

ENERGY BENCHMARKING AND TRANSPARENCY APPENDICES

*Compiled resources on national best practices, California policies,
and energy efficiency opportunities for the Port of San Diego*

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Prepared for
San Diego Unified Port District

Prepared by
Center for Sustainable Energy



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Appendix A: Existing Buildings Energy Efficiency Action Plan (AB 758 Action Plan)

The California Energy Commission passed the [AB 758 Action Plan](#) on September 9, 2015, providing a roadmap for doubling energy efficiency in buildings. The Action Plan serves as a guiding resource for local governments to take the lead in energy and water efficiency measures and provides vision and support to achieve energy efficiency goals. Please see relevant excerpts from the AB 758 Action Plan on the following pages:

The Opportunity and Challenge for Energy Efficiency: (Pages 8-10)

Increased Government Leadership in Energy Efficiency: (Pages 43-47, 56-57)

Strategy 1.1 State and School Buildings

Strategy 1.2 Nonresidential Benchmarking and Disclosure

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The Opportunity and Challenge for Energy Efficiency

The action plan encompasses all existing residential, commercial, and public buildings. It does not cover the industrial or agricultural sectors. California contains roughly 600,000 commercial buildings, 9 million single-family homes; and 4 million multifamily units.⁶ The diversity of ownership, tenancy, and building characteristics will require a variety of relevant, focused solutions.

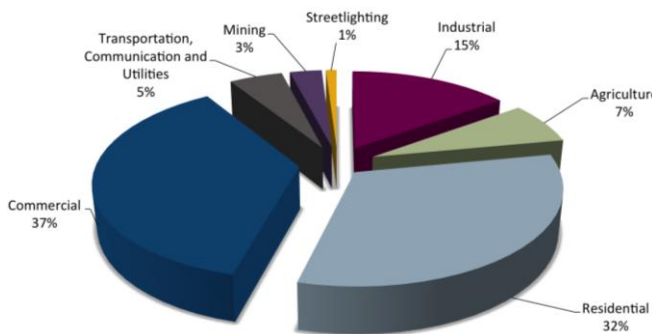
Residential and commercial buildings account for nearly 70 percent of statewide electricity use and 55 percent of natural gas use; they represent about 20 percent of all greenhouse gas emissions.⁷ An estimated 50 percent of existing buildings in California were built before California’s *Building Energy Efficiency Standards* went into effect in 1978.⁸ Buildings of later vintages also have significant opportunities for lighting, shell, and mechanical system efficiency improvements. Ongoing technological developments, as well as recent improvements in lighting efficiency and building

opportunities and challenges related to improving energy efficiency.

Overview of Trends, Opportunities, and Challenges Impacting Energy Efficiency

California invests about \$1.1 billion annually to promote and implement energy efficiency in buildings. The state’s long-term commitment to efficiency has resulted in billions of dollars in savings to businesses and residents, reduced utility bills for millions of low-income households, electricity bills 20 percent lower than the national average, and avoided carbon emissions equivalent to those of 400,000 cars, just in the last two years.⁹ Following is a brief overview of the key trends, opportunities, and challenges that are relevant for this plan and its implementation.

Figure 1.1: California Electricity Consumption by Sector



Source: California Energy Commission, Integrated Energy Policy Report, 2008.

control, are available in the building industry to save energy in and improve the functionality of all buildings, regardless of vintage. The following section provides a brief overview of each of the main building sectors covered in this action plan and the

Figure 1.2: Drivers for Energy Efficiency Demand



Source: http://www.encyfirst.org/static/files/promise_long_na.pptx.

Energy Efficiency as a Key Resource: Studies continue to support the concept that energy efficiency is a critical element of energy policy that can reduce the need for new generation.¹⁰

6 Commercial figures from CEUS 2003; residential figures from Department of Finance 2011.

7 International Panel on Climate Change (IPCC), *Climate Change 2014: Mitigation of Climate Change*, December 2013.

8 California Energy Commission, 2011 IEPR, document CEC-100-2011-001-CMF, page 63.

9 NRDC, *Scaling Up California’s Energy Efficiency to Save Money and Reduce Pollution*, fact sheet, March 2014.

10 Molina, Maggie, *The Best Value for America’s Energy Dollar: A National Review of the Cost of Utility Energy Efficiency Programs*, March 2014, Report Number U1402, for American Council for an Energy-Efficient Economy.

California's Existing Buildings Energy Efficiency Action Plan

The loading order¹¹, with efficiency and demand response as the highest priorities, continues to be central to California policy and is a core component of diverse, reliable, low-carbon energy supplies.

Property Valuation: Improved building performance directly reduces the carrying cost of any building, yet the market does not recognize this important cost factor in real estate valuations. Proper valuation will require adoption of standardized measures of energy efficiency in appraisals, mortgage calculations, and lease negotiations. In this way, the recognition of energy efficiency as a tangible benefit will be broadened, allowing the private sector to make informed energy decisions.

Long-Term Program Cycle: Historically, the CPUC and investor-owned utilities (IOUs) have operated on two- to three-year program cycles for energy efficiency portfolio development and implementation, requiring nearly constant planning by implementers and limiting program agility. The CPUC is moving to a 10-year rolling cycle, allowing for more flexible program improvements and ongoing changes in response to market evolution.

Land-Use Patterns: Energy-use intensity varies depending on building density, income patterns, and education levels. Understanding variations in land-use development and building trends is critical for creating effective strategies to reduce energy consumption.¹²

11 The loading order consists of decreasing electricity demand by increasing energy efficiency and demand response, and meeting new generation needs first with renewable and distributed generation resources, and second with clean fossil-fueled generation. The loading order was adopted in the 2003 Energy Action Plan prepared by the energy agencies and the Energy Commission's 2003 Integrated Energy Policy Report (2003 Energy Report) used the loading order as the foundation for its recommended energy policies and decisions.
<http://www.energy.ca.gov/2005publications/CEC-400-2005-043/CEC-400-2005-043.PDF>

12 Jones, Christopher, and Daniel M. Kammen, *Spatial Distribution of U.S. Household carbon Footprints Reveals Suburbanization Undermines Greenhouse Gas Benefits of Urban Population Density*, Energy and Resources Group, Goldman School of Public Policy, and Department of Nuclear Engineering, University of California, Berkeley, December 13, 2013.

Electric Vehicles: Increased purchasing of electric vehicles is expected to increase electricity consumption in California by more than 6,000 gigawatt-hours (GWh) annually by 2024, creating additional loads to commercial and residential buildings to consider in reduction targets.¹³ At the same time, electric vehicles present intriguing opportunities to provide grid flexibility by offsetting increased renewables and frequent overgeneration.

Information and Knowledge: A central tenet of energy efficiency behavior change is that consumers need to understand how they use energy. Historically, gaining access to energy consumption information, either customer-specific or thoughtfully combined, has been difficult for the customer, local governments, third-party implementers, and even community choice aggregators.¹⁴ Property owners in particular need these data to better understand their buildings and make well-considered energy-related improvements. Market actors can use the various forms, this data might take, to develop and tune innovative delivery and financing models.

Marketing and Education: Marketing, education, and outreach are important components of any market transformation effort. In 2010, the State adopted Energy Upgrade California as the statewide clean energy umbrella brand for energy management solutions in the residential and small commercial markets. In 2014, the brand was expanded to encompass all elements of energy management.¹⁵

Oversight of Efficiency Activities: The oversight of energy efficiency efforts is primarily the purview of the Energy Commission and CPUC. Linking efficiency to climate goals and electric system operations also requires coordination with the California Air Resources Board and the California Independent System

13 California Energy Commission, *California Energy Demand 2014-2024 Final Forecast*, January 2014, pages 3-4.

14 Community Choice Aggregators (CCAs) are governmental entities formed by cities and counties to serve the energy requirements of their local residents and businesses. Decision 12-12-036 December 20, 2012.
http://www.cpuc.ca.gov/NR/rdonlyres/0534F66E-61D3-44FE-AE9D-939BD00CDA/0/CodeofConduct_D1212036.pdf

15 <http://energyupgradeca.org/en/about>.

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Operator, respectively. Other state agencies, including the Department of General Services, Department of Education, and Division of the State Architect, oversee significant parts of the built environment. Local governments are responsible for verifying compliance with building code, and alongside utilities, nonprofits, and others, often play important roles in implementing efficiency programs. Similarly, water usage in buildings has a strong energy component, and coordinating with the numerous regional water agencies and programs overseen by the Department of Water Resources and the Water Resources Control Board is essential. Coordination across agencies and with implementers and the marketplace will improve program effectiveness, align goals and measures, and reduce duplicative effort.^{16 17}

Compliance: California's *Building Energy Efficiency Standards* are the most advanced in the United States. The latest update, the *2013 Building Energy Efficiency Standards*, is projected to save Californians \$1.6 billion in energy costs over the next 30 years.¹⁸ The 2016 update will take additional steps toward ensuring all cost-effective efficiency is included at time of construction. Alterations of existing buildings, especially homes, often take place without building permits, and compliance with building codes and the energy standards is uncertain. Addressing the application, compliance, and enforcement of building standards in existing buildings is a high priority.

Energy Efficiency Project Performance: Variability in the actual performance of energy efficiency improvements is natural and manageable if kept within reasonable limits. Almost 80 percent of California utility customers have smart meters, which can provide unprecedented ability to identify opportunities for and assess impacts of efficiency measures, both for individual projects and across

portfolios. New diagnostic technologies can better track performance and provide useful, timely feedback to operators and installers. Appropriately gathered, these data can help understand patterns and support investors across their portfolios. Such insights can help ensure transparency and accountability of the energy efficiency industry and increase the quality of installations.

"Code-as-Baseline": The increasing stringency of California's *Building Energy Efficiency Standards* widens the performance gap between existing buildings and current code. This increasing stringency both makes "to-code" projects in existing buildings more challenging (and expensive) than before and reduces the potential for "above-code" measures for a given project.¹⁹ In addition, the cost-effectiveness analysis that supports these increasingly stringent codes is based on the cost of incorporating efficiency measures into new construction, which is significantly lower than for existing buildings. At the same time, ratepayer-funded incentive programs are generally allowed to claim only the "above-code" energy savings of a project. Therefore, "to-code" projects have little or no program support, while "above-code" savings opportunities represent only incremental savings and tend to be more complex. If this disconnect between codes and voluntary programs is not addressed, attractive improvements in existing buildings may go unrealized or be driven underground. State agencies must better understand the extent of unrealized savings and the potential role of energy efficiency programs to make a positive impact.

16 Goodhill, Gina and Mary Luevano, "California's Comprehensive Law on Energy Efficiency in Existing Buildings: Leading the Way," paper presented at ACEEE Summer Study on Energy Efficiency in Buildings, 2012, p. 8-105.

17 Taylor, Mac "Energy Efficiency and Alternative Energy Programs," Sacramento: California Legislative Analyst's Office, 2012.

18 California Energy Commission, *California Energy Commission 2012 Accomplishments*, 2013

19 The Cadmus Group, Commercial Building Market Characterization for Savings by Design Program: Study ID: SCE0312.01, Southern California Edison, 2011.

Goal 1. Increased Government Leadership in Energy Efficiency

Objective: Policies, initiatives and programs signal a long-term commitment to the market and support market activation.

Strategy 1.1 State and School Buildings

The Governor's Executive Order B-18-12 requires aggressive improvements to the energy performance of state buildings, including space leased by the State. Timely execution and achievement of these goals will provide essential state government leadership, lend credibility to claims that cost-effective energy efficiency is achievable, demonstrate the value of improvements to the marketplace, and save taxpayer dollars.

California can look to the federal government for evidence of public agencies leading by example. The U.S. General Services Administration (GSA), one of the largest building property managers in the nation, published a Strategic Sustainability Performance Plan for 2010-2015 that delineates strategies to achieve a zero environmental footprint¹⁰². GSA building tenant education and outreach, bulk procurements, and continuous efficiency improvements are a few of the strategies included in this plan. The U.S. Department of Defense is employing innovative public/private partnerships to audit military base buildings and identify efficiency opportunities, using data collection and energy-modeling technologies to reduce the transaction costs of the audit processes¹⁰³.

Proposition 39, the Clean Energy Jobs Act of 2012, is providing hundreds of millions of dollars annually for five years to fund school energy-related upgrades. This new and substantive funding will result in significant improvements in school facilities and reduce school district operating costs. The Clean Energy Jobs Act is also creating a statewide approach to establish school energy use baselines and track energy performance

102 Johnson, Martha and Stephen Leeds, *FY 2010-2015 Strategic Sustainability Performance Plan*, U.S. General Services Administration.

103 "NREL Brings Precision, Savings to Energy Audits," accessed February 24, 2015, <http://www.energyvortex.com/pages/headlinedetails.cfm?id=6603>.

DGS Management Memo 15-04

Provides direction for all state agencies toward achieving the established performance targets of Executive Order B-18-12.

Sample of existing buildings performance targets:

- All existing state buildings more than 50,000 gross square feet complete LEED-EBOM certification.
- All existing state buildings reduce annual grid-based energy purchase by 20 percent compared to a 2003 baseline.
- All state agencies take measures towards achieving ZNE for at least 50 percent of state-owned building area managed.
- All renegotiated state building leases required to encourage lower-than-industry-standard energy and other resource use and participation in utility programs and alternative financing.

improvements over time. This program will provide state leadership in the areas of energy efficiency project planning, implementation, monitoring, and evaluation. The most successful school energy upgrades will be showcased such that analogous projects can be considered in other building sectors.

The Division of the State Architect plans to work with interested school districts and leading architects and engineers to develop several best-practice school upgrade designs that will be exemplars of deep retrofit opportunities in school buildings. These innovative retrofit plans can then be implemented by school districts using Clean Energy Jobs program funding.

California’s Existing Buildings Energy Efficiency Action Plan

Strategy	Metrics/Timeframe	Lead/Partners
<p>1.1.1 State Buildings: Achieve dramatically improved performance levels for all state buildings, as mandated by EO B-18-12. (Also see Strategies 1.6 and 5.5)</p> <ul style="list-style-type: none"> • DGS Capacity: Build capacity at Department of General Services (DGS) to accelerate state buildings energy use disclosure, deep-efficiency project scoping, upgrade implementation, energy performance contracting and execution of demonstration ZNE at state buildings. • Provide Investment Decision Support to Department of Finance and Treasurer: Assist DOF and Treasurer to understand and value energy efficiency improvements for state buildings. <ul style="list-style-type: none"> ○ Pilot energy efficiency risk assessment approaches using data collected from DGS American Recovery and Reinvestment Act funded projects. ○ Develop data collection specifications that support financial risk assessments; require use of this data collection protocol in all future state building energy efficiency projects. • Employ available credit instruments: Use budget and/or state-level credit instruments that can provide larger pools of capital for state building energy efficiency projects. • Agency Accountability: Each agency and department will track the energy performance metrics (consumption, EUI) of the properties under its purview, and be responsible for overall reductions in alignment with the executive order. • State Leasing: Continue requirements for all new state agency commercial building leases to include either an ENERGY STAR certification or a minimum Portfolio Manager energy performance benchmark. • Purchase Agreements: Use the state’s purchasing power to deploy high-efficiency equipment, appliances, and devices in state-owned and state-leased buildings. 	<p><i>2015 and ongoing</i></p>	<p><i>DGS, DOF/ Treasurers Office, DSA, Sustainable Building Working Group, CEC, GO</i></p> <p><i>DGS, DOF/ CEC, Treasurers Office</i></p>
<p>1.1.2 Clean Energy Jobs Act: Implement school building energy upgrades over the lifetime of this program. Create lasting statewide impacts on school building performance. In later program years, use results to influence efficiency actions in both building and finance sectors.</p>	<p><i>Ongoing</i></p>	<p><i>CEC, CDE/ Local Educational Agencies (LEAs)</i></p>
<p>1.1.3 DSA Deep Retrofit Exemplars: Produce detailed plans for deep energy retrofits of several California school buildings/campuses. Develop and disseminate case studies for school districts, explaining deep retrofit opportunities, and identifying where the designs will be applicable to school buildings across the State.</p>	<p><i>2016 - 2017</i></p>	<p><i>DSA/A&E firms, LEAs</i></p>

California’s Existing Buildings Energy Efficiency Action Plan

Strategy 1.2 Nonresidential Benchmarking and Disclosure

“[Benchmarking and disclosure policies] have the potential to influence the real estate decisions of tens of thousands of businesses, tenants, investors, pension funds, lenders and building owners and operators. Needless to say, that is no small thing.”

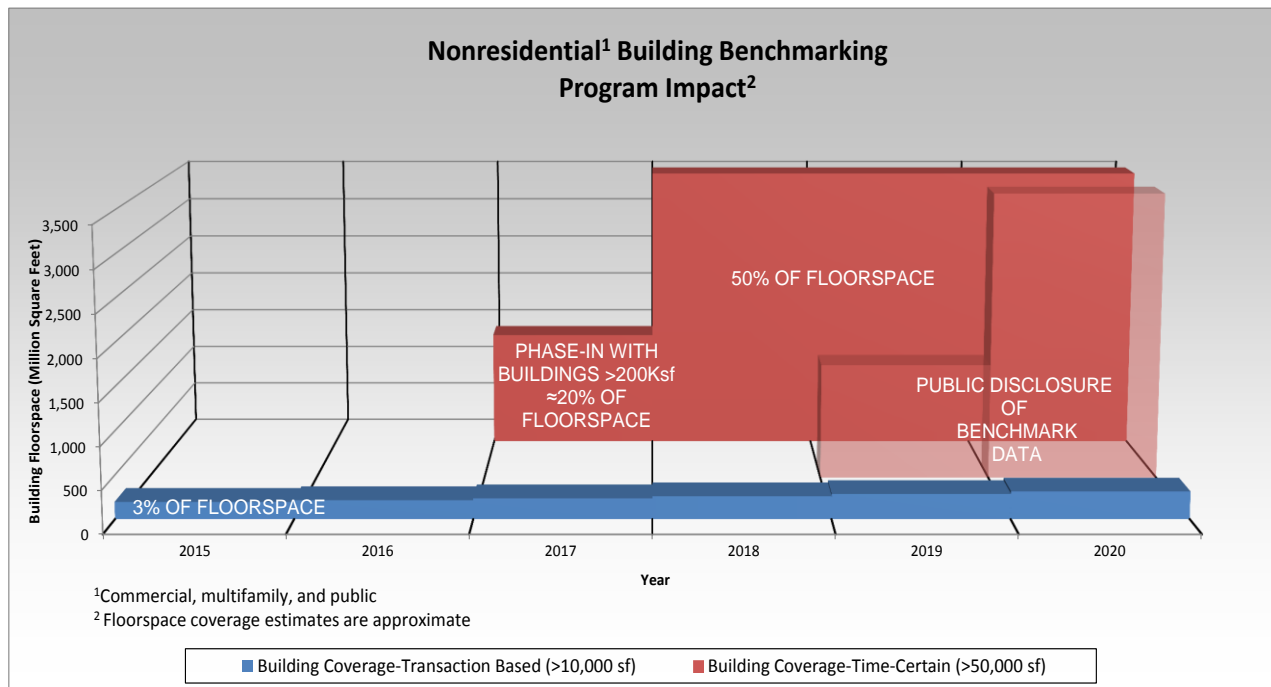
Institute for Market Transformation (IMT), “Building Energy Transparency, A Framework for Implementing US Commercial Energy Rating and Disclosure Policy”, July 2011

Knowledge of one’s energy use, placed in the proper context, can be a powerful motivator for making energy efficiency improvements. Jurisdictions across the country, including New York City, Boston, Seattle, Chicago, and San Francisco, have instituted nonresidential benchmarking and disclosure policies. California’s experience implementing the time-of-transaction benchmarking program (AB 1103) has produced lessons for what a workable and impactful benchmarking effort will entail. Furthermore, widely accepted, standardized tools developed, and supported by the federal government and already

used in California provide the essential infrastructure to implement a time-certain benchmarking and disclosure program at relatively low cost. Benchmarking information, provided to the Energy Commission by building owners, will improve statewide policy and planning by contributing real-world energy performance data for nonresidential buildings. That said, the primary intent for this strategy is to motivate private building energy performance improvements.

The vast majority of commercial buildings are relatively small (less than 50,000 square feet). Large commercial buildings are few in number but represent a high percentage of the state’s floorspace and are responsible for a large percentage of the state’s energy consumption. Owners of large commercial buildings typically have adequate resources to implement benchmarking, so this portion of the sector is well suited for a time-certain benchmarking and public disclosure program. This program will apply to all nonresidential buildings above 50,000 gross square feet of floor area and will be performed periodically at intervals to be determined by the CEC. For this strategy, “nonresidential” refers to commercial, public,

Figure 3.1: Statewide Whole-Building Energy Benchmarking and Disclosure



Source: California Energy Commission

California's Existing Buildings Energy Efficiency Action Plan

and multifamily buildings. Building owners and utilities will upload building characteristics and energy use data to the EPA's ENERGY STAR Portfolio Manager®. For each building, the benchmarking score and/or aggregate energy consumption will become public after the second benchmarking cycle, again with details to be defined through a rulemaking process.

The Energy Commission will work with jurisdictions that have existing or emerging benchmarking ordinances to ensure alignment with the statewide program. Local governments are encouraged to implement programs with more stringent and/or comprehensive requirements than those of the statewide program, and the Energy Commission will work to ensure minimal additional effort is required for statewide compliance. The program will be implemented over several years in a manner that dovetails with AB 1103, per Figure 3.1. For example, reported benchmarking data for buildings above 50,000 square feet will be deemed compliant with AB 1103, such that no additional effort is required by the building owner, other than providing the information to a prospective buyer, lessee, or lender. Commercial buildings smaller than 50,000 square feet will still be subject to the AB 1103 regulations—owners of covered buildings above 10,000 square feet must continue to provide benchmarking information to a prospective buyer, lessee, or lender and the Energy Commission at the time of sale, lease, or finance.

Rulemaking and program development will address:

- Phase-in and coordination with local jurisdictions.
- Whole-building energy use data aggregation protocols for utilities.
- Support services and other tools to enable straightforward compliance.
- Leveraging Portfolio Manager and other tools to encourage continuous assessment of energy performance beyond basic compliance.
- Strategies to move building owners, managers, and tenants from knowledge to action.
- Expanding the program to cover smaller buildings.

Easy access to energy use data for building owners will be essential to the success of this program. Staff will hold a workshop in fall 2015 to propose an aggregation threshold and discuss other requirements for whole-building data access. While this workshop will focus on clarifying these matters for the time-of-transaction program currently in place (AB 1103), it will create precedents for the time-certain program taking effect in 2017.

Future Potential Additional Mandatory Elements

The energy agencies will evaluate market trends and the growth of energy efficiency upgrades over the first three years of the time-certain benchmarking and disclosure program. Based on that evaluation, the Energy Commission will determine if, under future *Existing Buildings Energy Efficiency Action Plan* updates, it will recommend, to the Governor's office and legislature, mandatory actions for consistently low-performing buildings. Such requirements might include cost-effective retrofit measures and/or retrocommissioning, and could be accompanied by support tools such as direct technical assistance and accessible financing. The Energy Commission will also consider including smaller buildings in the program at that time.

California’s Existing Buildings Energy Efficiency Action Plan

Strategy	Metrics/Time Frame	Lead/Partners
<p>1.2 Statewide Nonresidential Benchmarking: Establish a statewide energy benchmarking program with eventual public disclosure for commercial, public, and multifamily buildings above 50,000 sf gross floor area.</p> <p>1.2.1 Update Time-of-Transaction (AB 1103) Regulations:</p> <ul style="list-style-type: none"> • Streamline access to whole-building energy use data for building owners. • Implement an aggregation threshold that will enable simple access to useful, actionable data for building owners, while respecting tenant privacy. • Work with utilities to map building addresses to meters. <p>1.2.2 Time-Certain Benchmarking and Disclosure Rulemaking: Determine program structure, requirements, high-level process, and timeline.</p> <p>1.2.3 Benchmarking and Reporting Infrastructure Development:</p> <ul style="list-style-type: none"> • Evaluate the Standard Energy Efficiency Data platform for matching utility data with physical property information and storing benchmarking data. • Partner with local governments to employ a database infrastructure for public disclosure of benchmarking data. • Work with the EPA to ensure the seamless integration of Portfolio Manager and California’s benchmarking and disclosure database. <p>1.2.4 Implement Statewide Program:</p> <ul style="list-style-type: none"> • Monitor and facilitate compliance with the benchmarking and disclosure regulations. • Establish clear metrics to evaluate effectiveness. <p>1.2.5 Potential Mandatory Programs:</p> <ul style="list-style-type: none"> • Review the benchmarking and disclosure programs to determine whether they motivate improvements and result in sufficient savings. • Determine whether mandatory retrofits and/or retrocommissioning are necessary to deepen savings. • Determine whether the program should be extended to smaller buildings. 	<p><i>Phased, 2015 - 2021. State buildings beginning 2016.</i></p> <p><i>Prerulemaking and Rulemaking 2015; New regulations effective 2016</i></p> <p><i>Prerulemaking and Rulemaking in 2016; New regulations effective 2017</i></p> <p><i>Fully operational in 2016</i></p> <p><i>Phased 2018 - 2022</i></p> <p><i>Evaluation of disclosure policy effectiveness within 2 –5 years of implementation for each sector</i></p>	<p><i>CEC/CPUC, Utilities, Pacific Coast Collaborative (PCC)</i></p> <p><i>CEC/EPA, Utilities</i></p> <p><i>CEC/PCC</i></p> <p><i>CEC/DOE, EPA, LGs, PCC</i></p> <p><i>CEC/CPUC, Utilities,</i></p> <p><i>CEC, CPUC/GO, Legislature</i></p>

Strategy 1.7 Local Government Leadership

Local governments (LG) are essential loci for innovation. At the same time, one of the major challenges for many LGs is the lack of consistent funding sources for sustainability activities. LG obligations under Senate Bill 375 (Steinberg, Chapter 728, Statutes of 2008) dovetail well with efforts to improve the efficiency of the built environment. The State should encourage forward-thinking LGs to adopt policies and gather relevant experience for wider application, building in performance incentives where appropriate. Balancing statewide consistency with the flexibility to accommodate differences in local tools and resources, the Local Government Challenge builds on previous CEC collaborations with diverse local and regional governments by continuing to focus on areas such as:

- Aggressive efficiency for jurisdiction-owned buildings.
- Early adoption of nonresidential benchmarking and disclosure programs.
- Innovation in building permitting systems, and rigorous code enforcement.
- Significant increase in project flow for residential and small commercial upgrades.
- Data-driven communitywide energy planning
- Audit/assessment requirements at specific trigger points (for example, business license renewals).
- Energy performance districts (see sidebar).

Funding of around \$13 million for this effort will come from leftover administration funds and repayment streams from several ARRA local and regional financing programs that have been closed. Ongoing funding of at least \$20 million per year would allow this effort to flourish.

The California Air Resources Board's Cool California City Challenge is an example of a statewide initiative that promotes incentives for local governments to achieve environmental policy objectives. The challenge encourages cities to motivate their residents to reduce carbon footprints by lowering household energy use and vehicle travel. Sponsored by Energy Upgrade California, the challenge is a competition among participating cities, where prize money is awarded

based on residential emission reductions achieved under the program.

Energy Performance District

An energy performance district (EPD) is a new approach for local governments to pilot either within local government partnership programs, REN activities or via new funding opportunities such as for climate action plans and local grants. An EPD is a specific area or neighborhood identified by a local government using energy data mapping tools to identify high opportunity areas (high energy users, vintage of buildings, and so on).

LG identifies "district"—potentially in connection with a business improvement district, residential neighborhood, or other assessment area using new regional decision-making data tools such as shown on pages 61-62. An energy savings goal is developed along with a 2–5 year plan to achieve those savings. Ideally, LGs are awarded with funding for achieving its goals and maintaining long-term performance in the district. Leading LGs in California have had varied successes with neighborhood approaches to project aggregation; the EPD model may be attractive for amplifying the successes of those efforts.

