August 17, 2020

Via Email

Ms. Debra A. Howland
Executive Director
New Hampshire Public Utilities Commission
21 South Fruit Street, Suite 10
Concord, New Hampshire 03301
ExecutiveDirector@puc.nh.gov

Re: Docket No. DE 19-197,
Direct Testimony of Michael Murray on Behalf of Mission:data Coalition

Please find enclosed the Direct Testimony of Michael Murray on Behalf of Mission:data Coalition in the above-referenced docket.

Pursuant to the Commission's emergency directive relating to the ongoing pandemic, cover letter and testimony are being filed in electronic form only, and no hard copies are being submitted.

Respectfully submitted,

_____/s/_____

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cc: Parties to Docket No. DE 19-197

BEFORE THE NEW HAMPSHIRE
PUBLIC UTILITIES COMMISSION

DOCKET NO. DE 19-197

DEVELOPMENT OF A STATEWIDE, MULTI-USE ONLINE ENERGY DATA PLATFORM

DIRECT TESTIMONY OF

MICHAEL MURRAY

ON BEHALF OF MISSION:DATA COALITION

August 17, 2020

TABLE OF CONTENTS

I. INTRODUCTION

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

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

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

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

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

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

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

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

A. Yes, it is.

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

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

Q. ON WHOSE BEHALF ARE YOU FILING THIS TESTIMONY?

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

Q. WHAT IS THE MISSION:DATA COALITION?

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

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

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

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

II. BACKGROUND & CONTEXT

A. NATION-WIDE MOVEMENT TOWARD DATA PORTABILITY

Q. WHAT IS DATA PORTABILITY?

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

Q. IN WHAT SECTORS IS DATA PORTABILITY BEING ADOPTED?

A. Data portability is being adopted in the U.S. and around the world in sectors including banking, healthcare, social media and energy. In the U.S., several federal and state laws promote data portability. For example, in banking, the Gramm-Leach-Bliley Act promotes the sharing of personal financial information among banks upon the request of a customer. In healthcare, the Health Insurance Portability and Accountability Act similarly enables the sharing of medical information between healthcare providers and insurance companies. In social media, the Data Transfer Project is an initiative led by Google, Facebook, Microsoft, Twitter and Apple to allow individuals to move their online data between different platforms, without the need for users to download and re-upload data. In addition, several bills are being discussed on Capitol Hill that would enhance data portability, such as the Augmenting Compatibility and Competition by Enabling Service Switching (ACCESS) Act[1] and the Access to Consumer Energy Information Act (E-Access).[2]

In the utility sector, data portability has been mandated in five (5) states: California, Colorado, Illinois, New York and Texas. It is enabled by the standard known 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).

Q. WHAT IS GREEN BUTTON CONNECT MY DATA?

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

With GBC, a utility provides an application programming interface ("API") for machine-to-machine communication that third party developers of energy management software can, with customer authorization, automatically and securely retrieve energy data. These authorizations are valid for an agreed upon time and can be revoked at any time by the consumer. The data received can then be accessed and analyzed by the 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.

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

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

Q. WHAT IS GREEN BUTTON DOWNLOAD MY DATA?

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

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

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

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

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

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

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

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

Q. WHAT IS "CREDENTIAL-SHARING"?

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

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

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

Q. WHAT IS YOUR VIEW ON CREDENTIAL-SHARING?

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

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

B. DIGITAL PLATFORM REGULATION

Q. WHAT IS DIGITAL PLATFORM REGULATION?

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

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

terms of use.[5] New laws such as Europe's General Data Protection Regulation ("GDPR"), Australia's Consumer Data Right ("CDR"), and California's Consumer Privacy Act ("CCPA") all attempt to incorporate many of these elements, as do the aforementioned bills recently introduced in Congress.

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

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

After presenting cost-benefit analyses below, I make fourteen (14) specific proposals. The first ten proposals are based upon our report, "Energy Data: Unlocking 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/.

