CALICO
ENERGY

Utility-Enabled Whole Building Data Access:

The Problems, Processes and Possibilities

Building energy consumption remains an unsolved problem at scale – it takes baselines across all building types and sizes to drive meaningful change. Utility data is the key, 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. 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. 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 is 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.

The industry needs utilities, policy drivers and the commercial real estate stakeholders working together to champion a new data access model. Why? Chicago, Philadelphia, and Washington DC have long established mandatory benchmarking ordinances. DC is now moving to a Building Energy Performance Standard (BEPS), mandating a minimum threshold of energy performance, while Chicago and Philadelphia are evaluating BEPS.

There's no question what the future looks like; we will be forced to solve for this.

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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.
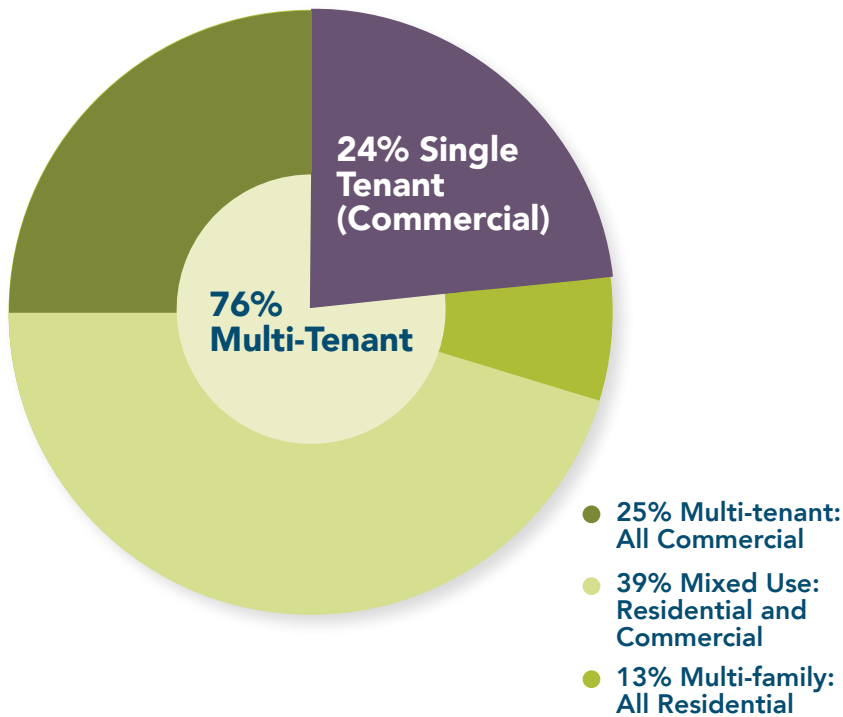

SIngle Owner: Residential

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

A sector-wide approach means recognizing the opportunity and serving every building.

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 Residential

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.

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

As previously stated, multi-family and mixed-use building owners face a unique obstacle: tenants own their individual consumption data and building owners need aggregated totals to comply with relevant ordinances and evaluate potential for any further steps. Multitenancy is the primary pain point and why we don't have baseline data at scale for much of our building sector.

Baseline data for buildings of every type is the first step toward scaling energy efficiency investments, advanced energy management, renewables, and grid edge technologies in buildings. Research from The Rockefeller Foundation[5] projects that $279B invested in energy efficiency retrofits equals $1 trillion in savings over ten years, reductions of up to 600 million metric tons of CO_2 a year and 3.3 million new jobs. The Biden

5. https://www.rockefellerfoundation.org/wp-content/uploads/United-States-Building-Energy-Efficiency-Retrofits.pdf

Administration's GEB Roadmap estimates 622 TWh per year[6] in potential returns from demand flexibility and energy efficiency in grid-interactive efficient buildings (GEBs). New York City's Local Law 97 is forecasted to expand their retrofit market by 10-13x.

These numbers about the potential are clear but reaching any forecasted returns at scale depends on scaling access to data first. That's where utilities come back into the picture, and where there are little-understood barriers standing in the way.

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.

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6. https://gebroadmap.lbl.gov/A%20National%20Roadmap%20for%20GEBs-20210712.pdf

The Proven Model

The following approach is currently live with multiple investor-owned utilities, allowing building owners and operators of all types of facilities to get the usage data they need.

"Benchmarking is a win-win; it unlocks the saving potentials for so many customers across the Midwest and speaks to the cumulative savings and not just for those ready to comply but those looking to drive change. For customers, it's the gateway to energy efficiency."

– Utility building benchmarking program manager

Calico has seen utilities implement solutions in response to benchmarking ordinances, building performance standards, and non-mandatory incentives and contests. Any of those can catalyze enough requests for building level data to create operational challenges for utilities responding. We've also seen slow but steady evolution in utilities understanding the internal value of building level for their own programs and priorities.

Whatever the initial drivers are for a solution, the trajectory of external catalysts and internal advantages is clear: buildings are increasingly energy assets under management. And over time utilities will be contributors to, participants in and beneficiaries of that management.

Calico's Building Data Solution provides a secure way for building owners or operators to access their data and manage their energy usage while leveraging the ENERGY STAR ® program for benchmarking if they desire. Over 12,000 buildings use the solution to request and receive their data.
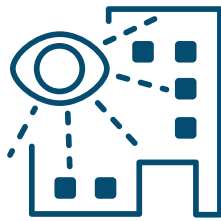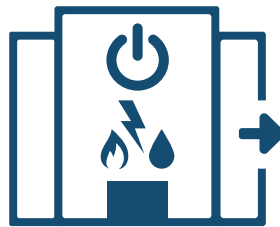
Owners and operators can:

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.

With the onset of numerous regulations and incentives requiring submission of energy usage data, ComEd's Benchmarking Application deployment, known as EUDS (Energy Usage Data System), is a success story for other utilities looking to help customers leverage the ENERGY STAR® program. Realizing the growing need for a whole building benchmarking application (and the likelihood of future regulations), ComEd launched EUDS years ahead of Chicago's 2013 benchmarking ordinance.

The EUDS tool provides a secure way for building owners and operators to access their data and manage energy usage. For its efforts, the Association of Energy Services Professionals (AESP) awarded ComEd its Outstanding Achievement in Energy Program Design & Implementation award in February 2010. ComEd also received the 2009 ENERGY STAR® Special Recognition Award for Innovation in Customer Service.

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.

Utility Programs + Whole Building Data

Once a utility knows the definition of a building, they can apply it reliably and repeatedly, externally and internally. Here are just a few ways utilities can build on building level data:

- The ability to evaluate **energy efficiency savings** for benchmarked buildings.
- Lead generation for a pipeline of **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 DER strategy and DERMS implementation where **buildings can be modeled and managed as resources**.

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

With this approach, utilities and program administrators can leverage:
- Current and historical EUI and ENERGY STAR® Scores
- Building owner and/or their representatives' direct contact information (often non-account holders)
- Building level billing and interval data, rather than only tenant and account-based data
- Overlays of building data and scores with programs, building demographics and other internal data
- 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 to 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.