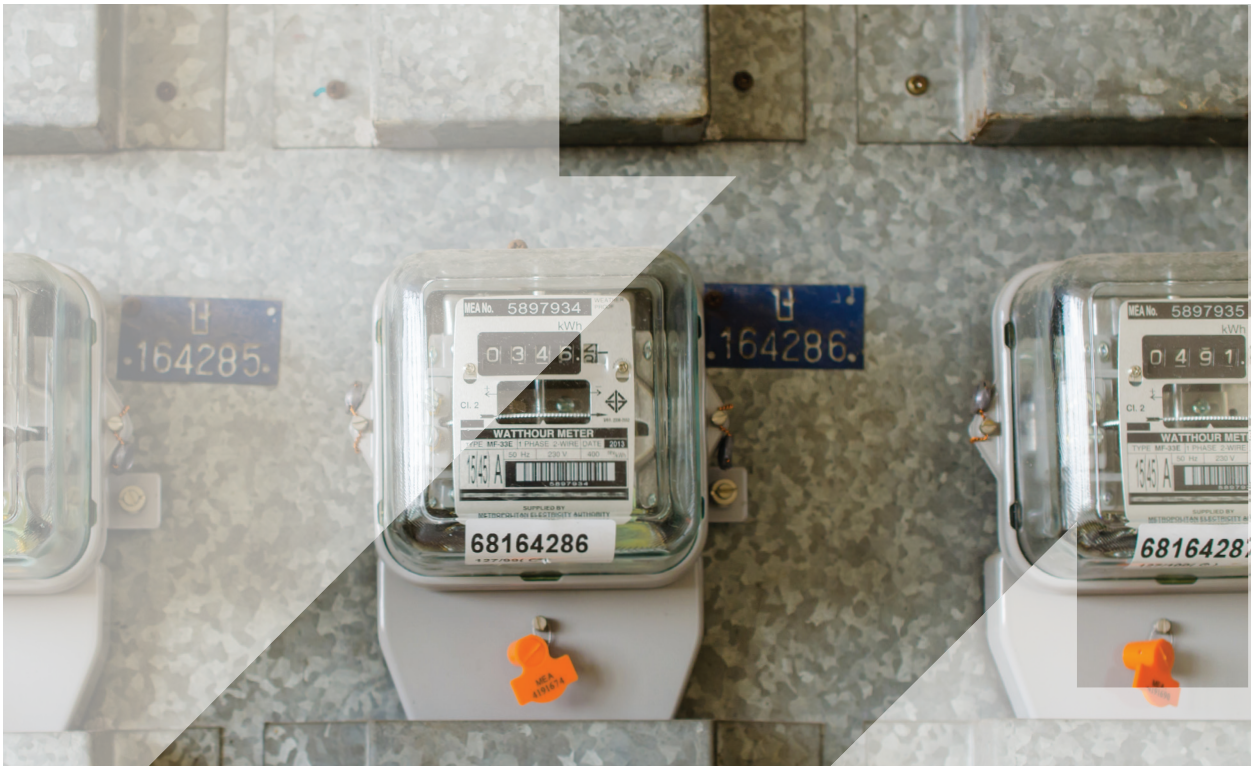
Better Buildings®
U.S. DEPARTMENT OF ENERGY

Energy Data Accelerator

Best Practices for Providing Whole-Building Energy Data: A Guide for Utilities

JANUARY 2016



U.S. DEPARTMENT OF ENERGY

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About the Energy Data Accelerator

The U.S. Department of Energy's Better Building Energy Data Accelerator (BBEDA) was a two-year partnership with cities and utilities to improve energy efficiency by making energy data more accessible to building owners. As a result of best practices developed by partners in this Accelerator, 18 utilities serving more than 2.6 million commercial customers nationwide will provide whole-building energy data access to building owners by 2017. This historic expansion of data accessibility will increase building energy benchmarking, the first step many building owners take to improve the energy efficiency of their buildings.

The *Best Practices for Providing Whole-Building Energy Data: A Guide for Utilities* is part of the Energy Data Accelerator Toolkit, a collection of resources drawn from partners. By sharing how these partners overcame technical and policy barriers to whole-building energy data access, the Toolkit enables other communities to benefit from the work that has been done and foster the replication of these best practices throughout the country.

Introduction

This guide provides best practices for utilities to provide building owners with access to whole-building energy data to enable energy benchmarking. These best practices are drawn from the experiences of multiple BBEDA utility partners that have successfully developed whole-building energy data access capabilities. The guide summarizes the key components of developing a whole-building data access solution and provides recommendations to identify and overcome process-oriented barriers. It also provides case studies and model documents to support utilities in providing whole-building data access.

Across the nation, building owners and operators are measuring and tracking the energy performance of their buildings more than ever before. Known as energy benchmarking, this process helps building owners manage energy consumption, identify opportunities to improve energy efficiency, and quantify financial outcomes. Benchmarking has also been shown to increase customer participation in utility energy efficiency programs. To conduct benchmarking in such tools as U.S. Environmental Protection Agency's (EPA's) ENERGY STAR® Portfolio Manager® (ESPM or "Portfolio Manager"), building owners need to know how much energy is used in the entire building. Yet, they are often prevented from accessing energy information for tenant-occupied spaces, where the tenant is the utility customer of record. Specifically, building owners must request the energy consumption data from each tenant, aggregate the data for the whole building (unless the building is master-metered), and then upload the information into a benchmarking tool. Building owners frequently cite the inability to gather this data in a simple manner as a primary obstacle to benchmarking and improving the energy efficiency of their buildings.[1]

[1] See pp. 2–3 of the Transmittal Letter from NMR Group, Inc. and Optimal Energy Inc. (2012). *Statewide Benchmarking Process Evaluation: Volume 1: Report.* Accessed February 2015: *http://www.energydataweb.com/cpucFiles/pdaDocs/837/Benchmarking%20Report%20(Volume%201)%20w%20CPUC%20Letter%204-11-12.pdf.*

Best Practices for Offering Whole-Building Data Access

Accelerator partners identified three primary best practices for utilities seeking to develop a whole-building data access solution. Utility systems which incorporate these best practices will enable building owners to easily access information for benchmarking, protect the confidentiality of tenants within those buildings, and reduce administrative costs to the utility.