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

III. COST-BENEFIT ANALYSIS

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

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

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

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

Q. WHAT BENEFITS WERE ESTIMATED IN THOSE JURISDICTIONS?

A. Three jurisdictions estimated benefits. AEP Ohio estimated 1.1% to 2.5% energy savings,[7] and Duke Energy estimated 1% to 5% energy savings.[8] Perhaps the most detailed analysis of benefits was done for the Ontario, Canada government by Dunsky Energy Consulting in 2017. It estimated 2% to 10% electricity and natural gas savings for residential customers who participated in data-driven energy savings offerings, and 2% to 10% electricity and natural gas savings for non-residential customers participating in an energy savings offering.[9] The adoption of energy savings offerings enabled by 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 Dunsky Energy Consulting. October, 2017 at 30. Available at https://www.ontarioenergyreport.ca/pdfs/Green%20Button%20Cost-Benefit%20Analysis%20Report%20FINAL.PDF

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

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

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

A. Since 2012, some utilities have developed GBC systems, or systems similar to GBC, and their actual costs are reported below. Others have developed cost estimates for similar data-sharing IT systems but have not yet implemented them: Duke Energy, in 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.

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

	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

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 Meeeting 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.

Q. PLEASE EXPLAIN AEP OHIO'S COST ESTIMATE.

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

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

Q. PLEASE EXPLAIN DUKE ENERGY'S COST ESTIMATE.

A. Pursuant to a 2018 North Carolina Utilities Commission order, Duke Energy was 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,

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

Q. PLEASE EXPLAIN XCEL ENERGY'S COST ESTIMATE.

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

2018 at 11. Available at https://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=6168d3c2-b144-42dc-8fc2-1e3079866f67

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

Q. PLEASE EXPLAIN NATIONAL GRID'S COST ESTIMATE.

A. Several orders from New York's Commission have required utilities pursuing advanced metering infrastructure ("AMI") to provide GBC.[23] National Grid's AMI plans have not yet been approved, but the New York Commission subsequently required utilities to "expedite" their GBC implementations, even prior to AMI deployment.[24] National Grid notified the New York Commission it would spend up to $3 million on capital expenses associated with GBC, to be implemented by March 31, 2021.[25]

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

might receive and information necessary for participation in New York Independent System Operator ("NYISO") wholesale markets.[26]

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

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

Q. HOW MUCH WOULD THAT COST?

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

In California, the electric investor-owned utilities were required to post continuously-updated performance metrics of their data-sharing platforms on a website. 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.

time spent to compete an authorization on the utility's website, and how long it takes for data to be delivered after a completed authorization is received. Pacific Gas & Electric's ("PG&E") implementation costs were $430,600;[27] Southern California Edison's ("SCE") were $470,137;[28] and San Diego Gas & Electric's ("SDG&E") were $0.[29] SDG&E's implementation had no cost because SDG&E was already using Google Analytics for its website, and the tool could be easily adapted.

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

In addition, there are numerous web-based issue-tracking systems that are commercially available at a low cost. Providers such as Zendesk, Salesforce and others 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.

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

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

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

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

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

IV. PROPOSAL FOR A STATE-WIDE ENERGY DATA PLATFORM

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

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

A. #1: DATA TYPES

Q. PLEASE DESCRIBE PROPOSAL #1 REGARDING DATA TYPES.

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

[30] Footnote 6 *infra.*

1. Historical energy usage (kWh of electricity and therms of gas) over 24-48 months, at whatever time interval collected by the meter[31]
2. Ongoing energy usage (kWh of electricity and therms of gas), available as quickly as possible after being collected, with the "quality" of reading marked
3. Historical and ongoing line items on bills (and associated quantities) over 24-48 months
4. Account number(s)
5. Meter number(s), if applicable
6. Premise address(es)
7. What rate the customer is on (by meter or premise, if applicable)
8. Any information necessary to determine eligibility for, or participate in, a demand response, energy efficiency or renewable energy program

Q. WHY DO YOU RECOMMEND THIS SET OF INFORMATION?

A. Over the past decade, in my experience as a cleantech entrepreneur, leading Mission:data, and working with our members in the industry, the information above has been shown to be very important to a wide variety of DERs. It has also been the case that the lack of such information in certain utilities' implementations of GBC has led to serious problems. For example, Commonwealth Edison, in Illinois, does not provide #6 (premise addresses) in their GBC system. This has been identified as a blocker for energy management firms serving multi-site commercial customers, because it is 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.