Sonoma County's energy, water, and climate protection agencies are piloting the Pay As You Save (PAYS) program in the town of Windsor, where water- and energy-saving measures are installed in homes with no upfront costs or debt incurred by property owners or tenants. The PAYS program adds a surcharge to participants' water and/or energy bills, and these charges are guaranteed to be lower than expected bill savings.¹⁰⁷ This government partnership with utilities to provide innovative solutions that dramatically reduce consumer transaction costs is a great example of local government leadership.

¹⁰⁷ "Residential Programs," accessed February 24, 2015, <http://sonomacountyenergy.org/residential-programs/>

California’s Existing Buildings Energy Efficiency Action Plan

Strategy	Metrics/Time Frame	Lead/Partners
<p>1.7 Local Government Leadership: Engage and recruit LGs to demonstrate leadership in energy efficiency through various programs, activities, and mechanisms.</p> <p>1.7.1 Challenge Program: Transition ARRA-funded local and regional financing programs to a grant process aimed at both innovative jurisdictions and disadvantaged communities. Include cities, counties, joint power authorities, metropolitan planning organizations, councils of governments and other local government consortia. Award assistance based on LG actions and adoption of policies for aggressive energy efficiency, disclosure, compliance and permitting.</p> <ul style="list-style-type: none"> • Local governments apply in a competitive process • Disadvantaged communities can access separate, non-competitive grant funds • Ensure geographic and size diversity • Work with leading LGs on local benchmarking and upgrade programs. • Create a repository of best practices and lessons learned that can be readily shared. • Encourage data-driven local policy and targeted actions. 	<p><i>Seed funding available and program launch in 2016</i></p>	<p><i>CEC, LGC/OPR</i></p>
<p>1.7.2 Local Government Partnerships: Coordinate utility LG partnerships with the action plan goals and strategies to minimize duplication; actively share data to simplify LG jurisdictional activities to maximize energy-saving opportunities.</p>	<p><i>2016 and ongoing</i></p>	<p><i>CPUC, POUs/program implementers</i></p>
<p>1.7.3 Leverage Other Efforts: Leverage local climate action, general plan/land use, water conservation and other relevant planning mechanisms as a means to improve energy efficiency and reduce GHG (consistent with AB 32, <i>ARB Scoping Plan Update</i>).</p> <ul style="list-style-type: none"> • Ensure access by land-use and climate action planners to better building energy use baseline data and location-specific estimates of energy savings potentials. 	<p><i>2016 and ongoing</i></p>	<p><i>LG/ARB, OPR-Strategic Growth Council, CEC</i></p>

APPENDIX B: AB 802 (Williams) Energy Efficiency Bill

[AB 802](#) recently passed out of the California state legislature and was signed into law by Governor Brown. This bill will require monthly, whole-building energy use data to be disclosed to building owners, and also provides the California Energy Commission the authority to launch a statewide benchmarking and transparency program for commercial and multifamily buildings.

The full AB 802 bill text is included on the following pages.

Assembly Bill No. 802

Passed the Assembly September 11, 2015

Chief Clerk of the Assembly

Passed the Senate September 11, 2015

Secretary of the Senate

This bill was received by the Governor this _____ day
of _____, 2015, at _____ o'clock ____M.

Private Secretary of the Governor

CHAPTER _____

An act to amend Sections 25301 and 25303 of, and to repeal and add Section 25402.10 of, the Public Resources Code, and to amend Section 381.2 of, to amend and renumber Section 384.2 of, and to add Section 913.8 to, the Public Utilities Code, relating to energy efficiency.

LEGISLATIVE COUNSEL’S DIGEST

AB 802, Williams. Energy efficiency.

(1) Existing law requires the State Energy Resources Conservation and Development Commission (Energy Commission), at least every 2 years, to conduct assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery, distribution, demand, and prices. Existing law requires the Energy Commission to use these assessments and forecasts to develop energy policies that conserve resources, protect the environment, ensure energy reliability, enhance the state’s economy, and protect public health and safety. Existing law requires the Energy Commission to prepare an integrated energy policy report every 2 years and requires the report to include an assessment and forecast of system reliability and the need for resource additions, efficiency, and conservation that considers certain criteria.

This bill would require the Energy Commission, in consultation with the Public Utilities Commission, to make all reasonable adjustments to its energy demand forecasts conducted pursuant to the above-described provisions to account for its findings of market conditions and existing baselines, and in making those adjustments, would authorize the commission to consider the results from specified programs.

The bill would require the Energy Commission to use the above-described assessments and forecasts relating to various aspects of the energy industry to develop and evaluate energy policies and programs.

(2) Existing law requires electric and gas utilities to maintain records of the energy consumption data of all nonresidential buildings to which they provide service and requires that this data

be maintained, in a format compatible for uploading to the United States Environmental Protection Agency's ENERGY STAR Portfolio Manager, for at least the most recent 12 months. Existing law also requires, upon the written authorization or secure electronic authorization of a nonresidential building owner or operator, an electric or gas utility to upload all of the energy consumption data for the account specified for a building to the United States Environmental Protection Agency's ENERGY STAR Portfolio Manager in a manner that preserves the confidentiality of the customer. Existing law requires an owner or operator to disclose the United States Environmental Protection Agency's ENERGY STAR Portfolio Manager benchmarking data and rating to a prospective buyer, lessee of the entire building, or lender that would finance the entire building based on a schedule of compliance established by the Energy Commission.

This bill would revise and recast these provisions. The bill would require utilities to maintain records of the energy usage data of all buildings to which they provide service for at least the most recent 12 complete months. Beginning no later than January 1, 2017, the bill would require each utility, upon the request and the written authorization or secure electronic authorization of the owner, owner's agent, or operator of a covered building, as defined, to deliver or provide aggregated energy usage data for a covered building to the owner, owner's agent, operator, or to the owner's account in the ENERGY STAR Portfolio Manager, subject to specified requirements. The bill would also authorize the commission to specify additional information to be delivered by utilities for certain purposes. The bill would delete the requirement of an owner or operator of a building to disclose the above-described information to a prospective buyer, lessee of the entire building, or lender that would finance the entire building. The bill would require the Energy Commission to adopt regulations providing for the delivery to the commission and public disclosure of benchmarking of energy use for covered buildings, as prescribed. The bill would authorize the Energy Commission to impose a civil fine, as provided, for a violation of these data submission requirements.

(3) Existing law requires the Energy Commission to develop and implement a comprehensive program to achieve greater energy savings in existing residential and nonresidential building stock.

Existing law requires the Public Utilities Commission (PUC) to investigate the ability of electrical corporations and gas corporations to provide various energy efficiency financing options to their customers for the purposes of implementing the program developed by the Energy Commission.

This bill would require the PUC, by September 1, 2016, to authorize electrical corporations and gas corporations to provide incentives, rebates, technical assistance, and support to their customers to increase the energy efficiency of existing buildings, as specified, and would authorize electrical corporations and gas corporations to recover the reasonable costs of those programs in rates. The bill would require the PUC to authorize electrical corporations and gas corporations to count all energy savings achieved through the authorized programs, unless determined otherwise, toward overall energy efficiency goals or targets established by the PUC. The bill would authorize the PUC to adjust the energy efficiency goals or targets of electrical corporations and gas corporations to reflect the estimated change in energy savings resulting from those programs.

The people of the State of California do enact as follows:

SECTION 1. It is the intent of the Legislature to support strategies that enhance energy efficiency. Building owners should have access to their buildings' energy usage information, which enables understanding of a building's energy usage for improved building management and investment decisions. It is the intent of the Legislature that the State Energy Resources Conservation and Development Commission create a benchmarking and disclosure program through which building owners of commercial and multifamily buildings above 50,000 square feet gross floor area will better understand their energy consumption through standardized energy use metrics.

SEC. 2. Section 25301 of the Public Resources Code is amended to read:

25301. (a) At least every two years, the commission shall conduct assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery and distribution, demand, and prices. The commission shall use these assessments and forecasts to develop and evaluate energy policies and programs

that conserve resources, protect the environment, ensure energy reliability, enhance the state's economy, and protect public health and safety. To perform these assessments and forecasts, the commission may require submission of demand forecasts, resource plans, market assessments, related outlooks, individual customer historic electric or gas service usage, or both, and individual customer historic billing data, in a format and level of granularity specified by the commission from electric and natural gas utilities, transportation fuel and technology suppliers, and other market participants. These assessments and forecasts shall be done in consultation with the appropriate state and federal agencies including, but not limited to, the Public Utilities Commission, the Office of Ratepayer Advocates, the Air Resources Board, the Electricity Oversight Board, the Independent System Operator, the Department of Water Resources, the California Consumer Power and Conservation Financing Authority, the Department of Transportation, and the Department of Motor Vehicles. The commission shall maintain reasonable policies and procedures to protect customer information from unauthorized disclosure.

(b) In developing the assessments and forecasts prepared pursuant to subdivision (a), the commission shall do all of the following:

- (1) Provide information about the performance of energy industries.
- (2) Develop and maintain the analytical capability sufficient to answer inquiries about energy issues from government, market participants, and the public.
- (3) Analyze, develop, and evaluate energy policies and programs.
- (4) Provide an analytical foundation for regulatory and policy decisionmaking.
- (5) Facilitate efficient and reliable energy markets.

SEC. 3. Section 25303 of the Public Resources Code is amended to read:

25303. (a) The commission shall conduct electricity and natural gas forecasting and assessment activities to meet the requirements of paragraph (1) of subdivision (a) of Section 25302, including, but not limited to, all of the following:

- (1) Assessment of trends in electricity and natural gas supply and demand, and the outlook for wholesale and retail prices for

commodity electricity and natural gas under current market structures and expected market conditions.

(2) Forecasts of statewide and regional electricity and natural gas demand including annual, seasonal, and peak demand, and the factors leading to projected demand growth, including, but not limited to, projected population growth, urban development, industrial expansion and energy intensity of industries, energy demand for different building types, energy efficiency, and other factors influencing demand for electricity. With respect to long-range forecasts of the demand for natural gas, the report shall include an evaluation of average conditions, as well as best and worst case scenarios, and an evaluation of the impact of the increasing use of renewable resources on natural gas demand.

(3) Evaluation of the adequacy of electricity and natural gas supplies to meet forecasted demand growth. Assessment of the availability, reliability, and efficiency of the electricity and natural gas infrastructure and systems, including, but not limited to, natural gas production capability both in and out of state, natural gas interstate and intrastate pipeline capacity, storage and use, and western regional and California electricity and transmission system capacity and use.

(4) Evaluation of potential impacts of electricity and natural gas supply, demand, and infrastructure and resource additions on the electricity and natural gas systems, public health and safety, the economy, resources, and the environment.

(5) Evaluation of the potential impacts of electricity and natural gas load management efforts, including end-user response to market price signals, as a means to ensure reliable operation of electricity and natural gas systems.

(6) Evaluation of whether electricity and natural gas markets are adequately meeting public interest objectives including the provision of all of the following: economic benefits; competitive, low-cost reliable services; customer information and protection; and environmentally sensitive electricity and natural gas supplies. This evaluation may consider the extent to which California is an element within western energy markets, the existence of appropriate incentives for market participants to provide supplies and for consumers to respond to energy prices, appropriate identification of responsibilities of various market participants, and an assessment of long-term versus short-term market performance. To the extent

this evaluation identifies market shortcomings, the commission shall propose market structure changes to improve performance.

(7) Identification of impending or potential problems or uncertainties in the electricity and natural gas markets, potential options and solutions, and recommendations.

(8) (A) Compilation and assessment of existing scientific studies that have been performed by persons or entities with expertise and qualifications in the subject of the studies to determine the potential vulnerability to a major disruption due to aging or a major seismic event of large baseload generation facilities, of 1,700 megawatts or greater.

(B) The assessment specified in subparagraph (A) shall include an analysis of the impact of a major disruption on system reliability, public safety, and the economy.

(C) The commission may work with other public entities and public agencies, including, but not limited to, the California Independent System Operator, the Public Utilities Commission, the Department of Conservation, and the Seismic Safety Commission as necessary, to gather and analyze the information required by this paragraph.

(D) Upon completion and publication of the initial review of the information required pursuant to this paragraph, the commission shall perform subsequent updates as new data or new understanding of potential seismic hazards emerge.

(b) Commencing November 1, 2003, and every two years thereafter, to be included in the integrated energy policy report prepared pursuant to Section 25302, the commission shall assess the current status of the following:

(1) The environmental performance of the electric generation facilities of the state, to include all of the following:

(A) Generation facility efficiency.

(B) Air emission control technologies in use in operating plants.

(C) The extent to which recent resource additions have, and expected resource additions are likely to, displace or reduce the operation of existing facilities, including the environmental consequences of these changes.

(2) The geographic distribution of statewide environmental, efficiency, and socioeconomic benefits and drawbacks of existing generation facilities, including, but not limited to, the impacts on natural resources including wildlife habitat, air quality, and water

resources, and the relationship to demographic factors. The assessment shall describe the socioeconomic and demographic factors that existed when the facilities were constructed and the current status of these factors. In addition, the report shall include how expected or recent resource additions could change the assessment through displaced or reduced operation of existing facilities.

(c) In the absence of a long-term nuclear waste storage facility, the commission shall assess the potential state and local costs and impacts associated with accumulating waste at California's nuclear powerplants. The commission shall further assess other key policy and planning issues that will affect the future role of nuclear powerplants in the state. The commission's assessment shall be adopted on or before November 1, 2008, and included in the 2008 energy policy review adopted pursuant to subdivision (d) of Section 25302.

(d) The commission, in consultation with the Public Utilities Commission, shall make all reasonable adjustments to its energy demand forecasts conducted pursuant to Sections 25301 and 25302 to account for its findings of market conditions and existing baselines, and, in making those adjustments, may consider the results from subdivisions (b) and (d) of Section 381.2 of the Public Utilities Code.

SEC. 4. Section 25402.10 of the Public Resources Code is repealed.

SEC. 5. Section 25402.10 is added to the Public Resources Code, to read:

25402.10. (a) For the purposes of this section, the following terms have the following meanings:

(1) "Benchmark" means to obtain information on the energy use in an entire building for a specific period to enable that usage to be tracked or compared against other buildings.

(2) "Covered building" for purposes of this section means either or both of the following:

(A) Any building with no residential utility accounts.

(B) Any building with five or more active utility accounts, residential or nonresidential.

(3) "Energy" means electricity, natural gas, steam, or fuel oil sold by a utility to a customer for end uses addressed by the ENERGY STAR Portfolio Manager system.

(4) “ENERGY STAR Portfolio Manager” means the tool developed and maintained by the United States Environmental Protection Agency to track and assess the energy performance of buildings.

(b) On and after January 1, 2016, each utility shall maintain records of the energy usage data of all buildings to which they provide service for at least the most recent 12 complete calendar months.

(c) (1) Subject to the requirements of paragraph (2), beginning no later than January 1, 2017, each utility shall, upon the request and written authorization or secure electronic authorization of the owner, owner’s agent, or operator of a covered building, deliver or otherwise provide aggregated energy usage data for a covered building to the owner, owner’s agent, building operator, or to the owner’s account in the ENERGY STAR Portfolio Manager. The commission may specify additional information to be delivered by utilities to enable building owners to complete benchmarking of the energy use in their buildings and in other systems or formats for information delivery and automation.

(2) The delivery of information by utilities pursuant to this section shall be subject to the following requirements:

(A) For covered buildings with three or more active utility accounts, each utility shall deliver information showing the aggregated energy usage data of all utility customers in the same building for each of the 12 prior months. Notwithstanding any other law, energy usage data aggregated in this manner shall not be deemed customer utility usage information or confidential information by the utility for purposes of delivery to the owner, owner’s agent, or operator of a building. The building owner and utility shall not have any liability for any use or disclosure of aggregated energy usage data delivered as required by this section.

(B) For covered buildings not subject to subparagraph (A), each utility shall deliver the information showing the aggregated energy usage data of all utility customers in the same building for each of the prior 12 months if the accountholder provides written or electronic consent for the delivery of the accountholder’s energy usage data to the owner, owner’s agent, operator, or utility.

(C) Each utility shall deliver, upload, or otherwise provide aggregated energy usage data within four weeks of receiving a

request from an owner, owner's agent, or operator of a covered building.

(D) Each utility shall make available the covered building energy usage data aggregated at a monthly level unless otherwise specified by the commission.

(E) The building owner and utility shall not have any liability for any use or disclosure by others of usage information delivered as required by this section.

(d) The commission shall adopt regulations providing for the delivery to the commission and public disclosure of benchmarking of energy use for covered buildings, as follows:

(1) This subdivision shall not require the owner of a building with 16 or fewer residential utility accounts to collect or deliver energy usage information to the commission.

(2) The commission may do, but is not limited to doing, all of the following in regulations adopted pursuant to this subdivision:

(A) Identify and provide for the collection of the energy usage data for the calculation of benchmarking of energy use.

(B) Identify and provide for the collection of the covered building characteristic information deemed necessary by the commission for the calculation of benchmarking of energy use.

(C) Specify the manner in which certain benchmarking of energy use shall be publicly disclosed.

(D) Determine which covered buildings, in addition to those described in paragraph (1), are not subject to the public disclosure requirement.

(E) Set a schedule to implement the requirements for public disclosure adopted by the commission.

(F) Determine if compliance with a local or county benchmarking program fulfills the commission's requirements adopted pursuant to this subdivision.

(G) Identify categories of information it receives pursuant to this section that are protected from release under either the California Public Records Act (Chapter 3.5 (commencing with Section 6250) of Division 7 of Title 1 of the Government Code) or the Information Practices Act of 1977 (Chapter 1 (commencing with Section 1798) of Title 1.8 of Part 4 of Division 3 of the Civil Code).

(3) The commission shall determine who will deliver the energy usage data and related information for any covered building to the commission.

(e) The commission may ensure timely and accurate compliance with the data submission requirements of this section by using the enforcement measures identified in Section 25321. An owner of a covered building, or its agents or operators, shall not be liable for any noncompliance due to the failure of a utility to provide the information required for compliance.

(f) For buildings that are not covered buildings, and for customer information that is not aggregated pursuant to subparagraph (A) of paragraph (2) of subdivision (c), the commission may adopt regulations prescribing how utilities shall either obtain the customer's permission or determine that a building owner has obtained the customer's permission, for the owner to receive aggregated energy usage data or, where applicable, individual customer usage information, including by use of electronic authorization and in a lease agreement between the owner and the customer.

(g) The reasonable costs of an electrical or gas corporation in delivering electrical or gas usage data pursuant to this section or other information as required under state or federal law or by an order of the commission shall be recoverable in rates evaluated and approved by the Public Utilities Commission.

(h) The reasonable costs of local publicly owned electric utilities in disclosing electrical usage data pursuant to this section may be considered "cost-effective demand-side management services to promote energy efficiency and energy conservation" and thereby reimbursable by their general fund.

(i) Nothing in this section shall prevent a city or county from establishing its own benchmarking program requiring collection, delivery, and disclosure of building information.

SEC. 6. Section 381.2 of the Public Utilities Code is amended to read:

381.2. (a) The commission shall investigate the ability of electrical corporations and gas corporations to provide various energy efficiency financing options to their customers for the purposes of implementing the program developed pursuant to Section 25943 of the Public Resources Code.

(b) Recognizing the already underway 2015 commission work to adopt efficiency potential and goals, the Energy Commission work on its 2015 energy demand forecast, and the need to determine how to incorporate meter-based performance into determinations of goals, portfolio cost-effectiveness, and authorized budgets, the commission, in a separate or existing proceeding, shall, by September 1, 2016, authorize electrical corporations or gas corporations to provide financial incentives, rebates, technical assistance, and support to their customers to increase the energy efficiency of existing buildings based on all estimated energy savings and energy usage reductions, taking into consideration the overall reduction in normalized metered energy consumption as a measure of energy savings. Those programs shall include energy usage reductions resulting from the adoption of a measure or installation of equipment required for modifications to existing buildings to bring them into conformity with, or exceed, the requirements of Title 24 of the California Code of Regulations, as well as operational, behavioral, and retrocommissioning activities reasonably expected to produce multiyear savings. Electrical corporations and gas corporations shall be permitted to recover in rates the reasonable costs of these programs. The commission shall authorize an electrical corporation and gas corporation to count all energy savings achieved through the authorized programs created by this subdivision, unless determined otherwise, toward overall energy efficiency goals or targets established by the commission. The commission may adjust the energy efficiency goals or targets of an electrical corporation and gas corporation to reflect this change in savings estimation consistent with this subdivision and subdivision (d).

(c) Effective January 1, 2016, electrical corporations and gas corporations are authorized to implement the provisions of subdivision (b) for high opportunity projects or programs. The commission shall provide expedited authorization of high opportunity projects and programs to apply the savings baseline provisions in subdivision (b).

(d) In furtherance of subdivision (b), the commission, in consultation with the Energy Commission, shall consider all of the following:

- (1) The results of any interagency baseline assessment.

(2) Any available results from investor-owned utility baseline pilot studies ordered in D.14-10-046.

(3) Information necessary to ensure consistency with the energy forecast and planning functions of the Energy Commission and the Independent System Operator.

(e) The commission may direct electrical corporations and gas corporations to make filings that are necessary to ensure coordination with the energy forecast and planning functions of the Energy Commission and the Independent System Operator.

(f) The commission shall prioritize energy efficiency activities consistent with Sections 454.55 and 454.56.

SEC. 7. Section 384.2 of the Public Utilities Code is amended and renumbered to read:

913.7. The commission shall submit a report to the Legislature by July 15, 2009, and triennially thereafter, on the energy efficiency and conservation programs it oversees. The report shall include information regarding authorized utility budgets and expenditures and projected and actual energy savings over the program cycle.

SEC. 8. Section 913.8 is added to the Public Resources Code, to read:

913.8. In the report prepared pursuant Section 913.7, the commission shall include an assessment of each electrical corporation's and each gas corporation's implementation of the program developed pursuant to Section 25943 of the Public Resources Code.

Approved _____, 2015

Governor

Appendix C: Institute for Market Transformation Resources

The Institute for Market Transformation (IMT) is a Washington, DC-based nonprofit organization promoting energy efficiency, green building and environmental protection in the United States and abroad. IMT's work addresses market failures that inhibit investment in energy efficiency and sustainability in the building sector.

The following pages include IMT resources *Energy Benchmarking and Transparency Benefits* fact sheet and *U.S. Building Benchmarking and Transparency Policies* map.

ENERGY BENCHMARKING AND TRANSPARENCY BENEFITS

For more information, contact
Caroline Keicher at caroline@imt.org.

WHAT IS ENERGY BENCHMARKING?

Energy benchmarking is the process of measuring a building's energy use over time. This allows owners and occupants to understand their building's energy performance relative to similar buildings and helps identify opportunities to cut energy waste.

WHY IS IT IMPORTANT?

The building sector is the single largest user of energy in the United States, accounting for roughly 40 percent of total energy consumption. Each year, we spend \$450 billion on energy for our buildings. What's more, **the poorest performing buildings use 3 to 7 times the energy of the highest performing buildings**—for the exact same building use.

Energy benchmarking and transparency allows building owners, governments, and the public to better understand how their buildings use energy. With this knowledge, they can make smarter and more cost-effective improvements.

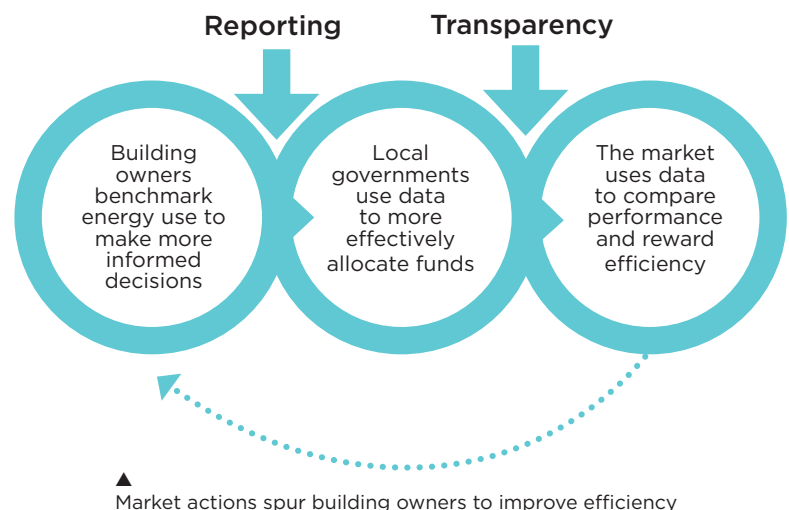
HOW DOES ENERGY BENCHMARKING WORK?

Benchmarking and sharing building energy use through transparency programs and policies is an easy way to examine energy use and make smarter, more cost-effective operational and capital investment decisions. At their core, benchmarking and transparency programs comprise three components:

- **Benchmarking.** You can't manage what you don't measure. Collecting building energy use data sets a performance baseline that allows building owners to know how their buildings compare to similar buildings, the magnitude of potential energy savings, and whether energy efficiency improvements are having a positive effect.
- **Reporting.** Sharing benchmarking data with a city, state, or province allows policymakers to analyze whether programs are achieving their intended results, more effectively utilize resources, and gain a better understanding of a region's building stock for infrastructure planning.
- **Transparency.** Sharing benchmarking data on a large scale opens up a conversation among all stakeholders and allows everyone to work toward common energy goals by recognizing and rewarding efficiency.

HOW BENCHMARKING TRANSFORMS THE MARKET

Collecting, reporting, and sharing benchmarking data on a regular basis allows the market and government agencies to make smarter investment decisions, reward efficiency, and drive widespread, continuous improvement.



CAPITALIZING ON ENERGY EFFICIENCY THROUGH ENERGY BENCHMARKING

Benchmarking building energy use offers consumers, building owners, government agencies, and utilities a multitude of benefits.

MARKET COMPETITION AND CONSUMER CHOICE

Data gleaned from benchmarking allows building owners to remain competitive, and requiring benchmarking across a region's building stock in turn makes states and cities more economically competitive.

- › Energy-efficient properties have [occupancy levels](#) up to 10% higher than less-efficient properties, [rental premiums](#) over 10% higher than less-efficient properties, and [sale prices](#) up to 25% higher than less-efficient properties.
- › [Evidence indicates](#) that benchmarking and transparency laws reduce utility expenditures by about 3%.
- › Global organizations that track and analyze their energy use have reported [taking three times more energy efficiency actions](#) than those that do not regularly track energy use. Benchmarking allows North American buildings to remain competitive.

ENERGY AND COST SAVINGS Energy waste in buildings drains millions of dollars from the economy every year. Benchmarking is highly correlated with energy efficiency improvements and savings.

- › Buildings across the U.S. that benchmarked over a 3-year time span reduced energy consumption by an average of 2.4% annually, [which for a 500,000-square-foot office building could result in cumulative energy cost savings of \\$120,000](#). In Washington, D.C., [buildings that benchmarked from 2010 to 2012 under the District's ordinance](#) have reduced energy use by 9% on average, adjusting for weather, over that 3-year period.
- › Of customers [that participated](#) in utility benchmarking programs, more than half agreed that benchmarking leads to the implementation of more comprehensive energy efficiency measures.
- › More than 70% of [facility managers surveyed](#) use benchmarking information to guide energy efficiency upgrade plans, and 67% use it to help justify energy efficiency improvements.

JOB CREATION AND ECONOMIC GROWTH

Giving the market better information about building performance unlocks demand for energy-efficient products and skilled workers such as engineers, energy auditors, architects, facility managers, and construction workers—quality jobs that can't be outsourced.

