DE 19-197 Statewide Multi-Use Online Energy Data Platform Stakeholder Use Case Reconciliation: A Requirements Engineering Approach

Amro M. Farid[1], James Brennan[2], Samuel Golding[3], April Salas[4], Kat McGhee[5], Pat Martin[6], Donald Kries[7], and Clifton Below[8]

I. Introduction & Motivation

This document comes out of the DE 19-197 Technical Session #X on 05/XX/2020. At that point, a wide variety of stakeholder use cases were submitted to the DE 19-197 docket. As a proposed set, it is less than clear

1.) how these use cases relate to each other,
2.) what benefits and values these use cases these provide
3.) how they can be used to drive the technical development of a well-architected and highly functional statewide multi-use online energy data platform,
4.) what are the data fields associated with such an energy data platform
5.) what is the cost for building the energy data platform.

In the course of DE 19-197 docket conversations, several ideas have been raised. We comment on two of these here.

The first idea centers around the concept of a "minimum viable product" (MVP). An MVP is a well-known software engineering concept that is tied exclusively to agile software engineering (ASE) methodologies. In ASE, an MVP is developed with a core set of functionalities and then validated. The functionality is then expanded and validated in another iteration. This process continues until the full functionality of the software product has been developed. In the context of the DE 19-197 docket, the authors of this document reject this idea entirely. First, we must distinguish between the technical project management process that will build the data platform from the regulatory process that is the DE 19-197 docket. The outcome of the former is the data platform itself whereas the outcome of the latter is the set of regulatory directives that trigger the building of the data platform. In that regard, the two processes are entirely distinct and should not be conflated in any way.

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[1] Prof. Amro M. Farid is serving as a technical advisor to the City of Lebanon's intervention in DE 19-197. He an associate professor of engineering at the Thayer School of Engineering at Dartmouth and an adjunct associate professor of computer science at the Department of Computer Science, Dartmouth College. He is also the director of the Laboratory for Intelligent Integrated Networks of Engineering Systems (LIINES).
[2] James Brennan is ….
[3] Samuel Golding is the President of Community Choice Partners Inc and is intervening directly in DE 19-197.
[4] April Salas is the Sustainability Director of the Town of Hanover and is part of the Town of Hanover's intervention in DE 19-197. She is also the executive director of the Revers Center for Energy at the Tuck School of Business at Dartmouth.
[5] Rep. Kat McGhee is intervening as an Eversource customer in Hollis. She represents the towns of Hollis, Milford, Mont Vernon, and New Boston in the NH General Court where she serves on the House ST&E Committee.
[6] Patricia Martin is a public member, Chair of the Town of Rindge Energy Commission, retired electrical engineer and participated in the PUC's Grid Modernization Investigation.
[7] Don Kries is…
[8] Clifton Below is the Assistant Mayor of the City of Lebanon and Chair of its Energy Committee.

Furthermore, because an MVP exists within the context of ASE, it assumes that there will many subsequent evolutions of the software product, whereas the DE 19-197 docket will only occur once. Consequently, discussion of an MVP at this stage is likely to produce data platform product that does not meet the needs of New Hampshire energy stakeholders and DE 19-197 docket intervenors. Finally, because an MVP exists in the context of ASE, it is unlikely to give adequate attention to relevant standards such as the IEC Common Information Model. Consequently, the likelihood that an MVP data platform is interoperable is quite low. In short, the minimum viable product is neither minimal nor viable.

The second idea as a way forward is "use case prioritization". The authors of this document reject this idea entirely as well. Normally, a NHPUC docket starts from the assumption that a consensus-based outcome is possible. Similarly, in the beginning of a (technical) systems engineering process, there is a sincere effort to determine the totality of requirements from all stakeholders and meet them **all**. Take the example of a city building a new road, it would soon here from motorists, cyclists, and pedestrians that they respectively need car lanes, bike lanes, and sidewalks. Such a city would be ill-advised to immediately prioritize the use cases of one stakeholder group over another. It would only consider such prioritization after 1.) it became abundantly clear from engineering documents that it was impractical to meet the needs of all stakeholders and 2.) the methodology of prioritization of one set of use cases over another was agreed upon following the city's governance. Furthermore, it is important to distinguish between prioritization of engineering implementation and prioritization of scope. In the former, the engineering scope is held fixed and engineering and financial constraints determine which parts of the scope will be built first. In the latter, the engineering scope is entirely open for discussion creating the potential for stakeholder winners and losers. We believe strongly that "use case prioritization" will destine this DE 19-197 docket to a highly contentious proceeding; one that most stakeholders wish to avoid as much as possible

Part of the reason that "use case prioritization" has been proposed is the unsupported belief that more stakeholder use cases will lead to impractical costs. First, this belief, until now, is not founded in any documented evidence. Second, it is extremely common that stakeholder use cases are overlapping. They could 1.) be identical use cases but stated differently, 2.) have overlapping elements, or 3.) be a more specific or general version of each other. Furthermore, the data fields necessary for two entirely different use cases could be entirely the same. In all of these situations, additional use cases does not necessarily increase costs. Moreover, additional use cases and requirements could **lower** costs because they add greater precision and certainty for the engineering contractor and less engineering analysis is required to determine how to fulfill the use cases. Finally, it is well known within the field of systems engineering that uses cases and requirements do NOT drive costs. Rather, it is engineering artifacts that do. Speaking of costs before the data platform has been designed is an engineering non-sequitur. Returning to the example of the road, one wouldn't ask for the project cost before specifying the road's length, width, thickness, material and grade. Similarly, a cost-based discussion should only occur after the data fields associated with use cases have been determined. In contrast, use cases and requirements do drive valuable benefits. It is entirely possible to estimate benefits use cases and requirements.

Finally, the authors of this document are concerned about efforts to specify the data platform's data fields prior to determining and reconciling the data platform's use cases and requirements. Normally, the engineering solution is discussed only after the requirements have been determined. Doing

otherwise can lead to a scenario where the engineering solution is determined before it is clear what problem it is trying to solve; dooming the engineering solution to be either ill-equipped or over-built.

The above points are well-established in the systems engineering literature. Failing to take heed of these observations could lead to either a contentious proceeding, a dysfunctional data platform, or potentially both. Given the above discussion, the authors recommend a way forward that is more consonant with the best practice of the systems engineering field. To that end, we propose the following steps

1. **Context Awareness:** Understand the legal context (i.e. SB 284 & SB 286). New Hampshire is in the midst of a number of concurrent and highly related regulatory reforms. Understanding the relationships between these reforms and this DE 19-197 docket is of the utmost importance.
2. ***Requirements Gathering***: Identify stakeholder requirements & use cases from existing legislation, regulations, stakeholder needs. Collect from all stakeholders. We have now reached this point in the DE 19-197 docket.
3. **Requirements Engineering:** Reconcile the stakeholder requirements & use cases into a mutually exclusive & collective exhaustive set of technical requirements. In order to maintain a consensus-driven process, we assume that all use cases & requirements are equally valid.
4. **Quantify the Associated Benefits (in dollar terms).** Requirements drive system function which drives valuable benefits.
5. **Determine the Relevant Data:** For each technical requirement, assure interoperability & extensibility with existing IEC Common Information Model standards
6. **Quantify the Associated Costs (in dollar terms): System Form → Costs**
7. **Address Governance and Implementation Challenges:**

This document is organized as follows.

- Section II entitled "Preliminaries" provides some common defintions to technical terms used in this document.
- Section III entitled "Data Platform Access" discusses the need for a data platform that is accessible to wide variety of grid stakeholders. It includes Use Case 1.
- Section IV entitled "Use Cases Taxonomy" discuss the need to classify use cases so that the complete set is mutually exclusive and collectively exhaustive. Doing so greatly facilitates downstream technical implementation.
- Section V entitled "Uses-Cases – Community Power Aggregators" focuses on the use cases necessary to support the implementation and operation of community power aggregators (CPAs). The uses cases are derived directly from the RSA 53-E as amended by SB 286.
- Section VI entitled "Use Cases – Exchanged Electricity Services" focuses on the exchanged electricity services defined in Use Case 4. It identifies a number of electricity services that a NH CPA would likely implement in the near term and then derives the associated use case.
- Each of the Appendices A-Q includes one use case table for each of the use cases identified in Section III-VI.

- Appendix R include ***some*** potential functionalities that we expect to find a in a statewide multi-use energy data platform (as identified by Greentel).
- Appendix S provides illustrative draft administrative rule language relating to use cases 2- 4, an earlier draft of which was presented at a PUC led stakeholder meeting on CPA rules.

II. Preliminaries

Definition 1 – Meta-Data Model: A meta-data model includes 1.) a set of data fields that are populated with instantiated numerical and textual data 2.) a set of classes which serve as containers of data fields and 3.) a set of relationships between the data fields and their classes.

Definition 2 – Data Platform Implementation: The governance, development, technical implementation, change management, and versioning of the meta-data model and its instantiated data.

Definition 3 – Use Case: A written description of how users will interact with and perform tasks on an information technology system or application. It outlines, from a user's point of view, a system's behavior as it responds to a request. Each use case is represented as a sequence of simple steps, beginning with a user's goal and ending when that goal is fulfilled[7].

III. Use Cases – Data Platform Access

First, we recognize that such a statewide multi-use online energy data platform must serve all New Hampshire energy stakeholders including specifically those represented on this docket's service list. Fifteen categories of stakeholders are identified here. Such service necessarily creates interfaces between all of these stakeholders and the data platform itself as shown in Figure 1. Use Case #1 follows straightforwardly:

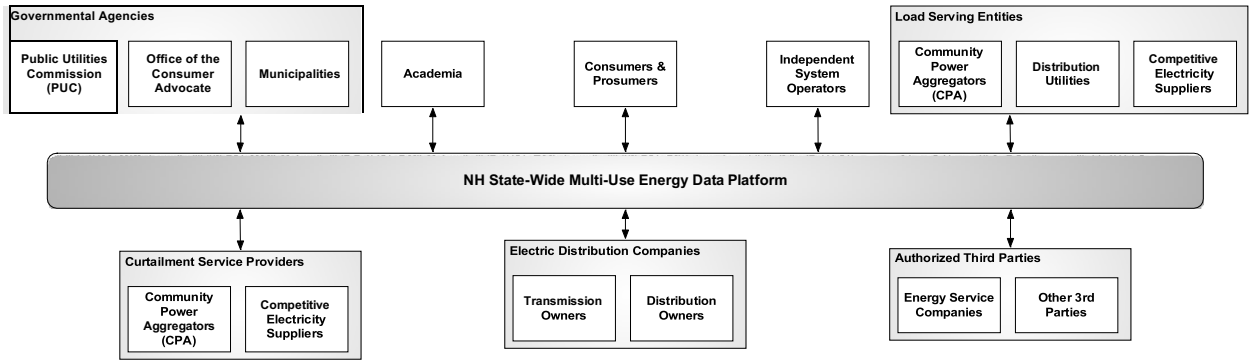

Figure 1. Interfaces between a NH State-Wide Multi-Use Energy Data Platform and NH Energy Stakeholders

[7] Adapted from: https://www.usability.gov/how-to-and-tools/methods/use-cases.html

Use Case 1: Stakeholder Access The NH State-Wide Multi-Use Energy Data Platform shall provide stakeholder-appropriate, secure, and interoperable access for each of the stakeholder categories identified above.

Here "stakeholder-appropriate" means that each of the categories of stakeholders will have a specific "role" in the data platform that gives them read, write, append, or no-access to the platform's data.

Here "secure" means that the platform will utilize IT security mechanisms such as passwords and two-factor authentication.

Here, "interoperable" means that the data shall be provided in human-readable and machine-readable formats according to established electric power grid standards such as the Common Information Model published by the IEC.
[Q: Do IEC standards align with Green Button Connect or North American Standards Board's Energy Service Provider Interface discussed in the DE 19-197 Order of Notice? Or is a different standard / protocol?]
[A: The order of precedence is the opposite of the premise of the question. Green Button Connect and the North American Standard Board's (NASB) Energy Service Provider Interface (ESPI) are derived from IEC standards. So when the IEC standards change, the Green Button Alliance and the NASB revise their standards accordingly. The Local Government Coalition references the IEC standards because it is very likely that the future DE 19-197 data platform will have functionality beyond Green Buton Connect and the NASB-ESPI. Furthermore, it is possible that it will have first-in-North America functionality and consequently will have to rely on (international) IEC standards.
The associated NH PUC Use Case Table is found in Appendix A.

IV. Use Cases Taxonomy

Given the above, NH energy stakeholders can expect that the NH State-Wide Multi-Use Energy Data Platform will have to serve a wide variety of use cases beyond access. The number of use cases will likely proliferate. In order to support downstream software engineering efforts, the final set of use-cases must be mutually-exclusive and collectively exhaustive. Consequently, it is important to classify use cases by life cycle stage: operations, operations improvement, and life-cycle stage. Drawing on the uses cases identified in the scoping comments, we offer examples of each type in Figure 2.

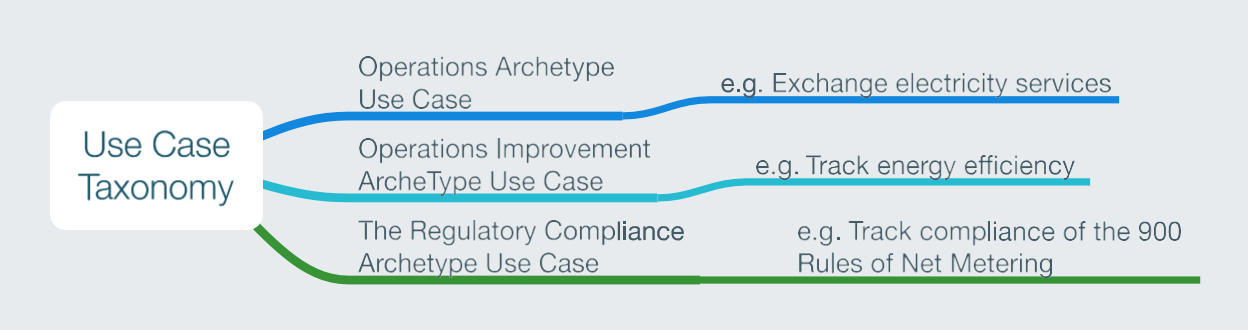

Figure 2. A Use Case Taxonomy Classified by Life Cycle Stage

For the remainder of this document, we focus on use cases that enable the successful operation of community power aggregators as legislated in SB 286.

V. Use Cases – Community Power Aggregators

The community power aggregator use cases are derived directly from RSA 53-E as amended by SB 286 (and other relevant statutes). The table below shows the relevant provisions and their associated use cases.