- **Map Energy Meters to Buildings:** The utility develops an internal process to map individual energy meters or customer accounts to physical buildings. Building owners or customers will need to provide information to initiate the mapping, and then ultimately validate the results.
- **Simplify the Tenant Authorization Process:** The utility provides building owners with aggregated energy usage information without the need for individual tenant authorization by setting an aggregation threshold. Standard electronic forms can be used when specific tenant authorization is still needed.
- **Streamline Data Transfer:** The utility automates the transfer of whole-building data directly into benchmarking tools, such as Portfolio Manager, via web services, significantly reducing administrative burdens for both utilities and building owners.

Supported by the work of the BBEDA, many utilities are now offering, or are in the process of offering, solutions that provide building owners with the information they need to benchmark their buildings. These solutions commonly involve aggregating energy consumption information for all the meters within a building and providing the building owner with a single, "whole-building" energy consumption figure that protects the confidentiality of the building's tenants. This approach is being used by more than 16 utilities across the country to provide building owners with whole-building energy data, and is being considered by several other utilities.

Key Components of a Utility Solution

Many utilities have developed internal approaches and systems to provide whole-building energy data to building owners. There are three best practices that utilities are using to develop their capability to provide whole-building data access:

- Mapping energy meters to buildings
- Simplifying the tenant authorization process
- Streamlining the transfer of data into benchmarking tools.

This section describes each of these best practices and provides background on the current state-of-practice and information about how the best practice helps overcome specific barriers.

Mapping Energy Meters to Buildings

Many commercial and multifamily buildings have numerous energy meters serving different areas of the building, including tenant spaces. Utilities that provide whole-building energy consumption data to building owners must first be able to link those meters (or in some cases, the customer accounts) to each building. Although this may seem straightforward, in reality it is a challenge. Many utility customer information systems—the systems utilities use to bill customers—are not designed to track energy consumption at the building level, and may not be able to "map" individual meters to specific structures. Additionally, the addresses used by utilities to associate meters with buildings (known as service addresses) often differ from the physical street address for a building.

This issue has presented a significant barrier for many utilities considering whole-building data access. Figure 1 shows the difference between traditional billing practices and the new demands being placed on utility data systems to aggregate meters at the building level.

PARTNER SPOTLIGHT

Puget Sound Energy

Puget Sound Energy (PSE), an Accelerator partner with the City of Seattle, Washington, provides whole-building data access to customers in the Puget Sound region of Western Washington. Using information generated from its customer information system and from Seattle's benchmarking ordinance, PSE matched meters to physical buildings to make it easier for its customers to conduct benchmarking and comply with the ordinance. PSE's meter-mapping process was a combination of automated system queries based on service addresses, and manual follow up when additional confirmation was needed.

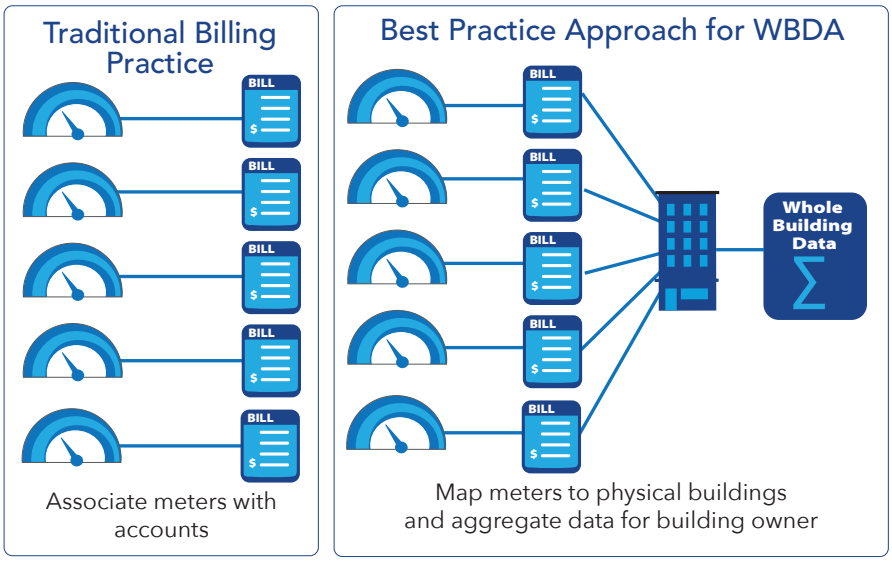


Figure 1. Meter Mapping

Current State-of-Practice

Utilities that have mapped meters to buildings used several different methods:

- Run queries in their customer systems to identify all service points, accounts, or meters associated with the addresses of individual buildings. Building owners helped utilities identify cases where a building had multiple street addresses, an issue that occurs frequently in some jurisdictions.
- Match customer account information with external data sets, such as tax assessment information, to link accounts to physical addresses.
- Use geographic information system data to match meters to a specific geographic location (typically, only newer meters will have this capability).
- Send requests to building owners to provide them with the meter numbers for all meters that supply energy to a particular building.

Best Practice

Utilities should develop an internal process to map meters to buildings, leveraging building owners or customers to validate results or to provide specific information that only they can provide. The exact process used by a utility will depend on the capabilities of their existing customer information and metering systems, but might include one of the first three methods listed above. Building owners or customers will need to provide information to initiate the mapping, and then ultimately validate the results. When implementing new customer information systems, utilities should ensure meter mapping is addressed early in system design.

Partner Adoption

At the beginning of 2016, six BBEDA partners had adopted this best practice, and six more will incorporate this practice into their WBDA systems by the beginning of 2017. Two additional BBEDA partners are either piloting or considering this practice.

PARTNER SPOTLIGHT

Eversource

Eversource partnered with both the City of Boston, Massachusetts, and the City of Cambridge, Massachusetts, to participate in the Accelerator. The utility provides aggregated, whole-building energy data to building owners as long as a threshold is met—there are at least four separate tenants at the property, and the energy usage of any single tenant does not exceed 50% of the total aggregated energy usage. This threshold not only helps to protect customer data privacy, but it also enables Eversource to simplify and streamline tenant authorizations, reducing paperwork and staff time. To date, Eversource's data access solution and threshold has not resulted in any privacy issues or complaints from building owners or tenants.

