Assistance Project. *Protecting Customers from Utility Information System and Technology Failures*. September, 2019. Available at <https://www.raponline.org/knowledge-center/protecting-customers-from-utility-information-system-and-technology-failures/>.

1 **N. #14: AGGREGATED DATA**

2 **Q. HOW DO YOU DEFINE AGGREGATED DATA?**

3 A. There are several definitions. The first refers to a sum of energy used across a
4 number of customers over a certain time period – for example, annual energy usage by
5 zip code, or monthly energy usage in a particular commercial building. Another
6 definition refers to statistics derived from a group of customers.

7 **Q. WHAT DO YOU PROPOSE WITH REGARD TO AGGREGATED DATA?**

8 A. My proposal has several parts: (1) Data aggregation standards should be use
9 case specific, should evolve over time, and should be based on a mathematically
10 rigorous framework; (2) New Hampshire’s Energy Efficiency and Sustainable Energy
11 Board (“EESE Board”) should convene experts and advise the Commission on
12 recommendations for aggregated data privacy standards; and (3) for the purposes of
13 EnergyStar benchmarking of commercial buildings, the “4/80” standard should be used.

14 **Q. PLEASE EXPLAIN YOUR FIRST PROPOSAL.**

15 A. Data aggregation standards aim to balance individual privacy with the public
16 interest associated with analyzing energy data for societal benefit. There is, however,
17 not a single envisioned use of aggregated energy data; in fact, there are multiple “use
18 cases.” For example, aggregated usage by zip code or within municipal boundaries
19 could be used by community power authorities (“CPAs”); whole-building energy usage
20 could be used for EnergyStar benchmarking; and so forth. Standards for aggregated

1 data are not “one size fits all”: a single aggregation standard for the state of New
2 Hampshire would, in some cases, be too protective of privacy and analytically
3 worthless, while too revealing of individual customers in others. So the first part of my
4 proposal is that aggregation standards should be specific to each use case. I discuss a
5 specific use case – EnergyStar benchmarking – below.

6 Second, aggregation standards should evolve over time and should be based on
7 a mathematically rigorous framework. Recent advances in statistical methods have led
8 to new approaches that better balance privacy with the public interest. “Differential
9 privacy” is an emerging best practice in which varying amounts of “noise” are added to
10 aggregated statistics in order to mask any one individual’s contribution. For example,
11 the U.S. Census releases aggregated data about the U.S. population according to
12 certain geographic areas known as “census blocks.” In a recent privacy assessment,
13 the U.S. Census found that, in some census blocks, it was possible to re-identify as
14 many as 46% of individual respondents’ race, ethnicity, sex and age. Simply adjusting
15 aggregation parameters was found to be insufficient to protect privacy, and differential
16 privacy was chosen as the core privacy technology for the 2020 decennial census.⁶¹

⁶¹ Abowd, J.M. *Staring Down the Database Reconstruction Theorem*. American Association for the Advancement of Science Annual Meeting. Available at <https://www2.census.gov/programs-surveys/decennial/2020/resources/presentations-publications/2019-02-16-abowd-db-reconstruction.pdf>.

1 Other applications of differential privacy include Google’s and Facebook’s analysis of
2 detailed location data in tracking COVID-19 infections.⁶²

3 Approaches to “masking” individual data in an aggregated dataset must evolve
4 over time as re-identification methodologies improve. In differential privacy, masking
5 can be increased or decreased by setting a value for epsilon (ϵ), which is used in the
6 mathematical determination of the probability of individual disclosure. A high value for
7 epsilon means that the dataset is more revealing (because less noise has been added);
8 conversely, a low value for epsilon means greater privacy, but resulting analysis is less
9 useful. Re-assessing epsilon values periodically for different use cases is both valuable
10 and necessary because a single, universal, unchangeable aggregation threshold for
11 New Hampshire – such as a minimum number of customers for aggregations – can be
12 appropriate in some use cases but not others. For example, the “15/15” rule is used in
13 some states as an aggregation standard in which the usage of at least 15 customers
14 must be combined, and no single customer may compromise greater than 15% of the
15 total usage. The 15/15 rule may be appropriate for monthly or annual energy usage
16 totals, but a recent analysis demonstrated that 15/15 fails to protect individual privacy
17 when analyzing smart meter data for weekly timescales, even with much larger
18 aggregations than 15.⁶³ Furthermore, I am not aware of any mathematical evaluation of

⁶² See <https://www.google.com/covid19/mobility/> and <https://research.fb.com/blog/2020/06/protecting-privacy-in-facebook-mobility-data-during-the-covid-19-response/>.

⁶³ Scheer, Adam et al. *The Impacts of COVID-19 on Energy Usage in MCE’s Territory: Implications for Policies and Programs*. Report by Recurve prepared for Marin Clean Energy. July, 2020.

1 the 15/15 rule as to its merits, and I suspect its adoption in several jurisdictions is due
2 more to its apparent simplicity and comprehensibility than to its empirical merits. For
3 these reasons, the public release of different aggregated datasets should be tailored to
4 the particulars of the use case; mathematically analyzed; and revisited over time as
5 circumstances change.

6 **Q. PLEASE EXPLAIN YOUR SECOND PROPOSAL.**

7 A. I propose that the EESE Board should convene experts and advise the
8 Commission on data aggregation standards over time. I also propose that the EESE
9 Board and the Commission should consider engaging with a national body that is
10 refining use cases, recommending privacy thresholds (i.e., epsilon values), and
11 ensuring ongoing mathematical evaluation as circumstances change. For example, the
12 U.S. Department of Energy’s National Renewable Energy Laboratory (“NREL”) recently
13 funded a project known as the Energy Data Vault (“EDV”), which has develop
14 differential privacy algorithms.⁶⁴ The EESE Board and the Commission should consider
15 learning from and aligning the state’s aggregation policies with this work.

16 **Q. PLEASE EXPLAIN YOUR THIRD PROPOSAL.**

17 A. For the limited purpose of EnergyStar benchmarking of commercial buildings, I
18 propose that the “4/80” standard should be used. This means there must be four or
19 more meters summed together, with no single meter comprising more than 80% of the

⁶⁴ See <https://www.energy.gov/eere/buildings/energy-data-vault>.

1 total. The requester must be a property owner or valid utility accountholder to one or
2 more of the meters whose aggregation is sought. To be clear, I propose that the 4/80
3 standard be applied *only* to monthly usage data for commercial buildings for the express
4 purpose of EnergyStar benchmarking. The 4/80 standard should not be a universal
5 dictum for all scenarios.

6 **IV. CONCLUSION**

7 **Q. WHAT IS YOUR CONCLUSION?**

8 A. Across the U.S., several other state commissions have required utilities to
9 implement data-sharing platforms of various types. My objective has been to help
10 ensure that New Hampshire does not needlessly replicate many of the mistakes that
11 have been in other jurisdictions.

12 My proposals are intended to incorporate the best practices from other states as
13 much as possible. Toward that end, the Commission should appreciate that creating a
14 GBC platform in New Hampshire is not a single issue; in fact, it involves 14 discrete
15 topics, each of which must be addressed. Failure to address one of these 14 issues will
16 create downstream problems that can be avoided.

17 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

18 A. Yes.

19