



SEE Action
STATE & LOCAL ENERGY EFFICIENCY ACTION NETWORK

Energy Benchmarking, Rating, and Disclosure for Regulators of Ratepayer-Funded Programs

What is Energy Benchmarking?

Benchmarking is the process of comparing inputs, processes, or outputs within or between organizations, often with an aim toward motivating performance improvement. Benchmarking typically measures performance using an indicator per common unit (e.g., cost per unit produced), which allows for comparison over time, to others, or to an applicable standard.

When applied to building energy use, benchmarking can provide a mechanism for measuring how efficiently a building uses energy relative to the same building over time, other similar buildings, or modeled simulations of a building built to code or some desired standard. Building energy use is typically measured in energy use per square foot (ft²). To make comparison even easier, buildings can also be rated against pre-determined scales that can provide a single rating or score, taking into account variations in building operating characteristics, climate, or other factors. By making energy performance information readily available, disclosure of such ratings can facilitate market transformation toward more energy-efficient buildings.

Why Encourage Energy Benchmarking?

Commercial buildings consume nearly half of building energy use and roughly 20% of total energy consumption and greenhouse gas emissions in the United States.^{1,2} Energy expenditures average more than \$2 per square foot,¹ making energy a cost worth managing. Benchmarking, especially when accompanied by rating and disclosure, provides energy performance information that can motivate building owners to invest in efficient upgrades through increased awareness of energy performance. For example, a recent evaluation study found that energy performance benchmarking prompted energy efficiency investment in over 60% of participants through improved energy management processes, building upgrades, and behavioral efficiency projects.³ Many of these upgrades, and those completed as part of Massachusetts benchmarking programs, were made or are planned to be made with assistance from other utility programs.^{3,4} As a result of the benchmarking and disclosure ordinance enacted by Austin, Texas,⁵ Austin Energy (Austin's municipally owned utility) has seen an 11% increase in participation in its existing residential efficiency programs and has registered nearly 250 local energy efficiency firms.⁶

Utility regulators can require utilities and other program administrators to use benchmarking to:

- Increase customer awareness of their buildings' energy performance
- Offer enhanced customer service
- Verify energy savings
- Encourage customers to participate in complementary programs, thereby increasing portfolio-wide energy savings.

Key Points

- Energy benchmarking is a standardized method for measuring building energy efficiency.
- Benchmarking public buildings is a low-cost way to identify buildings that are good candidates for energy audits and upgrades.
- Program administrators can use benchmarking as an entry point for recruiting participants for energy-efficiency programs.
- Benchmarking and disclosure policies can facilitate market-based competition and drive investment in energy efficiency, thus creating local jobs.

About SEE Action

The State and Local Energy Efficiency Action Network (SEE Action) is a state and local effort facilitated by the federal government that helps states, utilities, and other local stakeholders take energy efficiency to scale and achieve all cost-effective energy efficiency by 2020.

About the Working Group

The working group is comprised of representatives from a diverse set of stakeholders; its members are provided at www.seeaction.energy.gov.

Benchmarking programs can be most cost effective when linked to a whole-building/whole-portfolio approach that sustains long-term savings. In California, benchmarking was found to encourage more comprehensive retrofits,³ and Massachusetts utility customers who were trained in benchmarking reported follow-through in repeat benchmarking and benchmarking of new buildings.⁴ Although few whole-building focused benchmarking programs have operated long enough to provide verified cost-effectiveness data, the Salt River Project—an Arizona municipally owned electric utility—reports a 1.75 benefit-cost ratio for an energy information system program that includes customer support and training to improve customers' awareness of their energy use and promote participation in the utility's other energy efficiency programs.⁷ Although benchmarking is not specifically included, key program elements and costs are similar to those for benchmarking.

Who is Affected?

Benchmarking and disclosure policies can affect key stakeholders:

- Public and private building owners and managers can benchmark their facilities and disclose the results.
- Interest groups that represent property managers, real estate professionals, tenants, and energy service providers can help educate owners and managers.
- Utility companies can provide customers access to their energy-usage data.
- State and local governments can use the data to generate interest in energy efficiency programs.

