December 1, 2022

The Honorable Chair and Members
of the Hawai‘i Public Utilities Commission
Kekuanao‘a Building, First Floor
465 South King Street
Honolulu, Hawai‘i 96813

Dear Commissioners:

Subject: Docket No. 2022-0212
Instituting a Proceeding Relating to an Innovative Pilot Process for the Hawaiian Electric Companies
Hawaiian Electric Companies' Responses to PUC-HECO-IRs 1-11

The Hawaiian Electric Companies[1] enclose for filing the Companies' responses to PUC-HECO-IRs 1-11, which the Commission issued in this proceeding on November 25, 2022, and a certificate of service.

Very truly yours,

/s/ Dean K. Matsuura

Dean K. Matsuura
Director, Regulatory Rate Proceedings

Enclosures

[1] Hawaiian Electric Company, Inc., Maui Electric Company, Limited, and Hawai‘i Electric Light Company, Inc. are collectively referred to as the "Hawaiian Electric Companies" or "Companies."

PUC-HECO-IR-01

Reference: Notice at 11-12 and Exhibit E at 2.
In the Notice, Hawaiian Electric states that:

> The Clearinghouse will be built on the Companies' existing Enterprise Data Analytics Platform ("EDAP"). The EDAP was initially an internal proof of concept effort started in 2021 with a production version established in July 2022. This established a next generation cloud data warehouse/data lake and analytics platform to address key business objectives relating to seamless access to integrated business data, storage of large volumes of (time-series) data, and the ability to process data leveraging analytics and machine learning with computational resources not available in on-premise systems. The Clearinghouse Pilot will further develop upon the Companies' existing investments in a modern, secure EDAP, by adding a layer of enhanced data capabilities with external data sharing services and user interface that enables stakeholder groups to efficiently access and use available utility data that is not readily available currently.

In Exhibit E to the Notice, Hawaiian Electric states that it has engaged TEKsystems "for system integration and consulting services to support the implementation and ongoing maintenance of the [EDAP]," and that "TEKsystems has provided initial support for the Clearinghouse concept development and will provide the primary support and development throughout this Pilot effort in conjunction with support for the core EDAP."

a. Please elaborate on the distinctions between the functions of the Clearinghouse Pilot and the existing EDAP.
b. Do the Companies have plans to improve upon the EDAP? If so, how are these unique from the services and functionalities of the proposed Clearinghouse Pilot?
c. Are the Companies currently pursuing alternative means to improve their internal organization and management of data, separate and apart from the Clearinghouse Pilot?
d. Given that the Clearinghouse Pilot appears to be a natural outgrowth of the Companies' existing EDAP and is proposed to be performed by the same vendor servicing the EDAP, please explain why the Clearinghouse Pilot should be considered "innovative," or is otherwise distinct from a business-as-usual improvement.
e. Please succinctly describe what is "innovative" about this pilot.
f. Does Hawaiian Electric believe this pilot reflects innovation at a State level, industry level, or both?
g. Does Hawaiian Electric view the software, the provision of data itself, that potential analyses, or another aspect of the Pilot as most innovative?

Hawaiian Electric Companies' Response:

a. The distinction between the Enterprise Data Analytics Platform ("EDAP") and the Clearinghouse are in the intended audiences and the applications operating at the user interface layer.

1. The Clearinghouse is the User Interface. The Clearinghouse Pilot interface layer will be anchored by a user interface (e.g., web portal) that provides a non-query language programing intuitive user experience to review, request, and access data. This is supported by multiple technologies to provide the four key services of the Clearinghouse to external stakeholders such as public research entities initially and potentially to the interested public, students, research agencies, non-profit agencies, and energy industry service providers. One component of the user interface will be a supporting data catalog to track the lineage of the data and serve the datasets within the Clearinghouse.

   Demonstrated examples of publicly accessible data warehouse sites include:

   - State of Hawaii Department of Health COVID-19 Data Portal (https://health.hawaii.gov/coronavirusdisease2019/current-situation-in-hawaii/)
   - U.S. Energy Information Administration (https://www.eia.gov/electricity/data.php)
   - State of Hawaii Department of Economic Development and Tourism Data Warehouse (https://dbedt.hawaii.gov/economic/datawarehouse/)
   - Hawaii State Energy Office Data Portal https://energy.hawaii.gov/energy-data

2. The EDAP is the Core Data "Engine." The EDAP by contrast is a technical level data analytics platform that provides data storage in a fast query table format using

Databricks "lakehouse" architecture running within the Microsoft Azure Cloud platform for the processing and analytics of datasets. The EDAP is an internal Hawaiian Electric resource used to build pipelines to raw data sources and perform the work required to create views and tables ready for analytics work. The concentration has been on EDAP to provide a platform that can store and provide the tools and compute resources required for utilizing the "Big Data" Advanced Metering Infrastructure ("AMI") datasets. A comparison of Features/Functions of the Clearinghouse versus the EDAP are provided in the following table.

Feature / Function	Clearinghouse	EDAP
Target Audience	External - Public and Research Entities	Internal
Interface	Presentation Layer - Friendly User Interface	Application Layer - Technical interfaces
Curated Data Catalog	Yes	No
Request for Data Form	Yes. This function will greatly enhance the fulfillment and tracking of datasets requested of the Companies. The data collected will identify the most requested datasets and provide basis to create new datasets based on market demand.	No
Customer Identifiable Information	No	Yes
Access to Ready Made Data for Download	Yes. Direct " Click to download" access. Datasets available will be divided into open public and authenticated permission required.	No. All views and tables require a script/query operation to be performed on the Delta Tables for "in-memory" creation and use. Downloading of the resulting query/table builds can then be performed.
Access to Data in Place* for Authenticated Requestors	Yes, Will be available through a data sharing application to connect to data in-place using compatible applications such as PowerBI, Tableau, Spark, pandas and Java.	Yes. Core functionality of Databricks for a managed set of Databricks for technical users or functional users through a BI application.
File Stored As	For Download = .csv, .pdf, parquet In-Place = Databricks Delta Tables	Databricks Delta Tables

* This function is important for both Big Data access where transferring of the datasets is cumbersome and time consuming as well as providing a method for external parties to set up ongoing queries to access current versions of datasets.

b. Yes, the Companies are continually improving the EDAP as an ongoing operational tool that is being developed in-house to meet the analytics needs of the Companies. However, this work is distinct from the Clearinghouse Pilot as the EDAP is the core data processing and analytics platform that underlies the datasets that could be served up within the Clearinghouse Pilot.

The Clearinghouse will serve as a location for the presentation and serving of the datasets created by the EDAP and will not perform the core foundational work which includes: Secure access to data sources and the extract, load, and transformations (ELT) required to connect to "Big Data" (e.g., as of November 28, 2022, the AMI Meter Data Management system has 177,000 meters with 151 billion rows of data) and integrate multiple data sources (e.g., customer records, billing systems and other internal and external descriptive datasets).

c. Yes, the Companies will continue to pursue alternative means to improve their internal organization and management of data separate and apart from the Clearinghouse Pilot. The Clearinghouse Pilot is intended for external data provision and not a comprehensive solution for the Companies' internal organization and management of data.

d. The key distinctions identified in response to part a. would not be developed as a business-as-usual improvement. Among other things, the Clearinghouse Pilot is innovative and not business-as-usual due to the following:

- State Agency Collaboration – The Pilot will facilitate better collaboration between the Companies and state agencies with the ability to access data more seamlessly, align on data definitions and meaning, and result in mutual benefits as discussed in the Notice.
- Other states have identified the need but have yet to implement data sharing platforms similar to what is proposed with this Pilot. See also the response to part f.
- Data Access, Transparency, and Data Utilization – The Clearinghouse presentation layer and services enable increased external data access, transparency, and use of the data for analysis. See also the response to part g.

- Modern Data and Analytics Toolsets – The use of modern data and analytics tools to overcome current challenges and limitations in the use of voluminous and difficult to utilize data and the early adoption of toolsets is innovative. For example, the high volume of AMI data has posed significant challenges for State agencies to download, process and effectively utilize AMI data for analysis, and the Pilot aims to make the data more readily useable for review and analysis. The use of AMI data is particularly challenging given the number of meters, interval of data records, the voluminous size of the records, the time it takes to download the data, the hardware requirements, etc., to accommodate the hundreds of millions of records that will be generated per month.
- The Pilot Directly Supports Area of Collaboration 4 – Data Sharing, Access, and Analytics (see Innovation Pilot Framework Workplan, filed on November 12, 2021, Attachment 1 at 6).

e. See the response to part d.

f. The Clearinghouse Pilot's interface and flexibility to grow to provide increasingly more data and the potential to conduct analysis on Big Data is innovative on a state level and is innovative or comparable to ongoing innovative initiatives at a national industry level. For related industry actions see New York Public Service Commission ("NYPSC") *Order Implementing an Integrated Energy Data Resource* ("Order"), dated February 11, 2021 (see Attachment 1)[1] which indicates an in-progress timeline with use cases expected in 2023, and discusses similar challenges around data availability, accessibility, and usefulness of information (see Attachment 1, page 6). The Climate Change and Business Research Initiative Policy Report – *Data Access for a Decarbonized Grid*, dated February

[1] Available at: https://www.nyserda.ny.gov/All-Programs/Integrated-Energy-Data-Resource-Program

2021 (see Attachment 2)[2] reviews energy data initiatives in other states including Texas, New Hampshire, and Ohio indicating the need for shared data platforms which are all still in proposal or development stages.

The following is a summary of energy data initiatives in other states from the *Data Access for a Decarbonized Grid* report:[3]

Energy Data Initiatives in Other States

States around the country with a range of energy regulatory structures are developing centralized and standardized approaches to energy data generation and sharing, primarily focused on customer data applications. As California legislators, regulators, and utilities consider new approaches to accelerate data access, these examples could serve as models.

In March 2020, the **NEW YORK** Public Service Commission initiated a comprehensive energy data access proceeding to address market development, efficiency, and privacy and cybersecurity concerns through the development of a "clearly defined data access framework."[34] Through the proceeding, commission staff proposed a statewide data access framework that would serve as a "single source for data access" including a standard guide for framework application and definitions of key terms, a risk management certification for cybersecurity and privacy requirements, customer consent and opt-out requirements, and data quality and integrity standards.[35] A proposed single, statewide integrated energy data resource (IEDR) would collect, integrate, analyze, and manage the data in one location, to be managed by a third-party program manager with oversight by state energy regulators.[36] While the commission has yet to implement these proposals, they represent potential examples of state-level standardization and platform creation.

Other states developing centralized, standardized data platforms include:

TEXAS: The Smart Meter Texas program, a regulator-endorsed collaboration among five electric utilities, facilitates customer and third-party access to energy data in a standardized format, with recent public utilities commission determination that advanced metering systems must provide on-demand data reads.[37]

NEW HAMPSHIRE: Senate Bill 284, enacted in 2019, established a statewide multi-use energy data platform to facilitate access for utilities, customers, and qualified third parties, and directed the state public utilities commission to undertake a rulemaking (currently underway) to set governance, data accuracy and security, and third-party access standards.[38]

OHIO: The state public utilities commission organized an energy data stakeholder workgroup, which in late 2019 issued a report calling for standard privacy protocols and methodologies for third-party access to customer data including the Green Button Connect platform.[39]

Some states are also leading efforts to develop grid data platforms similar to California utilities' ICA maps.[40] In **MINNESOTA**, state law requires utilities to identify optimal DER interconnection points and necessary grid upgrades, and a recent public utilities commission ruling clarified that this includes information on the location and capacity of individual distribution lines.[41] New York's electric utilities have developed hosting capacity maps with a focus on distributed solar resource deployment. These state efforts, including California's, highlight the need for data validation in development of grid structure data resources, particularly to avoid publication of data that may limit development by suggesting more restrictive grid capacity than actually exists.[42]

[2] Available at: https://www.law.berkeley.edu/wp-content/uploads/2021/02/Data-Access-for-a-Decarbonized-Grid-February-2021.pdf
[3] Attachment 2 at 16.

g. While the software abilities and data provision have elements of innovation the enablement and potential for analyses is the most innovative outcome of the Clearinghouse pilot. These analyses though are enabled by the software (ML/AI/Notebook/SQL tools), computing power, and provisioning of the data. In the Companies' experience with the current AMI dataset and the Companies' interaction with the analysis use of the dataset with the National Renewable Energy Laboratory (NREL), engineers stated that the current EDAP environment both serves the data with descriptive fields and provides a superior analytics environment for analysis than they have seen any other utility provide. The Clearinghouse Pilot is the basis to unlock the potential for more comprehensive and collaborative analysis work.

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

CASE 20-M-0082 - Proceeding on Motion of the Commission Regarding Strategic Use of Energy Related Data.

ORDER IMPLEMENTING AN INTEGRATED ENERGY DATA RESOURCE

Issued and Effective: February 11, 2021

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STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

At a session of the Public Service Commission held in the City of Albany on February 11, 2021

COMMISSIONERS PRESENT:

John B. Rhodes, Chair
Diane X. Burman, dissenting
James S. Alesi
Tracey A. Edwards
John B. Howard

CASE 20-M-0082 - Proceeding on Motion of the Commission Regarding Strategic Use of Energy Related Data.

ORDER IMPLEMENTING AN INTEGRATED ENERGY DATA RESOURCE

(Issued and Effective February 11, 2021)

BY THE COMMISSION:

INTRODUCTION

New York is transforming its electricity system into one that is cleaner, more resilient, and more affordable. Effective access to useful energy data will play a critical role in this transformation, unleashing the power of integrated energy customer data and energy system data to speed the deployment of clean energy solutions. This will attract investment, enable analytics, help identify operational efficiencies, promote innovation, and encourage new business models, which will in-turn create value for customers and the State's energy system. The creation of an Integrated Energy Data Resource (IEDR) will provide New York's energy stakeholders with a platform that enables effective access and use of such integrated energy customer data and energy system data.

On May 29, 2020, Department of Public Service Staff (DPS Staff) filed the "Department of Public Service Staff Whitepaper Recommendation to Implement an Integrated Energy Data Resource" (the Whitepaper),[1] which describes the current state of access to energy-related data for New York State and recommends an approach for the creation of an IEDR that would provide a platform for access to customer and system data. The Whitepaper also includes an analysis of energy data initiatives in other jurisdictions and specific recommendations for stakeholder engagement, data resource design, data resource use cases, implementation, and operation.

Broadly, the Whitepaper recommends that the IEDR collect and integrate a large and diverse set of energy-related information on one statewide data platform. To advance the development of a statewide IEDR, the Whitepaper details specifics related to the IEDR's purpose, scope, capabilities, program management, and governance for the Public Service Commission's (Commission) consideration.

By this order, the Commission adopts the recommendation to establish a statewide IEDR and adopts the detailed path as described in the Whitepaper, with modifications. As discussed below, the Commission directs the implementation of an IEDR that securely collects, integrates, and provides useful access to a large and diverse set of energy-related information on one statewide data platform. The types of information and tools made accessible through the IEDR should provide useful insights related to the provision and use of

[1] Case 20-M-0082, Department of Public Service Staff Whitepaper Recommendation to Implement an Integrated Energy Data Resource (filed May 29, 2020) (the Whitepaper).

electricity and natural gas in New York State. While numerous data-related initiatives exist in New York, encompassing both customer and system data access, the Commission's actions will accelerate efficient and expanded useful access to useful energy data, for all types of users, including Energy Service Entities (ESEs), utilities, governmental agencies and academics. To enable implementation, this Order directs the development of the IEDR's design and adopts the necessary frameworks for funding, program management, and governance.

SUMMARY OF THE WHITEPAPER

The Whitepaper provides relevant background information on recent regulatory actions in New York State, including the Pilot Data Platform,[2] and a summary of the Distributed Energy Resource (DER) Industry Group Initiative.[3] It then describes the existing energy information framework in New York, emphasizing that while the volume and variety of accessible utility data has increased since 2014, the current status and rate of progress does not meet Commission expectations due to several issues that are preventing useful

[2] The Storage Deployment Order directed DPS Staff and the New York State Energy Research and Development Authority (NYSERDA) to lead coordination efforts with the Joint Utilities, Long Island Power Authority (LIPA), New York Power Authority (NYPA), and other stakeholders to develop and implement a Pilot Data Platform (Pilot Data Platform) with the assistance of a third party platform provider. See, Case 18-E-0130, Energy Storage Deployment Program, Order Establishing Energy Storage Goal and Deployment Policy (issued December 13, 2018) (Storage Deployment Order), p. 84.

[3] Case 16-M-0411, In the Matter of Distributed System Implementation Plans, Summary Report: Distributed Energy Resource Market Enablement Data Needs (filed as a Public Comment January 6, 2020).

access to useful data. These issues include availability, accessibility, and usefulness of information. The Whitepaper identifies notable energy data initiatives in other states, including California, Illinois, New Hampshire, and Texas. While each state initiative has one or more goal and characteristic that informed the recommendations, none of the other state initiatives match the scope and depth of the IEDR proposal.

Next, the Whitepaper proposes a detailed path forward to develop and operate an IEDR that will collect, integrate, and make useful a large and diverse set of energy related information on one statewide data platform to materially improve stakeholders' ability to understand and affect the provision and use of electricity and natural gas in New York State. The detailed path assumes that the IEDR evolves in a sequence that begins with a "minimum viable data set" closely aligned with use-case priorities. The execution of the path begins with the assignment of a Program Sponsor role, for which DPS Staff recommended NYSERDA. The Program Sponsor would first select the Program Manager. Once retained, the Program Manager would determine and recommend a team structure that would be best suited for each course of action, including Stakeholder Engagement, Architecture, Design, Implementation, and Operation. The Program Sponsor and Program Manager's work would be overseen by way of a Steering Committee and Advisory Group.

The Whitepaper also describes DPS Staff's effort working with NYSERDA to issue a Request for Information (RFI) to obtain the information needed to inform the Commission of the expected expenditures necessary to build and operate the IEDR. The Whitepaper suggests that the Commission use such information, as well as information obtained through the comment process, to set an overall budget cap to be managed by the

Program Sponsor and to understand the sequence and timing of work and expenditures by all program participants.

Lastly, the Whitepaper delineates the roles and responsibilities of each of the relevant entities involved. In addition to the Commission, other State agencies and entities would have a role in implementing the IEDR, including NYSERDA, NYPA, LIPA, the New York Independent System Operator, Inc. (NYISO), and the New York State investor-owned electric and gas utilities (IOUs).[4]

PUBLIC NOTICE

Pursuant to the State Administrative Procedure Act (SAPA) §202(1), a Notice of Proposed Rulemaking (Notice) was published in the State Register on June 24, 2020, [SAPA No. 20-M-0082SP2]. The minimum time period for submission of comments pursuant to the SAPA Notice expired on August 24, 2020. In addition, on June 30, 2020, the Secretary to the Commission (Secretary) issued a Notice of Stakeholder Meeting and Soliciting Comments (Secretary's Notice), which invited stakeholders to submit written initial comments by August 24, 2020, and reply comments by September 11, 2020. The Secretary's Notice also invited interested stakeholders to a technical conference held by DPS Staff on July 22, 2020, and conducted via

[4] New York's electric and gas IOUs are: Consolidated Edison Company of New York, Inc. (Con Edison), Orange and Rockland Utilities, Inc. (O&R), Central Hudson Gas & Electric Corporation (Central Hudson), Niagara Mohawk Power Corporation d/b/a National Grid (National Grid), New York State Electric & Gas Corporation (NYSEG), Rochester Gas and Electric Corporation (RG&E), National Fuel Gas Distribution Corporation (National Fuel), St. Lawrence Gas Company, Inc. (St. Lawrence Gas), Keyspan Energy Delivery New York (KEDNY), and Keyspan Energy Delivery Long Island (KEDLI).