Simplifying the Tenant Authorization Process

For buildings that have separately metered tenants, utilities must decide whether authorization is needed from each tenant—the utility customers of record for those meters—before providing the building owner with whole-building energy usage data. Some large buildings may have 50 or more separately metered tenants within the structure, and requiring authorization from each tenant can create significant administrative, time, and cost barriers for both utilities and building owners. However utilities decide to handle tenant authorization, the solution should balance the need to streamline data access with the need to protect customer data privacy.

Current State-of-Practice

The current state-of-practice varies significantly. Many utilities require tenant authorization for all data requests involving a tenant's energy usage, while others are adopting practices that other utilities have used to reduce authorizations while maintaining customer data privacy. The range of practices include:

- **Signed authorizations without exception:** Utilities require a signed authorization form (paper or electronic) from every tenant within a building before providing aggregated, whole-building energy data to building owners. This practice creates the most burden on building owners and utilities to facilitate data access, requiring authorization forms to be distributed, collected, and processed for each tenant.
- **Approved authorizations in other forms:** If tenants have already agreed to share energy usage with building owners per the terms of their lease contract, the utility recognizes these lease agreements and does not require further authorization. This practice simplifies the authorization process for building owners, tenants, and utilities. This practice is growing within the real estate industry. More information is available at www.greenleaselibrary.com.
- **Aggregation thresholds:** Utilities do not require individual tenant authorizations for aggregated energy usage data, except where aggregation may not sufficiently mask individual tenant energy usage. Utilities are developing thresholds based on the number of tenants within a building and the total energy usage of individual tenants to ensure aggregation protects customer privacy. This practice simplifies the tenant authorization process for all parties, while including protections to maintain the privacy of individual customers.

Best Practice

Most BBEDA utility partners are using, or are considering using, aggregation thresholds that only require tenant authorization if aggregation may not sufficiently mask the energy usage of individual tenants. Most BBEDA partners have set aggregation thresholds between two and five tenants—meaning that individual tenant authorization is necessary in cases where the number of tenants in a building falls below the threshold. Additionally, some utilities are using a second threshold to ensure that the energy usage of any individual tenant does not account for most of the aggregated energy usage total. These thresholds are often set between 50% and 80% of the total. Figure 2 illustrates approaches to aggregation thresholds. For a list of BBEDA partners using the aggregation thresholds, refer to the Summary of Energy Data Accelerator Systems section of this document. For sample utility language for tenant authorization, refer to Appendix A.

PARTNER SPOTLIGHT

Pepco

Pepco Holdings (Pepco) partnered with Washington, D.C., to participate in the Accelerator. Pepco understood the value of automating its whole-building data transfer to building owners, but took a phased approach to implement a solution. In the first phase, Pepco provided building owners with a spreadsheet containing their aggregated energy data that could be uploaded to Portfolio Manager. In the second phase, Pepco automated the flow of information directly from its system, Resource Advisor, into Portfolio Manager using web services.

Partner Adoption

At the beginning of 2016, eight BBEDA partners were using aggregation thresholds and seven more partners will be using an aggregation threshold by early 2017. Two additional BBEDA partners are either piloting or considering this practice.

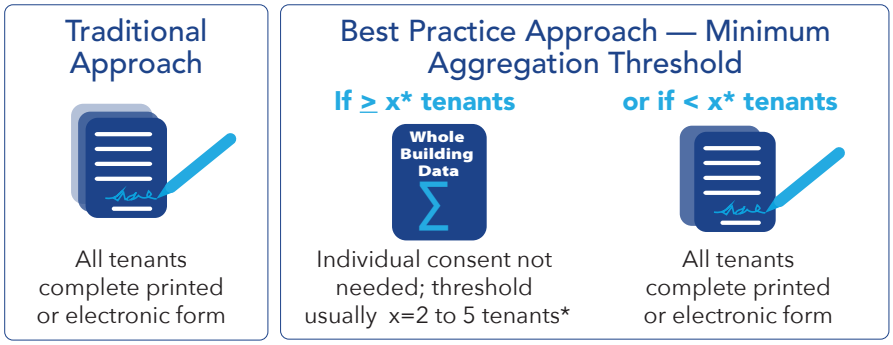


Figure 2. Traditional and Best Practice Approaches to Tenant Consent.

* Five is a common cutoff, but some use a different number. Some utilities also specify a threshold for the maximum percentage of total load attributable to any one tenant (typically > 50%).

Streamlining the Transfer of Data into Benchmarking Tools

Increasingly, building owners are seeking more efficient ways to input energy data into their benchmarking tools. Manually collecting, organizing, and uploading these data is a barrier to benchmarking for many building owners, and is also known to cause errors in data entry that affect benchmarking results.

Current State-of-Practice

Customers receive energy usage data from their utilities in a range of methods and formats, including paper utility bills by mail, downloadable PDFs or other electronic files, the Green Button XML format, online Web portals, and email. This variety is reflected in how building owners collect and input energy information into benchmarking tools, including the EPA's ENERGY STAR® Portfolio Manager®. Typically, energy information can be entered into Portfolio Manager in three ways:

- **Manual entry:** Energy information from paper or electronic utility bills is manually input into Portfolio Manager by building owners.
- **Spreadsheet upload:** Energy information is formatted into a spreadsheet file and uploaded into Portfolio Manager by building owners.
- **Fully automated:** Energy information is delivered securely from a third-party system directly into Portfolio Manager using an application program interface (API), replacing manual input by building owners (see Figure 3).

When manually entering data or using spreadsheets to upload data, energy consumption values must be extracted from utility bills. Fully automating the process offers a more elegant approach. Portfolio Manager web services enables utilities to transfer energy data directly from their systems into Portfolio Manager on an ongoing basis, eliminating the need for manual input by customers. EPA provides technical support to utilities who want use web services as part of their data access solution. For more details on EPA's Portfolio Manager web services, see *http://portfoliomanager.energystar.gov/webservices/home*.

