FACT SHEET   **Existing Commercial Buildings Working Group**   **May 2012**

SEE Action
STATE & LOCAL ENERGY EFFICIENCY ACTION NETWORK

Energy Benchmarking, Rating, and Disclosure for State Governments

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 a desired standard. Building energy use is typically measured in energy use per square foot (ft^2). 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 comprise nearly half of building energy use and roughly 20% of total energy consumption and greenhouse gas emissions in the United States.[1, 2] Government-owned buildings are nearly 25% more energy-intensive than non-government-owned buildings.[1] Energy expenditures average more than $2 per square foot in commercial and government buildings,[1] making energy a cost worth managing.

To manage energy costs, they must be measured in a way that allows for decision making. By making energy performance measurable and visible, local governments can encourage building owners to improve the efficiency of their buildings, which can drive new investment and create an estimated 5 to 15 green jobs per $1 million invested.[3] For example, a recent 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.[4] Energy efficiency services companies in New York City and San Francisco are seeing a 30% increase in business in response to local benchmarking laws.[5] Efficient buildings are also more profitable and more valuable at resale,[6] which can increase property tax revenues. Building owners seek benchmarking data to differentiate a building or company, help value rental rates, and inform the sale or acquisition of existing buildings.[4] In this role, disclosure of benchmarking data can also help strengthen local real estate markets.

By using benchmarking data to drive energy performance improvement in public buildings, governments can save taxpayer dollars while paving the way for benchmarking policies aimed at the private sector. Similarly, disclosing public building energy performance data can build public trust and confidence in the effectiveness of such policies. But, like most individual policies or practices, benchmarking and disclosure are not sufficient to realize the full efficiency potential of the commercial buildings market. Benchmarking should be considered a foundational element that can improve awareness of building energy performance and drive users to undertake other energy-efficient practices.

Key Points

- Energy benchmarking is a standardized process of measuring building energy efficiency.

- Benchmarking public buildings is a low-cost way to identify buildings that are good candidates for energy audits and upgrades.

- Local governments can lead by example with their own buildings, then phase in benchmarking and disclosure for the private sector.

- Benchmarking and disclosure policies can facilitate market-based competition and drive investment in energy efficiency, 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.

Who is Affected?

Benchmarking and disclosure policies can affect key stakeholders, including:

- Public and private building owners and managers must benchmark their facilities and disclose the results.
- Interest groups that represent property managers, real estate professionals, tenants, and energy service providers may help educate owners and managers.
- Utility companies may facilitate access to energy data.
- Building, energy, or environmental agencies may review and post data online (with support from information technology agencies if applicable).

How Does It Work?

States can start by benchmarking a sample of their own buildings, using the results to develop a broader policy that requires all public buildings to be benchmarked at least annually. Governments can also reach private markets with mandatory benchmarking and disclosure policies and voluntary public-private partnerships, such as energy challenges. The remainder of this fact sheet focuses on policies requiring private sector action. Other SEE Action fact sheets provide information on public-private partnerships and ratepayer-funded programs that promote benchmarking.

Implementing Benchmarking Policies

Governments are best positioned to create a common market-based currency for energy performance. Recognizing this and states' roles in creating the legal authorization for benchmarking, some states have moved to encourage or require benchmarking and performance information disclosure in their own port-folio of buildings and in private real estate markets.

Public Buildings

States can benchmark their own buildings to track the performance of public buildings over time and determine which facilities to target for energy efficiency upgrades, as outlined below.

1. **Select appropriate combination of benchmarking methods.** Benchmarking can be conducted using multiple approaches including:

   - **Statistical.** A building's energy performance can be compared on a statistical basis to a pop-ulation of comparable buildings. Benchmarking tools that use this approach include the U.S. Environmental Protection Agency's (EPA) ENERGY STAR® Portfolio Manager, Lawrence

Berkeley National Laboratory's EnergyIQ, 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 per-formance can be benchmarked against an energy simulation of a building with similar physical and operational attributes. For example, Minnesota's B3 Benchmarking tool[7] uses an energy simulation to compare a building's actual energy use to expected energy use if built to code.

   A recent California study found that building owners and managers are most interested in comparing a building's performance against itself over time (81%), followed by comparison to a national rating scale based on similar buildings (65%).[4]

2. **Benchmark one or more public buildings.** Start with a sample of buildings that are suspected or known to be large energy users or poor energy performers or that reflect a diversity of building types that are representative of the government's building portfolio. This early benchmarking experience can help inform future benchmarking and disclosure policies and provide an opportunity to update building records used for maintenance and other purposes. Key data include:

   - Building characteristics (e.g., age, gross floor area, percentage of gross floor area that is heated and cooled, presence of a garage)

   - Operating characteristics (e.g., weekly operating hours, number of computers)

   - Energy and water (optional) usage data.

