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Utility-Enabled Whole Building Data Access: The Problems, Processes and Possibilities

Building energy consumption remains an unsolved problem at scale – it takes baselines across building types to drive meaningful change. Utility data is a key component, but easy, consistent access has stalled progress for years. This e-book explores barriers, practical approaches, and stakeholder benefits around utility-enabled whole building data access.

Building Level Utility Data:
The Dual Reality

A key to scaling building sector climate solutions, and a long-standing barrier.

Existing buildings account for nearly 40% of energy consumption in the U.S.[1] Moreover, direct and indirect emissions from buildings rose to 10 GtCO2 globally in 2019, the largest amount ever recorded and a serious threat to our climate.[2] Meaningful change starts with reducing consumption, continues with investing in energy efficiency and retrofits, and leads to transforming buildings into grid-interactive assets – none of which can happen at scale without baseline data for every building.

In an individual building with an energy efficiency plan, the options abound. Technologies, systems, sustainable building practices – put together, a building owner can do a great deal to reduce consumption. Across even a small portfolio of properties, there is potential for significant return on investment. Working towards grid-interactive efficient buildings (GEBs) represents even more potential across multiple stakeholders.

However, as sophisticated as they are, building-specific mechanisms to understand consumption (and the investments they require) cannot move the needle sector-wide. Any scalable approach requires that every building start with a baseline. Only then can bold, progressive solutions finally take shape. The historical data needed resides in utility systems, and that's where things get complicated. Though utility data a key ingredient to scaling climate solutions, today, accessing it is usually a barrier.

From city to city and territory to territory, the landscape of utility data access looks different. Scaling approaches to building sector energy efficiency, grid-interactivity and decarbonization starts with a new approach to utility-enabled whole building data access. Not only will this get data into the right hands for sustainability purposes, but utilities will also reap the benefits of the powerful, progressive solutions that follow.

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1. U.S. Energy Information Administration, 2018: Consumption and Efficiency. Available at: https://www.eia.gov/consumption/
2. IEA, Tracking Buildings 2020, June 2020, https://www.iea.org/reports/tracking-buildings-2020

Broadening the Scope of Building Data Access:
From Owner-Occupied to Multi-Tenant and Mixed-Use

Without access to energy consumption data, many buildings have no baseline.

Consider a home and its residential utility bill. On some interval, utilities will provide a data comparison chart – how that customer's energy consumption stacks up to similar customers. This benchmark is an important flag for homeowners – showing their relative performance and potentially inspiring behavioral changes or the exploration of other corrections or upgrades.
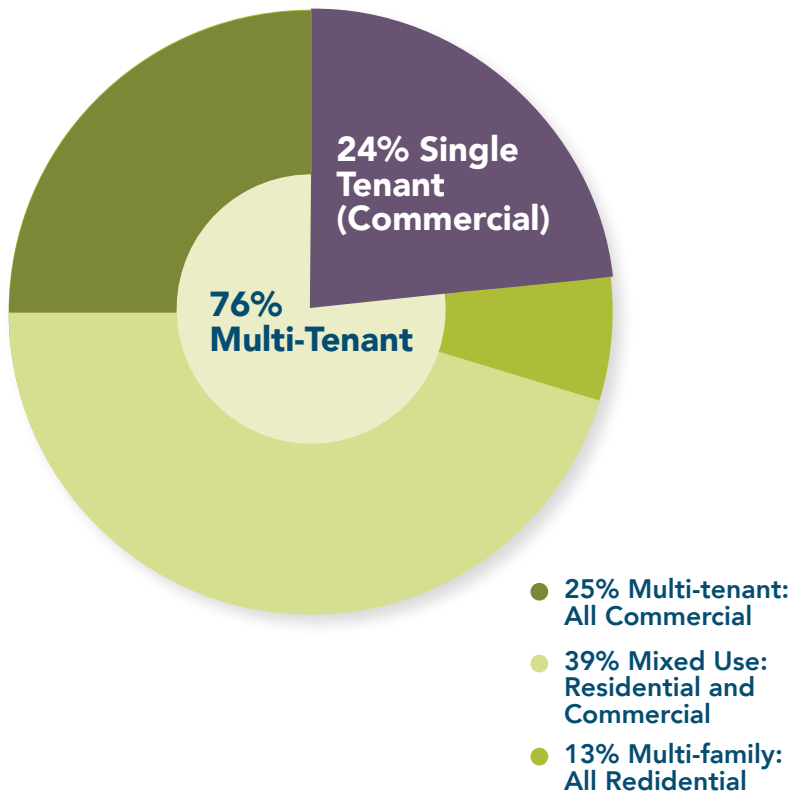

