

# How States Can Ensure Data Access to Drive Energy and GHG Performance in Buildings

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## ABSTRACT

In recent years, there has been rapid growth in the number of policy and programmatic initiatives seeking to drive energy and GHG performance in commercial and multifamily buildings including benchmarking ordinances, building performance standards, voluntary competitions and challenges, and new utility program models.

At the root of all these efforts lies a need for streamlined access to accurate and complete data to measure and track energy and GHG performance at the whole-building level. To date, more than 50 utilities across the U.S. are offering solutions to help commercial customers obtain the whole-building energy consumption data needed to benchmark in ENERGY STAR Portfolio Manager. Increasingly, however, policymakers are recognizing the need for action at the state level to ensure that all building owners regardless of utility service territory have access to complete and accurate data. State action can close the many gaps where this data remains inaccessible, a particular issue for multi-tenanted buildings like offices and multifamily housing that prevents their ability to participate in and comply with new initiatives and more broadly to benchmark and understand performance at a whole-building level.

This paper will explore recent and forthcoming efforts to systematize the process for data access with a focus on best practices and key considerations that should be addressed by enabling policies, including the value proposition for utilities. In addition, we will explore how the specific use case of data access for whole-building benchmarking is expected to coexist and interact with other data access use cases, and how concurrent initiatives like Green Button, UBID, and the New York State IEDR may inform these discussions.

## Introduction

This paper defines what aggregated whole-building utility data access is, demonstrates the benefits of solutions that provide it including those flowing to specific stakeholders, reviews key considerations for the development of solutions, argues that states have a unique ability to advance data access, and connects aggregated whole-building utility data access with other emerging topics.

## What is Aggregated Whole-Building Utility Data Access?

The term “utility data access” can mean many things to many audiences – from 15-minute interval demand data to aggregated consumption data at the ZIP code or census tract level. This paper will focus on the specific need for aggregated whole-building energy consumption data to benchmark building energy performance in the U.S. Environmental

Protection Agency's (EPA) ENERGY STAR® Portfolio Manager® tool. Whether driven by mandates (e.g., local/state benchmarking ordinances; building performance standards), or by voluntary initiatives (e.g., benchmarking competitions; local government “lead by example” efforts), the number of benchmarked buildings continues to grow year over year, and so too the need for streamlined access to the energy data required by the tool.

As a whole-building benchmarking tool, Portfolio Manager directs users to account for the total consumption of all fuels consumed in the operation of a building or property, regardless of how this consumption may be allocated to specific systems or tenants within the building. For many commercial building types, gathering these consumption data can be straightforward; however, in certain multi-tenant scenarios (e.g., multi-tenant office; multifamily housing; certain retail and warehouse configurations), the process of obtaining complete whole-building consumption data can be a significant barrier to benchmarking. In these cases, the entity seeking to benchmark—whether voluntarily or in compliance with a mandate—is likely to be the building owner or manager. However, if individual tenants or residents are the utility account holders—a common scenario—then the building owner/manager may lack a clear path to accessing their consumption data, particularly in large buildings where requesting and gaining access across tens or even hundreds of tenants may represent a herculean burden.

In recent years, more than 50 utilities across the country have created solutions to provide aggregated whole-building consumption data as a means of overcoming this barrier to benchmarking. Typically, these utilities apply a “threshold” number of tenants (or meters, or utility accounts), at or above which the aggregated total consumption for a given period is no longer considered individual customer data, and therefore can be released to the building owner or manager upon request, without the need for tenant-level authorization. In doing so, these utilities can fulfill their customer data privacy obligations, while also facilitating access to the data needed by building owners and managers to accurately benchmark the energy performance of their properties—a true need in the more than 40 local and state jurisdictions in the U.S. with benchmarking or building performance standard requirements.

In order to provide aggregate whole-building data to the requestor, utilities typically use one of two options: delivery of data via spreadsheet (in which case the recipient must re-enter or upload the data into Portfolio Manager); or delivery of data directly into the requestor's Portfolio Manager account via application programming interface (API or “web services”). As discussed further below, the use of web services typically provides the greatest value to both the utility and the requestor. As of today, more than three-quarters of all utilities offering aggregate whole-building data are using the Portfolio Manager web services API. Historically, there have also been utilities that have begun by providing data via spreadsheet and have subsequently upgraded their system to leverage web services.