WebEx. In response to the SAPA Notice and the Secretary's Notice, comments were filed by several organizations and individuals. A complete summary of these comments is included in Appendix A, and they have been considered and addressed in the discussion below.

LEGAL AUTHORITY

The Public Service Law (PSL) provides the Commission with broad jurisdiction and authority related to the "[m]anufacture, conveying, transportation, sale, or distribution of … electricity … ."[5] Furthermore, PSL §5(2) instructs the Commission to "encourage all persons and corporations subject to its jurisdiction to formulate and carry out long-range programs … with economy, efficiency, and care for the public safety, the preservation of environmental values and the conservation of natural resources." The Commission's supervision of electric corporations includes the responsibility to ensure that all charges made by such corporation for any service rendered shall be just and reasonable.[6] PSL §66 empowers the Commission to "[p]rescribe from time to time the efficiency of the electric supply system." The Commission may exercise this broad authority to direct regulatory standards to execute the provisions contained in the PSL. Additionally, the Commission has the authority to direct the treatment of DER by electric corporations.[7]

[5] PSL §5.

[6] PSL §65.

[7] PSL §§5(2), 66(1), 66(2), 66(3), 66-c, 66-j, and 74.

DISCUSSION

I. The Need for a Statewide Integrated Energy Data Resource Whitepaper Recommendations

The Whitepaper notes that since 2014, as part of the Commission's Reforming the Energy Vision (REV) efforts, each utility has independently implemented a portfolio of stakeholder-facing online resources that provide access to various types of system-related information.[8] Those resources are summarized in Appendix A of the Whitepaper. DPS Staff provides an evaluation of the current portfolio of utility-provided data access resources by examining the availability, accessibility, and usefulness of customer and system data provided by the utilities. Overall, DPS Staff opines that the development of utility-provided resources to-date represents notable progress that should generally be maintained until the IEDR can replace and surpass those tools. However, DPS Staff's analysis concludes that IOU progress falls short of timely providing the State's energy stakeholders with useful access to useful energy-related data.

DPS Staff recommends that the Commission direct the planning, design, implementation, and operation of a statewide IEDR that will collect, integrate, analyze, and manage a wide variety of standardized energy-related information from the State's utilities and other sources. DPS Staff asserts that integrating such information in one location would enable DER providers, utilities, energy consumers, government agencies, and others to more readily develop valuable technical and business

[8] Case 14-M-0101, Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision, Order Adopting Regulatory Policy Framework and Implementation Plan (issued February 26, 2015) (REV Track One Order), p. 92.

insights by using queries and other functions to filter, aggregate, analyze, and generate useful information. The Whitepaper suggests that those insights will, in turn, lead to faster and better policy, investment, and operational decisions that will accelerate the realization of New York State's REV and Climate Leadership and Community Protection Act (CLCPA) goals. Furthermore, DPS Staff asserts that the proposed IEDR strategy is the least-cost approach to drive progress toward improved information access and usefulness. To achieve that result, DPS Staff provides detailed recommendations for the elements of a comprehensive IEDR program framework comprising program sponsorship, program oversight, program management, system architecture, system design, system implementation, system operation, and stakeholder engagement.

Comments

The Joint Utilities[9] agree with Staff that, properly developed, a standardized platform has the potential to facilitate investment and community planning that will accelerate the deployment of clean energy solutions throughout New York State. The Joint Utilities also state that the IEDR development should be nimble, able to respond to evolving market needs and technological capabilities in a timely and cost-effective manner, while providing upfront value that third parties and developers need to design and launch products.

Logical Buildings agrees with the need for a central repository for all the information that may be utilized for providing energy management services. They also agree that material relevant to educate third parties as to which

[9] The Joint Utilties are: Central Hudson, Con Edison, NYSEG, National Grid, O&R, and RG&E.

geographic areas may have the highest need for certain services should also be made available to DER developers.

While Logical Buildings asserts that the process for companies trying to access data is currently overly complicated and needs simplification, a number of commenters including the Association for Energy Affordability (AEA), Advanced Energy Economy (AEE), Flux Tailor and the Retail Energy Supply Association(RESA), agreed that the provision of data under existing Commission rules and existing utility practices should continue without interruption while the proposed IEDR is developed and adopted.

Determination

The Commission finds that the current state of energy stakeholders' access to energy information provided by New York State's utilities is inadequate and inefficient. It is clear that the utilities' existing and currently planned data access resources and practices will likely fall short of the State's needs. Further, the Commission agrees with comments asserting that the current processes for gaining access to utility-provided data is burdensome.

Consequently, the Commission affirms that it is necessary to expeditiously implement the IEDR as recommended by DPS Staff in the Whitepaper.

DPS Staff's proposal for implementing a centralized, statewide IEDR provides a comprehensive and coherent vision to move beyond the current landscape's serious shortcomings. The Commission agrees with DPS Staff's assertion that the proposed IEDR will provide New York State's energy stakeholders with useful access to useful energy-related information and tools in a manner that will most efficiently accelerate progress toward achieving the State's clean energy and climate goals.

Furthermore, the Commission finds that DPS Staff's detailed recommendations for program structure and execution will effectively address the commenter concerns regarding program governance, goals, milestones, timeframes, and stakeholder involvement.

The Commission notes that several programs have been initiated relating to various aspects of accessing and using energy customer and energy system data. The actions directed by this Order specify the next steps to substantially increase useful access to useful energy-related data through the IEDR, while not prematurely transitioning away from data access tools and resources that are already operational. Considering the time needed to implement all the IEDR capabilities, it will be necessary and reasonable for the utilities to maintain existing data access resources and to continue developing currently planned resource enhancements and additions that would provide stakeholders with earlier access to more data.

II. IEDR Program Parameters

A. IEDR Program Scope

Whitepaper Recommendations

Staff proposes that the statewide IEDR would collect, integrate, analyze, and manage a wide variety of standardized energy-related information from the State's electric and gas utilities and other sources. In addition to collecting and housing the data, the IEDR would provide a collection of analytic tools that would enable users to design and run useful queries and calculations that operate across all the data types in the system and be a trusted resource for the State's energy stakeholders. The number and functionality of those tools should increase over time to align with the various use cases

that develop. In addition, to comply with the data privacy and protection framework adopted by the Commission, the users' access to the IEDR's various tools would be governed by access controls that align with the legitimate needs of each user type while also preventing unwarranted access to information that does not serve those legitimate needs.

The Whitepaper indicates IEDR should also perform other functions to produce additional useful information that is derived from the information acquired from its outside sources. For example, one such function would compensate for the large amount of missing consumption interval data (due to the lack of widely implemented smart metering) by synthesizing estimated customer interval data based on the customer's monthly consumption and the generic load profile for the customer type. Another example is users' ability to obtain calculated monthly bill estimates based on a customer's energy usage data and digitized tariff parameters.

In addition, the design, operation, and management of the IEDR should readily accommodate adding new information sources, information types, and functions as new market and utility needs emerge. Over time, the IEDR should evolve to include useful information and functions related to weather, demographics, zoning, building attributes, land attributes, property taxes, real estate values, locations of environmental justice areas, Electric Vehicle (EV) registrations, EV charger types and locations, EV charger loads, localized grid load-serving capacity, DER aggregations by operator, DER aggregations by grid service, and power quality measurements.

According to DPS Staff, relational information that describes the relationships among the various information elements in the IEDR must also be included since it would

materially affect the users' ability to find, analyze, and generate useful information. The IEDR should also be able to continually analyze its various data sets to generate additional relational information that is not obtainable from outside sources.

To address the standardization of data, DPS Staff recommends that all information providers should fully align each provided data element's attributes with standards for the attributes required to meet the needs of the use cases enabled by the IEDR. Important attributes that significantly affect a data element's usefulness - including temporal granularity, spatial granularity, precision, accuracy, age, and uniformity – should all meet or exceed minimum levels of adequacy for each use case that employs that data element.

DPS Staff recognized that the Commission is also considering the establishment of new state policies for a uniform and comprehensive Data Access Framework to govern the means and methods for accessing and protecting all types of energy-related information. DPS Staff recommends that all aspects of implementing and operating the proposed IEDR must comply with the policies comprising any future new Data Access Framework.

Finally, DPS Staff includes, as Appendix B of the Whitepaper, a table listing the recommended data items to be acquired, integrated, managed, analyzed, and made accessible by the proposed IEDR. That list includes both structured data (organized and sortable numbers, letters, words, and phrases) and unstructured data (documents, diagrams, images, and video items that are characterized by metadata). Recognizing the need to approach the execution of the IEDR in phases, DPS Staff indicates which data items should be implemented in Phase 1 and

which should be implemented in Phase 2, based on use case priorities.

Comments

As discussed above related to the need for the statewide IEDR, several stakeholders support the general scope of the IEDR. The Joint Utilities state that the proposed scope is ambitious from a technical perspective and will take many years to be fully realized and recommend that the Commission direct DPS Staff to work with stakeholders to develop a comprehensive scoping phase before continuing further IEDR development. Several commenters specifically supported evolving the platform from an initial set of core use cases, for which the City of New York, as well as Mission Data, provided input.

With regard to collecting large and diverse sets of data, Climate Action Associates (CAA) stated that emphasis should be on: standardizing utility-provided data and making it available to third parties; avoiding investment in custom tools for individual use cases; and, an effort by the Joint Utilities to understand and harmonize basic utility data management practices. AEE also recommends first focusing on standardizing data. RESA stresses that utilities must take all necessary steps to ensure that the IEDR contains timely and accurate information.

Determination

The Commission agrees with DPS Staff's recommended scope for a statewide IEDR that will collect, integrate, analyze, and manage a wide variety of standardized energy-related information from the State's electric and gas utilities and other sources. In addition, the inclusion of analytic tools that would enable DER providers, utilities, government agencies, and others to more readily develop valuable technical and

business insights will, in turn, lead to faster and better policy, investment, and operational decisions that will accelerate realization of New York State's clean energy goals. In addition, the Commission notes that the IEDR will enable entities that would like to perform their own data analytics and services by having access to the various data sources.

Furthermore, the Commission agrees with the proposed development approach that is centered around identifying and prioritizing IEDR use cases that provide the most value to New York State's energy stakeholders. To enhance stakeholder value over the long-term, the IEDR's design, operation, and management shall readily accommodate adding new information sources, information types, and analytic functions as new beneficial use cases emerge. A use case will be particularly beneficial if it materially improves or accelerates investment, operational, or regulatory decisions related to DERs, energy efficiency, environmental justice, or electrification strategies for transportation and buildings, thereby facilitating faster fulfillment of one or more of New York State's REV and CLCPA objectives.

The Commission also agrees with DPS Staff's assertion that much of the IEDR's value will depend on the extent to which the State's energy stakeholders trust the IEDR as a reliable source of accurate information. Consequently, to establish and maintain that trust, the IEDR must be designed, implemented, and operated in a manner that ensures the integrity and accuracy of data stored within the IEDR.

In a closely related part of this proceeding, the Commission is considering new state policies for a uniform and comprehensive Data Access Framework to govern the means and methods for accessing and protecting all types of energy-related

information.[10] Consequently, all aspects of implementing and operating the proposed IEDR must comply with any future policies adopted under a new Data Access Framework.

B. IEDR Program Schedule

Whitepaper Recommendations

The Whitepaper suggests that the Program Manager should be required to submit to the Program Sponsor detailed budgets and schedules for each aspect of building the IEDR. Such budgets and schedules should reflect an IEDR development approach that is centered around identifying and prioritizing IEDR use cases that provide the most value to New York State's energy stakeholders. DPS Staff further notes that the IEDR's design, operation, and management should readily accommodate adding new information sources, information types, and analytic functions as new market and utility needs emerge.

Comments

The Joint Utilities believe it is essential that the IEDR development schedule accurately reflect each utility's varying timelines and their investments in information systems and data sharing capabilities, as data flowing from and across these foundational systems will dictate what information can be made available to third parties in the IEDR. The Joint Utilities agree that the platform should evolve from a set of baseline or core use cases and system requirements that are prioritized based on cost-effectiveness and stakeholder value. RESA states that an implementation schedule that identifies goals and milestones, recognizes dependencies between goals and

[10] Case 20-M-0082, Data Access Framework Whitepaper (filed May, 29, 2020).

milestones, and establishes each activity's timing is an essential feature to the successful implementation of the IEDR.

Determination

DPS Staff defined a two-phase schedule in both the RFI to the market and information requests to the utilities as part of DPS Staff's efforts to obtain the best possible cost information to inform the Commission determination on the IEDR budget. Since the budget caps we adopt below are based on those assumptions, we adopt that approach for the IEDR program schedule. Therefore, Program Phase 1, the initial IEDR implementation, shall enable at least five of the highest priority use cases with the expectation that there could be ten or more achieved. Program Phase 2 shall expand and enhance the initial IEDR to enable approximately an additional forty use cases incrementally, by building upon the success of Phase 1. The total duration for enabling approximately 50 IEDR use cases shall be about 60 months. Phase 1 shall be completed in 24 – 30 months. Phase 2 shall be completed in 30 – 36 months. Operation of the utility's IEDR data feeds shall persist for the life of the IEDR (multiple decades). The Commission notes that the prioritization and implementation will reflect technical conditions and stakeholder input and shall be based on the Project Manager's recommendations after consultation with the Advisory Group and Steering Committee.

Noting that the Joint Utilities recommend that the schedule should take into account the varying timelines of each utility's current capabilities as it relates to collection and provision of the various data elements, the Commission defers decision of any phased implementation at the utility level to the design and development process to be carried out by the Project Manager. The Commission expects those processes to

consider the different data readiness levels at each utility and consider such criteria as advanced metering infrastructure (AMI) implementation status, overall size of customer base, DER market activities, and smart grid implementation status.

C. IEDR Program Budget Cap and Cost Recovery

Whitepaper Recommendations

DPS Staff proposes that the Program Budget should encompass all Commission-directed expenditures related to planning, designing, building, administering, and operating the central IEDR. Following the Initial Program Schedule's approval, the Program Manager, working with the Program Sponsor and other appropriate entities, should develop an Initial Program Budget that describes the type, purpose, predicted timing, and estimated amount of all significant expenditures. As the program progresses, program expenditures' scope and timing will come into better focus; consequently, the Program Manager and Program Sponsor should regularly meet to review actual and predicted program expenditures and determine whether budget and/or scope modifications are needed.

DPS Staff recommends that funding should be provided from all jurisdictional electric and gas ratepayers. This includes the initial funding needed to implement the IEDR, as well as ongoing funding for operating and enhancing the IEDR. DPS Staff anticipates that LIPA and NYPA will engage in the IEDR development and implementation process. This would allow LIPA and NYPA to align the various energy-related data activities under their control with the statewide IEDR ultimately directed by the Commission to maximize benefits of the resource to New York State.

To get information related to cost, DPS Staff worked with NYSERDA to issue a RFI to obtain information from a number of solution providers to inform the Commission on the expected expenditures necessary to build and operate the central IEDR. DPS Staff also sought comment from each utility pertaining to its anticipated IEDR-related work and expenditures needed to provide the data items listed in Appendix B of the Whitepaper.

Comments

The Joint Utilities requested clarification on the cost recovery mechanism for implementing the IEDR, believing that NYPA and LIPA should share a portion of the cost for development. The Joint Utilities believe that in Appendix B there are aspects of DPS Staff's request that are not detailed to the point that the Joint Utilities can prepare a cost estimate.

Determination

Given the multi-year and methodical approach to designing, developing, and implementing the statewide IEDR, the Commission finds it necessary to determine funding for Phase 1, as defined above, in this Order. Furthermore, funding for Phase 1 is determined for those efforts that shall be undertaken and competitively procured by the Project sponsor which include:

- Managing the IEDR Program
- Developing the IEDR Architecture
- Developing and Integrating Detailed IEDR Designs and Specifications
- Deploying and Integrating IEDR Components and Services
- Testing and Commissioning IEDR Use Cases
- Operating the IEDR

In parallel to the efforts to be carried out by the Project Sponsor, funding for Phase 1 is determined for the gas and electric utilities that will need to perform the following:

- Managing the utility's Internal IEDR Data Sourcing

Program
- Developing the Architecture for the utility's IEDR Data Sourcing Resources and Processes
- Developing and Integrating Detailed Designs and Specifications for the utility's IEDR Data Sourcing Resources and Processes
- Deploying and Integrating the utility's IEDR Data Sourcing Resources and Processes
- Testing and Commissioning IEDR Use Cases
- Operating and Managing the utility's IEDR Data Sourcing Resources and Processes

Based on the efforts of DPS Staff to obtain cost information from the results of the RFI, as well as the stakeholder comments and replies to information requests submitted to the utilities from DPS Staff, the Commission establishes a budget cap of $13.5 million for the Program Sponsor's efforts for Phase 1, including $12 million for procured resources and $1.5 million for the NYSERDA administrative costs as Project Sponsor.

While both gas and electric customers in New York State will benefit from the IEDR, recovering these costs from only electric customers will simplify the recovery and is equitable since all gas customers are also electric customers. We also agree with the Joint Utilities that NYPA and LIPA should share a portion of the Phase 1 development costs given the anticipated statewide benefits of the IEDR Program, and accordingly request that each contribute an amount based on their respective portions of total electric load for 2019, subject to approval by NYPA and LIPA's governing boards. The remaining costs shall be allocated and collected from the jurisdictional electric utilities in the same manner as the current authorized costs are being allocated and collected via the existing Bill-As-You-Go agreements that NYSERDA has with each utility. This should simplify the administration and help

to avoid cash flow issues between collections and expenditures. Collections for the IEDR Program are incremental to any collection schedule already approved in the Commission's Clean Energy Fund Order, which utilizes the existing Bill-As-You-Go agreements.[11] To document and effectuate this decision, NYSERDA is directed to file an updated Bill-As-You-Go Summary with the Commission within 60 days of the issuance of this Order and make any necessary changes to the funding agreements with the individual utilities.

Each of the utility's budget caps to complete the data sourcing efforts for Phase 1 shall be as follows. Con Edison, Central Hudson and National Grid shall be subject to a $12 million cap each. O&R, NYSEG, and RG&E shall be subject to a $6 million cap each. These budget caps shall cover the data sourcing efforts for the electric and gas businesses of each respective utility, with the exception of Con Edison that shall also include the steam business. All efforts shall be made to maximize efficiencies by the use of shared services to enable such data sourcing across the businesses of each IOU. National Fuel Gas, St. Lawrence Gas, KEDNY and KEDLI, shall each be subject to a budget cap of $1 million. Each IOU shall defer applicable costs, up to their individual cap, for future recovery in their next rate case filing after Phase 1 is completed. Applicable costs shall include incremental operation and maintenance expenses, net of related savings, and carrying

[11] Case 14-M-0094, et al., Order Authorizing the Clean Energy Fund Framework (issued January 21, 2016), p. 98 (Clean Energy Fund Order). The Clean Energy Fund Order authorized the Bill-As-You-Go approach to better match collections with expenditures, where collections are retained in utility accounts and transferred to NYSERDA at a specified frequency based on actual program expenditures.

costs on capital expenditures, which includes the “return-on” and “return-of” the investment, net of related incremental savings. The deferral balance shall accrue carrying costs at the rate specified in each IOU’s existing rate plan.

