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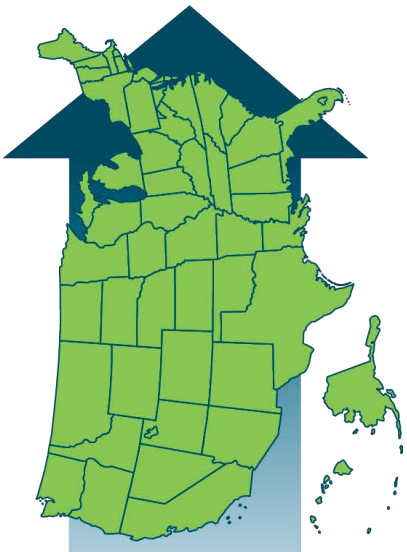

A Utility Regulator's Guide to Data Access for Commercial Building Energy Performance Benchmarking

Existing Commercial Buildings Working Group

May 2013

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Executive Summary

Purpose

This paper is designed to help utility regulators and their staff by:

- Explaining the value of commercial building energy performance benchmarking as a driver of energy and cost savings
- Identifying the key barriers and challenges related to energy data access for commercial customers seeking to benchmark their properties
- Establishing the case for regulators to take a more active role in driving customer data access solutions
- Clarifying key decision points and considerations for regulators when reviewing utility data access efforts.

What Is Energy Performance Benchmarking?

Benchmarking is the practice of comparing the measured performance of a device, process, facility, or organization to itself, its peers, or established norms with the goal of informing and motivating performance improvement. When applied to building energy use, benchmarking serves as a mechanism to measure the energy performance of a single building over time, relative to other similar buildings, or to a simulated reference building based on a specific standard (such as an energy code).

Why Are Benchmarking and Data Access Important?

Benchmarking helps building owners identify cost-effective energy upgrades, realize the energy and cost savings benefits from those upgrades, document the savings achieved, and communicate these accomplishments to stakeholders. To date, more than a quarter-million buildings representing almost 30 billion square feet have been benchmarked using the U.S. Environmental Protection Agency's ENERGY STAR® Portfolio Manager tool alone. This number continues to grow thanks to multiple drivers, including the private sector adoption of benchmarking, state and local voluntary benchmarking initiatives, utility energy efficiency programs incorporating benchmarking, and state and local legislation requiring that buildings be benchmarked and that the results of that benchmark be disclosed to the public (benchmarking and disclosure laws). As more and more customers begin benchmarking—whether voluntarily, to better manage energy costs and building operations, or as a result of mandates—these customers will be seeking streamlined, consistent processes for obtaining whole-building energy usage data. In many cases, this will lead to a focus on utilities as the ultimate provider of these data. In this way, the specific issue of data access for benchmarking may increasingly come under the purview of utility regulators.

A growing body of experience demonstrates a link between benchmarking, customer participation in utility programs, and energy performance improvements—suggesting strongly that owners and operators that benchmark their buildings are more likely to pursue and achieve energy savings than those who do not benchmark (see Figure ES-1). To this end, the National Association of Regulatory Utility Commissioners (NARUC) has recognized the value of benchmarking for energy and demand reduction, increased cost-effectiveness in utility program portfolios, cost savings for customers, and system-wide benefits.

What Is the Role of Regulators?

Regulators are increasingly asked to consider and rule on data access and related issues as utilities respond to state and local policy mandates as well as expressed customer needs. Regulatory policy can be the key to filling potential gaps between benchmarking tools and accessing the utility data necessary to use those benchmarking tools. Whole-building benchmarking tools, such as Portfolio Manager, are intended to facilitate the rapid entry of monthly energy usage data. However, commercial building owners and operators often have trouble accessing that energy data, thus hindering their ability to effectively evaluate building energy performance. In an effort to

overcome this and other barriers, building owners and managers, as well as policymakers, look to utilities and regulators for data access solutions.

For example, under the California and Washington State commercial building benchmarking and disclosure regulations, utilities are mandated to provide energy usage data to commercial customers to help them comply with benchmarking requirements. Outside of mandates, many utilities are exploring the role of data access as a customer service offering, and as an important avenue of entry for business customers into utility programs.

What Are the Key Issues?

A number of considerations fall within the purview of utility regulators, including:

- Selection of the appropriate tools or mechanisms by which the utility will provide customers with enhanced data access
- Clarifying the appropriate balance between customer access to data and customer data privacy
- Determining the appropriate cost-recovery framework for utility expenditures to develop customer data access solutions.

The key issues for utility regulators to consider are previewed in the table below, and are discussed at greater length in the succeeding chapters. This paper cannot cover all possible circumstances in which regulators may need to review or take action, as there will undoubtedly be jurisdiction- and case-specific considerations that are not anticipated here. As a starting point, however, this paper is intended to explore, and to help regulators prepare for, the issues that are most likely to arise in the context of data access for commercial building benchmarking.

Figure ES-1. The benchmarking value chain: from data access to energy savings

Table ES-1. Summary of Key Issues and Considerations for Regulators

Topic	Issue	Considerations for Regulators
Current Options for Enhanced Data Access	Multiple options exist to provide commercial customers with energy usage data for benchmarking.	• Review three mechanisms providing enhanced data access for benchmarking ▪ Utility delivery of aggregated whole-building data ▪ Green Button ▪ Portfolio Manager Web services
	No single solution will address all customer barriers to data access.	• Understand that the three mechanisms discussed can be complementary, and that a complete data access solution may require a combination of these approaches. • Encourage utilities to consider how multiple data access functionalities can be developed to reduce barriers to customer data access.
Effectively Implementing Data Access Solutions	The functionality and usability of a utility's data access solution will affect customer experience, uptake, and resulting energy savings.	• Where utilities are required by legislative mandates to provide data access, encourage them to identify cost-effective ways to go beyond simple compliance in terms of system features and usability. • Encourage utilities to provide data access as an ongoing service (e.g., monthly, quarterly) rather than having customers request data each time it is needed and to demonstrate that they have accounted for ongoing system maintenance, scalability, and the opportunity for future enhancements to functionality.
	Utilities may be limited in their ability to undertake information technology (IT) projects that affect their customer information and billing systems.	• Encourage utilities to consider the use of a data warehouse to provide greater flexibility in system development, and to facilitate subsequent updates. • Where large-scale IT projects are planned or are underway (e.g., advanced metering infrastructure [AMI] or smart grid efforts), encourage utilities to incorporate development of a data access solution into the project scope.
	Utilities may have difficulty mapping specific meters to specific buildings, which can affect their ability to provide aggregated whole-building data.	• Determine whether existing utility IT systems can be queried to identify and account for all meters in a specific building. ▪ If so, determine whether such data can be provided to building owners without explicit authorization from individual tenants (see section on customer privacy below). ▪ If not, encourage the utility to develop a plan for mapping existing meters to specific buildings. Ensure that this information is being tracked in order to better target future demand-side management efforts.
	Complete usage data for all fuel types is required to correctly benchmark a building.	• If there are multiple utilities serving a given jurisdiction, encourage and facilitate discussion of coordinated approaches to provide customers with enhanced data access. • Consider whether a third-party provider might be able to develop a single data access solution for multiple utilities in a given service territory.

Topic	Issue	Considerations for Regulators
Effectively Implementing Data Access Solutions (cont'd)	Additional information besides energy consumption will be required to benchmark a building.	• Encourage utilities to develop a plan for educating customers on the entire benchmarking process, including the input of data by the end user. Customers should clearly understand their responsibility for data entry versus the information that will be provided by the utility.
Enabling Benchmarking in Multi-Tenant Buildings While Protecting Customer Privacy	Jurisdictions vary with regard to the legality of providing building owners with aggregated, whole-building energy data absent explicit tenant authorization.	• Ensure that all existing statutes, regulations, and commission proceedings governing the privacy of customer data have been identified and reviewed. • If there is not established guidance governing the release of aggregated whole-building data without tenant authorization, convene a process for determining an appropriate threshold. This could entail a docketed hearing process and/or less formal working groups. • The threshold should specify the number of tenants in a building at or above which the utility can release aggregated whole-building usage data to owners, managers, and/or third parties without prior tenant authorization. • The threshold should also specify whether there is a limit on the size or proportion of energy consumption for any single tenant, above which tenant authorization must be provided • Work with stakeholders to arrive at the most appropriate threshold values.
	Utilities will tend to act with caution regarding any issues that affect customer privacy.	• Provide clear, affirmative guidance to utilities regarding the release of tenant energy usage data to building owners, managers, and other third parties. In addition to a specific threshold for the release of aggregated whole-building data, the following elements should be considered: ▪ Consider allowing customers to provide automated, electronic authorization for data release. ▪ If owners have received data release approval from tenants as part of a prior lease agreement, consider allowing utilities to accept this in lieu of additional tenant authorization.
Options for Cost Recovery	A strict focus on first cost during the implementation of a data access solution may result in more costly upgrades down the line.	• Emphasize lifetime (ongoing) costs rather than first cost when considering the cost-effectiveness of a utility's proposed data access solution. • Consider undertaking a commission study to demonstrate how a data access offering, and subsequent benchmarking activity by customers, will promote customer energy efficiency, lower energy bills, and drive greater participation across a portfolio of commercial energy efficiency programs.

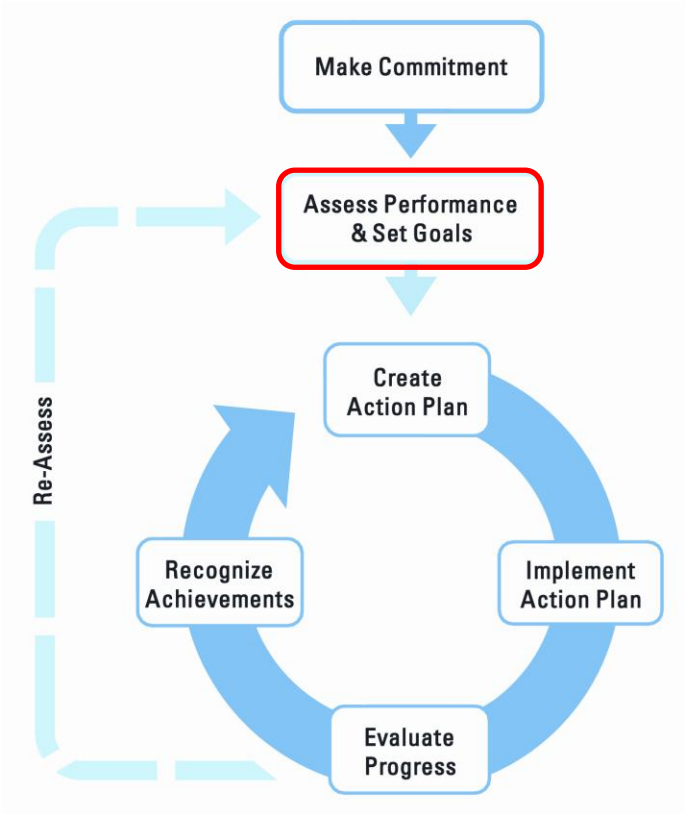
Topic	Issue	Considerations for Regulators
Options for Cost Recovery (cont'd)	Multiple cost-recovery options may be appropriate for the provision of data access to commercial customers.	• Determine whether data access efforts to drive benchmarking are subject to the same cost-effectiveness testing as resource acquisition measures, or whether they can be treated as "non-resource" activities, such as customer service, education, marketing, and so forth. • Assess whether the potential system benefits of data access and benchmarking warrant cost recovery through base rate adjustment. • Consider whether a fee-for-service approach is preferable to either rate-based or expensed cost recovery. • If shareholder incentives exist for utility efficiency programs, determine whether the costs incurred for data access solutions will be subject to those incentives.
	Utilities seek assurance that they will be able to recover costs related to data access solutions.	• Any guidance or limitations on allowable costs for data access efforts should be communicated clearly and in a timely manner, to the extent allowed by a state's regulatory framework, so that the utility can design and implement a solution that best meets utility, customer, and ratepayer needs. • Work to engage stakeholders as early in the process as possible to address their needs/concerns and thereby mitigate the possibility of prudence challenge and/or cost disallowance. If regulators have already approved another large-scale IT infrastructure upgrade (e.g., AMI or smart grid efforts), consider allowing data access solution costs to be incurred under these efforts.

Chapter 1: Introduction

Benchmarking is the practice of comparing the measured performance of a device, process, facility, or organization to itself, its peers, or established norms, with the goal of informing and motivating performance improvement. When applied to building energy use, benchmarking serves as a mechanism to measure the energy performance of a single building over time, relative to other similar buildings, or to modeled simulations of a reference building built to a specific standard (such as an energy code).

Commercial building energy performance benchmarking is generally considered a foundational element of an organization's energy management strategy. By understanding how buildings perform relative to their peers, property owners and managers can pinpoint underperforming buildings, identify opportunities for improvement, and plan upgrades that will drive cost-effective energy savings. Benchmarking can also be an important tool for ratepayer-funded energy efficiency efforts by identifying and prioritizing poorly performing buildings that provide the most cost-effective opportunities for energy efficiency program administrators. Numerous studies demonstrate a strong relationship between benchmarking and the implementation of energy reduction measures, suggesting that benchmarking is a critical factor in achieving energy use reductions in the commercial building sector.[1]

Figure 1-1 below illustrates how benchmarking underpins one commonly used approach to strategic energy management.



Source: www.energystar.gov/index.cfm?c=guidelines.guidelines_index

Figure 1-1. The role of benchmarking in the ENERGY STAR® Guidelines

[1] See footnotes 26, 27, and 28, below, for further discussion.

Across many commercial building markets, benchmarking has become standard operating procedure because energy costs and associated environmental and sustainability issues have raised awareness about the importance of energy management. Some ratepayer-funded programs use benchmarking as part of their commercial customer energy efficiency programs. State and local governments are also beginning to drive benchmarking as a policy priority.[2] The intent is that the increased availability of whole-building energy performance data will support energy efficiency investment, thereby harnessing market forces to realize operational improvements in the commercial sector.

Purpose of this Paper

In order to properly benchmark a commercial building, owners and operators (or their designated third-party service providers) must have ready access to energy usage data for the entire facility. A variety of factors can facilitate or hinder data access, and to the extent that utilities are involved in implementing data access solutions, many of these issues will fall within the purview of utility regulators for ultimate consideration and approval. Regulators' decisions could thus be instrumental in easing (or inhibiting) enhanced customer energy data access.

The purpose of this paper is to:

- Describe the value of benchmarking as an energy management best practice and establish that benchmarking activity is affected by the availability of data
- Identify key barriers and challenges related to utility provision of energy data to commercial customers
- Establish the case for utility regulators to take a more active role in driving data access solutions
- Identify and clarify key decision points to help utility regulators explore, assess, and rule on utility data access efforts.