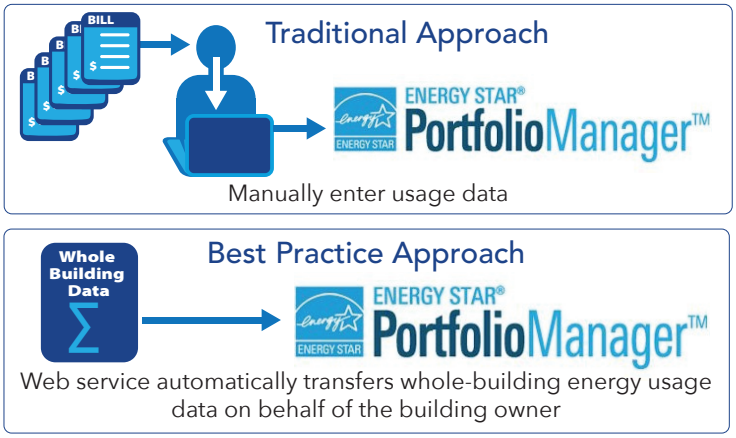


Figure 3. Utility Data Entry into Benchmarking Tool

Best Practice

Automating the transfer of whole-building energy consumption data to benchmarking tools, including EPA's Portfolio Manager via web services, is a best practice among BBEDA partner utilities. It provides significant value to building owners and can help utilities reduce their workload gathering and sending data to building owners by automating the process.

Partner Adoption

At the beginning of 2016, ten BBEDA partners were automating the transfer of data via Portfolio Manager web services, and three more partners will have this functionality in place by early 2017. Two additional BBEDA partners are either piloting or considering this practice.

Identify key internal stakeholders and work with them to gain support for your data access solution.

Overcoming Process Barriers

Utility partners identified many common challenges to designing and implementing a whole-building data access solution, including:

- Internal collaboration
- External collaboration
- System development
- Financial expense
- System design and information technology (IT) resources

Internal Collaboration

Utility partners found it was necessary to involve many different people within their companies to gain support for investing in a whole-building data access solution. Those people included energy efficiency program managers, legal and regulatory experts, customer solutions leaders, IT personnel, and executive officials.

The utility partners that successfully advanced whole-building data access identified these groups of people early on and clearly communicated the value proposition. For example, energy efficiency program managers may be interested in mapping meters to buildings and providing data access solutions because it creates greater visibility into the energy efficiency of

an entire structure, enabling energy efficiency marketing efforts to become more targeted and cost-effective. Legal and regulatory personnel may want to facilitate data access solutions as a strategy to achieve regulatory energy efficiency targets at the state level. And customer solutions leaders may be interested to the extent that data access is something their customers are requesting. Understanding how processes and outcomes related to offering whole-building data access affect and benefit different groups within a utility is an important first step toward implementing a solution.

External Collaboration

Utility partners found that contacting their utility peers for advice on whole-building data access was helpful. Utilities often reach out to one another for insights related to developing systems for whole-building data access, anticipating costs, setting aggregation thresholds, and advancing the issue with internal leaders.

In many cases, utilities also collaborated with building owners—the end users of whole-building data access—to make sure that systems were designed to meet their needs. Some utilities piloted data access solutions with key customers before releasing a full solution. For further discussion on engaging key stakeholders, see the *Energy Data Accelerator Toolkit: Stakeholder Engagement Strategy Guide*.

System Development

Utility partners have developed whole-building data access systems three different ways:

- Using in-house resources to build a custom system (usually within the IT department)
- Contracting a third-party vendor to develop a custom system
- Contracting a third-party vendor to install a plug-and-play system.

The right choice depends on many factors. Some utilities prefer to use their IT departments to retain control over schedule, cost, and design. Other utilities may prefer to contract with a vendor because they lack internal expertise, they are not willing to expend internal resources on development, or they feel comfortable with a system built by the vendor for another utility. For utilities considering a vendor for system development, a list of Sample Questions in Appendix B.

PARTNER SPOTLIGHT

Xcel Energy

Xcel Energy designed its whole-building data access system to enable those data to cross-pollinate with other utility operations, such as by helping calibrate energy models and tracking the energy performance of buildings over time. These corollary benefits helped Xcel gain support for a whole-building data access solution internally as well as demonstrate the broader impact within utilities that data access solutions can have.

Financial Expense

Utility partners must consider how to cover the cost of developing and implementing a whole-building data access system. Most utilities will be required to determine costs, and how those costs are recovered, during the system design process, often in the beginning as part of a go/no-go decision point. Initial and ongoing costs can be covered in the following ways:

- By using discretionary funds in the standard operating budget
- By using the IT project budget
- By using the marketing or customer service budget
- As approved energy efficiency program expenditures that are recoverable
- As system development costs included in the rate case and recovered via the base rate

The right choice again depends upon many factors that will be different among utilities, including the ability of different budgets to absorb costs, the willingness of regulators to expand energy efficiency program expenditures, and the part of the utility that will benefit most from such a system. Utilities typically do not charge a fee for this service.

System Design and Information Technology Resources

Utility partners found that, even when a utility uses a vendor to develop a system, substantial collaboration with its IT department is still necessary. That collaboration will typically include:

- Designing a system interface that provides a good customer experience
- Including quality assurance measures
- Including a verification component to ensure only authorized users can access the system
- Considering where data are stored, which may include a utility's customer information system, an external data warehouse, or a meter data management system
- Designing for interoperability and extensibility

Summary of Energy Data Accelerator Utility Partner Systems

The best practices discussed in this document are achievable and being used by many utilities across the country today. Figure 5 shows a list of city-utility pairs that participated in the Accelerator and had either completed a whole-building data access system, or are in the process of designing and implementing a system, by the early 2017. Figure 4 also includes other utilities that have whole-building data access systems, but did not participate in the Accelerator.