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

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

Q. WHAT DO YOU MEAN BY THE "QUALITY" OF THE ENERGY USAGE READING?

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

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

Q. WHAT DO YOU MEAN BY #8?

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

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

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

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

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

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

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

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

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

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

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

B. #2: STANDARDS AND IMPLEMENTATION ARCHITECTURE

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

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

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

Q. WHAT DO YOU MEAN BY "RETAIL CUSTOMER"?

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

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

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

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

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

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

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

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

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

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

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

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

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

For the reasons stated above, I propose that the JUNH offer a single, "virtual" 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.*

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

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

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

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

If a utility does not receive consent of the customer, then under RSA 363:38 utilities 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.

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

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

C. #3: ELIGIBILITY CRITERIA OF THIRD PARTIES

Q. PLEASE DESCRIBE PROPOSAL #3 REGARDING ELIGIBILITY CRITERIA.

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

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

Q. WHAT ARE THE ELIGIBILITY CRITERIA YOU PROPOSE?

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

Q. ARE THESE REQUIREMENTS SIMILAR TO OTHER STATES' REQUIREMENTS?

A. Yes. They are modeled after rules in California, which underwent a comprehensive proceeding on this topic in 2012-2013.[34] I added one requirement on top of California's: that third parties must adhere to the DataGuard standard.

Q. WHAT IS DATAGUARD?

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

[34] California Decision. Footnote 14 *infra.*

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

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

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

Q. DO YOU PROPOSE A FINANCIAL ELIGIBILITY REQURIEMENT?

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

Q. WHY IS THAT?

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

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

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

D. #4: TERMS OF USE

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

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

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

Q. WHY DO YOU PROPOSE A NEW PROCEEDING?

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

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

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

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

In New York, several years after the commission required GBC, the utilities unilaterally imposed a 15+ page set of terms and conditions on third parties. The terms, which conflicted with commission orders, imposed anti-competitive provisions such as 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.

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

Q. WHAT DO YOU MEAN BY "OPEN AND NON-DISCRIMINATORY"?

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

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

A. In my experience, if utilities are permitted to invent their own terms and conditions or to modify them at any time, such modifications have been one-sided, 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.

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

E. #5: AUTHORIZATION LANGUAGE AND FORMAT

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

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

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

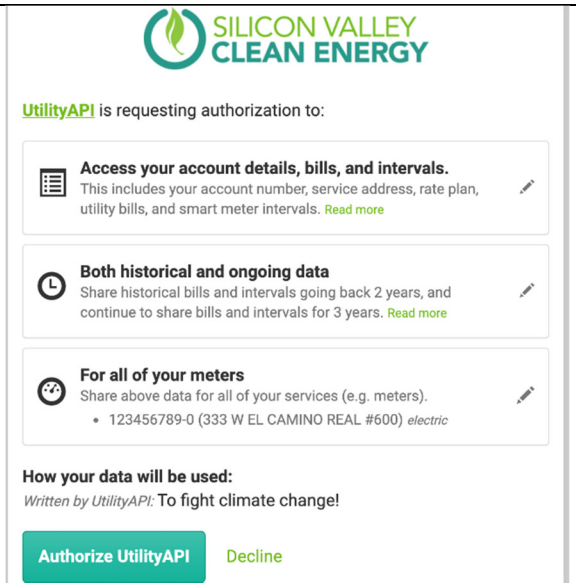

Figure 1: Example of Silicon Valley Clean Energy authorization screen.