- › [Out of Philadelphia's 7,000 commercial buildings](#), 77% need energy upgrades. Retrofitting them would generate more than \$600 million in local spending and support 23,000 jobs. Benchmarking was identified as a solution for helping buildings most in need of improvement.
- › Local businesses in markets with existing benchmarking and transparency laws reported significant new demand for energy efficiency services and are hiring new employees after the adoption of a benchmarking ordinance, with this demand driven by increased awareness of building energy efficiency opportunities.

SMARTER GOVERNMENTS AND UTILITIES

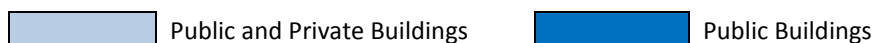
Buildings are one of a city's most important assets. Benchmarking data provides unparalleled insight into how buildings perform, enabling more informed investment decisions.

- › In New York City, an [analysis of benchmarking data](#) from more than 13,000 buildings showed energy use variations by a factor of 3 to 7 among properties with similar uses, exposing potential for sector-specific improvement and savings opportunities.
- › In San Francisco, account representatives of Pacific Gas and Electric Company [use benchmarking data](#) to streamline outreach efforts and reach out to building owners about specific efficiency programs.
- › In Massachusetts, the Low-income Energy Affordability Network, Massachusetts utilities, and WegoWise [used multifamily benchmarking data](#) as a screening tool to target low-performing buildings for improvements. Raising the performance of all buildings to the top quartile could save 1,800 gBtu of gas and electricity per year.

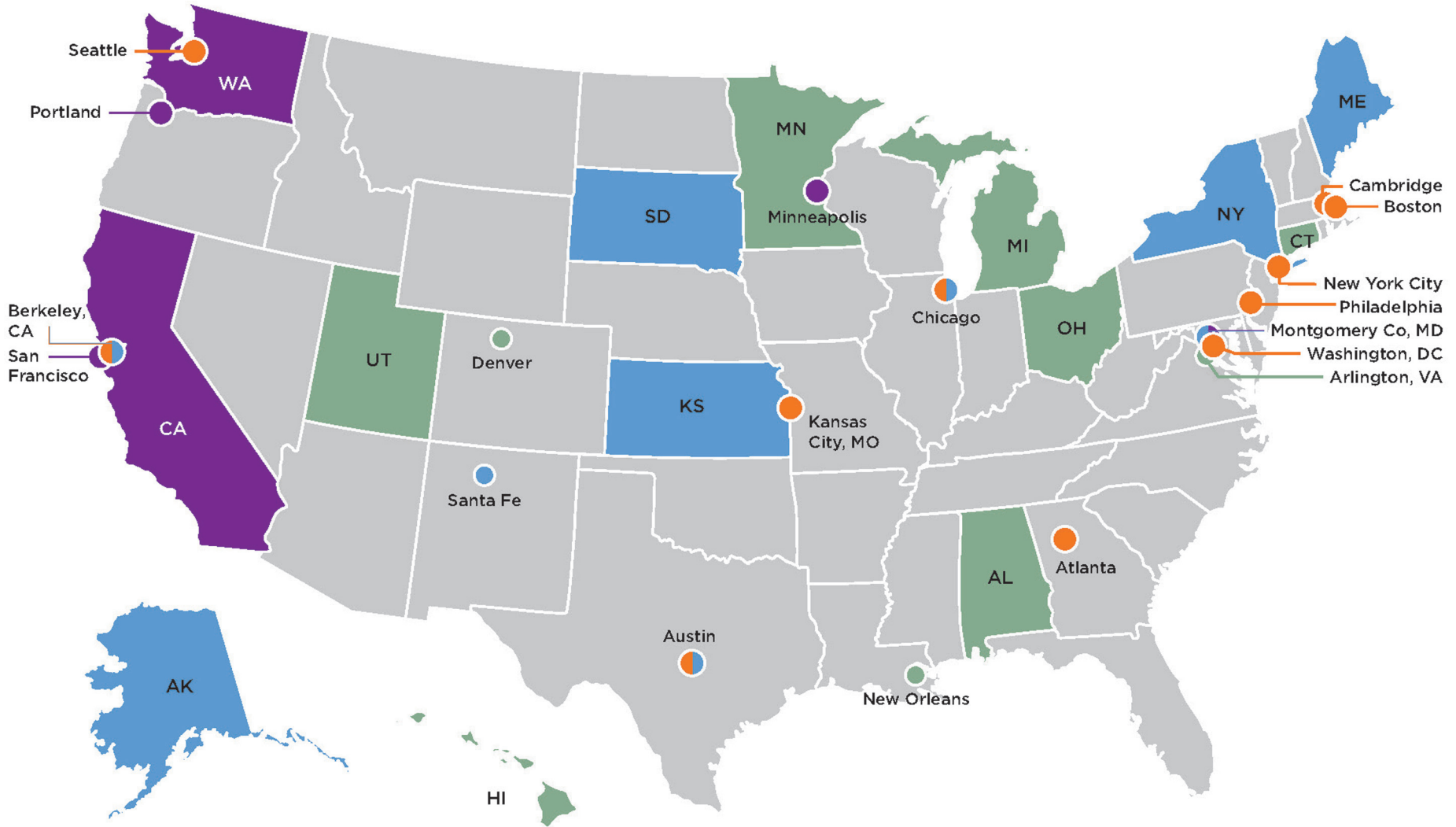
Building Energy Benchmarking Metrics Publicly Released by Cities



Property Characteristics	Boston	Minneapolis	New York	Philadelphia	San Francisco	Washington, DC
Gross Floor Area (ft ²)						
Reported Property Floor Area (buildings and parking) (ft ²)						
Number of Buildings						
Occupancy						
Primary Property Type						
Property Uses						
Year Built						
Year Renovated						
Energy Metrics						
Site EUI (kBtu/ft ²)						
Weather Normalized Site EUI (kBtu/ft ²)						
Source EUI (kBtu/ft ²)						
Weather Normalized Source EUI (kBtu/ft ²)						
Monthly Site EUI						
Annual Site MMBtu						
EUI Change Since 20xx						
Energy Star Score						
Electricity Use - Grid Purchase and Generated Onsite (kWh)						
Electricity Use - Grid Purchase and Generated from Onsite Renewable Systems (kBtu)						
Natural Gas Use (therms)						
Natural Gas Use (kBtu)						
District Steam Use (kBtu)						
Fuel Oil #2 Use (kBtu)						
Other Fuel Use						
Onsite Solar (kWh)						
Total Site Energy (kBtu)						
Total Site Energy - % Electricity						
Total Site Energy - % Gas						
Total Site Energy - % Steam						
Percent Better than National Median Site EUI						
Percent Better than National Median Source EUI						
Site Energy Use (kBtu)						
Source Energy Use (kBtu)						
Weather Normalized Site Energy Use (kBtu)						
Weather Normalized Source Energy Use (kBtu)						
Weather Normalized Site Electricity (kWh)						
Weather Normalized Site Natural Gas Use (therms)						
GHG Metrics						
Total GHG Emissions (Metric Tons CO ₂)						
Total GHG Emissions Intensity (kgCO ₂ e/ft ²)						
Direct GHG Emissions (MtCO ₂ e)						
Indirect GHG Emissions (MtCO ₂ e)						
Carbon Footprint (Lbs CO ₂ /ft ²)						
Water Metrics						
Water Use (kgal)						
Municipally Supplied Potable Water - Indoor Intensity, (gal/ft ²)						
Water Intensity (gal/ft ²)						



U.S. Building Benchmarking and Transparency Policies



- Commercial policy adopted
- Commercial & multifamily policy adopted
- Public buildings benchmarked
- Single-family transparency adopted



Appendix D: City of Berkeley, CA Ordinance

Berkeley's Energy Saving Ordinance (BESO), effective December 1, 2015, will require energy information and disclosure to reduce both energy and water usage in Berkeley buildings. The ordinance language is included in the following pages.

ORDINANCE NO. 7,397–N.S.

ADDING A NEW CHAPTER 19.81 OF THE BERKELEY MUNICIPAL CODE REQUIRING ENERGY INFORMATION AND DISCLOSURE TO REDUCE ENERGY AND WATER USE IN BERKELEY BUILDINGS, REPEALING CHAPTERS 19.16 AND 19.72 EFFECTIVE DECEMBER 1, 2015, AND REPEALING SECTIONS 19.16.080.A.3 AND 19.72.120.B EFFECTIVE OCTOBER 9, 2015

BE IT ORDAINED by the Council of the City of Berkeley as follows:

Section 1. That Section 19.16.080.A.3 of the Berkeley Municipal Code is repealed effective October 9, 2015.

Section 2. That Section 19.72.120.B of the Berkeley Municipal Code is repealed effective October 9, 2015.

Section 3. That Chapter 19.16 of the Berkeley Municipal Code is repealed in its entirety effective December 1, 2015.

Section 4. That Chapter 19.72 of the Berkeley Municipal Code is repealed in its entirety effective December 1, 2015.

Section 5. That Chapter 19.81 of the Berkeley Municipal Code is added to read as follows:

Chapter 19.81

BUILDING ENERGY SAVING

Sections:

- 19.81.010 Purpose.**
- 19.81.020 Applicability.**
- 19.81.030 Definitions.**
- 19.81.040 Large Buildings.**
- 19.81.050 Medium and Small Buildings.**
- 19.81.060 Single Family Buildings.**
- 19.81.070 Early Compliance.**
- 19.81.080 Incentives.**
- 19.81.090 Exceptions, Deferrals and Extensions.**
- 19.81.100 Responsibilities.**
- 19.81.110 Administration and Enforcement.**
- 19.81.120 Fees.**
- 19.81.130 Enforcement.**
- 19.81.140 Violation – Penalty.**
- 19.81.150 Appeals.**
- 19.81.160 Severability.**
- 19.81.170 Chapter Review and Reconsideration.**

19.81.010 Purpose.

The purpose of this chapter is to reduce energy and water consumption in existing buildings. These efficiency improvements will lower energy and water costs and greenhouse gas emissions citywide and increase comfort, safety and health for building occupants. The provisions of the ordinance will inform decision makers about energy performance and improvement opportunities.

19.81.020 Applicability.

The requirements of this Chapter shall apply to all buildings that are located in whole or in part within the City. However, it shall not apply to agencies that are not subject to City authority.

19.81.030 Definitions.

- A. "Administrator" means the Director of Planning and Community Development or her/his designee.
- B. "Building Owner" means the owner of record of a building. In the case of a building held in cooperative or condominium form of ownership, the term "Building Owner" shall refer to the board of managers, board of directors, homeowners association, or other representative body of the jointly-owned building with authority to make decisions about building assessments and alterations.
- C. "Building Energy Score" means a measurement of how efficiently a building uses energy and/or water based on modeled simulations or actual energy use of the building over time compared to similar buildings, which can be in the form of a performance score, asset score or other comparable metric that meets standards and formats established by the Administrator.
- D. "Energy Report" means a report submitted by a Registered Service Provider that identifies existing conditions, opportunities for water and energy efficiency in a building, and available incentives and financing, as well as any applicable Building Energy Score, in accordance with the standards and formats established by the Administrator.
- E. "ENERGY STAR Performance Report" means an ENERGY STAR Portfolio Manager Benchmark report generated by the on-line tool developed by the U.S. Environmental Protection Agency that determines energy use intensity and an Energy Star Performance Score for a building based on utility usage data.
- F. "Extensive Renovation" means any project that replaces all building space heating, cooling, and ventilation equipment and replaces at least half of the building envelope, in accordance to standards established by the Administrator.
- G. "Green Building Rating" means an approved rating by a green building verification system consistent with standards identified by the Energy Efficiency Standardization Coordination Collaborative (EESCC) of the American National Standards Institute (ANSI), including, but not limited to the following: Build It Green (BIG) GreenPoint

Rated Existing Building; US Green Building Council Leadership in Energy and Environmental Design Existing Building Operation and Maintenance (USGBC LEED-EBOM); Passive House Institute (PHI) Certified Passive House and EnerPHit; Passive House Institute US (PHIUS) PHIUS+ Certified Project; and the International Living Future Institute Zero Net Energy Building and Living Building Challenge Certification; or any other rating demonstrating approved levels of energy efficiency, as determined by the Administrator.

- H. "Gross Floor Area" means the total size, as measured between the principal exterior surfaces of the enclosed fixed walls of the building(s). This includes *all areas* inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation.
- I. "Large Building" means any building with 25,000 square feet or more of Gross Floor Area.
- J. "Medium Building" means any building with between 5,000 and 24,999 square feet of Gross Floor Area, excluding Single Family Buildings.
- K. "Registered Service Provider" means an entity that has been registered by the Administrator to provide an Energy Report and/or Building Energy Score as required by this ordinance.
- L. "Sale" means the conveyance of title to real property as a result of the execution of a real property sales contract as defined in Section 2985 of the California Civil Code as well as any change of ownership described in subdivision (c) of Section 61 and subdivision (c) of Section 64 of the California Revenue and Taxation Code. "Sale" does not include transfer of title pursuant to inheritance, involuntary transfer of title resulting from default on an obligation secured by real property, change of title pursuant to marriage or divorce, condemnation, or any other involuntary change of title affected by operation of law.
- M. "Single Family Building" means any building comprised solely of 1 to 4 residential units, regardless of size.
- N. "Small Building" means any building with less than 5,000 square feet of Gross Floor Area, excluding Single Family Buildings.

19.81.040 Large Buildings.

A. Annual ENERGY STAR Performance Report

Owners of Large Buildings shall submit to the Administrator an ENERGY STAR Performance Report on an annual basis in accordance with the phase-in schedule below and no later than October 1 each year thereafter.

B. Energy Report

Owners of Large Buildings shall have a Registered Service Provider prepare and submit to the Administrator an Energy Report as specified in the phase-in schedule below and by October 1 every five years thereafter.

C. Disclosure

The most recent ENERGY STAR Performance Report and a summary version of the most recent Energy Report including a Building Energy Score, when available, shall be made publicly available by the Administrator and shall be provided by the Building Owner to existing lessees and to prospective lessees and buyers prior to execution of a lease or contract for sale.

D. Phase-in and Reporting Cycle Schedule

Owners of Large Buildings shall be in compliance with the requirements of this section by the dates specified below.

1. October 1, 2016 for buildings with 50,000 or more square feet of Gross Floor Area, with an annual ENERGY STAR Performance Reporting cycle and a 5 year Energy Report reporting cycle thereafter.
2. October 1, 2017 for buildings with 25,000 or more square feet of Gross Floor Area with an annual ENERGY STAR Performance Reporting cycle and a 5 year Energy Report reporting cycle thereafter.

19.81.050 Medium and Small Buildings.

A. Energy Report

Owners of Medium and Small Buildings shall have a Registered Service Provider prepare and submit to the Administrator an Energy Report upon the earlier of:

1. Time of building Sale; or
2. Within 12 months of a lender having acquired title due to foreclosure or deed in lieu of foreclosure; or
3. The phase-in dates and reporting cycle provided in the schedule below.

The requirement at Sale may be transferred to the buyer and deferred for 12 months under the provisions of Section 19.81.090.B of this Chapter.

B. Disclosure

A summary version of the most recent Energy Report including a Building Energy Score, when available, shall be made publicly available by the Administrator and shall be provided by the Building Owner to existing lessees and to prospective lessees and buyers prior to execution of a lease or contract for sale.

C. Phase-in and Reporting Cycle Schedule

Effective December 1, 2015, owners of Medium Buildings and Small Buildings shall be in compliance with the requirements of this section at time of building Sale or within 12 months when a lender acquires title, or by the dates specified below, whichever comes first. The requirement at Sale may be transferred to the

buyer and deferred for 12 months under the provisions of Section 19.81.090.B of this Chapter.

1. By October 1, 2018 for Medium Buildings with 15,000 or more square feet of Gross Floor Area, and on an 8 year reporting cycle thereafter.
2. By October 1, 2019 for Medium Buildings with 5,000 or more square feet of Gross Floor Area, and on an 8 year reporting cycle thereafter.
3. By October 1, 2020 for Small Buildings with less than 5,000 square feet, and on a 10 year reporting cycle thereafter.

19.81.060 Single Family Buildings

A. Energy Report

Owners of Single Family Buildings shall have a Registered Service Provider prepare and submit to the Administrator an Energy Report at:

1. Time of building Sale; or
2. Within 12 months of a lender having acquired title due to foreclosure or deed in lieu of foreclosure.

The requirement at Sale may be transferred to the buyer and deferred for 12 months under the provisions of Section 19.81.090.B of this Chapter.

B. Disclosure

A summary version of the most recent Energy Report including a Building Energy Score, when available, shall be made publicly available by the Administrator and shall be provided by the Building Owner to existing lessees and to prospective lessees and buyers prior to execution of a lease or contract for sale.

C. Reporting Schedule

The requirements of this Section of the ordinance shall become effective December 1, 2015.

19.81.070 Early Compliance.

Any Energy Report completed after April 1, 2015 which otherwise meets the requirements of this Chapter or is deemed by the Administrator as equivalent shall be considered to be an Energy Report for the first compliance period.

19.81.080 Incentives.

The Administrator may establish rules and regulations to encourage participate in local, regional and statewide incentive programs and to otherwise incent property owners to pursue early compliance and/or achieve a high performance exemption.

19.81.090 Exceptions, Deferrals and Extensions.

- A. High Performance Exemption. Exemptions from the Energy Report requirements for current reporting periods may be granted for buildings that demonstrate effective and reasonably achievable level of efficiency, based on the specific

building type, use, vintage, and condition, that supports the Berkeley Climate Action Plan (CAP) goal of 33% energy-related greenhouse gas reduction from 2000 levels by 2020 and 80% reduction by 2050. Qualified exemptions shall include, but are not limited to:

1. Any building that receives a Building Energy Score or Green Building Rating that demonstrates an effective and reasonable level of efficiency, as determined by the Administrator.
 2. Any building that completes a multi-measure energy improvement project with a verified minimum improvement, as determined by Administrator.
 3. Any whole building that has been served by an income-qualified Weatherization Assistance program for low-income households.
 4. Any new building or Extensive Renovation with a construction completion date within ten years of the reporting deadline.
- B. Deferral at Time of Sale. The requirements for compliance prior to Sale may be deferred from the seller to the buyer, and any subsequent buyers, when the buyer and any subsequent buyers consent to comply with the requirements within 12 months of the original sale date with an application for deferral to the Administrator prior to execution of contract of sale.
- C. Distressed Sale Extension. A 12-month extension may be granted to a buyer of a building purchased from a lender following default or transfer by deed in lieu of foreclosure.
- D. Hardship Deferral. The requirement for an ENERGY STAR Performance Report and the requirement for an Energy Report may be deferred for up to one reporting cycle in cases of financial hardship where one of the following is provided by the Building Owner and approved by the Administrator:
1. Proof of participation in an energy assistance income qualified program, administered through the State of California or the local energy utility.
 2. Proof of approved participation in Property Tax Postponement or Property Tax Assistance for Senior Citizens, Blind or Disabled, or equivalent program as determined by Administrator.
 3. Proof that the property qualifies for sale at public auction or acquisition by a public agency due to arrears for property taxes, within two years prior to the due date of the Energy Report.
 4. Proof that a court appointed receiver is in control of the asset due to financial distress.
 5. Proof that the senior mortgage is subject to a notice of default.
 6. Proof that the responsible party is otherwise not able to meet the obligations of this Chapter.

Deferrals under this Section are granted to the Building Owner and are not transferrable with a building Sale, at which time compliance with this Chapter shall be required.

- E. Data Unavailable. An exemption from ENERGY STAR Performance Report requirement for any current reporting period may be granted if
 1. The Building Owner demonstrates to the Administrator that he or she has been unable to obtain tenant authorization to obtain tenant utility data, despite a good faith effort to obtain such consent, or
 2. The building occupant demonstrates to the Administrator that such disclosure may result in the release of proprietary information which can be characterized as a trade secret.

- F. Deferral for Planned Demolition or Extensive Renovation. The requirements of this Chapter may be deferred for 24 months if the owner or buyer has obtained a Building Permit, Demolition Permit, or Permit under the Zoning Ordinance that includes demolition or Extensive Renovation of the subject building.

Deferrals under this subdivision are granted to the Building Owner and are not transferrable with a building Sale, at which time compliance with this Chapter shall be required.

- G. Exemption for Sale of a Condominium. The requirements to submit an Energy Report with an Energy Benchmark to the Administrator shall not apply to any sale of a residential or commercial condominium that is a unit within a building and not a detached structure.

- H. Low Energy Use Deferral. Buildings with low energy use based on energy billing data comparing a building to similar efficient buildings or because of operations specific to their building use, such as institutions that operate less than three days a week, may be granted a Low Energy Use deferral for the current compliance cycle.

Deferrals under this subdivision are granted to the Building Owner and are not transferrable with a building Sale, at which time compliance with this Chapter shall be required.

- I. Exemption for Long-Term Tenancy under Rent Control. The requirements of this Chapter for any building which is subject to rent control in which all of the units, excluding any owner-occupied units, have leases that date prior to January 1, 1999 may be deferred until the next reporting period.

- J. Unconditioned Floor Area Reclassification. The size classification of a building may be reduced by the Administrator to exclude physically separated floor area that is not served by heating, ventilation or cooling equipment.

- K. Phase-In.
 1. Through December 1, 2015, compliance required pursuant to a Sale may be satisfied through compliance with the requirements specified under the prior

residential and commercial energy conservations ordinances, Chapters 19.16 and 19.72 of the Berkeley Municipal Code.

2. Any buyer who, prior to June 1, 2015, has filed an acceptance of compliance responsibility pursuant to Berkeley Municipal Code 19.16.080 Section A. 3 or 19.72.120 Section B, has the option of complying either with the requirements in effect at the time of filing or the requirements of this Chapter.

19.81.100 Responsibilities.

- A. It shall be the responsibility of sellers, buyers, owners, real estate agents and brokers, property managers, title companies, non-residential tenants, Registered Service Providers and energy service providers to comply with the requirements of this Chapter.
- B. The seller of any real property and the licensed real estate agent or broker handling a sale of real property shall be jointly responsible for disclosing to the prospective buyer the compliance status of the real property in question.

19.81.110 Administration and Enforcement.

The Administrator may adopt reasonable rules and regulations implementing the provisions and intent of this Chapter before the operative date of this Chapter and may amend these rules and regulations as needed. All rules and regulations adopted by the Administrator shall be posted on the City of Berkeley website.

19.81.120 Fees.

The City Council may set fees, by resolution, for the administration of this Chapter.

19.81.130 Enforcement.

The Administrator shall issue a written Notice of Violation to any building owner determined to be in violation of any provision of this Chapter. In the event a building owner fails to file an ENERGY STAR Performance Report within 30 days after the scheduled deadline or an Energy Report within 90 days after the scheduled deadline, the Administrator shall indicate the building's compliance status via the publicly accessible electronic reporting interface.

19.81.140 Violation – Penalty.

Violations of this Chapter, if charged pursuant to Chapter 1.20, shall be charged as infractions. Violations of this Chapter are also punishable pursuant to Chapter 1.28.

19.81.150 Appeals.

Aggrieved persons may file appeals to the City Manager or her/his designee.

19.81.160 Severability.

If any word, phrase, sentence, part, section, subsection, or other portion of this Chapter, or any application thereof to any person or circumstance is declared void, unconstitutional, or invalid for any reason, then such word, phrase, sentence, part,

section, subsection, or other portion, or the prescribed application thereof, shall be severable, and the remaining provisions of this Chapter, and all applications thereof, not having been declared void, unconstitutional or invalid, shall remain in full force and effect. The City Council hereby declares that it would have passed this title, and each section, subsection, sentence, clause and phrase of this Chapter, irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases is declared invalid or unconstitutional.

19.81.170 Chapter Review and Reconsideration.

The City Council, with advice from the Berkeley Energy Commission, shall, within 3 years of the effective date of this Chapter, evaluate implementation and outcomes and reconsider extending requirements to all Single Family Buildings starting in 2021. Implementation evaluation shall include an analysis of reporting systems and compliance rates, and outcomes evaluation shall analyze the number of energy improvements and amount of energy reduced as a result of this Chapter, and may recommend revisions and/or incentive programs to accelerate improvements to low performing buildings as it considers advisable. The Berkeley Energy Commission shall then report on its evaluation and recommendations to the City Council.

Section 6. Copies of this Ordinance shall be posted for two days prior to adoption in the display case located near the walkway in front of Council Chambers, 2134 Martin Luther King Jr. Way. Within 15 days of adoption, copies of this Ordinance shall be filed at each branch of the Berkeley Public Library and the title shall be published in a newspaper of general circulation.

At a regular meeting of the Council of the City of Berkeley held on February 24, 2015 this Ordinance was passed to print and ordered published by posting by the following vote:

Ayes: Anderson, Arreguin, Capitelli, Droste, Maio, Moore, Worthington and Bates.

Noes: None.

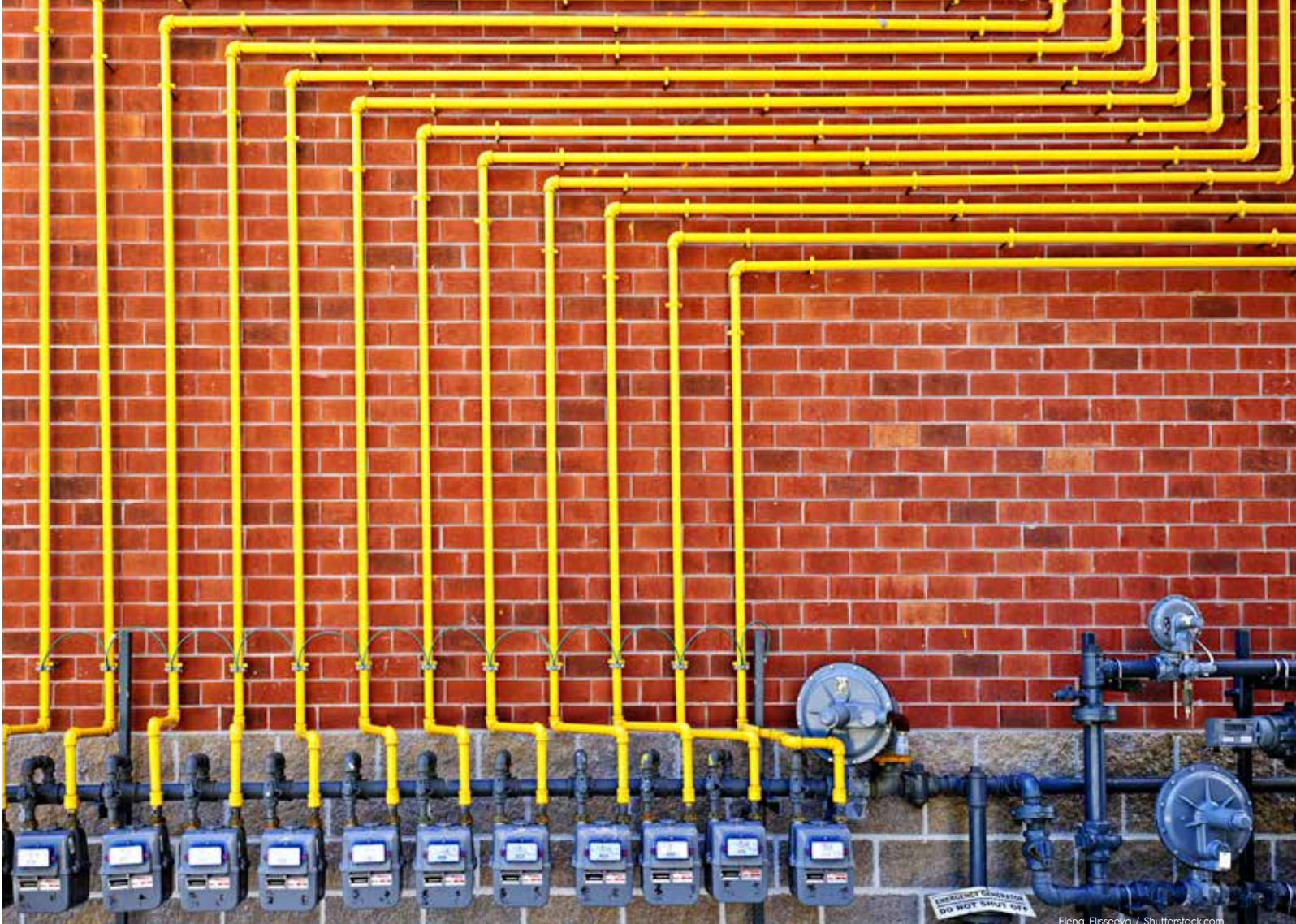
Abstain: Wengraf.