Utility No.	Utility	City(ies)/District	Utility-Led Mapping Meters[1]	Streamlining Tenant Consent[2]	Automating Data Transfer[3]	Implementation Timeframe
1	Austin Energy	Austin	●	●	●	Implemented
2	Eversource	Boston, Cambridge	●	●	●	Implemented
3	ComEd	Chicago	●	●	●	Implemented
4	SDG&E	Chula Vista, San Diego	◒	◒	●	2017
5	AEP Ohio	Columbus	◉	◉	◉	Pilot in 2016
6	KCP&L	Kansas City	◆	◆	◆	2017
7	LADWP	Los Angeles	◒	◒	◒	2017
8	So. Cal. Gas	Los Angeles	◒	◒	●	2017
9	Xcel Energy	Minneapolis	●	●	●	Implemented
10	National Grid	New York City	●	●	●	Implemented
11	Orlando Util. Com.	Orlando	◒	◒	◒	2017
12	PECO	Philadelphia	●	N/A[4]	●	Implemented
13	Rocky Mtn. Power	Salt Lake City	●	●	●	Implemented
14	Questar Gas	Salt Lake City	●	◒	◒	2016
15	PG&E	San Francisco	◒	◒	●	2017
16	So. Cal. Edison	Santa Monica	◒	◒	●	2017
17	Puget Sound Energy	Seattle	●	●	●	Implemented
18	Pepco Holdings	Washington, DC	●	●	●	Implemented

Figure 4. Summary of Energy Data Accelerator Utility Partner Systems

KEY: ● Yes ◒ In Progress ◉ Pilot ◆ Waiting for approval from MO PSC ● No

[1] The utility assists (utility-led) with mapping meters or accounts to physical buildings based on information provided by the building owner. Building owners or customers will need to ultimately validate the results. Utilities that don't do utility-led mapping, ask the customer to collect all of the meter or account numbers for their building and provide this to the utility.

[2] Utilities simplify the tenant authorization process by implementing an aggregation threshold above which individual consent is not required. Below the threshold level, usually between 2-5 tenants, the building owner is required to collect individual tenant authorization.

[3] Utilities automate the transfer of aggregated energy consumption data to benchmarking tools, such as EPA's ENERGY STAR® Portfolio Manager®, via web services.

[4] The prevalence of master meters in PECO's service territory greatly diminishes the need for an aggregation threshold and the issue of tenant consent.

APPENDICES

Appendix A

Example Tenant Authorization Language

Example #1 (from National Grid):

I,_____, the owner of_____, hereby authorize the release of the historical gas consumption usage and billing information for the period of January 1, 2011 to December 31, 2011. This authorization is to be used for the sole purpose of satisfying the requirements of NYC's Local Law 84 Benchmarking program.

Example #2 (from Puget Sound Energy):

Upon request of the owner, operator, or agent of the building that Customer occupies at the Address, PSE is required to disclose such energy consumption data to the United States EPA ENERGY STAR® Portfolio Manager®. Additionally, upon request from others, PSE will disclose a building's energy consumption data so long as 1) such data is aggregated so as not to disclose customer-specific information, or 2) the Customer provides consent. The following disclosure authorizes PSE to provide whole-building energy consumption data to the EPA or others requesting such information.

Example #3 (from National Grid and Eversource (formerly NSTAR):

See following pages.

Eversource Energy[1] and National Grid[2]
Tenant Authorization to Release Energy Information
Boston and Cambridge Building Energy Disclosure Ordinances

To promote energy efficiency in Boston, the Boston Building Energy Reporting Disclosure Ordinance *(City of Boston Code, Ordinances, Chapter VII, Section 7-2.2)* ("Boston Ordinance") requires that commercial and residential building owners disclose the annual energy usage of their buildings to the Air Pollution Control Commission ("Commission") for the previous calendar year. Under the Ordinance, building owners may request tenants of their buildings with separate utility meters to provide energy usage information or to authorize the tenant's utility to release this information to the building owner. The Ordinance requires the building owner to aggregate and report the building data and not disclose individual energy use data. The Ordinance requires the Commission to annually post energy use information for buildings (not individual tenants) on the City of Boston website by each May 15, beginning 2014.

To promote energy efficiency in Cambridge, the Cambridge Building Energy Usage Disclosure Ordinance (Ordinance Number 1360) ("Cambridge Ordinance") requires that certain commercial and residential building owners disclose the annual energy usage (electricity and gas) of the covered properties to the City of Cambridge Community Development Department ("Department") for the previous calendar year and to input energy usage and other information on the Energy Star Portfolio Manager tool maintained by the U.S. Environmental Protection Agency by each May 1, beginning 2015. Certain building tenants are required to disclose their energy usage to property owners upon request.

Utility and Energy Supplier Information (check monthly utility bill for required information)
Please fill out as applicable

Eversource Energy - Electric	**Eversource Energy - Gas**	**National Grid –**
Utility Account#: _____	Utility Account #: _____	Utility Account #:_____
Utility Meter #: _____	Utility Meter #: _____	Utility Meter #: _____

Utility Energy Information Release

ENERGY USAGE INFORMATION RELEASE – As the account holder or duly authorized agent of the account holder, I hereby authorize and give permission to the utilities named above to release account and energy usage information specific to the accounts listed above to the building owner or its representative or designee for the limited purpose of complying with the requirements of the Boston Ordinance and/or the Cambridge Ordinance, as defined above.

RELEASE PERIOD – This authorization covers the period starting a full calendar year before the date below through December 31 of the calendar year following the year I vacate the Utility Service Address below. I may revoke this authorization by written notice to the building owner and Customer Service department of the utilities named above.

As the account holder or duly authorized agent of the account holder, I hereby agree to release, indemnify and hold harmless the above-named utilities of which I am a customer, and their affiliates, employees, officers and agents from any and all liability, claims, demands, damages or expenses associated with the dissemination and use of such account and energy usage information and this authorization. An electronic copy of this authorization or electronic signature may be accepted with the same authority as the original.
I have read the foregoing complete authorization form and fully understand the contents hereof. I represent that I am of legal age and have the right to contract in my own name. I hereby consent to the foregoing.

