MAINE PUBLIC UTILITIES COMMISSION

Report on Statewide, Multiple-use Online Energy Data Platform

Pursuant to

Resolve, To Require the Public Utilities Commission to Issue a Request for Information on a Statewide, Multiple-use Online Energy Data Platform (Resolves 2021, Chapter 63)

Presented to the

Joint Standing Committee on

Energy, Utilities and Technology

January 20, 2022

I.   INTRODUCTION

During the First Special Session of the 130th Legislature, the Legislature enacted a Resolve, To Require the Public Utilities Commission to Issue a Request for Information on a Statewide, Multiple-use Online Energy Data Platform[1] (Resolves 2021, Chapter 63) (Resolve).

The Resolve required the Maine Public Utilities Commission (Commission) to look at the feasibility of establishing and operating an online energy data platform (Platform) for natural gas and electric utility customers. In addition, the Commission was tasked to evaluate the capabilities of information technology systems to view and manage energy use, what systems are available today and what kinds of systems are needed to support the capability described in the Resolve.

A Request for Information (RFI) was required by the Resolve to acquire the information from others already operating in this space. To prepare to write the RFI, the Commission spoke with several entities in the energy use data space consisting of other states, vendors, a utility, a trade coalition, a standards alliance, and the Efficiency Maine Trust. The RFI (Appendix C) was issued by the Commission in October 2021 with responses received at the end of November 2021. Six responses were submitted by vendors across the U.S. which have provided educational insight to the state of the art in the U.S. regarding Energy Use Information and Management Platforms.

In addition, the Commission was required to seek public comment on the RFI. To accomplish this, the Commission initiated Docket 2021-00378 and has received several comments.

The Resolve set out seven specific queries for which to obtain information from the RFI. The results of which are summarized in Appendix A. Additionally, the Resolve asked the Commission to gather information as to potential costs, complexities, and experiences of other states to assess the feasibility of development and operation of such a Platform for the State of Maine. This assessment is provided in the Executive Summary below.

II.   EXECUTIVE SUMMARY

The Commission makes four major conclusions as a result of our work evaluating the Platform contemplated by the RFI, and the specific responses received.

1. The Platform for electric and gas information described in the RFI has not yet been built by any other state. The state of maturity of existing products will likely evolve over time but no existing solution can provide the functionality described in the RFI, though a few can provide elements of those criteria.

2. The responses to the RFI detail the complexities of this information technology project. None of the Respondents to the RFI have built a system with the required functionality, so their costs are based on their industry experience. The estimated costs to develop such a project could exceed $2,000,000 and cost an additional $350,000 – $1,260,000 annually to

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[1] LD 1666

operate. Cost experiences related by Respondents to the RFI are summarized in Appendix B.

3. The Commission does not have the resources or technical expertise to establish and oversee a statewide data platform as contemplated by the Resolve.

4. The Commission recommends further study before proceeding with this initiative. The New York State Energy Research and Development Authority (NYSERDA) has established an office to develop their IEDR (Integrated Energy Data Resource) platform. After putting a program manager and a data advisor in place, they began their requirements work in the Summer 2021 and plan to issue an RFP for development in the Summer 2022 for Phase 1, with expectation of a fully operational Phase 1 platform by the end of 2023. Phase 2 is expected to be completed in 2026. In New Hampshire a great deal of work has gone into developing a framework and requirements prior to system procurement. Given the potential significant costs involved, the Commission would suggest a similar "phased" approach should the Committee elect to pursue this initiative. This phased approach should be conducted by a third-party with expertise in the energy industry as well as significant expertise in managing the development and integration of a significant technology project.

III.   FINDINGS FROM THE REQUEST FOR INFORMATION (RFI) RESPONSES:

A. Energy Use Data Platforms that have been developed in the U.S. have often been driven by City Ordinances for benchmarking, particularly for commercial entities to benchmark their energy usage. Benchmarking, in this context, is achieved through an EPA offering called Energy Star Portfolio Manager where building owners/managers enter usage data which is compared to similar buildings to give a score. The cities of Portland and South Portland have such ordinances in place.

B. The concept of energy usage by building is key to understanding energy expenditures and benchmarking against similar buildings both of which could lead to opportunities for energy efficiency gains. Utility data systems are generally not building centric, they are meter centric, so determining what meter is in what building can be difficult. Because buildings are central to the Energy Star Portfolio Management process, some work is needed to make full use of the benchmarking process.

C. The larger electric utilities and perhaps the gas utilities are providing energy use data by account through their Web Portals. The envisioned Platform would allow users to view usage for both energy sources and perhaps more in the future, but the percentage of customers who use both electric and gas is currently small.

D. Statewide energy use platforms bringing together usage data from multiple energy sources have been implemented in a few states for government owned buildings but not for privately owned accounts, though there is movement in this direction. New Hampshire has developed a framework to support its community aggregator program. This work would be

helpful to the State of Maine as NH has resolved a number of issues in its documentation, but the system itself has not been built. NYSERDA has secured resources to develop the requirements and use cases for a system and plans to have a Phase 1 system up and running in two years, with Phase 2 completed by 2026.