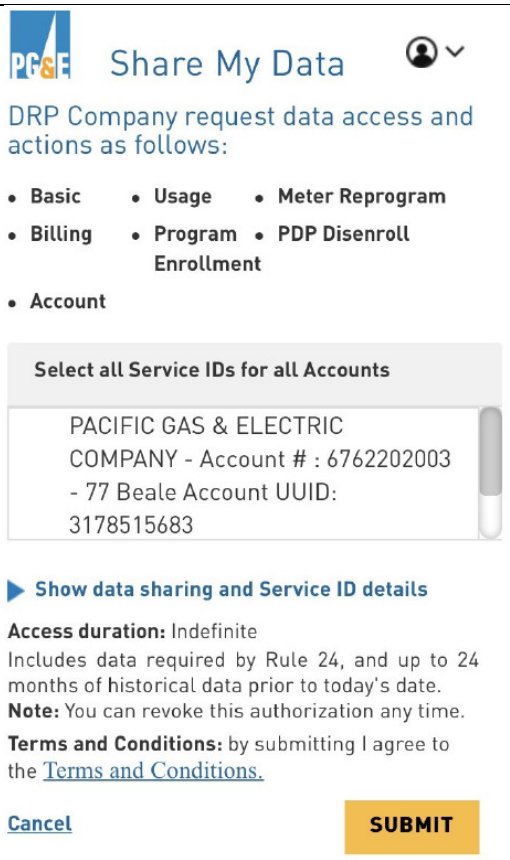

Figure 2: Example of PG&E authorization screen, formatted for mobile devices.

Q. WHY DO YOU MAKE THIS PROPOSAL?

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

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

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

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

F. #6: STREAMLINED USER EXPERIENCE

Q. WHY IS A STREAMLINED USER EXPERIENCE IMPORTANT?

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

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

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

The negative impacts of a poor customer experience are neither minor nor 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.

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

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

Q. PLEASE DESCRIBE YOUR PROPOSAL FOR A STREAMLINED USER EXPERIENCE.

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

Q. WHAT IS OAUTH 2.0?

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

Q. WHAT ARE OAUTH 2.0 BEST PRACTICES?

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

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

Q. WHAT DO YOU MEAN BY "REQUIRE THE MINIMUM NUMBER OF 'CLICKS' OF THE CUSTOMER"?

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

Q. WHAT DO YOU PROPOSE REGARDING AUTHENTICATION?

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

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

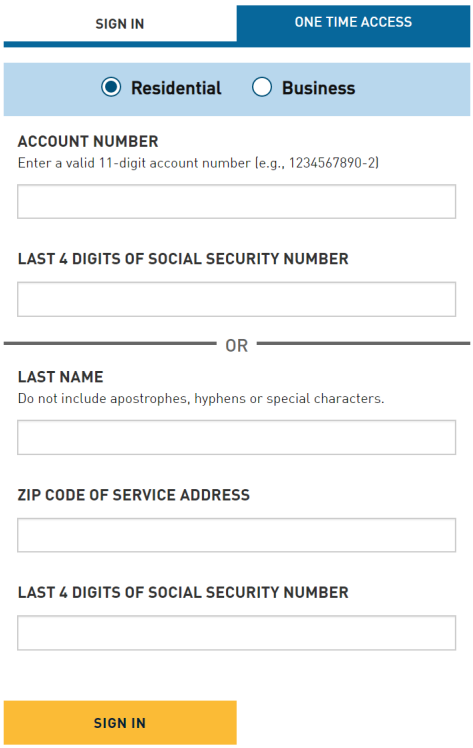

Table 2: Example of "alternate authentication" from PG&E.

Q. WHY IS AN ALTERNATE METHOD OF AUTHENTICATION IMPORTANT?

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

[43] Footnote 37 *infra* at 9.

Q. PLEASE DESCRIBE YOUR LAST PROPOSAL.

A. I propose the Commission adopt a "no more onerous" standard for GBC authorization processes in New Hampshire. What this means is that utilities are forbidden from making a data-sharing authorization process more onerous than that of a similar transaction on the utility's website. Experience from California was that one utility made it exceptionally easy for customers to pay their bills online with a minimum number of steps, but took the opposite approach to sharing customer data and created a labyrinthine maze. This asymmetry manifested itself in multiple unnecessary webpages and personal information that had to be entered for no legitimate purpose. Litigation in California led to the establishment of the "no more onerous" requirement in 2017.[44]

G. #7: TOOLS AND INFORMATION FOR THIRD PARTIES

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

A. I propose that the utilities be required to provide (1) an online technical support ticketing system for third parties who have questions or detect errors in the platform; (2) 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.