Since several IOUs are already in the process of planning and/or implementing certain information technology (IT) projects that would enable the collection and transfer of the data elements required under Phase 1 of the IEDR Program, the budget caps and deferral authority provided in this Order are for incremental projects and expenditures above and beyond those already in each utility’s current five year IT budgets and plans.

The Commission anticipates that LIPA and NYPA will actively engage in the IEDR development and implementation process and therefore will align their various energy-related data activities under their control to enable the transfer of the same data elements as those being provided by the jurisdictional utilities to maximize benefits of the resource to New York State. This engagement should include LIPA and NYPA participation in the Utility Coordination Group described later in this Order.

Several commenters note the importance of having access to technical expertise; for example AEE recommends that the Commission seek outside expertise to supplement DPS Staff’s capabilities. The Commission agrees with this comment, particularly as it relates to understanding the efforts and investments needed at each utility to enable the assembling and transfer of data to the IEDR. While we are setting budget caps on each utility, the expectation is that the actual investments needed will be revealed and more fully understood as we move through the design and implementation process of the IEDR.

During these tasks, DPS Staff will require a dedicated resource to oversee and provide guidance on the utility data sourcing efforts and investments. Therefore, NYSERDA, as Project Sponsor, shall include in its implementation plan, the provision of such resources.

Funding for Phase 2 of the IEDR will be the subject of future Commission action that will be informed by the Project Sponsor reports due in 2023, as described later in this Order.

III. IEDR Program Governance

A. IEDR Program Sponsor

Whitepaper Recommendations

In the Whitepaper, DPS Staff proposes establishing a Program Sponsor as the entity responsible for defining, initiating, overseeing, and facilitating the IEDR Program on behalf of the State. Staff identifies and recommends NYSERDA as the most appropriate candidate for this role. DPS Staff further recommends that the Program Sponsor's principal duties should include:

1) creating the IEDR Program Charter to formally establish the program's purpose, scope, guiding principles, objectives, participants, roles, and responsibilities;
2) organizing the membership and initial meeting schedule for an IEDR Steering Committee comprising five members of DPS Staff and four members of NYSERDA Staff;
3) organizing the membership and initial meeting schedule for an IEDR program Advisory Group comprising representatives for all significant stakeholder categories;
4) specifying, procuring, and administering the services provided by a professional Program Manager;
5) providing the program's participants with the means and methods for accessing and expending the funds allocated to the program by the Commission;

6) ensuring robust stakeholder engagement throughout the life of the IEDR program;
7) monitoring adherence to the Program Charter by all program participants; and,
8) helping the Program Manager investigate and resolve issues that could negatively affect the program's costs, schedule, or benefits.

Comments

There was a general consensus that the Sponsor should have access to resources who can provide: all necessary technical expertise; experience in identifying and procuring applicable software; experience in developing and integrating similar information systems; experience enabling and managing user access to secure data; strong cybersecurity acumen; and, an understanding of how energy solution providers can effectively apply integrated energy data. Logical Buildings and NYSERDA agreed that NYSERDA would be a good fit for the Program Sponsor role. CAA stated its concerns about the potential lack of participation by experts without compensation.

Determination

The Commission recognizes the need for an effective IEDR Program Sponsor and assigns the role to NYSERDA. In this role, NYSERDA will be responsible for defining, initiating, overseeing, and facilitating the IEDR Program on behalf of the State. NYSERDA's principal duties as Program Sponsor shall include:

1) creating the IEDR Program Charter to formally establish the program's purpose, scope, guiding principles, objectives, participants, roles, and responsibilities;
2) organizing the membership and initial meeting schedule for an IEDR Steering Committee comprising five members of DPS Staff and four members of NYSERDA Staff;

3) organizing the membership and initial meeting schedule for an IEDR program Advisory Group comprising representatives for all significant stakeholder categories;
4) specifying, procuring, and administering the services provided by a professional Program Manager;
5) providing the program's participants with the means and methods for accessing and expending the funds allocated to the program by the Commission;
6) ensuring robust stakeholder engagement throughout the life of the IEDR program;
7) monitoring adherence to the Program Charter by all program participants; and,
8) helping the Program Manager investigate and resolve issues that could negatively affect the program's costs, schedule, or benefits.

Given the multi-stage process that the Project Sponsor is expected to carryout, the Commission shall require NYSERDA to file an initial Implementation Plan within 30 days of the effective date of this Order, detailing how it will carry out its duties as the Program Sponsor up to the commencement of the Program Manager. The Implementation Plan shall then be updated and filed by August 10, 2021, following the procurement of the Program Manager, to reflect all of the subsequent tasks to be carried out to complete implementation of Phase 1 of the IEDR Program. Staff shall review the Implementation Plan filings to ensure compliance with this Order and provide any feedback to NYSERDA as necessary. NYSERDA, as the Program Sponsor, shall continue performing its duties as needed throughout the life of the IEDR.

B. IEDR Program Steering Committee

Whitepaper Recommendations

In the Whitepaper, DPS Staff states that the launch and progress of the proposed IEDR program should be overseen by

well-qualified persons who are tasked with effectively and timely monitoring program execution while providing guidance to the Program Sponsor and Program Manager as needed to help ensure program success. To that end, DPS Staff proposes that the Program Sponsor should convene an IEDR Steering Committee comprising five members of DPS Staff and four members of NYSERDA Staff. DPS Staff proposes that the Steering Committee should begin its work by selecting the members of the IEDR Advisory Group and should then meet regularly to timely review and, when necessary, act on: 1) program issues that require Steering Committee awareness and possible actions or decisions; 2) significant program risks that require management and mitigation; 3) planned and unplanned deviations from the program scope, schedule, or budget; and, 4) upcoming program milestones – especially those that depend on Steering Committee actions or decisions. DPS Staff states that the Steering Committee should also timely review all Advisory Group inputs and ensure that the Program Manager appropriately incorporates those inputs into the program's various workstreams. Finally, DPS Staff recommends that the Steering Committee should continue functioning over the life of the IEDR.

Comments

There was broad support for the creation of a Steering Committee from the commenters. NYSERDA asserts that the Steering Committee will ensure direct DPS Staff involvement throughout the duration of the process, and notes that a flexible regulatory construct should be in place to ensure full compliance by the jurisdictional entities to meet the needs of the IEDR as those needs are identified. RESA also supports the Steering Committee, adding that it should meet as frequent as

needed and that members should be chosen through experienced-based qualifications.

Determination

The Commission directs the Program Sponsor to convene an IEDR Steering Committee comprising five members of DPS Staff and four members of NYSERDA Staff who have the necessary experience, knowledge, and skills, to carry out the tasks as described in the Whitepaper. At its core, the Steering Committee will address policy, schedule, and budget issues based on the Project Sponsor's recommendations to be developed in consultation with the Project Manager.

The Program Sponsor shall schedule the Steering Committee's first meeting to occur within 60 days of this Order's issuance. In the early stages of the IEDR program, the Steering Committee shall meet monthly, with remote participation enabled by a virtual meeting technology such as WebEx or Microsoft Teams. As the program matures and stabilizes, Steering Committee meetings' frequency could decrease to bi-monthly and then to quarterly. Further, Steering Committee members are expected to participate personally in the committee's activities - substitutions or proxies should be prohibited. Finally, the Steering Committee shall function over the life of the IEDR.

C. IEDR Program Advisory Group

Whitepaper Recommendations

In the Whitepaper, DPS Staff states that the Program Sponsor should convene an IEDR Advisory Group to enable stakeholder groups to timely provide informed commentary and guidance to the program team. DPS Staff further states that the Advisory Group's members should be selected by the IEDR Steering

Committee and should represent all relevant stakeholder groups including, but not limited to: DER developers; electric and gas utilities; energy consumers; state and local government entities; and interested industry groups. DPS Staff also notes that the number and diversity of Advisory Group members should ensure adequate representation across stakeholder groups while remaining manageable.

DPS Staff recommends that the scope of Advisory Group activities includes timely reviews and guidance related to: 1) IEDR use cases and their respective requirements; 2) priorities and schedules for enabling use cases; 3) planned IEDR capabilities; 4) required stakeholder capabilities; 5) user interfaces and experience; 6) IEDR development and testing; 7) program governance; and, 8) upcoming program milestones – especially those that depend on Advisory Group guidance. DPS Staff also recommends having Advisory Group members act as testers whenever user acceptance testing (UAT) is performed. Furthermore, appropriate Advisory Group members shall be included as participants in any IEDR stakeholder surveys, focus groups, feedback sessions, or workshops.

In addition, DPS Staff states that the Program Sponsor should: 1) schedule the Advisory Group's first meeting to occur as soon as possible after its members are determined by the Steering Committee; 2) enable remote participation in Advisory Group meetings through a virtual meeting technology such as WebEx or Microsoft Teams; and, 3) schedule the Advisory Group's meetings to occur midway between the Steering Committee's scheduled meetings to ensure enough time for transfers of information to and from the Steering Committee. DPS Staff notes that, as the program matures and stabilizes, the Advisory Group's meetings' frequency should decrease to align with the

Steering Committee's shifts to bi-monthly and then quarterly meetings. DPS Staff further advises that the Advisory Group's members should be expected to participate personally in group activities - substitutions or proxies should be prohibited. Finally, Staff recommends that the Advisory Group should function over the life of the IEDR.

Comments

There was broad support for the creation of an Advisory Group from the commenters, including specific backing from NYPA who would like to see its Grid Flexibility and Clean Energy Advisory Service group be included as an initial member. RESA and Logical Buildings support the creation of an Advisory Group that represents all stakeholder interests as no single stakeholder can represent the varying interests in the energy market. CAA believes that the Advisory Group should have a more active design role and recommends establishing an Advisory Services Fund to support it.

Determination

The Commission directs the Program Sponsor to convene an IEDR Advisory Group to enable stakeholder groups to timely provide informed commentary and guidance to the program team and carry out the activities as described in the Whitepaper. The Commission notes that in addition to the Advisory Group, the Project Sponsor, together with the Program Manager, shall create opportunities for broad stakeholder engagement as described in the Program Execution section below. The Advisory Group is an essential source of expertise that will provide comments and recommendations on issues and decisions that will be considered by the Program Manager and Project Sponsor but does not hold any decision-making authority. The Advisory Group's members shall be selected by the Steering Committee and shall represent all

relevant stakeholder groups including, but not limited to: DER developers; electric and gas utilities; energy consumers; state and local government entities; and interested industry groups. The number and diversity of Advisory Group members should ensure adequate representation across stakeholder groups while remaining manageable.

IX. IEDR Program Execution Whitepaper Recommendations

The Whitepaper details the major components necessary to accomplish the IEDR. Those include Program Management, Solution Architecture, System Design, System Implementation, and System Operation.

In the IEDR White Paper, DPS Staff recommends that the Program Sponsor should acquire and oversee the services of a highly-qualified professional Program Manager to be responsible for organizing, administering, and reporting on the day-to-day activities required for IEDR implementation. DPS Staff notes that the program management services specified by the Program Sponsor and performed by the Program Manager should include: 1) developing and managing a detailed budget for all IEDR program execution costs related to the central IEDR platform; 2) developing and managing a detailed work breakdown and schedule for all program execution tasks related to the central IEDR platform; 3) specifying, procuring, and overseeing all of the professional technical services needed for all program execution tasks related to the central IEDR platform (architecture, design, implementation, and operation); 4) procuring all equipment, software, facilities, and services required to build and operate the central IEDR platform; 5) rigorously and timely identifying, reporting, and mitigating risks that could increase

the funds and/or time needed for any program execution activities related to the central IEDR platform; 6) regularly preparing and presenting program status reports that fully detail all program execution tasks completed, in-progress, and planned; 7) developing, implementing, facilitating, and documenting a rigorous process for IEDR Advisory Group engagement and communication to inform and guide all program life cycle phases; and, 8) coordinating the specification, timing, and execution of work related to the IEDR data feeds provided by the utilities and other data sources.

The Whitepaper describes that the Solution Architecture would provide the information needed to specify the complete IEDR design requirements. To ensure realization of the IEDR's potential value, a Solution Architect should employ an approach structured to identify, understand, and prioritize potential IEDR use cases. In addition, the Solution Architect should rigorously identify and comply with all applicable requirements concerning confidentiality and system security, as would be established in a Data Access Framework for Strategic Use of Energy-Related Data.

Before developing the detailed IEDR design requirements, the Whitepaper states that the Solution Architect should prepare a Preliminary Design Plan that describes the elements, structure, timing, deliverables, and estimated cost of the design effort. Following the Preliminary Design Plan's approval, the Solution Architect, assisted by other entities as needed, should specify the detailed requirements for fully designing the IEDR. The complete IEDR design would comprise descriptive text, specifications, tables, diagrams, configuration parameters, data definitions, data schemas, computer code, operating procedures, and other work products

that describe and explain all aspects of the IEDR's composition, configuration, and operation. The complete design scope should encompass the IEDR and all the other entities (systems and people) that will interact with the IEDR. The finished design should provide all the information needed to specify, procure, and execute all necessary IEDR implementation services. The Program Manager should procure the necessary design services based on the requirements specified.

The Whitepaper explains that IEDR System Implementation comprises full deployment, integration, and activation of all elements needed to fully implement the IEDR. Working within the Advisory Group engagement process managed by the Program Manager, DPS Staff recommends that the Implementation Contractor should obtain implementation-related inputs from the utilities, third-party data sources, providers of system components and services, and the System Operator. The System Implementation Contractor - with guidance and assistance provided as needed by the Program Manager, Solution Architect, Design Contractor, and System Operator - should acquire, deploy, test, and commission all IEDR elements as designed and in accordance with the Implementation Schedule.

Finally, IEDR System Operation comprises all the planning, scheduling, system administration, process control, monitoring, maintenance, access control, problem detection/resolution, change management, user support, and reporting activities needed to effectively manage the functionality and performance of operational IEDR capabilities.

Comments

Many commenters agreed with the necessary responsibilities delegated to the Program Manager, but there were concerns raised about their authorities and intents.

Mission Data advised the Commission to be wary of other entities that could serve in this role while not having the public's best interest in mind. Regarding a similar concern, RESA believes the task of selecting the Program Manager should not be assigned exclusively to the Program Sponsor. According to RESA, members of the Steering Committee and Advisory Group should have experience and knowledge to guide selection of the Program Manager. RESA also believes that the Commission should require the Solution Architect to provide the opportunity for, and take into consideration, input from all stakeholders, not just specific stakeholders in regard to the preliminary design plan describing the elements, structure, timing, deliverables, and estimated cost of the design effort. Alpha Struxure (ASX) recommends that the Program Manager should explicitly report to the Program Sponsor (NYSERDA). CAA expressed concerns regarding conflicts of interest and the role of Program Manager. They suggest an alternative governance model that organizes roles into separate design and implementation tracts. They also agree with AEA, AEE, the Joint Utilities, and RESA that more information, in part from stakeholders, as well as clear goals, milestones, and timeframes should be established to guide progress.

The Joint Utilities stress the importance of using lessons learned in the Pilot IEDR when addressing the work required to implement something similar or greater on a statewide scale. CAA believes the Solution Architect should either be NYSERDA staff or an ombudsman contractor. NYSERDA emphasizes the need for strong market engagement, agreeing with a detailed implementation and verification process. The U.S. Environmental Protection Agency (EPA) recommends integrating their Portfolio Manager web services within the IEDR

functionality, allowing building owners and operators to request the automated delivery of data directly from the IEDR. Flux Tailor believes that DPS Staff, NYSERDA, the utilities, and stakeholders should collaborate on technical work outside of this proceeding.

Determination

Within six months from this Order's issuance, the Program Sponsor shall acquire the services of a highly qualified Program Manager to carry out the activities as described in the Whitepaper. The Program Sponsor's acquisition of a Program Manager shall be informed by the Steering Committee. Guiding principles for the IEDR's procurement strategy include obtaining the best overall value for New York State and involved stakeholders, accelerating implementation timelines, reducing initiative costs and risks, and protecting the robust scope through sourcing high-quality components to be deployed during the IEDR implementation. The Commission expects that the Program Manager will identify opportunities for obtaining economies of scale and/or scope from any contracting required to obtain the needed professional services for the Solution Architecture, System Design, System Implementation, and System Operation in order to afford the decision-making flexibility that enables best possible procurement execution. Each functional need or project phase or service provider need not be a different entity or contracted for separately, even though the Whitepaper described the work to be done in bucketed groups.

The Commission directs the Project Sponsor to be accountable for stakeholder engagement and to meet those responsibilities through the support of, and the defined tasks of, the Program Manager. To address several commenter's suggestions that additional stakeholder engagement is necessary

prior to implementation of the IEDR, the Commission determines that NYSERDA, as Project Sponsor, shall include a near-term process to solicit stakeholder comments addressing, at a minimum, initial use case prioritization along with the rationale supporting that use, prior to selection of the Program Manager and seating of the Advisory Group. This widespread stakeholder outreach should result in a valuable information resource for the Program Manager and Advisory Group.

The Commission reiterates and affirms that data is owned by ratepayers and not the utilities. Nonetheless, management of data and providing useful access to useful information is a core business activity of New York's utilities. For these reasons, the Commission directs NYSERDA to form a Utility Coordination Group as a necessary component of the IEDR Program execution. The Utility Coordination Group shall include members of the Steering Committee (DPS Staff and NYSERDA) or designees, Project Sponsor, Program Manager, Staff Resource for Utility Data Systems, and the senior-level leader of each utility IEDR implementation team, which the Commission directs be formed at each utility. The Utility Coordination Group will also be used to assure alignment of implementation schedules and policies of the IEDR and the potential Data Access Framework. NYSERDA, as Project Sponsor, shall include the formation of the Utility Coordination Group in its Implementation Plan.

X. Accountability and Reporting

Whitepaper Recommendations

The Whitepaper describes that the Program Manager should implement and maintain a program reporting framework that includes: (1) monthly production and publication of reports that address all aspects of the IEDR program; (2) ongoing maintenance

of a program dashboard that presents an at-a-glance summary of program status; and, (3) frequent briefings to the Program Sponsor, Steering Committee, and Advisory Group. DPS Staff suggests that program reports should, in the context of the program schedule and budget, describe and explain (where necessary) the program's accomplishments and expenditures to date, current work and expenditures in progress, the latest program risk assessment and mitigation plan, and upcoming work and expenditures.

Comments

No party commented specifically on the reporting requirement recommendations in the Whitepaper.

Determination

Given that the Commission has selected NYSERDA to be the Program Sponsor directly responsible for defining, initiating, overseeing, and facilitating the IEDR Program on behalf of the State, it is NYSERDA that shall work with the Steering Committee, Advisory Group, and the Program Manager to monitor the program schedule and budget and have the responsibility to report to the Commission. The Commission recognizes that regular accountability and reporting measures are necessary for large, multi-year projects like the IEDR Program. Therefore, the Commission adopts the recommended reporting requirements from the Whitepaper and directs NYSERDA to file quarterly reports in this proceeding, with reports being filed at the end of April, July, October, and January for the prior quarter, including information from the Program Manager monthly reports, addressing all aspects of the IEDR program. In addition, NYSERDA shall create a publicly accessible program dashboard that presents an at-a-glance summary of the IEDR program and shall maintain the dashboard on an ongoing basis.