SIngle Owner: Residential

Now, imagine a mixed-use commercial and residential building with dozens of account-holding tenants in it. That helpful comparison chart doesn't exist. And the owner of the property doesn't have any insight into what's happening at the building level. When it comes to understanding what a full range of building types across the sector are consuming over time, that's a problem. Sector decarbonization depends on addressing all building types: Residential homes and owner-operated commercial, yes, but also multi-tenant commercial, mixed use, multifamily and more. Further, compliance with evolving energy performance policies increasingly requires utility-enabled solutions for each of those use cases.

Mixed-Use: Commercial & Residential

Policies and Progress Depend on Scaling: A Sector Wide Approach

Over the years working closely with utilities to offer building energy data access solutions to all building types, Calico has seen the following distribution of buildings participating:

24% Single Tenant (Commercial)

76% Multi-Tenant

- **25% Multi-tenant: All Commercial**
- **39% Mixed Use: Residential and Commercial**
- **13% Multi-family: All Redidential**

Digging into the Data: Buildings

In their running dataset of buildings in the United States, Microsoft has mapped nearly 130 million structures[3], about 86 million of which are single-family[4]. The remaining 44 million buildings in the US vary widely in size and use, but include multifamily, commercial, mixed use and industrial facilities and all are candidates for efficiency work or more.

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3. https://github.com/Microsoft/USBuildingFootprints/
4. https://www.census.gov/programs-surveys/ahs.html

An owner-occupied commercial scenario is relatively simple: the owner holds their usage data and can request it as they wish. They also receive it on their monthly bill. Multifamily and mixed-use building owners, typically face obstacles: tenants own their individual consumption data, but owners need aggregated totals to make smart building energy decisions and comply with benchmarking and performance policies. It's here where many utilities run into issues, exposing additional problems with today's data access paradigm.

The Barriers to Access: Utility Processes Today

As described earlier, many buildings don't easily fit into a simple, single unit, owner-occupied data request scenario. That makes it difficult for utilities to get them data – here's why:

Barrier 1: Utilities rarely store the notion of a building. So, while they have the customer and meter information, they don't automatically recognize which of their customers reside in any given building.

Barrier 2: Not every entity requesting data is a utility customer. Some are building managers, others energy efficiency consultants, while some are non-occupant owners. These stakeholders need data to make informed decisions but can't access it or be authenticated through a customer-only portal.

Barrier 3: Buildings don't always align with typical customer segmentation and program design – meaning, they don't neatly fall into typical utility C&I, SMB or residential categories.

The result of all these barriers? Utility solutions for data access and aggregation are often manual and time-consuming for all. To evaluate efficiency potential and more, and to comply with increasingly thorough building-focused energy policies, the building sector needs reliable, easy access to accurate data across building types. Luckily, a successful model for utility-enabled **whole building** data access exists, and it's beneficial to all involved.
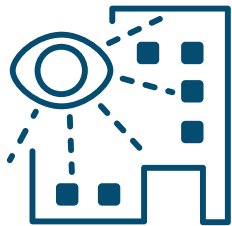
The Proven Model

The following model is currently live with multiple utilities, allowing buildings of all types to get the usage data they need. Owners and operators can:
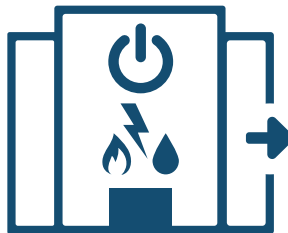
Establish their right to access.