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

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

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

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

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

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

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

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

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

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

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

Q. PLEASE DEFINE REVOCATION.

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

Q. PLEASE DESCRIBE PROPOSAL #8 REGARDING REVOCATION.

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

Q. WHY ARE THESE ELEMENTS IMPORTANT?

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

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

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

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

I. #9: ENFORCEMENT

Q. PLEASE DESCRIBE PROPOSAL #9 REGARDING ENFORCEMENT.

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

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

Q. WHAT IS THE BASIS OF YOUR PROPOSAL?

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

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

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

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

A. No. Although I am not a lawyer, I have experience with many states considering their jurisdiction over third parties that receive customer energy information from utilities. 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.

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

J. #10: ACCOUNTABILITY OF PLATFORM OPERATIONS

Q. PLEASE DESCRIBE PROPOSAL #9 REGARDING ACCOUNTABILITY.

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

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

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

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

Second, continuous reporting is important because poor performance with no reporting was a lesson learned from other jurisdictions. In Texas, for instance, when third party access functionality was first released in April, 2015, SMT inexplicably went offline for a period of two weeks, with no accountability.[47] It was difficult for parties, and the commission, to assess SMT's uptime because, at the time, SMT's operators did not provide any metrics. The Texas commission later approved monthly reporting metrics. In California, I previously described how poor performance and a lack of operational metrics led the commission requiring the state's utilities with GBC platforms to report ongoing performance on a publicly-accessible website. The California commission 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.

public, and third-party demand response providers to effectively monitor the performance" of the utilities' data-sharing platforms.[48]

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

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

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

Q. WHAT IS A SERVICE LEVEL AGREEMENT?

A. A service level agreement is a contractual guarantee from an online platform provider that ensures a high level of performance. SLAs frequently cover uptime, defect 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.

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

A. First, I propose a 99.5% uptime guarantee. Uptime requirements are widely used across the country, according to best practices guides written by IBM,[49] Microsoft[50] and Cisco.[51] Uptime should be calculated on a calendar month basis by taking the time the system was fully available divided by the total time over that period. I propose excluding from the uptime calculation scheduled maintenance windows. Scheduled maintenance windows should not exceed 6 hours per month. To be considered a valid scheduled maintenance window, it should be announced with at least seven (7) days notice via email to registered third parties and a publicly-available email listserve, and posted prominently to a publicly-accessible website.

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

[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.

Issue severity	*Acknowledgment time*	*Updates*	*Resolution time*
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

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

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

[52] Footnote 47 *infra* at 50-51.

Q. WHY DO YOU BELIEVE THESE GUARANTEES ARE APPROPRIATE?

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

K. #11: UTILITY LIABILITY

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

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

Q. PLEASE DESCRIBE PROPOSAL #11 REGARDING UTILITY LIABILITY.

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

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

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

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

Q. HAVE OTHER STATES ADOPTED THIS APPROACH TO LIABILITY?

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

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

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

> …[I]f a utility reasonably suspects that a third party has violated the Commission's privacy rules, it will be absolved of liability under its tariffs if it continues to transmit data to the authorized third party provided that the 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.

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

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

L. #12: GOVERNANCE AND CHANGE MANAGEMENT

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

A. In order for the GBC platform to improve over time and keep pace with technological changes, I propose that the Commission appoint a Data Platform Committee ("Committee") comprised of two utility representatives, two DER representatives, and one representative from the Office of the Consumer Advocate ("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.

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

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

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

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

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

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

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

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

M. #13: COST RECOVERY AND PERFORMANCE INCENTIVES

Q. WHAT DO YOU PROPOSE FOR COST RECOVERY?

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

Q. WHY DO YOU RECOMMEND THAT?

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

Q. WHAT DO YOU PROPOSE FOR PERFORMANCE INCENTIVES?

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

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

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

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

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

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

[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/.