In addition to the quarterly reports, the Commission

shall also require two additional reports from the Project Sponsor that will inform the Commission's future directives regarding the IEDR Program. At the end of Phase 1, after the initial use cases have been implemented and are operational, NYSERDA shall file a IEDR Phase 1 Status and Summary Report, on or before July 30, 2023, which is twenty-four months after the Program Manager is expected to begin its work. The second report shall be an IEDR Phase 2 Proposal, filed on or before January 15, 2023, six months prior to end of end of Phase 1, that addresses the remainder of the use cases to be implemented by July 30, 2026. This report shall include any information necessary to support Phase 2 funding and authorization, for efforts of the Project Sponsor and of the utilities, and shall be informed by the design and implementation process to date. Given the need for the IEDR Phase 2 Proposal to include details on the efforts and investments necessary at each utility to implement Phase 2, the Utility IEDR Implementation Teams shall provide such input to NYSERDA to be incorporated into the report, through the Utility Coordination Group process.

Given the extensive engagement expected from the utilities to enable the IEDR Program, the Commission directs each electric and gas utility to establish an IEDR Implementation Team. Each utility implementation team shall be led by a member of the company's senior management team. The utility IEDR Implementation Team leader shall have an obligation to actively engage with the IEDR Program Manager on all aspects of the IEDR Program execution, and have the specific obligation to share information and data as necessary within the timeframes to be established by the process. The utility IEDR Implementation Teams shall have the obligation to continually identify opportunities where the IEDR can provide value to the

respective utility's planning, operations, and Distributed Energy System Implementation Plan (DSIP)[12] data obligations in the most effective and efficient manner. To monitor the utility's obligations related to the IEDR Program, each utility shall file a quarterly report on IEDR enablement project planning and investments, with reports being filed at the end of April, July, October, and January for the prior quarter. Also included in these quarterly reports shall be any prospective economies of scope or scale identified for existing utility planning, operations, and DSIP data responsibilities that can be achieved as a result of the IEDR implementation.

CONCLUSION

The need to provide useful access to useful energy data to enable achievement of the State's energy policy goals is apparent. The timing to provide such access has become urgent with the recent adoption of the CLCPA. Evolving the existing fragmented framework will not meet New York State's energy industry stakeholders' needs most efficiently and effectively. The Commission's adoption of an IEDR, and associated development, build, and implementation processes, will meet those needs efficiently and effectively by taking advantage of economies of scale, minimizing the duplication of implementation and operating costs, reducing the costs to implement, and maintaining data quality and uniformity.

The Commission orders:

1. Central Hudson Gas & Electric Corporation, Consolidated Edison Company of New York, Inc., New York State

[12] See, Case 16-M-0411, In the Matter of Distributed System Implementation Plans.

Electric & Gas Corporation, Niagara Mohawk Power Corporation d/b/a National Grid, Orange and Rockland Utilities, Inc., Rochester Gas and Electric Corporation, National Fuel Gas Distribution Corporation, St. Lawrence Gas Company, Inc., KeySpan Energy Delivery New York, and KeySpan Energy Delivery Long Island are directed to work with the Department of Public Service Staff and the New York State Energy Research and Development Authority to implement a statewide Integrated Energy Data Resource Program, as discussed in the body of this Order.

2. Central Hudson Gas & Electric Corporation, Consolidated Edison Company of New York, Inc., New York State Electric & Gas Corporation, Niagara Mohawk Power Corporation d/b/a National Grid, Orange and Rockland Utilities, Inc., Rochester Gas and Electric Corporation, National Fuel Gas Distribution Corporation, St. Lawrence Gas Company, Inc., KeySpan Energy Delivery New York, and KeySpan Energy Delivery Long Island shall establish an Integrated Energy Data Resource Implementation Team, led by a member of the company's senior management team.

3. Central Hudson Gas & Electric Corporation, Consolidated Edison Company of New York, Inc., New York State Electric & Gas Corporation, Niagara Mohawk Power Corporation d/b/a National Grid, Orange and Rockland Utilities, Inc., Rochester Gas and Electric Corporation shall file tariff amendments necessary to effectuate the recovery of costs associated with the Integrated Energy Data Resource Program, on not less than 30 days' notice, to become effective on a temporary basis on June 1, 2021, as discussed in the body of this Order.

4. Central Hudson Gas & Electric Corporation, Consolidated Edison Company of New York, Inc., New York State

Electric & Gas Corporation, Niagara Mohawk Power Corporation d/b/a National Grid, Orange and Rockland Utilities, Inc., Rochester Gas and Electric Corporation, National Fuel Gas Distribution Corporation, St. Lawrence Gas Company, Inc., KeySpan Energy Delivery New York, and KeySpan Energy Delivery Long Island are directed to each file, within 30 days of the issuance of this Order, General Accounting Procedures associated with the Integrated Energy Data Resource implementation cost deferral provisions discussed in the body of this Order.

5. Central Hudson Gas & Electric Corporation, Consolidated Edison Company of New York, Inc., New York State Electric & Gas Corporation, Niagara Mohawk Power Corporation d/b/a National Grid, Orange and Rockland Utilities, Inc., Rochester Gas and Electric Corporation, National Fuel Gas Distribution Corporation, St. Lawrence Gas Company, Inc., KeySpan Energy Delivery New York, and KeySpan Energy Delivery Long Island are directed to each file quarterly reports on Integrated Energy Data Resource enablement project planning and investments, as discussed in the body of this Order, with the first report being due on or before October 31, 2021.

6. The New York State Energy Research and Development Authority shall file an initial Implementation Plan within 30 days of the issuance of this Order, and an updated Implementation Plan by August 10, 2021, as discussed in the body of this Order.

7. The New York State Energy Research and Development Authority shall file an updated Bill-As-You-Go Summary, as discussed in the body of this Order, within 60 days of the issuance of this Order.

8. The New York State Energy Research and Development Authority shall file quarterly reports, as discussed in the body

of this Order, with the first report being due on or before October 31, 2021.

9. The New York State Energy Research and Development Authority shall create a publicly accessible program dashboard that presents an at-a-glance summary of the Integrated Energy Data Resource program by October 31, 2021, and shall maintain the dashboard on an ongoing basis.

10. The New York State Energy Research and Development Authority shall file, as discussed in the body of this Order, an Integrated Energy Data Resource Program Phase 1 Status and Summary Report, on or before July 30, 2023. The New York State Energy Research and Development Authority shall file a second report, as discussed in the body of this Order, regarding the Integrated Energy Data Resource Program Phase 2 Proposal, filed on or before January 15, 2023, six months prior to the end of Phase 1, that addresses the remainder of the use cases to be implemented by July 30, 2026.

11. The requirements of Public Service Law §66(12)(b) and 16 NYCRR §720-8.1, related to newspaper publication of the tariff amendments required by Ordering Clause No. 3, are waived.

12. In the Secretary's sole discretion, the deadlines set forth in this Order may be extended. Any request for an extension must be in writing, must include a justification for the extension, and must be filed at least three days prior to the affected deadline.

13. This proceeding is continued.

By the Commission,

(SIGNED) MICHELLE L. PHILLIPS
Secretary

Appendix A - Comment Summaries

Parties who submitted comments:

Climate Action Associates (CAA)

Flux Tailor

Association for Energy Affordability (AEA)

The City of New York

Joint Utilities

NYSERDA

Mission Data

Logical Buildings

RESA

NYPA

Advanced Energy Economy (AEE)

Utilidata

Alpha Struxure (ASX)

U.S. Environmental Protection Agency

Purpose and Scope

AEE recommends that the efforts to standardize data begin first while a decision on the IEDR is held off until more feedback has been gathered, the proposal has been refined, and that a comprehensive schedule for stakeholder engagement is put in development for the Data Access Framework and IEDR. They also believe that the standardization of data should be considered a “no regrets” step that should take place regardless of the ultimate outcome of the IEDR.

CAA believes IEDR should focus on the standardization of data and making it available to third parties while avoiding investment in custom tools for individual use cases. CAA recommends that the Proceeding be amended with a Joint Utilities (JU) effort to understand and harmonize basic utility data management practices necessary to create IEDR data, although the Joint Utilities disagree with this method

The City of New York would like the Commission to consider its needs to access anonymized or aggregated data as well as the expected increase in energy consumption from EV charging stations when drafting the IEDR. The City utilizes this data to draft climate and energy policy.

Flux Tailor believes that DPS, NYSERDA, the utilities, and stakeholders should collaborate on technical work outside of the DPS Proceeding. They believe there is not enough time for the NYSERDA RFI/RFP process and think that focus should be placed on "minimum viable product" expansions and improvements to existing systems in the near future.

RESA believes there are many benefits that ESCOs can provide that the Whitepaper did not address and would like more attention given to the subject. RESA also believes that an implementation schedule that identifies goals and milestones, recognizes dependencies between goals and milestones, and establishes the timing of each activity is an essential feature to the successful implementation of the IEDR.

ASX is a firm proponent of the minimum viable data set, acknowledging that putting the power of data in just a few hands is not best for innovation, cost savings, and emissions reductions. Once a MVDS is established, then an expansion over time of the IEDR Data can be made with lessons learned from the stakeholder use of MVDS. This creates a much more open, need-based IEDR valuable to a wide base of stakeholders in NY.

Parallel Programs

AEA believes the provision of data under existing Commission rules and existing utility practices should continue without interruption while the new system is being developed and adopted. Flux Tailor strongly agrees with this statement.

AEE believes that utility capabilities, including portals and interfaces that directly serve customers and third parties, should continue apace and parallel with the development of an IEDR to avoid slowing progress or even backtracking while the platform is in the process of development and deployment.

Flux Tailor believes that pausing development of ConEd's ShareMyData portal is not beneficial for near term advancements in the project because waiting for the implementation of IEDR would take too long.

RESA believes that the Commission should not lose sight of the potential for incremental, near-term enhancements and projects that utilities are currently working on.

The Current State of Access to New York State Energy Information

The Joint Utilities believe it is essential that the IEDR development plan accurately reflect the varying timelines of each utility and their investments in information systems and data sharing capabilities, as data flowing from and across these foundational systems will dictate what information can be made available to third parties in the IEDR. The Joint Utilities stress the importance of using lessons learned in the Pilot IEDR when addressing the work required to implement something similar or greater on a statewide scale. The Joint Utilities strongly believe that the Framework and the data access roles require more consideration. Ineffective access controls could place customer and system data at risk of inappropriate disclosure.

Logical Buildings believe that the future process for companies trying to access data, especially via the Green Button Connect process, should be less time consuming and complicated than it is today. They also request that companies that have already gone through this process are not required to do so a second time. However, the Joint Utilities believe this brings unnecessary risk to customers and utility systems.

Mission Data believes the absence of important details regarding problems with permission-based customer energy data exchanges in New York today indicates that the Commission does not yet fully understand the problems it is trying to solve. These include the methods customers are able to authenticate and authorize a third party to access their usage and billing data.

RESA is concerned with the inconsistencies that currently exist between utilities regarding their data reporting. They stress that utilities must take all necessary steps to ensure that the IEDR contains timely and accurate information.

ASX points out that the availability of energy data is not consistent across NYS, partially due to inconsistent implementation of AMI. ASX considers a broader implementation of AMI as very important to the success of integrated energy data resource (IEDR).

Utilidata emphasis three important recommendations to achieve the IEDR’s goals. These include linking development of AMI with

the IEDR to ensure easy collection of customer and system data, recognizing the importance of real-time, grid-edge data for both operations and planning, and requiring key capabilities for new AMI rollouts to ensure that this major investment can provide actionable data to the IEDR platform.

The Path Ahead

AEA believes that more information is needed on how the IEDR will be operationalized regarding the number of providers, future changes, complaint reporting, and future technological advancements.

AEE recommends that the Commission seek more stakeholder input on whether the IEDR should be a centralized system versus a user interface for a more network-based system as it considers the development of the IEDR.

CAA is concerned with the role of the project manager being an independent contractor due to a lack of experience and conflicts of interest. They propose an alternative governance model that organizes roles into separate design and implementation tracts, with both tracts managed by NYSERDA acting as the Program Manager.

The Joint Utilities believe that the IEDR Whitepaper benchmarking discussion lacked acknowledgments of crucial data privacy changes that may impact the Joint Utilities' ability to provide customer information.

RESA believes that the Commission should establish clear goals, milestones, and timeframes to guide progress toward developing and implementing the IEDR in a phased approach with help from highly qualified personnel and input from a full range of stakeholders.

General Recommendations for an Integrated Energy Data Resource

The City of New York currently experiences a gap in its benchmarking building energy usage data when it comes to buildings smaller than 25,000 sq. feet. The City believes this would make a good use case for IEDR. Mission Data strongly agrees with The City of New York's request that building owners receiving monthly whole-building aggregated usage data should not be subject to any eligibility requirements. Mission data also supports the Commission collecting statistics from Energy

Services Entities (ESEs) seeking certification to find out how long it takes to become certified as an accountability measure.

The Joint Utilities agree that the IEDR development approach should be nimble, able to respond to evolving market needs and technological capabilities in a timely and cost-effective manner while providing upfront value that third parties and developers need to design and launch products. They also believe that the platform should evolve from a set of baseline or core use cases and system requirements that are prioritized based on cost-effectiveness and stakeholder value. Additionally, they believe that Staff and the Commission should clearly define limitations on liability for the Joint Utilities following the transmittal of data to the platform. They believe it is crucial that the Joint Utilities not be held responsible for instances which ESEs make improper use of customer or system data.

The Joint Utilities recommend that the cost recovery mechanism for implementation of the IEDR be clarified before development is approved. The Joint Utilities support NYPA's and LIPA's involvement in the IEDR development process, but also believe they should share a portion of the cost for development. They also believe that not all system and customer data should be centralized, as it is not always cost-effective to do so.

RESA believes that if there is any opportunity for the data to vary between EDI and the IEDR (e.g., data is entered manually in the IEDR), the Commission should clarify that, in the event of a discrepancy, the EDI data will be considered the accurate information.

AEE advises against large investments in on-premises hardware and supporting systems to support the IEDR. It would be a nearly impossible task to appropriately size on-premises computing systems up front when the design and user demand are hard to predict and may also vary considerably over time. They believe the capabilities of the system should be prioritized by the use cases they serve.

The EPA recommends integrating their Portfolio Manager web services within the IEDR functionality to capture and house details that will subsequently facilitate meter-to-building mapping and allow building owners and operators to request the automated delivery of data directly from the IEDR, rather than relying on a patchwork of individual utility solutions. This would simplify the process for building owners/operators as they

would only need to manage one process for obtaining customer data and deal with one source of customer questions.

ASX affirms the NY DPS Staff recommendation that a state-wide system described as an integrated energy data resource (IEDR) would become a basis for enabling utilities, customers, distributed energy resource (DER) providers, various agencies, and others who offer energy data assistance for the purpose of moving a new energy landscape forward.

Program Oversight

CAA believes that the Advisory Group should have a more active design role and recommends establishing an Advisory Services Fund to support it.

Logical Buildings agrees that there should be an Advisory group designated to work with stakeholder groups in order to obtain guidance about what information is important for each type of system participant.

NYPA supports the creation of a Steering Committee and Advisory Group and requests that its Grid Flexibility and Clean Energy Advisory Service group be included as an initial member of the Advisory Group. They believe their participation in the Advisory Group can offer stakeholders, the Steering Committee, the Program Sponsor, and the Program Manager with common, effective practices and lessons learned that will allow for the development of an IEDR that is tailored to meet both customer needs and achievement of the CLCPA's clean energy goals. NYPA supports a structure that allows stakeholders and subject matter experts to be directly involved in program development but cautions against prescribing firm outputs from each group at the outset of the program.

NYSERDA supports the proposal in the Staff Whitepaper to employ a Steering Committee to ensure direct DPS Staff involvement throughout the duration of the process, however, a flexible regulatory construct should be in place to ensure full compliance by the jurisdictional entities to meet the needs of the IEDR as those needs are identified. This includes cooperation from the utilities to align utility capital and operations planning and regulatory requirements for the creation and operation of the IEDR. Also, the foundational data access framework issues would need to be resolved prior to developing the IEDR.

RESA believes the Commission should establish experience-based qualification requirements for Steering Committee members. Additionally, the Steering Committee should meet as frequently as necessary to achieve IEDR milestones, even if that is more than once a month. RESA supports an Advisory Group that represents all stakeholder interests as no single stakeholder can represent the varying interests in the energy market.

Program Sponsor

AEE does not recommend a specific project sponsor at this time but does urge the Commission to consider the risks and reward structure associated with IEDR as a vital design component that will determine the program's ultimate success.

CAA believes that the PSC cannot expect experts to substantively engage unless they have an opportunity to be compensated. NYSERDA could issue a PON asking for proposals for IEDR public and private use cases, providing selected proponents resources to join the Advisory Group and to test the IEDR platform as a client.

Logical Buildings agrees that NYSERDA would be an appropriate Program Sponsor.

NYSERDA recommends that any entity serving as Program Sponsor should have access to technical expertise, prior experience in identifying software, and developing solutions for information systems along with experience enabling and managing user access to secure data, cybersecurity acumen, and an understanding of how solutions providers can better utilize grid-related energy data.

Program Manager

Mission Data is concerned with the significant delegation of the Commission's authority to other entities that, unlike the Commission, are not designed to serve the broader public interest.

RESA believes that the task of selecting the Program Manager should not be assigned exclusively to the Program Sponsor. Members of the Steering Committee and Advisory Group will have experience and knowledge that could guide selection of the Program Manager. This program manager should also be responsible for protecting against cybersecurity risks.

ASX recommends the Program Manager (NYSERDA) should explicitly report to the Program Sponsor. ASX recommends the Program Manager could be an external entity skilled in defining and delivering substantial data-based systems for broad stakeholder groups.

Solution Architect

CAA believes the Solution Architect should either be NYSERDA staff or an Ombudsman contractor.

Logical Buildings agrees with the need for a central repository for all the information that may be utilized for providing energy management services. They also agree that material relevant to educate third parties as to which geographic areas may have the highest need for certain services should also be made available to DER developers.

RESA believes that the following should be added to the nonexclusive list of use cases that the Solution Architect should include presented in the Whitepaper: Use cases supporting ESCO functions and Use cases supporting academic/research functions. RESA also believes that the Commission should assign the highest priority level to use cases supporting ESCO functions.

The EPA agrees with the consideration of the “building energy benchmarking” use case and stresses that “building owners and operators” will need to be included in the list of specific “user categories” to be considered. They caution against the owner/operator being treated as a unique category of data requestor with a unique need for streamlined access to the whole-building consumption data in question. They also believe it important to consider a functional distinction between customers, building owners/operators, and other third parties, and to ensure that data access authorization requirements recognize the unique position of the building owner/operator.

IEDR Design, Implementation, and Operation

CAA thinks that NYSERDA, with help from the Solution Architect, can procure a technology contractor to supply these services.

The City of New York, along with ConEd and National Grid, have developed records that match customer accounts to individual buildings. Currently, there is no formally established method in place for the utilities to update the building/account matching

records to ensure that the correct energy consumption values are being submitted for energy benchmarking reports, and the City requests this to be included in the IEDR.

The Joint Utilities believe that in Appendix B there are aspects of Staff's request that are not detailed to the point that the Joint Utilities can prepare a cost estimate.