This paper includes specific examples of utilities that have successfully addressed the issue of data access to facilitate commercial customer benchmarking activities, as well as building owners who use the information. Through these examples, this paper examines key implementation considerations to inform decision-making regarding the selection of data access solutions, integration with utility data systems, customer data privacy, and options for cost recovery. This approach is designed to give regulators a more complete understanding of utility approaches to data access, and to help them identify and draw upon precedents where utilities have successfully implemented these approaches.

Context: Benchmarking and Current Challenges to Data Access

The most widely used platform for benchmarking in the commercial building sector is the U.S. Environmental Protection Agency's (EPA's) Portfolio Manager. This free, online software tool provides energy performance benchmarks, including the ENERGY STAR energy performance score, that reflect a building's actual performance based on as-billed energy usage data. In addition to the energy use intensities that Portfolio Manager provides for all buildings, the ENERGY STAR score takes into account variations in building size, location (climate), and key operating parameters, to help building owners and operators identify how efficiently a building is consuming energy compared to similar buildings. These performance metrics allow owners and operators to not only measure and track individual building performance over time, but also to identify potential underperformers, implement efficiency improvements, and prioritize upgrades across portfolios.[3] Portfolio Manager is not the only whole-

[2] State and Local Energy Efficiency Action Network. (2012). *Energy Benchmarking, Rating, and Disclosure for Local Governments*. (2012). Accessed May 1, 2013: www1.eere.energy.gov/seeaction/pdfs/commercialbuildings_factsheet_benchmarking_localgovt.pdf.

[3] It is important to distinguish the ENERGY STAR score, which is an assessment of actual operating efficiency, from another benchmarking approach, the *asset rating*. An asset rating considers a building's physical characteristics (e.g., building envelope, HVAC systems) to assess its as-built potential for energy efficiency. The intent behind an asset rating is to help commercial building owners and operators rate the inherent efficiency (or inefficiency) of their building systems and to identify specific opportunities for potential upgrades. The U.S. Department of Energy is currently developing a national energy asset score for commercial buildings, which is intended to serve as a complement to Portfolio Manager. U.S. Department of Energy. (2012). *Commercial Building Energy Asset Score Program*. Accessed May 1, 2013: www1.eere.energy.gov/buildings/commercial/pdfs/energy_asset_score_factsheet.pdf.

building peer benchmarking tool available in the marketplace (there are some state-specific benchmarking tools that use statewide, in addition to nationwide, data sets for comparison purposes).[4] Nevertheless, all benchmarking tools have a common need for energy consumption data.

A key characteristic of Portfolio Manager and similar benchmarking tools is that they assess energy performance at the *whole-building* level,[5] which allows the tools to reflect the impacts of the interactive effects between energy systems, as well as operational adjustments and behavioral interventions. In order to benchmark a building, building owners and operators must obtain a minimum of one year of monthly energy usage data for the entire property, reflecting total energy consumption across all fuel types. Some building owners and operators, however, continue to experience difficulty in gaining ready access to the information they need to benchmark their properties in a streamlined and sustainable manner.

These data access challenges fall into three main categories:

- **Difficulty accessing complete energy usage data.** In certain situations, such as triple-net leased[6] commercial office properties and many multifamily buildings, tenants (or residents) are metered individually by the serving utility. Because the tenant is the utility customer of record, many states have laws and regulations that restrict the utility from sharing a customer's information with another party, including the building owner/manager, unless specifically authorized by the tenant.[7] In multi-tenant buildings, the process for obtaining this authorization from every tenant, recording and tracking permissions, and aggregating consumption information on an ongoing basis can be unduly burdensome for owners, tenants, and utilities. In some cases, tenants may be unresponsive, or may refuse to provide the owner/manager with the requested data, leaving the owner/manager without the complete data set needed for benchmarking. To address this challenge, utilities can be allowed (or in some cases, directed) to provide aggregated, whole-building energy usage data to a building owner or operator upon request, as long as the total usage information for multiple tenants does not reveal the usage information for any individual tenant.[8] With a few exceptions, however, [9] this practice has not been broadly accepted due to concerns regarding customer data privacy.
- **Wide variations in how utilities provide customer energy data.** Across the country, utilities differ significantly in the ways that they make energy usage data available to commercial customers.[10] At the more sophisticated end of the spectrum, some utilities exchange data directly with Portfolio Manager via Web services. In many cases, however, a customer's only option is postal delivery of monthly, hard-copy utility bills. In these cases, a customer who wishes to start benchmarking would need to re-key kilowatt-hour information after locating 12 months or more of historical bills, or make individual requests for assistance from their utility to obtain the data. This raises issues about data integrity and convenience. More frequently, utilities offer an online portal or interface through which customers can access their utility billing data. However, these interfaces vary greatly in terms of availability, granularity of metering intervals available to customers, and usability (e.g., the ease with which customers can download/export data for further analysis). For single-site utility customers, the ability to access their own energy usage

[4] For example, see the State of Minnesota and State of Iowa B3 benchmarking tools (https://mn.b3benchmarking.com/default.aspx and https://ia.b3benchmarking.com/default.aspx).

[5] ENERGY STAR scores are currently offered at the whole-building level, although Portfolio Manager may be used as a tool to benchmark energy consumption in separate spaces within a building (particularly if such spaces are separately metered).

[6] A triple-net lease is an "agreement that designates the lessee (the tenant) as being solely responsible for all of the costs relating to the asset being leased in addition to the rent fee applied under the lease" (see "Definition of 'Triple Net Lease.'" (Undated). Investopedia. Accessed May 1, 2013: www.investopedia.com/terms/n/netnetnet.asp). These costs include utilities, meaning that the tenant is billed directly by the utility company for energy usage, and therefore would be the party with access to the energy usage data (rather than the landlord).

[7] Even when data release authorization is provided by the tenant, some building owners have reported difficulties in getting utilities to fulfill the data access request.

[8] The rationale for this approach is that if data have been adequately aggregated, then there would be no customer-specific data to trigger privacy restrictions.

[9] Two such exceptions are Commonwealth Edison and Consolidated Edison, which will be discussed below.

[10] See, for example, "Utility Data Access Maps." (2013). OpenEnergyInfo. Accessed May 1, 2013: http://en.openei.org/wiki/OpenEI:Utility_data_access_map.

data on demand and in a convenient form can be a significant factor in the decision to benchmark a building. For building owners and managers with multiple sites, especially spanning multiple utility service areas, this wide variation in access to energy usage data can affect the feasibility of organization-wide benchmarking, related strategic energy management efforts, and consequently the ability to control operating costs.

- **Differences in the format of the data provided by utilities.** There has historically been no common format in which utilities provide energy usage data to commercial customers. Even among those utilities that provide Web-based access to historical data, the output format can vary widely, including electronic copies of actual bills, exportable summaries of consumption and cost, human-readable outputs (e.g., Excel spreadsheet, PDF, image file), and machine-readable outputs (e.g., XML). The format in which energy data is provided directly impacts the likelihood that the data will be used for value-added analyses such as benchmarking. For instance, the less manual re-keying of data required, the more likely that the energy usage data will be accurately entered into a benchmarking tool, and therefore be used to appropriately inform energy management decisions and reduce energy cost burdens.

In a subsequent chapter ("Current Options for Enhanced Data Access"), this paper will discuss various mechanisms that can be used to enhance customer access to energy usage data and therefore facilitate benchmarking activity. First, however, the following section will discuss the importance of benchmarking, including common drivers for benchmarking activity across the nation as well as the benefits of benchmarking for different audiences including customers, utilities, and regulators.

Chapter 2: The Importance of Benchmarking

To date, more than a quarter-million commercial buildings, representing nearly 30 billion square feet, are actively benchmarking their energy performance.[11] This chapter establishes the value proposition for benchmarking, in order to provide context for further discussion surrounding the importance of data access. As will be discussed, benchmarking delivers an array of benefits for various stakeholders, including customers, utilities, and regulators.

Key Drivers for Benchmarking Activity

Private Sector Adoption of Benchmarking as a Best Practice

For more than a decade, leading private sector organizations have used benchmarking as the foundation of their strategic energy management activities. A number of commercial sector organizations with national portfolios have earned recognition as ENERGY STAR Partners of the Year,[12] after leveraging their organization-wide benchmarking activities into significant, ongoing energy and cost savings. Especially in the commercial real estate sector, benchmarking has become standard practice, and the leading commercial real estate owners and managers association, BOMA International, has been a staunch advocate of benchmarking through its 7-Point Challenge[13] and the BOMA Energy Efficiency Program.[14] The number of associations promoting benchmarking to their members continues to grow, and, to date, the American Hotel & Lodging Association, the American Society of Healthcare Engineers, the International Facilities Management Association, the Retail Industry Leaders Association, and the Stadium Managers Association are among those industry groups that have promoted benchmarking as the starting point for energy savings.

State and Local Voluntary Benchmarking Initiatives

A number of cities, states, and regions are also driving benchmarking activities through voluntary campaigns that seek to engage the local business community, state and local governments, and utilities to work collaboratively in the pursuit of improved energy

EXAMPLE: LIBERTY PROPERTY TRUST

Liberty Property Trust is a $7.1 billion real estate investment trust with more than 80 million square feet of industrial and office space throughout the United States and the United Kingdom. Director of Sustainability Marla Thalheimer notes that "being able to rank a building according to its efficiency has provided enormous value to our company. With the price of energy always in flux and market trends foreshadowing an eventual risk of building obsolescence, benchmarking provides a framework that we use to focus our efforts, prioritize resources, and set and measure progress towards energy reduction goals."

Liberty began benchmarking energy usage with the ENERGY STAR Portfolio Manager tool in 2008. At that time, the portfolio-wide average score of the company's managed buildings was 55, or slightly above average on the 1–100 scale, with six ENERGY STAR-labeled buildings. Five years later, the portfolio average was 75, with more than 100 certified buildings. During this period, Liberty saved more than 46 million kilowatt-hours of electricity, with an estimated savings of $5 million for tenants across the country. Based on these results, Liberty recently expanded its efforts to benchmark its tenant-controlled (triple-net leased) portfolio through an energy efficiency partnership program. Even though Liberty doesn't benefit from direct cost savings at these properties, it understands that using benchmarking to help tenants find energy savings creates long-term value in the form of higher occupancy rates.

Source: M. Thalheimer. Personal communication (multiple). Liberty Property Trust. www.libertyproperty.com.

[11] U.S. Environmental Protection Agency. (2012). *Data Trends: Energy Use Benchmarking.* Accessed April 2013: www.energystar.gov/ia/business/downloads/datatrends/DataTrends_Energy_20121002.pdf?855c-b012.

[12] The names and accomplishments of annual ENERGY STAR award winners can be viewed at www.energystar.gov/index.cfm?c=pt_awards.pt_es_awards_archive.

[13] "BOMA 7-Point Challenge." (Undated). Building Owners and Managers Association International. Accessed May 1, 2013: www.boma.org/sustainability/commitment/Pages/7-point-challenge.aspx.

[14] "BEEP® (BOMA Energy Efficiency Program)." (Undated). Building Owners and Managers Association International. Accessed May 1, 2013: www.boma.org/education/online-learning/beep/Pages/default.aspx.

efficiency in buildings. The City of Atlanta, for example, is participating in the U.S. Department of Energy's (DOE) Better Buildings Challenge,[15] a voluntary leadership initiative that asks cities, states, commercial organizations, and others to commit to upgrading buildings across their portfolio and providing their energy savings data and strategies as models for others to follow. As part of Atlanta's commitment to achieving 20% energy savings by 2020 across more than 30 million square feet of building space, the city has launched a benchmarking initiative to help participating buildings identify a starting point for their reduction efforts, and to make their efforts more transparent to the local community.[16] Similarly, a competition-based approach to benchmarking has been deployed in multiple locations, frequently under the moniker "Kilowatt Crackdown."[17] These campaigns typically use benchmarking tools to track performance and recognize building owners that achieve the best performance improvement, or that set and achieve a specific improvement goal. Harnessing the power of friendly competition, voluntary campaigns incorporating benchmarking are widely viewed as an important driver for energy performance improvements in commercial buildings.

Utility Efficiency Programs Incorporating Benchmarking

A growing number of utilities and other energy efficiency program sponsors have integrated benchmarking into their commercial sector offerings, ranging from the delivery of benchmarking training to interested customers to the automated delivery of energy usage data into Portfolio Manager. In fact, EPA has identified nearly 50 utility programs across the country that have incorporated benchmarking, either as a requirement for incentive program participation, or as a stand-alone offering.[18] In certain jurisdictions, such as California and Washington State, utility provision of benchmarking services has been mandated by law as a component of commercial sector bench-marking legislation.[19] Most recently, EPA has launched the Building Performance with ENERGY STAR program model, which uses benchmarking as the focal point of a framework for utility sponsors to deliver the proven ENERGY STAR strategy to commercial sector customers. A number of studies indicate that customers that benchmark their buildings will be more likely to pursue energy improvements (see page 20 for more information).

State and Local Benchmarking and Disclosure Requirements

The past four years have seen a trend in state and local requirements, particularly in larger urban markets, for owners of commercial buildings to benchmark and disclose the energy performance of their properties. Currently, such jurisdictions include Austin, Texas; the State of California; the District of Columbia; Minneapolis, Minnesota; New York City; Philadelphia, Pennsylvania; San Francisco, California; Seattle, Washington; and the State of Washington, with a number of additional states and cities considering similar policies. Broadly speaking, these policies seek to "raise consumer awareness about energy performance and encourage building energy improvements through greater market transparency."[20] An even larger number of jurisdictions have passed legislation mandating the benchmarking of public buildings.[21] By using benchmarking data to drive energy

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[15] "Better Buildings Challenge." (Undated). U.S. Department of Energy. Accessed May 1, 2013: www4.eere.energy.gov/challenge/home.

[16] "Atlanta, GA." (Undated). U.S. Department of Energy. Accessed May 1, 2013: www4.eere.energy.gov/challenge/partners/better-buildings/atlanta.

[17] U.S. Environmental Protection Agency. (2013). *Federal, State, and Local Governments Leveraging ENERGY STAR*. Accessed April 2013: www.energystar.gov/ia/business/government/State_Local_Govts_Leveraging_ES.pdf?0d14-78ab.

[18] U.S. Environmental Protection Agency. (2012). *Directory of Energy Efficiency Programs Leveraging Energy Star*. Accessed April 2013: www.energystar.gov/ia/business/downloads/Directory_of_Energy_Efficiency_Programs_Leveraging_ENERGY_STAR.pdf?234d-c06d.

[19] Washington State Senate. (2009). *Engrossed Second Substitute Senate Bill 5854* (Section 6). 61st Legislature, 2009 Regular Session. Accessed May 1, 2013: http://apps.leg.wa.gov/documents/billdocs/2009-10/Pdf/Bills/Senate%20Passed%20Legislature/5854-S2.PL.pdf. Also see State of California. (2009). *California Assembly Bill 531* (Section 1). Accessed May 1, 2013: www.leginfo.ca.gov/pub/09-10/bill/asm/ab_0501-0550/ab_531_bill_20091011_chaptered.pdf.