Absent: None.

Appendix E: City of Los Angeles, CA pLAN

Los Angeles' pLAN was released by Mayor Eric Garcetti on April 8, 2015 and includes goals and targets related to broader topics of environment, economy, and equity.

Pages 28-33 of the pLAN lay out the Vision, Targets, and Strategies and Priority Initiatives in the *Energy Efficient Buildings* portion of the plan with near term goals (2017) and long term goals (2035).



Energy-Efficient Buildings

Buildings are the largest consumers of electricity in the city and a major source of greenhouse-gas emissions. Smart, cost-effective retrofits will benefit our buildings for decades, create local green jobs, and lower energy bills. Energy-efficient buildings also reduce LA's contribution to global warming and create healthier, more comfortable spaces. Our city's mild climate enables us to be a national leader in reducing energy consumption and make our buildings more efficient. LA's vision is to significantly reduce energy consumption per square foot across all building types in the city.



VISION

We save money and energy by increasing the efficiency of our buildings.

2017

60
million
square feet



By 2017 we will expand the Better Buildings Challenge (BBC) to over 60 million square feet, and avoid 1250 GWh of energy use due to efficiency programs

2035



REDUCE ENERGY USE

By 2035 we will reduce energy use per square foot – for all building types – by 30%

DID YOU KNOW?

- Use of electricity in buildings is the second largest source of greenhouse emissions in Los Angeles.
- Implementing energy-efficiency measures is often the most cost-effective action property owners can take to reduce energy bills and GHG emissions.
- Most buildings in Los Angeles were built before state energy codes, and use much more energy than those built today



boprice / Shutterstock.com

Energy-Efficient Buildings



LA's Leadership To Date

- LA has led the U.S. with the nation's largest municipal green-building program (requiring LEED Silver or better), and has converted 160,000 streetlights to LED, the largest such retrofit in the world.
- LA has the greatest number of EPA-rated Energy Star certified buildings in the nation in six of the last seven years.
- The Los Angeles Department of Water and Power has the most aggressive energy-efficiency program of any California utility.

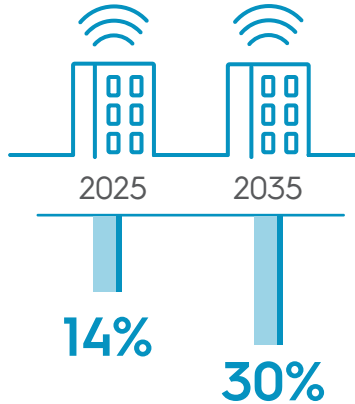


Targets

Long-Term Outcomes

Energy Use:

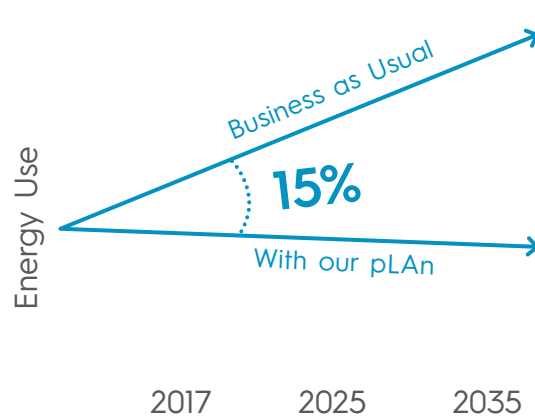
- Reduce energy use per square foot below 2013 baseline – for all building types – by at least:



Building Energy Use Intensity* of 70 mBTU/sf in 2013
 Source: Los Angeles Bureau of Sanitation Climate Inventory and LA County Tax Assessor Database
 *Energy Use Intensity, expresses building energy use per square foot

Energy Efficiency:

- Use energy efficiency to deliver 15% of all of LA's projected electricity needs by 2020, including through rebates, incentives, and education:



Source: LADWP Energy Efficiency Potential Study. Post 2020 savings are indicative and subject to revision.

2017

Near-Term Outcomes

- Avoid cumulative 1250 GWh of energy use between 2014 and 2017 due to efficiency programs
- 12,500 homes retrofitted with residential PACE financing
- Expand Los Angeles Better Buildings Challenge (LABBC) to 60 million square feet
- Create benchmarking policy to monitor and disclose building energy use
- Develop policy package (e.g., audits and retro-commissioning) to address energy consumption in the city's largest buildings (public and private)



Strategies & Priority Initiatives



We save money and energy by increasing the efficiency of our buildings.

Execute, expand, and continually refine DWP energy-efficiency programs

- Seek stakeholder input to ensure the most effective use of DWP energy-efficiency funding
- Ensure adequate funding levels for entire energy-efficiency program package through 2020
- Expand commercial building demand response pilot to full program and increase participation
- Extend energy-efficiency goals and funding beyond 2020

Measure, track, and make available building energy data

- Create benchmarking policy to monitor and disclose building energy use
- Develop comprehensive building data system
- Develop policy package (e.g., audits and retro-commissioning) to address energy consumption in the city's largest buildings (public and private)
- Expand and improve access to financing for energy-efficiency (e.g., PACE programs, green bank, private-sector lending, etc.)
- Make workforce training investments to meet increased demand for building professionals
- Implement energy-efficiency retrofits across the City's affordable housing portfolio
- Increase awareness of existing residential- and small-business- retrofit incentives via education campaigns

Measure, track, and make available building energy data (cont.d)

- Identify and communicate energy conservation potential for multifamily properties through City's Gateway to Green program

Advance energy-efficiency and green-building programs

- Expand LA Better Buildings Challenge to new sectors, including the City's affordable housing stocks
- Increase participation in energy-efficiency and green business certification programs
- Assess options for private-sector green-building policy to incentivize or require LEED Silver or better new construction and major rehabilitation

Prepare for energy code upgrades

- Pilot Net-Zero Energy municipal buildings (new or retrofit)
- Develop outreach and training on Title 24 compliance

Lead by example through reduced energy consumption in municipal buildings

- Adopt municipal target for energy reduction in city buildings
- Increase municipal green-building standard for new construction
- Implement systems and gather data to understand City energy use at the actionable level

This Page:

■ Strategies

■ Priority Initiatives

Appendix F: City of Philadelphia, PA Ordinance

Philadelphia's Energy Conservation Bill No. 120428 was passed in 2012, and mandates that all large commercial buildings in Philadelphia disclose energy and water usage via benchmarking.

The ordinance language is included in the following pages.

CITY OF PHILADELPHIA
DEPARTMENT OF LICENSES AND INSPECTIONS
REGULATION ON ENERGY AND WATER USE
BENCHMARKING PURSUANT TO PHILA. CODE § 9-3402

(1) Definitions.

Covered Building. Either of the following:

- (i) Any commercial building with indoor floor space of 50,000 square feet or more.
- (ii) All commercial portions of any mixed-use building where a total of at least 50,000 square feet of indoor floor space is devoted to any commercial use.

Any two or more buildings that are served by one common energy meter without sub-metering, such that their energy use cannot be tracked individually, shall be considered one building for the purpose of determining indoor floor space. For purposes of this definition, the term “commercial” shall mean relating to or associated with any activity, whether or not undertaken for a profit, involving any form of trade or commerce, or requiring consideration in exchange for any good, service, or privilege.

Portfolio Manager. The Benchmarking Application as defined under Phila. Code § 9-3402(1), together with the Philadelphia Custom Reporting Template.

Philadelphia Custom Reporting Template. The Philadelphia-specific template used to report data from Portfolio Manager to the City of Philadelphia, available at <http://www.phila.gov/benchmarking>.

Philadelphia Data Collection Worksheet. Document list of required data fields and default values for Philadelphia benchmarking requirements, available at <http://www.phila.gov/benchmarking>.

Whole Building Data. Aggregate energy and water usage data for the entirety of a Covered Building.

(2) Deadline. Every owner of a Covered Building shall benchmark such Covered Building for the previous calendar year by June 30 of each year, using Portfolio Manager. For calendar year 2012, however, this deadline shall be October 31, 2013. When, in any year, June 30 falls on a Saturday or a Sunday, the deadline for benchmarking shall be advanced to the next day that is not a Saturday or Sunday.

(3) Reporting.

(a) Template. Benchmarking information that must be reported under Phila. Code § 9-3402 using Portfolio Manager shall be reported through the Philadelphia Custom Reporting Template interface to the Benchmarking Tool. All information expressly denoted as mandatory by either Portfolio Manager itself or the Philadelphia Data Collection Worksheet shall be reported. The Philadelphia Custom Reporting Template is available at <http://www.phila.gov/benchmarking>.

(b) Reporting of Multiple Buildings Served by Common Systems. Two or more buildings that are served by at least one common energy metering system shall be reported as a single “building,” “property,” or “campus” in Portfolio Manager where recommended by Portfolio Manager, or the energy use of the buildings cannot be tracked individually.

(c) Whole Building Data. Whole Building Data shall be obtained as follows:

(i) Through electronic usage reporting by a utility or other energy supplier directly into Portfolio Manager under Phila. Code § 9-3402(4).

(ii) If, following a good faith effort, the owner is unable to report data through electronic usage reporting directly into Portfolio Manager, then data obtained directly from the utility or energy supplier, by means other than electronic usage reporting directly into Portfolio Manager, may be reported.

(iii) If, following a good faith effort, the owner is unable to obtain and report Whole Building Data in the manner set forth under subsections (i) or (ii), then the owner may use any of the following methods:

(.1) By manual aggregation of data from all individual building tenants pursuant to Phila. Code § 9-3402(3).

(.2) By any other means.

(.3) Where, despite good faith effort to obtain data as provided in this subsection (c), an owner is unable to obtain data for a portion of a building because the tenant in control of such portion of the building failed to comply Phila. Code § 9-3402(3)(a), the owner may report partial-building data.

(d) Amendment.

(i) Where an owner learns that any information reported in Portfolio Manager is inaccurate, the information so reported shall be amended in Portfolio Manager by the Owner within 30 days of learning of the inaccuracy.

(ii) Should Whole Building data be obtained after using partial-building data under subsection (3)(c)(iii)(.3), the owner shall, within 30 days after obtaining the data, recompute the Whole Building Data using such actual values, and report it in Portfolio Manager.

(iii) No amendment of data under subsection (d)(i) or (ii) shall be required after June 30 of the third year following the year for which such data was originally reported.

(e) Delegation to Single Tenant. Where the owner of a covered building leases the entire covered building to a single tenant, and the tenant is responsible for managing all energy and water usage for the building, the owner may, with the agreement of the tenant, delegate all owner responsibilities under Phila. Code § 9-3402 and these Regulations to the tenant. Such delegation shall be in writing, using the Single Tenant Delegation Form available at <http://www.phila.gov/benchmarking>.

(f) New or Renovated Buildings; Transfers in Ownership.

(i) Building owners shall report benchmarking information for new or renovated buildings starting with the first full calendar year following the year in which the building receives a certificate of occupancy (including any temporary certificate occupancy) for any portion of the building.

(ii) At the time any occupied Covered Building is transferred, the buyer and seller shall arrange for the seller to provide to the buyer all information necessary for the buyer to timely report benchmarking information for the entire year. It shall be a violation of these Regulations for any seller to fail to so provide any such information.

(g) Exemptions. Benchmarking shall not be required for a Covered Building where any of the following apply.

(i) In any calendar year, benchmarking shall not be required for that year where more than 50% of the indoor floor space is unoccupied for more than 180 days in total.

(ii) The Mayor's Office of Sustainability finds, upon application by an owner, that benchmarking or disclosure would cause exceptional hardship or would not be in the public interest. An exemption under this subsection (3)(g)(ii) shall be for such period as the Mayor's Office of Sustainability establishes based on the evidence presented by the owner.

(iii) Buildings primarily used for manufacturing or other industrial purposes for which benchmarking results would not meaningfully reflect building energy use characteristics due to the intensive use of process energy. "Process energy" refers to energy used in the actual manufacturing, production, or processing of a good, commodity, or other material.

(4) Records Retention. Owners shall retain the following records for a given calendar year for at least three years from the reporting deadline for such year:

(a) The Portfolio Manager confirmation email demonstrating proof-of-submission date.

(b) A copy of the building owner's energy, water, and space use attribute information entered into Portfolio Manager.

(c) Meter readings or energy supplier or utility statements documenting energy and water usage, whether obtained directly, from a utility, or from a tenant.

(d) Evidence used to claim an exemption from benchmarking under subsection (3)(g).

Owners shall make the foregoing records available for inspection and audit upon request by the Department of Licenses and Inspections, the Mayor's Office of Sustainability, or another authorized City agency.

(5) Public Disclosure. The Mayor's Office of Sustainability shall make benchmarking results for all covered buildings publicly available on the City benchmarking website (<http://www.phila.gov/benchmarking>) starting with benchmarking results for calendar year 2013. These results shall include, but are not limited to, (i) building address; (ii) energy use intensity (as reflected in Portfolio Manager); (iii) water use per gross square foot; (iv) greenhouse gas emissions from energy use; (v) Portfolio Manager EnergyStar rating (where applicable); and (vi) reported facility type under Portfolio Manager. No disclosure shall be required where benchmarking is exempted under subsection (3)(g).

(6) Enforcement. Violations of these Regulations shall be subject to a fine as provided in Phila. Code § 9-3402(6).

Appendix G: City of Kansas City, MO Ordinance

The [Kansas City Energy Empowerment Ordinance No. 150299](#) was adopted on June 4, 2015 and requires large commercial and multifamily buildings to benchmark and report energy and water usage data.

The ordinance language overview is included in the following pages.

ENERGY EMPOWERMENT ORDINANCE

On June 4th 2015, Mayor Sly James and Kansas City's City Council adopted an Energy Empowerment Ordinance to raise awareness of energy and water performance by benchmarking and reporting of energy and water use in large buildings. The goal of this ordinance is threefold: (1) to unlock energy and water savings that in turn will allow businesses and residents to save money on their utility bills, (2) to help drive citywide reduction in energy and water use and greenhouse gas emissions, and (3) create local jobs making energy efficiency improvements to our buildings.

Kansas City's Energy Empowerment Ordinance calls on existing large municipal, institutional, commercial, and multifamily residential buildings to track whole-building energy and water use and report to the City annually. The law covers about 3% of Kansas City's non-single family buildings, which account for nearly 47% of total energy used by all buildings in Kansas City. Building energy consumption represents more than 70% of the total energy use in our region.

For more information, please visit www.kcenergyproject.org/benchmarking

Who is Covered by the Ordinance?

Municipal buildings of at least 10,000 square feet and institutional, commercial and multifamily residential buildings of at least 50,000 square feet must track and report their energy and water usage annually in ENERGY STAR[®] Portfolio Manager, a free online tool.

Who is Responsible for Complying?

The building owner or condominium association is responsible for reporting whole building data. Tenants may, if asked, supply necessary information to the owner or association.

What are the Deadlines?

- All municipal buildings of at least 10,000 square feet must comply no later than May 1, 2016, and each May 1 thereafter.
- All non-municipal buildings (institutional, commercial, and multifamily residential) of at least 100,000 square feet must comply no later than May 1, 2017, and each May 1 thereafter.
- All non-municipal buildings (institutional, commercial, and multifamily residential) of at least 50,000 square feet must comply no later than May 1, 2018, and each May 1 thereafter.

Support

Resources, guidance and further information on Kansas City's Energy Empowerment Ordinance are available at www.KCEnergyProject.org. Portfolio Manager "help", including YouTube videos, is available at www.energystar.gov/buildings. Additional questions about using Portfolio Manager may be directed to the ENERGY STAR[®] helpdesk at buildings@energystar.gov. For questions about the Energy Empowerment Ordinance, including compliance, contact Jennifer.Gunby@kcmo.org and Dennis.Murphey@kcmo.org.

Appendix H: City of San Francisco, CA Ordinance and Report

[Chapter 20 of the San Francisco Environment Code](#) requires that audits and transparency measures be taken for commercial buildings over 10,000 square feet. The chapter was approved in 2011 and phased in over the following three years. The ordinance language overview is included in the following pages.

Additionally, a few excerpts pulled from the [San Francisco Existing Commercial Buildings Performance Report \(2010-2014\)](#) are included in the pages after the ordinance language. These pages highlight San Francisco's office, hotel, warehouse, and retail benchmarking results, as well as opportunities ahead.



Energy is the single largest controllable operating cost in commercial facilities, but you can't manage energy costs if you don't know where to begin. The Existing Commercial Buildings Energy Performance Ordinance will help decision-makers for commercial buildings have the information to control utility costs, improve energy efficiency, and benefit the bottom line. Adopted in 2011, the ordinance is being phased-in over three years. For existing nonresidential buildings 10,000 square feet and larger, the ordinance requires:

- An Actionable Plan: An energy efficiency audit once every 5 years identifying specific cost-effective measures that would save energy.
- A Benchmark: Annually summarize the energy used by the entire building. This enables tracking trends and understanding how your building is performing compared to similar buildings.
- Transparency: Annually share an overview of energy benchmarking results with tenants and the City. San Francisco Department of Environment is required to make this information available to the public.

The Ordinance was informed by the recommendations of the [Mayor's Task Force on Existing Commercial Buildings](#), which suggested policies, actions, and partnerships to meet local and state goals for greater energy efficiency. By reducing energy costs, this effort will improve competitiveness of commercial stock, support the economy, reduce greenhouse gas emissions, and help electricity reliability.

It is the building owner's decision how to benefit from opportunities identified in the energy efficiency audit. Commercial properties in San Francisco are eligible for rebates (www.sfenergywatch.org), [federal tax benefits](#), and [special financing that enhances both the bottom line and cash flow](#). Implementing specific cost-effective recommendations from credible experts helps cut operating costs, reduce exposure to utility rate increases, and improve asset value.

This document explains both the benchmark, and the audit - two separate requirements. Some buildings will be exempt from an energy audit, but benchmarking is required for all occupied nonresidential buildings of 10,000 square feet or larger that have been in operation for at least two years.

The information in this briefing can also be found at: www.sfenvironment.org/ecb.

Benchmarking

Each whole non-residential building larger than 10,000 square feet must be benchmarked using Energy Star Portfolio Manager (www.energystar.gov/benchmark). Portfolio Manager is an online tool provided at no cost to the user by the U.S. Environmental Protection Agency.

Building owners or their representatives must annually electronically report key benchmarking results to the Department of Environment and to tenants. This report is an "Annual Energy Benchmark Summary", and is based on data from the full calendar year. A 2014 Report will be based on energy used from January 2014 to December 2014.

An Annual Energy Benchmark Summary includes:

- Contact information and gross square footage
- Energy Use Intensity (how much energy the building used per square foot for the year)
- 1-100 Performance Rating provided by Portfolio Manager, where applicable
- Greenhouse gas emissions from energy usage
- Assessor's Parcel Number (APN or block/lot)

The Annual Energy Benchmark Summary does not include commodity energy use (kWh or therms) for the whole building, nor for any meters.

Benchmarking with Portfolio Manager will also be required under California Public Resources Code 25402.10 (also known as AB 1103.) Where the San Francisco Existing Commercial Buildings Energy Performance ordinance requires annual benchmarking and public disclosure of limited statistics summarizing overall performance, the complimentary state law will require private disclosure of all energy usage information between parties to the sale, lease, or refinance of the entire building. For additional information: www.energy.ca.gov/ab1103/

For the first year that an Annual Energy Benchmark Summary report is required from buildings larger than a given size, the Department of Environment must keep the report confidential. In subsequent years, the Department of Environment is required to make the Annual Energy Benchmark Summary public.

Exemptions to Benchmarking Requirements

An Annual Energy Benchmark Summary is not required for:

- **New Buildings:** (The Certificate of Occupancy from the Department of Building Inspection is dated less than two years prior to the Annual Energy Benchmark Summary due date.)
- **Unoccupied Buildings:** (The building had less than one full-time equivalent occupant for the previous calendar year.)

In all other cases, the Annual Energy Benchmark Summary is required. To obtain an exemption to benchmarking requirements, please write to: benchmark@sfenvironment.org. In the message, include:

- Contact information for the owner, and the **owner's agent if applicable.**
- Assessor Parcel Number (block and lot)
- Gross square footage of the building(s)
- Reason for exemption:
 - Date and Permit Number for Certificate of Occupancy, or a copy.
 - Statement that the building was unoccupied for the 12 months of the relevant calendar year.

Benchmarking Timeline

Annual Energy Benchmark Summary reports are due April 1 every year, with one exception: In 2011, the reports were due October 1.

The Annual Energy Benchmark Summary is based upon the energy performance data for an entire calendar year. For example, the 2013 Energy Benchmark Summary is based upon energy use January - December 2013, and is due April 1, 2014.

Due Date	Benchmarking	Status of Public Disclosure
October 1, 2011	Buildings larger than 50,000 square feet must benchmark	None
April 1, 2012	Buildings larger than 25,000 square feet must benchmark	Public disclosure begins for buildings greater than 50,000 square feet (only)
April 1, 2013	Buildings larger than 10,000 square feet must benchmark	Public disclosure for buildings greater than 25,000 square feet
April 1, 2014 and beyond	Buildings larger than 10,000 square feet must benchmark	Public disclosure applies to all affected buildings

How to Submit an Annual Energy Benchmark Summary

Detailed step-by-step benchmarking instructions are available at sfenvironment.org/benchmark.

Reports must be sent to SF Dept of Environment electronically using the Portfolio Manager tool. Clicking the appropriate links listed in this section will lead your internet browser to a Portfolio Manager login page. By accessing your account through the appropriate link, the Annual Energy Benchmark Summary reporting template provided by the City will be added to your Portfolio Manager account. The reporting template will securely send only the data required to meet the ordinance (and no more). The report is sent once – **only when you click “Send Data.”** If you need to correct an error, you may do so and then resend the data.

To add a Benchmark report template to your Portfolio Manager account, use the link in the table below:

Year	Due	Link
2014	4/1/2015	http://tinyurl.com/sfbenchmarking2014
2013	4/1/2014	http://tinyurl.com/sfbenchmarking2013
2012	4/1/2013	http://tinyurl.com/sfbenchmarking2012
2011	4/1/2012	http://tinyurl.com/sfbenchmarking2011
2010	10/1/2011	http://tinyurl.com/sfbenchmarking2010

Instructions will pop up when you open the report template. However, it's usually easier to work with instructions in a separate file. The instructions and the links above can be found at: www.sfenvironment.org/ecb.

For the first year that an Annual Energy Benchmark Summary report is required from a building, the Department of Environment must keep the report contents confidential and only publicly post which buildings have complied. In subsequent years, the Department of Environment is required to make the Annual Energy Benchmark Summary public.

When reporting, it is critical to use Portfolio Manager's "San Francisco Building ID" field to identify the building by Assessor Parcel Number (block and lot). To look up a parcel: <http://propertymap.sfplanning.org>

The Department of Environment will accept an Annual Energy Benchmark Summary for the entire building from any party with the necessary information about the entire building, **including the owner's representative or a whole-building tenant.**

Training and Technical Assistance

SF Environment offers presentations and webinars on meeting, and benefiting from, the new requirements. To sign up for a free webinar, go to www.sfenvironment.org/ecb. To request a presentation for your organization: benchmark@sfenvironment.org.

In-Person Step-by-Step Workshops

Pacific Gas & Electric Company provides free classes on benchmarking, and how to use your benchmark results to save energy and money. Classes are available online, at and the Pacific Energy Center at 851 Howard Street and locations throughout Northern California: www.pge.com/energyclasses

The PG&E course is divided into two sessions. In the morning session, "Benchmarking Energy Use in Commercial Buildings," you will be provided with a computer and walk step-by-step with your own data through the process of benchmarking your building. This includes instructions on using Portfolio Manager, setting up PG&E's Automated Benchmarking Services (ABS) to automatically update energy use data, and preparing an Annual Energy Benchmark Summary. Participants receive free follow-up technical support. The optional afternoon session puts your results into practice, asking: "You've Benchmarked Your Building: What's Next?"

Visit www.pge.com/energyclasses for more info.

Additional Free Training

US EPA's ENERGY STAR program provides webinars and on how to benchmark with Portfolio Manager. (Note: These videos and webinars are provided for a national audience. They do not cover local ordinances or PG&E's Automated Benchmark Service.) www.energystar.gov/benchmark

Energy Efficiency Audits

Benchmarking provides perspective about how a building performs relative to its peers. To identify specific opportunities for savings, weigh costs against benefits, and prioritize investments, an energy audit is necessary. The owner of each non-residential building larger than 10,000 square feet must obtain a comprehensive energy efficiency audit of the entire building from a qualified energy auditor at least once every five years. The auditor must submit a detailed **report to the building's decision makers, and the point** is to provide a reliable catalog of opportunities to save energy and save money.

The complexity of an energy audit and the potential for savings vary with the size, intricacy, and use of a building. The Ordinance requires audits to meet or exceed the American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) *Procedures for Commercial Building Audits*, with larger facilities required to receive a more rigorous evaluation than smaller facilities. The audit requirements are:

Building Size	Minimum Level of Effort
50,000 square feet and larger	ASHRAE Level 2 – An “intermediate” survey and energy analysis
10,000 to 49,999 square feet	ASHRAE Level 1 – A basic energy analysis

For a summary of what each level of effort entails, ASHRAE has provided the Department of Environment with an excerpt from the *Procedures for Commercial Building Audits*, which can be downloaded from: www.sfenvironment.org/ecb

The full *Procedures for Commercial Energy Audits* are available directly from ASHRAE: www.ashrae.org

Large facilities and buildings with complex systems are encouraged to consider retrocommissioning as an alternative way to meet the audit requirement. Retrocommissioning is the systematic, detailed examination of all systems and operations in a building to ensure they are operating as designed, and to identify opportunities for operational and capital improvements. The California Commissioning Collaborative provides an excellent guide to selecting a retrocommissioning provider: <http://www.cacx.org>

Audit Timeline

All building owners must have at least 12 months between the notice that an audit is required, and the date when the Confirmation of Energy Audit is due. Notification of audit requirements is sent to the party listed by the Office of the Assessor Recorder as the contact for property tax, and the owner is responsible for filing a Confirmation of Energy Audit on or before the due date assigned to the parcel.

Important: The due dates for benchmarking are not related to the due dates for an energy efficiency audit.

Due Date	Audit	Public Disclosure
November 15, 2012 January 25, 2013	Confirmation of Audit due for initial group of buildings, approximately 1/3 of stock.	Cost-effective energy efficiency opportunities in individual buildings are confidential.
April 1, 2013	Confirmation of Audit due for second group of buildings, approximately 2/3 of stock.	
April 1, 2014	Confirmation of Audit due for final group of buildings.	Confirmation of compliance (or exemption) will be published.
2017 and beyond	Confirmation of Energy Audit due for 20% of stock every year	

Energy audits completed since 2008 may be used to fulfill the audit requirement, provided that the audit is an evaluation of the whole building meeting the applicable ASHRAE Level of Effort, or retrocommissioning. If only portions or specific systems in the building have been evaluated, or if the energy efficiency evaluation was conducted prior to 2008, a current and comprehensive audit is required.