Mission Data believes that aggregation standards should evolve over time and should be based on a mathematically rigorous framework approved by the Commission. The public release of different aggregated datasets should be tailored to the particulars of the use case; mathematically analyzed; and revisited over time as circumstances change. They propose eight different categories of use cases based on whether or not customer consent is required prior to exchange of the information.

NYSERDA believes that a detailed implementation and verification process with strong market engagement is required. They also believe the Commission should determine the most responsible way to set privacy, cyber and other related standards and the most responsible way to establish accountability and responsibility when it comes to security.

RESA believes that the Commission should require the Solution Architect to provide the opportunity for, and take into consideration, input from all stakeholders, not just specific stakeholders in regard to the preliminary design plan describing the elements, structure, timing, deliverables, and estimated cost of the design effort.

ASX recommends that the Program Sponsor and Program Manager could establish an IEDR deployment plan that starts with what data is available and grows with the subsequent deployment of data infrastructure, such as AMI, hence an iterative release approach.

Appendix B Data Elements

The EPA comments on additional data points for consideration such as a unique building identifier. Many utilities currently do not track the concept of a building or property in their customer information systems, something that could prove useful in meter-to-building mapping for aggregated data provision. EPA suggests the Unique Building Identifier (UBID), which is currently being piloted by the Pacific Northwest National Lab

(PNNL). Additionally, persistent documentation of the mapping relationships for verification of accuracy of the consumption data being reported should be recorded. EPA recommends the IEDR team coordinates with the ENERGY STAR team who are currently in the process of scoping functionality in Portfolio Manager that would allow for the identification and documentation of the "constituent" meters for which consumption values are being combined into whole-building totals for ultimate entry as an "aggregate" or "virtual" meter object in Portfolio Manager Property owners have increasingly including clauses in their lease documents that allow data release authorization. The EPA brings attention to these clauses so that the IEDR can facilitate release of this data upon request. Additionally, for properties with on-site renewables, the IEDR should have data points for gross amount of grid electricity delivered to a building for a given time period or the specific amount of electricity generated onsite and sold back to the grid for that same time period.

DATA ACCESS *for a* DECARBONIZED GRID

Policy Solutions to Improve Energy Data Access and Drive the Clean and Resilient Grid of the Future

FEBRUARY 2021
Policy Report

Climate Change
and Business
Research Initiative

Berkeley Law | Center for Law, Energy, & the Environment

UCLA School of Law Emmett Institute on Climate Change & the Environment

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BANK OF AMERICA

ABOUT THIS REPORT

This policy report is part of a series on how specific sectors of the business community can drive key climate change solutions and how policymakers can facilitate those solutions. Each report results from workshop convenings that include expert representatives from the business, academic, policy, and environmental sectors. The convenings and resulting policy reports are sponsored by Bank of America and produced by a partnership of UC Berkeley School of Law s Center for Law, Energy & the Environment (CLEE) and UCLA School of Law s Emmett Institute on Climate Change and the Environment.

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ABOUT THE CENTER FOR LAW, ENERGY & THE ENVIRONMENT

The Center for Law, Energy & the Environment (CLEE) channels the expertise and creativity of the Berkeley Law community into pragmatic policy solutions to environmental and energy challenges. CLEE works with government, business and the nonprofit sector to help solve urgent problems requiring innovative, often interdisciplinary approaches. Drawing on the combined expertise of faculty, staff and students across University of California, Berkeley, CLEE strives to translate empirical findings into smart public policy solutions to better environmental and energy governance systems.

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The Emmett Institute on Climate Change and the Environment is among the leading environmental law programs in the country, with faculty members renowned for their public service, teaching excellence, and scholarship in state, federal, and international law. Located in Los Angeles, a diverse city facing unique environmental justice and climate change challenges, the Emmett Institute provides J.D. and LL.M. students unmatched opportunities for mentoring, career placement, and experiential learning. Through groundbreaking research and public interest initiatives, the Emmett Institute helps shape climate change and environmental law and policy in California, the United States, and jurisdictions around the world

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We dedicate this series to the memory of James E. Mahoney (1952-2020), who helped launch it and championed sustainability initiatives throughout his impactful career.

INTRODUCTION

California's electricity infrastructure is entering a period of profound change. From a policy perspective, the state is moving toward goals of 60 percent renewable electricity by 2030 and 100 percent zero-carbon power by 2045, while state and local governments are striving to electrify more buildings and vehicles. At the same time, climate change is destabilizing these efforts, as extreme heat waves and record-setting wildfires are leading to electricity demand spikes, public safety power shutoffs, and questions about the reliability and resilience of an increasingly renewable-powered grid.

As a result, stakeholders throughout the electrical grid are turning to flexible technologies that can balance supply and demand, increase efficiency, and provide greater reliability in real time.[1] Examples range from the development of advanced algorithms that reduce grid strain and energy costs by shifting aggregate electricity demand at public electric vehicle charging facilities from peak to off-peak periods; to the allocation of hundreds of millions of dollars to fund incentives for residents, small businesses, and agencies in low-income and disadvantaged communities to invest in energy resilience technologies like battery storage.[2] These responses are amplifying existing trends of residents and businesses adopting more small-scale, distributed generation (like rooftop solar) and storage technologies.

As the grid becomes more defined by flexible, distributed assets that generate, store, and consume power closer to when and where it is used—such as smart buildings, battery storage, and vehicle-grid integration—grid planners and stakeholders will need improved access to data about our energy system in order to deploy and operate them efficiently and effectively. The data can include information from the performance of generation assets to individual customer use and billing data. But significant questions remain about how to access, protect, and manage the data. State energy regulators, utilities, and developers of distributed energy resources must resolve long-standing issues around customer privacy, grid security, communication between data systems, and regulatory capacity in a rapidly evolving field.

To address these challenges, UC Berkeley School of Law's Center for Law, Energy and the Environment (CLEE) and UCLA School of Law's Emmett Institute on Climate Change and the Environment convened leaders from state and local government, utilities, and data management firms in August 2020 to identify top-priority policy solutions. This policy report outlines the vision these stakeholders discussed for California's energy data framework of the future; key barriers limiting progress toward that vision; and actionable solutions to overcome those barriers. Top barriers and solutions include:

BARRIER #1: PRIVACY AND SECURITY RULES AND CONCERNS IMPACT THE FLOW OF DATA

Solutions

- **The California Energy Commission and Public Utilities Commission** could create a definitive guide to the legal and regulatory framework for data privacy and security
- **The California Energy Commission, Public Utilities Commission, Independent System Operator, and Governor's Office of Planning and Research**, possibly with state legislative direction, could create a forum for stakeholders to achieve consensus on ways to resolve security and privacy concerns affecting data access
- **The California Public Utilities Commission** could re-examine the 15/15 rule for customer data aggregation (which sets numerical minimums for data-sharing) to consider an approach based on differential privacy (which can protect sensitive data regardless of sample size)
- **The California Public Utilities Commission** could enhance the scope of its 2011 privacy decision (which sets many of the current terms for collection, use, and disclosure of customer energy usage data) to expand customer data rights with regard to billing data and other customer-specific information, thereby facilitating more flexible grid applications

BARRIER #2: UTILITY OPERATING FRAMEWORKS, INCLUDING REGULATORY REQUIREMENTS AND INCENTIVES, CAN CREATE LIMITS ON CAPACITY TO SHARE AND INVEST IN DATA EXCHANGES

Solutions

- **The California Public Utilities Commission** could adopt performance-based regulation that rewards effective data-sharing
- **The California Public Utilities Commission** could expand upon existing regulatory proceedings or initiate a new proceeding to identify objectives, use cases, and cost considerations and direct achievement of specific related targets for progress in data exchange

BARRIER #3: ORGANIZATIONAL PRIORITIES, REQUIREMENTS, AND CAPACITY CAN IMPACT PROGRESS ON DATA PRIORITIES

Solutions

- **The California Energy Commission and Public Utilities Commission** could enhance enforcement of existing requirements for data exchange and usage
- **The state legislature** could appropriate funds for the California Energy Commission and California Public Utilities Commission to hire and retain more energy data experts
- **Electric utilities** could continue to modernize their information technology systems and expand internal staff capacity

I.
OVERVIEW: ENERGY AND GRID DATA FOR RESILIENT DECARBONIZATION

A. CALIFORNIA'S RESILIENT DECARBONIZATION NEED IS URGENT

As California progresses toward its targets of 60 percent renewable energy by 2030 and 100 percent zero-carbon energy by 2045, the looming and present risks of climate change threaten the energy grid itself, and stakeholders across the state's electrical system—including communities, businesses, utilities, and grid operators—have begun to raise questions around the reliability and resilience of a decarbonized grid. In December 2020, state energy regulators issued a report finding that the state's 100 percent zero-carbon target is achievable, although significant questions remain regarding system reliability and the integration of emerging technologies including storage and load flexibility.[3] Record wildfires in 2017, 2018, and 2020—some caused by a mix of vulnerable grid infrastructure and excessively hot, dry, and windy conditions—have burned millions of acres, cost hundreds of lives, and forced evacuation of communities throughout the state. Utilities have begun to implement wildfire mitigation and safety measures in the form of grid hardening, vegetation management, and advanced monitoring practices, as well as through public safety power shutoffs (PSPS) to proactively de-energize portions of the grid during periods of especially high fire risk. In 2019, shutoffs affecting millions of Californians may have helped to reduce utility-caused fires, but they also impacted business and residential service throughout the state, at times for extensive periods. These shutoffs were of particular concern for some older and medically vulnerable Californians.[4] The threat of future massive wildfire seasons and shutoffs raises concerns about the reliability of future energy supplies.

As an additional example of climate-related reliability concerns, August 2020 brought a period of extreme heat, which eventually triggered substantial fires

and contributed to rolling blackouts throughout California as grid managers struggled to meet electricity demand.[5] Greater deployment of intermittent wind and solar resources—essential for the state's climate efforts—adds complexity to grid planning and reliability in the face of these types of events.[6] In their preliminary analysis of the blackouts, leaders at the California Public Utilities Commission (CPUC), California Independent System Operator (CAISO), and California Energy Commission (CEC) highlighted increased procurement of distributed energy resources like demand response and flexible assets as key steps for maintaining grid reliability in the future.[7] (In November 2020, the Public Utilities Commission proposed a rulemaking to take near-term reliability actions including communications, flexible pricing, electric vehicle, and storage measures.[8]) As the climate continues to warm and California continues to electrify buildings and vehicles, peak energy demand will continue to grow.[9] The need to integrate distributed resources and load management technologies—which are heavily reliant on the efficient flow of energy data to operate efficiently and effectively—will rise accordingly.

B. A DIVERSE SET OF TECHNOLOGIES CAN ADDRESS THE CHALLENGE

While the rapid transition to a resilient, decarbonized grid presents a daunting policy and economic challenge, a number of existing and emerging technologies are available to serve the needs of a flexible and reliable system. Categorizing these technologies is a valuable first step for understanding the types of data these technologies and grid operators rely on for effective operation, and in turn the challenges facing greater access to those data:

- **Transmission and distribution grid technology,** which includes electrical system elements primarily controlled or controllable by grid operators, utilities, and power providers. These technologies include but are not limited to:
    - **Distribution grid infrastructure.** Advanced distribution line sensors can detect high winds and strain on lines to mitigate wildfire risk; forecasting algorithms can predict generation and demand; neighborhood area networks can aggregate usage data to inform grid operator activities; and smart sensors and automated substation technology can use grid performance information to facilitate load balancing and safety actions, each maximizing grid efficiency and reliability.[10]
    - **Smart meters.** Smart meters provide grid operators and utilities with visibility into real-time customer usage data, facilitating advanced billing and grid monitoring by grid operators (including outage locations) and consumption management by customers.
- **Grid-connected and customer technology,** which includes facilities, buildings, vehicles, and appliances that interact with the grid by providing distributed energy, storing energy, and modulating

production and consumption to balance the grid's supply and demand and minimize strain on distribution and transmission assets. Individual customers/facilities typically own and control these applications.

  - **Distributed energy resources (DERs).** Residential, commercial, and community-scale behind-the-meter DERs provide zero-carbon energy close to the point of use, reducing greenhouse gas emissions, functioning with energy storage and microgrids to boost local resilience, and limiting reliance on long-distance transmission lines. Smart inverters (and the power control systems that drive them), which allow distributed solar and other sources to modulate their activity in response to system fluctuations, maximize grid efficiency and reliability and facilitate aggregation of smaller resources.[11] Distributed solar provides approximately 15 percent of all renewable energy in California, which topped one third of total retail electricity sales in 2020.[12]
  - **Large-scale front-of-meter renewable energy and storage assets.** These assets provide the bulk of the zero carbon power and energy storage needed for grid decarbonization, and rely on granular load data for efficient deployment.
  - **Building and appliance load management.** The transition to electrified heat, hot water, and cooking systems in buildings throughout the state will add significant amounts of new demand to the electrical grid but will also afford substantial new opportunities for grid management and flexibility.[13] Electrified systems and smart appliances, linked to the grid via smart meters, can adjust their power consumption to help balance supply and demand, reduce strain at peak hours, reduce total energy costs, and maintain reliability for a grid increasingly reliant on intermittent renewable sources. These applications can also include vehicle-grid integration, which manages electric vehicle charging to capture excess supply and minimize usage when system demand is highest.[14]

- **Distributed energy storage.** Energy storage technology, including batteries as well as flywheels, fuel cells, and pumped hydropower, boosts grid resilience while supporting decarbonization by storing intermittent renewable energy and dispatching it during high-demand periods or during outages. Distributed and residential energy storage can maintain service to communities and essential services during planned or emergency system outages, in both cases supporting the reliability and efficiency of a low-carbon grid.[15]

In addition to these core categories of physical technology that support resilient grid decarbonization, two other types of non-hardware grid technology play key roles throughout the modern grid:

- **Grid software** builds the market interface between the bulk energy system and the customer, provides the ability to validate energy data at the level of distributed resources, and determines the effectiveness of customer-controlled load management efforts. Especially important is decision-support software that provides devices and appliances with a framework for how to interact with the grid, creating a financial value for the technology's grid services and facilitating resource dedication and planning. For example, many utilities are developing software to interact directly with DER providers to optimize operation, benefit the grid, and lower emissions (i.e., distributed energy resource management systems). The Green Button Connect platform and utility integrated capacity analysis (ICA) maps, leading efforts to provide customer usage and grid structure data to third parties, are other key examples in this category.
- **Financial technology** including swaps, hedges, and other financial instruments allow developers to fund assets, including many of the technologies identified above, whose value to the grid is based on real-time supply/demand imbalances and data applications, rather than on consistent long-term cash flows that can be funded via traditional debt instruments.

These technologies have the potential to transform the way the electrical grid functions by improving resilience and enabling decarbonization. The ways in which they generate, share, and rely on energy data can inform the policy solutions that drive improved data access.

C. EFFECTIVE AND EFFICIENT TECHNOLOGY DEPLOYMENT RELIES ON ACCESS TO A RANGE OF DATA TYPES

Participants at the August 2020 convening also emphasized the importance of classifying energy data types in order to develop policies to increase data access. Different data are needed to design the grid and to operate it; grid planners use planning data for long-term investment decisions and grid operators use operational data in real time to balance supply with demand. The grid of the future will shift away from the current system of just-in-time supply from a discrete set of utility-scale resources to a system composed of distributed storage and generation nodes, including energy stored in buildings and vehicles. The customers and developers seeking to provide these distributed energy resource services will need access to grid and operational data to enable them to provide services that are appropriate for the location and responsive to grid needs. Producers, consumers, and grid managers will need information about distributed applications such as battery charge levels, car use schedules, and building cooling needs in order to determine when to produce or consume power most efficiently—giving data architecture a time dimension as well as a geographic dimension. Ancillary data, including information on land uses, real estate assets, and vehicle types, can also provide key support for decision-making. Within this framework, participants emphasized three core data types:

- **Grid-level data,** including real-time information on the status of distribution and transmission equipment, loads by circuit and substation, and generation assets; energy tariff and transmission planning data; data on environmental factors for long-term climate risk and adaptation planning; and aggregated information on customer demographics and program participation to inform the design of utility and regulator incentives. Examples of grid data include:
    - **Basic grid structure data** that depict the locations of substations, transformers, distribution lines, and other assets (as well as current load and capacity at points throughout the system), shared through utility ICA maps that inform investment by DER developers.[16]
    - **System planning data** used to identify forecasted investments to meet grid needs and model DER interfaces, from supply reliability and historic grid conditions to capital investment figures and planned resiliency projects.[17]
    - **Regulatory compliance data** such as utility expenditure requests and renewables and DER procurement, which inform decisions on distribution system performance, compensation, rates.[18]
    - **Market efficiency data** that allow grid managers to evaluate the need and capacity for investment in resilient technologies and the system's ability to achieve consumer, environmental, and efficiency goals, from long-term grid studies to DER cost and capacity information.[19]
    - **Grid operations data** including real-time grid sensing and measurement device information, customer smart meter readings, DER capacity, circuit capacity, and power quality.[20]
- **Customer-level data,** which include energy use and billing data (including the line items of customer bills, account numbers, and residential and commercial addresses down to the unit level for multi-tenant buildings); what rate applies to a given customer (including machine-readable rate information); and voltage, current, and other technical data from smart meters.
- **DER performance data,** which inform grid operators about the actual energy production levels, cost, and capacity of distributed renewable and storage assets—intermittent and limited-capacity resources that will play an increasingly central role in the grid and will be deployed to shape electrical loads to match demand. The data can include the locational benefits to the grid of DER deployment in a specific location and the cost of interconnecting new DERs to the grid.[21]

D. ENERGY DATA ACCESS IS A GROWING PRIORITY FOR CALIFORNIA POLICYMAKERS

California legislators and regulators have taken steps over the last several decades to increase generation of and access to energy data. Beginning in 2009, Senate Bill 17 (Padilla, Chapter 327) required utilities deploying advanced metering infrastructure (AMI) to provide customers with access to their data and to enable third party access with the consent of customers.[22] In 2011, the CPUC finalized a comprehensive privacy and data access rulemaking that directed the utilities to submit applications detailing how customers could delegate their advanced meter data to a third party electronically.[23] Most recently, Assembly Bill 802 (Williams, Chapter 590, Statutes of 2015) directed the Energy Commission to create an energy benchmarking program based on mandatory utility collection and aggregation of energy use data for all large commercial and multifamily residential buildings.[24] The commission collects the data to create the energy use benchmark to develop energy demand forecasts, inform building owners' decisions about energy use through peer comparison, and inform the public about energy consumption.[25] Commission regulations require utilities to provide building owners or authorized third parties with energy performance data for their properties upon request; direct building owners to request the energy use data on an annual basis for the purpose of being publicly benchmarked; and allow the commission to make building energy use data (including building profile information, total energy use, energy use types, peak demand, and total greenhouse gas emissions) publicly available.[26] Prior legislation (Senate Bill 1476 [Padilla, Chapter 497, Statutes of 2010]) prohibited utilities from disclosing individual customers' energy consumption data without obtaining consent or removing all identifying information.[27]

In its role as manager of many state energy efficiency and customer incentive programs, the California Public Utilities Commission adopted measures to prevent dissemination of customer energy data to unauthorized third-parties (with exceptions that facilitate research and development while protecting privacy) and require utilities to report on smart grid applications.[28] The AB 802 benchmarking program established a baseline energy data disclosure protocol for California building owners and utilities, and authorized the Energy Commission to create a state energy use database that could form the backbone of a public energy data disclosure platform.