[20] "Rating and Disclosure." (Undated). Institute for Market Transformation. Accessed May 1, 2013: www.buildingrating.org/content/rating-disclosure.

[21] For the latest summaries of state and local benchmarking and disclosure activities, see "BuildingRating.org." (Undated). Institute for Market Transformation. Accessed May 1, 2013: www.buildingrating.org and U.S. Environmental Protection Agency. (2013). *Federal, State, and Local Governments Leveraging ENERGY STAR*. Accessed April 2013: www.energystar.gov/ia/business/government/State_Local_Govts_Leveraging_ES.pdf?0d14-78ab.

performance improvement in public buildings, governments can save taxpayer dollars while building trust and confidence in the effectiveness of benchmarking policies and practices.[22]

The presence of benchmarking and disclosure legislation can also have an additive effect on the three drivers previously discussed. For example, the publication of benchmarking results, as part of a mandatory disclosure process, may help local utilities better understand and target the building stock that could benefit from participation in their programs. In fact, the New York City benchmarking law, and the resulting requests for access to whole-building aggregated consumption data, actually provided the impetus and opportunity for Consolidated Edison (Con Edison) to better understand how specific meters were mapped to specific buildings, a level of insight that they had not previously been able to obtain in a streamlined manner.

Key Benefits of Benchmarking[23]

Benchmarking as a Gateway to Energy and Cost Savings

Benchmarking a building's energy performance is generally accepted to be the foundation of any energy management effort, whether at the single-building level, or across an organization's portfolio of buildings. In particular, a benchmarking-led approach can facilitate the following best practices for energy management planning:

- **Prioritizing energy management efforts and investment decisions.** Especially for building owners/operators with sizeable portfolios, and for whom resources are limited, benchmarking is an important step in prioritizing energy management projects. By benchmarking an entire portfolio of buildings and identifying underperformers, owners/operators can focus their efforts on the properties that are most likely to yield cost-effective, significant energy savings.
- **Identifying and Implementing low- and no-cost best practices.** Just as benchmarking can help to identify and prioritize buildings that need capital investment, high-performing properties can be targeted to identify best practices in operation and maintenance (O&M), which can be deployed throughout the entire portfolio to institutionalize cost savings immediately, and to help maintain savings achieved through capital measures (e.g., equipment and system upgrades, retrofits). Furthermore, a whole-building peer benchmarking tool, such as Portfolio Manager, will reflect *all* savings realized at a building, including O&M and behavioral changes, as well as specific hardware control measures.

A whole-building peer benchmarking tool is not intended to identify or prescribe specific system- or equipment-level measures that should be considered to improve a building's energy performance.[24] Furthermore, the act of benchmarking, by itself, will not reduce energy usage, which leads many to consider it an indirect source of energy savings. Keeping in mind the adage that "what gets measured gets managed," however, a number of recent findings support the idea that benchmarking is strongly correlated with the implementation of energy efficiency measures and actual energy reduction.[25]

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[22] State and Local Energy Efficiency Action Network (SEE Action). (2012). *Energy Benchmarking, Rating, and Disclosure for Local Governments*. Accessed May 1, 2013: www1.eere.energy.gov/seeaction/pdfs/commercialbuildings_factsheet_benchmarking_localgovt.pdf. SEE Action has also published a policy design guide for state and local jurisdictions interested in implementing benchmarking and disclosure policies: *Benchmarking and Disclosure: State and Local Policy Design Guide and Sample Policy Language*. Accessed May 1, 2013: www1.eere.energy.gov/seeaction/pdfs/commercialbuildings_benchmarking_policy.pdf.

[23] This section focuses primarily on the benefits of benchmarking for utilities, utility customers, and utility regulators, with an emphasis on cost savings from energy use reductions. However, a growing number of studies suggest that benchmarking can also deliver job creation and workforce development benefits. See Institute for Market Transformation. (2012). *Analysis of Job Creation and Energy Cost Savings from Building Energy Rating and Disclosure Policy*. Accessed May 1, 2013: www.imt.org/uploads/resources/files/Analysis_Job_Creation.pdf, or Institute for Market Transformation. (2012). *Energy Disclosure & the New Frontier for American Jobs*. Accessed May 1, 2013: www.imt.org/uploads/resources/files/Energy_Disclosure_New_Frontier.pdf.

[24] This is the role served by an investment-grade building audit, and it may be an objective of an asset rating (as discussed in footnote 3).

[25] It is important, of course, to acknowledge the distinction between correlation and causation. Specifically, it is difficult to state with certainty that the act of benchmarking directly led customers to implement energy efficiency measures at their buildings (in fact, it could be that customers who benchmarked had already made the decision to proceed with efficiency improvements at their properties). With this caveat in mind, however, it is still difficult to ignore the growing body of data that associates benchmarking with the implementation of energy efficiency measures and the achievement of measured energy savings.

- In 2012, the California Public Utilities Commission completed a process evaluation of the statewide benchmarking efforts being implemented by the major California investor-owned utilities. One key finding was that "those who benchmarked buildings went on to take energy management actions in their buildings, such as reviewing building control strategies and setpoints, monitoring electricity, gas or steam use, and identifying areas for reducing energy." Furthermore, "84% of those who benchmarked their buildings said that they either had, or planned to, implement improvements, especially lighting, HVAC, energy management systems and controls, audits and feasibility studies, motors and refrigeration. For most respondents, the improvements were associated with programs offered by their utility."[26]
- A study by the Institute for Building Efficiency considered a set of common efficiency best practices, which included information-based approaches such as benchmarking, tracking and analyzing energy data, and measuring and verifying energy savings. The study found that organizations that employed these practices typically implemented three times as many energy efficiency measures as those that had not.[27]
- A 2012 ENERGY STAR analysis reviewed more than 35,000 buildings that benchmarked consistently over a three-year period (2008–2011). As reported by EPA, "these buildings realized savings every year …. Their average annual savings is 2.4%, with a total savings of 7.0% and score increase of 6 points over the period of analysis."[28] Furthermore, EPA noted that "if all buildings in the U.S. followed a similar trend, over 18 million metric tons of carbon dioxide equivalents could be saved each year. Through 2020, the total savings could be approximately 25%."[29]

Benchmarking can also be a powerful tool to enhance energy efficiency program design. The 2008 National Action Plan for Energy Efficiency (National Action Plan)[30] report, *Utility Best Practices Guidance for Providing Business Customers with Energy Use and Cost Data*, surmised that support for customer benchmarking and energy performance tracking activity could expand the traditional utility focus on measure-by-measure, hardware-focused incentive programs. Specifically,

> [increased emphasis on benchmarking] would allow a utility to develop a fuller business case for a suite of efficiency investments and operating/maintenance practices. And, to the extent that the benchmarking results would reach senior management within the organization, it could drive increased customer investment in efficiency, with or without utility incentive dollars for a given technology. Over time, this approach could lead to a utility program portfolio in which customer investments are driven more from the top, using benchmarking and other energy management methods, rather than from the bottom, by incentives for individual technologies and transactions. Such a program design approach could reduce reliance on incentives, reducing overall program costs and overall rate impacts from efficiency programs.[31]

Since this report was written in 2008, this approach has been exemplified by EPA's Building Performance with ENERGY STAR program model.[32] While there is not yet enough implementation experience to support broad

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[26] NMR Group, Inc. and Optimal Energy Inc. (2012). *Statewide Benchmarking Process Evaluation: Volume 1: Report*. Accessed May 1, 2013: www.energydataweb.com/cpucFiles/pdaDocs/837/Benchmarking%20Report%20(Volume%201)%20w%20CPUC%20Letter%204-11-12.pdf. Citation from Transmittal Letter, pp. 2–3.

[27] Institute for Building Efficiency. (2012). *2012 Energy Efficiency Indicator: Global Results: Executive Summary*. Accessed May 1, 2013: www.institutebe.com/InstituteBE/media/Library/Resources/Energy%20Efficiency%20Indicator/2012-EEI-Global-Results-Executive-Summary.pdf. Citation from p. 9.

[28] U.S. Environmental Protection Agency. (2012). *Data Trends: Benchmarking and Energy Savings.* Accessed April 2013: www.energystar.gov/ia/business/downloads/datatrends/DataTrends_Savings_20121002.pdf?720e-4170.

[29] Ibid.

[30] The National Action Plan for Energy Efficiency was a private-public initiative to create a sustainable, aggressive national commitment to energy efficiency through the collaborative efforts of gas and electric utilities, utility regulators, and other partner organizations. See www.epa.gov/cleanenergy/energy-programs/suca/resources.html. SEE Action builds upon the success of the National Action Plan.

[31] National Action Plan for Energy Efficiency. (2008). *Utility Best Practices Guidance for Providing Business Customers with Energy Use and Cost Data*. Accessed May 1, 2013: www.epa.gov/cleanenergy/documents/suca/utility_data_guidance.pdf. Citation from pp. 3-4.

[32] See www.energystar.gov/buildingperformance. A number of other comprehensive frameworks for energy management exist as well, such as ISO 50001 (www.iso.org/iso/home/standards/management-standards/iso50001.htm).

conclusions, early experience has demonstrated that a benchmarking-led approach can drive increased customer attention on whole-building strategies (including O&M), establish a context in which longer term energy action planning can take place, and create an opportunity for the utility to drive customer implementation of energy efficiency measures beyond the immediate projects being rebated.

Benchmarking as a Driver of Utility Customer Satisfaction

Among utilities, a great deal of attention has been paid to customer experience management, which is defined as "the deliberate process of planning and enhancing all customer interactions … to deliver superior service and inspire loyalty."[33] While benchmarking support is only one specific point of interaction between the customer and its utility, it is growing in importance as customers become more aware of the value of energy management, and as they seek help to manage their energy use. By facilitating benchmarking to enable customers to better understand and take action to reduce their energy use and cost, utilities can enhance their role as a trusted advisor and build more value-added relationships with customers.[34]

To the extent that regulators, utilities, or non-utility program administrators are seeking to promote customer engagement and participation in demand-side management programs, customer satisfaction may be a crucial mediating factor. As Accenture noted in a 2010 report, "utilities/electricity providers must enhance their customer relationships and earn sufficient consumer trust before they see broad-based adoption of electricity management programs."[35] This finding was also echoed by E Source, which wrote that "an engaged customer is more likely to know about and participate in a utility's programs, and a loyal customer is more likely to become a vocal advocate for their utility."[36] So, not only is benchmarking an enabler of energy efficiency activities, but the very act of providing this service to customers may, in fact, improve the customer's overall satisfaction with the utility, and make it more likely that they will participate in other utility offerings, such as energy efficiency programs, to achieve larger energy efficiency and/or demand reduction goals.[37]

Commonwealth Edison (ComEd) has demonstrated the value of a utility providing benchmarking as a customer service. Historically, owners and managers of multi-tenant, separately metered commercial buildings in Chicago had encountered difficulty in benchmarking because of the need to collect electricity consumption data from each individual tenant.[38] Because this process was so time- and resource-intensive, a large percentage of multi-tenant building owners and managers in the city were not benchmarking as a means to measure, track, and compare the energy performance of their properties (which is considered a core best practice for successful energy management).

In an effort to help customers surmount this barrier, and to enable multi-tenant office customers to benefit from benchmarking, ComEd included a program for offering whole-building data to customers in its 2007 energy efficiency program filing. This solution was launched in 2008 as the Energy Usage Data System (EUDS).[39] Through

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[33] "The What, Why, and How of Customer Experience Management." (2012). E Source. Accessed May 1, 2013: https://www.esource.com/Customer_Experience_Management_Excerpt.

[34] Accenture. (2011). *Understanding Consumer Preferences in Energy Efficiency: Accenture end-consumer observatory on electricity management 2010*. Accessed May 1, 2013: www.accenture.com/SiteCollectionDocuments/PDF/Understanding_Consumer_Preferences_Energy_Efficiency_10-0229_Mar_11.pdf. Citation from pp. 33–34.

[35] Ibid., p. 33.

[36] "Top 3 Questions from Customer Experience 101." (2012). E Source. Prepared by S. Fiebiger. Accessed May 1, 2013: www.esource.com/Blog/ESource/5-18-12-CE101.

[37] For more examples of the relationship between utility energy efficiency program offerings and customer satisfaction, see State and Local Energy Efficiency Action Network. (2011). *Technical Brief: Impacts of Energy Efficiency Programs on Customer Satisfaction*. Accessed May 1, 2013: www1.eere.energy.gov/seeaction/pdfs/ratepayer_efficiency_customersatisfaction.pdf.

[38] Bricknell, K. (2010). "ComEd: Helping Chicago Businesses Turn Green." *Electric Energy T&D Magazine*, November/December 2010; pp. S-4–S-6. Accessed May 1, 2013: www.energydataalliance.org/wp-content/uploads/2011/07/EUDS_Article_Nov_20101.pdf. As a whole-building peer benchmarking tool, Portfolio Manager requires that users account for all energy usage at the property being benchmarked. If the building owner/manager of a multi-tenant, separately metered building cannot obtain consumption data from each tenant, then the building cannot be benchmarked to completion.

[39] "Benchmark your building's consumption." (Undated). ComEd. Accessed May 1, 2013: https://www.comed.com/business-savings/energy-tools/Pages/energy-usage-data.aspx.

the online EUDS interface, building owners can now submit a request for aggregated energy usage data across all tenants and common space, suitable for entry into Portfolio Manager (the aggregated data output masks the consumption of individual tenants). In 2009, ComEd further enhanced the functionality of EUDS, allowing users to input aggregated consumption data directly into Portfolio Manager via EPA's Web services. According to ComEd's estimates, the EUDS system reduces the time needed to benchmark a building from almost two weeks to about a day.[40] This has generated strong customer interest: through the end of 2012, more than 3,300 ComEd customers had signed up to use EUDS.[41] Because of the service that ComEd provides, these building managers can spend less time collecting and compiling data, and more time using benchmarking results to support energy management strategies that lead to direct cost savings. For these efforts, EPA awarded ComEd a Special Recognition Award for Innovation in Customer Service in 2009.[42]

Growing Regulatory Support for Benchmarking and Whole-Building Data Access

The benefits of benchmarking accrue to multiple parties simultaneously, including customers (tenants, building owners, and/or building operators), utilities and other energy efficiency program administrators, and regulators. As a customer service offering, for example, benchmarking can improve the utility customer experience while at the same time increasing customer participation in energy efficiency programs. And energy savings driven by benchmarking programs can deliver cost savings to the customer while helping program administrators and regulators to achieve energy savings goals. Furthermore, as recognized by the National Association of Regulatory Utility Commissioners (NARUC), "demand reductions motivated by data access and benchmarking allow utility programs to drive greater energy efficiency results per program dollar, increasing the cost-effectiveness of overall portfolios" and "demand reductions motivated by benchmarking can result in direct cost savings to customers and peak load reductions that benefit all ratepayers."[43]

Recognizing these myriad benefits, NARUC issued a resolution in 2011 that acknowledged the need for public utility commissions to support and promote benchmarking efforts, including the importance of providing customers with data suitable for benchmarking (excerpts from the resolution are presented on the following page).