RSA 53-E & Other Statutory Provision	Asoociated Use Case
RSA 53-E:6 "Electric Aggregation Plan. – I. The governing body of a municipality or county may form an electric aggregation committee to develop a plan for an aggregation program for its citizens. . . . II. The plan shall provide universal access, reliability, and equitable treatment of all classes of customers . . . III. The plan shall detail: . . . (f) How net metered electricity exported to the distribution grid by program participants, including for group net metering, will be compensated and accounted for. (g) How the program will ensure participants who are enrolled in the Electric Assistance Program administered by the commission will receive their discount. Also: RSA 38-D ENERGY COMMISSIONS, including RSA 38-D:4 re: Duties; & RSA 674:2 Master Plan; Purpose and	**2. LOCAL GOVERNMENT COMMUNITY POWER PROGRAM, ENERGY, AND CLIMATE ACTION PLANNING.** 2.1 To enable planning and development of aggregation plans and other energy and climate action planning by local governments and RPCs, the data platfrom shall provide access to read aggregated historic (and current) monthly customer load data for each class of customer by municipality (and county) of where they take service. This data should be available to any electric aggregation committee created pursuant to RSA 53-E (as well as other governmental entities). 2.2 The data platform shall also provide access to anonymized individual customer interval load data where such data is available with a granularity of an hour or less. This data should include groupings within each customer rate class of whether the customer is on utility provided default energy service or competitive supply for each month in the history, as well as

Description. – including III (a), (c), (g), (i), (n), and (o) re: topics to include in Master Plans.	counts of customers by rate class and supply type using net metering on in the EAP. [Q: What customer data needs to be excluded to ensure data is "anonymized"?] [A: Data that would allow identification (name) of individual customers, such as contact information (name, mailing address, phone numbers, email address), meter number, account number, service address.] [Q: What data is included?] [A: Daily, hourly, more granular intervals if available. See proposed draft Puc 2203.03(b)-(g) under "Provision of Load Information by Utilities"] [C: This question/comment applies to all of the following use cases that reference "anonymized individual customer interval load data".] [R: The answer provided above applies to all of the use cases that reference "anonymized individual customer interval load data".]
RSA 53-E:7, "Aggregation Program . . . II. If the plan is adopted or once adopted is revised to include an opt-out alternative default service, the municipality or county shall mail written notification to each retail electric customer within the municipality or county. To enable such mailed notification and notwithstanding RSA 363:38, after an aggregation plan is duly approved the electric distribution utility or utilities serving an	**3. IMPLEMENTATION OF AN OPT-OUT COMMUNITY POWER PROGRAM** 3.1 The data platform shall be the repository of a current list of the names and mailing addresses of all electric customers taking distribution service within the municipality or county. CPAs and electric distribution utilities shall have read, write, and append access to this data. [Q: What data do CPAs envision writing or appending?] [A: The data could be as simple as mailing address corrections, addition of email addresses, other contact information, or things like service requests.] [Q: Is it envisioned that "appending access to this data" will be a feature added into the energy data platform?] [A: Yes. Because the CPA provides the default service, it must have the ability to revise the list of customers on default service. Naturally, there is a need to add this information to the data platform so that relevant grid stakeholders – including distribution utilities -- have access the relevant parts of the data.

adopting municipality or county shall provide to such municipality or county a current list of the names and mailing addresses of all their electric customers taking distribution service within the municipality or county. IV. Customers who are on default service provided by an electric distribution uttility shall be automatically enrolled in an aggregation provided alternative default service if they do not elect to opt out. . . . New Customers . . . shall be given a choice of enrolling in utility provided default service or aggregation provided default service, where such exists. New customers shall be informed of pricing for each when they apply for service. Such new customers may also enroll with a competitive electricity supplier. New customers who do not make such a choice shall be enrolled in the default service of any geographically appropriate approved aggregation, or, if none exists, the utility provided default service." ot elect to opt out."	3.2 To enable such mailed notification and notwithstanding RSA 363:38, after an aggregation plan is duly approved the electric distribution utility or utilities serving an adopting municipality or county shall provide to such municipality or county a current list of the names and mailing addresses of all their electric customers taking distribution service within the municipality or county. 3.3 The data platform shall provide customer access to read the data necessary to make an informed choice between utility provided default service, community aggregation services, and competitive electricity supplier service. This data includes the pricing information on these services. It also includes customers' consumption and distributed generation data. (See Use Case 4) [Q: Would this comparison information and distributed generation data be part of energy use data?] [A: Yes, possibly fed in from other secure APIs] [Q: Would this be built into the platform?] [A: Yes, the capability would be built into the platform.] 3.4 The data platform shall provide utilities, community aggregators, and competitive suppliers access to write and update data pricing information for these services.
RSA 53-E:3 "Municipal and County Authorities. . . . II "[CPAs have the authority to] provide for: (1) The supply of electric power. (2) Demand side management. (3) Conservation. (4) Meter reading.	**4. OPERATION OF A COMMUNITY POWER AGGREGATION PROGRAM** [Q: Will the energy data platform be used to extract data into a third party system used by community power aggregators?] [A: Yes.] [Q: Are the notes below recommending that additional data analysis, services and functionality be incorporated into the energy data platform?] [A: No, the data platform is just that a platform consisting of a database and a hosted secure

(5) Customer service. (6) Other related services. (7) The operation of energy efficiency and clean energy districts adopted by a municipality pursuant to RSA 53-F.”	API. From there, third-party apps (outside the scope of DE 19-197) will be able to access the data, conduct analyses, and provide additional functionality as part of a vibrant marketplaces of energy services.] The data platform shall provide CPAs and customers the read, write, and append access to support the exchange of electric power services. [Q: What data would CPAs and Customers envision writing or appending?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3 or other laws, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged. Please see Use Cases 10-17 for a list of electric power services that CPAs are likely to offer. [Q: How would these updates be done?] [A: Through the data platform’s secure API. It must support read, write, and append capabilities. [Q: Would this be feature of the energy data platform?] [A: Yes. Beyond the data platform’s database, the data platform’s secure API is its single most important feature. The exchanged electric power services are not part of the data platform.] The data platform shall provide CPAs and

	customers the read, write, and append access to support the exchange of demand side management services. [Q: What data would CPAs and Customers envision writing or appending? How would these updates be done? Would this be a feature of the energy data platform or a separate third party system?] [A: The answer to this question is analogous to the same set of questions posed about the exchanged electric power services. The data depends on the nature of the demand side management services. It is read, written, and appended via the secure API. The services themselves are offered by the CPA or 3rd party systems.] The data platform shall provide CPAs and customers the read, write, and append access to support the exchange of conservation services. [Q: What data would CPAs and Customers envision writing or appending? How would these updates be done? Would this be a feature of the energy data?] [A: The answer to this question is analogous to the same set of questions posed about the exchanged electric power services. The data depends on the nature of the conservation services. It is read, written, and appended via the secure API. The services themselves are offered by the CPA or 3rd party systems.] The data platform shall provide CPAs and customers the read, write, and append access to

	support the exchange of energy efficiency services. [Q: What data would CPAs and Customers envision writing or appending? How would these updates be done? Would this be a feature of the energy data platform?] [A: The answer to this question is analogous to the same set of questions posed about the exchanged electric power services. The data depends on the nature of the energy efficiency services. It is read, written, and appended via the secure API. The services themselves are offered by the CPA or 3rd party systems.] The data platform shall provide CPAs and customers the read, write, and append access to support customer service activities. [Q: What data would CPAs and Customers envision writing or appending? How would these updates be done? Would this be a feature of the energy data?] [A: The answer to this question is analogous to the same set of questions posed about the exchanged electric power services. The data depends on the nature of the customer service activities. It is read, written, and appended via the secure API. The services themselves are offered by the CPA or 3rd party systems.] The data platform shall provide the CPAs, and electric utilities (as owners/operators of metering systems) access to read, write and update customers' consumption and distribution generation meter data. [Q: What data would CPAs envision writing or updating? How would the distribution generation meter data be consumed and integrated and who update this data?] [A: Whoever is providing the meter or reading meter data will generate the data. This could be the distribution utility, the end-

	customer (or prosumer), a CPA, or eventually others such as CEPS. [Q: How would these updates be done?] [A: The data is read, written, and appended via the secure API.] [Q: Would this be a feature of the energy data platform.] [A: Yes.] 4.5 The data platform shall provide customers access to read their consumption and distributed generation meter data.
RSA 53-E:4, IV "For the purpose of obtaining interval meter data for load settlement, the provision of energy services, and near real-time customer access to such data, municipal and county aggregators may contribute to the cost of electric utility provided meter upgrades, jointly own revenue grade meters with an electric utility, or provide its own revenue grade electric meter, which would be in addition to a utility provided meter, subject to commission finding in the public good and approval of the terms and conditions for such arrangements, including sharing or transfer of meter data from and to the electric distribution utility."	**5. AMI INTERVAL DATA TO SUPPORT RTP & DR** [Q: Is this section envisioned to be a full service meter data management system?] [A: Not likely – that would be inconsistent with the concept of a data platform. A "full-service meter data management system" is best viewed as a third-party application that interfaces with the data platform through the secure API. Again, such a meter data management system can be owned and operated by distribution utility, the end-customer (or prosumer) or a CPA. [Q: What is meant by "near real-time interval meter data"?] [A: We expect to see interval meter data with a delay that is approximately equal to the temporal granularity of interval data. Near real-time interval is necessary to support highly accurate and near real-time load forecasting as well as electricity services based upon real-time electricity services.] [Q: Is it envisioned that the energy data platform would be integrated with the ISO-NE Market system? Would this be a feature of the energy data platform?] [A: As shown in Use Case 1, ISO-NE is one of the New Hampshire's grid stakeholders. Therefore, ISO-NE is likely to have access to the data platform through its secure API. We do

	not foresee a use case where data platform needs to be directly and automatically integrated with ISO-NE's market system.] 5.1 The data platform shall support near real-time interval meter data for load settlement (between the CPA, wholesale electricity market, and the CPA's customers). [Q: Is it envisioned that the energy data platform would be integrated with the ISO-NE Market system?] [A: No, see the response to this question above.] [Q: Would the load settlement system be a feature of the energy data platform?] [A: No. Rather the data platform is source and repository of data for the load settlement activity. Through its secure API, it should interface with the distribution and transmission utilities' load settlement system] The data platform shall support near real- time interval meter data for the provision of energy services (between the CPA and its customers) such as dynamic demand response. [Q: For about 20 years, energy service providers have been using Electronic Data Interchange (EDI) transactions to receive usage data for billing purposes. With customer approval (and with utility secure equipment added), some suppliers have direct, near real-time access to interval meters. How is it envisioned that this energy data platform would provision energy services different from the EDI System or from suppliers directly accessing customer internal meters? [A: That the EDI has been used for 20 years is irrelevant. Just as one could potentially say that it is a "tried-and-true" technology, one could also potentially say that it is an obsolete outdated technology. What is relevant is whether the EDI as a technology solution serves the purposes of the identified uses cases and

	enables the newly ratified legislation. It is only after this question has been answered that we can determine the role of the EDI as a technological solution. Out of good engineering design practice, the LGC neither assumes that the EDI will be part of the final design of the data platform nor does it rule out this design option. In regards to the situation where suppliers directly access customers' interval meters, it is likely that this is a short-lived, unsustainable approach that encourages non-scalable and non-interoperable IT services. For every new type of customer's interval meter, the suppliers need to develop new data exchange mechanisms. Once they have done so, the customers are effectively "locked-in" to that supplier lest they lose the types of services they had with the supplier. The scalable and interoperable approach is to use a standards-compliant data platform to which customers and suppliers can connect. This would allow suppliers to scale their businesses and not have to develop new non-standard technologies for every new type of customer's interval meter. It also allows customers to move on to new suppliers that offer superior services. In the design of the data platform, there is room for considering non-standard and standard legacy IT systems, but in no way should such systems impede the overall functionality of the data platform as it meets these use cases and the enacted legislation that they support. The data platform does not provide energy services. It provides the data upon which energy services can be exchanged by grid stakeholders. [Q: Would this be a feature of the energy data platform?] [A: We are not sure what "this" refers to.]

	5.2 The data platform shall support customer's read access of near real-time interval meter data. [Q: Is it envisioned that the utilities will modify their current systems and procedures to read and verify interval meters to load this data on a near real-time basis? [A: Not necessarily. The distribution utilities may find that modifying their current systems and procedures to read and verify interval meters to load this data on a near-time basis is the best way for them to provide competitive, high-quality, and customer-oriented service. Alternatively, they can "pass-through" the interval meter data to the data platform and then update it once a batch-verification is complete. If not either of these, then RSA 53-E allows for the data to come from revenue-grade CPA meters or new interval meters jointly owned by the utility and the CPA and read by the CPA. In all cases, interval meter data is expected to be an integral part of a successful energy data platform. Q: Would this be a feature of the energy data platform? A: Interval meter data is a feature of the energy data platform. How the utilities modify their own systems is not within the scope of the energy data platform.
RSA 53-E:3, II(b) "CPAs may exercise their new authorities on an individual basis, or may choose to standardize the provision of any and all services across multiple jurisdictions by "operating jointly pursuant to RSA 53-A"**.**	**6. SUPPORT FOR CPA JOINT ACTION** 6.1 The data platform shall create equal access for jointly operated CPAs as for individually operated CPAs. Q: Does this mean that in a jointly operated CPAs, one town would be able to access energy use data of customers in the other town(s) A: No. It means that a jointly operated CPA will have the same type of stakeholder role as

	an individually operated CPA on the data platform. Of course, a CPA would only be able to access the energy use data of its own customers. Furthermore, the access is only by authorized users of the CPA for primary purposes pursuant to RSA 363:37.
RSA 53-E: 4, VI "[CPAs are] subject to RSA 363:38 as service providers and individual customer data shall be treated as confidential private information and shall not be subject to public disclosure under RSA 91-A. An approved aggregation may use individual customer data to comply with the provisions of RSA 53-E:7, II and for research and	**7. USE AND PROTECTION OF INDIVIDUAL CUSTOMER DATA** 7.1 The data platform shall provide CPAs access to individual customer data in a confidential manner and free from public disclosure. [Q: Is this statement intended to grant CPA's access to all customer data or only participating customer data?] [A: This statement is intended to grant CPA's access to all CPA customers (i.e. those who have not opted out to do otherwise) unless aggregated or anonymized or necessary to comply with the provisions for RSA 53-E:7, II.] [Q: Will this special access need to be incorporated as a special situation in the setup of access and security rules?] [A: Yes, absolutely. New Hampshire law has provisions for CPAs that make them distinct from all of the other types of grid stakeholders identified in Use Case 1. Each type of stakeholder is treated differently in the law, and so the data platform needs to be designed to comply accordingly].

development of potential new energy services to offer to customer participants." The authority to use individual customer data for "research and development of potential new energy services" is a much broader authority, while the relevant provisions of RSA 53-E:7 more specifically relate to the notification by mail of (1) default service customers to be enrolled on an opt-out basis as well as (2) customers on competitive supply that must be offered CPA service on an opt-in Basis	7.2 The data platform shall allow CPAs to use individual customer data to comply with the provisions of RSA 53-E:7. 7.3 The data platform shall allow CPAs to engage R&D entities (academia, laboratories, and consultants) that support development of new energy services to offer to customer participants. [Q: How will customer confidential data be protected should a CPA provide this data to R&D entities?] A: Contractually. CPAs as "service providers" would be subject to same statutory duties and responsibilities as distribution utilities under RSA 363:38 with regard third parties, such as R&D entities.] Furthermore, most research universities and national laboratories are highly accustomed and equipped to comply with contractual terms related to sensitive, confidential, and human-subjects related data. These R&D entities normally implement data management plans to operationalize the provisions of these data-related contractual terms.
RSA 53-E:3-a "[CPAs are] expressly authorized to aggregate other services commonly and regularly billed to customers" [including] "combining billing for any or all utility services".	**8. EXCHANGE OF BILLING DATA** 8.1 The data platform shall <u>provide customer access to read the pricing information</u> in terms of its constituent components (e.g. energy, system benefit, regional access, distribution delivery, distribution demand, and service charges). [Q: What is meant by regional access?] [A: Transmission charges.] [Q: How would these updates be done?] [A: Through secure APIs.] [Q: Would this be a feature of the energy data platform?] [A: Yes, to access all billing determinants.]