The Legislature has also taken a more direct approach to driving building-based flexibility solutions, which will rapidly accelerate the need for more and better data. In 2019, Senate Bill 49 (Skinner, Chapter 697) directed the California Energy Commission to adopt appliance energy efficiency standards that incorporate demand flexibility, and in 2020 the Energy Commission released research and development funds to establish a flexible load research and development hub, which will support market adoption of advanced flexible demand technologies and other DERs.[29] Under Assembly Bill 3232 (Friedman, Chapter 373, Statutes of 2018), the Energy Commission is assessing the feasibility of reducing GHG emissions in all residential and commercial buildings 40 percent below 1990 levels by 2030.[30]

Finally, the state has taken multiple steps to develop standards and rules for physical grid security. Assembly Bill 327 (Perea, Chapter 611, Statutes of 2013) directed electric utilities to develop plans to identify optimal DER deployment locations, initiating the Public Utilities Commission's Distribution Resources Plan proceeding and the development of a range of grid information-sharing processes, including utility ICA maps.[31] Senate Bill 699 (Hill, Chapter 550, Statutes of 2014) directed the Public Utilities Commission to adopt rules addressing physical risks to grid assets, resulting in a 2019 commission decision requiring electric utilities to identify high-priority grid assets and develop plans (as well as review and maintenance processes) to improve security and response to physical attacks.[32] Utility security plans must include measures to prevent, respond to, and recover from physical attacks, from cameras and fencing to backup generation and spare equipment; undergo third-party and CPUC review; and include ongoing maintenance and overhaul every five years. The decision also addresses emergency preparedness requirements for grid infrastructure, as directed by Assembly Bill 1650 (Portantino, Chapter 472, Statutes of 2012).[33] Utilities' final security plans, which may have significant implications for the availability of information on the shape and structure of the grid, are expected in 2021.

Energy Data Initiatives in Other States

States around the country with a range of energy regulatory structures are developing centralized and standardized approaches to energy data generation and sharing, primarily focused on customer data applications. As California legislators, regulators, and utilities consider new approaches to accelerate data access, these examples could serve as models.

In March 2020, the **NEW YORK** Public Service Commission initiated a comprehensive energy data access proceeding to address market development, efficiency, and privacy and cybersecurity concerns through the development of a "clearly defined data access framework. [34] Through the proceeding, commission staff proposed a statewide data access framework that would serve as a "single source for data access" including a standard guide for framework application and definitions of key terms, a risk management certification for cybersecurity and privacy requirements, customer consent and opt out requirements, and data quality and integrity standards.[35] A proposed single, statewide integrated energy data resource (IEDR) would collect, integrate, analyze, and manage the data in one location, to be managed by a third-party program manager with oversight by state energy regulators.[36] While the commission has yet to implement these proposals, they represent potential examples of state level standardization and platform creation.

Other states developing centralized, standardized data platforms include:

TEXAS: The Smart Meter Texas program, a regulator-endorsed collaboration among five electric utilities, facilitates customer and third-party access to energy data in a standardized format, with recent public utilities commission determination that advanced metering systems must provide on-demand data reads.[37]

NEW HAMPSHIRE: Senate Bill 284, enacted in 2019, established a statewide multi-use energy data platform to facilitate access for utilities, customers, and qualified third parties, and directed the state public utilities commission to undertake a rulemaking (currently underway) to set governance, data accuracy and security, and third-party access standards.[38]

OHIO: The state public utilities commission organized an energy data stakeholder workgroup, which in late 2019 issued a report calling for standard privacy protocols and methodologies for third-party access to customer data including the Green Button Connect platform.[39]

Some states are also leading efforts to develop grid data platforms similar to California utilities' ICA maps.[40] In **MINNESOTA**, state law requires utilities to identify optimal DER interconnection points and necessary grid upgrades, and a recent public utilities commission ruling clarified that this includes information on the location and capacity of individual distribution lines.[41] New York s electric utilities have developed hosting capacity maps with a focus on distributed solar resource deployment. These state efforts, including California's, highlight the need for data validation in development of grid structure data resources, particularly to avoid publication of data that may limit development by suggesting more restrictive grid capacity than actually exists.[42]

E. EMERGING ENERGY DATA APPLICATIONS PRESENT GRID SECURITY AND CUSTOMER PRIVACY AND SECURITY CONCERNS

Generation, collection, and use of the energy data types identified earlier is essential for a resilient, decarbonized grid to operate with maximum resource and cost efficiency. But it also raises a set of concerns around privacy and security. These concerns fall into three related but distinct categories:

- **Customer privacy** concerns associated with the unauthorized disclosure or misuse of personal identifying information (PII), such as contact information or account numbers of residents or businesses that are associated with particular electric meters.
- **Cybersecurity** concerns associated with the risk of managing utility IT systems or electrical grid operations on digital platforms, including communications with third-party providers, which could be vulnerable to risk of hacking, and cyberattacks that could disrupt certain services or damage grid assets.
- **Physical security** concerns associated with disclosure of the location or security status of grid assets, which could be vulnerable to disabling physical attacks. Physical security concerns are exclusively related to grid-level data.

For example, a grid reliant on the continuous flow of operations data from remote sensors at switches and transformers, and on the ability to make real-time changes in power flows, could be vulnerable to disruption by attackers with the ability to infiltrate digital exchanges to slow, misdirect, or falsify data. Recent, highly public cyberattacks against energy infrastructure in the US and Ukraine have raised concerns about grid security, and in some cases resulted in blackouts.[43] Similarly, individual customers could be vulnerable to unauthorized disclosure of PII through digitization of billing data, or "snooping" into habits and household patterns inferred by analyzing smart meter usage data.[44] While California has a greater than 80% smart meter penetration rate, customer concerns related to privacy, data-mining, and government or third-party control of appliances may limit uptake of efficient technologies.[45] The U.S. Department of Energy's DataGuard and privacy program, which seeks to standardize privacy enforcement, as well as safeguards contained in California legislation including AB 802 and SB 1476, can help address these concerns.[46]

Moreover, participants at the August 2020 convening emphasized the importance of distinguishing between the types of data security concern. Customer privacy protections are vital, and adherence to privacy policies and data anonymization/aggregation protocols can be essential to limit harm to individuals as well as potential public safety concerns from large-scale breaches. Customer privacy breaches, however, typically do not present a direct threat to grid operation and efficiency like cybersecurity and physical security concerns.[47] And while these grid-level security threats present significant risks to system safety, they also target data and infrastructure primarily within utility and grid operator control. As a result, they may be more readily addressed by strict data protocols and regulatory oversight. Although these risks may be related to one another, they are nonetheless distinct, with different sets of stakeholders involved, and may merit distinct solutions.

II.
VISION

Participants at the August 2020 convening discussed ideas for a future state framework for energy data access to support a resilient and decarbonized grid based on a system that is dynamic, accessible to authorized persons or entities, and available for state, regional, local, and tribal government decision-making.

In particular, this system would be:

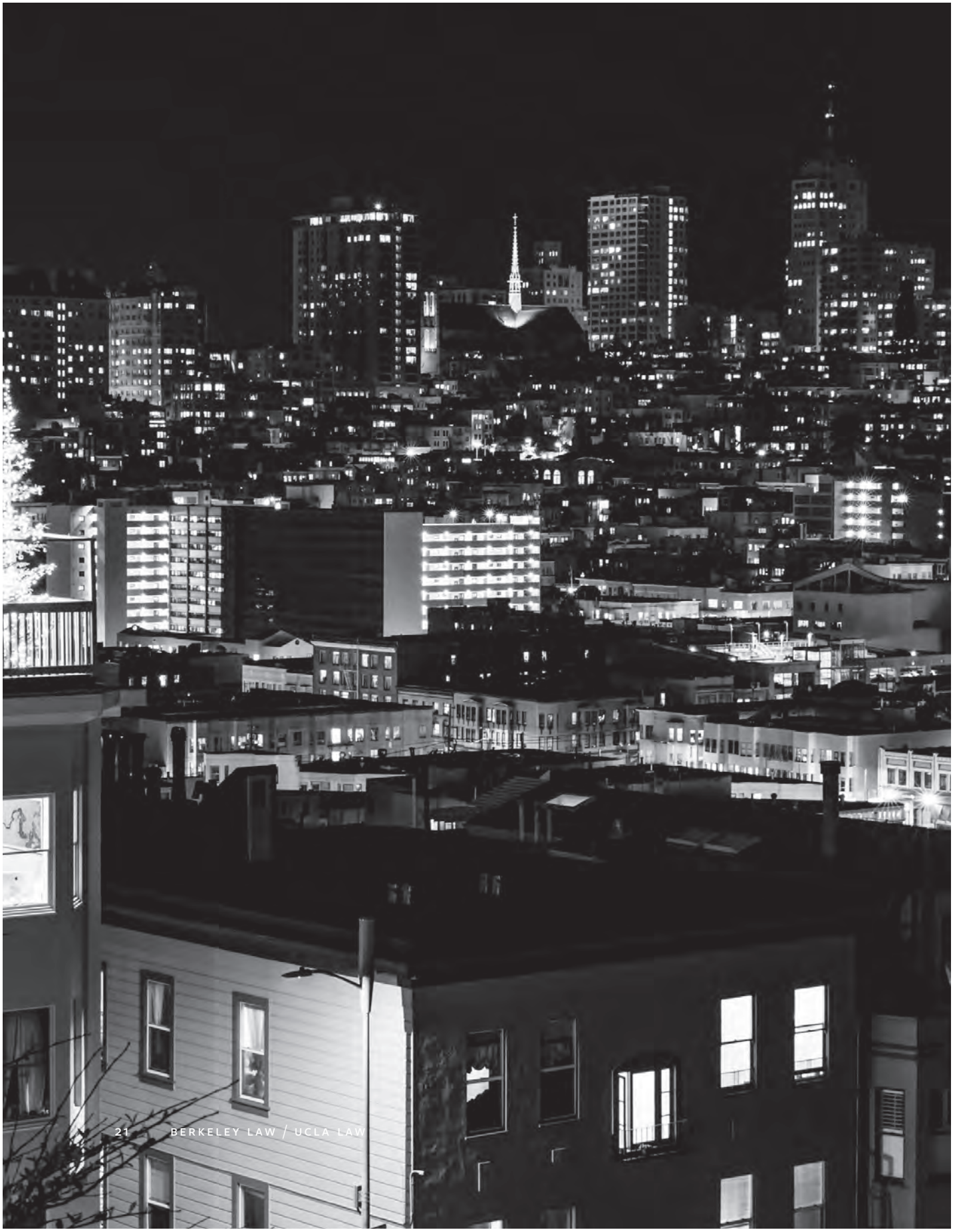
- **Comprehensive.** The energy data system would include all grid-level, customer-level, and DER performance data necessary to facilitate system-wide planning; DER sales, grid integration, and operations; and individual customer decision-making.
- **Standardized.** Data would be generated and shared via common application programming interfaces (APIs) and in machine-readable formats to the maximum extent feasible, to allow participants at all levels to process the data without spending time and resources on manual data translation or transfer. Consistency of data access methods and formats between California's various utilities was particularly important to the expert group.
- **Consent-driven and anonymized.** Individual customers would have the right to control their data and consent to its being shared. Their personal information could be disassociated from usage and other data except for essential applications.
- **Reliable.** Energy data would be available promptly upon authorized request, in contrast to some existing programs, such as some utilities' implementations of Green Button Connect, which can suffer from delays or periods of unavailability. Bug and error tracking systems would allow users to report problems and see instant responses.
- **Real-time and long-term.** The system would incorporate both real-time grid and customer data necessary to support load flexibility and grid safety applications, and long-term aggregated supply and performance data necessary to support power purchase agreement

transactions for new generation assets and hedging transactions that finance load management investments.

- **Integrated with other relevant data platforms and decision-making processes.** Energy data would be capable of seamlessly interacting with energy and environmental data essential to informing resilient grid development priorities, including data on climate mitigation and adaptation, transit and transportation electrification potential, and transmission grid development needs and opportunities. (The multi-agency analysis of the August 2020 blackouts highlighted the need for integrated demand forecasting, transmission planning, and climate scenario analysis.[48]) It would also be available to integrate into relevant state, local, tribal, and private decision-making processes, from CPUC regulation and Rule 21 interconnection decisions to land-use planning and building retrofitters' outreach efforts.

This combination of characteristics would facilitate a number of crucial capacities for the grid of the future, including real-time load management to ensure reliable and efficient supply; real-time safety protocols to minimize wildfire and other risks; long-term infrastructure investment planning and financing arrangements to fund it; individual decision-making and marketing/outreach efforts on efficiency investments; shifting of load based on dynamic price signals; protection of customer-identifying and security-essential information; and policy initiatives at the state, regional, and local levels to support and accelerate these efforts. Local and tribal governments would have access to data necessary to shape investments in resilience and transportation electrification. And utilities would focus more on facilitating customer and developer access through well documented platforms and responsive technical support.

By integrating operational and planning data, such a system could both draw in the customers and enable the capital mobilization needed to rapidly scale up investment in demand response and load management technologies. And it would allow public and private actors to build climate risk projections into grid planning processes and investment decision-making, to map multiple future grid scenarios that address a range of potential needs. A single, one-stop-shop data platform (potentially hosted by the Energy Commission, building on its AB 802 program) could support these functions—and the Public Utilities Commission considered the concept at least as early as 2012—but may not be necessary to achieve it.[49]



III.
BARRIERS AND PRIORITY POLICY SOLUTIONS

Participants at the August 2020 convening identified a range of barriers to achieving this vision for resilient decarbonization energy data access and use, including concern over privacy and security issues, the inherent limitations of current utility business models, a lack of consistency between utilities' IT systems, and limited personnel and information technology capacity. These barriers focused on three core themes:

- **Privacy and security rules and concerns** that impact the flow of data through restrictive requirements and heighten concern for risk and liability.
- **Utility operating frameworks**, including regulatory requirements and incentives, which can create limits on capacity for data sharing.
- **Organizational priorities, requirements, and capacity limitations** among utilities and regulators that can impact progress on data access priorities.

This section describes those barriers in detail and highlights the top-priority policy solutions participants identified to overcome them.

A. PRIVACY AND SECURITY RULES AND CONCERNS IMPACT THE FLOW OF DATA

The central privacy and security concerns that shape energy data frameworks—protection of customer privacy, cybersecurity, and physical security—can also restrict access. Participants agreed that confusion around the distinctions among the different issues can be particularly problematic: customer privacy concerns may be conflated with grid security concerns, when they often arise in distinct scenarios and are amenable to distinct solutions; both issues can overlap with trade secret issues, which utilities and DER providers may elevate but are commercial rather than public in nature. The amount of data privacy customers actually want can vary, leading utilities and regulators to apply a more broadly protective standard out of an abundance of caution. Third parties seeking customer data also may not consistently narrow the

amount of data sought to solely that which is needed for the services they provide, and enforcement protocols for control/destruction of data after use may not be clear.

Physical and cyber grid security risks also impact the flow of data: Information regarding the location, design, and capacity of key distribution infrastructure can raise concerns over security and resilience to physical and cyberattacks, and Federal Energy Regulatory Commission (as well as CPUC) requirements limit public disclosure of this critical energy/electric infrastructure information (CEII).[50] This same information can be critical for DER providers seeking to deploy load managing technologies, which rely on granular knowledge of load and capacity throughout the grid. Concerns around physical security of grid assets also contributed to delayed publication of updated utility ICA maps, which help developers determine where DERs can be located without need for grid upgrades or modifications. In a 2018 ruling, the Public Utilities Commission required utilities to make the maps available via registration-restricted portals (instead of user non-disclosure agreements), emphasizing that the need to redact or restrict access to CEII must be proven with granular specificity, weighing public benefit against potential risk.[51]

In addition, confusion over what legal requirements actually apply to California energy data, including CPUC regulation, state law, and Federal Energy Regulatory Commission rules, compounds the challenge. And those rules that clearly do apply—such as the CPUC's 15/15 rule that sets numerical minimums for aggregated customer information—may meet some needs but be counterproductive to others.

Solution: The California Energy Commission and Public Utilities Commission could create a definitive guide to the legal and regulatory framework for data privacy and security.

Lack of clarity on the application of federal, state, and utility data privacy and security requirements can lead energy data stakeholders to take an overly risk-averse approach to sharing grid and customer data. Participants suggested that a definitive guide to applicable legal and regulatory requirements would be particularly helpful to local and tribal governments, which often have limited information and expertise on energy data issues. The Energy Commission and the Public Utilities Commission could prepare or commission a regulatory guide to help these governments, small DER providers, and state regulators understand how data generation and sharing are limited by current law and policy. The guide could cover such issues as:

- **Federally designated CEII** and Federal Energy Regulatory Commission regulations designed to prohibit unauthorized disclosure.[52]
- **The California Information Practices Act** and limitations on agency disclosure of individuals' information.[53]
- **The California Public Records Act** and exceptions for confidential information related to utility systems development.[54]

- **Senate Bill 1476** and limitations on utility disclosure of customer data.[55]
- **Other state law requirements for confidentiality of data**, including Public Utilities Code section 583.[56]
- **Public Utilities Commission Decisions 11-07-056 and 14-05-16** and requirements for notice of collection and disclosure of customer data, customer access to data, and use and disclosure of data.[57]
- **The Public Utilities Commission's 15/15 rule**, its regulatory status, and its real-world application.[58]
- **Public Utilities Commission Decision 19-01-018** and requirements for electric utilities to identify and prepare physical security plans for critical grid assets.

Solution: The California Energy Commission, Public Utilities Commission, Independent System Operator, and Governor's Office of Planning and Research could create a forum for stakeholders to achieve consensus on security and privacy issues, potentially with direction from the state legislature.

In addition to increased clarity about applicable requirements, stakeholders need a regular, public forum for energy regulators, utilities, DER providers, local and tribal governments, consumer advocates, data security experts, and climate change planners to establish firm priorities between privacy/security goals and appropriate flows of data to support DER applications. The forum could allow a broader group of stakeholders to gain insight into investor-owned and public utilities' system configurations and security needs (whereas many currently feel that decisions are made in a 'black box'), increase understanding of the use cases and actual data needs of DER providers, and help utilities to better coordinate decision-making. It could also help participants identify and adopt best practices (and address risks) from the tech sector.

In particular, this conversation could focus on the substantive goals of achieving a clean and resilient grid and include the voices of community and environmental stakeholders not often involved in energy data decision-making. The forum could also include third-party civil society groups, such as the Institute of Electrical and Electronics Engineers or the Linux Foundation, which have experience developing independent energy data platforms and standards, and can offer clarity on best practices without a direct stake in a given decision or proceeding. These participants could be particularly instructive in:

- Setting clear requirements for data quality and validation (expanding on the CPUC's requirement for "reasonably accurate and complete" data[59]) and appropriate requirements for customer authentication and authorization, which are vital components of data security;
- Crafting standards that ensure liability and penalties are adequate but do not hinder progress;

- Integrating differential privacy principles into data protection regimes; and
- Structuring a potential consolidated energy data platform, similar to the Integrated Energy Data Resource currently under consideration in New York.[60]

Existing forums for this discussion include the Energy Commission-led Integrated Energy Policy Report (IEPR) process, which makes consensus state policy recommendations on energy efficiency, reliability, and decarbonization, among other issues;[61] and the Office of Planning and Research-led Integrated Climate Adaptation and Resiliency Program (ICARP), whose Technical Advisory Council facilitates climate adaptation policy development among state and local governments.[62] However, participants emphasized that this forum may ultimately need regulatory authority to make even consensus rules apply. Thus, legislation creating this forum could either direct regulatory action by CEC or CPUC based on decisions made in the forum or explicitly direct the regulators to return their recommendations to the legislature for future codification in law.