Summary

This section has highlighted not only the drivers and benefits of benchmarking, but also the broad consensus among policymakers that benchmarking is a critical activity for achieving reductions in commercial building energy use and avoiding unnecessary costs. As noted in the NARUC resolution, however, and as discussed in the introduction to this paper, the issue of benchmarking is closely linked to the issue of data access. In the following sections, this paper will explore various approaches that utilities and others have employed in delivering data to customers (and customer-authorized third parties) to facilitate benchmarking. In the process, it will also discuss the selection of data access solutions, integration with utility data systems, customer data privacy, and options for cost recovery.

[40] Bricknell, K. (2010). "ComEd: Helping Chicago Businesses Turn Green." *Electric Energy T&D Magazine*, November/December 2010; pp. S-4–S-6. Accessed May 1, 2013: www.energydataalliance.org/wp-content/uploads/2011/07/EUDS_Article_Nov_20101.pdf.

[41] EEB Hub Data Access Working Group meeting. (October 25, 2012). Meeting notes. Information at www.eebhub.org/policy-and-finance/regional-building-energy-data-management-working-group.

[42] Bricknell, K. (2010). "ComEd: Helping Chicago Businesses Turn Green." *Electric Energy T&D Magazine*, November/December 2010; pp. S-4–S-6. Accessed May 1, 2013: www.energydataalliance.org/wp-content/uploads/2011/07/EUDS_Article_Nov_20101.pdf.

[43] National Association of Regulatory Utility Commissioners. (2011). *Resolution on Access to Whole-Building Energy Data and Automated Benchmarking*. Accessed May 1, 2013: www.naruc.org/Resolutions/Resolution%20on%20Access%20to%20Whole-Building%20Energy%20Data%20and%20automated%20Benchmarking.pdf.

2011 NARUC RESOLUTION ON ACCESS TO WHOLE-BUILDING ENERGY DATA AND AUTOMATED BENCHMARKING [EXCERPTS]

… WHEREAS, Whole-building energy benchmarking is an important tool that enables commercial building owners and managers to identify energy performance issues in buildings, undertake energy management actions and cost-effective improvements in buildings, track energy performance over time, and set energy performance goals; *and* …

… WHEREAS, Access to aggregated building energy usage data by commercial building owners may be difficult to obtain and may be a significant barrier to whole-building benchmarking because the data resides in multiple utility accounts with multiple tenants and may require the consent of each tenant customer to release or even aggregate the data; *now, therefore be it*

RESOLVED, That the Board of Directors of the National Association of Regulatory Utility Commissioners … acknowledges the need for commercial building owners and managers to access whole-building energy consumption data to support energy-efficient building operations; *and be it further*

RESOLVED, That NARUC encourages State public utility commissions seeking to capture cost-effective energy savings from commercial buildings to consider a comprehensive benchmarking policy that includes:

- Use of EPA ENERGY STAR automated benchmarking services and other benchmarking services ...;
- Adopting methodologies to consistently and accurately credit program impact to benchmarking-driven energy efficiency programs; and

Taking all reasonable measures to facilitate convenient, electronic access to utility energy usage data for building owners, including aggregated building data that does not reveal customer-specific data to protect individual customer privacy, as well as the sharing of customer-specific data to the extent provided for under State law and regulations.[44]

[44] Ibid.

Chapter 3: Current Options for Enhanced Data Access

Table 3-1. Section at a Glance

Issue	Considerations for Regulators
Multiple options exist to provide commercial customers with energy usage data for benchmarking	• Review three mechanisms providing enhanced data access for benchmarking ▪ Utility delivery of aggregated whole-building data ▪ Green Button ▪ Portfolio Manager Web services
No single solution will address all customer barriers to data access	• Understand that the three mechanisms discussed can be complementary, and that a complete data access solution may require a combination of these approaches. • Encourage utilities to consider how multiple data access functionalities can be developed to reduce barriers to customer data access.

Introduction

As discussed earlier, three key data-related barriers to commercial building benchmarking are:

- Difficulty accessing complete energy usage for multi-tenant buildings
- Wide variations in how customers gain access to their energy data
- Differences in the format of the data provided by utilities.

When considering solutions to these barriers, three solutions stand out based on experience to date: utility delivery of aggregated whole-building data, platforms that leverage the Green Button data standard, and EPA's Portfolio Manager Web services functionality. The following chart summarizes each approach and maps it to the ways that it can address one or more barriers to benchmarking.

The intent of this section is not to prioritize one data access approach over another, but rather to demonstrate the range of mechanisms currently being used to provide customers with enhanced access to energy data to facilitate benchmarking. Furthermore, these approaches are not mutually exclusive, and they can be applied in various blends to meet the needs of a given state or utility. ComEd's EUDS system, for example, provides a means to aggregate whole-building data upon customer request, and then exchange these data with Portfolio Manager via Web services. Similarly, at least one third-party vendor has designed an application to receive Green Button data from utility customers, and then exchange this information with Portfolio Manager via Web services.

Utility Delivery of Aggregated Data

Utility delivery of aggregated data is the most basic option for providing enhanced data access, especially in scenarios where there are multiple, directly metered tenants, and where it is difficult for building owners to obtain explicit data release authorization forms from each individual tenant. Using this approach, a building owner (or authorized representative, such as a building manager or other service provider) makes a request to the utility for the building's aggregated historical usage data. The utility then verifies the identity of the requestor as the owner of the building or an approved third party. Finally, the utility provides whole-building energy usage information back to the requestor, usually in spreadsheet format, and in an aggregated manner that obscures the usage of any single tenant. To complete the benchmarking process, the building owner or manager (or a service provider acting on behalf of the owner) is responsible for inputting this information into a benchmarking tool.

This approach serves one primary function, which is to overcome the challenge of multi-tenant billing that building owners may encounter in obtaining the data necessary to benchmark their buildings. Although it greatly facilitates

Table 3-2. Options for Data Access for Commercial Building Benchmarking

	Facilitates collection of energy usage data across multiple, individually metered tenants?	Provides a consistent process to obtain data across utilities?	Provides consistency in the format of data received from utilities?
Utility delivery of aggregated data	**Yes.** Building owner receives single file containing monthly consumption for whole building (assuming that authorization has been provided by all tenants **or** local regulations permit the aggregation of whole-building data without the need for individual tenant authorization).	**Not observed to date.** Individual utilities develop their own processes by which building owners request and receive data.	**Not observed to date.** Individual utilities develop their own formats (spreadsheet-based; online) in which building owners receive aggregated data.
Green Button	**Not observed to date.** Green Button data are provided at the meter level. Subsequent aggregation must be performed by building owner or third party.	**Yes.** A core purpose of the Green Button standard is to provide a simple, replicable process by which utilities can enable one-click download of energy data by customers.	**Yes.** A core purpose of the Green Button standard is to establish a common format for the release of energy usage data to customers and authorized third parties/applications seeking to consume and analyze these data.
Portfolio Manager Web services	**Yes.** Authorization functionality within Portfolio Manager allows customers to identify and map specific meters to specific buildings (assuming that individual tenants have granted access to these meters).	**Yes.** Although some specifics may differ between utilities, the core process by which a Portfolio Manager user connects with a utility and authorizes the sharing of buildings and meters is the same for all.	**Yes.** Portfolio Manager Web services operate based on defined, standardized data schemas. The end result for all Portfolio Manager users is the entry of energy usage data directly into the Portfolio Manager tool.

the ability to obtain historical consumption data for multi-tenant buildings, it does not address the need for continued data access for ongoing tracking of progress. Furthermore, delivery of aggregated data, by itself, does not completely remove the burden of data entry for benchmarking purposes.

One example of a utility that is currently taking this approach is Con Edison, which provides this service with the goal of supporting building owners and managers subject to New York City's benchmarking and disclosure law (Local Law 84). Upon request, Con Edison will provide two years of aggregated gas and electricity data for a fee of $102.50 per building. Individual tenant authorization is not required for release of aggregated data to building owners; however, a letter of authorization must be filed by any third party (e.g., a consultant) that is obtaining data on behalf of the building owner.[45] This provision is important because more than half of the data requests that Con Edison received during the first year that this service was offered were submitted by consultants.

A more advanced example of this approach can be seen in the case of ComEd in northern Illinois. Prior to the development of its Web-based EUDS system in 2008, ComEd provided aggregated whole-building usage data to

[45] "Greener Greater Buildings Plan—Benchmarking." (Undated). Consolidated Edison. Accessed May 1, 2013: www.coned.com/energyefficiency/city_benchmarking.asp.

building owners/managers upon request (without the need for individual tenant authorization). This service was provided on a case-by-case basis, initiated by direct requests from customers to their account managers, and was not generally advertised as a customer offering. ComEd found that data retrieval for a multi-tenant building could be labor intensive, with turnaround times of up to two weeks. For this reason, ComEd charged commercial customers $600 per building for this manual service.[46] By rolling out the EUDS system in 2008 as a free, Web-based offering to commercial customers, ComEd responded to the growing customer demand for more streamlined and automated access to whole-building aggregated data. With this service in place, the number of buildings requesting data for benchmarking rose from fewer than 100 to more than 3,000. ComEd subsequently made the decision to integrate Portfolio Manager Web services into EUDS in order to expand the customer service value of the tool, and to transition it from a data provision resource to a full-service benchmarking service. In doing so, ComEd was able to leverage the data access function that it had already deployed in order to introduce additional and value-added functionality for customers.

In both of these cases, the sponsoring utilities determined that they could provide whole-building aggregated data to building owners without compromising tenant privacy. However, this approach may not be possible or appropriate in all jurisdictions. If state or local interpretation of privacy rules precludes the utility's ability to release whole-building aggregated data without individual tenant consent, then this data access option may have limited use in driving benchmarking activities (see further discussion in Chapter 5).

Green Button

Since the beginning of 2012, the Green Button initiative has become a significant aspect of the data access discussion.[47] Based in part on the federal health information initiative known as Blue Button, Green Button is an "industry-led effort … [to] provide electricity customers with easy access to their energy usage data in a consumer-friendly and computer-friendly format."[48] Participating utilities host the Green Button function within their secure Web portals. When customers log into their accounts, they can download electricity consumption data for associated meters with the simple click of a button. Depending on the metering infrastructure a utility has in place, customers can use Green Button's Download My Data function to obtain monthly summary data, daily load profile data, and even hourly or 15-minute interval data (if the utility provides this level of data granularity).

The second phase of Green Button implementation, which is currently underway, introduces the Connect My Data function. This feature offers a platform through which customers can authorize the release of energy data directly to third-party service providers, providing an ongoing flow of data without the need for repeated approval processes. This would allow an authorized third party to collect baseline usage data, and then track usage over time, potentially providing advanced analysis and other services to customers. Utility customers that take advantage of this function would be able to specify the duration of the data release authorization, and would be able to provide different levels of authorization to different providers. In all applications of Green Button, the customer always has control over whether or not they choose to share the data with a third party.

Most notable, perhaps, is the fact that Green Button establishes a standardized, machine-readable (XML) data output format.[49] This means that as customers download their own Green Button data, regardless of the sponsoring utility, the data will be made available in the exact same format. This can be especially beneficial to owners of multiple properties across multiple utility service territories. An additional advantage of gaining access to energy usage data in the Green Button format is that building owners can take advantage of emerging innovative, value-added services and products (e.g., virtual energy audit tools, devices) built according to the Green Button data standard. These services and products can help building owners to make better decisions, save energy, and save money. Recently, DOE sponsored the Apps for Energy contest, which awarded $100,000 in prize

[46] EEB Hub Data Access Working Group meeting. (October 25, 2012). Meeting notes. Information at www.eebhub.org/policy-and-finance/regional-building-energy-data-management-working-group.

[47] "NARUC Applauds States, Utilities for 'Green Button' Efforts." (2012). National Association of Regulatory Utility Commissioners. Accessed May 1, 2013: www.naruc.org/News/default.cfm?pr=306.

[48] "Green Button: About." (Undated). Accessed May 1, 2013: http://greenbuttondata.org/greenabout.html.

[49] A human-readable format of this output can also be obtained via a Web browser's style sheet.

money to eight software developers whose Web-enabled products "help utility customers make the most of their Green Button electricity usage data."[50] In just six weeks, more than 50 apps were developed to leverage energy usage data in the Green Button format.

As of the second quarter of 2013, more than 30 utilities had committed to and/or implemented Green Button. Furthermore, almost 50 private sector companies had committed to and/or succeeded in developing products and services that incorporate Green Button data,[51] and 65 applications had been built to leverage energy data in the Green Button format. The initial implementations of Green Button mainly focused on single-family homes and small commercial buildings (these are the simplest scenarios, because a single meter is typically aligned with a single building). However, utilities are increasingly working to make Green Button available for commercial customers. For example, Con Edison made an announcement on October 1, 2012, that it would initiate its Green Button offering with 2,500 of its largest commercial buildings.[52] Through the beginning of 2013, most participating utilities were focused on the provision of electricity data in the Green Button format, although a few had begun offering natural gas data in the Green Button format as well. The data standard is flexible enough to support different types of utility data.

To the extent that Green Button makes energy usage data readily available in a consistent format for commercial building owners and managers, it can be a data access solution to facilitate benchmarking. Especially at buildings with master meters (or with a limited number of meters, all of which are accessible to the property owner/manager), the ability to obtain energy usage data on demand, through a single portal, can reduce the time needed to benchmark a building. However, building owners and managers may still run into problems obtaining complete benchmarking data for large, multi-tenant buildings where tenants are metered directly. Because these tenants are the utility customers of record, building owners will typically not be able to access tenant Green Button data without prior authorization. It is conceivable that platforms providing data in the Green Button format could also enable utilities to provide whole-building aggregated data to building owners (either without tenant authorization, if allowable, or by integrating electronic tenant authorization into the platform).[53] However, as is the case with other data access options, any Green Button-mediated solution to whole-building data aggregation would need to be supported by the appropriate policy measures or guidance to protect the privacy of individual tenants (see Chapter 5 for further discussion).

It is important to clarify that Green Button is not a benchmarking tool. Rather, it is intended to provide a standard format for energy usage data and (in the case of Green Button Connect My Data) a standard process for customers to authorize the release of their data from a utility to a third party. Users who want to benchmark their buildings will still need to collect and input other information besides energy usage (e.g., building/space use attributes). Most utility platforms that currently offer energy usage data in the Green Button format were not built to provide a full suite of benchmarking services. And while utilities could consider integrating these capabilities, this is also an opportunity for service providers that benchmark buildings on behalf of building owners to adopt Green Button into their platforms.