How Does It Work?

Regulators' roles can include:

- Requiring utilities to provide customers with their energy-usage data, preferably on an automated basis that reduces time and cost requirements
- Requiring utilities to support benchmarking by offering technical assistance and incentives to support energy performance improvement over time
- Resolving energy-data privacy and security concerns (see Step 4 below).

Implementing Benchmarking Programs

Regulators play a key role in engaging electric and gas utilities which—as energy suppliers to almost all buildings—can provide critical support in making benchmarking a standard practice. Although some benchmarking and disclosure efforts might need legal authorization or specific direction from state legislatures, regulators can take the following steps as they consider ratepayer-funded benchmarking programs.

1. **Assess the feasibility of benchmarking and disclosure policies for your area.** Utility regulators should determine whether there is active support in the public and private sectors, and whether state law and regulatory practices permit or inhibit such policies.
2. **Engage key stakeholders.** In states where benchmarking is an emerging topic, regulatory bodies can create stakeholder working groups and hold informal hearings or workshops. These forums can provide a way to get stakeholder input, begin forming consensus around program design principles, and gain support from key parties. Key stakeholders are likely to include:
 - **Real estate owners and managers.** Most states have an association or other network representing these key players.
 - **Tenant organizations.** As primary consumers of benchmarking information, tenants can build support for the policy and ensure that program design serves user needs.
 - **Electric and gas utilities.** Utilities can provide customers their energy-usage data (the basic currency for benchmarking), in some cases through an automated process.
 - **Energy services experts.** Engineers, consultants, contractors, and building service firms can provide support for the policy and can help educate clients.
 - **State and local governments.** Governments might have enacted benchmarking and disclosure or similar policies that can benefit from ratepayer-funded technical and financial assistance programs and provision of automated benchmarking services.

3. Evaluate available benchmarking methods.

Benchmarking can be conducted using multiple approaches including those listed below.

- **Statistical.** A building's energy performance can be compared on a statistical basis to a population of comparable buildings. Benchmarking tools that use this approach include: the U.S. Environmental Protection Agency's (EPA) ENERGY STAR® Portfolio Manager,⁸ Lawrence Berkeley National Laboratory's EnergyIQ,⁹ and a host of proprietary tools.
- **Same building/building portfolio.** The energy performance of a building can be benchmarked against itself to track performance over time. In addition to tracking energy consumption, this can be a useful approach for measuring changes in an organization's carbon footprint or sustainability profile over time.
- **Energy simulation.** A building's energy performance can be benchmarked against an energy simulation of a building with similar physical and operational attributes. For example, Minnesota's B3 Benchmarking tool uses an energy simulation to compare a building's actual energy use to expected energy use if built to code.¹⁰

A recent study found that building owners and managers are most interested in comparing a building's performance against itself over time (81% of participants), followed by comparison to a national rating scale based on similar buildings (65% of participants).³

- ### 4. Address key data issues.
- Data is the lifeblood of benchmarking, so it is important to resolve key issues regarding access to and use of energy-consumption data. Building owners and managers often do not know how to find or read meter data accurately, and data entry is subject to manual entry error.³ Some utilities support benchmarking by making customer energy usage data available on an automated basis, reducing opportunities for error.

Privacy and security issues regarding use of data also must be resolved. Data aggregation is a common technique for overcoming this barrier: regulators can require utilities to release whole-building data to building owners while adopting rules to ensure that customer privacy is protected. Although state legislation could be needed to authorize some utility actions in this area, regulators can require utility involvement.