Solution: The California Public Utilities Commission could re-examine the 15/15 rule for customer data aggregation to consider an approach based on differential privacy.

The Public Utilities Commission follows a "15/15" rule for the public release of aggregated customer energy data, in which all reports containing aggregated customer data must include at least 15 customers' data, and no individual customer's data may represent more than 15 percent of a given customer class within the sample.[63] Participants emphasized that while the rule was properly intended to protect individual account information, in practice—with the availability of modern software and anonymization capabilities—it may prove too restrictive, limiting utilities' and DER providers' ability to work with smaller, more granular datasets. The Public Utilities Commission could explore whether to adopt a new data aggregation rule based on differential privacy principles, which protect sensitive underlying data by introducing small amounts of distortion or inaccuracy into a dataset, delivering statistically accurate results on the relevant metrics while obscuring sensitive identifying information.[64] Requiring utilities, DER providers, and data servicers to use differential privacy systems, which have advanced significantly since the CPUC adopted the 15/15 rule, could preserve privacy while facilitating better data access.[65] This will be particularly valuable as providers move to install more solar, storage, and electric vehicle resources at multifamily residential buildings, which pose more complex data privacy concerns. Any new approach should ensure large customers with broad security implications (such as the military) are protected from individual identification, and take into account the appropriate amount of cost relative to system and customer benefit.

Solution: The Public Utilities Commission could enhance the scope of its 2011 privacy decision to expand customer data rights with regard to billing data and other customer-specific information.

The Public Utilities Commission's 2011 privacy decision, which sets many of the terms for collection, use, and disclosure of customer energy data, focused narrowly on advanced metering infrastructure usage data, which are central to the flexible functions of a clean and resilient grid.[66] However, participants indicated that the decision's rules concerning usage data (i.e., kilowatt-hour values over time) leave significant gaps and uncertainties about the treatment of non-usage data that is becoming increasingly important to distributed energy resources of all types. As the market for DERs has evolved significantly over the past decade, the 2011 privacy decision's focus on usage data is leading to confusion and differing interpretations of how to manage non-usage customer data. Billing data and information necessary to participate in Independent System Operator demand response programs are the subject of ongoing, unresolved disputes over utilities' proprietary data and the obligation to make such information portable. For example, registered demand response providers have access to more customer data (such as billing information) than do other DER providers, such as pure solar and energy efficiency providers. The Public Utilities Commission could revisit and expand the 2011 decision to systematically classify all types of customer data (such as billing information) for their accessibility/portability, determine whether utilities should create different data sets based on data required for certain DER applications, and grant customers clearer rights to share a more complete set of their data with third parties for any type of DER. In October 2020, the commission issued a ruling in an ongoing proceeding which held that expanding the utilities' "Click-Through" data-sharing programs (which cover not only usage data but also billing and account information) to DERs other than demand response providers was out-of-scope for the current proceeding, suggesting a holistic expansion of the 2011 privacy decision could encompass these programs as well.[67]

B. UTILITY OPERATING FRAMEWORKS, INCLUDING REGULATORY REQUIREMENTS AND INCENTIVES, CAN CREATE LIMITS ON CAPACITY TO SHARE AND INVEST IN DATA EXCHANGES

Current utility operating frameworks can present obstacles to investments and technologies for optimal energy data flows that are needed to support decarbonization. Some participants felt that the traditional rate-of-return model for investor-owned utilities, which primarily rewards (and provides shareholder value from) large-scale investments in generation and transmission infrastructure, does not create strong incentives for increasing the efficiency of existing assets—the fundamental benefit of advanced energy data use. At the same time, utilities also must balance investment decisions among multiple priorities and regulatory requirements and maintain affordability for their customers, while some data-driven DERs may represent a form of competition. In addition, rules like must-offer obligations implemented by

the California Independent System Operator, which support competition in resource adequacy by requiring all resource adequacy-qualifying resources to be offered into the market, may not fit the business model for data-reliant demand response applications. Since some demand response applications are only needed sporadically, they need increased flexibility in offer obligations as compared to traditional generation supply resources and even other flexible resources.[68]

Solution: The California Public Utilities Commission could adopt performance-based regulation that rewards effective data-sharing.

Investor-owned utilities justify rates and revenue in large part based on the capital cost of major generation and transmission infrastructure investments, with potentially limited financial incentives to invest in flexible grid assets or in supporting the grid, customer, and DER performance data that support them. Some participants emphasized that in order to develop an optimally efficient decarbonized grid, utilities should have an incentive structure that also rewards investments in data sharing and management. The Public Utilities Commission could introduce performance-based regulation that links utility returns and shareholder value to resilient decarbonization performance goals, including goals for data generation, sharing, and adherence to privacy and security best practices. Data-sharing performance metrics could include total number of completed data-sharing authorizations; percentage of data-sharing attempts that are successful; average and maximum data delivery time following customer authorization; Green Button Connect system availability; and number of complaints received, among others. Regulation could particularly reward data-sharing performance and best practice in the context of other programs (e.g., energy efficiency incentives) to ensure that data progress is directly linked to achievement of substantive targets.

Performance standards should reflect customer demand, simplicity and comprehensibility, and affordability priorities to ensure that utilities' investments accord with market and consumer needs over the full decarbonization timeline. Commission leaders could look to recent moves toward performance-based ratemaking in Hawaii, Colorado, and other states for examples of resilience-focused regulation.[69] This shift will become increasingly valuable as California begins its transition to a fully electric vehicle market by 2035, which could place significant strain on existing grid assets but also offer the opportunity for aggregated flexibility and load management (as well as the potential for lower electricity rates system-wide).[70]

As an alternative mechanism to realign incentives toward greater sharing of data, state energy leaders could consider the creation of an independent distribution system operator (DSO) function to manage of load and capacity in the distribution grid. A DSO responsible for sharing of data between utilities, individual customers, and DER developers would reduce disincentives to share data by eliminating potential competition concerns among service providers and by centralizing privacy/security management capacities and functions. The Public Utilities Commission could consider authorizing community choice

aggregators or other independent entities to take on DSO functions, particularly if performance-based regulations do not create the desired data-sharing incentives.

Solution: The California Public Utilities Commission could expand on existing regulatory proceedings or initiate a new proceeding to identify objectives, use cases, and cost considerations and direct achievement of specific related targets for progress in data exchange.

While reforming investor-owned utility financial incentives could facilitate a significant increase in advanced energy data investments, participants suggested that on certain high-priority data issues the Public Utilities Commission could exercise its rulemaking authority to drive immediate action. The commission could expand an existing proceeding or initiate a targeted proceeding to address these issues, including matters such as:

- Identifying overarching objectives, needs and use-cases, cost, and timing considerations for customer data access;
- Requirements for bug/error reporting, tracking, and response;
- Performance improvements for the Green Button Connect data access system;
- Confirming data access obligations and requirements for third parties;
- Best-fit options for new data anonymization methods; and
- Planning, outreach, and privacy protocols for multifamily building data-sharing.

Such a proceeding could not only facilitate progress on these key immediate-term priorities, but also potentially inform the multi-stakeholder data forum described above.

C. ORGANIZATIONAL PRIORITIES, REQUIREMENTS, AND CAPACITY CAN IMPACT PROGRESS ON DATA PRIORITIES

Participants perceived that utility and energy regulator staff responsible for major energy data decisions often face concerns when engaging with and facilitating third-party access to customer and grid data. The potential risk of exposing private information or grid security data, including concern over liability, can outweigh the benefit of using data to increase efficiency of investments and dispatch, leading decision-makers to default to inaction. In addition, existing regulations developed to ensure safe interconnection and operation of renewable energy can result in barriers to utilizing data to streamline the integration of renewable energy, unlock all potential value streams it can provide the grid, and ensure the safety and reliability of the electric system. (Examples include CPUC Rule 21 for interconnections and FERC's Wholesale Distribution Access Tariff.[71]) Moreover, a lack of agency staff fully devoted to energy data issues

limits regulators' grasp of the data already in the system and the regulations already in place. Participants highlighted the California Solar Initiative as an example of the benefits that can accrue when state agencies focus on evolving and facilitating data access: while some early data sets published under the program were incomplete or lower-quality when first launched in 2010, the Energy Commission and Public Utilities Commission were able to refine them over time into a world resource for distributed generation data that has helped facilitate a dramatic market transformation in the industry.[72]

Solution: The California Energy Commission and California Public Utilities Commission could enhance enforcement of existing requirements for data exchange.

Participants described multiple instances of failure by some utilities to meet data sharing and management requirements or targets set by the Energy Commission and Public Utilities Commission, with inadequate commission tracking and enforcement compounding the problems. Examples included flaws in Green Button Connect data access platforms, imposition of additional terms and conditions for access, delayed registration applications, and slow-moving proceedings on applications to improve the platforms; intermittent access to home area networks and Integrated Capacity Analysis maps; and frequent data system outages which were only corrected after substantial and costly advocacy from outside parties.[73] Participants also noted examples of utilities minimizing provision of excess data or time-limiting access to data, citing conflicts with third parties' needs. While many of these instances arose in early iterations of data exchange platforms as utilities gained understanding of third parties' needs and capacities, some continue. Public Utilities Commission data management requirements can go unmet, slowing much-needed progress. (Utility performance metrics websites were identified as a helpful step in maintaining data access, when consistently operating.[74]) The Energy Commission and Public Utilities Commission could create new, high-level data management positions to enforce existing rules and coordinate and demonstrate the importance of enforcement activities. The Energy Commission and Public Utilities Commission could also add new data-focused staff to enhance scrutiny of utility operations and periodically review their IT platforms, as well as third-party data access practices and adherence to customer authorization/data minimization requirements. In addition, the Public Utilities Commission could consider increased use of enforcement tools like citations that are more efficient than traditional adjudicatory regulatory mechanisms.

Solution: The state legislature could appropriate funds for the California Energy Commission and California Public Utilities Commission to hire and retain more energy data experts.

Participants emphasized that recent legislation and regulatory decisions on data privacy and generation—including AB 802's building energy benchmarking program and SB 1476's privacy requirements—have had the effect of giving state regulators increasing levels of responsibility for data sharing and management.

The benefits of greater data centralization and uniform rules of access are counter-balanced, however, by the challenge of handling the massive quantities of data generated by the modern grid. Shifting from a passive or reactive role to an active data management role requires new hiring and organizational adjustment at the Energy Commission and Public Utilities Commission, including the creation and/or expansion of divisions focused entirely on energy data.

In addition, multiple state processes to modernize and decarbonize the grid expressly rely on fluid and efficient information-sharing between these two agencies. Examples include the Energy Commission's assessment of electric vehicle charging infrastructure needs under Assembly Bill 2127 (Ting, Chapter 365, Statutes of 2018), which requires Public Utilities Commission data on grid capacity and ICA maps; and the Public Utilities Commission's development of long-term grid scenarios in the Integrated Resource Plan process, which relies on Energy Commission projections of future demand and Integrated Energy Policy Report analyses.[75] The accuracy of these assessments—increasingly essential in light of emerging state policies such as the target of 100 percent zero-emission passenger vehicle sales by 2035—relies on open lines of communication between the agencies, and experienced staff committed to issuing and handling data requests.

The legislature could appropriate funds for these positions (and for increased compensation to retain talent) to ensure that data management expertise is built in-house at the agencies, rather than at outside consultants; and that staff have capacity to focus on sharing data and expertise with counterparts at sister agencies, facilitating regulatory, technology deployment, benchmarking, and research and development goals.

Solution: Electric utilities can continue to modernize their information technology systems and expand internal staff capacity.

Electric utilities are responsible for some of the most complex, high-risk, and data-intensive infrastructure in the state—increasingly resembling information technology companies more than their traditional role as managers of physical infrastructure. Yet participants noted that in many cases their IT systems are outdated or unmatched to the data management task of the grid of the future, with particular implications for bug tracking and interoperability. At the same time, some third parties' requirements that consumer interactions occur entirely on third-party websites and platforms can add difficulty to utilities' authentication and authorization responsibilities. Utilities also face challenges in identifying and implementing solutions for future third-party and customer needs that continue to evolve, given the mismatch between the multi-year process required for substantial updates to a utility IT system and the rapid technological development of DERs. With authorization and guidance from the Public Utilities Commission and/or Energy Commission, utilities could be enabled to invest in IT systems for broad data needs on cooperative timelines, to ensure that they can exchange data in formats that function for technology and data firms, that they can respond appropriately to user and customer concerns and feedback, and that the data remain secure and appropriately protected. Utilities could also expand their IT teams (with regulatory authorization) to ensure these new investments and customer response capacities are fully staffed.

CONCLUSION

As California moves to increase electrical grid resilience in the face of climate risks while reducing greenhouse gas emissions, regulators, utilities, and technology providers will need unimpeded access to the energy data needed to support resilient decarbonization technologies. Record-setting wildfires, continuing extreme weather conditions, and potential public safety power shutoffs highlight both the urgency of this need and the scale of the challenge. State leaders can take near-term policy steps to facilitate effective and efficient deployment of these technologies while protecting customer privacy and grid security.

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Reference: "Hawaii Electric Companies' Data Analytics Clearinghouse Pilot Notice of Intent; Exhibits A-E; and Certificate of Service," filed on October 26, 2022 ("Notice").
On page 1 of Exhibit D, of the Notice, several potential "[e]xamples of analyses" that will be supported by the Clearinghouse are articulated: "detailed usage patterns within rate schedules, site-type load patterns, EV charging patterns, PV program load profile changes and trends, voltage change/trend analysis, time-of-day usage reviews, energy efficiency project impacts, and weather and price change correlations."

a. Will each of the examples of analyses be their own data package?
b. Will each of these identified examples of analyses be made available to the participants within the Pilot period?
c. Please indicate which of these example analyses were informed and/or identified by the Companies' discussions with proposed pilot participants. Where informed by discussions with participants, please elaborate on the example questions they expressed an intention to use the data to answer and the venues in which participants expressed an intention of using the data. Please provide as many detailed examples as possible.
d. If the Companies do not have detailed use cases as requested in subpart (c), above, please describe at least five example use cases. Use cases should include reference to a user of the data analytics clearing house, the goal or intended purpose that the data analytics clearing house will support, and how the data provided will be used to support the goal or intended purpose.

Hawaiian Electric Companies' Response:

a. Through communications with the Companies, the public research entities indicated that they seek the "raw" data to perform their own independent analyses. Therefore, the Companies intended to and the Clearinghouse Pilot will provide access to the full datasets, without analysis. As part of the Clearinghouse, the Companies will provide the key data services that include this raw data, as well as packaged data sets and ability for interactive analytics. This raw data would include the fields and related datasets such as whether to perform segmentation and analysis work. The Companies will consider providing performed analyses as part of one of the Clearinghouse Pilot Minimum Viable Products to demonstrate collaborative functionality and the Companies remain committed to supporting ongoing analytics activities collaboratively.

b. See the response to part a.

c. Through discussions with the Companies, the public research agencies have indicated interest in some or all of the example use cases. For example, the University of Hawaii, the Division of Consumer Advocacy and Hawaii Energy have expressed the following related to the potential use cases described in discussions, responses to a survey issued to public research entities in March 2022, and in support letters provided in Exhibit B.

1. University of Hawaii has interest in all the example analyses with exception of the voltage change/trend analysis. Some of these may include:

   (a) Clustering of load patterns to find similar load patterns and the grouping of customers according to how clustering aligns with geographical groupings such as the census tract

   (b) Data to allow the review of how historical Company and Energy Efficiency programs and rate changes have influenced behavior of businesses and households

2. The Division of Consumer Advocacy has expressed interest in the data to perform analyses related to detailed usage patterns within rate schedules, site-type load patterns, EV charging patterns, PV program load profile changes and trends, time-of-day usage reviews used to help inform work in ongoing PUC dockets. The Division of Consumer Advocacy specifically indicated interest in:

   (a) Assessing load profile information and the impacts of different rates and programs

   (b) Use of the data for research (white papers)

(c) Desire to include EV and PV data as complementary datasets to the AMI and standard meter usage data

(d) Interest in historical data from prior phases of AMI roll outs would be helpful to assess how load shapes may have changed over time

(e) Provision of additional identifiers or characteristics such as DER tariff type (NEM, CGS, CGS+, CSS, Smart Export, NEM+), their effective date, and system size; commercial end-use site type; other anonymized monthly billing data

3. Hawaii Energy sees value in the use of the Clearinghouse Pilot data to provide:

(a) Analytical applications for customer targeting and analysis of customer characteristics

(b) Additional raw and processed datasets including census data, health-related datasets, PV generation, EV load profiles, and circuit capacity constraint

d. The Companies have reviewed potential data use cases that would be applicable to the Clearinghouse Pilot but have not yet conducted detailed analysis or descriptions to specify exactly the use cases for the Pilot. More specific details for the use cases will be better known approximately three (3) months after project start once the first MVP is ready to initiate. Below is a sample table of target use cases that are under consideration that the Companies believe best fit with the intent and needs of the proposed Pilot participants.

Potential Use Cases for Data	User	Goal or Purpose	Data Shape(s)	How Data will the used to Support
1. Correlation of Weather on Energy Use Patterns	UH / UHERO Consumer Advocate HSEO Hawaii Energy County Energy Offices	Correlation analyses to inform policy, forecasting, trend and program development Develop weather normalization algorithms for improved comparisons of usage over time	Date-Time "Key" - Weather and energy usage datasets Aggregation may be applied (Rate Class, Site Type, Geography) as needed depending on the use case specifics	The weather and energy use data may be joined using the Date-Time key to allow regression and pattern tools to identify various energy use load shape behaviors as the weather components change.
2. Energy Efficiency Participation Impacts on Energy Use Patterns	UH / UHERO Consumer Advocate HSEO Hawaii Energy County Energy Offices	Evaluation of program impacts and the potential load shape changes pre-post of program offerings	15-min. load data associated with specific participants and non-participants in aggregated groups or for Hawaii Energy for specific participants	Data can be used to perform analytical applications for customer targeting and analysis of customer characteristics that would benefit from a program Data provided may be joined with participation and the measure implemented to obtain per-post impacts to the load shapes
3. Site Type Load Patterns Benchmarking	UH / UHERO Consumer Advocate HSEO Hawaii Energy County Energy Offices	Use of load shape information by Site Types to assist in policy targeting, program development and evaluation, end-user education and benchmarking and solution provider insight for product and service development specific to the Hawaii market	Load data aggregated by type of site such as Office, Apartment, Shopping Centers, Hotels, Hospitals, Single-Family Home etc.	Segmentation into the site types will provide a source of metered load data not previously available for evaluation
4. PV Program Participation Load Shape Patterns	UH / UHERO Consumer Advocate HSEO Hawaii Energy County Energy Offices	Use of pre-post usage trends in PV customers to inform policy and program impacts, potential and opportunities	Anonymized Load Data with the features of PV Program, Pre and Post Start Date, Residential and Commercial segmentation flag	Hawaii specific PV load shapes by program can be developed and utilized for the evaluation of policy and potential development
5. EV Charging Patterns	UH / UHERO Consumer Advocate HSEO Hawaii Energy County Energy Offices	Identify charging patterns and trends in EV charging in both private and public charge settings	Potentially aggregated by known public/private share stations Known EV charge site load shapes for use in pattern recognition to identify sites with EV charging	Collaboration to build segmentation data with EV charger owners and the use of Machine Learning tools to identify locations that have EV Charging

PUC-HECO-IR-03

Reference: Notice at 2.
Hawaiian Electric states that "[p]ilot participation will be initially offered to public research agencies," and identifies specific entities.

