

Submetering

Providing the Information Necessary to Manage Energy Consumption

One of the most vexing issues facing energy managers and policymakers is the "split incentive," in which building owners and tenants can not effectively distribute the rewards of energy conservation efforts. This is frequently due to communal utility usage via master meters wherein tenant usage is aggregated by design. Submetering helps to overcome the "split incentive" by ensuring that tenants can measure their individual energy and water consumption. A good policy enables greater and more targeted access to information while fairly and clearly allocating any associated costs for submetering to responsible parties.

Background

While not always the case, utilities often do not install direct meters for every tenant of a commercial building or complex. Instead, the building owner pays the utility for all energy consumed, as measured by a master meter, and then charges tenants for energy use based on a standard metric such as square footage. As a result the tenant does not know the true cost of their energy consumption and no party is adequately incentivized to utilize energy efficiency practices such as occupancy sensors, high-efficiency lighting, or energy-efficient office equipment.



Individual tenants are more likely to reduce their energy consumption if energy use information is available.

Under a submetering arrangement, a meter is installed at the tenant level, and the owner usually administers the monitoring and billing functions. Contract provisions for additional operational rent can be removed and tenants pay for what they consume, resulting in a variety of environmental, economic, and equity benefits for both the tenant and the building owner. Electricity is the most common and valuable submetered utility type. Submeters are also available for water, heat, and steam.

Benefits

Reduced Energy Consumption. Submetering reduces energy consumption in leased spaces by sending an accurate price signal to energy end users, in this case, commercial tenants. Tenants are more likely to pursue energy efficiency opportunities if they are able to track their energy usage and review their utility bills.

The Bank of America Building in San Francisco was retrofitted with 120 tenant submeters when it was discovered that the tenant's square footage rate was being exceeded by 300%, and the owner recovered approximately \$1 million in energy costs in the first year after installation. ²

While commercial submetering is a relatively new development and comprehensive case study data has not been evaluated, residential submetering has shown deep reductions in energy consumption over the years. One review documented kilowatt hour reductions of 12% to 20% in multiple projects.¹ Other potential benefits associated with reduced energy consumption include lower tenant operating costs, reduced reliance on fossil fuel imports, and improvements in greenhouse gas emissions and regional air quality.

Equity Considerations. Submetering represents a fairer way to account for energy consumption and costs by enabling a "user pay" approach. Under conventional master-metering, tenants that consume less energy per square foot effectively subsidize the more intensive consumers. Submetering promotes fairness by allocating the cost of energy based on use, eliminating subsidy for energy-intensive tenants and rewarding efficiency.

Cost Certainty for Building Owners. Submetering allows building owners to bill tenants for the actual costs that the owner incurs in purchasing power from the utility. In the conventional master-metered model, the additional fee that tenants pay to the owner is based on static factors such as square footage, rather than the dynamic factor of actual energy consumption, while the owner is still liable for actual consumption costs. This arrangement exposes the owner to volatility and a risk of receiving insufficient payments to cover its utility cost during periods of unusually high consumption. Submetering provides an assurance that the owner's utility costs will be covered by tenant payments that reflect actual consumption.

Getting Started

Starting a submetering program is a great way to rapidly educate tenants about their actual energy usage and achieve reductions in overall consumption.

Step 1: Evaluate State Law.

Some states or local governments do not allow submetering of commercial spaces, while others encourage it. Review your state and local laws before proceeding to Step 2.

Step 2: Engage Stakeholders.

Including utility, construction, real estate, and property management companies in the process of evaluating submetering policies will help to ensure overall program success. New York City included the Real Estate Board President and a CEO of a major commercial construction company on its PlaNYC Advisory Board. The San Francisco Task Force was chaired by an executive manager from a commercial leasing company and Board Member of the Building Owners and Managers Association (BOMA).

Step 3: Conduct Market Analysis.

Evaluate current costs, including equipment (meters and data collection systems), installation, maintenance, and billing administration. Consider how these costs would manifest in commercial buildings of different sizes and configurations, and develop alternatives that allow for the phasing of submetering requirements. Assess associated costs to determine which party or parties should be responsible for installation, and create a reasonable timeframe for expected implementation.

Existing Policies or Programs

New York City, NY: Greater, Greener Buildings Plan, Local Law 88

http://www.nyc.gov/html/planyc2030/downloads/pdf/1188of2009_lighting_upgrades_and_sub-meters.pdf

- **Adopted:** December 2009 / **Effective:** December 2009, with full compliance by January 1, 2025.
- **Affected Property Types:** All non-residential buildings larger than 50,000 square feet, in tenant spaces larger than 10,000 square feet.
- **Key Requirements:** By January 1, 2025:
 - Building owner must install one submeter for each tenant space greater than 10,000 square feet.
 - Building owner must provide each submetered tenant with a monthly statement showing the amount of electricity measured by the submeter and any amount charged to the tenant or subtenant for electricity.
 - Building owner must submit a report prepared by a registered design professional or licensed electrician to NYC Department of Buildings demonstrating compliance.