Utility Account Holder:_____ **(As it appears on your bill)**

Signature: _____ **Date:** _____

Printed Name: _____

Email Address:_____

Phone Number:_____

Mailing Address: _____

Utility Service Address(if different): _____

Building Owner or Property Manager (if known): _____

Please return the completed form with the subject line "__Tenant Authorization__**"** to:
EnergyDisclosure@eversource.com and**/or** BERDOSupport@nationalgrid.com

Thank You

Form (Use for less than 4 tenants per Property or single tenant usage exceeds 50% of Property annual energy usage)
V3 11.4.15

[1] NSTAR Electric Company and NSTAR Gas Company, each d/b/a Eversource Energy
[2] Boston Gas Company d/b/a National Grid

Eversource Energy[1] and National Grid[2]

Property Owner Verification and Authorization Form

Boston and Cambridge Building Energy Disclosure Ordinances

Dear Sir / Madam:

I represent and warrant that:

I am the owner or the duly authorized representative of the owner of the property located at the Property Street Address set forth below ("Property");

I agree to access the Eversource Property Owner Energy Usage Database or National Grid Property Owner Energy Usage Database (as applicable) to obtain the historical energy usage of the Property for the sole purpose of satisfying the requirements of Boston's Building Energy Reporting and Disclosure Ordinance program as set forth in City of Boston Code, Ordinances, Chapter VII, Section 7-2.2 mandating disclosure of energy usage and/or Cambridge's Building Energy Usage Disclosure Ordinance Number 1360 mandating disclosure of energy usage (collectively "Ordinances").

I agree to maintain the confidentiality of any tenant information including, without limitation, tenant utility account and energy or gas usage information ("Tenant Information") accessed through the above mentioned databases and will not disclose such information to a third party except to the extent strictly required to comply with the Ordinances.

As the owner or the duly authorized representative of the owner of the Property, I hereby agree to release, indemnify and hold harmless the above-named utilities which provide utility services to the Property, and their affiliates, employees, officers and agents from any and all liability, claims, demands, damages or expenses arising from or associated with the dissemination and/or use of the Tenant Information and/or this authorization form. An electronic copy of this completed authorization form or electronic signature may be accepted with the same authority as the original.

I have read the foregoing complete authorization form and fully understand the contents hereof. I represent that I am of legal age and have the right to contract in my own name. I hereby consent to the foregoing.

Building Owner Information

Building Owner: _____

Authorized Representative (if applicable)**:** _____

Signature: _____ **Date:** _____

Printed Name and Title: _____

Signatory's email address: _____

Telephone number: _____

Property Street Address: _____

Please return the completed form with the subject line "**Owner Verification"** to your utility:

EnergyDisclosure@eversource.com; and/or

BERDOSupport@nationalgrid.com

Thank You

[1] NSTAR Electric Company and NSTAR Gas Company, each d/b/a Eversource Energy

[2] Boston Gas Company d/b/a National Grid

Appendix B

Sample Vendor Questions

Utilities seeking to work with a vendor in order to implement a whole-building data access solution are encouraged to consider the following list of questions when making their selection. These questions do not represent a prescriptive or comprehensive list of what should be included in an RFP/RFQ for data access implementation, but do offer some suggested lines of inquiry in order to ensure that the vendor is able to work with the utility to develop a solution that aligns with the technical best practices identified by the Better Buildings Energy Data Accelerator.

- Discuss your prior experience with this scope of work, including any functionality currently available. Provide screen captures and/or links to an existing website you have built for benchmarking data management.
- Discuss your experience creating and managing web services accounts and connection or sharing requests via EPA's ENERGY STAR® Portfolio Manager®.
- Discuss how you propose to process the information from requests received through your website and from requests received through ENERGY STAR® Portfolio Manager®, in order to provide consumption use for the requested building(s).
    - Provide detailed flowcharts, including timeframe, to demonstrate the process from customer request via all methods through data upload completion.
    - Discuss your process and proposed frequency to upload usage data to EPA website.
- Discuss how you will gather information from the customer necessary to validate the request including management of customer release authorization forms.
- Discuss how you will work with customers to establish the necessary sharing request to upload data, validate data upload, and troubleshoot.
- Discuss your planned approach for working with the utility to identify individual meters at a specific location (e.g., a building address), and use this information to "map" meters to buildings for the purpose of whole-building data aggregation. Describe what information the utility would need to make available in order to perform this function and validate the mapping with utility customers.
- Discuss the process by which you will aggregate individual meter consumption for a building. Include a description of how you will calendarize aggregated building consumption, in cases where individual meters at a building have different read periods.
- Discuss how you will ensure and validate accuracy of the data uploaded to ENERGY STAR® Portfolio Manager®. How will the accuracy of data be reviewed and maintained over time (for instance, in cases of re-bills, or the addition of new tenants at a property)?
- Provide an overview of the proposed project implementation including steps in the process, timeframe for the project, supplier resources, and anticipated utility resources to support the implementation.
- Do you have experience promoting electrical energy efficiency programs/measures with consumers? If so, please provide a summary of your work and how benchmarking data was used or could have been used in the consumer's adoption of the energy efficiency programs/measures.

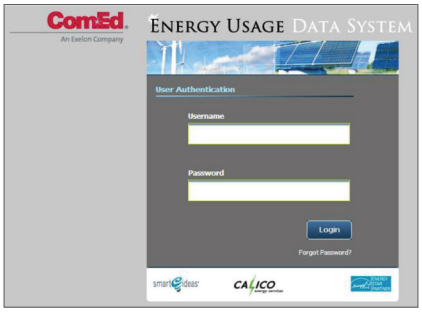
Appendix C

Utility Data Access System Fact Sheet: Commonwealth Edison (ComEd) Chicago

Commonwealth Edison (ComEd) partnered with the City of Chicago, Illinois, to participate in the Better Buildings Energy Data Accelerator (EDA).