RSA 374-D:2 "Powers. – Municipalities may design, develop, acquire, and construct small scale power facilities at sites owned or leased by them or otherwise made available to them for a period at least equal to the term of any financing undertaken under this chapter. Municipalities may operate, or may enter into contracts for the operation of, such facilities on such terms and conditions as the governing board may determine. Power produced by such facilities may be transmitted and distributed by a municipality to any user of power or to any public utility, at such price and on such terms and conditions as may be agreed to by the governing board." Also: RSA 362-A:2-a Purchase of Output by Private Sector. RSA 374-F:1, Purpose and RSA 374-F:3, II Customer Choice.	**9. ENABLE RETAIL & INTRASTATE WHOLESALE ENERGY MARKET UNDER STATE JURISDICTION** 9.1 The data platform shall enable municipal producers of electricity to sell directly to CPAs, any retail customer, or any competitive electricity supplier that they can supply over the state jurisdictional distribution grid, without having to become a FERC jurisdictional interstate wholesale market participant. [Q: What data fields are needed to accomplish this?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 374-D:2, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged. Please see Use Cases 10-17 for a list of electric power services that CPAs are likely to offer.] [Q: How would an energy data data platform enable electricity sales? [A: The energy data platform provides data so that parties that are deciding to exchange electricity services can do so in an informed manner. The nature of the data depends on

	the exchanging parties and the nature of the electricity service.] [Q: How can the energy data platform ensure jurisdictional surety?] [A: Please see Use Case #1. Each grid stakeholder that has access to the energy data platform will be granted access to the data to which they have jurisdictional and legal right. Every commercial data management system must do the same. Please keep in mind that the data platform does not execute the exchange of electricity services. It simply provides the data upon which exchanging parties can make informed decisions.] Q: Would this be a feature of the energy data platform?] A: Yes, as described in Use Case #1.

VI. Use Cases – Exchanged Electricity Services

The use cases identified above describe the exchange of electricity services. More specifically, Use Case 4 mentions the exchange of electric power services (4.1), demand side management services (4.2), conservation services (4.3), and energy efficiency services (4.4). Each of these sub-use cases must be further detailed because they each have their respective sets of data. Rather than offer an exhaustive list of exchanged services, we offer here a list of electricity services that a New Hampshire community power aggregator is likely to deploy in the near-term.

CPA Retail Electricity Service	Associated Use Case
Default CPA Retail Electricity Service: The CPA exchanges a number of consumed kilo-watt hours (active power integrated over time) in normal operating mode at a flat market rate (cents/kWh) with self-scheduled electricity consumers over a monthly billing cycle in the jurisdiction of the CPA.	**10. Default CPA Retail Electricity Service Data** The data platform shall provide the data that enables Default CPA Retail Electricity Service. [Q: What is meant by "Retail Electricity Service"?] [A: Retail Electricity Service includes energy supply and related retail transactive energy

	services such as DER integration by facilitating P2P (peer to peer) distributed generation exchanges with retail consumers, demand response (through price responsive demand and opportunities for automation and storage), other forms of load management and efficiency services, such as improving power quality and load factors (such as to reduce kVA charges), and support BTM microgrid operations such as emergency power systems.] [Q: What data is envisioned to enable Default CPA Retail Electricity Service?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being

	exchanged. That said, for an early indication of the associated data in broad terms, without adhering to the specificities of the underlying technical standards, please see the proposed Puc 2206.01-03] [Q: Would this be a feature of the energy data platform?] [A: Yes]
Net-Metered CPA Retail Electricity Service: The CPA exchanges a number of generated kilo-watt hours (active power integrated over time) in normal operating mode at a flat market rate (cents/kWh) with self-scheduled electricity generators over a monthly billing cycle in the jurisdiction of the CPA.	**11. Net-Metered CPA Retail Electricity Service Data** The data platform shall provide the data that enables Net-Metered CPA Retail Electricity Service. [Q: What data is envisioned to enable Net-Metered CPA Retail Electricity Service?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged. That said, for an early indication of the associated data in broad terms, without adhering to the specificities of the underlying technical standards, please see the proposed Puc 2206.07.] [Q: Would this be a feature of the energy data platform?] [A: Yes.]

Time-of-Use CPA Retail Electricity Service: The CPA exchanges a number of consumed kilo-watt hours (active power integrated over time) in normal operating mode at a market rate (cents/kWh) differentiated by the hour-block of consumption with self-scheduled electricity consumers over a monthly billing cycle in the jurisdiction of the CPA.	**12. Time-of-Use CPA Retail Electricity Service Data** The data platform shall provide the data that enables Time-of-Use CPA Retail Electricity Service. [Q: What energy use data fields are envisioned to enable Time-of-Use CPA Retail Electricity Service?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged. That said, for an early indication of the associated data in broad terms, without adhering to the specificities of the underlying technical standards, at least hourly interval data would be necessary.] [Q: Would this be a feature of the energy data platform?] [A: Yes.]

Time-of-Use Net-Metering CPA Retail Electricity Service: The CPA exchanges a number of generated kilo-watt hours (active power integrated over time) in normal operating mode at a market rate (cents/kWh) differentiated by the hour-block of generation with self-scheduled electricity generators over a monthly billing cycle in the jurisdiction of the CPA.	**13. Time-of-Use Net-Metered CPA Retail Electricity Service Data** The data platform shall provide the data that enables Time-of-Use Net-Metered CPA Retail Electricity Service. [Q: What energy use data fields are envisioned to enable Time-of-Use Net Metered CPA Retail Electric Service?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged. That said, for an early indication of the associated data in broad terms, without adhering to the specificities of the underlying technical standards, at least hourly interval data would be necessary.] [Q: Would this be a feature of the energy data platform?] [A: Yes.]
Wholesale Real-Time Pricing CPA Retail Electricity Service: The CPA exchanges a number of (generated or consumed) kilo-watt	**14. Wholesale Real-Time Pricing CPA Retail Electricity Service Data**

hours (active power integrated over time) in normal operating mode at the wholesale market rate (cents/kWh) of the associated ISO-New England 5-minute time block with self-scheduled electricity generators and consumers over a daily settlement period in the jurisdiction of the CPA.	The data platform shall provide the data that enables Wholesale Real-Time Pricing Time-of-Use Net-Metered CPA Retail Electricity Service. [Q: At what frequency is real-time energy use data envisioned here?] [A: Initially, as a matter of engineering practicality at least hourly. However, wholesale real-time pricing works on 5-minute time blocks and so this service would need to work at this temporal granularity at a minimum. Eventually, a 1-minute would be the target. There is significant evidence in the literature that "downstream retail" markets are most effective when they have a temporal granularity that is faster than the "upstream" wholesale market. CB and the Dartmouth-LIINES are now getting data every few seconds from revenue grade meters over an internet-cloud service with a 1-2 second delay.] [Q: For what customer classes?] [A: All] [Q: What energy use data fields are envisioned to enable Wholesale Real-Time PricingTime-of Use Net Metered CPA Retail Electricity Service?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The

	nature of the data itself depends on the nature of the electric power services that are being exchanged. That said, for an early indication of the associated data in broad terms, without adhering to the specificities of the underlying technical standards, kWh for interval at first, eventually interval kWh & kVA, momentary (i.e. 1sec) kW, voltage, power factor & frequency.] [Q: Would this be a feature of the energy data platform?] [A: Yes]
Transactive Energy Real-Time Pricing CPA Retail Electricity Service: The CPA exchanges a number of (generated or consumed) kilo-watt hours (active power integrated over time) in normal operating mode at an optimal market rate (cents/kWh) every 5-minutes between self-scheduled electricity generators and consumers and dispatchable generators and consumers over a a daily settlement period in the jurisdiction of the CPA.	**15. Wholesale Real-Time Pricing CPA Retail Electricity Service Data** The data platform shall provide the data that enables Transactive Energy Real-Time Pricing CPA Retail Electricity Service. [Q: At what frequency is real-time energy use data envisioned here?] [A: Initially, as a matter of engineering practicality at least hourly. However, wholesale real-time pricing works on 5-minute time blocks and so this service would need to work at this temporal granularity at a minimum. Eventually, a 1-minute would be the target. There is significant evidence in the literature that "downstream retail" markets are most effective when they have a temporal granularity that is faster than the "upstream" wholesale market. CB and the Dartmouth-LIINES are now getting data every second from revenue grade meters over an internet-cloud service with a 1-2 second delay.] [Q: For what customer classes?] [A: All]
Yearly Coincident Peak Reduction CPA Retail Electricity Service: The CPA exchanges a reduction in consumed kilo-watt hours (active power integrated over time) in normal operating mode at the predicted time of the coincident peak at an optimal market rate (cents/kWh) with dispatchable generators and consumers in the jurisdiction of the CPA.	**16. Yearly Coincident Peak CPA Retail Electricity Service Data** The data platform shall provide the data that enables Yearly Coincident Peak Reduction CPA Retail Electricity Service. [Q: What data fields are needed to provide this function?] [A: In the orderly conduct of a normal

	software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged. That said, for an early indication of the associated data in broad terms, without adhering to the specificities of the underlying technical standards, hourly interval data and the hour of the peak would be necessary.] [Q: Is this envisioned to be done by using interval data for all customers classes, load shapes by customer class, or some combination of the two?] [A: The service would be based upon actual interval data.] [Q: Would this be a feature of the energy data platform?] [A: Yes, the necessary data fields would be a part of the data platform. The exchange the electricity service itself is not part of the data platform.]
Monthly Coincident Peak Reduction CPA Retail Electricity Service: The CPA exchanges a reduction in consumed kilo-watt hours (active power integrated over time) in normal operating mode at the predicted time of the coincident peak at an optimal market rate (cents/kWh) with dispatchable generators and consumers in the jurisdiction of the CPA.	**17. Monthly Coincident Peak CPA Retail Electricity Service Data** The data platform shall provide the data that enables Monthly Coincident Peak Reduction CPA Retail Electricity Service. [Q: What data fields are needed to provide this function?]

	[A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged. That said, for an early indication of the associated data in broad terms, without adhering to the specificities of the underlying technical standards, hourly interval data, hour of RNS and LNS peak. RNS and LNS transmission charge per MWh or kWh for each month.] [Q: Is this envisioned to be done by using interval data for all customers classes, load shapes by customer class, or some combination of the two?] [Q: Actual interval data only.] [A: Would this be a feature of the energy data platform?] [A: Yes, the necessary data fields would be a part of the data platform. The exchange the electricity service itself is not part of the data platform.]

A. Use Case 1: STAKEHOLDER ACCESS

Name	STAKEHOLDER ACCESS
Author/last updated	Document Authors: LGC Last updated 4/3/2020
Description (1-2 sentences)	The NH State-Wide Multi-Use Energy Data Platform shall provide stakeholder-appropriate, secure, and interoperable access for each of the stakeholder categories identified above.
Step-by-step process – what happens?	1. Stakeholder signs up with data platform website or mobile app. 2. Stakeholder is prompted to authenticate themself and authorize sharing of data as define by their "role" in the data platform. The premise methods for authentication/authorization can vary depending upon architecture and user experience; but it should be simple, convenient, and require no more information than utilities require today for establishing an online account (typically account number and telephone number) [Q: Will access and security requirements vary by stakeholder?] [A: Yes, absolutely. Different types of stakeholder have different requirements under the law. The data platform must be designed accordingly. Different stakeholders within a stakeholder group/type will have access to only the data that pertains to them.] [Q: How will vetting and enrollment be done?] [A: This will depend on the type of stakeholder. Vetting and enrollment for the "large" stakeholders (e.g. utilities, government agencies, CPAs will likely be straightforward because they are relatively few and well-known. Stakeholder groups with many more participants (e.g. customers, small-business energy service providers) will likely need a cross-referencing functionality either with other databases (e.g. CPA/utility customer information, state-government business register.] [Q: Will stakeholder enrollment expire, require renewal or periodic review?] [A: Periodic renewal is a good design practice in data platforms of this scale.] [Q: Will customers be responsible for providing stakeholders with access to their energy usage data?] [A: First, the platform does not just include customer data. All stakeholder groups have the potential to be sources and consumers of data. As a design principle, all stakeholders will have to positively consent to the data that they will share. In the case of consumers, specifically, they will do this up-front as a one-off stating what groups of data can be shared to

	to what groups of stakeholders. After that, the data platform will manage access. Consumers will have the right to stop sharing their data at any time for all but a very few set of exceptions (e.g. for billing). 3. Once authorized, the data platform begins transmission of data within 60 seconds to relevant parties. [Q: Just curious, where does the "within 60 seconds" requirement come from?] [A: This is a practical "common-sense" estimate. When all of us as consumers log in to a commercial data platform (e.g. a bank, an online retailer, etc) and wish to download our data, there is a general expectation that the data is transmitted in the same user-session within a minute or so. We believe that taking longer than 60-seconds can very much detract from the user-experience and the widespread adoption by a wide variety of stakeholders.] 4. Ongoing data continues to be transmitted as defined by the governance of the data platform. [Q: Do customers have a say in the start and end dates of data sharing?] [A: Yes.]
Data fields required	This use case describes the stakeholder's initial "user experience" – and not a specific set of data.
Estimated costs	As stated in our scoping comments, the cost of an individual use case should never be assessed individually. A given use case often accrues significant costs for "generic groundwork" that can be shared across multiple use cases. [Q: How can we best determine the costs?] [A: The cost of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic cost analysis is required.]
Estimated benefits	The primary benefit of this use case is to achieve privacy and cyber-security up front. That said, as stated in our scoping comments, the benefits from an individual use case should never be assessed individually. The total benefits of a given use case are usually not realized until other use cases have been implemented as well. [Q: How can we best determine the benefits?] [A: The benefits of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic benefits analysis is required.]
What policy changes required for benefits to be realized?	None at the legislative or regulatory level. That said, the governance of the data platform needs to be established in concert with the technical implementation.

Project Risks	None. It is conventional cyber-security practice to establish the read, write, append, and no-access permissions of a data platform's users and roles. [Q: Given that there have been numerous, well publicized breaches of public and retail data and financial systems, wouldn't there be some risks associated with inappropriate access to customer energy usage data? This question/comment applies to all of the following use cases that reference providing access to financial data, customer protected usage data, customer personal identification data".] [A: The notion of zero-risk in physical-security or cyber-security is a fallacy. There is always "some risk". In both cases, we attempt to quantify the risk of technical failure and define a tolerable level. This is especially true in the cyber-security space. For example, a well-financed and deeply trained malicious actor (e.g. an adversarial nation-state) when given enough time can compromise just about any IT system we have ever designed. Expecting a zero-risk from a technical system of any kind leads to one of two undesirable outcomes: 1.) a highly over-built and remarkably expensive technical solution or 2.) a technical solution that never gets built at all. Instead, this data platform should be designed with reasonable, prudent, and diligent cyber-security measures in mind. For example, the commonly discussed notion of exchanging spreadsheets is a bad cyber-security practice for many reasons. APIs can be much more easily secured. Two-factor authentication is another common cyber-security technology that is almost universal in banking websites. This answer applies to all of the following use cases as well.]
Cybersecurity Issues	The purpose of this use case is to achieve cyber-security.
Assumption/Pre-Conditions	None. [C: Please explain.] [R: This use case is explained over several pages in the main body of this report as well as in this table. We are happy to answer specific questions as they are posed.]