San Francisco City and County, CA: Recommendations of the Mayor's Task Force on Existing Commercial Buildings

http://www.imt.org/files/FileUpload/files/Benchmark/sf_existing_commercial_buildings_task_force_report.pdf



- **Adopted:** December 2009
- **Affected Property Types:** Commercial and City buildings.
- **Key Requirements:**
 - Required via ordinance that by January 1, 2014, either tenant or landlord shall have the right to request submetering downstream of the master meter, obligating installation of the submeter at the expense of the requesting party. (Unilateral submetering)
 - Modify the Building Code to immediately require submeters to be installed in new construction multi-tenant buildings.
 - Modify the Building Code to require submeter installation during major tenant improvements, phased in over four years to encompass progressively smaller buildings and tenant spaces:
 - 2011: Spaces >10,000 sq.ft. in buildings >100,000 sq. ft.
 - 2012: Spaces >7,500 sq.ft. in buildings >75,000 sq.ft.
 - 2013: Spaces >5,000 sq.ft. in buildings >50,000 sq.ft.
 - 2014: Spaces >2,500 sq.ft. in buildings >25,000 sq.ft.

State of Georgia: Water Stewardship Act

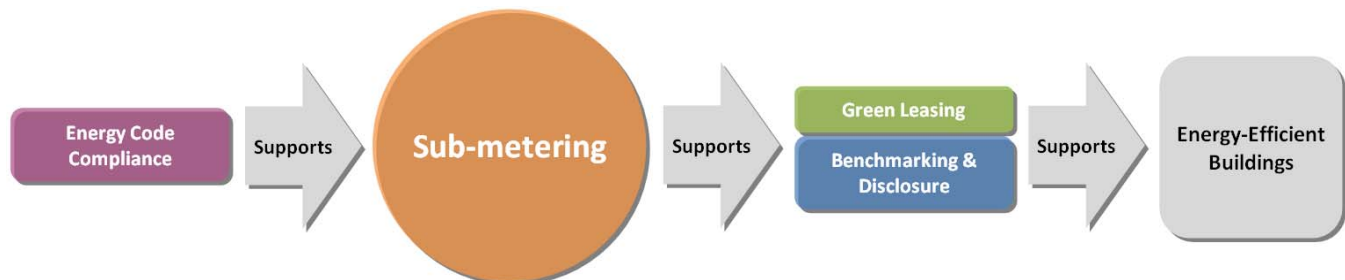
http://www1.legis.ga.gov/legis/2009_10/pdf/sb370.pdf



- **Adopted:** March 2010 / **Effective:** June 2012
- **Affected Property Types:** Residential and Commercial Buildings.
- **Key Requirements:**
 - For all new residential and commercial multi-unit projects, submetering is required so that each unit will receive consumption reports and have incentive to practice conservation measures.
 - Requires efficient water fixtures in all new residential and commercial construction statewide as well as the installation of efficient cooling towers in new industrial construction.
 - The legislation also instructs eight different state agencies to look at local government and water provider grant and loan programs to develop incentive criteria that would encourage retrofit programs on existing construction.

Complementary Policies

Complementary Policy Landscape for Submetering



Tenant submetering can make complementary policies much more effective.

- **Measurement and verification (M&V)** efforts in leased buildings often rely on submetering, since tenants cannot participate unless they have information about their energy usage. Submetering allows building owners, property managers and tenants to verify savings from energy projects they've undertaken.
- **Energy code compliance** or an updated energy code can also support submetering practices. Installation of submeters can be encouraged or required when updating commercial building energy codes. Commercial tenant submetering is a requirement in the final public draft of the International Green Construction Code.

References

1. New York State Energy Research and Development Authority. Residential Electrical Submetering Manual. October 2001.
<http://www.submeteronline.com/pdf/subman2001.pdf>
2. Gurewitz, Sim, E-Mon, LLC. Electric Submeters Save Energy and Cut Cost Across the Facility Landscape. USGBC Nevada Newsletter. November 2009.
http://www.usgbcnv.org/docs/pdf/NOV%20NEWSLETTER_Nov09_Final.pdf

Additional Resources

- Building Owners and Managers Association (BOMA) of California. "Guide to the Implementation of Tenant Submetering and Billing for Commercial Buildings in Northern California."
<http://www.bomacal.org/energyissues.htm>
- New York State Energy Research and Development Authority. "Residential Electrical Submetering Manual."
www.submeteronline.com/pdf/subman2001.pdf
- International Code Council. International Green Construction Code.
<http://www.iccsafe.org/cs/IGCC/Pages/default.aspx>
- EPA. "Sub-Metering Energy Use in Colleges and Universities: Incentives and Challenges." (December, 2002)
http://www.energystar.gov/ia/business/higher_ed/Submeter_energy_use.pdf