## **The Case for Aggregated Whole-Building Data Access Solutions**

The benefits of whole-building aggregated data access accrue to multiple stakeholders, including the building owners/managers who request it; the utilities that provide it; and the state and local jurisdictions whose voluntary initiatives and/or mandatory requirements help drive the demand for benchmarking and performance information.

## **Benefits to Building Owners**

The availability of aggregated data promises greater potential for owners and managers to reduce the energy use, GHG emissions, and energy costs of their multi-tenanted buildings, by enabling them to understand performance and focus improvement efforts where they are needed most—a value that only increases for large portfolio holders. Indeed, access to this data can be a deciding factor as to whether owners and managers of multi-tenant properties are able to benchmark their buildings and thereby understand their performance. This access benefits owners of all types of tenanted buildings, including building types and sectors that tend to be lower resourced where tenants pay bills directly including non-covenanted affordable housing. There are multiple reasons why an organization might benchmark its buildings, such as voluntary commitments, investor-driven requirements, and state and local laws. With the latter, streamlined access to data may help by making compliance easier and more possible. Building owners and managers – even in the absence of mandates – may be more inclined to pursue benchmarking as an energy management best practice if the data they need are readily available, also increasing their likelihood of improving performance. This benefit is further amplified where utilities are using Portfolio Manager web services to deliver data to requestors, since aggregate consumption data can be delivered on a recurring monthly basis, minimizing the effort needed from the owner to benchmark.

## **Benefits to Utilities**

Where utility territories overlap with jurisdictions that have mandated benchmarking, the most immediate benefit to providing whole-building data access has to do with customer satisfaction. Building owners and managers required to benchmark can be expected to seek out resources that will make reporting easier – and when it comes to collecting energy consumption data, their first call will be to their utility. The availability of a streamlined data access solution can meet this need. Beyond this, however, benchmarking presents a valuable opportunity for utilities to engage with their customers at a more strategic level. Utilities making use of the Portfolio Manager web services API can not only push data to their customers' buildings, but also to see how these buildings are performing. This “two-way” flow of data enables utilities to more proactively identify buildings that can benefit from energy savings measures – positioning the utility as a trusted solution provider, while also improving the utility's ability to target and direct program resources towards the buildings with the greatest potential for savings.

## **Benefits to State and Local Governments**

When utility data access solutions are in place, state and local governments with voluntary and mandatory benchmarking and improvement initiatives benefit through the inclusion of multi-tenanted buildings. Altogether, these buildings often constitute a significant wedge of energy consumption and GHG emissions in most jurisdictions, particularly through property types like Office buildings and Multifamily Housing. Without solutions in place, the energy and GHG reductions that any initiatives can achieve will be constrained, given that most multi-tenanted buildings would be unable to participate or comply. As such, the development of utility data access solutions benefits state and local governments through the potential for achieving deeper energy use and GHG emissions reductions. The solutions also open the possibility for jurisdictions to obtain more complete views of their building stock – information

that can be used to inform the development of future programs and policies. States that require their utilities to provide whole-building data access solutions can benefit indirectly by supporting building owners that seek access to this information, local governments that hope to advance benchmarking and improvement initiatives of their own, and even the utilities being regulated, provided the state requirements create standardization, support for the development of solutions, and cost recovery mechanisms.

### **Benefits to Tenants**

With owners and managers of tenanted buildings having greater access to whole-building data, there is greater likelihood that owners will benchmark to understand performance and move forward with efforts to improve lower-performing buildings. Decarbonization improvements such as greater energy efficiency, fuel switching, and onsite solar tend to carry co-benefits such as operational and energy cost savings, improved indoor air quality, improved thermal comfort, improved asset values, and others. Many of these co-benefits extend beyond the owner and common areas to building tenants and their spaces. Additionally, access to whole-building performance data opens the possibility for voluntary and mandatory disclosure of average energy use to potential tenants or the public. This information can help prospective tenants—such as those comparing non-covenanted affordable housing buildings—to make more informed decisions, factoring in anticipated energy burdens and even using the data as a proxy for how well-managed different buildings are.