B. Use Case 2 LOCAL GOVERNMENT COMMUNITY POWER PROGRAM, ENERGY, AND CLIMATE ACTION PLANNING.

Name	LOCAL GOVERNMENT COMMUNITY POWER PROGRAM, ENERGY, AND CLIMATE ACTION PLANNING.
Author/last updated	Document Authors: LGC Last updated 4/3/2020
Description (1-2 sentences)	2.1 To enable planning and development of aggregation plans and other energy and climate action planning by local governments and RPCs, the data platfrom shall provide access to read aggregated historic (and current) monthly customer load data for each class of customer by municipality (and county) of where they take service. This data should be available to any electric aggregation committee created pursuant to RSA 53-E (as well as other governmental entities). 2.2 The data platform shall also provide access to anonymized individual customer interval load data where such data is available with a granularity of an hour or less. This data should include groupings within each customer rate class of whether the customer is on utility provided default energy service or competitive [Q: What customer data needs to be excluded to ensure data is "anonymized"?] [A: Please see our response on p. 5.] [Q: What data fields are envisioned to be included?] [A: Please see our response on p. 5.]
Step-by-step process – what happens?	Once Use Case #1 is completed, then the data platform should make this information available to the appropriate stakeholders perpetually. [Q: Should stakeholders access expire or be reviewed and verified periodically?] [A: Periodic renewal is a good design practice in data platforms of this scale.]
Data fields required	Generic description: 1.) aggregated historic and current monthly customer load data for each class of customer by municipality and county where they take service. 2.) anonymized individual customer interval load data with a granularity of an hour or less grouped within each customer rate class of whether the customer is on utility provided default energy service or competitive. For an ***interoperable*** implementation of the specific data fields, please consult the Common Information Model standards published by the IEC. [Q: What are the data fields envisioned here?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on

	the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged. That said, for an early indication of the associated data in broad terms, without adhering to the specificities of the underlying technical standards, a generic description of the data fields is provided on page 6.] [Q: What specific section of the Common Information Model standard is referenced?] [A: The Common Information Model standard comprises three series of standards, each with a specific focus, but all are based on a single, unified model: IEC 61970, IEC 61968, IEC 62325. The data platform will likely have to reference all three. Further specifying the relevant sections of the standards is equivalent to designing the data platform's data model.]
Estimated costs	As stated in our scoping comments, the cost of an individual use case should never be assessed individually. A given use case often accrues significant costs for "generic groundwork" that can be shared across multiple use cases. [Q: How can we best determine the costs?] [A: The cost of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic cost analysis is required.]
Estimated benefits	The primary benefit of this use case is to achieve regulatory compliance with RSA 53-E:6. That said, as stated in our scoping comments, the benefits from an individual use case should never be assessed individually. The total benefits of a given use case are usually not realized until other use cases have been implemented as well. [Q: How can we best determine the benefits?] [A: The benefits of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic benefits analysis is required.]

What policy changes required for benefits to be realized?	None at the legislative or regulatory level. That said, the governance of the data platform needs to be established in concert with the technical implementation.
Project Risks	None. [C: Please explain.]

	[R: Please see our answer under *Project Risks* for Use Case 1.]
Cybersecurity Issues	None. [C: Please explain.] [R: Please see our answer under *Project Risks* for Use Case 1.]
Assumption/Pre-Conditions	None. [C: Please explain.] [R: This use case is explained over several pages in the main body of this report as well as in this table. We are happy to answer specific questions as they are posed.]

C. Use Case 3 IMPLEMENTATION OF AN OPT-OUT COMMUNITY POWER PROGRAM

Name	**IMPLEMENTATION OF AN OPT-OUT COMMUNITY POWER PROGRAM**
Author/last updated	Document Authors: LGC Last updated 4/3/2020
Description (1-2 sentences)	3.1 The data platform shall be the repository of a current list of the names and mailing addresses of all electric customers taking distribution service within the municipality or county. CPAs and electric distribution utilities shall have read, write, and append access to this data. 3.2 To enable such mailed notification and notwithstanding RSA 363:38, after an aggregation plan is duly approved the electric distribution utility or utilities serving an adopting municipality or county shall provide to such municipality or county a current list of the names and mailing addresses of all their electric customers taking distribution service within the municipality or county. 3.3 The data platform shall provide customer access to read the data necessary to make an informed choice between utility provided default service, community aggregation services, and competitive electricity supplier service. This data includes the pricing information on these services. It also includes customers' consumption and distributed generation data. (See Use Case 4) [Q: Is this functionality anticipated to be built into the energy data platform?] [A: Please see our response to 3.3 above.] [Q: What data fields are needed to accomplish this?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged.] [Q: How would a data platform enable electricity sales? [A: The energy data platform provides data so that parties that are deciding to exchange electricity services can do so in an informed

	manner. The nature of the data depends on the exchanging parties and the nature of the electricity service.] [Q: How can the data platform ensure jurisdictional surety?] [A: Please see Use Case #1. Each grid stakeholder that has access to the energy data platform will be granted access to the data to which they have jurisdictional and legal right. Every commercial data management system must do the same. Please keep in mind that the data platform does not execute the exchange of electricity services. It simply provides the data upon which exchanging parties can make informed decisions.] [Q: What specific distributed generation data fields are envisioned here?] [A: Please see our response higher up in this table.] 3.4 The data platform shall provide utilities, community aggregators, and competitive suppliers access to write and update data pricing information for these services.
Step-by-step process – what happens?	Once Use Case #1 is completed, then the data platform should make this information available to the appropriate stakeholders perpetually. [Q: Should stakeholders access expire or be reviewed and verified periodically?] [A: Periodic renewal is a good design practice in data platforms of this scale.]
Data fields required	Generic description: 1.) a current list of names and mailing addresses of electric customers taking distribution service within the municipality or county. 2.) Pricing information on default service, community aggregation services, and competitive electricity supplier service. 3.) Customer consumption and distributed generation data – See Use Case 4. For an ***interoperable*** implementation of the specific data fields, please consult the Common Information Model standards published by the IEC. [Q: What are the data fields envisioned here?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to

	effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged. That said, for an early indication of the associated data in broad terms, without adhering to the specificities of the underlying technical standards, a generic description of the data fields is provided on page 6.] [Q: What specific section of the Common Information Model standard is referenced?] [A: The Common Information Model standard comprises three series of standards, each with a specific focus, but all are based on a single, unified model: IEC 61970, IEC 61968, IEC 62325. The data platform will likely have to reference all three. Further specifying the relevant sections of the standards is equivalent to designing the data platform's data model.]
Estimated costs	As stated in our scoping comments, the cost of an individual use case should never be assessed individually. A given use case often accrues

	significant costs for "generic groundwork" that can be shared across multiple use cases. [Q: How can we best determine the costs?] [A: The cost of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic cost analysis is required.]
Estimated benefits	The primary benefit of this use case is to achieve regulatory compliance with RSA 53-E:7. That said, as stated in our scoping comments, the benefits from an individual use case should never be assessed individually. The total benefits of a given use case are usually not realized until other use cases have been implemented as well. [Q: How can we best determine the benefits?] [A: The benefits of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic benefits analysis is required.]
What policy changes required for benefits to be realized?	None at the legislative or regulatory level. That said, the governance of the data platform needs to be established in concert with the technical implementation.
Project Risks	None. [C: Please explain.] [R: Please see our answer under *Project Risks* for Use Case 1.]
Cybersecurity Issues	None. [C: Please explain.] [R: Please see our answer under *Project Risks* for Use Case 1.]
Assumption/Pre-Conditions	None. [C: Please explain.] [R: This use case is explained over several pages in the main body of this report as well as in this table. We are happy to answer specific questions as they are posed.]

D. Use Case 4 OPERATION OF A COMMUNITY POWER AGGREGATION PROGRAM

Name	OPERATION OF A COMMUNITY POWER AGGREGATION PROGRAM
Author/last updated	Document Authors: LGC Last updated 4/3/2020
Description (1-2 sentences)	4.1 The data platform shall provide CPAs and customers the read, write, and append access to support the exchange of electric power services. [Q: To support the exchange of electric power services by CPAs and customers, what data fields would be envisioned here?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged.] [Q: Is it envisioned that "appending access to support the exchange of electric power services" will be a feature added into the energy data platform?] [A: Yes. Through the secure-API. The data platform does not have a GUI-based application for appending data.] 4.2 The data platform shall provide CPAs and customers the read, write, and append access to support the exchange of demand side management services. [Q: To support the exchange of demand side management services by CPAs and customers, what data fields would be envisioned here? Is it envisioned that "append access to support the exchange of demand side management services" will be a feature added into the energy data platform?] [A: Please see our analogous response to 4.1 above.] 4.3 The data platform shall provide CPAs and customers the read,

	write, and append access to support the exchange of conservation services. [Q: To support the exchange of conservation services by CPAs and customers, what data fields would be envisioned here? Is it envisioned that "append access to support the exchange of conservation services" will be a feature added into the energy data platform?] [A: Please see our analogous response to 4.1 above.] 4.4 The data platform shall provide CPAs and customers the read, write, and append access to support the exchange of energy efficiency services. [Q: [To support the exchange of energy efficiency services by CPAs and customers, what data fields would be envisioned here? Is it envisioned that "append access to support the exchange of energy efficiency services" will be a feature added into the energy data platform?][A: Please see our analogous response to 4.1 above.] 4.5 The data platform shall provide CPAs and customers the read, write, and append access to support customer service activities. [Q: To support the exchange of customer service activities by CPAs and customers, what data fields would be envisioned here? Is it envisioned that "append access to support the customer service activities" will be a feature added into the energy data platform?] [A: Please see our analogous response to 4.1 above.] 4.6 The data platform shall provide the CPAs, and electric utilities (as owners/operators of metering systems) access to read, write and update customers' consumption and distribution generation meter data. [Q: [To support the exchange of energy efficiency services by CPAs, what consumption and distribution data fields would be envisioned here? Is it envisioned that "append access…and update customers' consumption and distribution generation meter data" will be a feature added into the energy data platform?] [A: Please see our analogous response to 4.1 above.] 4.7 The data platform shall provide customers access to read their consumption and distributed generation meter data.
Step-by-step process – what happens?	Once Use Case #1 is completed, then the data platform should make this information available to the appropriate stakeholders perpetually. [Q: Should stakeholders access expire or be reviewed and verified periodically?]

	[A: Periodic renewal is a good design practice in data platforms of this scale.]
Data fields required	Generic description: 1.) The required data fields depend on the nature of the exchanged electric power services. 2.) The required data fields depend on the nature of the exchange demand side management services 3.) The required data fields depend on the nature of the conservation services. 4.) The required data fields depend on the nature of the energy efficiency services.

	5.) The required data fields depend on the nature of the customer service activities associated with the services in 1-4. 6.) Consumption and distribution meter data has been standardized in the Common Information Model published by the IEC. 7.) Same as 6. For an ***interoperable*** implementation of the specific data fields, please consult the Common Information Model standards published by the IEC. [Q: What are the data fields envisioned here?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged. That said, for an early indication of the associated data in broad terms, without adhering to the specificities of the underlying technical standards, a generic description of the data fields is provided on page 6.] [Q: What specific section of the Common Information Model standard is referenced?] [A: The Common Information Model standard comprises three series of standards, each with a specific focus, but all are based on a single, unified model: IEC 61970, IEC 61968, IEC 62325. The data platform will likely have to reference all three. Further specifying the relevant sections of the standards is equivalent to designing the data platform's data model.]
Estimated costs	As stated in our scoping comments, the cost of an individual use case should never be assessed individually. A given use case often accrues significant costs for "generic groundwork" that can be shared across multiple use cases. [Q: How can we best determine the costs?] [A: The cost of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic cost analysis is

	required.]
Estimated benefits	The primary benefit of this use case is to achieve regulatory compliance with RSA 53-E:3. That said, as stated in our scoping comments, the benefits from an individual use case should never be assessed individually. The total benefits of a given use case are usually not realized until other use cases have been implemented as well. [Q: How can we best determine the benefits?] [A: The benefits of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic benefits analysis is required.]
What policy changes required for benefits to be realized?	None at the legislative or regulatory level. That said, the governance of the data platform needs to be established in concert with the technical implementation.
Project Risks	None. [C: Please explain.] [R: Please see our answer under *Project Risks* for Use Case 1.]
Cybersecurity Issues	None. [C: Please explain.] [R: Please see our answer under *Project Risks* for Use Case 1.]
Assumption/Pre-Conditions	None. [C: Please explain.] [R: This use case is explained over several pages in the main body of this report as well as in this table. We are happy to answer specific questions as they are posed.]

E. Use Case 5 AMI INTERVAL DATA TO SUPPORT RTP & DR

Name	AMI INTERVAL DATA TO SUPPORT RTP & DR
Author/last updated	Document Authors: LGC Last updated 4/3/2020
Description (1-2 sentences)	5.1 The data platform shall support near real-time interval meter data for load settlement (between the CPA and its customers). 5.2 The data platform shall support near real-time interval meter data for the provision of energy services (between the CPA and its customers) such as dynamic demand response. 5.3 The data platform shall support customer's read access of near real-time interval meter data. [Q: Does this envision the utilities will purchase, install and implement metering equipment and systems to be able to provide "near real-time interval data"?] [A: No, not necessarily. The distribution utilities may find that modifying their metering equipment and systems is the best way for them to provide competitive, high-quality, and customer-oriented service. If not, then RSA 53-E allows the possibility of CPAs or others to install and/or read revenue-grade interval meters themselves for load settlement.] [Q: Will "load settlement" and "provision of energy services… such as dynamic demand response" functions be built into the energy data platform?] [A: The energy data platform provides data so that parties that are deciding to exchange electricity services can do so in an informed manner. The nature of the data depends on the exchanging parties and the nature of the electricity service.]
Step-by-step process – what happens?	Once Use Case #1 is completed, then the data platform should make this information available to the appropriate stakeholders perpetually. [Q: Should stakeholders access expire or be reviewed and verified periodically?] [A: Periodic renewal is a good design practice in data platforms of this scale.]
Data fields required	Generic description: 1.) Near real-time load data as standardized in the Common Information Model published by the IEC. For an ***interoperable*** implementation of the specific data fields, please consult the Common Information Model standards published by the IEC.

	[Q: What are the data fields envisioned here?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged.] [Q: What specific section of the Common Information Model standard is referenced?] [A: The Common Information Model standard comprises three series of standards, each with a specific focus, but all are based on a single, unified model: IEC 61970, IEC 61968, IEC 62325. The data platform will likely have to reference all three. Further specifying the relevant sections of the standards is equivalent to designing the data platform's data model.]
Estimated costs	As stated in our scoping comments, the cost of an individual use case should never be assessed individually. A given use case often accrues significant costs for "generic groundwork" that can be shared across multiple use cases. [Q: How can we best determine the costs?] [A: The cost of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic cost analysis is required.]
Estimated benefits	The primary benefit of this use case is to achieve regulatory compliance with RSA 53-E:4, IV. That said, as stated in our scoping comments, the benefits from an individual use case should never be assessed individually. The total benefits of a given use case are usually not realized until other use cases have been implemented as well. [Q: How can we best determine the benefits?] [A: The benefits of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic benefits analysis is required.]
What policy changes required for benefits to be realized?	None at the legislative or regulatory level. That said, the governance of the data platform needs to be established in concert with the technical implementation.
Project Risks	None.

	[Q: Does access to customers "near real time interval meter data" introduce additional customer privacy concerns and/or risks?] [A: With respect to privacy, no. A customer would need to consent to sharing their interval meter data for other than a primary purpose as defined in RSA 363:37, III pursuant to RSA 363:38. With respect to (cyber-security) risk, please see our response to Use Case #1.]
Cybersecurity Issues	None. [C: Please explain.] [R: Please see our answer under *Project Risks* for Use Case 1.]
Assumption/Pre-Conditions	None. [C: Please explain.] [R: This use case is explained over several pages in the main body of this report as well as in this table. We are happy to answer specific questions as they are posed.]

F. Use Case 6 SUPPORT FOR CPA JOINT ACTION

Name	SUPPORT FOR CPA JOINT ACTION
Author/last updated	Document Authors: LGC Last updated 4/3/2020
Description (1-2 sentences)	6.1 The data platform shall create equal access for jointly operated CPAs as for individually operated CPAs.
Step-by-step process – what happens?	Once Use Case #1 is completed, then the data platform should make this information available to the appropriate stakeholders perpetually. [Q: Should stakeholders access expire or be reviewed and verified periodically?] [A: Periodic renewal is a good design practice in data platforms of this scale.]
Data fields required	Generic description: 1.) The data fields in this use case are equivalent to those for individually operated CPAs. For an ***interoperable*** implementation of the specific data fields, please consult the Common Information Model standards published by the IEC. [Q: What specific section of the Common Information Model standard is referenced?] [A: The Common Information Model standard comprises three series of standards, each with a specific focus, but all are based on a single, unified model: IEC 61970, IEC 61968, IEC 62325. The data platform will likely have to reference all three. Further specifying the relevant sections of the standards is equivalent to designing the data platform's data model.]
Estimated costs	As stated in our scoping comments, the cost of an individual use case should never be assessed individually. A given use case often accrues significant costs for "generic groundwork" that can be shared across multiple use cases. [Q: How can we best determine the costs?] [A: The cost of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic cost analysis is required.]
Estimated benefits	The primary benefit of this use case is to achieve regulatory compliance with RSA 53-E:3, II(b). That said, as stated in our scoping comments, the benefits from an individual use case should never be assessed individually. The total benefits of a given use case are usually not realized until other use cases have been implemented as well. [Q: How can we best determine the benefits?] [A: The benefits of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic benefits analysis is

	required.]
What policy changes required for benefits to be realized?	None at the legislative or regulatory level. That said, the governance of the data platform needs to be established in concert with the technical implementation.
Project Risks	None. [C: Please explain.] [R: Please see our answer under *Project Risks* for Use Case 1.]
Cybersecurity Issues	None. [C: Please explain.] [R: Please see our answer under *Project Risks* for Use Case 1.]
Assumption/Pre-Conditions	None. [C: Please explain.] [R: This use case is explained over several pages in the main body of this report as well as in this table. We are happy to answer specific questions as they are posed.]