Implementation Highlights

- ComEd was the first utility in the country to provide aggregate whole-building data to commercial building customers for the express purpose of enabling energy performance benchmarking.
- The 2008 release of ComEd's Energy Usage Data System (EUDS) as a data access solution was a direct response to the needs of the local real estate community. Prior to EUDS, many property owners sought to benchmark, but could not because of the difficulty in obtaining whole-building consumption data for multi-tenant properties.
- The EUDS tool provided an early example of best practices for data access systems, including:
  - Meter-to-building mapping based on building address; an aggregation threshold to allow the utility to release whole-building data to owners without the need for tenant consent.
  - Portfolio Manager web services to send energy consumption data directly into EPA's benchmarking tool (web services were not a part of the initial EUDS implementation, but were included in 2009 to increase the functionality of the tool).
- ComEd chose to engage with a vendor partner Calico Energy to build and maintain EUDS.
- The development of EUDS pre-dated Chicago's commercial building benchmarking ordinance. As such, the existence of a robust data access solution was critical in driving compliance with the ordinance once it was enacted in 2013.



LOCAL COMMUNITY	
EDA Local Government Partner	Chicago, Illinois
Local Benchmarking Programs	City of Chicago ordinance (however, EUDS pre-dates ordinance)
UTILITY DATA ACCESS PROGRAM	
Name of Utility Benchmarking/Data Access Program	Energy Usage Data System (EUDS)
Web Address for Accessing Benchmarking Data	*www.comed.com/business-savings/energy-tools/pages/energy-usage-data.aspx*
Types of Utility Customers Receiving Benchmarking Data	Commercial and Multifamily Building Owners
ADDRESSING CUSTOMER PRIVACY	
Method of Balancing Customer Privacy with Data Access	★ Aggregation threshold: if 4 or more tenants in building, utility can provide aggregate whole-building data to building owner without explicit tenant authorization. If fewer than 4 tenants, utility must have written authorization from each tenant before providing aggregate whole-building data.
AGGREGATING AND TRANSFERRING WHOLE-BUILDING DATA	
Method for Transferring Utility Benchmarking Data to the Building Owner	★ Whole-building data delivered directly into Portfolio Manager via web services. Owner can also access whole-building data through online interface and/or spreadsheet output.
Method of Mapping Meters/Accounts to Physical Buildings	★ Owner enters service address(es); utility identifies associated meters/accounts; owner confirms or edits.
TYPE OF DATA	
Format of the Data	Portfolio Manager Web Services
Temporal and Spatial Granularity of the Data	Monthly, whole-building

Key: ★ Best Practice

Appendix D

Utility Data Access System Fact Sheet: Eversource

Eversource partnered with the City of Boston, Massachusetts, and the City of Cambridge, Massachusetts, in the Better Buildings Energy Data Accelerator (EDA).

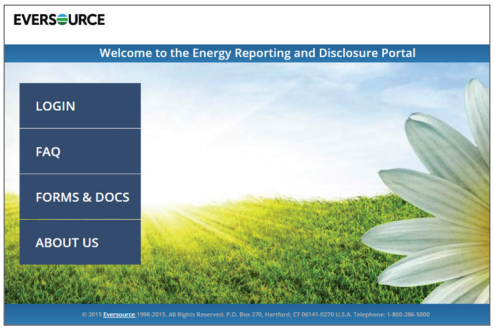
Implementation Highlights

- The City of Boston and Eversource worked collaboratively to develop a data access solution. Starting with a Memorandum of Understanding to clearly define the goal of providing whole-building data access to commercial building owners, Eversource also provided a dedicated staff member to interface with the city, and to ensure that the data access solution supported compliance with the city's benchmarking ordinance.

- Based on the initial experience of working with the City of Boston, Eversource was readily able to expand its data access system to support building owners in the neighboring City of Cambridge, in order to support the Cambridge benchmarking ordinance.

- Eversource's solution featured a standalone data access portal, through which commercial customers in Boston and Cambridge could submit requests for aggregate whole-building data.

  - In the current version of the tool, the building owner uses the portal to identify their building and to initiate the meter-to-building mapping process. The owner then receives the aggregate data output in spreadsheet format, which must be manually uploaded into EPA's Portfolio Manager® to complete the benchmarking process.
  - In the future, Eversource seeks to incorporate Portfolio Manager web services, in order to send whole-building aggregate data directly into EPA's benchmarking tool.



LOCAL COMMUNITY	
EDA Local Government Partner	Boston, Massachusetts, and Cambridge, Massachusetts
Local Benchmarking Programs	City of Boston and City of Cambridge ordinances
UTILITY DATA ACCESS PROGRAM	
Name of Utility Benchmarking/Data Access Program	Energy Disclosure and Reporting Portal
Web Address for Accessing Benchmarking Data	*www.eversource.com/ccberdoapps/energydisclosurereporting/energydisclosurelogin.aspx*
Types of Utility Customers Receiving Benchmarking Data	Commercial and Multifamily Building Owners
ADDRESSING CUSTOMER PRIVACY	
Method of Balancing Customer Privacy with Data Access	★ Aggregation threshold: if 4 or more tenants in building (and no single tenant consumes more than 50% of total building energy), utility can provide aggregate whole-building data to building owner without explicit tenant authorization. If fewer than 4 tenants (or a single tenant consumes more than 50% of total building energy), utility must have written authorization from each tenant before providing aggregate whole-building data.
AGGREGATING AND TRANSFERRING WHOLE-BUILDING DATA	
Method for Transferring Utility Benchmarking Data to the Building Owner	Owner receives a spreadsheet file from Eversource containing whole-building aggregate data; owner must manually input this information into Portfolio Manager to complete the benchmarking process.
Method of Mapping Meters/Accounts to Physical Buildings	Owner enters service address(es) and at least one account/meter number for the property; utility identifies associated meters/accounts.
TYPE OF DATA	
Format of the Data	Spreadsheet, formatted to facilitate easy upload into Portfolio Manager
Temporal and Spatial Granularity of the Data	Monthly, whole-building

Key: ★ Best Practice

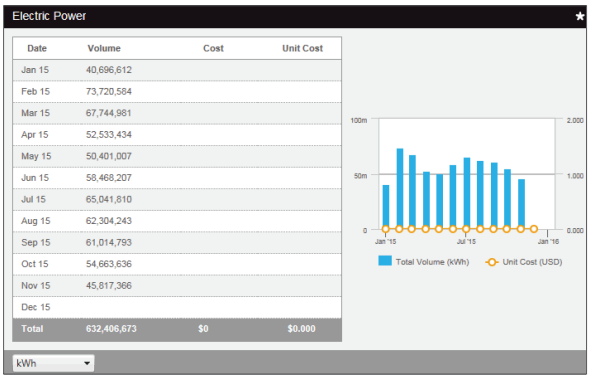
Appendix E

Utility Data Access System Fact Sheet: Pepco Holdings, Inc.