Audit due dates for individual buildings have been established on a rolling deadline determined by the Dept of Environment. Spreading audits over three years will help the engineering community be able to meet demand.

Qualifications for Energy Auditors:

The Energy Efficiency Auditor responsible for the Energy Efficiency Audit Report must possess one of the following qualifications:

	Certification or License	AND	Minimum Experience
(1)	Licensed Engineer (PE) OR PhD in mechanical engineering*	AND	<ul style="list-style-type: none"> At least 2 years experience performing energy efficiency audits or commissioning of existing buildings; OR Any certification listed in #2 below.
(2)	<ul style="list-style-type: none"> ASHRAE Building Energy Assessment Professional (BEAP); Association of Energy Engineers Certified Building Commissioning Professional (CBCP);* Association of Energy Engineers Certified Energy Manager (CEM); Association of Energy Engineers Existing Building Commissioning Professional (EBCP); OR Northwest Energy Education Institute Energy Management Certification 	AND	<ul style="list-style-type: none"> At least 2 years experience performing energy efficiency audits or commissioning of existing buildings
(3)	<ul style="list-style-type: none"> BOC International Building Operator Certification Level II; OR International Union of Operating Engineers Certified Energy Specialist 	AND	<ul style="list-style-type: none"> At least 10 years experience as a building operating engineer; OR At least 5 years experience as a chief operating engineer
(4)	Equivalent professional qualifications to manage, maintain, or evaluate building systems, as well as specialized training in energy efficiency audits and maintenance of building systems, as determined by the Director of the Department of Environment		

* Credentials noted with an asterisk (*) have been approved by the Director as substantially equivalent to the credentials cited in the ordinance.

How to File a Confirmation of Energy Audit

To confirm the energy audit was completed and the building owner has complied, the auditor must submit a **brief summary called a 'Confirmation of Energy Audit'** to the Department of Environment. It is the **building owner's decision** whether to implement retrofits, and to take advantage of financing and incentives that may be available by implementing the opportunities identified in the energy efficiency audit.

The Confirmation of Energy Audit is a brief online summary of the findings in the Energy Audit Report. It includes:

- Contact information
- Auditor, their qualifications, and when the audit was completed
- A list of all cost-effective energy efficiency measures identified. For reporting purposes, "cost-effective" means energy efficiency measures that are estimated by the auditor to either:
 - Have a simple payback of 3 years or less,
 - Have a beneficial net present value,
 - As an integrated package, offer an overall simple payback of approximately 3 years, OR
 - As an integrated package, offer positive net present value.

Accessing the Confirmation of Energy Audit tool:

A Confirmation of Energy Audit may only be filed by the auditor responsible. To register:

- Create a free account with Zoho Creator [<https://www.zoho.com/creator/lp/signup.html>]. Be sure to use the email address you will use for submitting the Confirmation of Energy Audit.
- Email benchmark@sfenvironment.org requesting access to the CEA. Include:
 - Full name AND
 - Email address associated with your Zoho Creator account.
- Upon receipt of your request, SFE staff will authorize the auditor to use the Confirmation of Energy Audit tool and email you an invitation to use the tool.

Exemptions to Audit Requirements

An Energy Efficiency Audit is not required if the building is new or is recognized by a third party as high performing:

- **High Performance Buildings:** The building has received the ENERGY STAR in 3 of the past 5 years, or LEED for Existing Buildings certification in the past 5 years.
- **New Construction:** The building was constructed (i.e. received a final Certificate of Occupancy) in the past 5 years.

Buildings that meet these criteria are exempt from an audit until the next audit cycle, and will remain exempt if they maintain current recognition for high performance.

Buildings are also exempt from the audit requirement for as long as any of the following conditions apply:

- **Unoccupied Buildings:** (The building had less than one full-time equivalent occupant for the previous calendar year.)
- **Financial Distress:** Examples of qualifying financial distress include:
 - Properties qualified for sale at public auction by the Treasurer and Tax Collector due to arrears of property taxes that resulted in the property's qualification for sale at public auction, or acquisition by a public agency within two years prior to the due date of an energy efficiency audit report
 - A court appointed receiver is in control of the asset due to financial distress
 - Buildings owned by a financial institution through default by the borrower
 - Buildings acquired by a deed in lieu of foreclosure
 - Buildings where the senior mortgage is subject to a notice of default.

In all other cases, the Confirmation of Energy Audit is required.

Enforcement

The priority of the Department of Environment is education; we will work with property owners, managers, operators, and tenants to improve energy management. As such, enforcement will emphasize outreach and education, and we will collaborate with the commercial sector to draw attention to facilities and teams who are demonstrating leadership in energy management.

If necessary, the ordinance directs the Department of Environment to take the following steps:

1. **Warning** – A written notice of violation.
2. **Public Notice** – 30 days or more after a deadline, the Department of Environment will indicate via a public website that a building is not in compliance with local law.
3. **Fine** – Fines can be levied 45 days after the written notice. Buildings of 25,000 square feet and larger can be subject to fines of \$100 per day, up to a maximum of \$2,500 per violation. Buildings smaller than 25,000 square feet can be subject to fines of \$50 per day, up to a maximum of \$1,500 per violation.

For More Information

Web: www.sfenvironment.org/ecb

Call: (415) 355-3750

Email: benchmark@sfenvironment.org

San Francisco Benchmarking and Disclosure Policy



Passed in 2011, the Existing Commercial Buildings (ECB) Energy Performance Ordinance, requires annual energy benchmarking, periodic energy efficiency assessments, and public disclosure of benchmarking information for commercial buildings with 10,000 square feet or more of heated or cooled space. The energy efficiency assessment or retrocommissioning must be performed by a qualified professional at least once every five years, and must include the entire building. The ordinance was informed by the recommendations of the Mayor's Task Force on Existing Commercial Buildings and aims to empower owners, operators, managers, and occupants with strategic data to control utility costs, and to motivate owners to seize the benefits of energy efficiency for their business and buildings.

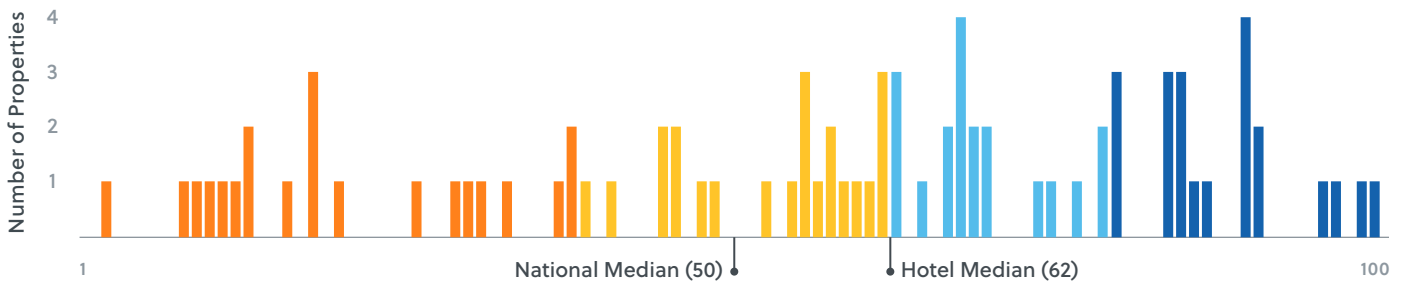
To phase in the new policy, initial reporting deadlines were staggered by square footage, starting with the largest buildings. As of 2013, all nonresidential buildings 10,000 square feet and larger have been required to annually benchmark their energy use through ENERGY STAR Portfolio Manager. As a result, decision makers are able to make peer comparisons, and audits provide actionable options for cost-effective improvements.

Hotel Benchmarking Results

The hotel sector in San Francisco is performing better than the national median in terms of ENERGY STAR score, but is on par with the national median with regards to EUI, which is consistent with the city's position as a top U.S. travel destination. From 2012 to 2014, the number of tourists traveling to the city increased by 7 percent and the number visitors by 14 percent.¹⁸ The local hotel occupancy rate in 2014 was 87 percent,¹⁹ significantly above the national average of 64 percent.²⁰ A large number of rooms and workers per San Francisco hotel likely contributes to the average EUI values combined with high ENERGY STAR scores.

PROPERTY TYPE	HOTEL
# of Properties	88
SF of floor area	16,607,305
Energy Like for Like 2013-2014 (80 properties)	-3.6%
Total GHG Emissions (MT CO ₂ e)	71,427
Compliance Rate	94%

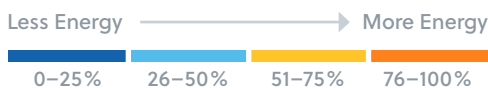
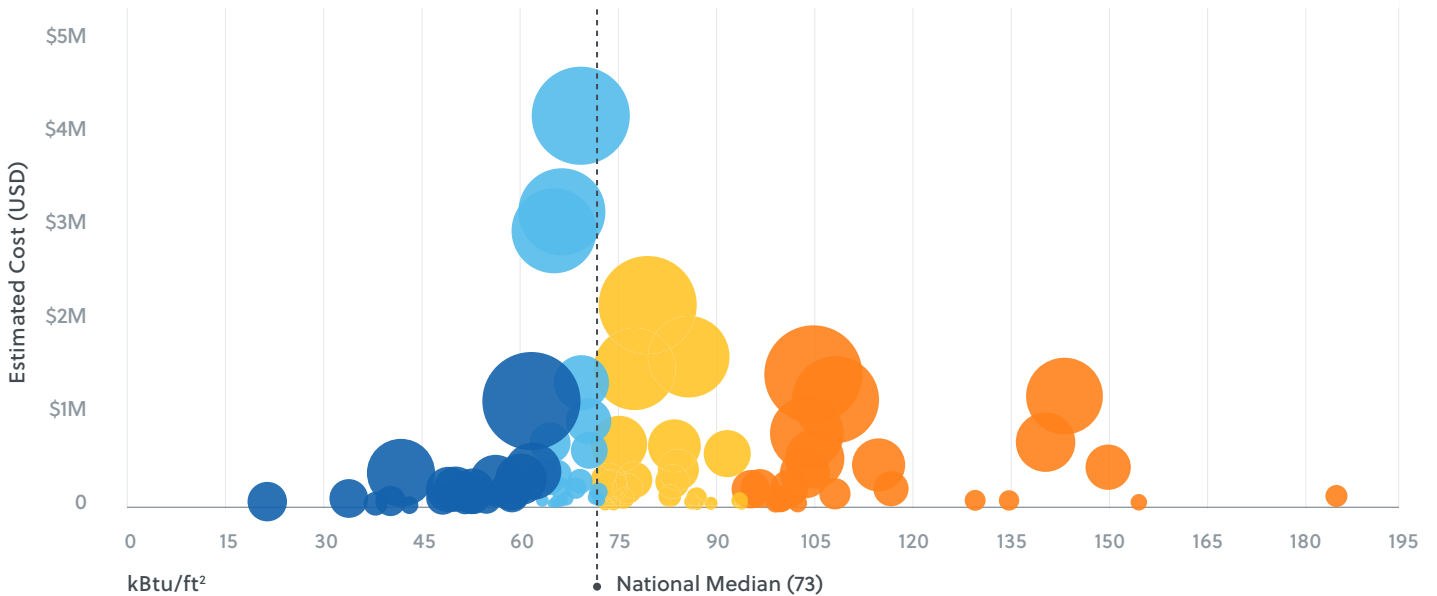
ENERGY STAR SCORE DISTRIBUTION



ENERGY USE INTENSITY



ESTIMATED UTILITY COSTS/SITE EUI



Retail Benchmarking Results

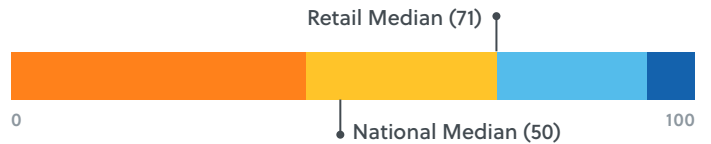
As noted in "Unique Market for Sustainable Real Estate," the San Francisco retail market is strong, and many retailers are seeking opportunities to expand into the city. With strong demand and limited development of new retail space, vacancy is low and rents continue to rise.²¹ Due to the importance of lighting to retail energy use, incentive programs and codes have prioritized installation of LED in recent years, which likely contributed to the declining reported median EUI for the sector from 2012 to 2014.

No consistent relationship was observed between retail building size and energy use per square foot, but as would be expected, smaller retail properties consume less energy overall than large ones, resulting in lower energy costs. However, a handful of outliers exhibit particularly high energy consumption and relative costs. These properties should be prioritized for outreach based on audit results in order that they can develop a program to improve performance and cut energy expenses.

PROPERTY TYPE	RETAIL STORE	ENCLOSED MALL*
# of Properties	81	4
SF of floor area	4,839,913	723,825
Energy Like for Like 2013-2014 (72 retail stores, 4 enclosed mall properties)	-5.9%	-2.3%
Total GHG Emissions (MT CO ₂ e)	14,718	2,386
Compliance Rate	49%	

*Excluded due to limited data

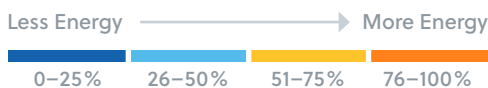
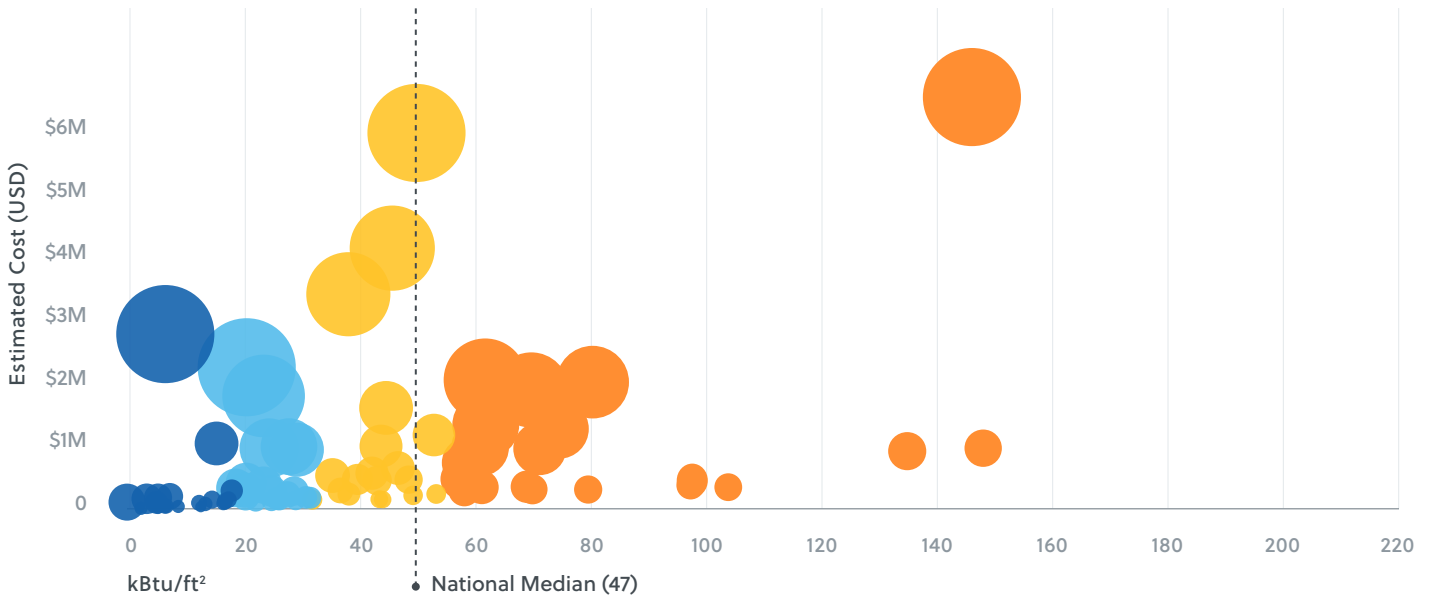
ENERGY STAR SCORE



ENERGY USE INTENSITY



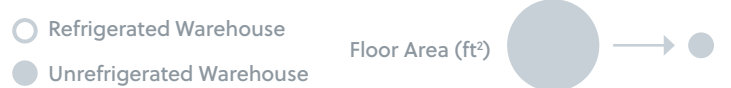
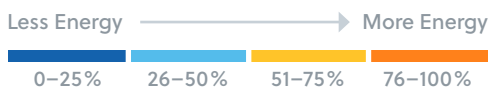
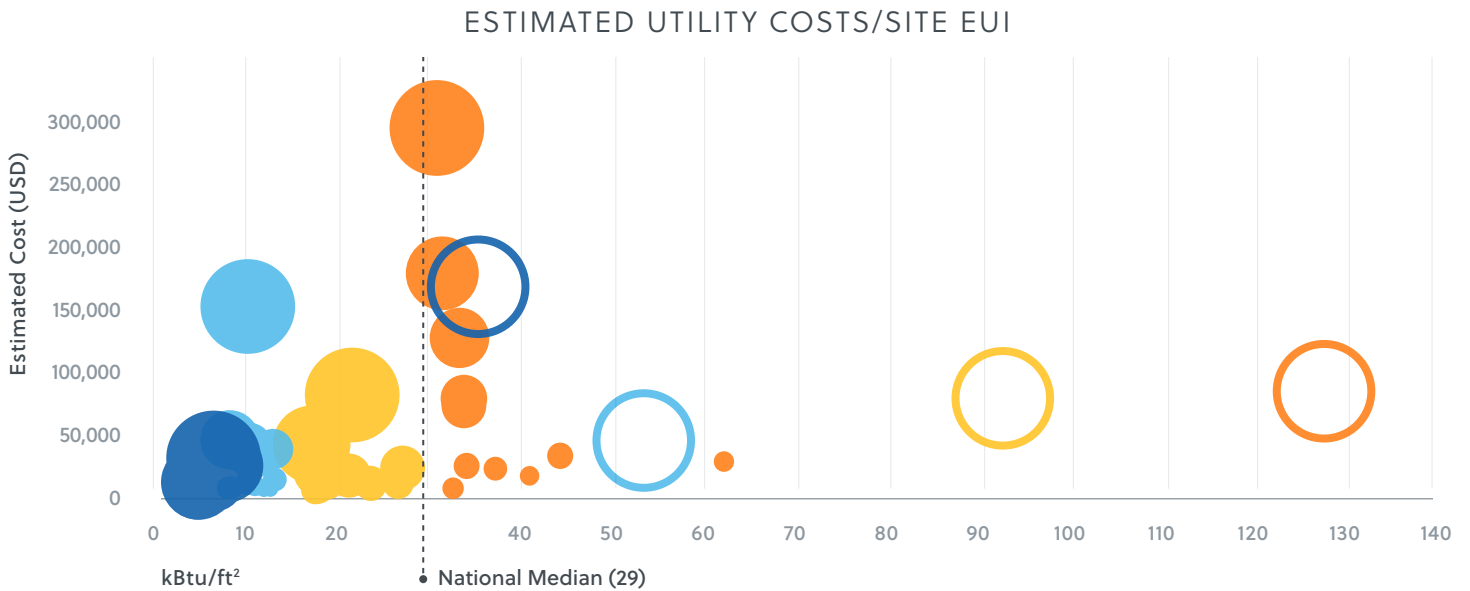
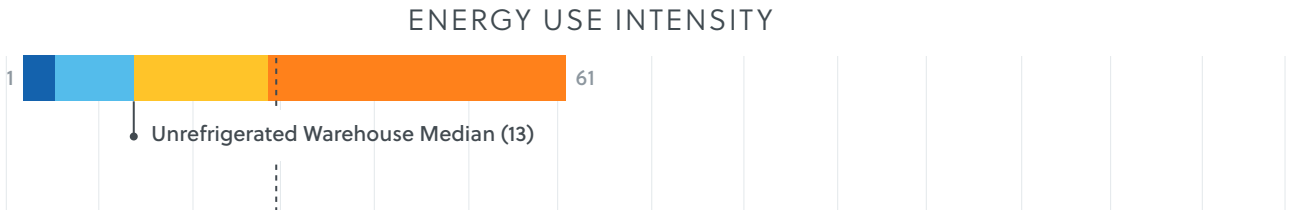
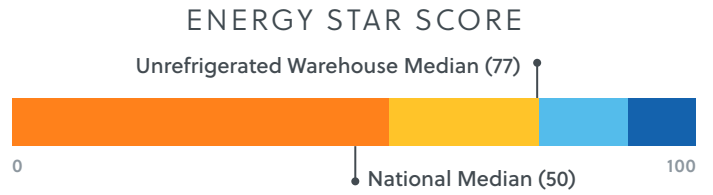
ESTIMATED UTILITY COSTS/SITE EUI



Warehouse Benchmarking Results

Demand for warehouse space in San Francisco has grown each year. Economic recovery and rising consumer spending have led to a low 5 percent vacancy rate. The current average asking rent is up 26 percent from 2011 and 5 percent from the previous record high in 2007.²² Unrefrigerated warehouses perform much better than the national median EUI and have a high median ENERGY STAR score for the sector. Refrigerated warehouses also perform better than the national median EUI, possibly due to both strong local energy codes and the city's mild climate. Refrigerated warehouses also report a low median ENERGY STAR score, potentially due to the small sample size.

PROPERTY TYPE	UNREFRIGERATED WAREHOUSE	REFRIGERATED WAREHOUSE
# of Properties	44	4
SF of floor area	3,188,098	200,572
Energy use, like-for-like change, 2013–2014 (38 unrefrigerated warehouse, 1 refrigerated warehouse property)	-3.4%	9.0%
Total GHG Emissions (MT CO ₂ e)	3,177	777
Compliance Rate	43%	



Opportunities



The information collected through the ECB ordinance has created a foundational data set to raise awareness, increase transparency, and accelerate continued adoption of energy efficiency best practices and technologies. This regulation and the results outlined in this report speak to the general leadership of the community – city, private sector, and utility – in advancing effective energy management practices. However, there are many opportunities to increase the power of the data and the productivity of the legislation. While the analysis presented in this document is a collaboration, this section differs. The following are constructive suggestions from ULI Greenprint to SFE.

Outreach

ULI Greenprint encourages SFE to continue to scale up outreach efforts. Considerable resources are available: the agency maintains a help desk that addresses issues specific to reporting and data quality. PG&E also offers a helpdesk focused on data access and provides six to ten in-person, hands-on benchmarking training sessions each year, an on-demand webinar, and click-by-click guide to benchmarking. However, though the city provided considerable training at the launch of the ordinance (at least 30 training events in each of the first three years), there remains considerable opportunity to reinvigorate outreach content and engage more building owners, operators, and contractors—particularly small buildings—in benchmarking and data quality. The goal of increased outreach would be to saturate the market with information about benchmarking and increase the amount and quality of submitted data.

Providing feedback, best practices, and lessons learned on data collection, the decision making process, and implementation of environmental performance improvements could help motivate participation. Providing more positive recognition, such as an award from the mayor for best performers to facilities that improve the most, and those that comply most consistently, can also stimulate participation.

Additional Metrics

SFE should consider collecting additional data of interest, such as occupancy, utility costs, water consumption, and the energy mix at each property. With the exception of water and energy costs, the data are already entered in ENERGY STAR Portfolio Manager and should be collected to provide crucial context for performance data. Additional data can help the SFE correlate changes in performance with other metrics, enabling a deeper examination of trends, which can help inform policies and support further efficiencies.

As an example, ULI Greenprint collects FTE data alongside energy and water data. This allows members to benchmark performance and understand shifts in resource consumption attributable to changes in how their properties are occupied. This is relevant where the historic design standards associated with offices are shifting and workplaces become more dynamic, with fewer traditional offices, more common areas, and a higher worker density.

Accelerate Data Collection and Publication

Given that the legislature has acted to ameliorate the structural problems with data access (*vis à vis* Assembly Bill 802), ULI Greenprint recommends that SFE institute a more formal disclosure schedule. The schedule should include a deadline for submitting the data for compliance, a timeline for data quality review, and a release date for the data and formal reporting. This suggestion will help the data more readily support a market transformation around building energy use.

Multifamily and Mixed Use

San Francisco's policy does not currently apply to large residential properties. Collecting consent from each resident, particularly considering ongoing churn of leases, is challenging for building owners under current California information practices. However, more than two-thirds of San Francisco housing units are in properties with five or more units. Mixed-use properties with residential space constitute not only a substantial portion of the city's existing built environment, but also the predominant program in the development pipeline. There is an opportunity to work with utilities to provide aggregate data in multitenant occupied properties. As the state appears to be moving to mitigate the problem of data access for these properties, ULI Greenprint recommends that San Francisco expand data requirements to apply to all large buildings, as is being done successfully in New York City, Seattle, and other major US cities with energy benchmarking requirements.

Appendix I: SEE Action Policy Design and Language Guide

The State and Local Energy Efficiency Action Network (SEE Action) is led by state and local governments to facilitate discussion and adoption of energy efficiency programs and policies and is a joint effort by the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (EPA). SEE Action's [Benchmarking and Disclosure: State and Local Policy Design Guide and Sample Policy Language](#) provides examples from existing state and local policies related to commercial benchmarking and disclosure to guide policymaking and planning efforts.

The following **pages 12-15** of the report appendix provide an example of the policy language and terminology.



Appendix: Sample Policy Language (Without Annotation)

This section provides sample policy language without annotation, organized into sections:


- Section A. Definitions
- Section B. Benchmarking Required for [State/Local Government] Buildings
- Section C. Benchmarking Required for Covered Buildings
- Section D. Disclosure and Publication of Benchmarking Information
- Section E. Whole-Building Energy Consumption Data
- Section F. Providing Benchmarking Information to the Building Owner
- Section G. Violations
- Section H. Enforcement
- Section I. Rules.

An annotated version of the sample policy language is also available in Section 2.

Section A. DEFINITIONS. AS USED IN THIS SECTION;

- (1) *“benchmark” means to input the total energy consumed for a building and other descriptive information for such building as required by the benchmarking tool.*
- (2) *“benchmarking information” means information related to a building’s energy consumption as generated by the benchmarking tool, and descriptive information about the physical building and its operational characteristics. The information shall include, but need not be limited to:*
 - (a) *Building address;*
 - (b) *Energy use intensity (EUI);*
 - (c) *Annual greenhouse gas emissions;*
 - (d) *Water use; and*
 - (e) *The energy performance score that compares the energy use of the building to that of similar buildings, where available.*
- (3) *“benchmarking tool” means the U.S. Environmental Protection Agency’s ENERGY STAR Portfolio Manager tool, or an equivalent tool adopted by the director.*
- (4) *“building owner” means an individual or entity possessing title to a building, or an agent authorized to act on behalf of the building owner.*
- (5) *“covered building” means:*
 - (a) *Any nonresidential building containing [xx,xxx] or more gross square feet, or any residential building containing [xx] or more dwelling units;*
 - (b) *Two or more buildings on the same tax lot that together exceed [xxx,xxx] gross square feet or [xx] dwelling units;*
 - (c) *Two or more buildings held in the condominium form of ownership that are governed by the same board of managers and that together exceed [xxx,xxx] gross square feet or [xx] dwelling units.*

The term “covered building” shall not include any building owned by the [state/local government].
- (6) *“director” means the director of the [agency overseeing administration of law].*

- 
- (7) “dwelling unit” means a single unit consisting of one or more habitable rooms, occupied or arranged to be occupied as a unit separate from all other units within a building, and used primarily for residential purposes and not primarily for professional or commercial purposes.
 - (8) “energy” means electricity, natural gas, steam, heating oil, or other product sold by a utility for use in a building, or renewable on-site electricity generation, for purposes of providing heating, cooling, lighting, water heating, or for powering or fueling other end-uses in the building and related facilities.
 - (9) “energy performance score” means the numeric rating generated by the ENERGY STAR Portfolio Manager tool or equivalent tool adopted by the director that compares the energy usage of the building to that of similar buildings.
 - (10) “ENERGY STAR Portfolio Manager” means the tool developed and maintained by the U.S. Environmental Protection Agency to track and assess the relative energy performance of buildings nationwide.
 - (11) “[state/local government] building” means any of the following:
 - (a) a building that is 10,000 gross square feet or more that is owned by the [state/local government]; or
 - (b) a building that is 10,000 gross square feet or more where a [state/local government] agency leases at least 5,000 rentable square feet of space.
 - (12) “tenant” means a person or entity occupying or holding possession of a building or premises pursuant to a rental agreement.
 - (13) “utility” means an entity that distributes and sells natural gas, electric, or thermal energy services for buildings.