Currently, there are a few options for transferring energy usage data in the Green Button format to the Portfolio Manager tool. With Green Button Download My Data, a building owner can manually enter the data into Portfolio Manager, upload the data through Portfolio Manager's spreadsheet import function, or work with a third party to automatically transfer the data through Portfolio Manager Web services. As the Green Button Connect My Data function is implemented, there will be further opportunities to automate the data transfer more directly into the Portfolio Manager tool. This will increase the ability of third parties to play a role in benchmarking buildings on behalf of building owners, while also leveraging the enhanced data access provided by Green Button. In addition,

[50] "Apps for Energy." (Undated). U.S. Department of Energy. Accessed May 1, 2013: http://appsforenergy.challenge.gov.

[51] "Green Button: Adopters." (Undated). Accessed May 1, 2013. http://greenbuttondata.org/greenadopt.html.

[52] Council on Environmental Quality, Office of Science and Technology Policy. (2012). *Energy Datapalooza Fact Sheet*. Accessed May 1, 2013: www.whitehouse.gov/sites/default/files/microsites/ostp/energy_datapalooza_fact_sheet.pdf.

[53] For example, ComEd's EUDS system has already greatly automated the process by which customers obtain whole-building aggregated data. Systems like this one could further incorporate the ability to absorb Green Button data by meter, aggregate the data for the whole building, express it in the Green Button format for the building owner, and transfer the data directly to Portfolio Manager.

EPA is exploring options to facilitate the transfer of energy usage data in the Green Button format into the Portfolio Manager tool. This assessment will be informed by EPA's experience with adding functionality for uploading Green Button data into the ENERGY STAR Home Energy Yardstick tool for homeowners (this capability was added in April 2013).[54]

Portfolio Manager Web Services

Portfolio Manager Web services,[55] previously known as automated benchmarking, allows utilities or other energy service providers to establish a connection between their databases and EPA's Portfolio Manager database. Core functionality includes the ability to:

- Create Portfolio Manager accounts on behalf of customers
- Create and update buildings, spaces, and meters in these customers' accounts
- Extract meter and building details
- Run reports on key calculated metrics provided by Portfolio Manager.

The Web services also include the capability for service providers to connect to a building that is already being benchmarked manually in Portfolio Manager, allowing users to authorize selected third parties to assume responsibility for some or all of the data entry required for benchmarking. The primary benefit of Portfolio Manager Web services is that it substantially reduces the effort required by building owners and managers to benchmark their properties, removing the need to re-key data and enabling them to interpret the benchmarking results and use the information as the foundation of strategic energy management decisions.

The ability to exchange data with Portfolio Manager via Web services entered the marketplace in 2006, when this functionality began to be used by utility bill processing and payment providers. Because these companies processed utility bills for large national chains, they had significant quantities of energy usage data flowing through their systems. By exchanging data with Portfolio Manager via Web services, they could provide benchmarking as a value-added service offering, allowing their clients to obtain ENERGY STAR benchmarking metrics with greatly reduced effort. Over time, additional business types, including utilities, energy information service providers, energy management software vendors, controls and monitoring vendors, and energy service companies, integrated Portfolio Manager Web services into their service offerings.

Currently, approximately 15 utilities in the United States are exchanging data with Portfolio Manager using Web services, with the majority located in California and Washington State. ComEd is a notable provider of Portfolio Manager Web services in the Midwest, and as of the beginning of 2013, Philadelphia-based PECO had committed to implementing a Web services solution as well. With the exception of ComEd, the majority of utilities exchanging data with Portfolio Manager via Web services to date have been driven by state or local benchmarking mandates. However, as experiences across the country continue to demonstrate the significant value of benchmarking as a driver for cost savings and customer satisfaction, more and more utilities are becoming interested in exchanging data with Portfolio Manager via Web services as a means to drive benchmarking activity among their commercial building customers. Some utility efficiency programs, for example, require benchmarking as a prerequisite for customer participation as a means of tracking program impact at a whole-building level (e.g., New Jersey's Pay for Performance program[56]).

Although implementations of Portfolio Manager Web services will vary in terms of technical details, the general business processes are the same. First, customers set up their buildings in Portfolio Manager, defining utility

[54] "ENERGY STAR Home Energy Yardstick." (Undated). U.S. Environmental Protection Agency. Accessed April, 2013: https://www.energystar.gov/index.cfm?fuseaction=HOME_ENERGY_YARDSTICK.showGetStarted.

[55] A Web service is a software system designed to support interoperable machine-to-machine interaction over a network. "W3C Working Group Note 11: Web Services Glossary." (2004). W3C. Accessed May 1, 2013: www.w3.org/TR/2004/NOTE-ws-gloss-20040211.

[56] "Pay for Performance—Existing Buildings." (Undated). New Jersey's Clean Energy Program. Accessed May 1, 2013: www.njcleanenergy.com/commercial-industrial/programs/pay-performance/existing-buildings.

meters and operational/property use parameters. Then, from within Portfolio Manager, customers select a utility that is exchanging data via Web services and place an authorization request. By approving the request, the utility maps its database record of the customer's buildings and meters to the corresponding records in Portfolio Manager. From that point on, the utility has a connection to the customer's account whereby it can send energy usage data directly into the Portfolio Manager record according to the schedule established (e.g., monthly, quarterly, annually).

Portfolio Manager Web services can be distinguished from the other data access mechanisms discussed above because Web services provide a direct link from a utility's billing data system to Portfolio Manager. Typically, the customer will still need to access the Portfolio Manager interface in order to update space use information and run reports (such as compliance reports for demonstrating adherence to local benchmarking laws). But by sending energy use information directly into Portfolio Manager, utilities exchanging data via Web services can greatly reduce the data entry burden on customers.

Even when utilities are exchanging energy usage data with Portfolio Manager via Web services, customers must still identify and/or define in Portfolio Manager the specific meters that they are requesting to be updated by the utility. This continues to present a barrier for large, multi-tenant buildings where owners/managers do not have access to all tenant meters or billing records. One approach for overcoming this barrier is for the utility to build a whole-building data aggregation process into its functionality. In this way, after the customer makes the initial data request and verifies their identity via Portfolio Manager (or via an additional utility-defined process), the utility can identify all meters in the building and aggregate this information into one "virtual meter" to send back to the customer's Portfolio Manager account. This is the approach that ComEd has taken with its EUDS tool in order to combine its data aggregation function with its Portfolio Manager Web services. As with prior options, however, if state or local interpretations of privacy laws do not allow for whole-building aggregation of data in the absence of explicit tenant authorization, then this approach may still be challenging for large, multi-tenant buildings (see further discussion in Chapter 5).

Chapter 4: Effectively Implementing Data Access Solutions

Table 4-1. Section at a Glance

Issue	Considerations for Regulators
The functionality and usability of a utility's data access solution will affect customer experience, uptake, and resulting energy savings.	• Where utilities are required by legislative mandates to provide data access, encourage them to identify cost-effective ways to go beyond simple compliance in terms of system features and usability. • Encourage utilities to provide data access as an ongoing service (e.g., monthly, quarterly) rather than having customers request data each time it is needed and to demonstrate that they have accounted for ongoing system maintenance, scalability, and the opportunity for future enhancements to functionality.
Utilities may be limited in their ability to undertake information technology (IT) projects that affect their customer information and billing systems.	• Encourage utilities to consider the use of a data warehouse to provide greater flexibility in system development, and to facilitate subsequent updates. • Where large-scale IT projects are planned or are underway (e.g., advanced metering infrastructure [AMI] or smart grid efforts), encourage utilities to incorporate development of a data access solution into the project scope.
Utilities may have difficulty mapping specific meters to specific buildings, which can affect their ability to provide aggregated whole-building data.	• Determine whether existing utility IT systems can be queried to identify and account for all meters in a specific building. ▪ If so, determine whether such data can be provided to building owners without explicit authorization from individual tenants (see section on customer privacy below). ▪ If not, encourage the utility to develop a plan for mapping existing meters to specific buildings. Ensure that this information is being tracked in order to better target future demand-side management efforts.
Complete usage data for all fuel types is required to correctly benchmark a building.	• If there are multiple utilities serving a given jurisdiction, encourage and facilitate discussion of coordinated approaches to provide customers with enhanced data access. • Consider whether a third-party provider might be able to develop a single data access solution for multiple utilities in a given service territory.
Additional information besides energy consumption will be required to benchmark a building.	• Encourage utilities to develop a plan for educating customers on the entire benchmarking process, including the input of data by the end user. Customers should clearly understand their responsibility for data entry versus the information that will be provided by the utility.

Introduction

Utilities will face key technical implementation considerations in deploying their selected approach. The goal of this section is to help regulators understand that the time frame, level of effort, and ultimate cost required to implement a data access solution will depend on the complexity of the solution chosen as well as the existing capabilities of a utility's data systems and current customer interfaces.

Integration with Existing Systems

Before implementing any data access solution, a utility will need to determine how this function can and should interact with existing databases and interfaces. For example, a 2009 study that examined the early experiences of California investor-owned utilities (IOUs) with the implementation of Portfolio Manager Web services (previously known as automated benchmarking, or ABS) found that

> [o]ne of the largest technical hurdles is determining how to access the data from the utility Customer Information System (CIS). The staff designing a utility's ABS needs to understand the structure of the database and the protocols for accessing the data. In most cases, the more difficult and expensive approach is connecting directly to a utility's enterprise CIS. ABS involves more than just reporting from a utility CIS …. In fact, ABS requires that a utility not only pull customer data, but also store some of the values returned from ABS. This type of transactional process may not be ideal for the typical CIS architecture and can provide greater challenges for a legacy CIS.

A better setup is for a utility to have a separate data warehouse where usage data is replicated on a daily basis to support utility programs including demand side management efforts. This infrastructure allows a utility to build ABS without adding additional requirements to the enterprise CIS. To effectively address this issue, a utility will want to make a thorough upfront comparison of its specific infrastructure and the ABS Web services to plan the data access approach.[57]

In fact, as discussed in the 2008 National Action Plan report,

> [Pacific Gas and Electric Company (PG&E)] created a localized data warehouse outside its enterprise CIS to support the numerous and evolving needs of its energy efficiency programs [including automated benchmarking]. This warehouse helps PG&E quickly add products and services to its program portfolio without having to wait for resources and development windows in the scheduled release cycles of their enterprise CIS. This dedicated data management environment does incur separate ongoing operation and maintenance costs, but those costs are minimal compared to the costs of continually altering the enterprise-level system to meet new program requirements.[58]

Different data access solutions may rely upon different utility data systems. The integration of Portfolio Manager Web services will focus on monthly billing data, and therefore will need to interact with data from a utility's customer information system (CIS). But if a utility wants to provide customers with interval data in the Green Button format, it may need to pull data from systems further downstream (such as a meter data management system). This distinction is important, especially if a utility is seeking to pursue multiple approaches (e.g., Portfolio Manager Web services and Green Button). However, it is very feasible to aggregate data from an interval format to a monthly format. Also, from the standpoint of utility information management, it may be beneficial to express energy usage data in a standard format across systems.

In some cases, it may be possible to build out a data access solution in coordination with existing functions. For example, many utilities already have, or may be planning to implement, a "My Utility Account" interface (or similar function), through which commercial customers can access their bills and pay online. These utilities may wish to explore whether this is an appropriate platform through which to provide commercial customers with the data needed for benchmarking, and/or exchange data with Portfolio Manager using Web services. Likewise, an interface that is already being used to provide energy usage data in any time interval (hourly or monthly) to large commercial customers may be a suitable point of integration for a commercial Green Button implementation.

The best opportunities for implementing data access solutions may be situations where utilities are currently pursuing a wholesale upgrade to their data systems as part of a smart grid or advanced metering infrastructure (AMI) initiative. The funding provided by American Recovery and Reinvestment Act grants supported deployment of millions of advanced meters and related smart grid infrastructure nationwide. Combined with ongoing state-based smart grid and AMI efforts, this is driving major data system overhauls in many states, and thus provides a significant opportunity to incorporate data access solutions into utilities' planning and regulators' review processes. It is almost certainly easier to build Portfolio Manager Web services or Green Button functionality into a system that is being comprehensively revamped or designed from the ground up instead of building out this

[57] Analysis was conducted on the costs experienced by the California utilities in implementing ABS. ICF International. (2009). *California's Automated Benchmarking System Cost Summary*. Accessed May 1, 2013: www.h-m-g.com/downloads/energybenchmarking/For%20Utilities/CA%20ABS%20Cost%20Summary%207-7-09.pdf.

[58] National Action Plan for Energy Efficiency. (2008). *Utility Best Practices Guidance for Providing Business Customers with Energy Use and Cost Data*. Accessed May 1, 2013: www.epa.gov/cleanenergy/documents/suca/utility_data_guidance.pdf. Citation from pp. 4–5.

function later as an incremental add-on. Given the sheer size of these larger data system upgrade projects, the effort needed to incorporate a data access solution to facilitate commercial building benchmarking may be comparatively small, and much easier to integrate as part of an overall user requirements plan.

Above all, it is critical that utilities plan their data access solutions with an eye toward the future. In designing the initial implementation of a data access solution, it is important to consider system scalability and the ease of subsequent maintenance and enhancements. Especially in the context of regulatory mandates that call upon utilities to deliver benchmarking data to customers, utilities may be tempted to build out only the minimum functionality required to achieve compliance. However, if subsequent customer demand for benchmarking and other energy data applications requires further system upgrades, or even a complete redesign of the system, then the limited scope of the initial build may prove to be shortsighted (and, ultimately, more costly). For example, Puget Sound Energy (PSE) reported that its initial implementation of Portfolio Manager Web services was carried out with an emphasis on speed and a primary focus on meeting the demands of the Washington State benchmarking mandate. Because of this, customers connecting to PSE via Web services received only a one-time download of 24 months of energy usage data. If customers wanted to receive further data in the future (in order to continue benchmarking), they would need to repeat the request and authorization process. Over time, however, the most frequent request that PSE received from its customers was the desire for a subscription service whereby customers could receive usage data on an ongoing basis. Although this capability existed within the suite of Portfolio Manager Web services, it was too difficult for PSE to make this change in the first version of its system. In redesigning its Web services for the 2013 Portfolio Manager upgrade, however, PSE sought to implement this functionality as a means for driving further usability for customers.[59]

Mapping Meters to Buildings

The intended unit of analysis for benchmarking is an entire building. In order to obtain an accurate benchmarking result, it is necessary to account for the gross square footage of the structure as well as all energy consumed in the operation of the building (including all fuel sources). This level of focus, however, is different from the manner in which utilities typically collect and store consumption data. For utilities, the most common unit of analysis is the customer account, which is the level at which billing occurs. There may be one or more meters associated with a given account, and in multi-tenant offices and multifamily residences, there may be multiple accounts in a given building. Especially in the context of providing aggregated whole-building consumption data (discussed earlier as a potential means to facilitate benchmarking activity), a utility needs to be able to map individual meters to a given building in order to ensure that all energy usage is being accounted for.