## **Key Considerations for Providing Aggregate Whole-Building Data**

The experience to date across utilities offering aggregate whole-building data solutions points to some common challenges and associated key considerations.

### **Cost Recovery**

Utilities considering data access solutions will also need to understand whether and how they will be able to recoup the costs of developing and deploying these solutions. In most cases to date, utilities have built their data access offerings in response to local government benchmarking mandates. While critical from a customer service perspective, it is often unclear how a utility would recover the costs incurred to develop, implement, and maintain a data access solution for customers, absent their public utility commission providing clear information around this. Given this uncertainty, utilities may choose to focus their solutions on a set of minimum requirements (i.e., providing data for benchmarking), as opposed to pursuing a deployment that would more fully integrate data access and benchmarking into DSM program offerings (e.g., integration with a customer engagement platform). Greater clarity regarding cost recovery, including recognition of benchmarking as an enabling factor for achieving energy and greenhouse gas reductions, may result in utilities' willingness and ability to pursue more comprehensive data access solutions that can drive greater value for customers and utilities alike. One benefit of state-led requirements for utility data access is that they may require or encourage public utility commissions to establish clear cost recovery pathways for utility data access.

## Data Privacy

As discussed above, several utilities have successfully used aggregation thresholds to determine a number of tenants/meters/accounts above which any single tenant's energy consumption cannot be isolated from an aggregated value, ensuring privacy. Attainment of this threshold allows the utility to release aggregate whole-building data to the building owner or manager upon request, without requiring tenant-level authorization. While aggregation thresholds vary from utility to utility, they tend to cluster in the range of three to five tenants/meters/account, with four (4) tenants/meters/accounts as the most common threshold used across the country.

A common question among utilities developing data access solutions is how to set this threshold. In many cases, individual utilities have determined this on their own, in consultation with their legal and regulatory teams. However, some investor-owned utilities (IOUs) have been reluctant to take this step without explicit guidance from their public utility commission (to resolve any perceived or potential conflicts with existing statewide data privacy requirements). For this reason, there are some states in which the determination of aggregation thresholds has been the subject of public utility commission proceedings.<sup>1</sup> These proceedings can offer greater opportunities for stakeholder involvement, but can also add time and complexity to the process. Alternatively, a growing number of states (including CA, CO, WA, and NJ) have sought to define the aggregation threshold through state-level legislation – which offers utilities the “bright-line” guidance they seek, while bypassing the need for a lengthy PUC proceeding. In these cases, the relevant legislation may specify that aggregated whole-building energy consumption data is no longer considered “private” or “sensitive,” and is therefore no longer subject to the same data privacy restrictions as tenant-level data.

## Technical Implementation

Whether a utility delivers aggregate whole-building data to requestors via spreadsheet or via the Portfolio Manager web services API, several technical implementation considerations will need to be addressed. Perhaps the most significant of these will be the process by which utilities identify the individual meters at a given property that must “roll up” to the aggregate consumption total (i.e., “meter-to-building mapping”). Historically, utility data systems have been focused at the meter and/or account levels, as this is where billing takes place. Therefore, with few exceptions, utilities do not have a clear concept of the “building” as a unit of measurement, and there is not a single, unambiguous “key” that utilities can use to identify all meters located at a designated geographical location. In practice, this means that meter-to-building mapping for the aggregation of whole-building consumption data is both an art and a science, with approaches that differ from utility to utility based on their existing database structure and whether individual meters are geolocated (a functionality that may be available where utilities have pursued Advanced Metering Infrastructure (AMI) for commercial buildings). Furthermore, this means that utilities must develop processes that allow for a back-and-forth dialogue with the data requestor in order to ensure that the constituent meters/accounts have been correctly identified prior to aggregation, and that this mapping is kept up to date over time. This process has direct implications for the accuracy of the data that are provided to the building

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<sup>1</sup> See, for instance, Colorado Public Utilities Commission Proceeding No. 14R-0394EG, Minnesota Public Utilities Commission Dockets 12-344 and 19-505, and New Jersey Board of Public Utilities Docket QO21071023.

owner or manager, including for any downstream uses including benchmarking, improvement efforts informed by the results, and reporting to local and state governments under any voluntary or mandatory initiatives.