Section B. BENCHMARKING REQUIRED FOR [STATE/LOCAL GOVERNMENT] BUILDINGS


- (1) No later than April 1, [xxxx], and no later than every April 1 thereafter, each [state/local government] building shall be benchmarked for the previous calendar year by the entity primarily responsible for the management of such building, in coordination with the director.

Section C. BENCHMARKING REQUIRED FOR COVERED BUILDINGS

- (1) Building owners shall annually benchmark for the previous calendar year each covered building and obtain an energy performance score as available according to the following schedule:
 - (a) A nonresidential building that is [xxx.xxx] gross square feet or more by May 1, [xxxx] and by every May 1 thereafter; and
 - (b) A nonresidential building that is [xx.xxx] gross square feet or more, or a residential building that has [xx] or more dwelling units, by May 1, [xxxx] and by every May 1 thereafter.

Section D. DISCLOSURE AND PUBLICATION OF BENCHMARKING INFORMATION

- (1) The building owner shall annually provide benchmarking information to the director, in such form as established by the director’s rule, by the date provided by the schedule in Section (C)(1).
- (2) The director shall make available to the public on the internet, and update at least annually, benchmarking information for the previous calendar year for [state/local government] buildings no later than Sept. 1, [xxxx], and each Sept. 1 thereafter; and for covered buildings for the previous calendar year no later than Sept. 1, and each Sept. 1 thereafter, following the second annual receipt of benchmarking information. No benchmarking information received by the director in the first year a covered building is required to benchmark pursuant to Section (C) will be published.
- (3) The director shall make available to the public, and update at least annually, the following information:
 - (a) Summary statistics on energy consumption in [state/local government] buildings and covered buildings derived from aggregation of benchmarking information for those buildings;
 - (b) Summary statistics on overall compliance with this chapter;
 - (c) For each [state/local government] building and covered building:

- 
- (1) *The status of compliance with the requirements of this chapter;*
 - (2) *Annual summary statistics for the building, including energy use intensity, annual greenhouse gas emissions, water use per gross square foot, and an energy performance score where available; and*
 - (3) *A comparison of benchmarking information across calendar years for any years such building was benchmarked.*

Section E. WHOLE-BUILDING ENERGY CONSUMPTION DATA ACCESS

- (1) *Utilities providing energy service to a covered or [state/local government] building shall maintain energy consumption data for each building for at least the most recent 36 months in an electronic format capable of being uploaded to the benchmarking tool.*
- (2) *On and after Jan. 1, [xxxx], upon the written or electronic request and authorization of a building owner, a utility shall provide the building owner with at least 12 consecutive months of energy consumption data for the specified building in its entirety, including consumption data derived from readings of separate utility-grade meters that measure energy consumption in tenant-occupied spaces. The utility shall provide the data in the following manner:*
 - (a) *Within 14 days of a request by the building owner; and*
 - (b) *In an electronic format capable of being uploaded to the benchmarking tool, or through the direct, secure upload to the benchmarking tool account specified by the building owner.*
- (3) *Utilities may provide such data in a form that aggregates energy consumption data from tenant meters. Aggregated data shall be provided to the building owner without prior consent from tenants, provided that the data.*
 - (a) *Does not contain the individual identities of tenants or other personally identifying information;*
 - (b) *Does not contain additional customer-specific billing data; and*
 - (c) *Otherwise provides adequate protections for the security of the information and the privacy of the owner and tenants.*

Section F. PROVIDING BENCHMARKING INFORMATION TO THE BUILDING OWNER


- (1) *Each tenant located in a covered building subject to this chapter shall, within 30 days of a request by the building owner and in a form to be determined by the director, provide all information that cannot otherwise be acquired by the building owner and that is needed by the building owner to comply with the requirements of this chapter. A failure to provide information to a building owner may result in penalties as provided under Section (H)(2).*
- (2) *Where the building owner is unable to benchmark due to the failure of any or all tenants to report the information required by Section (F)(1), the owner shall complete benchmarking using such alternate values as established by the director prior to the implementation of this chapter. The director shall evaluate the quality of any alternate values established pursuant to Section (F)(2) and propose revisions that increase the quality of such values prior to Dec. 31, [xxxx], and not less than once every 10 years thereafter.*

Section G. VIOLATIONS

- (1) *It shall be unlawful for any entity or person to fail to comply with the requirements of this chapter or misrepresent any material fact in a document required to be prepared or disclosed by this chapter.*

Section H. ENFORCEMENT

- (1) *If the director determines that a building owner has failed to report accurate energy benchmarking information pursuant to Section (D)(1), the director may seek the following remedies:*
 - (a) *A written warning may be issued for the first violation; and*
 - (b) *If benchmarking information is not reported within 15 days of the date the written warning is issued, the director may issue a notice of violation with a penalty of up to \$[xxx] per day for the first 10 days of noncompliance, then up to \$[xxx] per day for each day in violation past the 10th day until compliance is achieved.*

- 
- (2) *If the director determines that a tenant has failed to provide information to a building owner pursuant to Section (F)(1), the director may seek the following remedies:*
- (a) *A citation of up to \$[xxx] may be issued for the first violation;*
 - (b) *A citation of up to \$[xxx] may be issued for the second violation within a 12-month period; and*
 - (c) *A citation of up to \$[xxx] may be issued for the third and subsequent violation within a 12-month period.*

Section I. RULES

- (1) *The director shall promulgate such rules as deemed necessary to carry out the provisions of this article.*

Appendix J: City of Chicago, IL

Chicago Energy Benchmarking includes useful resources to assist with implementing a benchmarking program. The resources include:

- Chicago Energy Benchmarking Compliance Checklist
- Chicago Energy Benchmarking Fact Sheet
- Benchmarking at a Glance Infographic

Compliance Checklist

In 2015, covered buildings are required to complete these steps no later than **August 1st**.

All completed benchmarking submissions received by August 1, 2015 will be treated as in compliance with the ordinance this year. **After 2015, June 1st will remain the ongoing annual deadline.** Please visit the **Chicago Energy Benchmarking Website** for step-by-step guidance, training sign-up, and other free resources: www.CityofChicago.org/EnergyBenchmarking.

<input type="checkbox"/> 1. Get Started - Suggested 2015 Completion Date: May 8, 2015		
<input type="checkbox"/>	Determine whether your building(s) must comply in 2015	<ul style="list-style-type: none"> Commercial and municipal buildings 50,000-250,000 square feet and residential buildings 250,000 square feet and larger must benchmark (Step #2), verify (Step #3), and report (Step #4). Commercial buildings 250,000 square feet and larger that complied in 2014 must benchmark (Step #2) and report (Step #4).
<input type="checkbox"/>	Identify a benchmarking lead	<ul style="list-style-type: none"> Designate a building staff member or 3rd party partner. Arrange for in-house or 3rd party data verification (Step #3).
<input type="checkbox"/> 2. Benchmark Your Building(s) - Suggested 2015 Completion Date: May 29, 2015		
<input type="checkbox"/>	Create a Portfolio Manager account	<ul style="list-style-type: none"> Visit http://www.energystar.gov/portfoliomanager You may use existing Portfolio Manager accounts and profile(s)
<input type="checkbox"/>	Gather basic information required by Portfolio Manager and set up property profile(s)	<ul style="list-style-type: none"> Required info for various property use types is available at: http://www.energystar.gov/buildings/tools-and-resources/list-portfolio-manager-property-types-definitions-and-use-details Refer to the <i>Benchmarking Guide</i> at http://www.CityofChicago.org/EnergyBenchmarking
Obtain monthly, whole-building energy use data for January-December 2014 (all fuel types)		
<input type="checkbox"/>	<input type="checkbox"/>	Electricity: Request whole-building 2014 electricity use through ComEd's Energy Use Data System: www.ComEd.com/EnergyUsageData
	<input type="checkbox"/>	Natural Gas: Request whole-building 2014 natural gas use data from Peoples Gas: www.PeoplesGasDelivery.com/Business/Aggregation.aspx
	<input type="checkbox"/>	Other Fuel Types: Refer to monthly bills for other fuel types (ex: chilled water, steam, diesel, oil, etc.)
<i>Note: Buildings may also enter monthly energy use data directly from energy bills.</i>		
<input type="checkbox"/>	Enter property uses & details into profile(s)	<ul style="list-style-type: none"> On the DETAILS tab, use the ADD ANOTHER TYPE OF USE menu to select a property use. Click ADD and enter requested info, and repeat for add'l property uses.
<input type="checkbox"/>	Enter energy use data for all fuel types	<ul style="list-style-type: none"> On the METERS tab, click ADD ANOTHER METER. Enter requested info, and repeat for add'l meters or fuel types. <i>Note: Chicago's ordinance does not require water or cost data.</i>
<input type="checkbox"/>	Enter your Chicago Energy Benchmarking ID(s)	<ul style="list-style-type: none"> On the DETAILS tab, click UNIQUE IDENTIFIERS (IDs). From STANDARD IDs, select CHICAGO ENERGY BENCHMARKING ID. Enter the 6-digit ID (listed on notification letter).

Chicago Energy Benchmarking

<input type="checkbox"/> 3. Verify Building Data - Suggested 2015 Completion Date: June 19, 2015 (for first-time compliers only; official data verification is required every three years)		
<input type="checkbox"/>	Generate a Data Verification Checklist in Portfolio Manager	<ul style="list-style-type: none"> On the REPORTING tab, under ENERGY STAR PERFORMANCE DOCUMENTS, click DATA VERIFICATION CHECKLIST. Specify SINGLE YEAR timeframe, ending DEC 2014 using the dropdown boxes, and download the Data Verification Checklist. Buildings do not need to submit the signed Data Verification Checklist to the City, but buildings are required to produce it upon request.
<input type="checkbox"/>	Have a recognized professional review and sign the Data Verification Checklist and save it for your records.	Recognized data verifier credentials (as of March, 2015): <ul style="list-style-type: none"> Professional Engineer (State of IL) Licensed Architect (State of IL) Building Operator Certification Level I (MEEA) Building Energy Technology Certificate (City Colleges of Chicago) Certified Energy Manager (AEE) Building Energy Assessment Professional(ASHRAE)
<input type="checkbox"/>	Add data verifier information to Portfolio Manager	<ul style="list-style-type: none"> On the DETAILS tab, scroll down to the PROPERTY NOTES field. In the text field, type: verifier's name, organization, email, recognized credential, unique identifying information (ex: license or certificate number), and date of verification.
<input type="checkbox"/> 4. Report to the City – Suggested 2015 Completion Date: July 1 – August 1, 2015. (All completed benchmarking submissions received by August 1, 2015 will be treated as in compliance with the ordinance this year. After 2015, June 1st will remain the ongoing annual deadline.)		
<input type="checkbox"/>	Generate and review the building's report in Portfolio Manager	<ul style="list-style-type: none"> Click on the reporting link at www.CityofChicago.org/EnergyBenchmarking. Scroll down to YOUR RESPONSE, select building(s) from the PROPERTIES dropdown box, and click GENERATE RESPONSE PREVIEW. Review any data alerts or other instructions that may appear. In the TEMPLATES AND REPORTS table, find the row for 2015 CHICAGO ENERGY BENCHMARKING REPORTING; under the ACTION menu in that row, select DOWNLOAD PREVIEW IN EXCEL from the dropdown box. Review the resulting Excel preview data that will be shared with the City (fields that do not apply to the building will be left blank).
<input type="checkbox"/>	Submit the report to the City through Portfolio Manager	<ul style="list-style-type: none"> On the REPORTING tab, in the TEMPLATES AND REPORTS table, find the row for 2015 CHICAGO ENERGY BENCHMARKING REPORTING; under the ACTION menu, select SEND RESPONSE (<i>Note: reporting to the City is distinct from sharing data through Portfolio Manager's SHARE tab</i>). Review any data alerts or other instructions that may appear. Enter requested information, e-sign with your Portfolio Manager username and password, and click SEND DATA. Save the ENERGY STAR Portfolio Manager confirmation email.

Questions? We Can Help!

- Guidance, training, and other free resources: www.CityofChicago.org/EnergyBenchmarking
- Chicago Energy Benchmarking Help Center: (855) 858-6878 (M-F, 9:00am-5:00pm) or email Info@ChicagoEnergyBenchmarking.org

Chicago Energy Benchmarking

The **Chicago Energy Benchmarking Ordinance** seeks to raise awareness of energy performance through information and transparency, with the goal of unlocking energy and cost savings opportunities for businesses and residents. To comply, covered buildings must track whole-building energy use, report to the City annually, and verify data accuracy every three years. For more information, please visit www.cityofchicago.org/energybenchmarking.

Which buildings are covered?

The ordinance applies to municipal, commercial, and residential buildings >50,000 square feet. Exemptions are available for buildings experiencing financial hardship or low occupancy rates, new construction (previous calendar year), and buildings with specific space uses.

When must buildings comply?

In 2015, commercial and municipal buildings 50,000 - 250,000 square feet and residential buildings over 250,000 square feet will benchmark, verify, and report for the first time. Commercial and municipal buildings that benchmarked, verified, and reported for the first time in 2014 are required only to benchmark and report in 2015; the next required data verification deadline for these buildings is June 1, 2017.

In 2015, all completed benchmarking submissions received by **August 1, 2015** will be treated as in compliance with the ordinance. After 2015, June 1st will remain the ongoing annual deadline.

Building sector	Building size (ft ²)	Benchmarking Timeline:			
		2014	2015	2016	2017
Non-Residential	≥ 250,000	Benchmark, Verify, Report	Benchmark, Report	Benchmark, Report	Benchmark, Verify, Report
	≥ 50,000		Benchmark, Verify, Report	Benchmark, Report	Benchmark, Report
Residential	≥ 250,000		Benchmark, Verify, Report	Benchmark, Report	Benchmark, Report
	≥ 50,000			Benchmark, Verify, Report	Benchmark, Report

The City will report annually on energy efficiency trends, and the ordinance authorizes the City to share building-specific data with the public after an initial one-year grace period.

How do I get started?

- Visit www.cityofchicago.org/energybenchmarking to download the **Compliance Checklist** and step-by-step **Benchmarking Guide**.
- Set up a Portfolio Manager profile for your building at www.energystar.gov/benchmark
- If your building has multiple energy meters and accounts, request whole-building data:
 - ComEd (electricity): www.comed.com/energytools
 - Peoples Gas (natural gas): www.peoplesgasdelivery.com/business/aggregation.aspx
- Arrange for in-house or 3rd party professional data verification. Details on recognized data verifier training programs and credentials are available online.
- Report to the City through the “Report” link at www.cityofchicago.org/energybenchmarking

Where can I find help?

- **Contact the Help Center** at info@chicagoenergybenchmarking.org or call (855) 858-6878.
- **Attend a free training.** Schedules and registration links are available online.

Support provided by the Chicago Energy Benchmarking Working group:

AIA Chicago | ASHRAE | City of Chicago | Elevate Energy | Energy Center of Wisconsin
Midwest Energy Efficiency Alliance | Natural Resources Defense Council | USGBC-Illinois

CityofChicago.org/EnergyBenchmarking | Info@ChicagoEnergyBenchmarking.org | (855) 858-6878

April 2015

REACHING FOR NEW HEIGHTS: ENERGY BENCHMARKING UNCOVERS ANNUAL SAVINGS POTENTIAL OF UP TO \$77M

BY TAKING ACTION TO IMPROVE ENERGY EFFICIENCY, CHICAGO'S LARGEST BUILDINGS ARE MAKING OUR CITY MORE:

Livable
Competitive
Sustainable



ENERGY BENCHMARKING HELPS BUILDINGS TAKE CONTROL OF ENERGY USE

Chicago buildings spend
\$3 BILLION
per year on energy



Building energy use drives
71%
of citywide greenhouse gas (GHG) emissions

\$77 MILLION
IN POTENTIAL SAVINGS IDENTIFIED FROM 2014 ENERGY BENCHMARKING

ANNUAL SAVINGS POTENTIAL IDENTIFIED TO DATE*



13% to 23% energy savings



\$44 million to \$77 million cost savings



460,000 to 844,000 avoided tons of GHGs
(equivalent to removing 95,000 to 175,000 cars from the road)



Investment to achieve these savings could create more than 1,000 jobs

*Savings estimate from improving buildings' energy intensity to the 50th or 75th percentile, by sector

IN 2014, CHICAGO'S LARGEST BUILDINGS TRACKED, VERIFIED AND REPORTED ENERGY USE FOR THE FIRST TIME



348 commercial and municipal buildings



60 Chicago neighborhoods

WHAT'S NEXT?

In 2015 Chicago Energy Benchmarking is rolling out to more buildings and sectors

JUNE 1, 2015 REPORTING DEADLINE



Appendix K: Sample Portfolio Manager Data Request

[EPA ENERGY STAR Portfolio Manager](#) is the tool most often used to benchmark building energy usage. The following pages include a guiding document titled *Sample Portfolio Manager Data Request Template Instructions for Governments*.

Sample Portfolio Manager Data Request Template Instructions for Governments

The simple choice for energy efficiency.



March 11, 2015

Data Requests

Portfolio Manager contains a data request feature within the Reporting tab that allows users to create a custom report with desired metrics that they can publish to request data from other users. This allows for efficient collection of desired data and metrics from across a wide base of properties. Many municipalities with benchmarking and disclosure requirements use data request templates to collect data from building owners to verify compliance.

This document provides sample instructions to include with a data request being used to verify compliance with a benchmarking and disclosure requirement. The headers are drawn from the fields provided in Portfolio Manager when a data request is created, and the language is drawn from text used by other cities in their data request instructions. The highlighted portions are those that will be filled in with specific details from the municipality creating the data request.

Template Instruction Language

About this Data Request

Data Requested by: [Name of government office overseeing implementation of the benchmarking ordinance]

Instructions: [201X Municipality] Energy Benchmarking Reporting] (Jan-Dec 201X Building Data)

In 20XX, [municipality] adopted an ordinance to raise awareness of energy performance, with the goal of helping building owners and managers identify energy and cost savings opportunities.

The ordinance calls on existing municipal, commercial, and residential buildings larger than [threshold] square feet [of included building types] to track energy use, report to the [municipality] annually, and [any additional requirements, such

as verification]. Buildings larger than [threshold] must comply by [deadline].

Please use the dropdown menu within the “Your Response” box below to select the building(s) you wish to report, then download a preview of your report, e-sign your report, and submit your report by clicking the 'Send Data' button.

If Portfolio Manager detects any data quality issues within the information you are releasing, you will receive an alert after generating a preview response that takes you to a page with detailed descriptions of each issue, including links that will allow you to correct those issues within the web tool. We highly recommend using this page of alerts to correct each issue identified before sending data to [municipality]. **Data quality issues must be resolved in order to comply with the ordinance.**

Note: Your benchmarking report will not be shared with [municipality] until you click “Send Data.” You will also receive a confirmation email, which we recommend you retain as proof-of-submission.

REMINDERS- Before you submit, please ensure that your buildings in Portfolio Manager include:

1. [Municipality Energy Benchmarking Building ID]:

- On the 'Details' tab of your building profile, click 'Unique Identifiers (IDs).' From the 'Standard IDs' menu, select [Municipality Energy Benchmarking ID].

- Enter your building's ID number [found at location] or available from the [Municipality Energy Benchmarking Help Center]: [phone] or [email].

No-cost Training, Resources, and Other Support:

ENERGY STAR® is the simple choice for energy efficiency. For more than 20 years, EPA's ENERGY STAR program has been America's resource for saving energy and protecting the environment. Join the millions making a difference at energystar.gov.

Sample Portfolio Manager Data Request Template Instructions for Governments

The simple
choice for
energy
efficiency.



March 11, 2015

Visit [municipality benchmarking website] for detailed information on benchmarking training, resources, and other support to help buildings comply with the ordinance, including:

- [Municipality Energy Benchmarking] guidance materials
- No-cost training (live and web-based)
- [US EPA ENERGY STAR® buildings resources](#)

Questions? We Can Help!

Visit the [Municipality Energy Benchmarking Website] or contact the Help Center:

- Website: [Municipality Benchmarking Website]
- Phone Hotline: [phone] (Monday-Friday, 9:00am-5:00pm)
- Email: [Municipality Energy Benchmarking Email]

For help, contact: [Municipality Energy Benchmarking Team] at [PointOfContactEmailAddress] or [PointOfContactPhoneNumber]

ENERGY STAR® is the simple choice for energy efficiency. For more than 20 years, EPA's ENERGY STAR program has been America's resource for saving energy and protecting the environment. Join the millions making a difference at energystar.gov.

Appendix L: City of Washington, D.C. Ordinance

The [Clean and Affordable Energy Act of 2008 \(CAEA\)](#) was passed on July 15, 2008, and requires energy performance of commercial buildings to be annually rated and disclosed as well as the creation of the DC Sustainable Energy Utility (SEU).

The ordinance language is included in the following pages.

AN ACT

IN THE COUNCIL OF THE DISTRICT OF COLUMBIA

*Codification
District of
Columbia
Official Code*

2001 Edition

**2008 Fall
Supp.**

**West Group
Publisher**

To establish authority to contract with a private company to be known as a Sustainable Energy Utility to administer sustainable energy programs in the District of Columbia; to establish an advisory board for the Sustainable Energy Utility; to define the responsibilities of the Sustainable Energy Utility Advisory Board; to define the role of the Sustainable Energy Utility; to lay out the structure of the Sustainable Energy Utility contract; to require the Mayor to design and implement a brand for sustainable energy services in the District of Columbia; to require the Commission to rule on a portion of Formal Case 945; to require the incumbent distribution utilities to share certain customer energy use data with the Sustainable Energy Utility; to establish a renewable energy incentive program in the District of Columbia; to establish the Sustainable Energy Trust Fund and associated assessment; to establish the Energy Assistance Trust Fund and associated assessment; to amend the Retail Competition and Consumer Protection Act of 1999 to eliminate the Reliable Energy Trust Fund and associated charge; to amend the Omnibus Utility Amendment Act of 2004 to eliminate the Natural Gas Trust Fund and associated charge; to amend the Renewable Portfolio Standard Act of 2004 to increase the renewable requirement, allow solar thermal to count as a Tier 1 solar resource, and increase the alternative compliance payment; to amend the Green Building Act of 2006 to establish benchmarking requirements for all qualified public and private buildings; to amend An Act Making appropriations to provide for the expenses of the government of the District of Columbia for the fiscal year ending June thirtieth, nineteen hundred and fourteen, and for other purposes to amend the responsibilities of the Public Service Commission; to amend AN ACT To provide a People’s Counsel for the Public Service Commission in the District of Columbia, and for other purposes to amend the responsibilities of the Office of the People’s Counsel; to require the Mayor to commission a study of the feasibility of District investment or involvement in the construction of a renewable energy generating facility; and to require lessors of nonresidential buildings to measure and bill each rental unit for energy costs.

BE IT ENACTED BY THE COUNCIL OF THE DISTRICT OF COLUMBIA, That this act may be cited as the “Clean and Affordable Energy Act of 2008”.

TITLE I. DEFINITIONS.

Sec. 101. Definitions.

For the purposes of this act, the term:

- (1) "Commission" means the Public Service Commission.
- (2) "District Department of the Environment," "DDOE," or "Energy Office" means the District Department of the Environment Energy Office.
- (3) "Electric company" shall have the same meaning as in the fifteenth unnumbered paragraph, beginning "The term "electric company"", of section 8(1) of An Act Making appropriations to provide for the expenses of the government of the District of Columbia for the fiscal year ending June thirtieth, nineteen hundred and fourteen, and for other purposes, approved March 4, 1913 (37 Stat. 974; D.C. Official Code § 34-209).
- (4) "Energy Assistance Trust Fund" or "EATF" means the Energy Assistance Trust Fund established under section 211.
- (5) "Existing electricity programs" means those programs operated by the District Department of the Environment under the names "Weatherization Plus," "Low Income Appliance Replacement Program," and "Weatherization and Rehabilitation."
- (6) "Existing low-income programs" means those programs operated by the District Department of the Environment under the names "LIHEAP Expansion and Energy Education," "RAD Expansion," "RAD Arrearages Retirement and Education Program," and "Residential Essential Service Expansion and Awareness Program."
- (7) "Existing natural gas programs" means those programs proposed or operated by the District Department of the Environment under the names "Heating System Repair, Replacement, and Tune-Up Program," "Residential Weatherization and Efficiency Program," "Energy Awareness Program," and "Saving Energy in D.C. Schools."
- (8) "Fiscal Agent" means the Office of the Chief Financial Officer.
- (9) "Gas company" shall have the same meaning as in the thirteenth unnumbered paragraph, beginning "The term "gas company"", of section 8(1) of An Act Making appropriations to provide for the expenses of the government of the District of Columbia for the fiscal year ending June thirtieth, nineteen hundred and fourteen, and for other purposes, approved March 4, 1913 (37 Stat. 974; D.C. Official Code § 34-209).
- (10) "Green collar jobs" means jobs in the environmental sector of the economy which jobs may involve the implementation of environmentally-conscious design, policy, or technology.
- (11) "OIML" means the International Association of Legal Metrology.
- (12) "Request for Proposals" or "RFP" means the request for proposals prepared by the District Department of the Environment for the SEU.
- (13) "Residential Aid Discount" means the utility discount program offered by the electric company to low-income electricity customers in the District of Columbia.
- (14) "Residential Essential Service" means the utility discount program offered by the gas company to low-income natural gas customers in the District of Columbia.

(15) “Solar thermal systems” means systems which utilize the sun’s radiation to efficiently heat fluids or air.

(16) “SRCC” means the Solar Rating and Certification Corporation.

(17) “Substantial improvement” has the same meaning as in section 202 of Title 12J of the District of Columbia Municipal Regulations (12J DCMR § 202).

(18) “Sustainable Energy Trust Fund” or “SETF” means the Sustainable Energy Trust Fund established under section 210.

(19) “Sustainable Energy Utility” or “SEU” means the private contractor selected to develop, coordinate, and provide programs for the purpose of promoting the sustainable use of energy in the District of Columbia.

(20) “Sustainable Energy Utility Advisory Board”, “Advisory Board”, or “Board” means the board established under section 203 that advises the DDOE on the procurement of the contract with the SEU and monitors the progress of the SEU under its contract.

(21) “Temporary electricity programs” means those programs operated by the District Department of the Environment under the names “Affordable Housing Energy Efficient Rebate Program”, “Weatherization Rehabilitation Asset Partnership”, and “Home Energy Rating System”.

(21) “Utility or energy company” means a company distributing, supplying, or transmitting electricity or natural gas in the District of Columbia.

TITLE II. MANAGEMENT OF SUSTAINABLE ENERGY PROGRAMS.

Sec. 201. Contract with a Sustainable Energy Utility.

(a) The Mayor, by, and through DDOE, shall contract with a SEU to conduct sustainable energy programs on behalf of the District of Columbia.

(b) The SEU shall be a private entity.

(c) The SEU shall conduct the sustainable energy programs under a brand name to be determined by the District Department of the Environment.