N. #14: AGGREGATED DATA

Q. HOW DO YOU DEFINE AGGREGATED DATA?

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

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

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

Q. PLEASE EXPLAIN YOUR FIRST PROPOSAL.

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

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

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

Other applications of differential privacy include Google's and Facebook's analysis of detailed location data in tracking COVID-19 infections.[62]

Approaches to "masking" individual data in an aggregated dataset must evolve over time as re-identification methodologies improve. In differential privacy, masking can be increased or decreased by setting a value for epsilon (ε), which is used in the mathematical determination of the probability of individual disclosure. A high value for epsilon means that the dataset is more revealing (because less noise has been added); conversely, a low value for epsilon means greater privacy, but resulting analysis is less useful. Re-assessing epsilon values periodically for different use cases is both valuable and necessary because a single, universal, unchangeable aggregation threshold for New Hampshire – such as a minimum number of customers for aggregations – can be appropriate in some use cases but not others. For example, the "15/15" rule is used in some states as an aggregation standard in which the usage of at least 15 customers must be combined, and no single customer may compromise greater than 15% of the total usage. The 15/15 rule may be appropriate for monthly or annual energy usage totals, but a recent analysis demonstrated that 15/15 fails to protect individual privacy when analyzing smart meter data for weekly timescales, even with much larger 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 an Programs.* Report by Recurve prepared for Marin Clean Energy. July, 2020.

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

Q. PLEASE EXPLAIN YOUR SECOND PROPOSAL.

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

Q. PLEASE EXPLAIN YOUR THIRD PROPOSAL.

A. For the limited purpose of EnergyStar benchmarking of commercial buildings, I propose that the "4/80" standard should be used. This means there must be four or 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.

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

IV. CONCLUSION

Q. WHAT IS YOUR CONCLUSION?

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

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

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

IV. APPENDIX A – SUMMARY OF PROPOSAL

1. **Data Types**. The following data types should be available via Green Button Connect ("GBC"):
    a. Historical energy usage (kWh of electricity and therms of gas) over 24-48 months, at whatever time interval collected by the meter
    b. Ongoing energy usage (kWh of electricity and therms of gas), available as quickly as possible after being collected, with the "quality" of reading marked
    c. Historical and ongoing line items on bills (and associated quantities) over 24-48 months
    d. Account number(s)
    e. Meter number(s), if applicable
    f. Premise address(es)
    g. What rate the customer is on (by meter or premise, if applicable)
    h. Any information necessary to determine eligibility for, or participate in, a demand response, energy efficiency or renewable energy program
2. **Standards and Implementation Architecture**. The JUNH, including its gas utilities, should:
    a. Provide GBC to all customer types
    b. Certify its GBC implementation every two years
    c. Provide customer information from (1) above using the "Retail Customer" schema
    d. Provide a "harmonized" GBC in which a third party can receive information through a single API regardless of which utility is providing the data; customer authorization experiences are consistent between the JUNH; and a customer served by multiple utilities can grant an authorization once
3. **Eligibility Criteria of Third Parties**. Utilities should be required to provide customer data to any third party who meets these criteria:
    a. provides contact information to the JUNH;
    b. demonstrates technical interoperability with the GBC platform;
    c. accepts certain terms and conditions, to be approved by the Commission, including adherence to the U.S. Department of Energy's DataGuard privacy standard ("DataGuard"); and
    d. not be on the Commission's list of "banned" or prohibited third parties

4. **Terms of Use**. The Commission should open a new proceeding to determine terms of use for third parties that:
    a. are reasonable and appropriate, balancing the interests of third parties using the platform and customer privacy and security;
    b. are open and non-discriminatory, meaning that any third party agreeing to the terms and conditions is entitled to receive customer data upon customer consent;
    c. permit third parties to use information technology ("IT") vendors to interact with the GBC platform; and
    d. should not be changed or modified by utilities unless ordered by the Commission.
5. **Authorization Language and Format**. The utilities' web-based authorization forms should be submitted for Commission approval and should:
    a. succinctly describe the information to be shared;
    b. display the third party's name and the purpose for which it seeks customer information;
    c. use icons and clickable links in order to hide larger blocks of text from the initial presentation, while making larger blocks of text accessible should a customer want to learn more; and
    d. be consistent with the examples provided.