ComEd's EUDS tool is an example of one system that is capable of identifying all meters in a building based on the building's street address. However, not all utility data systems are set up to perform this kind of mapping. The ability to query a billing system at a level higher than the customer account depends on the extent to which the meter-to-building associations have been systematically established. Different utilities employ different identifiers, such as service address, building ID, premise ID, tax lot, or other such designations. This introduces complexity in that a given building (e.g., one located on the corner of a city block) could be associated with more than one service address. Similarly, a premise ID or tax lot could be used to designate multiple structures that are co-located (but which need to be defined in a benchmarking tool as separate buildings). Further complicating the issue is that frequently these higher level identifiers are manually input into the customer's billing account by field technicians, introducing the possibility of data entry errors.[60] Finally, given the turnover in multi-tenant office and multifamily properties, meters may go in and out of service as accounts are created or closed, making it more difficult to verify that all active meters and all energy usage have been accounted for in delivering this information to building

[59] EEB Hub Data Access Working Group meeting. (October 25, 2012). Meeting notes. Information at www.eebhub.org/policy-and-finance/regional-building-energy-data-management-working-group.

[60] Blockowicz, B. (26 November 2012). Personal conversation. San Diego Gas & Electric, San Diego, CA.

owners/managers for a given time period.[61] Some utilities will maintain active energy usage records in their CIS for accounts that have been closed, while others will not.[62]

What this means, therefore, is that some utilities may not currently be able to query their systems with a single service address or unique building ID number in order to identify and aggregate the consumption from all active meters at the building during a given time period. If utilities wish to adopt a data aggregation approach, they may need to carry out more complex programming to obtain the necessary data from their billing systems, and even then, automated data pulls may still require ongoing manual review by humans. The ComEd example demonstrates that the automation of data aggregation is possible, and can drastically reduce the amount of time needed to respond to customer requests for benchmarking data. However, regulators should be aware that the technical requirements for identifying, aggregating, and delivering data at the whole-building level may be significant drivers of project costs and timelines.

Additional Implementation Topics

There are a few additional items that warrant consideration during the planning and build-out of utility data access solutions. This is not an exhaustive list of implementation considerations, but rather is intended to reflect the impact that certain business processes can have on the ultimate effectiveness of a data access solution.

In-House Versus Outsourced Development

A key question with regard to the technical implementation of a data access solution is whether a utility will develop this function using internal information technology (IT) staff, or whether it will seek to contract with a third party to develop and maintain the system. Utility IT staff may have the most immediate knowledge of the core data systems that house customer usage information, but their availability may be limited due to other projects and priorities. For this reason, some utilities may determine that third-party IT contractors will be better able to deliver a focused effort in a limited time frame. This decision needs to be balanced against the risk of the utility becoming "locked in" to using the proprietary product of a specific vendor. If third parties are engaged, however, it will be necessary to clearly define their responsibilities regarding customer data privacy, and to establish contractual protocols for the handling of potentially sensitive energy usage information.[63]

Ensuring Complete Energy Usage Data

In jurisdictions that are served by multiple utilities (for instance, separate electric and gas companies), there is an added challenge in terms of coordinating data access efforts. Because benchmarking at the whole-building level requires accounting for all fuel sources, a complete data access solution should allow commercial customers to obtain this information with as little confusion or duplication of efforts as possible. This is not always feasible, however, especially because different utilities may develop different approaches based on their data systems and/or their interpretation of privacy regulations. In Seattle, for example, commercial building owners and

[61] One strategy to address this problem is to identify energy consumed at specific service points, which remain fixed, instead of tracking individual meters, which may be installed and uninstalled as tenants move in and out. Again, however, the ability to do this depends on the way in which the data structure has been established in the utility's CIS. Using this approach, it is still necessary to ensure that all service points within a given building can be identified and accounted for.

[62] See, in particular, question 12 from Consolidated Edison. (2011). *Aggregated Consumption Frequently Asked Questions*. Accessed May 1, 2013: www.coned.com/energyefficiency/PDF/FAQ's%20External%20(4-5-11).pdf. When Con Edison first implemented its data access solution, it could not pull data for accounts that had closed during the requested 24-month period because these had been archived upon account termination. Subsequent revisions to the tool had to be introduced to allow the system to capture all energy usage within a building during a given time frame.

[63] This should not be unduly burdensome because many utilities already rely on program implementation contractors, and share customer data as necessary for effective program implementation. With regard to customer data privacy, utility program implementation contractors are typically viewed as extensions of the utility itself provided that the contractor is held to privacy standards at least as strict as those under which the utility operates, and provided that the contractor only uses this information in order to carry out the primary purpose of energy efficiency program delivery. This topic is discussed at greater length in the SEE Action paper, *A Regulator's Privacy Guide to Third-Party Data Access for Energy Efficiency*: www1.eere.energy.gov/seeaction/pdfs/cib_regulator_privacy_guide.pdf.

managers must go through three separate authorization processes in order to obtain data from the local utilities (i.e., Puget Sound Energy, Seattle City Light, and Seattle Steam).

While a single, streamlined approach across multiple utilities may not always be feasible, regulators are encouraged to engage all utilities with overlapping service territories early on in the process of developing a data access solution in order to ensure that all parties are communicating with one another, with the goal of delivering the easiest possible customer experience. In terms of efficiency program delivery, there are numerous precedents for such joint implementation (e.g., ComEd and Nicor Gas co-deliver a significant number of programs in northern Illinois). And although there is not currently an example of two utilities coordinating to develop a single data access solution for jointly served customers, this could potentially be achieved through the use of a third-party implementer.

Helping Customers Successfully Complete the Benchmarking Process

Finally, successful implementation of the technical components of a data access solution may not, by itself, be sufficient to drive benchmarking activity among commercial customers. Energy usage data is only one component of the benchmarking process, which also requires users to input and maintain information about building operating characteristics. For this reason, commercial customers should recognize that they (the customers) have a role to play in the process, even though the utility is providing the energy usage data. To do this, utilities can develop training and other educational materials to help customers complete their elements of the benchmarking process. PG&E and Southern California Edison, in particular, have developed not just dedicated customer support Web pages to explain and support the benchmarking process, but also training to help customers carry out their required data entry tasks in coordination with the utilities' Portfolio Manager Web services.[64] It is important for regulators to recognize that these communications and education components, and their associated costs, should also be considered part of a data access solution.

[64] For example, see www.pge.com/benchmarking and https://www.sce.com/wps/portal/home/business/tools/benchmarking-how-do-i-compare.

Chapter 5: Enabling Benchmarking in Multi-Tenant Buildings While Protecting Customer Privacy

Table 5-1. Section at a Glance

Issue	Considerations for Regulators
Jurisdictions vary with regard to the legality of providing building owners with aggregated, whole-building energy data absent explicit tenant authorization.	• Ensure that all existing statutes, regulations, and commission proceedings governing the privacy of customer data have been identified and reviewed. • If there is not established guidance governing the release of aggregated whole-building data without tenant authorization, convene a process for determining an appropriate threshold. This could entail a docketed hearing process and/or less formal working groups. • The threshold should specify the number of tenants in a building at or above which the utility can release aggregated whole-building usage data to owners, managers, and/or third parties without prior tenant authorization. • The threshold should also specify whether there is a limit on the size or proportion of energy consumption for any single tenant, above which tenant authorization must be provided • Work with stakeholders to arrive at the most appropriate threshold values.
Utilities will tend to act with caution regarding any issues that affect customer privacy.	• Provide clear, affirmative guidance to utilities regarding the release of tenant energy usage data to building owners, managers, and other third parties. In addition to a specific threshold for the release of aggregated whole-building data, the following elements should be considered: ▪ Consider allowing customers to provide automated, electronic authorization for data release. ▪ If owners have received data release approval from tenants as part of a prior lease agreement, consider allowing utilities to accept this in lieu of additional tenant authorization.

Introduction

The closely intertwined subjects of data access and data privacy have become increasingly prominent in the context of energy efficiency policy and programs. As advanced technologies make it possible for energy end users, energy providers, and authorized third parties to develop greater insight into the nature of energy usage at the building or even meter level, a concurrent conversation focuses on how to ensure that access to this information is controlled, and that appropriate levels of customer privacy and data security are maintained. This discussion is playing out across the country at both the federal and state levels, ranging from voluntary codes of conduct to formal standards, legislation, and orders from public utility commissions. For a more comprehensive discussion of these issues, the SEE Action Network Customer Information and Behavior Working Group has developed *A Regulator's Privacy Guide to Third-Party Data Access for Energy Efficiency*.[65]

Because this paper focuses on improving data access to facilitate commercial building benchmarking, it deliberately narrows the scope of the discussion surrounding privacy to address the issue of whether and how utilities can provide building owners with aggregated whole-building energy usage data in the absence of explicit authorization from individual tenants.

[65] State and Local Energy Efficiency Action Network. (2012). *A Regulator's Privacy Guide to Third-Party Data Access for Energy Efficiency*. Prepared by M. Dworkin, K. Johnson, D. Kreis, C. Rosser, J. Voegele, Vermont Law School; S. Weissman, University of California, Berkeley; and M. Billingsley, C. Goldman, Lawrence Berkeley National Laboratory. Accessed May 1, 2013: www1.eere.energy.gov/seeaction/pdfs/cib_regulator_privacy_guide.pdf.

The Data Access Challenge for Benchmarking Multi-Tenant Facilities

Benchmarking may not present significant data access or privacy issues for many buildings because a large portion of the buildings in any city are owner-occupied. Moreover, many multi-tenant office buildings and multifamily residential buildings have a single building meter managed by the owner, with expenses allocated to tenants by formula or by readings from owner or tenant submeter devices that are accessible to the building manager.

However, there is a significant barrier to benchmarking in multi-tenant buildings where multiple tenants (or residents) are metered directly by the utility. Because the owner/manager cannot properly benchmark the property without knowing the total amount of energy consumed within the building envelope, it is necessary to assemble energy usage data from each of the building's tenants. Furthermore, in order to continually benchmark the building (especially as the tenants change), it is necessary to develop a process whereby this tenant-level data can be obtained on an ongoing basis. The process of requesting, obtaining, monitoring, and renewing tenant data release authorizations via individually signed paper forms can quickly grow onerous, especially in large buildings that can have tens or even hundreds of distinct tenants. Manual entry of these disparate records into a benchmarking tool presents similar challenges. Furthermore, if not all tenants agree to release their data, then the benchmarking record will be incomplete and inaccurate. Given these requirements, it is little wonder that owners and managers of some directly metered tenant properties are hesitant, or even unable, to benchmark. In this age of electronic information, however, there are many approaches to reduce the difficulty and cost associated with such manual transactions. Electronic authorization processes, the incorporation of data release authorization into tenant lease documents, and other options can be explored as ways of addressing this challenge.

Whole-Building Aggregated Data as a Possible Solution

One proposed solution to the issue of data access in multi-tenant properties (including commercial offices and multifamily housing) is that utilities can provide building owners with aggregated energy usage data covering all tenant space and common space. In such cases, the data provided to the building owner or manager seeking to benchmark would be a single monthly sum of all energy consumed for the building, without providing any consumption information at the level of the individual tenant or resident. Because tenant anonymity is maintained, it is argued, there is no need for data release authorization by individual tenants/residents. And because whole-building benchmarking tools only require the user to input total building energy usage across all fuels, this approach delivers the necessary data for benchmarking.

NARUC has formally encouraged "state public utility commissions … to consider a comprehensive benchmarking policy that includes … taking all reasonable measures to facilitate convenient, electronic access to utility energy usage data for building owners, ***including aggregated building data that does not reveal customer-specific data to protect individual customer privacy***."[66] However, owing to the technical difficulties of providing whole-building aggregated data, as well as the potential for legal complications, this approach is not a universal solution. Furthermore, if commercial buildings in a given utility jurisdiction are predominantly master metered, then the need for data aggregation may not be a primary concern (although a utility could still benefit from offering a data access portal to customers to accomplish other objectives in addition to data aggregation). Nevertheless, because the topic of data aggregation is so prevalent in the discussion surrounding data access,[67] it bears special consideration.

Legal Uncertainties Regarding the Whole-Building Aggregated Data Approach

At this time, there is no consistency from state to state as to whether the release of whole-building aggregated data to a building owner or manager is considered a suitable safeguard for the privacy of individual

[66] National Association of Regulatory Utility Commissioners. (2011). *Resolution on Access to Whole-Building Energy Data and Automated Benchmarking*. Accessed May 1, 2013: www.naruc.org/Resolutions/Resolution%20on%20Access%20to%20Whole-Building%20Energy%20Data%20and%20automated%20Benchmarking.pdf.Emphasis added.

[67] Not only is this a key pillar of the NARUC resolution on data access, but it is also a key component of the platform advanced by the Data Access and Transparency Alliance. See www.energydataalliance.org/about-us.

tenants/residents. In particular, there is concern that, in some cases, aggregated data can be reverse-engineered to reveal the consumption behavior of tenants if there are only a few tenants in a building, and/or if one tenant occupies most of the space within a building. The issues are the same whether the utility releases the data to the building owner/manager for upload into a benchmarking tool, or directly into Portfolio Manager via Web services. Given this sensitivity, there is significant room for uncertainty and conflicting interpretations among legislators, regulators, utilities, and other stakeholders. The experience of California policymakers in designing and implementing Assembly Bill (AB) 1103 (the statewide commercial building benchmarking and disclosure law) in 2007 is particularly instructive, and points to the need for clear guidance from regulators regarding the appropriate balance of data access versus customer data privacy.