E. Costs for the development of a Platform were estimated by Respondents and range from $150,000 to $2,000,000 for development of the core system, all very dependent on desired functionality and accessibility of essential data, and $75,000-$125,000 to integrate each utility source. For example, for the six utilities referenced in the RFI, this could cost as much as $750,000. Annual operating costs cited by Respondents ranged from $350,000 to $1,260,000. This does not include the cost to the utilities themselves to build the data export processes, which today would be substantial due to legacy systems and the immaturity of data exchange mechanisms.

IV.   SUMMARY OF PUBLIC COMMENTS

A. Summary of EPA Comments

Comments from the EPA were primarily encouraging Maine to incorporate the concept of a "whole building" into the energy use data model. Their Energy Star Portfolio Manager is based on this "whole building" concept but often utility data is not managed in this way, they are meter-centric or account-centric. Meters may, but may not, have an association to a building in the utility databases. This disconnect reduces the ability for commercial and multi-tenant building managers to easily benchmark their energy use.

Excerpt from comments by the EPA:

"The U.S. EPA's ENERGY STAR Buildings program encourages that Maine's Online Energy Data Platform emphasize the use case to **support building owners and managers in obtaining the whole-building energy consumption data required for building energy benchmarking."**

B. Summary of Comments from Municipalities

Cities who wish to develop benchmarking ordinances to encourage building owners to reduce greenhouse gas emissions say that one impediment is the difficulty owners of tenant occupied buildings have in accessing energy usage in their buildings. They believe that a statewide platform would improve this access. Cities also wish to see aggregated energy use data made available to many users for multiple purposes such as: increasing the ability to see what difference improvements have made and allowing distributed energy providers to see opportunities for provision of services.

Excerpt from joint comments by the Cities of Portland and South Portland:

"Achieving our local, state, and national climate goals depends on wise and efficient use of energy. This, in turn, depends on up to date, accurate, information about energy consumption. Our utilities collect vast quantities of this data through the "smart meters" that were installed at ratepayer expense. Aggregating it for use by individuals, businesses, and governments will support efforts to achieve climate goals and spur innovation in the energy sector."

C. Summary of Utility Comments

Two of Maine's utilities voiced concerns regarding the challenges of providing data in a way that may be required for an energy use data platform, for example whole-building views, and asked that any further efforts be coordinated with them. One of these utilities has worked extensively with New Hampshire in the development of its energy use data framework and suggests we look closely at the direction taken to layer their platform with an API layer for data export/input, and a Hub layer for viewing functionality.

These comments are consistent with RFI Respondents who cautioned that this effort will require significant IT resources in the utilities to be able to export data from their legacy systems in a form that can be incorporated into the Platform on a nightly basis.

V.   RECOMMENDATIONS

While a statewide multi-use energy data platform would be beneficial to the goals of reducing greenhouse gas emissions and fossil fuel usage, given the findings above, the Commission recommends that the State defer this effort until data exchange mechanisms are more mature and therefore less costly. While waiting for some maturity in this space, there are a few preparation steps that could be undertaken which would facilitate Platform development in the future.

These include:

1. Identify and assign an entity in the State of Maine to monitor efforts undertaken over the next year or two to improve energy use data standards and to implement platforms similar to the one envisioned for Maine. As noted above, the Commission should not be the entity to perform this work.

    A better understanding of similar implementations will position Maine to be able to move forward at an advantageous time with deeper knowledge of what the effort will require and with more robust standards to rely upon. Particular attention should be paid to developments in the area of standards for the representation of a building in utility and energy use data.

2. Based on maturity in the areas noted above, encourage enhancements to utility company systems that would incorporate the concept of a building – and to specifically identify meters to the buildings they are metering. This was mentioned by several RFI respondents and the EPA as important for any platform. Ideally this would be based on a standard definition of a building (or other entity) and a standard association of a meter to a building.

3. Develop policies for sharing data to unauthorized users without compromising customer privacy. Each entity that has developed a system for viewing usage data has developed a threshold policy for data sharing to protect individual customers privacy, Maine should do the same.

4. Consider encouragement of policies/ordinances for benchmarking commercial buildings to municipalities across the state to expand the measurement of energy usage as a tool in addressing greenhouse gas emissions. A future Platform could facilitate the benchmarking process.

5. Consider pursuing a system of narrower scope to help manage energy usage for government buildings in Maine. This model is something that has been developed for a number of governmental entities such as Maryland State Government and numerous universities. This could possibly help determine the framework needed for a wider scope multi-user platform in the future.

6. Because few residential customers[2] use both natural gas and electric energy sources, benefits to using the Platform instead of, or in addition to, utility-provided applications may not be obvious. Maine could consider offering incentives to encourage residential customers to use the envisioned Platform. For example, Energy Star offers a service to residential customers that is similar to their Portfolio Manager though less structured. If a statewide platform could export data to this service, perhaps it would offer an incentive for residential customers to use the Platform.