(d) The SEU contract shall provide that the SEU shall, at a minimum, achieve the following:

- (1) Reduce per-capita energy consumption in the District of Columbia;
- (2) Increase renewable energy generating capacity in the District of Columbia;
- (3) Reduce the growth of peak electricity demand in the District of Columbia;
- (4) Improve the energy efficiency of low-income housing in the District of

Columbia;

(5) Reduce the growth of the energy demand of the District of Columbia’s largest energy users; and

- (6) Increase the number of green-collar jobs in the District of Columbia.

(e) The SEU contract shall be funded by the SETF. The SEU contract may also be funded by any other source of funding available to the Mayor, including:

- (1) Federal funds;
 - (2) Private funds, subject to DDOE approval; and
 - (3) Other District funds.
- (f) All funds used to support the SEU contract shall be managed by the Fiscal Agent.
- (g) The SEU contract shall permit coordination with any similar private entity operating in an adjacent or nearby jurisdiction.
- (h) The use of private grant money by the SEU shall be subject to DDOE approval.
- (i) Notwithstanding the provisions of the District of Columbia Procurement Practices Act of 1985, effective February 21, 1986 (D.C. Law 6-85; D.C. Official Code § 2-301.01 *et seq.*), the SEU contract shall be awarded pursuant to the procedure set forth under this title.

Sec. 202. Structure of the SEU contract.

- (a) The initial SEU contract shall be for a period of not less than 5 years.
- (b) The SEU contract shall be funded as provided in section 201(e).
- (c) The SEU contract shall be performance-based and shall provide financial incentives for the SEU to surpass the performance benchmarks set forth in the SEU contract. The SEU contract shall also provide financial penalties to be applied to the SEU if the SEU fails to meet the required performance benchmarks.
- (d) The SEU contract shall require that the SEU program shall, when taken as a whole, meet the societal benefit test on an annual and contract-term basis.
- (e) Each bid shall detail how the contractor proposes to nearly meet, meet, or exceed each performance benchmark. The performance benchmarks shall be set forth in the bid.
- (f) The SEU contract shall permit the programs, benchmarks, and level of funding to be changed at any time with the approval of both the SEU and the DDOE. No change to the funding shall allow the Mayor to exceed the SETF funding limits set forth in section 210.
- (g) The SEU contract shall be revocable if the SEU fails to meet the performance benchmarks of the contract.
- (h) The SEU contract shall provide that the annual expenditure on natural gas-related programs shall be no less than 75%, and no greater than 125%, of the amount provided in the contract from the assessment on the natural gas company.
- (i) The SEU contract shall provide that the expenditure on electricity-related programs shall be no less than 75%, and no greater than 125%, of the amount provided in the contract from the assessment on the electricity company.
- (j) Subsections (h) and (i) shall not apply to funds from a source other than an assessment on the gas company or the electric company.
- (k) The SEU contract shall provide that the SEU shall submit, to the DDOE and Board, a quarterly report detailing expenditures under the contract and performance of SEU programs.

Sec. 203. Establishment of a Sustainable Energy Utility Advisory Board.

(a) There is established a Sustainable Energy Utility Advisory Board whose purpose shall be to:

(1) Provide advice, comments, and recommendations to the DDOE and Council regarding the procurement and administration of the SEU contract described in sections 201 and 202.

(2) Advise the DDOE on the performance of the SEU under the SEU contract;
and

(3) Monitor the performance of the SEU under the SEU contract.

(b) The Board shall be comprised of:

(1) The Mayor, or his or her designee, who shall chair the Advisory Board;
(2) The People's Counsel or his or her designee;
(3) The Chair of the Public Service Commission or his or her designee;
(4) One member appointed by the Chairman of the Council committee with oversight of the Energy Office;

(5) One member appointed by the Chairman of the Council;
(6) One member, appointed by the Mayor, representing the renewable energy industry;

(7) One member, appointed by the Mayor, representing an environmental group;
(8) One member, appointed by the Mayor, representing the low-income community;

(9) One member, appointed by the Mayor, representing the building construction industry;

(10) One member, appointed by the Mayor, representing the building management industry;

(11) One member, appointed by the Mayor, representing the economic development community with particular expertise in the generation of green-collar jobs;

(12) One member, appointed by the Mayor, representing the electric company;
and

(13) One member, appointed by the Mayor, representing the gas company.

(c) Each member of the Advisory Board appointed by the Mayor or Council shall have demonstrable expertise in energy efficiency or renewable energy.

(d) Board members shall be entitled to reimbursement for expenses, including transportation, parking, mileage expenses, and conference admission fees incurred in the performance of official duties of the Board. The reimbursement shall be limited to \$2,000 per board member per year.

(e) Each member of the Board shall serve a 3-year term.

(f) The Mayor, Council Chairman, or Chairman of the Council committee with oversight of the Energy Office may replace any appointee at any time, but shall not replace the appointee to any individual position more than 2 times per calendar year.

(g) Any Board member who is an employee of the District government, or who serves on the Board as the representative of a particular organization, group, business, or other entity, including an elected official, shall be removed from the Board upon leaving the employment of the District government, elected office, or other entity, as applicable.

Sec. 204. Operations of the Sustainable Energy Utility Advisory Board.

(a) Within 45 days after the effective date of this act, the Mayor, Council Chairman, and Chairman of the Council committee with oversight of the Energy Office shall appoint the respective members of the Board.

(b) Within 120 days after the effective date of this act, the Board shall adopt rules and procedures governing its meetings and decisionmaking processes. The procedures shall include a formal means for members of the Board to submit their dissent from the recommendations of the Board with the comments of the Board provided to the DDOE.

(c) Within 210 days after the effective date of this act, the Board shall recommend to the Mayor performance benchmarks for the SEU contract based on the requirements set forth in section 201.

(d) Within 60 days after the submission of a draft RFP to the Board by the DDOE, pursuant to section 205(b), the Board shall submit to the DDOE and Council comments on the draft RFP.

(e) Within 60 days of the final submission of bids for the contract for the SEU, the Board shall submit to the DDOE and Council comments on the bids submitted for the SEU contract.

(f) During the term of a SEU contract, the Board shall meet quarterly with representatives from the SEU to monitor the performance of the SEU and programs operated by the SEU.

(g) The Board shall present a report on the progress of the SEU to the Council annually, with the 1st report being due 30 days after the conclusion of the 1st year of the SEU contract. The DDOE shall make this document available to the public on its website within 10 days of its submission to the Council.

(h) The Board may convene any subcommittees and working groups it considers appropriate without any limitation as to the membership of such groups.

(i) All Board meetings shall be subject to the open meeting provisions contained in section 742 of the District of Columbia Home Rule Act, effective December 24, 1973 (87 Stat. 831; D.C. Official Code §1-207.42).

(j) The DDOE shall provide staff resources to the Board and coordinate the involvement of staff from the Public Service Commission, Office of the People's Counsel, and any other appropriate agency or organization as necessary for the Board to fulfill its mandate.

Sec. 205. Implementation of the Sustainable Energy Utility contract.

(a) The District Department of the Environment shall be responsible for the procurement and monitoring of the contract for the SEU, including:

- (1) Drafting and revising the RFP for the SEU;
- (2) Staffing the Advisory Board;
- (3) Accepting the bids for the SEU contract;
- (4) Reviewing bids for the SEU contract; and

(5) All other responsibilities not otherwise expressly delegated to another entity for purposes of operation under this act.

(b) Within 180 days of the Board's recommendation of performance benchmarks for the SEU contract, pursuant to section 204(c), the DDOE shall prepare a draft RFP and submit the RFP to the Board for comments. In preparing the RFP, the DDOE shall consult with at least one person or organization that has had experience in the drafting of a RFP for the state-wide provision of end-user energy efficiency services, and shall hold an industry day to solicit the advice and input of private entities that may bid on the contract.

(c) Within 60 days of the receipt of the Board's comments on the RFP pursuant to section 204(d), the DDOE shall revise the RFP to the extent it considers necessary and shall issue the RFP for bids for such period as it considers appropriate.

(d) Within 30 days of the completion of the bidding period, the DDOE shall submit the bids to the Board. The Board shall have 30 days to recommend a bidder or, failing the submission of a bid considered adequate by the Board, recommend the modification of the RFP.

(e) If the DDOE determines that there is not a sufficient bid, DDOE shall modify the RFP, if necessary, and solicit additional bids.

(f) The DDOE shall maintain the brand name adopted pursuant to section 206.

(g) The DDOE shall administer the transition from one SEU to another.

(h) Prior to the execution of the contract with the SEU, \$1 million shall be allocated annually for the purposes of:

- (1) Preparing the RFP;
- (2) Staffing the Board;
- (3) Maintaining the brand name adopted pursuant to section 206; and
- (4) Operating the renewable energy rebate program established by section 209.

(i) After the execution of the contract with the SEU, 10% of the annual cost of the SEU contract shall be allocated to DDOE for administrative costs.

(j) The DDOE shall submit to the Council, within 30 days following the end of each fiscal year, a report detailing the expenditures of money from the SETF and EATF during the previous fiscal year. The DDOE shall make this document available to the public on its website within 10 days of its receipt.

(k) The DDOE shall commission, on an annual basis, an independent review of the performance and expenditures of the SEU and shall provide the results of this review to the Board and Council within 6 months of the conclusion of each year of the SEU contract.

Sec. 206. Sustainable energy branding.

(a) Within 90 days after the effective date of this act, the DDOE shall determine a brand name for the provision of energy efficiency and renewable energy services in the District of Columbia.

(b) Within 90 days after the effective date of this act, the DDOE shall establish and maintain a website for the brand, with a web address of the brand name bracketed by www. and .org, .com, or .gov. The purpose of this website shall be to serve as a portal that will provide information about every energy efficiency and renewable energy program available to District residents and businesses, including those offered by:

- (1) The DDOE;
- (2) The SEU;
- (3) The electricity or natural gas companies;
- (4) The federal government;
- (5) Nonprofit entities; and
- (6) Any contractors or subcontractors for any of the entities set forth in

paragraphs (1) through (5) of this subsection.

(c) The DDOE shall provide a phone number that shall serve as a hotline for the brand during normal business hours.

(d) The DDOE shall be responsible for working with providers of energy efficiency and renewable energy services to ensure that all information is accurate and up-to-date.

Sec. 207. Electric company.

(a) Within 90 days of the completion of the record on Formal Case 945, the Commission shall issue an order regarding the demand-side management programs proposed by the electric company.

(b) In considering Formal Case 945, the Commission shall seek to approve those programs that:

- (1) Can be implemented most quickly;
- (2) Take advantage of the electric company's frequent contact with customers;

and

(3) Do not replicate the efforts of sustainable energy programs operated by the DDOE.

(c) The programs that the Commission approves may be funded by the SETF under section 210.

(d)(1) Within 30 days after the execution of a contract with the SEU, the electric company shall disclose, or allow access to, the aggregate energy use data for every rate class for electric company customers in the District of Columbia. Customer-specific information, including the customer's name, account number, service address, phone number, and energy use data, shall not be provided without the customer's express written consent.

(2) The electric company shall ensure the privacy of any and all customer information, including the electric company customer's name, account number, service address, billing address, phone number, and energy use data, in making the disclosure. The SEU shall not sell or otherwise disclose any customer or billing information to any third party without express written authorization from the customer.

(3) The electric company shall not be liable for any damages resulting from its provision of customer energy use data to the SEU absent gross negligence. The SEU shall be liable for damages to the customer for any unauthorized use of customer information or data, including the electric company customer's name, account number, service address, billing address, phone number, and energy use data.

(e) Within one year after the effective date of this act, all energy efficiency and renewable energy programs administered by the electric company and funded by the SETF shall be operated in coordination with the brand managed by the DDOE. To effectuate this mandate, the electric company shall:

(1) Prominently display the name and logo of the brand name on all advertisements of the programs;

(2) Include the website and phone number for the DDOE brand on all advertisements of the programs;

(3) Post a link to the brand website on all company webpages related to energy efficiency and renewable energy; and

(4) Provide timely, accurate, and comprehensive information regarding its programs to the DDOE to permit DDOE to include such information in material provided to the public.

Sec. 208. Natural gas company.

(a) Within 30 days after the execution of a contract with the SEU, the gas company shall disclose, or allow access to, the aggregate energy use data for every rate class for gas company customers in the District of Columbia. Customer-specific information, including the customer's name, account number, service address, phone number, and energy use data, shall not be provided without the customer's express written consent.

(b) The gas company shall ensure the privacy of any and all customer information, including the gas company customer's name, account number, service address, billing address, phone number, and energy use data, in making the disclosure. The SEU shall not sell or otherwise disclose any customer or billing information to any third party without express written authorization from the customer.

(c) The gas company shall not be liable for any damages resulting from its provision of customer energy use data to the SEU absent gross negligence. The SEU shall be liable for damages to the customer for any unauthorized use of customer information or data, including the gas company customer's name, account number, service address, billing address, phone number, and energy use data.

Sec. 209. Renewable energy incentive program.

(a) There is established a rebate program that shall provide funding to the owners of the following new renewable energy generation systems in the District of Columbia:

- (1) Solar photovoltaic;
- (2) Solar thermal;
- (3) Geothermal;
- (4) Wind;
- (5) Biomass; and
- (6) Methane or waste-gas capture.

(b) The program shall provide funding in the following amounts:

- (1) The amount of \$3 for each of the first 3,000 installed watts or watt-equivalents of capacity;
- (2) The amount of \$2 for each of the next 7,000 installed watts or watt-equivalents of capacity; and
- (3) The amount of \$1 for each of the next 10,000 installed watts or watt-equivalents of capacity.

(c) The program shall be administered by DDOE and shall operate until the end of fiscal year 2012.

(d) The program shall receive funding from the SETF as set forth in section 210.

(e) DDOE shall allocate ½ of the funds available annually every 6 months.

(f) DDOE shall only fund systems installed in the District of Columbia.

(g) Applications shall be considered and approved or rejected in the order in which they are received. Rebate payments shall be awarded immediately upon receipt by DDOE of the invoice for the purchase of the renewable energy generating equipment.

(h)(1) An owner shall have 6 months from the date of the approval of its rebate application to complete the installation.

(2) DDOE shall visit each project site to verify the completion of each project upon the earlier of 14 days of notification by the owner of the completion of the project or 6 months after DDOE approves the project for funding. If the project has not been completed, the DDOE may, in its discretion, allow the owner up to an additional 6 months to complete the installation. If the owner fails to complete the installation within the period allowed under paragraph (1) of this subsection, it shall return the amount of the rebate within 30 days after the expiration of such period. If the owner fails to return the rebate money within 30 days after the expiration of such period, this subsection shall constitute a lien on all of the property, real or personal, of the owner to secure repayment of the rebate.

(i) Within 90 days after the effective date of this act, the DDOE shall post, and update monthly, on the website required by section 206, information about the rebate program, including:

- (1) The date that funds shall be made available;
- (2) A printable copy of the rebate application determined by DDOE;

(3) The amount of rebate funds remaining to be awarded; and

(4) The amount of rebate funds awarded.

(j) The application form for the rebate shall be substantially the same as the application for the analogous program in use in Maryland as of the date of the program.

(k) Within 90 days after the effective date of this act, the DDOE shall define a method for converting the heating and cooling capacity of solar thermal and geothermal systems to kilowatt equivalents to permit such systems to qualify for rebates under this program.

(l) The Mayor, pursuant to Title 1 of the District of Columbia Administrative Procedure Act, approved October 21, 1968 (82 Stat. 1204; D.C. Official Code § 2-501 *et seq.*), may issue rules to modify the incentive program as market conditions dictate.

(m) DDOE may pay for the installation of monitoring and communications systems, for collecting generation data from renewable energy systems funded by the rebate program and transmitting it to a designated web site; provided, that the system owner shall permit the DDOE to make the data publicly accessible on the DDOE website.

Sec. 210. Sustainable Energy Trust Fund.

(a)(1) There is established as a nonlapsing fund the Sustainable Energy Trust Fund, which shall be used solely for the purposes stated in subsection (c) of this section. The Sustainable Energy Trust Fund shall be funded by an assessment on the natural gas and electric companies under subsection (b) of this section and from the sale of credits associated with the Regional Greenhouse Gas Initiative or any successor program. All funds collected from these sources shall be deposited into the SETF and shall be disbursed by the Fiscal Agent.

(2) All funds deposited into the Sustainable Energy Trust Fund, and any interest earned on the funds, shall not revert to the unrestricted fund balance of the General Fund of the District of Columbia at the end of a fiscal year, or at any other time, but shall be continually available for the uses and purposes set forth in subsection (a) of this section without regard to fiscal year limitation, subject to authorization by Congress.

(b)(1) There is imposed upon the natural gas company an assessment calculated on sales on a per-therm basis as follows:

(A) The amount of \$.011 in fiscal year 2009;

(B) The amount of \$.012 in fiscal year 2010;

(C) The amount of \$.014 in fiscal year 2011 and each year thereafter.

(2) There is imposed upon the electric company an assessment calculated on sales on a per-kilowatt hour basis as follows:

(A) The amount of \$.0011 in fiscal year 2009;

(B) The amount of \$.0013 in fiscal year 2010;

(C) The amount of \$.0015 in fiscal year 2011 and each year thereafter.

(3) The assessments shall be paid to the Fiscal Agent before the 21st day of each month, beginning in November, 2008, or the 1st full month following the effective date of this act, whichever is later, for sales for the preceding billing period.

(4) The assessment shall be applied to the sale of every kilowatt hour and therm in the District, except to those sold to residents participating in the Residential Essential Service or Residential Aid Discount programs operated by DDOE.

(5) Nothing in this title shall be construed to prohibit the electric company or natural gas company from recovering the assessment imposed under paragraphs (1) and (2) of this section, respectively, in its rates as a surcharge on customers' bills.

(c) The funds in the Sustainable Energy Trust Fund shall be used solely to fund:

(1) The SEU contract in the following amounts:

(A) The amount of \$7.5 million in the 1st year of the contract;

(B) The amount of \$15 million in the 2nd year of the contract;

(C) The amount of \$17.5 million in the 3rd year of the contract; and

(D) The amount of \$20 million in the 4th and each subsequent year of the initial contract, and for each year of any subsequent contract;

(2) The administration of the SEU contract by DDOE, on an annual basis, equal to 10% of the payments under the contract in that fiscal year;

(3) An independent review of the performance of the SEU under section 205(1) in the amount of \$100,000 annually;

(4) The activities of the SEU Advisory Board under section 203 in the amount of \$26,000 annually;

(5) Existing electricity programs in the amount of \$3.545 million annually for fiscal years 2009 through 2011;

(6) Temporary electricity programs in the amount of \$916,000 for fiscal year 2009;

(7) Existing natural gas programs in the amount of \$3 million annually for fiscal years 2009 through 2011;

(8) Renewable energy incentive program under section 209 in the amount of \$2 million annually for fiscal years 2009 through 2012, of which up to \$20,000 annually may be used to pay for the installation of monitoring and communications systems; and

(9) Energy efficiency programs administered by the electric company under section 207 in the amount of \$6 million annually for fiscal years 2009 through 2011.

(d) If, at the beginning of a fiscal year, the fund balance of the SETF exceeds the projected annual cost of all programs pursuant to subsection (c) of this section in that fiscal year by at least \$10 million, the Fiscal Agent shall suspend payment and the collection of the SETF assessment, until such excess is estimated by the Fiscal Agent to be \$5 million.

(e) The DDOE shall submit to the Council a quarterly report detailing:

(1) Expenditures from the SETF; and

(2) The performance of SETF programs operated by the DDOE.

Sec. 211. Energy Assistance Trust Fund.

(a)(1) There is established as a nonlapsing fund the Energy Assistance Trust Fund, which shall be used solely for the purposes stated in subsection (c) of this section. The Energy Assistance Trust Fund shall be funded by an assessment on the natural gas and electric companies under subsection (b) of this section. All funds collected from these sources shall be deposited into the EATF and be disbursed by the Fiscal Agent.

(2) All funds deposited into the Energy Assistance Trust Fund, and any interest earned on the funds, shall not revert to the unrestricted fund balance of the General Fund of the District of Columbia at the end of a fiscal year, or at any other time, but shall be continually available for the uses and purposes set forth in subsection (a) of this section without regard to fiscal year limitation, subject to authorization by Congress.

(b)(1) There is imposed upon sales of the gas company an assessment of \$.006 per therm.

(2) There is imposed upon the sales of the electric company an assessment of \$.0004 per-kilowatt hour.

(3) The assessments shall be paid to the Fiscal Agent before the 21st day of each month, beginning in November, 2008, or the first full month following the effective date of this act, whichever is later, for sales for the preceding billing period.

(4) The assessment shall be applied to the sale of every kilowatt hour and therm in the District, except sales to residents participating in the Residential Essential Service or Residential Aid Discount programs operated by DDOE.

(5) Nothing in this title shall be construed to prohibit the electric company or natural gas company from recovering the assessment imposed under paragraphs (1) and (2) of this section, respectively, in its rates as a surcharge on customers' bills.

(c) The Energy Assistance Trust Fund shall be used solely to fund:

(1) The existing low-income programs in the amount of \$3.3 million annually;
and

(2) The Residential Aid Discount subsidy in the amount of \$3 million annually.

(d) The Mayor, pursuant to Title 1 of the District of Columbia Administrative Procedure Act, approved October 21, 1968 (82 Stat. 1204; D.C. Official Code § 2-501 *et seq.*), may issue rules to modify the assessments under subsection (b) of this section and the programs funded by the EATF.

(e) The DDOE shall submit to the Council a quarterly report detailing:

(1) Expenditures from the EATF; and

(2) The performance of EATF programs operated by the DDOE.

Sec. 212. Conforming amendments.

(a)(1) Section 114 of the Retail Electric Competition and Consumer Protection Act of 1999, effective May 9, 2000 (D.C. Law 13-107; D.C. Official Code § 34-1514), is repealed.

Repeal
§ 34-1514

(2) One-half of the funds remaining in the Reliable Energy Trust Fund shall be transferred to the Sustainable Energy Trust Fund and ½ of the funds shall be transferred to the Energy Assistance Fund.

(b)(1) Section 101 of the Omnibus Utility Amendment Act of 2004, effective April 12, 2005 (D.C. Law 15-142; D.C. Official Code § 34-1651), is repealed.

Repeal
§ 34-1651

(2) One-half of the funds remaining in the Natural Gas Trust Fund shall be transferred to the Energy Assistance Trust Fund and ½ of the funds shall be transferred to the Sustainable Energy Trust Fund.

Sec. 213. Solar and Renewable Home Improvement Financing Proposal.

(a) Within 90 days after the effective date of this act, the Commission shall open an investigation into mechanisms to make long-term affordable financing available to energy consumers to purchase:

(1) Renewable energy generating systems, including solar thermal and solar photovoltaic panels and geothermal heating and cooling systems; and

(2) Home and business improvements that increase the energy efficiency of buildings, including weatherizing, adequate insulation, efficient doors and windows, and central air conditioning.

(b) The Commission's investigation shall include the means by which the electric and gas companies' billing systems can be used to collect payments from individuals to purchase renewable energy generating systems and make energy efficiency improvements to homes and businesses.

(c) Within 60 days after the close of the record of the investigation, the Commission shall issue a report, including findings, on the feasibility of the implementation of the proposal set forth in subsections (a) and (b) of this section.

TITLE III. RENEWABLE PORTFOLIO STANDARDS.

Sec. 301. The Renewable Energy Portfolio Standard Act of 2004, effective April 12, 2005 (D.C. Law 15-340; D.C. Official Code § 34-1431 *et seq.*), is amended as follows:

(a) Section 3(14)(D.C. Official Code § 34-1431(14)) is amended to read as follows:

Amend
§ 34-1431

“(14) “Solar energy” means radiant energy, direct, diffuse, or reflected, received from the sun at wavelengths suitable for conversion into thermal, chemical, or electrical energy, that is collected, generated, or stored for use at a later time.”.

(b) Section 4 (D.C. Official Code § 34-1432) is amended as follows:

Amend
§ 34-1432

(1) A new subsection (a-1) is added to read as follows:

“(a-1)(1) For nonresidential solar heating, cooling, or process heat property systems producing or displacing greater than 10,000 kilowatt hours per year, the solar systems shall be rated and certified by the SRCC and the energy output shall be determined by an onsite energy meter that meets performance standards established by OIML.

“(2) For nonresidential solar heating, cooling, or process heat property systems producing or displacing 10,000 or less than 10,000 kilowatt hours per year, the solar systems shall be rated and certified by the SRCC and the energy output shall be determined by the SRCC OG-300 annual system performance rating protocol applicable to the property, by the SRCC OG-100 solar collector rating protocol, or by an onsite energy meter that meets performance standards established by OIML; and

“(3) For residential solar thermal systems, the system shall be certified by the SRCC and the energy output shall be determined by the SRCC OG-300 annual rating protocol or by an onsite energy meter that meets performance standards established by OIML.”.

(2) Subsection (c) is amended to read as follows:

“(c) The renewable energy portfolio standard shall be as follows:

“(1) In 2008, 2% from tier one renewable sources, 2.5% from tier two renewable sources, and not less than 0.011% from solar energy;

“(2) In 2009, 2.5% from tier one renewable sources, 2.5% from tier two renewable sources, and not less than 0.019 % from solar energy;

“(3) In 2010, 3% from tier one renewable sources, 2.5% from tier two renewable sources, and not less than 0.028% from solar energy;

“(4) In 2011, 4% from tier one renewable sources, 2.5% from tier two renewable sources, and not less than 0.04% from solar energy;

“(5) In 2012, 5% from tier one renewable sources, 2.5% from tier two renewable sources, and not less than 0.07% from solar energy;

“(6) In 2013, 6.5% from tier one renewable sources, 2.5% from tier two renewable sources, and not less than 0.10% from solar energy;

“(7) In 2014, 8% from tier one renewable sources; 2.5% from tier two renewable sources, and not less than 0.13% from solar energy;

“(8) In 2015, 9.5% from tier one renewable sources, 2.5% from tier two renewable sources, and not less than 0.17% from solar energy;

“(9) In 2016, 11.5% from tier one renewable sources, 2% from tier two renewable sources, and not less than 0.21% from solar energy;

“(10) In 2017, 13.5% from tier one renewable sources, 1.5% from tier two renewable sources, and not less than 0.25% from solar energy;

“(11) In 2018, 15.5% from tier one renewable sources, 1% from tier two renewable sources, and not less than 0.30% from solar energy;

“(12) In 2019, 17.5% from tier one renewable sources, 0.5% from tier two renewable sources, and not less than 0.35% from solar energy; and

“(13) In 2020, 20% from tier one renewable sources, 0% from tier two renewable sources, and not less than 0.4% from solar energy.”.

(3) A new subsection (e) to read as follows:

“(e) Subject to subsections (a) and (c) of this section, an electricity supplier shall meet the solar requirement by obtaining the equivalent amount of renewable energy credits from

solar energy systems interconnected to the distribution grid serving the District of Columbia. Only after an electricity supplier exhausts all opportunity to meet this requirement that the solar energy systems be connected to the grid within the District of Columbia, can that supplier obtain renewable energy credits from jurisdictions outside the District of Columbia.”.

(c) Section 6(c) (D.C. Official Code § 34-1434(c)) is amended as follows:

Amend
§ 34-1434

(1) Paragraph (1) is amended to read as follows:

"(1) Five cents for each kilowatt-hour of shortfall from required tier one renewable sources;”.

(2) Paragraph (3) is amended to read as follows:

"(3) Fifty cents in 2009 until 2018 for each kilowatt-hour of shortfall from required solar energy sources.”.

(3) New paragraphs (4) and (5) are added to read as follows:

"(4) Beginning on March 1, 2010, and annually thereafter, energy companies that sell electricity in the District of Columbia shall file an energy portfolio report for the preceding calendar year with DDOE, which shall include a breakdown of the average cost per kilowatt hour of electricity that the company sold in the District of Columbia by source of generation, to include coal, gas, oil, nuclear, solar, land-based wind, off-shore wind, and other renewable sources. The breakdown of cost should also include the average capital cost per kilowatt, as well as the average fixed and variable costs associated with operations and maintenance per megawatt.