    Parties should have the opportunity to comment on the JUNH's submission. Upon approval, the Commission should enter a finding that the JUNH's proposed authorization language and format satisfies RSA 363:38 Section I (a)'s requirement for obtaining "express consent" of the customer.
6. **Streamlined User Experience**. The utilities should provide a user experience for customers that:
    a. adheres to OAuth 2.0 and best practices;
    b. requires the minimum number of "clicks" of a customer;
    c. supports alternative methods of authenticating customers who do not have, or do not want, an online account with the utility; and
    d. is no more onerous for customers than the process a utility requires for a similar online transaction.
7. **Tools and Information for Third Parties**. The utilities should provide:
    a. an online technical support ticketing system for third parties that have questions or detect errors in the platform;

b. a testing environment and a production environment to assist with on-boarding third parties;
c. publicly-available, web-based methods for third parties to register and to provide thorough technical documentation, including API samples, updated at least monthly; and
d. the ability for a third party to register multiple times with the platform to accommodate different products or services from the same entity.

8. **Revocation of a Data-Sharing Authorization**.
   a. Any customer should be able to quickly and easily view, manage and revoke their authorizations at any time on a utility's website;
   b. A third party may revoke an authorization, such as in cases if the third party discontinues a product or service; and
   c. A utility may not revoke any authorization except by order of the Commission.
9. **Enforcement**. A utility with a reasonable suspicion of wrongdoing shall notify Staff, who has 21 days to gather information and resolve the issue. Punishment of third parties may include suspension or termination.
10. **Accountability of Platform Operations**. Utilities shall provide:
    a. Web-based reporting of performance metrics, including
       i. Number of customers and web page views
       ii. Number and type of errors generated
       iii. Data delivery time (in seconds)
       iv. Web page loading times (in milliseconds)
    b. A service-level agreement ("SLA") with these attributes:
       i. 99.5% uptime guarantee
       ii. Meet timetables for acknowledgment and resolution of technical issues
       iii. Data delivery within 90 seconds
11. **Utility Liability**. Utilities should not be liable for misuse of customer data provided that:
    a. The utility has operated the GBC platform prudently, and
    b. Has followed the enforcement procedures described above.
12. **Governance and Change Management**. A Data Platform Committee:

a. Consists of utility representatives, two DER representatives, one OCA representative;
b. Makes decisions by majority vote, following Roberts Rules of Order;
c. Reviews and attempts to resolve outstanding support tickets;
d. Refines and approves change requests less than $250,000/year

13. **Cost Recovery**. Prudently-incurred costs should be recovered from all ratepayers. In addition, utilities may receive 25% per year of upfront costs as a performance incentive based on these metrics:
    a. Time elapsed for a random sample of customers to complete a data-sharing authorization with a third party
    b. Average and maximum data delivery time (seconds) following customer authorization (searchable timeframe)
    c. GBC system availability (uptime)
    d. Number and type of errors generated, if any
    e. Number and type of issues raised by third parties and customers, including severity, mean and max acknowledgment time, and mean and max resolution time
    f. Number of complaints received from third parties, including type and severity
    g. Number of customers with one-time and ongoing data-sharing authorizations
    h. Time to complete third party technical and administrative onboarding
14. **Aggregated Data**.
    a. Aggregation standards should be use case specific, should evolve over time, and should be based on a mathematically rigorous framework such as differential privacy;
    b. New Hampshire's Energy Efficiency and Sustainable Energy Board ("EESE Board") should convene experts and advise the Commission on recommendations for aggregated data privacy standards;
    c. The 4/80 standard should be used for the purposes of EnergyStar benchmarking of commercial buildings.