For utilities that opt to deliver aggregate whole-building data to requestors using the Portfolio Manager web services, there will be additional technical requirements associated with API integration, which can translate into increased development costs. In recent years, however, a growing number of utilities have successfully outsourced the development of web services-enabled data access offerings to third-party vendors, which can reduce the timeline and complexity of deployment compared to development by an in-house IT team. In-house solutions will likely result in higher up-front development costs, followed by ongoing annual costs for system maintenance, customer service, and so on. Vendor solutions, on the other hand, may be more aligned with “software-as-a-service” approaches, which limit up-front costs but entail annual costs associated with subscription and/or throughput, and may also include customer support.

In addition to considerations around meter-to-building mapping and API integration, utilities may need to address additional technical issues, including how aggregate energy consumption data will be calculated for buildings with onsite renewable generation. While many utility billing systems focus on net-metered consumption, Portfolio Manager requires that buildings account for the total (gross) consumption of grid electricity, and so utility aggregate data solutions will need to account for this.

## **The Role of State Governments to Drive Whole-Building Data Access**

Given the range of key considerations for data access solutions discussed above, it should not be surprising that implementations to date differ from one utility to the next. However, these differences are observed not just between utilities in different states/service territories, but also between utilities serving the same jurisdiction (for instance, a building owner or manager may need to go through multiple processes to request and obtain data from their electric and gas utilities). These differences can be further exacerbated when considering investor-owned utilities (IOUs) versus municipal utilities. Given available resources, IOUs may be more willing or likely to pursue a Portfolio Manager web services integration, while a municipal utility may opt to start with a spreadsheet-based solution. Conversely, municipal utilities may be able to move more quickly in standing up their solution, as they answer to the local jurisdiction, as opposed to the state-level PUC.

One growing solution that may streamline the “patchwork” deployment of data access solutions is the specification of utility data access requirements in state law. The data access requirements can be connected to state benchmarking ordinances and/or building performance standards or pursued separate from any requirements on building owners and managers, to encourage and enable voluntary benchmarking and improvement in multi-tenanted buildings. To date, state utility data access requirements have been observed in California (Assembly Bill 802), the State of Washington (House Bill 1257), and Colorado (House Bill 21-1286). In these cases, the data access requirements have been connected to requirements on building owners and managers, creating certainty for the regulated community that whole-building data will be available for them to use to comply.

In addition to providing needed clarity regarding aggregation thresholds and the relationship between data privacy and data access, state-level utility data access requirements can communicate that the legislature wants utilities to make investments in data access solutions a

priority. By communicating a sense of priority and identifying cost-recovery mechanisms, state-level requirements can support the development of more comprehensive solutions that prioritize customer experience and broader integration with DSM programs – as opposed to focusing on the one-way delivery of data that meets an immediate need but that does not necessarily drive the most value for utilities or customers.

State-level requirements for whole-building utility data access may also provide an opportunity to streamline the technical approaches taken by affected utilities. While statewide legislation is unlikely to include specific details regarding the development of data access solutions, it can offer guidelines to ensure improved consistency of offerings across utilities in a state. For example:

- Specifying a utility size threshold at or above which aggregate whole-building data must be provided to requestors via Portfolio Manager web services, thereby allowing smaller utilities to begin by providing aggregate data in spreadsheet format;
- Requiring that data requestors be given the opportunity to review and confirm the constituent meters/accounts that have been identified for roll-up into aggregated whole building data—a critical starting point for ensuring accuracy of aggregated data, and therefore the benchmarking results;
- Requiring utilities to maintain and provide historical aggregate whole-building data going back a minimum length of time, e.g., as necessitated by requirements on building owners that hinge on baseline performance; and
- Clarifying that the aggregate whole-building consumption data provided by utilities must reflect total (gross) consumption of grid electricity, regardless of any onsite renewable energy that may have been sold back to the grid.