In addition to these entities, will the Commission have access to the Clearinghouse Pilot?

Hawaiian Electric Companies' Response:

Yes. The Companies welcome the Commission to join Clearinghouse Pilot participants and to participate in the Big Data journey that the Companies and the public research agencies are on.

PUC-HECO-IR-04

Reference: Notice, Exhibit E at 2-3.
Hawaiian Electric describes its intention to work with TEKsystems Global Services, LLC ("TEKsystems) in Exhibit E:

> The Companies have engaged TEKsystems for system integration and consulting services to support the implementation and ongoing maintenance of the Enterprise Data Analytics Platform ("EDAP"), initially evaluating several technologies as a pilot effort and ultimately leveraging Azure Data Lake Storage and Databricks service for analytics in a production version in 2022. TEKsystems has provided initial support for the Clearinghouse concept development and will provide the primary support and development throughout this Pilot effort in conjunction with support for the core EDAP.

a. Will the Clearinghouse Pilot feature custom-designed software services for Hawaiian Electric from TEKsystems or an off-the-shelf software solution? If the former, please explain why custom software is necessary and why an off-the-shelf solution would not be effective for this context.
b. Please describe the technical stack (also known as the solution stack or software stack) upon which the Clearinghouse Pilot will be built.

Hawaiian Electric Companies' Response:

a. The Pilot is not expected to use custom-designed software and will utilize off-the-shelf solutions in all instances where possible. In limited instances, the Pilot may use some customization of standard applications, such as for development of the web portal or other presentation layers.

b. The currently planned solution or software stack includes the following:

    1. For data storage the Companies are using Azure Data Lake Storage Gen 2 (ADLSG2) storage accounts to store raw data files and Delta Tables. The raw data goes through a series of transformation steps to prepare the data for analytic purposes which are ultimately stored in Delta Tables for consumption by Data Analyst.

    2. For data ingestion into ADLSG2 the Companies are using Azure Data Factory.

3. For analytics the Companies are using Azure Databricks notebooks with PySpark libraries.
4. For data catalogs, security and lineage the Companies will use Databricks Unity Catalog. Microsoft Purview may also be incorporated.
5. For data sharing (direct data access) with business partners the Companies plan to use Databricks Delta Sharing. The Databricks Delta Sharing will allow the Companies to share data directly from the Companies' data lake without having to transmit that data to each participant.
6. For interactive analytics the Companies plan to a BI presentation tool that may include Microsoft Power BI or Tableau Service.

Pilot participants will still need to ensure that they have sufficient compute resources to query and process the data in their technical stack. Databricks Delta Sharing which can provide connections to data "in-place[1]" will require the participants to connect their cloud or on-premise compute resources to point to the data and make direct queries to the Big Data that resides within the Companies' Enterprise Data Analytics Platform cloud.

[1] Sharing data "in place" is a capability to share data directly from the Azure Data Lake without having to extract, download, and transmit data via Secure File Transfer Protocol (SFTP).

PUC-HECO-IR-05

Reference: Notice at 23
Hawaiian Electric states:

> Pilot Participants will be asked to periodically fill out surveys (e.g., useability survey) and to provide feedback throughout workshops or other vehicles on features and usability of the solutions being implemented. Participant feedback will be requested and collected throughout the Pilot and within the Early Life Support phase.

a. Has Hawaiian Electric determined the frequency that it will issue these periodic surveys to pilot participants? If so, please elaborate. If not, please explain why not.
b. Has Hawaiian Electric developed specific criteria for which it will evaluate the Clearinghouse Pilot's success (e.g., useability), either in a quantitative or qualitative manner?

Hawaiian Electric Companies' Response:

a. The Companies will provide an open survey to the users upon the release of each Minimum Viable Product ("MVP") and possibly during the Early Life Support phase. More importantly, to assess the useability and alignment to expectations and actual needs, the Companies will propose engagement throughout the development and testing increments discussed more in response to part b., below. The frequency of these iterative engagements will likely occur approximately every six (6) weeks once the first MVP starts and at minimum quarterly.

b. The highest-level criteria for success will be the volume of use of the features of the Clearinghouse both in the number of visitors and volume of the data being utilized. The Companies intend to develop and complete a testing plan to gauge the usability of the Clearinghouse resources. The Companies plan to execute the testing plan iteratively at specific milestones to evaluate progress and get valuable insights before the next Program Increment development cycle, rather than only completing acceptance testing at the end. Typically, a testing session is held early in the process to validate information architecture,

high-level work flows, and feature prioritization. Periodic testing is conducted throughout the execution stages, aligned with the program increments, to guide the design and usability. Various methods for useability testing are used to validate design decisions, based on what stages of design are completed. For example, card sorting is a method used for initial information architecture design and feature prioritization, and A/B testing is a method used for decision making in different designs or comparing against previous implementations. Periodic testing is typically completed midway through project design so the designer is able to make adjustments and changes during project development.

PUC-HECO-IR-06

Reference: Notice at 17-18.
Hawaiian Electric states that:

> Non-participants are expected to indirectly benefit from the Pilot through the action of the Pilot Participants who represent the interests of customers across the State. One of the primary benefits is the value of better data-driven decisions, which is expected to benefit all customers over the long-term.

a. Has Hawaiian Electric performed any studies or analyses to support its statement that non-Pilot participants will indirectly benefit from the Pilot?
b. Has Hawaiian Electric performed any analyses studying the benefits that this Pilot could bring specifically to customers?
c. Has Hawaiian Electric identified any specific improvements to existing customer programs that it believes will be supported by the Clearinghouse Pilot?

Hawaiian Electric Companies' Response:

a. There have been no studies or analyses performed by the Companies to determine specific quantifiable benefits for non-pilot participants. However, the public agencies letters of support provided in Exhibit B (i.e., letters from the City and County of Honolulu ("C&CH") Office of Climate Change, Sustainability and Resiliency ("CCSR"), the Consumer Advocate, Hawaii Energy, the Hawaii State Energy Office ("HSEO"), and the University of Hawaii Economic Research Organization ("UHERO")) demonstrate significant stakeholder support for the proposed Pilot and how the Pilot is expected to lead to benefits for all customers. For example, the CCSR's letter states:

> It is our view that increased access to data is a key enabler to innovation on the grid, and essential to achieving our very ambitious statewide energy and climate action goals. By making energy data more available while protecting customer privacy, HECO enables participants across the market. With the need for much greater integration of buildings and vehicles on the grid comes a need for greatly increased collaboration across a broader set of stakeholders. Improved data access supports this need and enables improved innovation, policymaking, and projects across O'ahu.[1]

[1] Exhibit B at 1.

b. The Companies have not performed analyses studying specific quantifiable benefits for customers. However, the proposed Pilot directly enables increased access to data, and as stated by the CCSR, increased access to data is essential to achieving State energy and climate goals and enables improved policy making – which is expected to lead to benefits for all customers, including non-pilot participants.

Similarly, the Consumer Advocate states in its letter that "[t]he Consumer Advocate believes that the ability to access anonymized, aggregated, customer-level usage data would provide valuable opportunities for analyses and research in several areas, including but not limited to helping to inform public policy decisions,"[2] the HSEO states in its letter that "HSEO's role to provide analysis to inform polices is predicated on access to data,"[3] and UHERO states in its letter that "this collaboration will inform decision making focusing on the impact of energy policy in Hawaii."[4] As discussed in these letters of support, the direct benefits (i.e., increased access to data and tools) to Pilot participants are expected to lead to more informed decision-making and thereby benefit all customers.

c. At this time, the Company has not identified specific improvements related to existing customer programs that would benefit directly from the Clearinghouse Pilot which is intended primarily for external audiences. However, an example of Clearinghouse support of customer program improvements would be with regard to Hawaii Energy's efficiency efforts, who indicated in response to a collaboration survey (completed in March 2022) that Clearinghouse data would be useful for customer targeting, load profile analysis, program

[2] *Id.* at 3.
[3] *Id.* at 6.
[4] *Id.* at 8.

impact evaluation, and the analysis of customer characteristics, impact evaluation, and forecasting.[5]

[5] *See also* Hawaii Energy's letter of support, Exhibit B at 5.

PUC-HECO-IR-07

Reference: Notice at 24.

Hawaiian Electric states:

> There are no specific terms and conditions for pilot participants as the initial participants are limited to public research agencies. However, there will be data access terms and conditions incorporated into the registration process for usage of Clearinghouse services.

What types of "terms and conditions" will be required of participants to the Clearinghouse Pilot?

Hawaiian Electric Companies' Response:

Pilot participants accessing the Clearinghouse will be required to agree to general terms and conditions for data access and usage that have yet to be determined. A limited example of these is provided below, though the specific and complete list of terms and conditions will be developed as part of the Pilot project. The following examples are illustrative.[1]

- Intellectual Property: Data Ownership is retained by the Companies, or appropriate third parties, and accessing the data is for personal or non-commercial use only. Data content will be used lawfully and only for the permitted uses. The reproduction of any document or graphic in whole or in part for any other purpose is expressly prohibited, unless prior written consent is obtained from the respective copyright holder(s). The sale, modification, reverse engineering, recompilation, disassembly, framing or creating derivative works of or otherwise exploit for any commercial purpose the Clearinghouse or any portion thereof without prior written consent is prohibited.
- Privacy Policy: Access to the Clearinghouse will require users to agree that they will not make any attempt to re-identify or de-anonymize the data by combining or

[1] The following websites include additional examples of terms and conditions:
- https://www.hawaiihealthmatters.org/utilities/index/termsofuse
- https://opendata.hawaii.gov/pages/terms-of-use

cross-referencing it with other data sets, whether such other data sets are in the public domain or obtained from any other source, to link any of the data to an individual or residence.

- General usage terms may include a provision that prohibits users from allowing any other person to access the Clearinghouse using a shared account.
- Disclaimer of Liability: Terms and conditions may include a provision that the Companies are not and will not be liable for any loss or damage arising from the viewing of, or use of a Dataset or the Data in a Dataset, third-party links or usage of the Clearinghouse.
- Data Use Guidelines: The Clearinghouse is intended as a collaborative resource and if any errors or omissions are discovered or if clarification of data definitions is required, users agree to notify the Companies for resolution.
- The Companies reserve the right to: modify any Dataset and the Data in a Dataset, including but not limited to the data format, schemas, as well as the collection and assembling of the Data selected, coordinated or arranged in the Dataset; to discontinue providing any or all of the Datasets at any time without prior notice; and to require the termination of any and all graphical displays displaying, distributing or otherwise using any or all of a Dataset or the Data in a Dataset.

PUC-HECO-IR-08

Reference: Notice at 12, Figure 1.

a. Please describe "Data Stewardship" as used in Figure 1.
b. How does Hawaiian Electric intend to protect the privacy of customers whose data may be used in the Clearinghouse Pilot?
c. What anonymization/aggregation standards does Hawaiian Electric plan to employ for this Pilot?
d. With regards to customer privacy, does Hawaiian Electric have concerns about provision of locational meta-data? Please describe why or why not and any mitigating features of the pilot that will reduce customer privacy concerns specific to locational meta-data.

Hawaiian Electric Companies' Response:

a. Data Stewardship is the process or a collection of data governance functions that ensure that data assets are accessible, useable, secure, and trusted. Data Stewardship involves management and oversight of the data lifecycle from creation to usage, storage, and deletion. Data Stewardship in context of the Clearinghouse is intended to assure that the process and workflows are aligned to the Companies data policies and governance model.

b. The Companies will follow their standard governance practices to protect customers' Personally Identifiable Information ("PII") and other confidential data according to the Companies' privacy policies, including strict adherence to the Data Access and Privacy Policy accepted by the Commission in Order No. 37146, issued on May 21, 2020, in the Grid Modernization proceeding, Docket No. 2018-0141.

In addition, except as specified below, no legally protected PII or other specific identifying information will be provided in Clearinghouse datasets and reviews will be made to ensure that such customer information will not be revealed through attempts to "re-identify" or "de-anonymize" the data by combining or cross-referencing one set of data with other data sets. There is an exception for data provided to Hawaii Energy that includes identifying information such as customer name and service address that will be

protected by access credentials, encryption, and Protective Order No. 38665 in the event that such identifying data is provided to the Commission and Consumer Advocate during the course of this proceeding.

c. The Companies will continue to utilize the current 15/15 anonymization standard, whereby aggregated data must include the data of at least 15 customers, and that no single customer included in the sample is to comprise more than 15% of the total energy use.

d. The Companies are concerned with protecting customer privacy including locational metadata. The Clearinghouse Pilot datasets will not contain location data below the level of Census Tract and City locations. The locational data such as latitude and longitude for specific customer sites will not be used in any Clearinghouse datasets.

PUC-HECO-IR-09

Reference: Notice, Exhibit E at 2-3.
Hawaiian Electric states that it selected TEKsystems through a request for proposal for work related to the implementation and management of its EDAP. Hawaii Electric also states that "TEKsystems has provided initial support for the Clearinghouse concept development and will provide the primary support and development throughout this Pilot effort in conjunction with support for the core EDAP." Further, Hawaiian Electric states that:

> Prior engagements with TEKsystems included negotiations for cost sharing resulting in direct hourly discounts on rates and select resources available at no cost. As part of the development of the Statement of Work ("SOW") for this Pilot engagement, a similar cost sharing mechanism will be negotiated with TEKsystems.

a. Did Hawaiian Electric consider any other vendors for the Clearinghouse Pilot other than TEKsystems? If so, please explain why TEKsystems was chosen among them. If not, please explain why other vendors were not considered.
b. Please elaborate on the nature of the cost sharing mechanism that Hawaiian Electric anticipates it will negotiate with TEKsystems.
c. Are the anticipated cost savings associated with the "similar cost sharing mechanism" incorporated into Hawaiian Electric's pilot budget of $2.76 million?

Hawaiian Electric Companies' Response:

a. Hawaiian Electric did not consider other vendors for the Clearinghouse Pilot due to a number of factors. TEKsystems was selected for the Pilot for the following reasons:

In the initial Request for Proposal for system integration and consulting services to support the implementation Enterprise Data Analytics Platform, four top candidates were evaluated with TEKsystems selected as the highest-ranked bidder based on value provided for the budgeted cost.

TEKsystems possesses difficult-to-source skilled resources and has prior experience working with the Companies.

Prior engagements with TEKsystems included negotiations for cost sharing resulting in direct hourly discounts on rates and select resources available at no cost. As part of the development of the Statement of Work ("SOW") for this Pilot engagement, the

Companies intended to negotiate and have negotiated a similar cost sharing mechanism with TEKsystems for the outside service expenses for this Pilot.

TEKsystems has local offices and has supported the Companies with local representation of account management, staff augmentation, contract to hire, and talent placements.

In addition, the Pilot Process as understood by the Companies is intended to be an expedited process to "test new programs and ideas quickly and elevate any successful pilots for consideration of full-scale implementation."[1] In establishing the Pilot Process, D&O 37507 stated that "[t]he Commission agrees with the Companies that flexibility is important to the success of the Pilot Process. Consequently, the Companies may exercise flexibility in selecting pilot vendors and need not strictly adhere to traditional contract bidding and selecting processes."[2] The Companies selected TEKsystems for the reasons discussed above.

b. The Companies have completed negotiations on a SOW with TEKsystems, and TEKsystems has agreed to provide outside staffing resources (an Onshore Engagement Manager and the Offshore Technical Service Manager) that will not be billed to the Companies. The SOW is pending execution upon Commission review and approval of the Notice.

c. Yes. The anticipated cost savings have been factored into the pilot budget.[3]

[1] D&O 37507 at 166.
[2] *Id.* at 169 (footnotes omitted).
[3] Pilot cost recovery will be limited to the actual costs incurred in accordance with the Pilot Process (at 6) and Order No. 37865 (at 9).

PUC-HECO-IR-10

Reference: Notice at 21.
Hawaiian Electric states:

> The non-labor Early Life Support maintenance expenses are for outside services support and are intended to provide approximately three quarters of life support to answer pilot questions on stability, supportability, use, and on-going costs.

And:

> One of the Pilot objectives is to determine the requirements for full-scale management of the Clearinghouse and estimate continuing operations and maintenance ("O&M") expenses.

a. Please describe what Hawaiian Electric means by "three quarters of life support" and explain where the other quarter will come from.
b. Please describe what Hawaiian Electric envisions a full-scale version of the Clearinghouse may look like in comparison to the pilot version.

Hawaiian Electric Companies' Response:

a. The Companies' proposed project timeline includes an estimated fifteen (15) months to establish the Data Analytics Clearinghouse services, to be followed by an estimated additional nine (9) months of Early Life Support (referred to as "ELS" in the project timeline shown on page 18 of the Notice) to include continued data collection and stakeholder feedback on the system. "Three quarters of life support" refers to the estimated nine (9) months of ELS. The Pilot as proposed does not include a fourth quarter of ELS. Depending on Pilot participant feedback and utilization, the Companies may propose to extend and/or expand the Pilot project, and the Companies will submit a request to the Commission to modify the Pilot in accordance with D&O 37507. See Notice at 18-20.

b. The Companies envision a full-scale version of the Data Analytics Clearinghouse to include additional development of datasets, use cases, and features based on Pilot participant feedback and lessons learned as well as ongoing operational support and maintenance of the functionality established in the Pilot. As discussed in the Notice, the

proposed Pilot is intended to be an iterative process to identify and address stakeholder/user needs. The Pilot will build capabilities and iteratively improve through a series of "beta" versions and work to address Pilot participant feedback received through workshops and other vehicles on the usability of the use cases and solutions being implemented. See Notice at 22-23.

In addition, as part of assessing the Pilot, the Companies will consider broadening access to a wider range of stakeholders should the Pilot be extended/expanded or lead to full-scale implementation.

PUC-HECO-IR-11

Reference: Notice at 14.
Hawaiian Electric states that one of the Project aims is to, "[i]dentify potential market interest for data."
How will Hawaiian Electric assess the potential market interest for data?

Hawaiian Electric Companies' Response:

The Companies will evaluate potential market interest with likely parties such as the solar industry after completion of Minimum Viable Product 3 and there is a better understanding of the datasets, use cases, and capabilities that the platform will provide. The Companies will assess the costs and benefits associated with processing new requests, education, hosting data and computational resources, etc., to have a more informed assessment of the market viability of providing data as a service.

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF HAWAI‘I

In the Matter of PUBLIC UTILITIES COMMISSION Instituting a Proceeding Relating to an Innovative Pilot Process for the Hawaiian Electric Companies.	DOCKET NO. 2022-0212

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing document, together with this Certificate of Service, were duly served on the following party, by electronic mail service as set forth below:

Dean Nishina
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DATED: Honolulu, Hawai‘i, December 1, 2022.

/s/ Kyle Kawata
Kyle Kawata
HAWAIIAN ELECTRIC COMPANY, INC.