   EPA offers a Portfolio Manager Data Collection Worksheet[8] to help gather necessary data inputs. Similar data are required for other benchmarking tools.

3. **Establish a benchmarking policy or plan for public buildings.** Based on the results of the sample of buildings benchmarked, develop a policy or plan for benchmarking the entire building portfolio at least annually. It may be worthwhile to establish a way to automatically transfer utility billing data to the benchmarking software. Some utilities offer this type of automated benchmarking service. Publicly

disclosing the results can build public trust and confidence in the effectiveness of such policies. For example, see Arlington County, Virginia's, Building Energy Report Cards.[9]

4. **Use benchmarking results to improve energy management.** Figure 1 shows how benchmarking can help prioritize energy efficiency projects. EPA Portfolio Manager is an example of one bench-marking tool available. 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).[10] Buildings with a score below 50 are, statistically speaking, in the lower half of energy performers nationwide and therefore may 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 main-tenance 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 higher performance.

Other tools may use different scales, but accomplish similar ends: (1) analyzing buildings' operating efficiency and (2) identifying the most cost-effective energy investment opportunities across a portfolio of buildings, thereby helping to prioritize the use of limited resources.
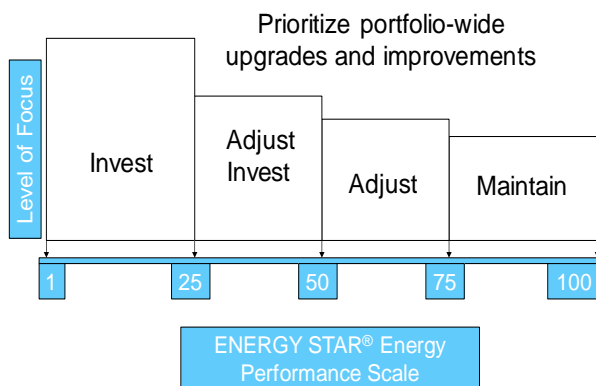

Figure 1. Example of how benchmarking can help prioritize efficiency upgrades among buildings with different scores
Source: U.S. Environmental Protection Agency

5. **Document the costs and benefits of benchmarking.** Cost-benefit data can be invaluable in developing policies and programs that influence the private sector to follow the government's example. For example, Arlington County's benchmarking and efficiency improvement projects completed from 2007 through 2010 have reduced the energy intensity of its building stock by nearly 10%, saving the equivalent of more than 300 U.S. homes' annual energy use and $450,000 in avoided energy costs each year. The county has seen a 20% return on investment for projects uncovered through benchmarking and other energy management techniques.[11] Arlington County is sharing its lessons learned through a community-wide green business challenge, Arlington Green Games.

6. **Monitor and verify results.** Pre- and post-project benchmarking can be used to document energy savings from energy efficiency retrofit projects identified through benchmarking. Some bench-marking systems provide greenhouse gas emissions data that can help calculate emissions inventories.

Private Buildings

State governments can also influence the private real estate market by following the steps outlined below to adopt mandatory benchmarking and disclosure policies.

1. **Assess the feasibility of benchmarking and disclosure policies in your state.** State governments 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.** Engaging stakeholders from the beginning can speed the adoption of and increase the long-term effectiveness of the policy. Key stakeholders are likely to include:

   - **Real estate owners and managers.** These groups, typically represented by associations or other networks, are critical to the development and execution of benchmarking policy.

   - **Real estate brokers.** Brokers are important because they arrange the purchase and sale of most properties.

   - **Tenant organizations.** As a primary consumer of benchmarking information, tenants can build support for the policy and ensure that policy design serves user needs.

   - **Electric and gas utilities.** These energy sup-pliers can provide the energy use data that is

the basic currency for benchmarking, in some cases through an automated process.

- **Utility regulators.** State legislatures and executive agencies can engage regulators of ratepayer-funded programs to gain broader support in the utility sector.

- **Energy services experts.** Engineers, consultants, contractors, and building service firms can provide policy support educate clients.

3. **Define the scope and mechanics of the requirement.** Consider what building types will be covered, the ownership type and size of affected buildings, the implementation timeframe, disclosure requirements, and possible exemptions. If specific analytical tools or software are to be used, define such technical requirements and how they will be administered and supported. Such details need not be specified in enabling legislation, but can be worked out through agency proceedings.

4. **Adopt policy.** Governments may consider a phased-in implementation schedule based on building size, type, etc. to help building owners and managers start small and work up to a portfolio-wide benchmarking program similar to the approach recommended for public buildings.