- ### 5. Educate program administrators.
- By connecting the dots on how benchmarking results can be used to promote whole-building energy management, benchmarking can help prioritize energy efficiency projects,³ as shown in Figure 1. The EPA's Portfolio Manager is an example of one benchmarking tool available for public and private buildings. It generates a 1 to 100 energy performance score, comparing a building to its peers using data from the national Commercial Building Energy Consumption Survey (CBECS).¹¹

Buildings with a score of less than 50 are—statistically speaking—in the lower half of energy performers nationwide and therefore could require capital investment to improve their efficiency. Buildings scoring in the average to above-average range (50 to 74) can improve energy performance by adjusting their approach to energy management, largely through low-cost operations and maintenance improvements that can be identified through more detailed retro-commissioning studies. Buildings scoring 75 and higher can focus on maintaining successful practices, while continuously striving for even better performance.

- ### 6. Support implementation.
- To most effectively earn market acceptance, benchmarking programs should be supported with education, outreach, and technical assistance. There is a learning curve with using Portfolio Manager and other benchmarking tools, and it may take more than one cycle before users are proficient in data entry.³ The many players in the affected markets need repeated opportunities to learn about—and become familiar with—the concept of benchmarking, the new requirements, technical tools, and processes.

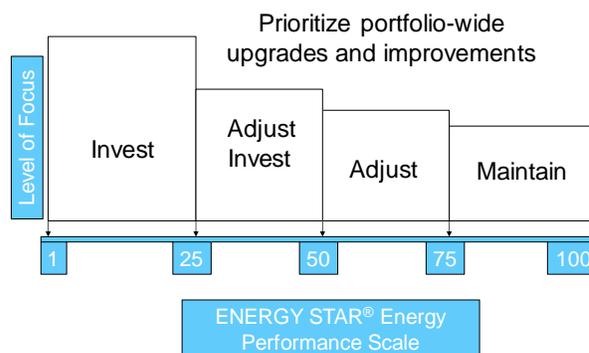


Figure 1. Example of how benchmarking can help prioritize efficiency upgrades

Source: U.S. Environmental Protection Agency

Existing Policies/Programs

California Public Utilities Commission: California Investor-Owned Utilities 2010–2012 Energy Efficiency Program Plans¹²

Adopted: 2009 / **Effective:** 2010.

Affected Property Types: Commercial customers of California's investor-owned utilities (IOUs).

Key Requirements: Approves and increases funding for benchmarking. Requires that every building "touched" by a utility energy efficiency program perform benchmarking. Leverages automated benchmarking to achieve utility goals efficiently and support the state benchmarking and disclosure law.

Also assigns specific benchmarking goals to California's IOUs:

- Pacific Gas and Electric and Southern California Edison: 50,000 buildings benchmarked
- San Diego Gas and Electric: 20,000 buildings benchmarked.

Illinois Commerce Commission: Commonwealth Edison (ComEd) Approved Program Proposal (Docket No. 07-0450)¹³

Adopted: 2008 / **Effective:** 2008.

Affected Property Types: Commercial customers in Chicago and surrounding areas.

Key Requirements: Commits ComEd to using automated benchmarking to transfer energy-use data to customers. Uses an innovative process to provide aggregate whole-building consumption data for multi-tenant buildings.

State of Minnesota: 2001 Minnesota Session Laws, Chapter 212, Section 3 (part of the Buildings, Benchmarks and Beyond [B3] Project)¹⁴

Signed: 2001 / **Effective:** 2003.

Affected Property Types: Public (including state, local, and school) buildings larger than 5,000 ft².

Key Requirements: Funded through electric and natural gas utility customer energy-efficiency surcharge. Encourages buildings to benchmark energy performance using the State of Minnesota B3 Benchmarking tool, which uses an energy simulation to compare the building's actual energy use to expected energy use if built to code and automatically integrates with EPA's Portfolio Manager to obtain an ENERGY STAR energy performance score and ENERGY STAR certification if desired and eligible. Allows jurisdictions to compare the energy used by various buildings to

focus efficiency investments on buildings with poor energy performance. Directs the state to develop a comprehensive plan to identify and implement efficiency measures in public buildings with a simple payback of 15 years or less. Links with other programs as a screening tool to identify cost-effective energy efficiency upgrades.