While the development of statewide utility data requirements must ultimately fall to state-level policymakers, EPA has developed many resources that can assist in this process – most recently summarized in its Benchmarking and Building Performance Standards Toolkit (EPA 2021). In addition to a chapter outlining the fundamental importance of data access to drive the success of benchmarking ordinances and building performance standards, this Toolkit includes more detailed discussion of the technical implementation considerations for data access solutions, as well as sample policy language to serve as a starting point for state and municipal policymakers seeking to require whole-building utility data access. In addition, EPA’s ENERGY STAR Buildings team offers technical and strategic guidance to utilities and other third-party providers developing data access solutions, including the use of Portfolio Manager web services. These discussions can clarify, for example, the data increments that Portfolio Manager can intake. The ENERGY STAR team can also participate, upon request, in discussions between stakeholders (e.g., state or local governments and utilities).

## **Emerging Topics for Aggregate Whole-Building Data Access**

While this paper has so far addressed common considerations that have emerged from utility data access implementations to date, it is also important to identify other trends that are likely to factor into the conversation around data access moving forward. This section explores some of these topics for consideration by utilities and policymakers alike.

## Development and Deployment of Standardized Building-Level Identifiers

As local and state jurisdictions enact policies aimed at improving the energy and emissions performance of buildings, they must assign specific identifiers in the development of covered building lists. Beyond facilitating the administration of benchmarking ordinances and building performance standards, e.g., by confirming a given building has complied, these identifiers can also be used to connect data reported under these requirements with a variety of data sets containing property-level information, such as tax assessor databases, building permit databases, utility program participation data, etc.

To date, efforts to generate and assign property-level IDs have largely taken place at the level of individual jurisdictions, in some cases where individual properties are assigned multiple unique identifiers associated with different program types (e.g., energy benchmarking, green building certification, real estate data management). From one jurisdiction and one program to the next, efforts assigning identifiers have deployed a range of methodologies. Unfortunately, many of these methodologies rely on street address, which is prone to ambiguity and inaccuracy, leading to inconsistencies and challenges around joining different data together.

The Pacific Northwest National Laboratory (PNNL) has developed a new approach for generating unique building identifiers, or UBIDs. These UBIDs are designed to provide unique, unambiguous, and replicable identification of a building footprint and/or property parcel, similar to how a Vehicle Identification Number (VIN) provides unambiguous identification for a car. Currently, PNNL offers several open-source tools and related documentation to assist interested parties in generating UBIDs for the properties in their data sets – and may be able to offer additional support to state and local governments as needed.

The driving concept behind UBID is that any property can be assigned a unique identifier derived from readily-accessible geospatial information – and that this identifier can be reliably and consistently generated by different users, for use across different data sets. In this way, the UBID becomes an “information bridge” that allows property records in one data set to be easily cross-referenced with corresponding records in other, separate data sets.

Several jurisdictions have already piloted the use of UBID, and in September 2020, Washington DC became the first major U.S. city to publish an open-access data set that included UBIDs. Additionally, EPA’s ENERGY STAR Program has added “UBID” to the list of standard IDs available in Portfolio Manager, enabling users who have a UBID in hand to enter and associate it with their Portfolio Manager property record.

As discussed previously, the lack of a “whole building” concept within utility data systems can lead to greater difficulty in performing the meter-to-building “mapping” required for aggregate whole building data. The use of a consistent and replicable building-level identifier, such as UBID, based on a building’s geospatial extent, presents a compelling resource to address this issue. Especially in cases where utilities have deployed AMI, with geolocated meters, the UBID could theoretically be an enabler of meter-to-building mapping. However, utilities would still need to update their data systems to include UBID as a field and backfill UBIDs for all deployed meters, both of which could carry significant effort. For this reason, it would be beneficial for utilities to keep this enhancement in mind as part of larger database updates or upgrades that may be on the horizon.