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[2] There are currently about 49,000 total natural gas customers (commercial and residential) in Maine that would all use electricity.

Appendix A

Chapter 63 Resolve Items – Summaries

The RFI must require the Platform to:

1. Consist of a common base of energy data for use in a wide range of applications and business uses.

   The Green Button Alliance data exchange standards appear to be the most widely preferred or adopted standards for sharing energy usage information across systems though they are still relatively new to the industry. Currently, legacy utility systems may not store data in a manner conducive to the GBC standards and therefore may require significant resources from the utility companies to provide data in the standard exchange format for import into an energy use data platform.   Once these data export routines are more established, this should facilitate development of a common base of energy data to be used in various applications.

2. Adhere to specific and well-documented standards for data accuracy, retention, availability, privacy, and security.

   As indicated above, data exchange standards have been developed and are beginning to be adopted across the utility industry. As more use is made of these formats, improvements should also be developed either in the standard formats or in the receiving systems, as appropriate, to handle data accuracy, retention, availability, privacy, and security.

3. Allow for 3rd-party access to customer energy data.

   Respondents indicated this was a common requirement for their systems for which they had developed processes and functionality to allow 3rd-parties to access data in a couple of ways. Specific data may be accessed under terms authorized by the direct customer. Aggregated data may be accessed by 3rd-parties who have not received customer authorization, this data has been scrubbed of personal identifying information according to the terms of the system requirements (e.g. threshold or other means).

4. Allow for the sharing of individual customer energy data and provide an opt-in option for utility customers when sharing data with 3rd-parties.

   Two of the RFI Respondents indicated they offered workflow functionality for authorization and authentication. Customers can use their systems to create accounts, authenticate to the accounts and give authorization to one or more 3rd party for a single use or ongoing access.

5. Protect utility customers from unauthorized disclosure of personally identifiable information and ensure customer privacy rights.

   This has been a common concern in the platforms that have been implemented to date and several methods are employed to address these concerns. One often used solution is to designate a threshold level under which data is not provided. A common threshold is to withhold data where a multi-tenant building has less than 4 units and if 4 or more units, if one unit uses more than 50% of the total energy used by the building unless each tenant has expressly authorized access.

6. Provide for the voluntary participation of consumer-owned transmission and distribution utilities and municipal power districts.

   RFI Respondents indicated that this can be done in their platform offerings. Each set of data from an additional utility would require development work to extract meter and customer data from the utility's systems and massage it into the standard format for import into the platform. Where utilities employ the same software to manage their energy use data, these interfaces could be incrementally more easily developed, though nuances at each utility would require some effort for each addition. <u>Respondents cautioned that IT resources in the utilities are crucial to incorporating their data into the Platform</u>.

7. Meet the requirements for certification from the Green Button Alliance and support the Green Button "Connect My Data" standard and the energy service provider interface of the North American Energy Standards Board.

   After discussions with the Green Button Alliance and several organizations in the country that are working with energy use data, this standard was found to be the common standard and interface employed in the systems that have been implemented.   Certification from Green Button is still a relatively new offering so not all vendors have accomplished this, but the RFI Respondents appear to be moving toward it.   One of the Respondents specializes in this standard and in providing software that facilitates other systems to exchange data using the format. Their software is sometimes used as a component of an energy use data platform.

Appendix B

Cost Summary from RFI Responses

Cost experiences provided in the vendor responses:

Company	Calico Energy	Uplight	UtilityAPI	Accelerated Innovations	EnergyCAP	Tyler Technologies
Start-up Costs	$80-150k software implementation	$500K-$2M (depends on final Implementation scope and timelines)	-	Typically has been in the $75k to $150k range	~$1.25 million - includes interface with 1 utility with ~200k meters	Ex: Total Contract Value: $1.1M for software and services over 4 years. Total Contract Value: $600,000 ARR
Utility Interfaces (per utility)	$75-125k integration implementation (one time)	$800K-$1.5M total (per utility costs depends on multiple factors including customer count, data type/volume, desired channels, etc.)	-	Annual licensing and support costs have been on the order of $80k to $100k per utility	Included in above cost	
Annual Costs	$180-300k software licensing and support $0-40k ongoing integration Support	TBD (annual operating costs will depend on the final Platform solution scope, features, functionality, etc.)	-		~$350k for subscription, based on # of meters	Range of available pricing options to state level usage can start as low as $100,000 annually, while states with unlimited user licenses have contracts in excess of $2.5MM annually.
Note on Response	Has developed platform with multiple utility sources	Used by Utilities to provide account usage access.	GBC format API only, not a platform	Geared to utilities but does have platform features	Geared to building owners, has platform features	Company has not yet developed an energy use platform

Appendix C

Request for Information released in October 2021

Link to RFI document on the State of Maine Request for Information Web Site:

https://www.maine.gov/dafs/bbm/procurementservices/sites/maine.gov.dafs.bbm.procurements ervices/files/inline-files/RFI%20202110158%20- %20Energy%20Data%20Platform%20FINAL.docx