Request building level data.

Verify units/building composition (without individual data).

Receive aggregated data.

Download/share/use that data as they see fit.

Making it Happen: Practical Advice

The model sounds simple, but it requires strategic pivots. Here's what utilities and involved entities can do to facilitate the transition:

Take a customer-status agnostic approach.

This approach makes it possible for approved building representatives (from managers to energy efficiency consultants to non-resident owners) to get the data they need. They will not all be utility account holders. And more – when utilities know who the right contact is for energy management in a building, they have the right lead for their own EE and incentive programs.

Leverage building owner knowledge and utility data.

Building owners know their units and who their tenants are/were better than a utility ever could. An software-enabled approach that combines utility data and building owner knowledge is an elegant way to get accurate, aggregated data into building owner hands while maintaining privacy. It also gives everyone involved the assurance that the aggregated data is accurate.

Get involved with the stakeholder community.

Whether you're a utility program manager facing a new ordinance, a legislator or city official trying to reduce energy consumption in buildings, there are groups eager to work on the problems and solutions with you. Organizations like MEEA, ACEEE, and IMT are committed to providing best practices and helping regions shape effective building-focused legislation.

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Utility Programs + Whole Building Data

Once a utility knows what a building is, they can apply the definition reliably and repeatedly, internally and externally. Here are just a few ways utilities benefit from the process of enabling data access (following the model outlined earlier):

- The ability to **capture energy efficiency savings** for benchmarked buildings.

- Lead generation for a pipeline of the **energy efficiency program opportunities**.

- Internal and/or external capabilities **leveraging building level AMI data** – including offering things like Green Button data at the building level.

- **Commercial energy use and analysis tools connected to building level data**, rather than only offered for single commercial accounts.

- A utility DERMS implementation where **buildings can be managed as resources.**

Digging into the Data:
What else is in this Data Set for Utilities?

When utilities and energy efficiency program administrators have access to aggregated whole building data they can:

- Access current and historical EUI and ENERGY STAR® Scores
- Contact building owners and/or their representatives directly
- View building level consumption, rather than only tenant and account-based data
- Overlay data and scores with programs, building demographics and building management data
- Develop whole building energy modeling and DER plans
- Measure carbon emissions at the building level

Looking Ahead:
The Win-Win-Win

Easy access to accurate, whole building data unlocks new opportunities for everyone involved.

With a renewed focus on climate change at the federal level, investments in carbon reduction and energy efficiency will increase through direct federal activity, while cities and states continue to lead the way. Building-focused policies are evolving from benchmarking to performance and even to carbon taxing. With electrification underway and utilities advancing into DERMS and beyond, **building owners and utilities need an accurate, ongoing line of sight into building level data.** Utilities will remain the only source of historical data at scale, and those who step into this opportunity will capture numerous strategic advantages while enabling others.

This requires a new approach to utility-enabled whole building data access. By considering the best practices outlined above, utilities can unlock a new paradigm where:

- Building owners can access accurate historical whole building data (monthly, daily, or even interval data),

- Utilities themselves can identify under performing buildings and customers create pipelines for their existing programs,

- Program administrators, vendors and regulators can use the data to benchmark, evaluate opportunities, calibrate and perform M&V.

Utility-enabled whole building data access is a win-win-win for all involved.

If you are interested to learn more about the model above watch Calico's webinar, Utility Enabled Whole Building Data at Scale: It's a Win-Win, in collaboration with MEEA, and ComEd.

Or, reach out to contact@calicoenergy.com today.