## **Exploration of Statewide Data Access Hubs**

As part of the “next generation” of utility data access, states such as New York, New Hampshire, and Maine are exploring the potential for development of statewide databases that would allow a variety of authorized users (utilities, system operators, customers, energy service providers) to access a wide range of data points, which would include energy consumption data. While the scope of these implementations is expected to include a broad number of data access use cases, along with various data types and levels of granularity, these databases could also be set up to fulfill data requests from building owners that are trying to benchmark—including the technical processes of meter-to-building mapping. Importantly, this could remove the need for individual utilities to build out and maintain their own data access platforms (although as the primary collectors of consumption data, utilities would still be responsible for feeding this information into the statewide database). This would have the added benefit of providing building owners and managers with a “one-stop shop” to request and obtain aggregate whole-building data for benchmarking, thereby eliminating variations in the request process between different utilities. By shifting solution development to states, these platforms could also promise implementations that better optimize benefits to building owners and managers, such as prioritizing accurate and complete whole-building data and fully leveraging Portfolio Manager web services.

New York State is currently the farthest along in this process, having begun the scoping of initial use cases to be addressed by a statewide Integrated Energy Data Resource (IEDR). While energy benchmarking was not the initial impetus for the development of the IEDR, the provision of aggregate whole building data for benchmarking is likely to be among the priority use cases for which functionality will be developed. For this reason, the IEDR will be an important model for state-level policymakers to consider, and to keep apprised of its development.

## **Enabling the Flow of Disaggregated Data for Greenhouse Gas Emissions Accounting and Other Needs**

The provision of whole-building aggregate data to building owners and managers has been, and will continue to be, an important solution that facilitates benchmarking and the subsequent improvements that result from the interpretation of benchmarking data. However, it is important to recognize that the solution is not one-size-fits-all, and that there are use cases closely related to benchmarking that present additional data needs. For instance:

- Building owners who have obtained explicit authorization to access their tenants’ energy consumption data may want their utility to deliver data at this level of granularity – whether in addition to or in place of aggregate whole-building data.
- Building owners quantifying emissions at the building level may need to differentiate between indirect emissions incurred through base building operations (Scope 2) and those emissions incurred by tenants in the operation of their space (Scope 3).
- Individual tenants may want to benchmark, participate in initiatives, and focus improvement efforts across a portfolio of tenant spaces, all of which may be aided by the automated flow of their energy consumption data into Portfolio Manager.

In each of these cases, the process for delivering data need not entail a completely different solution from the approach to whole-building data access – assuming that the process for mapping meters to buildings can also be used to differentiate which meter points are associated with the building landlord, as opposed to individual tenants. Rather, it becomes a process of determining how the individual meter data is aggregated (or not) before delivery to the requestor via Portfolio Manager web services or spreadsheet. For example, to delineate Scope 2 vs. Scope 3 emissions, a utility could work with a data requestor to identify all meters/accounts that are paid by the building owner/manager (Scope 2) and could aggregate these data separately from the remainder of the building's consumption – thereby creating “aggregate owner” and “aggregate tenant” consumption values. In cases where requestors other than individual tenants are seeking meter-level data, it will be important that the data access solution include a mechanism for capturing and validating 3<sup>rd</sup> party data release authorizations – whether these are utility forms or other types of documentation, such as lease-level provisions that authorize the landlord to obtain energy consumption data.

### **Dovetailing Aggregate Whole Building Data Access with Utility Data Standards**

Utility data standards get frequent reference in the discussion around data access. Green Button is one such example, seeking to define both a standard data format and a standard data authorization protocol by which utilities can deliver energy data to end-users and approved third parties. While policymakers should not view Green Button or other standards as interchangeable with Portfolio Manager web services, given that they are not specifically designed for the purpose of benchmarking in Portfolio Manager, they also should not view the two as an “either/or” proposition. In fact, for example, there are scenarios in which the infrastructure used in a utility Green Button deployment could be leveraged into a platform for sending aggregate whole-building data to customers’ Portfolio Manager accounts via web services.

### **Conclusion**

In summary, aggregated whole-building utility data access solutions are crucial offerings related to driving energy and GHG performance in buildings. These solutions make benchmarking – and improving performance based on the resulting information – easier and more possible for owners and managers of multi-tenanted buildings, which are significant in terms of their energy consumption and GHG emissions. States are uniquely positioned to advance utility data access at scale and can do so in a way that recognizes the key considerations surrounding solution development, dovetails with other priorities, and maximizes the benefits to all stakeholders.

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