G. Use Case 7 USE AND PROTECTION OF INDIVIDUAL CUSTOMER DATA

Name	USE AND PROTECTION OF INDIVIDUAL CUSTOMER DATA
Author/last updated	Document Authors: LGC Last updated 4/3/2020
Description (1-2 sentences)	7.1 The data platform shall provide CPAs access to individual customer data in a confidential manner and free from public disclosure. [Q: How will customer confidential data be protected under the NH Right-to-Know Law (RSA Chapter 91-A:1)?] [A: The NH Right-to-Know Law (RSA Chapter 91-A:1) applies to the public records of governmental bodies and would not apply to the data platform per se but any utility or vendor operating the data platform would be subject to RSA 363:38. CPAs are also subject to RSA 363:38 as service providers and individual customer data held by (or accessible by) a CPA is exempt from disclosure under RSA 91-A pursuant to RSA 53-E:4, VI. 7.2 The data platform shall allow CPAs to use individual customer data to comply with the provisions of RSA 53-E:7. [Q: Would the energy data platform "enable" a CPA to perform some of the requirements of this statute, or is "comply" the correct word? Are there other ways the utilities could work with CPAs to enable them to perform tasks detailed in this statute?] [A: Yes, there are many ways to comply with statute. Indeed, such data will be needed before the data platform is implemented. That said, the distribution utilities have repeatedly stated as part of the PUC-led CPA rule making discussions that they wish for standardized and relatively automated mechanisms for the transfer of data to CPAs. This energy data platform is the most likely standardized, automated, secure, and cost-effective means to achieve such compliance.] 7.3 The data platform shall allow CPAs to engage R&D entities (academia, laboratories, and consultants) that support development of new energy services to offer to customer participants. [Q: What assurances will be in place to ensure that customer confidential data is protected by"R&D entities".] [A: Contractually. CPAs as "service providers" would be subject to same statutory duties and responsibilities as distribution utilities under RSA 363:38 with regard third parties, such as R&D entities.] Furthermore, most research universities and national laboratories are highly accustomed and equipped to comply with contractual terms related to sensitive, confidential, and human-subjects related data. These R&D entities normally implement data management plans to operationalize the provisions of these data-related contractual terms.]

Step-by-step process – what happens?	Once Use Case #1 is completed, then the data platform should make this information available to the appropriate stakeholders perpetually. [Q: Should stakeholders access expire or be reviewed and verified periodically?] [A: Periodic renewal is a good design practice in data platforms of this scale.]
Data fields required	Generic description: 1.) The data fields associated with individual customer data. For an ***interoperable*** implementation of the specific data fields, please consult the Common Information Model standards published by the IEC. [A: The Common Information Model standard comprises three series of standards, each with a specific focus, but all are based on a single, unified model: IEC 61970, IEC 61968, IEC 62325. The data platform will likely have to reference all three. Further specifying the relevant sections of the standards is equivalent to designing the data platform's data model.]
Estimated costs	As stated in our scoping comments, the cost of an individual use case should never be assessed individually. A given use case often accrues significant costs for "generic groundwork" that can be shared across multiple use cases. [Q: How can we best determine the costs?] [A: The cost of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic cost analysis is required.]
Estimated benefits	The primary benefit of this use case is to achieve regulatory compliance with RSA 53-E:4, VI. That said, as stated in our scoping comments, the benefits from an individual use case should never be assessed individually. The total benefits of a given use case are usually not realized until other use cases have been implemented as well. [Q: How can we best determine the benefits?] [A: The benefits of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic benefits analysis is required.]
What policy changes required for benefits to be realized?	None at the legislative or regulatory level. That said, the governance of the data platform needs to be established in concert with the technical implementation.
Project Risks	None. [C: Please explain.] [R: Please see our answer under *Project Risks* for Use Case 1.]
Cybersecurity Issues	None. [C: Please explain.] [R: Please see our answer under *Project Risks* for Use Case 1.]

Assumption/Pre-Conditions	None. [C: Please explain.] [R: This use case is explained over several pages in the main body of this report as well as in this table. We are happy to answer specific questions as they are posed.]

H. Use Case 8 EXCHANGE OF BILLING DATA

Name	EXCHANGE OF BILLING DATA
Author/last updated	Document Authors: LGC Last updated 4/3/2020
Description (1-2 sentences)	8.1 The data platform shall provide customer access to read the pricing information in terms of its constituent components (e.g. energy, system benefit, regional access, distribution delivery, distribution demand, and service charges). [Q: Is this use case giving customers access to the lines items on their bills?] [A: Yes.] [Q: Is this intended to include all other utility (or CPA or Supplier) billing items such as equipment rentals, line extension fees, on-bill financing, etc.?] [A: Electricity service are currently compound in nature, in that they are the sum of several components – as identified above. This level of decomposition is necessary for customers to make informed decisions. It is not necessary to decompose further.] [Q: Will this be based on billed data, or informational to customers when selecting an energy supplier?] [A: Both. An informed decision is a comparison of previously billed data and the informational data provided by potential suppliers.] [Q: Is it envisioned that these billing constituent components will be added into the energy data platform?] [A: Yes. The data for these billing constituent components are necessary for customers to make informed decisions.]
Step-by-step process – what happens?	Once Use Case #1 is completed, then the data platform should make this information available to the appropriate stakeholders perpetually. [Q: Should stakeholders access expire or be reviewed and verified periodically?] [A: Periodic renewal is a good design practice in data platforms of this scale.]
Data fields required	Generic description: 1.) The data fields associated with pricing information and its constituent components. For an ***interoperable*** implementation of the specific data fields, please consult the Common Information Model standards published by the IEC. [Q: What are the data fields envisioned here?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support

	compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged.] [Q: What specific section of the Common Information Model standard is referenced?] [A: The Common Information Model standard comprises three series of standards, each with a specific focus, but all are based on a single, unified model: IEC 61970, IEC 61968, IEC 62325. The data platform will likely have to reference all three. Further specifying the relevant sections of the standards is equivalent to designing the data platform's data model.]
Estimated costs	As stated in our scoping comments, the cost of an individual use case should never be assessed individually. A given use case often accrues significant costs for "generic groundwork" that can be shared across multiple use cases. [Q: How can we best determine the costs?] [A: The cost of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic cost analysis is required.]
Estimated benefits	The primary benefit of this use case is to achieve regulatory compliance with RSA 53-E:3-a. That said, as stated in our scoping comments, the benefits from an individual use case should never be assessed individually. The total benefits of a given use case are usually not realized until other use cases have been implemented as well. [Q: How can we best determine the benefits?] [A: The benefits of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic benefits analysis is required.]
What policy changes required for benefits to be realized?	None at the legislative or regulatory level. That said, the governance of the data platform needs to be established in concert with the technical implementation.
Project Risks	None. [C: Please explain.] [R: Please see our answer under *Project Risks* for Use Case 1.]
Cybersecurity Issues	None. [C: Please explain.] [R: Please see our answer under *Project Risks* for Use Case 1]

Assumption/Pre-Conditions	None. [C: Please explain.] [R: This use case is explained over several pages in the main body of this report as well as in this table. We are happy to answer specific questions as they are posed.]

I. Use Case 9 ENABLE RETAIL & INTRASTATE WHOLESALE ENERGY MARKET UNDER STATE JURISDICTION

Name	ENABLE RETAIL & INTRASTATE WHOLESALE ENERGY MARKET UNDER STATE JURISDICTION
Author/last updated	Document Authors: LGC Last updated 4/3/2020
Description (1-2 sentences)	9.1 The data platform shall enable municipal producers of electricity to sell directly to CPAs, any retail customer, or any competitive electricity supplier that they can supply over the state jurisdictional distribution grid, without having to become a FERC jurisdictional interstate wholesale market participant. [Q: How will the energy use data platform enable electricity producers to sell electricity? Is it envisioned that "enable municipal producers of electricity to sell directly to CPAs, any retail customer, or any competitive electricity supplier" will be a feature added into the energy data platform?] [A: The energy data platform provides data so that parties that are deciding to exchange electricity services can do so in an informed manner. The nature of the data depends on the exchanging parties and the nature of the electricity service.]
Step-by-step process – what happens?	Once Use Case #1 is completed, then the data platform should make this information available to the appropriate stakeholders perpetually. [Q: Should stakeholders access expire or be reviewed and verified periodically?] [A: Periodic renewal is a good design practice in data platforms of this scale.]
Data fields required	Generic description: 1.) The data fields associated with pricing and quantity of electricity generation by asset at the temporal resolution associated with the electricity service. For an ***interoperable*** implementation of the specific data fields, please consult the Common Information Model standards published by the IEC. [Q: What are the data fields envisioned here?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived

	because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged.] [Q: What specific section of the Common Information Model standard is referenced?] [A: The Common Information Model standard comprises three series of standards, each with a specific focus, but all are based on a single, unified model: IEC 61970, IEC 61968, IEC 62325. The data platform will likely have to reference all three. Further specifying the relevant sections of the standards is equivalent to designing the data platform's data model.]
Estimated costs	As stated in our scoping comments, the cost of an individual use case should never be assessed individually. A given use case often accrues significant costs for "generic groundwork" that can be shared across multiple use cases. [Q: How can we best determine the costs?] [A: The cost of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic cost analysis is required.]
Estimated benefits	The primary benefit of this use case is to achieve regulatory compliance with RSA 374-D:2 and RSA 362-A:2-a consistent with RSA 374-F. That said, as stated in our scoping comments, the benefits from an individual use case should never be assessed individually. The total benefits of a given use case are usually not realized until other use cases have been implemented as well. [Q: How can we best determine the benefits?] [A: The benefits of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic benefits analysis is required.]
What policy changes required for benefits to be realized?	None at the legislative or regulatory level. That said, the governance of the data platform needs to be established in concert with the technical implementation.
Project Risks	None. [C: Please explain.] [R: Please see our answer under *Project Risks* for Use Case 1.]
Cybersecurity Issues	None. [C: Please explain.] [R: Please see our answer under *Project Risks* for Use Case 1.]
Assumption/Pre-Conditions	None. [C: Please explain.] [R: This use case is explained over several pages in the main body of this report as well as in this table. We are happy to answer specific questions as they are posed.]

J. Use Case 10 ENABLE DEFAULT CPA RETAIL ELECTRICITY SERVICE DATA

Name	ENABLE DEFAULT CPA RETAIL ELECTRICITY SERVICE DATA
Author/last updated	Document Authors: LGC Last updated 4/3/2020
Description (1-2 sentences)	10. The data platform shall provide the data that enables Default CPA Retail Electricity Service. [Q: Is this monthly usage data?] [A: Yes, initially unless more granular interval data is available.] [Q: Would this duplicate the provision of data to suppliers via EDI transactions?] [A: "Duplicate"? Not necessarily. We must assess whether the EDI as a technology serves the purposes of the identified uses cases and enables the newly ratified legislation. It is only after this question has been answered that we can determine the role of the EDI as a technological solution. Out of good engineering design practice, the LGC neither assumes that the EDI will be part of the final design of the data platform nor does it rule out this design option. It is likely that the use cases derived by the newly ratified legislation will require data transfer mechanisms that surpass rather than duplicate the capabilities of the EDI.] [Q: How does the term "Default CPA Retail Electricity Service" compare with the "Default Energy Service" that only utilities are authorized to provide?] [A: That is no longer the case; provision of default service is no longer a monopoly effective 10/1/19 and CPAs are authorized to provide default service. See RSA 53-E:7 and the definition of "default service" at RSA 374-F:2, I-a. **"'Default service' means electricity supply that is** available to retail customers who are otherwise without an electricity supplier and are ineligible for transition service and is **provided by electric distribution utilities** under RSA 374-F:3, V **or** as an alterative, **by municipal or county aggregators under RSA 53-E.**" (By the way, "alterative" means "gradually changing, or tending to change, a morbid state of the functions into one of health, (15th C)" although I think the word "alternative" was intended as is used in RSA 53-E.)] [Q: How might an energy use data platform enable Default CPA Retail Electricity Service?] [A: The energy data platform provides data so that parties that are deciding to exchange electricity services can do so in an informed manner. The nature of the data depends on the exchanging parties and the nature of the electricity service.]

Step-by-step process – what happens?	Once Use Case #1 is completed, then the data platform should make this information available to the appropriate stakeholders perpetually. [Q: Should stakeholders access expire or be reviewed and verified periodically?] [A: Periodic renewal is a good design practice in data platforms of this scale.]
Data fields required	Generic description: See Use Case #4 For an ***interoperable*** implementation of the specific data fields, please consult the Common Information Model standards published by the IEC. [Q: What are the data fields envisioned here?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged.] [Q: What specific section of the Common Information Model standard is referenced?] [A: The Common Information Model standard comprises three series of standards, each with a specific focus, but all are based on a single, unified model: IEC 61970, IEC 61968, IEC 62325. The data platform will likely have to reference all three. Further specifying the relevant sections of the standards is equivalent to designing the data platform's data model.]
Estimated costs	As stated in our scoping comments, the cost of an individual use case should never be assessed individually. A given use case often accrues significant costs for "generic groundwork" that can be shared across multiple use cases. [Q: How can we best determine the costs?] [A: The cost of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic cost analysis is required.]

Estimated benefits	The primary benefit of this use case is to achieve regulatory compliance with RSA 53-E:3. That said, as stated in our scoping comments, the benefits from an individual use case should never be assessed individually. The total benefits of a given use case are usually not realized until other use cases have been implemented as well. [Q: How can we best determine the benefits?] [A: The benefits of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic benefits analysis is required.]
What policy changes required for benefits to be realized?	None at the legislative or regulatory level. That said, the governance of the data platform needs to be established in concert with the technical implementation. [Q: Is there anything related or implied by "Default CPA Retail Electricity Service" that impacts rules, laws, regulations or tariffs that designate the utilities as energy provider of last resort (Default Energy Service Provider)?] [A: See above, utilities are no longer the energy provider of last resort. CPAs can elect to be default energy service providers. So probably all the data that utilities need to administer default energy service will ultimately be needed by CPAs and tariff and rule revisions may be necessary to conform with the law.]
Project Risks	None. [C: Please explain.] [R: Please see our answer under *Project Risks* for Use Case 1.]
Cybersecurity Issues	None. [C: Please explain.] [R: Please see our answer under *Project Risks* for Use Case 1.]
Assumption/Pre-Conditions	None. [C: Please explain.] [R: This use case is explained over several pages in the main body of this report as well as in this table. We are happy to answer specific questions as they are posed.]