California's AB 1103 (and the superseding AB 531, from 2009) established that

> … upon the written authorization or secure electronic authorization of a nonresidential building owner or operator, an electric or gas utility shall upload all of the energy consumption data for the account specified for a building to the United States Environmental Protection Agency's ENERGY STAR Portfolio Manager in a manner that preserves the confidentiality of the customer.[68]

The final implementing regulations for AB 1103/531 (February 2013) further clarified that "[i]f a building has a utility or energy provider account for which the owner is not the customer of record, the utility or energy provider shall aggregate or use other means to reasonably protect the confidentiality of the customer."[69]

While implementing regulations for AB 1103/531 were being worked out, California Senate Bill (SB) 1476 (2010) established more specific responsibilities for the electric and gas utilities with regard to data release to third parties. In particular, the bill stated that "nothing…shall preclude an electrical corporation or gas corporation from using customer aggregated electrical or gas consumption data for analysis, reporting, or program management if all information has been removed regarding the individual identity of a customer."[70] Furthermore,

> [n]othing in this section shall preclude an electrical corporation or gas corporation from disclosing a customer's electrical or gas consumption data to a third party for system, grid, or operational needs, or the implementation of demand response, energy management, or energy efficiency programs, provided that, for contracts entered into after January 1, 2011, the utility has required by contract that the third party implement and maintain reasonable security procedures and practices appropriate to the nature of the information ….[71]

And finally,

> [n]othing in this section shall preclude an electrical corporation or gas corporation from disclosing electrical or gas consumption data as required or permitted under state or federal law or by an order of the commission.[72]

In seeking to implement the provisions of SB 1476, the California Public Utilities Commission (CPUC) adopted a rule to protect the privacy and security of customer data, which was intended to be consistent with the Federal Trade Commission's Fair Information Practice Principles.[73] With regard to the ability of utilities to provide aggregated energy usage data, the CPUC ruled that:

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[68] California Assembly. (1999). Section 1(b) of *California Assembly Bill 531*. AB 531. Accessed May 1, 2013: www.leginfo.ca.gov/pub/09-10/bill/asm/ab_0501-0550/ab_531_bill_20091011_chaptered.pdf.

[69] California Energy Commission. (2013). *Adopted Regulations: Nonresidential Building Energy Use Disclosure Program*. CEC-400-2010-004-CMF. Accessed May 1, 2013: www.energy.ca.gov/2010publications/CEC-400-2010-004/CEC-400-2010-004-CMF.pdf. Citation from p. 4.

[70] State of California. (2010). "Bill Number: SB 1476 Chaptered."*California Public Utilities Code.* Division 4.1, Chapter 5, §8380(e)(1). Accessed May 1, 2013: www.leginfo.ca.gov/pub/09-10/bill/sen/sb_1451-1500/sb_1476_bill_20100929_chaptered.html.

[71] Ibid at §8380(e)(2).

[72] Ibid at §8380(e)(3).

[73] "Fair Information Practice Principles." (Undated). Federal Trade Commission. Accessed May 1, 2013: www.ftc.gov/reports/privacy3/fairinfo.shtm.

> [c]overed entities shall permit the use of aggregated usage data that is removed of all personally identifiable information to be used for analysis, reporting or program management provided that the release of that data does not disclose or reveal specific customer information because of the size of the group, rate classification, or nature of the information.[74]

Notably, however, neither the AB 1103/531 implementing regulations, nor SB 1476, nor the CPUC rule specified any threshold for determining when data have been sufficiently aggregated to ensure the protection of individual customer privacy. This led to uncertainty on the part of the California investor-owned utilities (IOUs) as to whether and when whole-building aggregated data can be released without explicit tenant authorization. Given the extent to which data privacy is, and will continue to be, a critical issue, the California IOUs sought to ensure that any release of aggregated data to third parties (such as building owners or Portfolio Manager) would not expose them to liability for violations of customer privacy. In the absence of specific CPUC guidance establishing when whole-building data aggregation is allowable without explicit tenant authorization, some IOUs have fallen back on the more conservative (but potentially less convenient) approach of requiring explicit customer authorization for any release of data to a building owner/manager and/or Portfolio Manager.[75]

One suggested threshold for data aggregation can be seen in California's "15/15 Rule." According to this rule, "any aggregated information provided by the Utilities [without the permission of individual customers] must be made up of at least 15 customers and a single customer's load must be less than 15 percent of an assigned category."[76] However, the CPUC has noted that the 15/15 rule "was adopted in the context of availability of data for Direct Access [in 1997]" and that there has been "no showing as to why a standard used in the context of retail choice should be a requirement in making aggregated data available to third parties that will use the data 'for analysis, reporting or program management ….'"[77] The applicability of the 15/15 rule is particularly relevant because this approach is currently being applied elsewhere,[78] as are other similar threshold-based limitations guiding the allowance of data aggregation (see Table 5-2).

Regardless of the specific threshold selected by a given city, state, or utility jurisdiction, it is important that this figure be determined in light of the pros and cons of different thresholds. Tradeoffs include hindering customer data access (if the threshold is set too high), and compromising customer data privacy (if the threshold is set too low). Utilities and their regulators should seek to establish a threshold that is reasonable given the specific outcomes sought and the overall approach to privacy in that state; the examples cited above can be used to inform their deliberations.

Table 5-2. Examples of Data Aggregation Thresholds

Utility	Threshold for Data Aggregation
Austin Energy (Austin, Texas)	4 or more separately metered tenants
ComEd (Northern Illinois)	4 or more separately metered tenants
Pepco (Washington, D.C.)	5 or more separately metered tenants
Puget Sound Energy (Seattle, Washington)	5 or more separately metered tenants

[74] California Public Utilities Commission. (2011). *Decision Adopting Rules To Protect The Privacy And Security Of The Electricity Usage Data Of The Customers Of Pacific Gas And Electric Company, Southern California Edison Company, And San Diego Gas & Electric Company.* Decision 11-07-056. Accessed May 1, 2013: http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/140369.PDF. Citation from p. 87.

[75] It is worth noting, however, that utilities like PG&E are exploring mechanisms to facilitate the collection of tenant data release authorizations through online (electronic) means. This represents an improvement over paper-based authorization, and may potentially facilitate the release of data by individual tenants to building owners and managers, thus speeding up the benchmarking process.

[76] Pacific Gas & Electric. (2012). *Electric Schedule E-CCAINFO: Information Release to Community Choice Providers.* Accessed May 1, 2013: www.pge.com/tariffs/tm2/pdf/ELEC_SCHEDS_E-CCAINFO.pdf (see Special Condition 2).

[77] California Public Utility Commission. (2012). "Resolution." Resolution E-4535. Accessed May 1, 2013: http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M028/K609/28609033.PDF. Citation from footnote 38.

[78] Colorado has also adopted an identical provision in its state regulations. See 4 Code of Colorado Regulations (CCR) 723-3. Part 3: Rules Regulating Electric Utilities and Steam Utilities, §3031(b)(c).

Summary

While this section has focused primarily on the experience of a single state, it provides a clear illustration of the complicated "privacy landscape" that regulators will need to navigate in the context of a large-scale benchmarking policy or program—especially one that will seek to encourage and facilitate the benchmarking of multi-tenant properties. Notably, even when regulators strive to harmonize directives with concurrent privacy legislation, affected utilities may be hesitant to move ahead with the unilateral release of aggregated data if they are not certain that they have sufficient legal coverage to do so. In the case of California, this lack of certainty led to significant delays in the implementation of AB 1103/531. This suggests, therefore, that regulators should strive to ensure clear and affirmative guidance dictating the utilities' responsibilities with regard to customer data privacy and that specific state legislation regarding liability may be needed. This would likely take the form of specific language stating the approaches, such as data aggregation, that utilities are allowed to undertake for the purposes of transmitting data to facilitate benchmarking. Furthermore, there must be consistent interpretation of this guidance on the part of the affected utilities and all other relevant stakeholders.

Chapter 6: Options for Cost Recovery

Table 6-1. Section at a Glance

Issue	Considerations for Regulators
A strict focus on first cost during the implementation of a data access solution may result in more costly upgrades down the line.	• Emphasize lifetime (ongoing) costs versus first cost when considering the cost-effectiveness of a utility's proposed data access solution. • Consider undertaking a commission study to demonstrate how a data access offering and subsequent benchmarking activity by customers will promote customer energy efficiency, lower energy bills, and drive greater participation across a portfolio of commercial energy efficiency programs.
Multiple cost-recovery options may be appropriate for the provision of data access to commercial customers.	• Determine whether data access efforts to drive benchmarking are subject to the same cost-effectiveness testing as resource acquisition measures or whether they can be treated as "non-resource" activities, such as customer service, education, marketing, and so forth. • Assess whether the potential system benefits of data access and benchmarking warrant cost recovery through base rate adjustment. • Consider whether a fee-for-service approach is preferable to either rate-based or expensed cost recovery. • If shareholder incentives exist for utility efficiency programs, determine whether the costs incurred for data access solutions will be subject to those incentives.
Utilities seek assurance that they will be able to recover costs related to data access solutions.	• Any guidance or limitations on allowable costs for data access efforts should be communicated clearly and in a timely manner, to the extent allowed by a state's regulatory framework, so that the utility can design and implement a solution that best meets utility, customer, and ratepayer needs. • Work to engage stakeholders as early in the process as possible to address their needs/concerns and thereby mitigate the possibility of prudence challenge and/or cost disallowance. If regulators have already approved another large-scale IT infrastructure upgrade (e.g., advanced metering infrastructure [AMI] or smart grid efforts), consider allowing data access solution costs to be incurred under these efforts.

Introduction

Considerations related to the implementation of data access solutions to drive commercial building benchmarking will require decisions to be made by utilities, and each of those decisions will impact the costs incurred in developing the resulting customer solution. Ultimately, these costs will need to be approved by regulators. This section discusses various cost-recovery approaches that can be used for data access initiatives, as well as how the selection of these approaches can impact the ultimate delivery of enhanced data access to commercial customers.

Typical Costs Expected for Implementing Data Access Solutions

Detailed descriptions of the costs that utilities incur to provide a data access solution are difficult to parse out from other costs and even harder to compare based on differing situations and solutions. Based on the array of implementation options, as well as the variation in utilities' IT systems, no two data access solutions will be exactly alike, and the notion of a single "indicative cost" would be misleading. However, various estimates do exist:

- Interviews conducted in 2009 with California utilities "revealed that project costs [for implementing Portfolio Manager Web services ranged] from $50,000 to $310,000 and that certain project components [i.e., access to CIS data, system design, and customer data confidentiality] play[ed] a key role in determining these costs." Furthermore, it was noted that "these cost ranges represent limited experience

with four large utilities. Other smaller utilities or even large utilities with different IT infrastructure challenges could potentially experience costs higher than those of California utilities."[79]

- In a presentation to the Energy Efficient Buildings (EEB) Hub in Philadelphia in October 2012, a representative from Puget Sound Energy (PSE) stated that the initial build-out of PSE's Portfolio Manager Web services solution cost roughly $400,000 to $500,000, and that a pending system upgrade (to align with EPA's forthcoming redesign of the Web services system architecture) would cost about the same amount. At the same meeting, a representative from ComEd stated that the initial build-out of the EUDS system cost about $300,000, with an ongoing licensing and maintenance cost of about $75,000 per year (because the system was built and is maintained by a third party).[80]

It is important to note that the costs cited above are related to the implementation of the first generation of Web services offered by EPA. After more than five years in the marketplace, and with more solutions being provided by an ever-growing number of vendors, it is expected that the cost to implement Portfolio Manager Web services will drive costs down. When an upgraded suite of Portfolio Manager Web services goes into effect in July 2013, it is expected that implementation of this new functionality will cost the same or less than the prior system, and that ongoing maintenance costs of the new system will be significantly lower.

Comparable cost estimates for the implementation of Green Button services are not publicly available, and are usually captured as a small component of a larger smart meter or IT investment. The cost of Green Button implementation can vary, although so far, utilities have not indicated that implementation of Green Button Download My Data is cost-prohibitive. Costs may be affected by a utility's decision to develop the function in-house versus working with a vendor that has already made Green Button a standard offering in their meter data management or Web presentation platforms.

Regardless of the specific path or paths chosen, the costs of implementing data access solutions should be compared with the expected benefits to customers and to the utility system as a whole. These benefits are defined differently in different states and utility service areas and can include:

- Increased customer awareness of energy use and costs
- Energy use reductions related to behavior change that is motivated by the feedback provided through data access
- Support for organization-wide energy management efforts
- Increased participation in and resource benefits from ratepayer-funded efficiency programs
- Increased customer satisfaction.

Each regulatory body and its utilities will need to define how these benefits are identified and quantified.

Cost-Recovery Approaches

The fundamental question underlying utility cost recovery is whether an expense incurred by a utility provides (or is expected to provide) value to customers and to the system as a whole. Commercial customers have embraced, and even demanded, benchmarking services so as to better manage energy use and costs. Given this clear demand from utility customers and policymakers, providing commercial customers with the necessary data to benchmark their buildings appears, in many situations, to be a worthwhile activity, and one for which utilities should be able to recover reasonable and prudent costs.[81] The presence of a regulatory mandate, by itself, can compel utilities to

[79] ICF International. (2009). *California's Automated Benchmarking System Cost Summary*. Accessed May 1, 2013: www.h-m-g.com/downloads/energybenchmarking/For%20Utilities/CA%20ABS%20Cost%20Summary%207-7-09.pdf.

[80] EEB Hub Data Access Working Group meeting. (October 25, 2012). Meeting notes. Information at www.eebhub.org/policy-and-finance/regional-building-energy-data-management-working-group.

[81] If regulators in a given jurisdiction are not in agreement with this conclusion, then the success of a benchmarking initiative is likely to be affected.

develop data access systems (see, for example, Washington State and California), but an effective and timely means of recovering costs can be important to ensuring that utilities deliver effective solutions in a timely manner.

The 2008 National Action Plan report, *Utility Best Practices Guidance for Providing Business Customers with Energy Use and Cost Data*, provided a summary of the various approaches to cost recovery that might apply in the case of utility data access initiatives. These included:

- Recovery through efficiency program costs (either as a stand-alone efficiency program offering or as part of cross-program delivery costs)
- Recovery through base rates (bundled into revenue requirements as part of a rate case)
- Recovery through a fee-for-service approach (charging customers on a per-transaction basis).[82]

Recovery through Efficiency Program Costs

Utilities taking this approach might choose to treat data access efforts as a cross-program delivery cost, similar to marketing expenses. The costs, therefore, would be spread across a portfolio of programs, typically without a significant impact on the cost-effectiveness of any particular program. Furthermore, utilities that recover efficiency program costs through line-item fees on monthly bills can choose to allocate these to the affected customer classes. For example, ComEd considers its EUDS program to be part of a general Market Transformation and Education cost pool for its commercial programs, and includes this cost as part of the surcharge paid by commercial customers (residential customers do not pay for EUDS because the system's functionality is limited to commercial buildings at this time).[83]

Currently, few (if any) utilities are treating data access solutions for commercial customers as stand-alone programs. The primary reason is that benchmarking (and, therefore, data access to support benchmarking) is considered a "non-resource" activity (i.e., it is not defined as an efficiency measure or program associated with specific and quantified resource benefits such as energy or capacity savings). The argument for this classification is that the act of benchmarking, by itself, cannot be said to save energy. Rather, it is the specific actions taken after benchmarking that deliver savings, and savings can be attributed to these measures via existing incentive channels. In this way, data access and the benchmarking activity that it facilitates can be seen as similar to other Market Transformation and Education activities, specifically as a means to drive customers into programs that do deliver direct energy or capacity savings.[84]

Benchmarking can serve as the basis for energy efficiency improvements and actual energy savings depending on the actions taken by building owners.. However, it is not yet clear whether this relationship is one of correlation or causation. Decisions by regulators to treat benchmarking and other information- and behavior-based approaches as resource acquisition programs would represent a departure from standard practice. However, movement in this direction (including the information- and behavior-based programs in the residential sector,[85] such as OPower's Home Energy Reports) is demonstrating measurable and verifiable savings, and is increasingly being adopted by utilities and approved by regulators as stand-alone programs.[86] Furthermore, NARUC has expressed support for "adopting methodologies to consistently and accurately credit program impact to benchmarking-driven energy efficiency programs."[87]

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[82] National Action Plan for Energy Efficiency. (2008). *Utility Best Practices Guidance for Providing Business Customers with Energy Use and Cost Data*. Accessed May 1, 2013: www.epa.gov/cleanenergy/documents/suca/utility_data_guidance.pdf. Citation from pp. 4-6 and 4-7.