Pepco Holdings, Inc. (Pepco) partnered with the District of Columbia (DC) in the Better Buildings Energy Data Accelerator (EDA).

Implementation Highlights

- Pepco took a phased approach to the development of its data access solution, focusing first on providing the data necessary to comply with Washington, DC's benchmarking ordinance. Once this immediate need was met, Pepco introduced further functionality to enhance usability.
- As part of the first phase, Pepco's system helped commercial and multifamily building owners to obtain spreadsheets containing aggregate whole-building data. Customers would then manually upload data into Portfolio Manager® to complete the benchmarking process.
- As part of the second phase, Pepco's enhanced its system to offer automated transfer of data into EPA's Portfolio Manager tool via web services. The updated system also featured several online visualization and tracking options (see screenshot below).
- Rather than build the system from scratch, Pepco worked with vendor partner Schneider Electric to build web services functionality into the Resource Advisor platform, which Pepco was already offering to commercial customers.



LOCAL COMMUNITY	
EDA Local Government Partner	Washington, DC
Local Benchmarking Programs	Washington, DC, ordinance
UTILITY DATA ACCESS PROGRAM	
Name of Utility Benchmarking/Data Access Program	Resource Advisor
Web Address for Accessing Benchmarking Data	*www.pepco.com/pages/myhome/energymanagement/energybenchmarking.aspx*
Types of Utility Customers Receiving Benchmarking Data	Commercial and Multifamily Building Owners
ADDRESSING CUSTOMER PRIVACY	
Method of Balancing Customer Privacy with Data Access	★ Aggregation threshold: If 5 or more tenants in building, utility can provide aggregate whole-building data to building owner without explicit tenant authorization. If fewer than 5 tenants, utility must have written authorization from each tenant before providing aggregate whole-building data.
AGGREGATING AND TRANSFERRING WHOLE-BUILDING DATA	
Method for Transferring Utility Benchmarking Data to the Building Owner	★ Whole-building data delivered directly into Portfolio Manager via web services. Owner can also access whole-building data through online interface and/or spreadsheet output.
Method of Mapping Meters/Accounts to Physical Buildings	Customer required to identify all meters that should be included in aggregate whole-building data.
TYPE OF DATA	
Format of the Data	Portfolio Manager web services
Temporal and Spatial Granularity of the Data	Monthly, whole-building

Key: ★ Best Practice

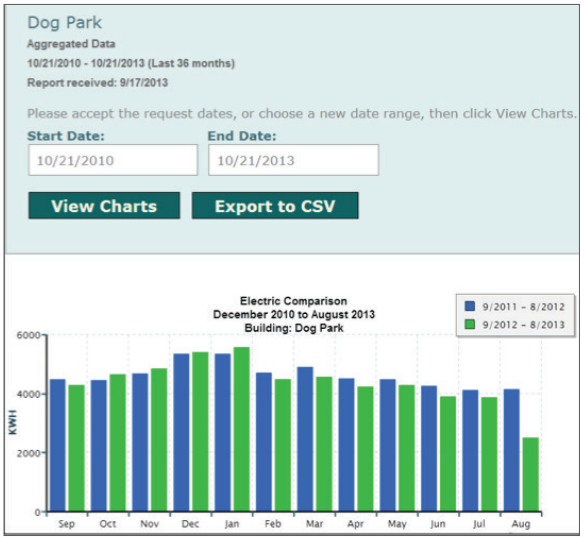
Appendix F

Utility Data Access System Fact Sheet: Puget Sound Energy

Puget Sound Energy (PSE) partnered with the City of Seattle, Washington, to participate in the Better Buildings Energy Data Accelerator (EDA).

Implementation Highlights

- PSE began developing its whole-building data access solution in 2009 to help Seattle-area building owners conduct benchmarking and comply with Seattle's new benchmarking requirements.
- When EPA's ENERGY STAR® Portfolio Manager® tool was upgraded in 2013, PSE capitalized on the opportunity to further enhance its data access offering by:
  - Improving its automated data transfer capabilities using new EPA web services functionality; and
  - Developing a new, online customer interface that supported meter-to-building mapping and the ongoing, monthly delivery of monthly energy data.
- Taking a multi-phase approach allowed PSE to respond to the immediate needs of Seattle building owners (whole-building data for compliance), and then improve the functionality and user experience of its system over time to ensure that it would provide maximum value in driving building energy performance awareness and improvements.



LOCAL COMMUNITY	
EDA Local Government Partner	Seattle, Washington
Local Benchmarking Programs	City of Seattle ordinance; State of Washington law
UTILITY DATA ACCESS PROGRAM	
Name of Utility Benchmarking/Data Access Program	MyData
Web Address for Accessing Benchmarking Data	*mydata.pse.com*
Types of Utility Customers Receiving Benchmarking Data	Commercial and Multifamily Building Owners
ADDRESSING CUSTOMER PRIVACY	
Method of Balancing Customer Privacy with Data Access	★ Aggregation Threshold: if 5 or more tenants in building, utility can provide aggregate whole-building data to building owner without explicit tenant authorization. If fewer than 5 tenants, utility must have written authorization from each tenant before aggregate whole-building data can be provided.
AGGREGATING AND TRANSFERRING WHOLE-BUILDING DATA	
Method for Transferring Utility Benchmarking Data to the Building Owner	★ Whole-building data delivered directly into Portfolio Manager via web services. Owner can also access whole-building data through online interface and/or spreadsheet output.
Method of Mapping Meters/Accounts to Physical Buildings	★ Owner enters service address(es); utility identifies associated meters/ accounts; owner confirms or edits.
TYPE OF DATA	
Format of the Data	Portfolio Manager Web Services
Temporal and Spatial Granularity of the Data	Monthly, whole-building

Key: ★ Best Practice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