K. Use Case 11 ENABLE NET-METERED CPA RETAIL ELECTRICITY SERVICE DATA

Name	ENABLE NET-METERED CPA RETAIL ELECTRICITY SERVICE DATA
Author/last updated	Document Authors: LGC Last updated 4/3/2020
Description (1-2 sentences)	11. The data platform shall provide the data that enables Net-Metered CPA Retail Electricity Service. [Q: Is this monthly usage data or something else (e.g., monthly usage data less group net meter credit)?] [A: Yes, initially unless more granular interval data is available.] [Q: If this is monthly usage data, this data is already provided to suppliers via EDI transactions? Would this duplicate that process? [A: "Duplicate"? Not necessarily. We must assess whether the EDI as a technology serves the purposes of the identified uses cases and enables the newly ratified legislation. It is only after this question has been answered that we can determine the role of the EDI as a technological solution. Out of good engineering design practice, the LGC neither assumes that the EDI will be part of the final design of the data platform nor does it rule out this design option. It is likely that the use cases derived by the newly ratified legislation will require data transfer mechanisms that surpass rather than duplicate the capabilities of the EDI. More granular interval data than monthly may be needed to provide CPA and customer choice of net metering terms and valuation.] [Q: What is meant by "Retail Electricity Service"?] [A: The service of electricity at a retail level, rather than a wholesale level. See also response on p. 20 under the main body description of Use Case 10, same question.] [Q: Does this conflict with RSA 53-E:4 subsection III that says that transmission and distribution service shall remain with the transmission and distribution utilities?] [A: Not at all. Use Case 11, is a sub-use case of Use Case 4 which is, in turn, derived from RSA 53-E:3 which explicitly includes "the supply of electric of power, demand side management, conservation, meter reading, customer service, other related services, and the operation of energy efficiency and clean energy districts. Those are services other than the transmission and distribution wires delivery/grid operation utility service.] [Q: How would this process work? Is it envisioned that "enables Net-Metered CPA Retail Electricity Service" will be a feature added into the energy data platform?] [A: The energy data platform provides data so that parties that are deciding to exchange electricity services can do so in an informed

	manner. The nature of the data depends on the exchanging parties and the nature of the electricity service.]
Step-by-step process – what happens?	Once Use Case #1 is completed, then the data platform should make this information available to the appropriate stakeholders perpetually. [Q: Should stakeholders access expire or be reviewed and verified periodically?] [A: Periodic renewal is a good design practice in data platforms of this scale.]
Data fields required	Generic description: See Use Case #4 For an ***interoperable*** implementation of the specific data fields, please consult the Common Information Model standards published by the IEC. [Q: What are the data fields envisioned here?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged.] [Q: What specific section of the Common Information Model standard is referenced?] [A: The Common Information Model standard comprises three series of standards, each with a specific focus, but all are based on a single, unified model: IEC 61970, IEC 61968, IEC 62325. The data platform will likely have to reference all three. Further specifying the relevant sections of the standards is equivalent to designing the data platform's data model.]
Estimated costs	As stated in our scoping comments, the cost of an individual use case should never be assessed individually. A given use case often accrues significant costs for "generic groundwork" that can be shared across multiple use cases. [Q: How can we best determine the costs?] [A: The cost of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic cost analysis is required.]

Estimated benefits	The primary benefit of this use case is to achieve regulatory compliance with RSA 53-E:3. [Q: Subsection 3 is a permissive provision and has no compliance requirements. What type of regulatory compliance is referenced here and is being achieved by this use case?] [A: RSA 53-E:3 is a grant of authority from the state to its subdivisions. While subdivisions of the state are not required to exercise these authorities, making them permissive, if they can't be implemented despite the CPAs wishing to do so then the authorities are not being permitted, are meaningless, and not actual authorities. For example, if utilities, hypothetically, do not share the data needed for CPAs to implement and exercise these authorities, then utilities are effectively impeding the permissive authorities granted to the CPAs by law. RSA 53-E:7, VI specifically authorized the PUC to adopt rules to implement the Chapter, and thus enable the delegated authorities. Regulation should enable, be consistent with, and comply with statutory authorities. The development of a data platform as called for by the enactment of SB 284 is an exercise of state regulatory authority. The General Court in Chapter 286:1, I, Laws of 2019 finds that "[a]ccess to granular energy data is a foundational element for moving New Hampshire's electric and natural gas systems to a more efficient paradigm in which empowering consumers is a critical element" and calls for the data platform to "facilitate municipal and county aggregation programs authorized by RSA 53-E" among other purposes.] That said, as stated in our scoping comments, the benefits from an individual use case should never be assessed individually. The total benefits of a given use case are usually not realized until other use cases have been implemented as well. [Q: How can we best determine the benefits?] [A: The benefits of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic benefits analysis is required.]
What policy changes required for benefits to be realized?	None at the legislative or regulatory level. That said, the governance of the data platform needs to be established in concert with the technical implementation.
Project Risks	None. [C: Please explain.] [R: Please see our answer under Project Risks for Use Case 1.]
Cybersecurity Issues	None. [C: Please explain.] [R: Please see our answer under Project Risks for Use Case 1.]
Assumption/Pre-Conditions	None. [C: Please explain.]

	[R: This use case is explained over several pages in the main body of this report as well as in this table. We are happy to answer specific questions as they are posed.]

L. Use Case 12 ENABLE TIME-OF-USE CPA RETAIL ELECTRICITY SERVICE DATA

Name	ENABLE TIME-OF-USE CPA RETAIL ELECTRICITY SERVICE DATA
Author/last updated	Document Authors: LGC Last updated 4/3/2020
Description (1-2 sentences)	12. The data platform shall provide the data that enables Time-of-Use CPA Retail Electricity Service. [Q: Does "Retail Electricity Service" actually refer to Energy "Supply" Service?] [A: The service of electricity at a retail level, rather than a wholesale level. See also response on p. 20 under the main body description of Use Case 10, same question.] [Q: How might an energy use data platform enable Time-of-Use CPA Retail Electricity Service?] [A: The energy data platform provides data so that parties that are deciding to exchange electricity services can do so in an informed manner. The nature of the data depends on the exchanging parties and the nature of the electricity service.] [Q: Will this require new metering?] [A: For the utilities, no, not necessarily. The distribution utilities may find that modifying their metering equipment and systems is the best way for them to provide competitive, high-quality, and customer-oriented service. If not, then RSA 53-E allows the possibility of CPAs to install and read revenue-grade interval meters themselves for load settlement.] [Q: How would this process work? What role would utility metering (monthly & interval) play in this process or use case?] [A: This depends on whether the utilities adopt revenue-grade interval meters. If the utilities do adopt such meters, then the interval meter would feed its data to the data platform so as to enable a competitive marketplace. If not, then the CPAs or others can install the meters or possibly read existing meter at more frequent intervals and feed it to the data platform themselves.] [Q: Is it envisioned that "enables Net-Metered CPA Retail Electricity Service" will be a feature added into the energy data platform?] [A: The energy data platform provides data so that parties that are deciding to exchange electricity services can do so in an informed manner. The nature of the data depends on the exchanging parties and the nature of the electricity service.]
Step-by-step process – what happens?	Once Use Case #1 is completed, then the data platform should make this information available to the appropriate stakeholders perpetually. [Q: Should stakeholders access expire or be reviewed and verified periodically?] [A: Periodic renewal is a good design practice in data platforms of this scale.]

Data fields required	Generic description: See Use Case #4 For an ***interoperable*** implementation of the specific data fields, please consult the Common Information Model standards published by the IEC. [Q: What are the data fields envisioned here?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged.] [Q: What specific section of the Common Information Model standard is referenced?] [A: The Common Information Model standard comprises three series of standards, each with a specific focus, but all are based on a single, unified model: IEC 61970, IEC 61968, IEC 62325. The data platform will likely have to reference all three. Further specifying the relevant sections of the standards is equivalent to designing the data platform's data model.]
Estimated costs	As stated in our scoping comments, the cost of an individual use case should never be assessed individually. A given use case often accrues significant costs for "generic groundwork" that can be shared across multiple use cases. [Q: How can we best determine the costs?] [A: The cost of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic cost analysis is required.]
Estimated benefits	The primary benefit of this use case is to achieve regulatory compliance with RSA 53-E:3. [Q: Subsection 3 is a permissive provision and has no compliance requirements. What type of regulatory compliance is referenced here and is being achieved by this use case?] [A: RSA 53-E:3 is a grant of authority from the state to its subdivisions. While subdivisions of the state are not required to exercise these authorities, making them permissive, if they can't be implemented despite the CPAs wishing to do so then the authorities are not being permitted, are meaningless, and not actual authorities. For example, if utilities, hypothetically, do not share the data needed for CPAs to implement and exercise these authorities, then utilities are

	effectively impeding the permissive authorities granted to the CPAs by law. RSA 53-E:7, VI specifically authorized the PUC to adopt rules to implement the Chapter, and thus enable the delegated authorities. Regulation should enable, be consistent with, and comply with statutory authorities. The development of a data platform as called for by the enactment of SB 284 is an exercise of state regulatory authority. The General Court in Chapter 286:1, I, Laws of 2019 finds that "[a]ccess to granular energy data is a foundational element for moving New Hampshire's electric and natural gas systems to a more efficient paradigm in which empowering consumers is a critical element" and calls for the data platform to "facilitate municipal and county aggregation programs authorized by RSA 53-E" among other purposes.] That said, as stated in our scoping comments, the benefits from an individual use case should never be assessed individually. The total benefits of a given use case are usually not realized until other use cases have been implemented as well. [Q: How can we best determine the benefits?] [A: The benefits of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic benefits analysis is required.]
What policy changes required for benefits to be realized?	None at the legislative or regulatory level. That said, the governance of the data platform needs to be established in concert with the technical implementation.
Project Risks	None. [C: Please explain.] [R: Please see our answer under Project Risks for Use Case 1.]
Cybersecurity Issues	None. [C: Please explain.] [R: Please see our answer under Project Risks for Use Case 1.]
Assumption/Pre-Conditions	None. [C: Please explain.] [R: This use case is explained over several pages in the main body of this report as well as in this table. We are happy to answer specific questions as they are posed.]

M. Use Case 13 ENABLE TIME-OF-USE NET-METERED CPA RETAIL ELECTRICITY SERVICE DATA

Name	ENABLE TIME-OF-USE NET-METERED CPA RETAIL ELECTRICITY SERVICE DATA
Author/last updated	Document Authors: LGC Last updated 4/3/2020
Description (1-2 sentences)	13. The data platform shall provide the data that enables Time-of-Use Net-Metered CPA Retail Electricity Service. [Q: Is this use case referring to behind-the-meter net metering or group net metering? [A: Potentially, both. The CPA can revise its portfolio of energy service offerings.] [Q: Will this require new metering?] [A: For the utilities, no, not necessarily. The distribution utilities may find that modifying their metering equipment and systems is the best way for them to provide competitive, high-quality, and customer-oriented service. If not, then RSA 53-E allows the possibility of CPAs or others to install and/or read revenue-grade interval meters themselves for load settlement purposes.] [Q: Does "Retail Electricity Service" actually refer to Energy "Supply" Service?] [A: Yes. The service of electricity at a retail level, rather than a wholesale level. See also response on p. 20 under the main body description of Use Case 10, same question.] [Q: How might an energy use data platform enable Time-of-Use CPA Retail Electricity Service? How would this process work? Is it envisioned that "enables Time-of-Use Net-Metered CPA Retail Electricity Service" will be a feature added into the energy data platform?] [A: The energy data platform provides data so that parties that are deciding to exchange electricity services can do so in an informed manner. The nature of the data depends on the exchanging parties and the nature of the electricity service.]
Step-by-step process – what happens?	Once Use Case #1 is completed, then the data platform should make this information available to the appropriate stakeholders perpetually. [Q: Should stakeholders access expire or be reviewed and verified periodically?] [A: Periodic renewal is a good design practice in data platforms of this scale.]
Data fields required	Generic description: See Use Case #4 For an ***interoperable*** implementation of the specific data fields, please consult the Common Information Model standards published by the IEC.

	[Q: What are the data fields envisioned here?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged.] [Q: What specific section of the Common Information Model standard is referenced?] [A: The Common Information Model standard comprises three series of standards, each with a specific focus, but all are based on a single, unified model: IEC 61970, IEC 61968, IEC 62325. The data platform will likely have to reference all three. Further specifying the relevant sections of the standards is equivalent to designing the data platform's data model.]
Estimated costs	As stated in our scoping comments, the cost of an individual use case should never be assessed individually. A given use case often accrues significant costs for "generic groundwork" that can be shared across multiple use cases. [Q: How can we best determine the costs?] [A: The cost of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic cost analysis is required.]
Estimated benefits	The primary benefit of this use case is to achieve regulatory compliance with RSA 53-E:3. [Q: Subsection 3 is a permissive provision and has no compliance requirements. What type of regulatory compliance is referenced here and is being achieved by this use case?] [A: RSA 53-E:3 is a grant of authority from the state to its subdivisions. While subdivisions of the state are not required to exercise these authorities, making them permissive, if they can't be implemented despite the CPAs wishing to do so then the authorities are not being permitted, are meaningless, and not actual authorities. For example, if utilities, hypothetically, do not share the data needed for CPAs to implement and exercise these authorities, then utilities are effectively impeding the permissive authorities granted to the CPAs by law. RSA 53-E:7, VI specifically authorized the PUC to adopt rules to implement the Chapter, and thus enable the delegated authorities. Regulation should enable, be consistent with, and comply with statutory authorities. The development of a data platform as called for by the

	enactment of SB 284 is an exercise of state regulatory authority. The General Court in Chapter 286:1, I, Laws of 2019 finds that "[a]ccess to granular energy data is a foundational element for moving New Hampshire's electric and natural gas systems to a more efficient paradigm in which empowering consumers is a critical element" and calls for the data platform to "facilitate municipal and county aggregation programs authorized by RSA 53-E" among other purposes.] That said, as stated in our scoping comments, the benefits from an individual use case should never be assessed individually. The total benefits of a given use case are usually not realized until other use cases have been implemented as well. [Q: How can we best determine the benefits?] [A: The benefits of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic benefits analysis is required.]
What policy changes required for benefits to be realized?	None at the legislative or regulatory level. That said, the governance of the data platform needs to be established in concert with the technical implementation.
Project Risks	None. [C: Please explain.] [R: Please see our answer under Project Risks for Use Case 1.]
Cybersecurity Issues	None. [C: Please explain.] [R: Please see our answer under Project Risks for Use Case 1.]
Assumption/Pre-Conditions	None. [C: Please explain.] [R: This use case is explained over several pages in the main body of this report as well as in this table. We are happy to answer specific questions as they are posed.]