Complementary Policies/Programs

Benchmarking is just one component of an effective portfolio of ratepayer-funded commercial energy efficiency programs. Although it can tell a building owner how a given building rates, it does not explain how to develop solutions, how to finance them, or how to implement them.

Thus, benchmarking should be part of a larger framework that includes components such as energy audits, retro-commissioning, and financial and technical assistance. For example, the California Public Utilities Commission tied benchmarking to all other commercial energy efficiency programs offered by California's IOUs.⁹ For access to related SEE Action resources, visit www.seeaction.energy.gov/existing_commercial.html.

Other Resources

California Public Utilities Commission. Statewide Benchmarking Process Evaluation, Volume 1: Report. <http://www.energydataweb.com/cpucFiles/pdaDocs/837/Benchmarking%20Report%20%28Volume%201%29%20w%20CPUC%20Letter%204-11-12.pdf>.

ICF International. *National Action Plan for Energy Efficiency. Utility Best Practices Guidance for Providing Business Customers with Energy Use and Cost Data*. www.epa.gov/cleanrgy/documents/suca/utility_data_guidance.pdf.

Institute for Market Transformation. Energy Disclosure Website. www.buildingrating.org.

Northeast Energy Efficiency Partnerships. *Valuing Building Energy Efficiency through Disclosure and Upgrade Policies: A Roadmap for the Northeast U.S.* http://neep.org/uploads/policy/NEEP_BER_Report_12.14.09.pdf.

University of California-Davis. *Benchmarking California's Buildings: Lessons Learned on the Road to Energy Use Disclosure*. <http://eec.ucdavis.edu/ACEEE/2010/data/papers/2061.pdf>.

U.S. Environmental Protection Agency. Automated Benchmarking System. www.energystar.gov/istar/has.

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- ⁴ Vaidya, Rohit et al., *ENERGY STAR® Portfolio Manager and Utility Benchmarking Programs: Effectiveness as a Conduit to Utility Energy Efficiency Programs*, 2009. http://s3.amazonaws.com/zanran_storage/www.iepec.org/ContentPages/1886526335.pdf.
- ⁵ “About the Energy Conservation Audit and Disclosure (ECAD) Ordinance.” www.austinenergy.com/about%20us/environmental%20initiatives/ordinance/index.htm.
- ⁶ Tim Kisner, Project Manager, Austin Energy. E-mail communication to Jennifer Clymer. April 27, 2011.
- ⁷ Consortium for Energy Efficiency (CEE). Summary of Commercial Whole Building Performance Programs: Continuous Energy Improvement and Energy Management and Information Systems. www.cee1.org/files/WBCEI&EMISProgSumm.pdf.
- ⁸ ENERGY STAR Portfolio Manager Overview. www.energystar.gov/benchmark.

⁹ Lawrence Berkeley National Laboratory. EnergyIQ: Action Oriented Energy Benchmarking. <http://energyiq.lbl.gov>.

¹⁰ State of Minnesota. “Minnesota B3 Benchmarking.” www.mnbenchmarking.com.

¹¹ U.S. Energy Information Administration. Commercial Building Energy Consumption Survey. www.eia.doe.gov/emeu/cbecs.

¹² Public Utilities Commission of the State of California. “Application of Southern California Edison Company (U338E) for Approval of its 2009-2011 Energy Efficiency Program Plans and Associated Public Goods Charge (PGC) and Procurement Funding Requests. Decision Approving 2010 to 2012 Energy Efficiency Portfolios and Budgets.” <http://docs.cpuc.ca.gov/PUBLISHED/Graphics/107829.PDF>.

¹³ Illinois Commerce Commission. e-Docket Website. www.icc.illinois.gov/e-docket.

¹⁴ Minnesota Session Laws, 2002 Regular Session. CHAPTER 398-H.F.No. 2972. www.revisor.mn.gov/laws/?id=398&year=2002&type=0.

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