[83] Bricknell, K. (29 November 2012). Personal conversation. Commonwealth Edison.

[84] See Chapter 2 of this report, which provides support for the assertion that benchmarking is directly enabling customers to undertake concrete energy efficiency measures.

[85] See, for example, American Council for an Energy-Efficient Economy. (2012). Ehrnhardt-Martinez, K.; Donnelly, K.A.; Laitner, J.A. *Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Saving Opportunities.* Report No. E105.

[86] "Results." (Undated). Opower. Accessed May 1, 2013: http://opower.com/utilities/results.

[87] National Association of Regulatory Utility Commissioners. (2011). *Resolution on Access to Whole-Building Energy Data and Automated Benchmarking*. Accessed May 1, 2013: www.naruc.org/Resolutions/Resolution%20on%20Access%20to%20Whole-Building%20Energy%20Data%20and%20automated%20Benchmarking.pdf.

To the extent that a program administrator already has (or has begun planning) an energy efficiency program portfolio, the inclusion of benchmarking-related data access as a cross-program cost is a convenient approach to cost recovery. However, some stakeholders may want to review the specific benefits, costs, and associated issues involved with data access solutions. Regulators will therefore need to balance such concerns based on the situation in their jurisdiction.

Recovery through Base Rates

We are not aware of specific examples of this cost recovery option, however recovery through base rates may become more broadly used as an emerging practice in jurisdictions with robust benchmarking programs. Incorporating costs for data access into base rates for commercial customers would require acknowledging data access as a basic or standard customer service offering (where the costs can be borne by all) instead of a specialized service (where the costs should be borne only by the customers that benefit). In general, this would require recognition by customers (and regulators) that even if the customer is not making use of these services, the customer will still benefit from the reduced system impact generated by others who are using the services, and who are undertaking energy reduction efforts as a result. These issues would typically need to be decided in the context of a full and formal rate case.

However, as discussed in the 2009 National Action Plan report, Discussion of Consumer Perspectives on Regulation of Energy Efficiency Investments,

> Energy efficiency programs and needs often change faster than most utility tasks …. [For this reason, some] customers favor adjusting the amount of energy efficiency costs in rates using a regulatory device called a rider. An energy efficiency rate rider is an additional charge above the approved base rates for utility service. It can be changed with fewer administrative requirements and less time than base rates, accommodating the changing nature of energy efficiency.[88]

Nevertheless, if benchmarking activity continues to grow as a result of data access services being provided via efficiency programs, it is conceivable that a case could be made for treating data access as a revenue requirement to be captured through base rates.[89]

Recovery through a Fee-for-Service Approach

Examples of this option include ComEd's approach prior to 2008 (charging $600 per building requesting aggregated whole-building data) and Con Edison's current approach (charging $102.50 per building requesting aggregated whole-building data). As noted in the 2008 National Action Plan report, "certain fees may be appropriate for customized or more complex services that serve the specific needs of a limited class of customers. Where providing basic data access is concerned, though, fees can be a barrier to achieving the widest use of enhanced data services by customers."[90] As such, the suitability of this approach may come down to a decision by regulators as to whether data access for benchmarking is a basic or an enhanced service. The experience of ComEd suggests the widespread applicability of data access services for commercial customers: the number of buildings accessing whole-building aggregated data as a means to benchmarking grew from fewer than 70 when the process was manual, to more than 3,000 once the EUDS service was made available to commercial customers without an explicit fee attached.

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[88] National Action Plan for Energy Efficiency. (2009). *Discussion of Consumer Perspectives on Regulation of Energy Efficiency Investments.* Accessed May 1, 2013: www.epa.gov/cleanenergy/documents/suca/consumer_perspectives.pdf. Citation from p. 5-5.

[89] A related issue is whether investment in a data access system should be expensed (as a cost) or capitalized (as an investment that otherwise would have been made to increase capacity). This decision impacts the timing of cost recovery and cash flow, as well as the magnitude and suddenness of changes that customers will see on their bills. For further discussion of this topic, see www.epa.gov/cleanenergy/documents/suca/consumer_perspectives.pdf and www.epa.gov/cleanenergy/documents/suca/incentives.pdf.

[90] National Action Plan for Energy Efficiency. (2008). *Utility Best Practices Guidance for Providing Business Customers with Energy Use and Cost Data*. Accessed May 1, 2013: www.epa.gov/cleanenergy/documents/suca/utility_data_guidance.pdf. Citation from p. 4-7.

Regulators also need to decide whether and how utility shareholders would be able to earn a return on such costs. Especially in a scenario where commercial customers are benchmarking under a state or local mandate, it may be seen as sound policy to limit the fee in such a way that it is revenue neutral (as in the case of Con Edison). However, it is up to regulators to determine what is appropriate and allowable, balancing the interests of utilities, ratepayers, and other stakeholders. To the extent that a fee-for-service model allows utilities to quickly and reliably recoup expenses incurred in delivering a data access solution, this can be a beneficial approach. But it is necessary to understand the appetite of the commercial customer base: if the presence of an up-front fee (instead of a rider or an invoice line item) is perceived as a burden or becomes a disincentive for customers to take advantage of data access solutions, then this approach could have the unintended consequence of hampering the policy that it is meant to enable.

Additional Considerations

- **Stakeholder engagement.** Regardless of the cost-recovery method selected, regulators, policymakers, ratepayers, and other stakeholders should understand why a utility has proposed a given data access solution, and how this will impact customers. Frequently, data access initiatives are included in regulatory filings without much discussion, and/or they are introduced during an ongoing program cycle. Regulators should feel comfortable with the approach taken and the expenses incurred, and should ensure that stakeholders are engaged during the process in order to avoid, or at least minimize, issues being raised and costs disallowed during a subsequent prudence review.
- **Other funding sources.** Some utilities may choose to pursue data access efforts in the larger context of their smart grid/AMI activities. In such cases, it may be possible for data access expenditures to be recovered through the specific mechanisms approved in the context of those proceedings.

Chapter 7: Summary of Key Issues and Considerations

In each of the preceding sections, specific issues have been presented for regulators to consider when reviewing utility proposals for providing data access solutions to commercial customers. They do not cover all decisions or issues that regulators may need to consider because there will undoubtedly be jurisdiction- and case-specific topics that are not anticipated here. However, these considerations provide a starting point for addressing many of the issues that will arise in the context of benchmarking.

Table 7-1. Summary of Key Issues and Considerations for Regulators

Topic	Issue	Considerations for Regulators
Current Options for Enhanced Data Access	Multiple options exist to provide commercial customers with energy usage data for benchmarking.	• Review three mechanisms providing enhanced data access for benchmarking ▪ Utility delivery of aggregated whole-building data ▪ Green Button ▪ Portfolio Manager Web services
	No single solution will address all customer barriers to data access.	• Understand that the three mechanisms discussed can be complementary, and that a complete data access solution may require a combination of these approaches. • Encourage utilities to consider how multiple data access functionalities can be developed to reduce barriers to customer data access.
Effectively Implementing Data Access Solutions	The functionality and usability of a utility's data access solution will affect customer experience, uptake, and resulting energy savings.	• Where utilities are required by legislative mandates to provide data access, encourage them to identify cost-effective ways to go beyond simple compliance in terms of system features and usability. • Encourage utilities to provide data access as an ongoing service (e.g., monthly, quarterly) rather than having customers request data each time it is needed and to demonstrate that they have accounted for ongoing system maintenance, scalability, and the opportunity for future enhancements to functionality.
	Utilities may be limited in their ability to undertake information technology (IT) projects that affect their customer information and billing systems.	• Encourage utilities to consider the use of a data warehouse to provide greater flexibility in system development, and to facilitate subsequent updates. • Where large-scale IT projects are planned or are underway (e.g., advanced metering infrastructure [AMI] or smart grid efforts), encourage utilities to incorporate development of a data access solution into the project scope.
	Utilities may have difficulty mapping specific meters to specific buildings, which can affect their ability to provide aggregated whole-building data.	• Determine whether existing utility IT systems can be queried to identify and account for all meters in a specific building. ▪ If so, determine whether such data can be provided to building owners without explicit authorization from individual tenants (see section on customer privacy below). ▪ If not, encourage the utility to develop a plan for mapping existing meters to specific buildings. Ensure that this information is being tracked in order to better target future demand-side management efforts.

Topic	Issue	Considerations for Regulators
Effectively Implementing Data Access Solutions (cont'd)	Complete usage data for all fuel types is required to correctly benchmark a building.	• If there are multiple utilities serving a given jurisdiction, encourage and facilitate discussion of coordinated approaches to provide customers with enhanced data access. • Consider whether a third-party provider might be able to develop a single data access solution for multiple utilities in a given service territory.
	Additional information besides energy consumption will be required to benchmark a building.	• Encourage utilities to develop a plan for educating customers on the entire benchmarking process, including the input of data by the end user. Customers should clearly understand their responsibility for data entry versus the information that will be provided by the utility.
Enabling Benchmarking in Multi-Tenant Buildings While Protecting Customer Privacy	Jurisdictions vary with regard to the legality of providing building owners with aggregated, whole-building energy data absent explicit tenant authorization.	• Ensure that all existing statutes, regulations, and commission proceedings governing the privacy of customer data have been identified and reviewed. • If there is not established guidance governing the release of aggregated whole-building data without tenant authorization, convene a process for determining an appropriate threshold. This could entail a docketed hearing process and/or less formal working groups. • The threshold should specify the number of tenants in a building at or above which the utility can release aggregated whole-building usage data to owners, managers, and/or third parties without prior tenant authorization. • The threshold should also specify whether there is a limit on the size or proportion of energy consumption for any single tenant, above which tenant authorization must be provided • Work with stakeholders to arrive at the most appropriate threshold values.
	Utilities will tend to act with caution regarding any issues that affect customer privacy.	• Provide clear, affirmative guidance to utilities regarding the release of tenant energy usage data to building owners, managers, and other third parties. In addition to a specific threshold for the release of aggregated whole-building data, the following elements should be considered: ▪ Consider allowing customers to provide automated, electronic authorization for data release. ▪ If owners have received data release approval from tenants as part of a prior lease agreement, consider allowing utilities to accept this in lieu of additional tenant authorization.
Options for Cost Recovery	A strict focus on first cost during the implementation of a data access solution may result in more costly upgrades down the line.	• Emphasize lifetime (ongoing) costs rather than first cost when considering the cost-effectiveness of a utility's proposed data access solution. • Consider undertaking a commission study to demonstrate how a data access offering, and subsequent benchmarking activity by customers, will promote customer energy efficiency, lower energy bills, and drive greater participation across a portfolio of commercial energy efficiency programs.

Topic	Issue	Considerations for Regulators
Options for Cost Recovery (cont'd)	Multiple cost-recovery options may be appropriate for the provision of data access to commercial customers.	• Determine whether data access efforts to drive benchmarking are subject to the same cost-effectiveness testing as resource acquisition measures, or whether they can be treated as "non-resource" activities, such as customer service, education, marketing, and so forth. • Assess whether the potential system benefits of data access and benchmarking warrant cost recovery through base rate adjustment. • Consider whether a fee-for-service approach is preferable to either rate-based or expensed cost recovery. • If shareholder incentives exist for utility efficiency programs, determine whether the costs incurred for data access solutions will be subject to those incentives.
	Utilities seek assurance that they will be able to recover costs related to data access solutions.	• Any guidance or limitations on allowable costs for data access efforts should be communicated clearly and in a timely manner, to the extent allowed by a state's regulatory framework, so that the utility can design and implement a solution that best meets utility, customer, and ratepayer needs. • Work to engage stakeholders as early in the process as possible to address their needs/concerns and thereby mitigate the possibility of prudence challenge and/or cost disallowance. If regulators have already approved another large-scale IT infrastructure upgrade (e.g., AMI or smart grid efforts), consider allowing data access solution costs to be incurred under these efforts.

For Further Reading

Readers interested in further information on regulatory proceedings related to customer data privacy, especially as it pertains to aggregated energy usage data, are encouraged to consult the following sources. Please note that this is an indicative, rather than exhaustive, list of resources:

- State and Local Energy Efficiency Action Network. (2012). *A Regulator's Privacy Guide to Third-Party Data Access* for *Energy Efficiency*. Prepared by M. Dworkin, K. Johnson, D. Kreis, C. Rosser, J. Voegele, Vermont Law School; S. Weissman, UC Berkeley; M. Billingsley, C. Goldman, Lawrence Berkeley National Laboratory. www1.eere.energy.gov/seeaction/pdfs/cib_regulator_privacy_guide.pdf.
- California Public Utility Commission. (September 2012). *Energy Data Center Briefing Paper.* www.cpuc.ca.gov/NR/rdonlyres/8B005D2C-9698-4F16-BB2B-D07E707DA676/0/EnergyDataCenterFinal.pdf.
- Minnesota Public Utilities Commission. (March 2012). Docket Number E,G002/M-12-188. See Xcel Energy's Petition for a Customer Data Access Tariff at https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId=%7BB9935C53-8004-4EC3-9F89-D6DE8DCF1C09%7D&documentTitle=20123-72239-01.
- Michigan Public Service Commission. (October 2012). Case No. U-17102. http://efile.mpsc.state.mi.us/efile/docs/17102/0001.pdf.
- New York State Public Service Commission. (August 2010). Case 09-E-0428. See Con Edison's Tariff on Aggregated Records at www.coned.com/energyefficiency/PDF/Tariff%20Filing%20(8-26-10).pdf.

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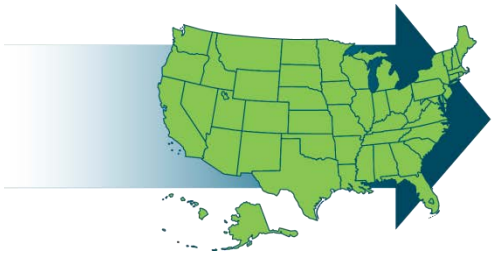

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