N. Use Case 14 ENABLE WHOLESALE REAL-TIME PRICING CPA RETAIL ELECTRICITY SERVICE DATA

Name	ENABLE WHOLESALE REAL-TIME PRICING CPA RETAIL ELECTRICITY SERVICE DATA
Author/last updated	Document Authors: LGC Last updated 4/3/202
Description (1-2 sentences)	14. The data platform shall provide the data that enables Wholesale Real-Time Pricing Time-of-Use Net-Metered CPA Retail Electricity Service. [Q: Will this require new metering?] [A: For the utilities, no, not necessarily. The distribution utilities may find that modifying their metering equipment and systems is the best way for them to provide competitive, high-quality, and customer-oriented service. If not, then RSA 53 allows for CPAs or others to install and operate revenue-grade interval meters themselves.] [Q: Does "Retail Electricity Service" actually refer to Energy "Supply" Service?] [A: Yes. The service of electricity at a retail level, rather than a wholesale level. See also response on p. 20 under the main body description of Use Case 10, same question.] [Q: How might an energy use data platform enable Wholesale Real-Time CPA Pricing Retail Electricity Service Data ? How would this process work? Would this transaction be done as part of the energy data platform or be done somewhere else?] [A: The energy data platform provides data so that parties that are deciding to exchange electricity services can do so in an informed manner. The nature of the data depends on the exchanging parties and the nature of the electricity service.]
Step-by-step process – what happens?	Once Use Case #1 is completed, then the data platform should make this information available to the appropriate stakeholders perpetually. [Q: Should stakeholders access expire or be reviewed and verified periodically?] [A: Periodic renewal is a good design practice in data platforms of this scale.]
Data fields required	Generic description: See Use Case #4 For an ***interoperable*** implementation of the specific data fields, please consult the Common Information Model standards published by the IEC. [Q: What are the data fields envisioned here?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be

	carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged.] [Q: What specific section of the Common Information Model standard is referenced?] [A: The Common Information Model standard comprises three series of standards, each with a specific focus, but all are based on a single, unified model: IEC 61970, IEC 61968, IEC 62325. The data platform will likely have to reference all three. Further specifying the relevant sections of the standards is equivalent to designing the data platform's data model.]
Estimated costs	As stated in our scoping comments, the cost of an individual use case should never be assessed individually. A given use case often accrues significant costs for "generic groundwork" that can be shared across multiple use cases. [Q: How can we best determine the costs?] [A: The cost of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic cost analysis is required.]
Estimated benefits	The primary benefit of this use case is to achieve regulatory compliance with RSA 53-E:3. [Q: Subsection 3 is a permissive provision and has no compliance requirements. What type of regulatory compliance is referenced here and is being achieved by this use case?] [A: RSA 53-E:3 is a grant of authority from the state to its subdivisions. While subdivisions of the state are not required to exercise these authorities, making them permissive, if they can't be implemented despite the CPAs wishing to do so then the authorities are not being permitted, are meaningless, and not actual authorities. For example, if utilities, hypothetically, do not share the data needed for CPAs to implement and exercise these authorities, then utilities are effectively impeding the permissive authorities granted to the CPAs by law. RSA 53-E:7, VI specifically authorized the PUC to adopt rules to implement the Chapter, and thus enable the delegated authorities. Regulation should enable, be consistent with, and comply with statutory authorities. The development of a data platform as called for by the enactment of SB 284 is an exercise of state regulatory authority. The General Court in Chapter 286:1, I, Laws of 2019 finds that "[a]ccess to granular energy data is a foundational element for moving New Hampshire's electric and natural gas systems to a more efficient paradigm in which empowering consumers is a critical element" and calls for the data platform to "facilitate municipal and county

	aggregation programs authorized by RSA 53-E" among other purposes.] That said, as stated in our scoping comments, the benefits from an individual use case should never be assessed individually. The total benefits of a given use case are usually not realized until other use cases have been implemented as well. [Q: How can we best determine the benefits?] [A: The benefits of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic benefits analysis is required.]
What policy changes required for benefits to be realized?	None at the legislative or regulatory level. That said, the governance of the data platform needs to be established in concert with the technical implementation.
Project Risks	None. [C: Please explain.] [R: Please see our answer under Project Risks for Use Case 1.]]
Cybersecurity Issues	None. [C: Please explain.] [R: Please see our answer under Project Risks for Use Case 1.]
Assumption/Pre-Conditions	None. [C: Please explain.] [R: This use case is explained over several pages in the main body of this report as well as in this table. We are happy to answer specific questions as they are posed.]

O. Use Case 15 ENABLE WHOLESALE REAL-TIME PRICING CPA RETAIL ELECTRICITY SERVICE DATA

Name	ENABLE WHOLESALE REAL-TIME PRICING CPA RETAIL ELECTRICITY SERVICE DATA
Author/last updated	Document Authors: LGC Last updated 4/3/2020
Description (1-2 sentences)	15. The data platform shall provide the data that enables Transactive Energy Real-Time Pricing CPA Retail Electricity Service [Q: Does "Retail Electricity Service" actually refer to Energy "Supply" Service?] [A: Yes. The service of electricity at a retail level, rather than a wholesale level. See also response on p. 20 under the main body description of Use Case 10, same question.] [Q: Will this require new metering?] [A: For the utilities, no, not necessarily. The distribution utilities may find that modifying their metering equipment and systems is the best way for them to provide competitive, high-quality, and customer-oriented service. If not, then RSA 53 allows for CPAs or others to install and operate revenue-grade interval meters themselves.] [Q: What real-time info is envisioned and where will it come from?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged.] [Q: How might an energy use data platform enable Transactive Wholesale Real-Time Pricing CPA Retail Electricity Service Data?] [A: The energy data platform provides data so that parties that are deciding to exchange electricity services can do so in an informed manner. The nature of the data depends on the exchanging parties and the nature of the electricity service.] [Q: What data is envisioned here?] [A: See our response above.] [Q: Will this energy use data platform also be used to do sub-ISO-NE load settlement processing? How would this process work?] [A: Load settlement by CPAs and third parties will rely on the data

	provided by the data platform.] [Q: Is it envisioned that "enables Transactive Energy Real-Time Pricing CPA Retail Electricity Service" will be a feature added into the energy data platform?] [A: See the response above.] [Q: What vendors have developed "transactive energy real-time pricing"systems?] [A: There are approximately a dozen different commercial solutions available from domestic and international vendors. Some of the more famous ones include PowerLedger, LO3Energy, PowerMatcher and PNNL. The Dartmouth-LIINES is currently developing such a technology as well.] [Q: Will integration with ISO-NE systems be required? [A: As shown in Use Case 1, ISO-NE is one of the New Hampshire's grid stakeholders. Therefore, ISO-NE is likely to have access to the data platform through its secure API. We do not foresee a use case where data platform needs to be directly and automatically integrated with ISO-NE's market system.]
Step-by-step process – what happens?	Once Use Case #1 is completed, then the data platform should make this information available to the appropriate stakeholders perpetually. [Q: Should stakeholders access expire or be reviewed and verified periodically?] [A: Periodic renewal is a good design practice in data platforms of this scale.]
Data fields required	Generic description: 1.) The data fields associated with pricing and quantity of electricity generation by asset at the temporal resolution associated with the electricity service. For an ***interoperable*** implementation of the specific data fields, please consult the Common Information Model standards published by the IEC. [Q: What are the data fields envisioned here?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power

	services that are being exchanged.] [Q: What specific section of the Common Information Model standard is referenced?] [A: The Common Information Model standard comprises three series of standards, each with a specific focus, but all are based on a single, unified model: IEC 61970, IEC 61968, IEC 62325. The data platform will likely have to reference all three. Further specifying the relevant sections of the standards is equivalent to designing the data platform's data model.]
Estimated costs	As stated in our scoping comments, the cost of an individual use case should never be assessed individually. A given use case often accrues significant costs for "generic groundwork" that can be shared across multiple use cases. [C: This seems like it is a very complex load settlement process and will need further specification to estimate costs. SB 284 mandates that we determine costs feasibility prior to implementation. [R: As stated above, the presence of a data platform does not require utilities to change their load settlement functionality and does not required costs in that regards. Nor is load settlement part of the data platform functionality, and so it should not incur any costs in that regard either. The data platform simply provides the necessary for CPAs and 3rd parties to conduct load settlement of transactive energy services.] [Q: How can we best determine the costs?] [A: The cost of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic cost analysis is required.]
Estimated benefits	The primary benefit of this use case is to achieve regulatory compliance with RSA 374-D:2 and RSA 53-E:3. [Q: Regarding RSA 374-D:2, how would an energy data platform achieve regulatory compliance by securing financial bonds for a Municipal Small Scale Power Facility?] [A: The data platform (or other means, but this seems the right place to plan for it) needs to enable municipalities to exercise the authority granted under RSA 374-D:2: "**Power produced by such facilities may be transmitted and distributed by a municipality to any user of power** or to any public utility, **at such price and on such terms and conditions as may be agreed to by the governing board**. Munis need to be enabled to sell power from their generation facilities to "any user of power" at the price and terms they determine. If under 5 MW and not a generator in the ISO-NE market, this needs to be enabled for direct producer to consumer retail sales and as intrastate wholesale sales to CPAs or CEPS. From a data point of view this means that the interval consumption load of users and DG production needs to be accounted for to figure the net load for ISO-NE load settlement purposes. Also, the parties to such bi-lateral exchanges, whether at retail or intrastate wholesale, need to be designated to properly account

	for the power exchanges to figure net retail loads for each LSE for ISO-NE load settlement purposes. Having more choice of off-takers and PPA possibilities by exposure to many possible users can help secure revenue bonding, much as pre-leasing through exposure to many possible tenants and deals can help secure financing for a commercial development.] [Q: Subsection 3 is a permissive provision and has no compliance requirements. What type of regulatory compliance is referenced here and is being achieved by this use case?] [A: RSA 53-E:3 is a grant of authority from the state to its subdivisions. While subdivisions of the state are not required to exercise these authorities, making them permissive, if they can't be implemented despite the CPAs wishing to do so then the authorities are not being permitted, are meaningless, and not actual authorities. For example, if utilities, hypothetically, do not share the data needed for CPAs to implement and exercise these authorities, then utilities are effectively impeding the permissive authorities granted to the CPAs by law. RSA 53-E:7, VI specifically authorized the PUC to adopt rules to implement the Chapter, and thus enable the delegated authorities. Regulation should enable, be consistent with, and comply with statutory authorities. The development of a data platform as called for by the enactment of SB 284 is an exercise of state regulatory authority. The General Court in Chapter 286:1, I, Laws of 2019 finds that "[a]ccess to granular energy data is a foundational element for moving New Hampshire's electric and natural gas systems to a more efficient paradigm in which empowering consumers is a critical element" and calls for the data platform to "facilitate municipal and county aggregation programs authorized by RSA 53-E" among other purposes.] That said, as stated in our scoping comments, the benefits from an individual use case should never be assessed individually. The total benefits of a given use case are usually not realized until other use cases have been implemented as well. [Q: How can we best determine the benefits?] [A: The benefits of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic benefits analysis is required.]
What policy changes required for benefits to be realized?	None at the legislative or regulatory level. That said, the governance of the data platform needs to be established in concert with the technical implementation.
Project Risks	None. [Q: Would system complexity be considered a project risk?] [A: No. Transactive energy at the wholesale level is called real-time pricing has been in effect for decades. At the retail-level, pilots all over the world have been demonstrated including the Olympia Peninsula

	Project in 2008 by PNNL and American Electric Power in 2011. There is now sufficient evidence that indicates that a CPA can implement transactive energy system at scale via a third-party vendor.
Cybersecurity Issues	None. [Q: What is the scale of financial security that is needed to enable Transactive Energy Real-Time Pricing?] [A: The term financial security is not clear in the context of cyber-security issues. The implementation of transactive energy requires a market operator. The best practice (e.g. for all of the ISOs) is that this market operator is a non-for-profit entity. Financial security in the sense of solvency of a for-profit company is not an issue. Financial security in the sense of the data transfer of financial data is well-proven through the experience of wholesale electricity markets.
Assumption/Pre-Conditions	None. [Q: Are there published standards for transactive energy systems and processes that address financial controls, cyber security and data processing?] [A: Yes. There are many financial controls, cyber-security, and data processing standards that are readily adopted from real-time wholesale markets. The IEEE, IEC, and CIGRE are developing further guidance on their implementation in a retail/distribution level context.]

P. Use Case 16 ENABLE YEARLY COINCIDENT PEAK CPA RETAIL ELECTRICITY SERVICE DATA

Name	ENABLE YEARLY COINCIDENT PEAK CPA RETAIL ELECTRICITY SERVICE DATA
Author/last updated	Document Authors: LGC Last updated 4/3/2020
Description (1-2 sentences)	16. The data platform shall provide the data that enables Yearly Coincident Peak Reduction CPA Retail Electricity Service. [Q: Does "Retail Electricity Service" actually refer to Energy "Supply" Service?] [A: Yes. The service of electricity at a retail level, rather than a wholesale level. See also response on p. 20 under the main body description of Use Case 10, same question.] [Q: Will this require new metering?] [A: For the utilities, no, not necessarily. The distribution utilities may find that modifying their metering equipment and systems is the best way for them to provide competitive, high-quality, and customer-oriented service. If not, then RSA 53-A allows the possibility of CPAs or others to install and/or read revenue-grade interval meters themselves for load settlement.] [Q: How might an energy use data platform enable "Yearly Coincident Peak Reduction CPA Retail Electricity Service"? [A: The energy data platform provides data so that parties that are deciding to exchange electricity services can do so in an informed manner. The nature of the data depends on the exchanging parties and the nature of the electricity service.] [Q: What data and frequency of data is envisioned? For some customers, the utilities allocate coincident peak by load shape and customer class. Based on this use case, how is the coincident peak reduction supposed to be calculated (or estimated)?] [A: Initially, as a matter of engineering practicality at least hourly. However, wholesale real-time pricing works on 5-minute time blocks and so this service would need to work at this temporal granularity at a minimum. Eventually, a 1-minute would be the target.] [Q: Will this require ISO-NE integration? How would this process work? [A: As shown in Use Case 1, ISO-NE is one of the New Hampshire's grid stakeholders. Therefore, ISO-NE is likely to have access to the data platform through its secure API. We do not foresee a use case where data platform needs to be directly and automatically integrated with ISO-NE's market system.] [Q: Is it envisioned that "enables Yearly Coincident Peak Reduction CPA Retail Electricity Service" will be a feature added into the energy

	data platform?] [A: See response to the similar question above.]
Step-by-step process – what happens?	Once Use Case #1 is completed, then the data platform should make this information available to the appropriate stakeholders perpetually. [Q: Should stakeholders access expire or be reviewed and verified periodically?] [A: Periodic renewal is a good design practice in data platforms of this scale.]
Data fields required	Generic description: 1.) The data fields associated with pricing and quantity of electricity generation by asset at the temporal resolution associated with the electricity service. For an ***interoperable*** implementation of the specific data fields, please consult the Common Information Model standards published by the IEC. [Q: What are the data fields envisioned here?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged.] [Q: What specific section of the Common Information Model standard is referenced?] [A: The Common Information Model standard comprises three series of standards, each with a specific focus, but all are based on a single, unified model: IEC 61970, IEC 61968, IEC 62325. The data platform will likely have to reference all three. Further specifying the relevant sections of the standards is equivalent to designing the data platform's data model.]
Estimated costs	As stated in our scoping comments, the cost of an individual use case should never be assessed individually. A given use case often accrues significant costs for "generic groundwork" that can be shared across multiple use cases. [Q: SB 284 mandates that we determine costs feasibility prior to implementation. How can we best determine the costs?] [A: The cost of the data platform can be assessed once all of the use-

	cases have been agreed upon. A holistic cost analysis is required.]
Estimated benefits	The primary benefit of this use case is to achieve regulatory compliance with RSA 53-E:3. That said, as stated in our scoping comments, the benefits from an individual use case should never be assessed individually. The total benefits of a given use case are usually not realized until other use cases have been implemented as well. [How can we best determine the benefits?] [A: The benefits of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic benefits analysis is required.]
What policy changes required for benefits to be realized?	None at the legislative or regulatory level. That said, the governance of the data platform needs to be established in concert with the technical implementation.
Project Risks	None. [C: Please explain.] [R: Please see our answer under Project Risks for Use Case 1.]
Cybersecurity Issues	None. [C: Please explain.] [R: Please see our answer under Project Risks for Use Case 1.]
Assumption/Pre-Conditions	None. [C: Please explain.] [R: This use case is explained over several pages in the main body of this report as well as in this table. We are happy to answer specific questions as they are posed.]