5. **Support post-launch activities.** To most effectively earn market acceptance, benchmarking and disclosure policies 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.[4] The many stakeholders in the affected markets need repeated opportunities to learn about and become familiar with benchmarking, new requirements, technical tools, and processes. It is especially helpful if government agencies facilitate access to energy data by working with utilities and energy service professionals. Conversely, the benchmarking data can be invaluable to utilities in improving existing energy efficiency programs and designing new ones. Providing ongoing support for compliance and quality control can also be vital.

Existing Policies/Programs

State of California: Assembly Bill 1103[12]

Adopted: 2007 / Effective: 2012.

Affected Property Types: Non-residential public and private buildings larger than 5,000 ft^2.

Key Requirements: Requires disclosure of EPA Portfolio Manager benchmarking data to the California Energy Commission and transactional counterparties upon the sale, lease, or financing of a building. Begins with buildings larger than 50,000 ft^2 in 2012. Mandates that utilities have processes in place to upload 12 months of energy consumption data to Portfolio Manager upon request from a customer.

State of Massachusetts: Green Communities Act[13]

Adopted: 2008 / Effective: 2009.

Affected Property Types: Non-residential public buildings.

Key Requirements: Requires local governments to establish an energy baseline as a criterion for achieving green community status, thus qualifying the local government for state funding for energy projects. Requires communities to use a benchmarking baseline as a starting point for a 5-year plan to reduce energy use by 20%.[14] Allows communities to choose their own benchmarking tool, though the state promotes use of MassEnergyInsight or EPA Portfolio Manager.

State of Minnesota: 2001 Minnesota Session Laws, Chapter 212 Section 3 (part of the Buildings, Benchmarks, and Beyond [B3] Project)[15]

Signed: 2001 / Effective: 2003.

Affected Property Types: Non-residential public (state, local, and school) buildings larger than 5,000 ft^2.

Key Requirements: Encourages building owners to benchmark building energy performance using the State of Minnesota B3 Benchmarking tool, which compares a building's actual energy use to expected energy use if built to code and automatically integrates with EPA Portfolio Manager to obtain an ENERGY STAR energy performance score and 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 less than 15 years. Links with other programs as a screening tool to identify cost-effective energy efficiency upgrades.

State of Washington: Senate Bill 5854[16]

Adopted: 2009 / Effective: 2010.

Affected Property Types: Non-residential public and private buildings larger than 10,000 ft^2.

Key Requirements: Requires disclosure of EPA Portfolio Manager benchmarking data to transactional counter-parties upon the sale, lease, or financing of an entire building. Requires that utilities have processes in place to upload 12 months of energy consumption data to EPA Portfolio Manager upon request from a customer. Directs the state to publically disclose benchmarking information. Phases into effect:

- 2010: Owned or leased public buildings larger than 10,000 ft^2

- 2011: Private buildings larger than 50,000 ft^2

- 2012: Private buildings 10,000 to 49,999 ft^2.

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 above Washington state law requires public buildings with an energy rating below the statistical benchmark performance average to complete energy audits. If the audits identify cost-effective energy savings, the projects must be implemented. For access to related SEE Action resources, visit www.seeaction.energy.gov/existing_commercial.html.

Other Resources

Efficiency Cities Network, "Building Labeling Ordinances." www.efficiencycities.org/wp-content/uploads/030111/ECN03012011.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.

SEE Action, Benchmarking and Disclosure: State and Local Policy Design Guide and Sample Policy Language. www.seeaction.energy.gov/pdfs/commercialbuildings_benchmarking_policy.pdf.

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

U.S. Environmental Protection Agency, ENERGY STAR Portfolio Manager, www.energystar.gov/benchmark.

U.S. Environmental Protection Agency, ENERGY STAR Target Finder, www.energystar.gov/targetfinder.

U.S. Environmental Protection Agency, *State and Local Governments Leveraging ENERGY STAR*. www.energystar.gov/ia/business/government/State_Local_Govts_Leveraging_ES.pdf.

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[8] U.S. Environmental Protection Agency, ENERGY STAR Portfolio Manager Data Collection Worksheet, www.energystar.gov/ia/business/ downloads/PM_Data_Collection_Worksheet.doc.

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[13] Commonwealth of Massachusetts. Green Communities Act, www.malegislature.gov/Laws/ SessionLaws/Acts/2008/Chapter169.

[14] Commonwealth of Massachusetts. "Patrick-Murray Administration Awards $8.1 Million in Grants to Commonwealth's 35 Green Communities." www.mass.gov/eea/energy-utilities-clean-tech/green-communities/81-million-granted-to-35-green-communities.html.

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