Q Use Case 17 ENABLE MONTHLY COINCIDENT PEAK CPA RETAIL ELECTRICITY SERVICE DATA

Name	ENABLE MONTHLY COINCIDENT PEAK CPA RETAIL ELECTRICITY SERVICE DATA
Author/last updated	Document Authors: LGC Last updated 4/3/2020
Description (1-2 sentences)	17. The data platform shall provide the data that enables Monthly Coincident Peak Reduction CPA Retail Electricity Service. [Q: Does "Retail Electricity Service" actually refer to Energy "Supply" Service?] [A: Yes. The service of electricity at a retail level, rather than a wholesale level. See also response on p. 20 under the main body description of Use Case 10, same question.] [Q: How might an energy use data platform enable "Monthly Coincident Peak Reduction CPA Retail Electricity Service"?] [A: The energy data platform provides data so that parties that are deciding to exchange electricity services can do so in an informed manner. The nature of the data depends on the exchanging parties and the nature of the electricity service.] [Q: Will this require new metering?] [A: For the utilities, no, not necessarily. The distribution utilities may find that modifying their metering equipment and systems is the best way for them to provide competitive, high-quality, and customer-oriented service. If not, then RSA 53-E allows the possibility of CPAs or others to install and/or read revenue-grade interval meters themselves for load settlement purposes.] [Q: What data and what is the frequency of data envisioned? Based on this use case, how is the monthly coincident peak supposed to be calculated?] [A: Initially, as a matter of engineering practicality at least hourly. However, wholesale real-time pricing works on 5-minute time blocks and so this service would need to work at this temporal granularity at a minimum. Eventually, a 1-minute would be the target.] [Q: Will this require ISO-NE integration? How would this process work?] [A: As shown in Use Case 1, ISO-NE is one of the New Hampshire's grid stakeholders. Therefore, ISO-NE is likely to have access to the data platform through its secure API. We do not foresee a use case where data platform needs to be directly and automatically integrated with ISO-NE's market system.] [Q: Is it envisioned that "enables Monthly Coincident Peak Reduction CPA Retail Electricity Service" will be a feature added into the energy data platform?] [A: See response to the similar question above.]

Step-by-step process – what happens?	Once Use Case #1 is completed, then the data platform should make this information available to the appropriate stakeholders perpetually. [Q: Should stakeholders access expire or be reviewed and verified periodically?] [A: Periodic renewal is a good design practice in data platforms of this scale.]
Data fields required	Generic description: 1.) The data fields associated with pricing and quantity of electricity generation by asset at the temporal resolution associated with the electricity service. For an ***interoperable*** implementation of the specific data fields, please consult the Common Information Model standards published by the IEC. [Q: What are the data fields envisioned here?] [A: In the orderly conduct of a normal software engineering process, the specificities of the data are determined only after there is agreement on the relevant requirements and uses cases. Once this use case is recognized as part of the scope of DE 19-197 and necessary to support compliance with RSA 53-E:3, then the nature of the data can be carefully specified in accordance with the relevant technical standards. The Green Button standard followed this precedent as well. To do otherwise, is to effectively design the system before its requirements and use cases have been specified and thus either 1.) forcing the system to be ill-conceived because it did not adhere to the totality of requirements or 2.) forcing the requirements and use cases to conform to the ill-conceived design. The nature of the data itself depends on the nature of the electric power services that are being exchanged.] [Q: What specific section of the Common Information Model standard is referenced?] [A: The Common Information Model standard comprises three series of standards, each with a specific focus, but all are based on a single, unified model: IEC 61970, IEC 61968, IEC 62325. The data platform will likely have to reference all three. Further specifying the relevant sections of the standards is equivalent to designing the data platform's data model.]
Estimated costs	As stated in our scoping comments, the cost of an individual use case should never be assessed individually. A given use case often accrues significant costs for "generic groundwork" that can be shared across multiple use cases. [Q: How can we best determine the costs?] [A: The cost of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic cost analysis is required.]

Estimated benefits	The primary benefit of this use case is to achieve regulatory compliance with RSA 53-E:3. That said, as stated in our scoping comments, the benefits from an individual use case should never be assessed individually. The total benefits of a given use case are usually not realized until other use cases have been implemented as well. [Q: How can we best determine the benefits?] [A: The benefits of the data platform can be assessed once all of the use-cases have been agreed upon. A holistic benefits analysis is required.]
What policy changes required for benefits to be realized?	None at the legislative or regulatory level. That said, the governance of the data platform needs to be established in concert with the technical implementation.
Project Risks	None. [C: Please explain.] [R: Please see our answer under Project Risks for Use Case 1.]
Cybersecurity Issues	None. [C: Please explain.] [R: Please see our answer under Project Risks for Use Case 1.]
Assumption/Pre-Conditions	None. [C: Please explain.] [R: This use case is explained over several pages in the main body of this report as well as in this table. We are happy to answer specific questions as they are posed.]

R. Potential Functionalities of a Statewide Multi-Use Energy Data Platform by Greentel.

In addition to the 17 use cases identified above, we include ***some*** of the functionalities that we can expect to find in a statewide multi-use energy data platform.

Functionalities

Data Format
Data is accessible to all platform users in API , electronic, machine readable format
Data is accessible to all platform users in downloadable machine readable format
Data Type Availability
Platform will make available **customer data upon customer consent** (see data points and elements below) **[Q:** What **customer data (specifically metering and load data)** fields are envisioned?] **[A:** Please see responses above for a complete answer.]
Platform will make available **anonymous aggregated customer data** **[Q:** What **anonymous aggregated customer data** fields are envisioned here? What level(s) of anonymization is envisioned?] [A: Please see the responses above for a complete answer.]
Platform will make available **system data** (see data points and elements below). [Q: How is this related to customer energy use data?] [A: It is not. System data refers to data that describes the electric infrastructure itself rather than the behavior of customers.] [Q: What system data fields are envisioned here? System data fields are handled extensively in the CIM standards mentioned above.] [Q: Would system data requirements be met with hosting capacity maps?] [A: These can be produced
Platform will make available **market/financial data** (see data points and elements below) [Q: How is this related to customer energy use data?] [A: Financial data is measured in dollars rather than physical units.] [Q: What "**market/markets**" and **financial** data fields are envisioned here?] [A: See Use Case 10-17].
Platform will make available **DER data** (see data points and elements below) [Q: **[**What **DER data** fields are envisioned here?] [A: System data fields are handled extensively in the CIM standards mentioned above.]

Customers
Customers can authorize 3rd parties to access customer data via 1-click electronic authorization
Customers can access customer data via both data formats stated above (downloadable/API)
Customers can access portal (app store) to access registered 3rd parties for energy services (Makes it easier for the customer to access the market aka DERs providers, Competitive Suppliers, EE/DR Providers and Utilities) [Q: How does customer energy use data relate to the creation of an "app store"? [A: Apps are applications that can support load management, energy conservation, storage, demand response, energy audits, building automation, smart homes, smart neighborhood, and smart city apps, etc. etc. Apps would be developed and provided by 3rd parties but would be enabled to connect to the data platform through secure APIs to drive the apps (data sources) and stream back relevant data (such as system data collected through the apps). Two examples 1) CB's 3 revenue grade secondary meters move data to the cloud every few seconds and tells the frequency, voltage, and power factor at interfaces with the grid and BTM DG. Multiple 3rd parties offer apps that can access that cloud based meter data, with authorization, including continuous streaming it in near real time, to display or use it in different ways: See: https://www.ekmmetering.com/pages/software and scroll to bottom of page and see also: https://documents.ekmmetering.com/api-docs/?shell#introduction. 2) Another example is smart street lighting control nodes that can report at frequent interval (hourly or more frequent) revenue grade system data at hundreds of points on urban distribution grid – although it might be considered load data when the street light is on, the rest of the time it would be showing system data behind distribution transformers. If a town or city is collecting this through the cloud, it might make sense to stream it into the data platform to enhance utility situational awareness (i.e. voltage and power factor for conservation load management) at very low cost to the utility (compared with deploying 700 sensors on their own in a town the size of Lebanon). GPS coordinates for each data point could be available as part of this data stream.] [Q: Will there be any system integration requirements for an application to be accessible via this platform?] [A: The system integration is through the secure-API which will be compliant with IEC CIM standards.] [Q: Is this part of the energy data platform or will the app store be a separate third party application?] [A: The app store is not part of the data plaform.]
Distributed Energy Resource (DER) providers
DERs providers can access **customer data** upon customer consent

DERs providers can access **anonymous aggregated customer data**
DERs providers can access **system data**
DERs providers can access **market/financial data**
DERs providers can access **DER data**

Competitive Suppliers
Competitive suppliers can access **customer data** upon customer consent
Competitive suppliers providers can access **anonymous aggregated customer data**
Competitive suppliers providers can access **market data**
Community Choice Aggregators
CCA aggregators can access **customer data** upon customer consent
CCA aggregators can access **anonymous aggregated customer data**
CCA aggregators can access **system data**
CCA aggregators can access **market/financial data**
CCA aggregators can access **DER data**
Utilities
Utilities can provide **customer data** to customers to inform EE programs (1-stop shop platform for customers) **[Q:** What **customer data** fields are envisioned here?] [A: Please see responses in use case descriptions.]
Utilities can access **DER data**

Illustrative Draft Administrative Rule Language Relating to Use Cases 2-4.

Use Case 2 LOCAL GOVERNMENT COMMUNITY POWER PROGRAM, ENERGY, AND CLIMATE ACTION PLANNING

After notification to the PUC of the formation of an electric aggregation committee pursuant to RSA 53- E:5, I:

Puc 2203.02 Request for Load Information from Utilities. A committee or CPA may request load information for all electric customers located within the applicable municipality or county for each utility servicing such customers by making an email or written request for such data to each such utility with a copy to the PUC consistent with the requirements of Puc 202.06.
Puc 2203.03 Provision of Load Information by Utilities. Within 30 days from receipt of such request the utility shall provide the following load information for their customers taking service within the municipality or county:
For customer accounts with meters that record or report only interval data between readings, typically monthly, the following:

The most recent 60 months of monthly load data for each rate class, aggregated and sorted by whether they were taking competitive service or utility provided default service for each such month; and

Customer counts in each rate class for each month, sorted by whether they were taking competitive service or utility provided default service for each such month.

Aggregated capacity tag information by month for each rate class sorted by whether they were taking competitive service or utility provided default energy service.

A count of customers participating in the Electric Assistance Program (EAP) for each month sorted by whether they were taking competitive service or utility provided default energy service.

A count of customers that net meter by month for each rate class sorted by whether they were taking competitive service or utility provided default energy service.

[Not in this list are class average load shapes that are currently made available on utility websites for competitive suppliers. These seem to be only refreshed once per year and for through 2018 is available on-line. Could the data platform support monthly updates?
For customer accounts with meters that routinely record or report interval data more frequently than monthly, such as hourly or by time-of-use, the following:

All of the information in paragraph (a) above plus:

If requested, for customers then currently on default service all interval load data available for each customer for the most recent 36 months down to a granularity of not less than hourly if such interval data is retained at hourly or more frequent intervals.

Any individual customer data provided to a committee shall only be provided after information that identifies or enables the identification of any individual customer name, address, or account number is removed.

A code that allows the utility to release customer identity information to a CPA after accounts become customers of the CPA may be included with the utility provided anonymized individual customer data provided pursuant to (b)(2) above.

A committee or CPA may request to have such data refreshed or extended to the most recent month available not more frequently than once every 6 months after the initial request. [For data platform, this should be continuously available at any time – with data base perhaps updated daily or at least weekly as meters are read and verified for billing purposes. Monthly data probably needs a data stamp of the reading period (date of last meter read to date of most recent read). More granular interval data obviously needs date ***and time*** stamps.]

Load data shall include consumption in kWh, and where available, kW and kVA demand, for each reported interval.
Note: To protect individual customer privacy, including compliance with RSA 363:37-38, the following features or something similar could be built into the data platform:
If there are only 1 or 2 customers within a rate class by supplier (on default or competitive supply) for any applicable time period, their data will be placed in with the most similar other rate class and their data presented together. For example, if a given town only had 1 or 2 G-1 (largest C&I) customers on default service, their data would be aggregated with G-2 and the two together presented as G-1 and G-2 rate class on default service. (This is relevant for both (a) and (b) above.)
If there are only 3 to 6 customers within a rate class (or grouping due to 1 above), then all of them would be aggregated to show total or average load for the group (with a count of number of such customers) (This is relevant for (b) above.)
If there are 7 or more customers within a rate class (or grouping due to 1 above), then the 3 largest customer loads will be averaged together and presented as 3 customers with identical (average) loads and for the remaining customers load data can be provided individually without identifying information. (This is relevant for (b) above.)

Use Case 3 IMPLEMENTATION OF AN OPT-OUT COMMUNITY POWER PROGRAM

Puc 2204.02 Request for Names and Addresses of Customers.

Upon request, after a municipality or county files its approved electric aggregation plan with the commission, each utility serving the jurisdiction shall provide to the jurisdiction the names and mailing addresses for every electricity customer taking service within the municipality or county including the utility account numbers for each metered load within the jurisdiction.

Such data shall be in digital electronic format [not scanned images] such as a data base or spreadsheet file.

Use Case 4 OPERATION OF A COMMUNITY POWER AGGREGATION PROGRAM

PART Puc 2206 METERING, LOAD SETTLEMENT, AND BILLING

Puc 2206.01 Historic Load and Billing Data. Once a utility customer becomes a customer of a CPA the utility shall provide for each such customer:

A minimum of three years of historic load data for each such customer, consistent with the requirements of Puc 2203.03, except for Puc 2203.03(c), which may be by means of an unlocking key to the data provided under Puc 2203.03.

Individual customer data that allows the identification of that customer and association with their load data, including:

Name of customer;

Name of customer contact if different from customer;

Mailing address;

Service address; and

Account number.

Historic (3-5 yrs.), current [power year] and prospective [next power year] capacity tag information for each customer [when it becomes available].

Current and historic status of customers regarding:

whether they net meter under grandfathered terms [kWh credit];

whether they net meter under more recent tariffs [alternative net metering monthly monetary credit for surplus kWh];

whether they are a group net metering host or member with on-bill crediting;

whether the customer is certified under the RPS as being a qualified customer-cited source of RECs and if so, for which class of RECs;

whether they participate in the Liberty battery pilot;

whether they are currently enrolled in the EAP;

whether they are currently in a payment plan for arrearages; and

rate class of the customer.

At least one year's worth of billing data including monthly arrearage balances.

Puc 2206.02 Ongoing Meter Data Access. Utilities shall provide CPAs with access to metering and load data for each of their customers on as near contemporaneous time frame at they themselves have access to the meter and load data. This may be done by:

Providing the CPA access to meter and load data through a secure API; and

Enabling the CPA to directly read the customer meter. [Pursuant to RSA 55-E:3, II(4).]

Note: Going beyond utility provided meter data, the ongoing use case should incorporate the idea of the CPAs reading interval meters that they own or partially own making that data available through the platform for daily load settlement with ISO New England.
To implement RSA 53-E:3 after the CPA is launched and it has actual customers for Load Settlement and Allocation of Capacity Tags, these functions need to be enabled for customers with hourly interval meters and might best be done through the data platform:

Puc 2206.05 Use of Interval Load Data for Load Settlement. [Use interval meter data for daily load settlement where available, including from CPA provided secondary revenue grade meter. Use negative loads (with hourly or more granular interval data), whether from customer- generators, limited producers, or municipally owned, leased, or operated small power producers under 5 MW and not registered in ISO-NE wholesale market pursuant to RSA 374-D:2, to offset hourly consumption load to determine net load for wholesale market load settlement purposes.]

Puc 2206.06 Use of Interval Load Data for Capacity Tags. [For allocation of capacity tags for ISO-NE FCM use hourly interval load data to figure overall capacity tags for CPA customers, netting negative loads (like Puc 2206.05 above) at annual system peak hour to offset consumption loads at that coincident peak. Give net producer meters a zero capacity tag and reduce consumption meter capacity tags pro rata across the CPA customer base by negative loads unless CPA specifies specific consumer meters to apply the negative loads to, but not less than zero.]

Note: This allocation would probably best be done by the CPAs through the data platform, subject to utility verification that overall capacity tags for CPA customers and distributed generation (with none below zero) equal overall capacity tag for CPA meter group at the time annual capacity tags are assigned. (This could also be done by the software forcing it to be true.) This is an important new functionality that doesn't exist today. Negative loads at time of system peak (e.g. from net metered generation exports) are currently effectively socialized by the utilities to all customers. Distributed generation is this instance refers to generators < 5 MW that are connected behind retail meters on the distribution grid and that are not registered or participating in the FERC jurisdictional wholesale market (engaged in interstate commerce).

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