"(5) Beginning in 2018, and every year thereafter, the DDOE shall review the data found in the energy portfolio reports, and recommend to the Council a revised annual compliance fee. The proposed alternative compliance fee shall be submitted to the Council for a 45-day period of review, excluding Saturdays, Sundays, and legal holidays, and days of Council recess. If the Council does not approve or disapprove the proposed alternative compliance fee by resolution within this 45-day review period, the proposed rules shall be deemed approved.”.

(d) Section 8 (D.C. Official Code § 34-1436) is amended by adding a new subsection (f) to read as follows:

Amend
§ 34-1436

"(f) The DDOE shall provide to the Council a quarterly report detailing:

"(1) Expenditures from the Renewable Energy Development Fund; and

"(2) The performance of programs or projects funded by the Renewable Energy Development Fund.”.

Sec. 302. Section 2(a)(15)(A) of the Retail Electric Competition and Consumer Protection Act of 1999, effective May 9, 2000 (D.C. Law 13-107; D.C. Official Code § 34-1501(a)(15)(A)) is amended by striking the phrase “100 kilowatts” and inserting the phrase “1000 kilowatts” in its place.

Amend
§ 34-1501

TITLE IV. PUBLIC SERVICE COMMISSION AND THE OFFICE OF THE PEOPLE’S COUNSEL.

Sec. 401. Section 8 of An Act Making appropriations to provide for the expenses of the government of the District of Columbia for the fiscal year ending June thirtieth, nineteen hundred and fourteen, and for other purposes, approved March 4, 1913 (37 Stat. 974; codified in scattered sections of the Title 34 of the District of Columbia Official Code), is amended by adding a new paragraph (96A) to read as follows:

"Par. (96A) In supervising and regulating utility or energy companies, the Commission shall consider the public safety, the economy of the District, the conservation of natural resources, and the preservation of environmental quality."

Sec. 402. Section 1 of AN ACT To provide a People’s Counsel for the Public Service Commission in the District of Columbia, and for other purposes, approved January 2, 1975 (88 Stat. 1975; D.C. Official Code § 34-804), is amended by adding a new subsection (e) to read as follows:

Amend § 34-804

"(e) In defining its positions while advocating on matters pertaining to the operation of public utility or energy companies, the Office shall consider the public safety, the economy of the District of Columbia, the conservation of natural resources, and the preservation of environmental quality."

TITLE V. ENERGY BENCHMARKING REQUIREMENTS FOR PRIVATE AND GOVERNMENT BUILDINGS.

Sec. 501. The Green Building Act of 2006, effective March 8, 2007 (D.C. Law 16-234, D.C. Official Code § 6-1451.01 *et seq.*), is amended as follows:

(a) Section 3 (D.C. Official Code § 6-1451.02) is amended by adding a new subsection (a-1) to read as follows:

Amend § 6-1451.02

“(a-1)(1) Beginning 90 days after the effective date of the Clean and Affordable Energy Act of 2008, passed on 2nd reading on July 15, 2008 (Enrolled version of Bill 17-492), 10 buildings owned or operated by the District of Columbia shall be benchmarked using the Energy Star® Portfolio Manager benchmarking tool, and the results made available to the public on the Internet through the DDOE website.

“(2) Beginning one year after the effective date of the Clean and Affordable Energy Act of 2008, passed on 2nd reading on July 15, 2008 (Enrolled version of Bill 17-492), all buildings owned or operated by the District or any of its instrumentalities shall be benchmarked annually using the Energy Star® Portfolio Manager benchmarking tool; provided, that the building has at least 10,000 square feet of gross floor area and is of a building type for which Energy Star® benchmarking tools are available. Benchmark and Energy Star® statements of energy performance for each building shall, within 60 days of being generated, be

made available to DDOE, which shall then make them accessible to the public via an online database.”.

(b) Section 4 (D.C. Official Code § 6-1451.03) is amended as follows:

Amend
§ 6-1451.03

(1) A new subsection (a-1) is added to read as follows:

“(a-1)(1) All privately-owned buildings shall be benchmarked annually using the Energy Star® Portfolio Manager benchmarking tool as designated by the schedule in paragraph (2) of this subsection; provided, that the buildings are of a building type for which Energy Star® tools are available. Benchmark and Energy Star® statements of energy performance for each building shall, by January 1 of the following year, be made available to DDOE. DDOE shall, upon the receipt of the 2nd annual benchmarking data for each building, make the data accessible to the public via an online database.

“(2) The schedule shall be as follows:

“(A) All buildings over 200,000 square feet of gross floor area beginning in 2010 and thereafter;

“(B) All buildings over 150,000 square feet of gross floor area beginning in 2011 and thereafter;

“(C) All buildings over 100,000 square feet of gross floor area beginning in 2012 and thereafter; and

“(D) All buildings over 50,000 square feet of gross floor area beginning in 2013 and thereafter.”

(2) A new subsection (b-1) is added to read as follows:

“(b-1) A project that has submitted the 1st construction building construction permit after January 1, 2012, for new construction or substantial improvement shall, prior to construction, estimate its energy performance using the Energy Star® Target Finder Tool and be benchmarked annually using the Energy Star® Portfolio Manager benchmarking tool; provided, that the building has 50,000 square feet of gross floor area or more and is of a building type for which Energy Star® tools are available. Benchmark and Target Finder scores and Energy Star® statements of energy performance for each building shall, within 60 days of being generated, be made available to DDOE, which shall make the data accessible to the public via an online database.”.

TITLE VI. RENEWABLE ENERGY STUDY.

Sec. 601. Renewable energy study.

Within one year after the effective date of this act, the Mayor shall commission a study to determine the economic, legal, and technical viability of the District government pursuing a new large-scale wind energy project through public financing or private financing.

Sec. 602. Applicability.

This title shall apply upon the inclusion of its fiscal effect in an approved budget and financial plan.

TITLE VII. SUBMETERING PROVISIONS.

Sec. 701. Definitions.

For the purposes of this title, the term:

(1) "Building" means all of the individual units served through the same utility-owned meter within a property defined as Class 2 Property under D.C. Official Code § 47-813(c-6).

(2) "Building owner, operator, or manager" means any person or entity responsible for the operation and management of a building.

(3) "Commission" means the Public Service Commission.

(4) "Energy allocation equipment" means any device, other than submetering equipment, used to determine approximate electric or natural gas usage for any nonresidential rental unit within a building.

(5) "Electricity supplier" shall have the same meaning as in section 101(17) of the Retail Electric Competition and Consumer Protection Act of 1999, effective May 9, 2000 (D.C. Law 13-107; D.C. Official Code § 34-1501(17).)

(6) "Natural gas supplier" shall have the same meaning as in section 3(12) of the Retail Natural Gas Supplier Licensing and Consumer Protection Act of 2004, effective March 16, 2005 (D.C. Law 15-227; D.C. Official Code § 34-1671.02(12)).

(7) "Nonresidential rental unit" means real property leased for commercial purposes.

(8) "Owner-paid areas" means the portion of the real property for which the owner bears financial responsibility for energy costs, which portions include areas outside individual units or in owner-occupied or shared areas.

(9) "Public utility," "utility," or "utility company" shall have the same meaning as in the third unnumbered paragraph, beginning "the term "public utility" section 8(1) of An Act Making appropriations to provide for the expenses of the government of the District of Columbia for the fiscal year ending June thirtieth, nineteen hundred and fourteen, and for other purposes, approved March 4, 1913 (37 Stat. 974; D.C. Official Code § 34-214).

(10) "Submetering equipment" means equipment used to measure actual electricity or natural gas usage in any nonresidential rental unit when the equipment is not owned or controlled by the electric or natural gas utility serving the building in which the nonresidential rental unit is located.

Sec. 702. Commission to promulgate rules, including standards.

(a) The Commission shall promulgate rules, including standards, under which any owner, operator, or manager of a building which is not individually metered for electricity or gas for each nonresidential rental unit may install submetering equipment or energy allocation equipment for the purpose of fairly allocating:

(1) The cost of electrical or gas consumption for each nonresidential rental unit;
and

(2) Electrical or gas demand and customer charges made by the utility and electricity and natural gas supplier.

(b) In addition to other appropriate safeguards for the tenant, the rules shall require that a building owner, operator, or manager:

(1) Shall not impose on the tenant any charges over and above the cost per kilowatt hour, cubic foot or therm, plus demand and customer charges, where applicable, which are charged by the utility company, the electricity supplier, and natural gas supplier to the building owner, operator, or manager, including any sales, local utility, or other taxes, if any; provided, that additional service charges permitted by section 703 may be collected to pay administrative costs and billing; and

(2) Shall maintain adequate records regarding submetering and energy allocation equipment and shall make such records available for inspection by the Commission during reasonable business hours.

(c)(1) For the purposes of Commission enforcement of the rules adopted under this section, building owners, operators, or managers shall be treated as public utilities for the purposes of making a complaint under section 8(47) of An Act Making appropriations to provide for the expenses of the government of the District of Columbia for the fiscal year ending June thirtieth, nineteen hundred and fourteen, and for other purposes, approved March 4, 1913 (37 Stat. 984; D.C. Official Code § 34-917), and any rules governing the making of complaints adopted under section 8(32) of An Act Making appropriations to provide for the expenses of the government of the District of Columbia for the fiscal year ending June thirtieth, nineteen hundred and fourteen, and for other purposes, approved March 4, 1913 (37 Stat. 982; D.C. Official Code § 34-902).

(2) All submetering equipment shall be subject to the same rules, including standards, established by the Commission for accuracy, testing, and recordkeeping of meters installed by electric or gas utilities and shall be subject to the meter requirements of section 8(57) of An Act Making appropriations to provide for the expenses of the government of the District of Columbia for the fiscal year ending June thirtieth, nineteen hundred and fourteen, and for other purposes, approved March 4, 1913 (37 Stat. 987; D.C. Official Code § 34-303).

(3) All energy allocation equipment shall be subject to rules, including standards established by the Commission to ensure that such systems result in a reasonable determination of energy use and the resulting costs for each nonresidential rental unit.

(4) Violations of Commission rules and orders issued under this section shall be subject to the penalty provisions set forth in section 8(87) of An Act Making appropriations to provide for the expenses of the government of the District of Columbia for the fiscal year ending June thirtieth, nineteen hundred and fourteen, and for other purposes, approved March 4, 1913 (37 Stat. 992; D.C. Official Code § 34-708), and section 1 of AN ACT To provide alternative methods of enforcement of orders, rules, and regulations of the Joint Board and of the Public Utilities Commission of the District of Columbia, approved April 5, 1939 (53 Stat. 569; D.C. Official Code § 34-731).

(d) In implementing this section, no building owner, operator, or manager shall be considered a public utility engaged in the business of distributing or reselling electricity or gas except as provided in subsection (c) of this section. The building owner, operator, or manager may use submetering or energy allocation equipment solely to allocate the costs of electric or gas service fairly among the tenants using the building.

Sec. 703. Energy submetering and energy allocation equipment.

(a) Energy submetering equipment or energy allocation equipment may be used in a building if it is authorized in the rental agreement or lease for the nonresidential rental unit. All energy submetering equipment and energy allocation equipment shall meet the requirements and standards established and enforced by the Commission pursuant to subsection (b) of this section.

(b)(1) If energy submetering equipment or energy allocation equipment is used in any building, the building owner, operator, or manager shall bill the tenant for electricity or natural gas for the same billing period as the utility, the electricity supplier, or the natural gas supplier serving the building, unless the rental agreement or lease expressly provides otherwise.

(2) A late payment charge shall not be imposed on all amounts, including deferred payment installments, paid by the due date or on amounts in dispute before the Commission. Amounts paid after the due date shall bear a late payment charge of 1%, and an additional late payment charge at the rate of 1 1/2 % on the remaining unpaid balance per billing month thereafter.

(c) Energy allocation equipment shall be tested periodically under Commission rules by the building owner, operator, or manager. Upon the request by a tenant, the building owner, operator, or manager shall test the energy allocation equipment without charge. The test shall be conducted without charge to the tenant and shall not be conducted more frequently than once in a 24-month period for the same tenant. The tenant or his designated representative may be present during the testing of the energy allocation equipment. A written report of the results of the test shall be made to the tenant within 10 business days after the completion of the test.

(d) A building owner, operator, or manager shall maintain adequate records regarding energy submetering equipment or energy allocation equipment. A tenant may inspect and copy the records for the nonresidential unit during reasonable business hours at a convenient location within the building. The building owner, operator, or manager may impose and collect a reasonable charge for copying documents, reflecting the actual costs of materials and labor for copying, prior to providing copies of the records to the tenant.

(e) Notwithstanding any enforcement action undertaken by the Commission pursuant to its authority under section 702, tenants and owners, operators, or managers shall retain any private right of action resulting from any breach of the rental agreement or lease terms required by this section or section 703.

**TITLE VIII. APPLICABILITY; EFFECTIVE DATE; AND FISCAL IMPACT
STATEMENT.**

Sec. 801. Applicability.

This act shall apply on the later of October 1, 2008, or the effective date of this act.

Sec. 802. Fiscal impact statement.

The Council adopts the July 1, 2008 fiscal impact statement of the Chief Financial Officer as the fiscal impact statement required by section 602(c)(3) of the District of Columbia Home Rule Act, approved December 24, 1973 (87 Stat. 813; D.C. Official Code § 1-206.02(c)(3)).

Sec. 803. Effective date.

This act shall take effect following approval by the Mayor (or in the event of veto by the Mayor, action by the Council to override the veto), a 30-day period of Congressional review as provided in section 602(c)(1) of the District of Columbia Home Rule Act, approved December 24, 1973 (87 Stat. 813; D.C. Official Code § 1-206.02(c)(1)), and publication in the District of Columbia Register.

Chairman
Council of the District of Columbia

Mayor
District of Columbia

Appendix M: Benchmarking Case Studies

The following case studies highlight improvements in building performance via benchmarking and energy efficiency measures. Case studies include:

Project Profile, Prolongis, San Francisco, CA

Benchmarking: Key to Staying Competitive, Dexter Horton Building, Seattle, WA

Benchmarking: Capital Gains, One Franklin Square, Washington, DC

Energy End-Use Patterns in Full-Service Hotels: A Case Study, ACEEE



Prologis cuts energy bills and installs solar using San Francisco's PACE financing program

Pier 1 is a prized destination for commercial office space in San Francisco because of its breathtaking waterfront views and prominent location. In 2000, Prologis renovated a former sugar warehouse at Pier 1 and converted it into Class A office space. Dating from 1932, Pier 1 is in the National Register of Historic Places.

Prologis Inc., which received recognition for the sustainable features of its 2001 renovation, decided in 2011 that it was time to enhance the sustainability of Pier 1, and set goals to improve energy efficiency, reduce utility bills, and improve building comfort. Prologis sought to install a solar array to further reduce grid energy purchases and showcase renewable energy at its global headquarters. Furthermore, Prologis set out to implement these improvements in a way that resulted in immediate energy and cost savings to the occupants at Pier 1.

PACE financing to the rescue

To achieve these objectives, Prologis saw an opportunity to leverage an innovative financing program offered by the City of San Francisco. With the assistance of Johnson Controls, the global leader in delivering solutions that



Prologis is the first energy efficiency upgrade in San Francisco funded by PACE.

San Francisco is one of the first U.S. cities to launch a PACE program, called GreenFinanceSF, making \$100 million in bonding capacity available to the city's property owners.

increase energy efficiency in buildings, Prologis became the first energy efficiency upgrade in San Francisco funded by the City's Property-Assessed Clean Energy (PACE) bond financing. PACE financing is a tax assessment bond that enables building owners to raise capital for energy upgrades. San Francisco is one of the first U.S. cities to launch a PACE program, called GreenFinanceSF, making \$100 million in bonding capacity available to the city's property owners.

Johnson Controls engineered the following improvements at the Pier 1 facility:

- Designed a 200 kW rooftop solar array
- Upgraded 1,500 lighting fixtures to more efficiency technology including LEDs
- Added daylight harvesting and occupancy sensors to turn off lights when not needed
- Re-commissioned the building's heating, ventilation and air conditioning systems to provide better comfort and use less energy

Expected results

Together, these improvements were designed to reduce grid energy purchases by 32 percent and generate energy savings of \$98,000 per year for Prologis and other building occupants.

By using PACE financing, Prologis minimized upfront capital expenditures needed to implement the \$1.56 million building-wide energy efficiency and solar project. Under PACE, project financing is repaid through a tax assessment on the property tax bill. A low-interest bond is used to fund improvements and will be paid for over 20 years. This aligns costs and savings for building occupants and provides a solution to transfer the value of the improvements to any future building occupants or owners. Bay Area area companies, including Johnson Controls, are expected to complete the retrofit and construction work.

The Pier 1 project demonstrates Prologis' support for the City of San Francisco's efforts to promote an innovative new solution for financing sustainable building improvements. Prologis expects this project to serve as a catalyst for energy efficient and sustainable improvements among other commercial building owners.

BENCHMARKING:

KEY TO STAYING COMPETITIVE

CB Richard Ellis and LaSalle Investment Management are two companies that understand the value of investing in energy-efficient buildings and have set high standards for their portfolio. When the two began working together in 2006 as the asset service and management providers for the historic Dexter Horton building, there was a mutual understanding that they would invest in the upgrades needed to make the building as efficient as possible. By using the EPA's free benchmarking tool, **ENERGY STAR Portfolio Manager**, they were able to see how the building's energy performance compared to similar buildings and knew there was room for improvement.

Making energy-efficiency upgrades have paid off in big way. In just a year's time, the Dexter Horton building jumped from an energy rating of 60 to 78 and is currently holding a rating of 96.

Despite rising energy prices, the building's utility bills have dropped as a result of their investment in energy efficiency. The lower operating costs have helped to make the building highly desirable to tenants and enabled it to stay competitive in a tight real estate market.

Since 2007, per tenant electric consumption in the Dexter Horton building has been reduced by 34%.

The building has also earned:

- 2010 ENERGY STAR certification
- 2010 LEED-EB Gold certification



Dexter Horton Stats:

Address	710 Second Avenue Seattle, WA 98104
Year Built	1924
Size	15-story, 379 thousand sq. ft.
Type of Use	Office space
Major Tenants	Corbis, Hornall Anderson Design Works, Collins Woerman, AECOM
Building Ownership	La Salle Investment Management
Building Services	CB Richard Ellis

Dexter Horton Building
Seattle, WA



“The more aware you are of your building's energy use and work to rein in energy waste today, the better positioned you'll be in the future as energy costs continue to rise. By benchmarking the Dexter Horton building and making energy efficiency improvements, we are able to compete with buildings that are 60 years younger.”

CB Richard Ellis (Seattle)

Energy savings continued on back ▶

Let the Energy Savings Continue:

To determine what improvements made the most sense for the Dexter Horton building, CB Richard Ellis performed a full energy audit. Their approach was to first tackle the low- and no-cost measures, which would quickly begin adding dollars back to the bottom line.

They also developed a long-range plan, which took energy savings a step further by investing in measures with a higher initial cost but significant savings potential. Most improvements made to the Dexter Horton building were generating net savings within three years.

Some of the measures performed to date include:

- Stairwell lighting retrofit
- Elevator lobby retrofit
- Cooling tower variable frequency drive installation

Once energy-efficiency measures are paid for, they continue to save money for years to come. Fortunately, CB Richard Ellis was able offset some of the initial cost of these measures and quicken the payback period by using utility rebates. In total, they obtained more than \$30,000 from Seattle City Light for the following:

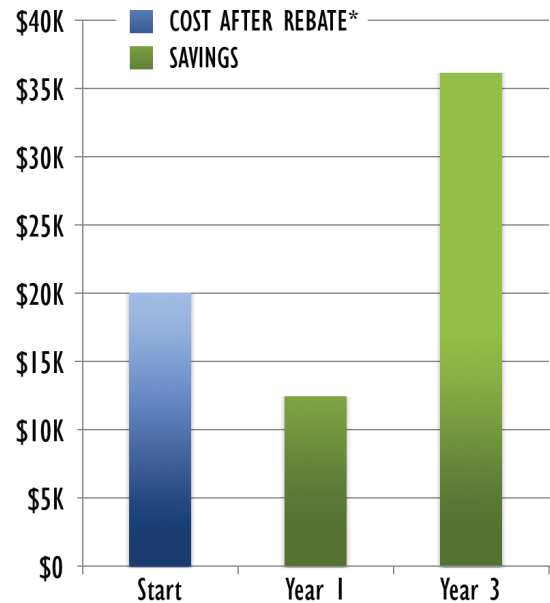
- Lighting retrofits
- Variable frequency drives

Since Dexter Horton is a historic building, CB Richard Ellis had to follow certain guidelines that do not apply to all buildings. However, that has not hindered their ability to improve energy performance. They continue to raise the energy-savings bar and are even considering making the switch to daytime cleaning to conserve

energy at night. This operational change would require no initial investment and immediately begin improving the bottom line.

The building is currently competing in the [Kilowatt Crackdown](#), a challenge put out to the real estate community to see which buildings can save the most energy in 2010 and 2011.

Energy Upgrades: Investment vs. Savings



Investment vs. savings for 3 energy-efficiency measures implemented at the Dexter Horton building.

* Used over \$30,000 in rebates from Seattle City Light

**GET STARTED
SAVING
TODAY:**

Soon, many non-residential buildings in Seattle will start to benchmark their energy performance.

Get a leg up on the competition and benchmark your building today using the EPA's free benchmarking tool.

For more information on rebates and other financial assistance for energy upgrades to buildings, visit your local utility website:

- Seattle City Light: seattle.gov/light/conserves/business
- Seattle Steam: seattlesteam.com
- Puget Sound Energy: pse.com/savingsandenergycenter

Visit the City of Seattle website, seattle.gov/dpd/energybenchmarking, to learn more about the city's benchmarking policy and how to get started.

Questions? Email energybenchmarking@seattle.gov

BENCHMARKING:

CAPITAL GAINS

One Franklin Square
Washington, DC

There are many reasons One Franklin Square is a star in Washington, D.C.: it's one of the few tall buildings in the District; its distinctive 24kt gold pinnacles make a noticeable punch in the skyline; and it was featured in the finale of Dan Brown's popular novel *The Lost Symbol*. However, if you look beyond the unique exterior, you'll see that One Franklin Square is an energy star, too.

With 839 **ENERGY STAR**® certifications under its belt and a company-wide policy requiring energy tracking, the real estate firm Hines, which owns and manages the building, knows the value of measuring its energy use and uses the information to achieve big savings.

When the company first benchmarked energy use at One Franklin Square in 1999 they found that it performed respectably well with an **ENERGY STAR** rating of 77 out of 100.

But they also knew that even small changes to improve performance add up quickly—and they have. As a result of energy improvements they have implemented since they started benchmarking, the company has reduced utility consumption by *six million kilowatt-hours* per year. And those savings continue to grow. Over the last 18 years utility rates have increased by 125% in the DC area, but Hines' tenants have only seen 19% of that thanks to these improvements.

Tracking and rating the energy performance of the building through benchmarking allowed Hines to determine how much energy the building was consuming and what improvements could be made.

Hines' Engineering Manager, Mark Jensen, said, "Any owner can spend a lot of capital on reducing overall utilities, but having the knowledge and experience to make operational changes that reduce utility consumption while maintaining tenant comfort and satisfaction, is paramount." Lowering utility costs also gives the building a better position in a competitive market. Today, One Franklin Square has further improved its **ENERGY STAR** rating to 89 and is LEED Gold certified.

One Franklin Square Stats:

Address	1301 K Street, NW, Suite 1180 West, Washington, DC
Year Built	1989
Size	12 stories, 591,840 sq. feet
Type of Use	Office space and retail
Major tenants	Pricewaterhouse Coopers, LLP, Reed Smith LLP, SNR Denton, Xerox Corporation
Building Owner/ Property Manager	Hines
Certifications	LEED Gold, ENERGY STAR



“As utility rates continued to rise, the cost per square foot for utilities steadily declined due to operational changes and technology upgrades.”

MARK JENSEN
Engineering
Manager



Energy savings continued on back ▶

How did they do it?

Most of the changes were hardly noticeable to tenants. In fact, they were able to reduce their utility charges by 13% in the first three years with no capital changes. Looking at the hourly energy needs of the tenants helped them to implement smart operational changes that required no financial investment at all. To increase their energy savings, Hines looked to other projects. Installing frequency drives on the pumps and motors throughout the building helped to ensure that these parts wouldn't be left running in off-hours. These drives have a lower startup cost and run on static pressure, offering a more efficient use of electricity. Switching from incandescent lighting to compact fluorescent bulbs added to energy savings in the common spaces. Tenants have also adopted more efficient lighting, swapping their incandescent bulbs for fluorescents through a Hines-sponsored exchange program.

Spending less on energy is a benefit that is passed directly onto tenants. One Franklin Square puts the spotlight on maintaining low operating costs while decreasing their overall environmental footprint.

Savings Up Close:

- Operational changes.

Project Cost	\$0
Annual Savings	2,100,000 kWh
Payback	Immediate

- Added variable frequency drives throughout building.

Project Cost	197,500 (spread over 9 years)
Annual Savings	\$92,500
Payback	< 2.5 years

- Installed LED lighting in garage.

Project Cost	\$50,400
Annual Savings	\$10,853
Payback	< 5 years



Other energy saving measures included:

- > Refitting the 5-level garage with lower wattage lamps
- > Installing self-dimming light fixtures in stairwells
- > Transitioning to LED bulbs where possible



**GET STARTED
SAVING
TODAY:**

Washington, D.C.'s building energy benchmarking policy requires nonresidential and multifamily buildings over 50,000 sq. ft. and municipal buildings over 10,000 sq. ft. to report building energy use with the EPA's free online tool, **ENERGY STAR Portfolio Manager**.

Need assistance benchmarking your building?

Contact the DC SEU at 202-525-7036 or benchmarking@dcseu.com

The DC SEU also offers financial and technical assistance to help you save energy and money.

DCSEU

DISTRICT OF COLUMBIA SUSTAINABLE ENERGY UTILITY

Questions about DDOE's benchmarking regulation?

Contact DDOE at 202-671-3042 or info.benchmark@dc.gov

DISTRICT
DEPARTMENT
OF THE
ENVIRONMENT



Energy End-Use Patterns in Full-Service Hotels: A Case Study

Marylynn Placet, Srinivas Katipamula, Bing Liu, James Dirks, and Yulong Xie
Pacific Northwest National Laboratory
Gregory Sullivan, Efficiency Solutions
Jim Walent, BF Saul, Inc.
Rebecca Williamson, InterContinental Hotel Group

ABSTRACT

The U.S. Department of Energy (DOE) recently initiated a program – Commercial Building Partnerships (CBP) – to work with private-sector companies in the design of highly-efficient retrofit and new construction projects. Pacific Northwest National Laboratory (PNNL) is conducting a project with a major hotel company to retrofit a full-service, large hotel with the goal of reducing energy consumption by at least 30%. The first step of the project was an intensive metering and monitoring effort aimed at understanding energy end use patterns in the hotel. About 10% of the guest rooms (32), as well as circuits for most of the end uses in public spaces (lighting, elevators, air handlers and other HVAC system components, and various equipment), were equipped with meters. Data are being collected at 1- or 5-minute intervals and downloaded on a monthly basis for analysis.

This paper presents results from the first four months of the monitoring effort, which revealed energy end-use consumption patterns, variability of guest room energy use, daily load curves, monthly variations, and other aspects of hotel energy use. Metered end-use data for hotels at this level of detail are not available from any currently-available public sources. This study presents unique information and insight into energy end-use patterns in the lodging sector of commercial buildings and can also serve as a case study of a complex sub-metering project.

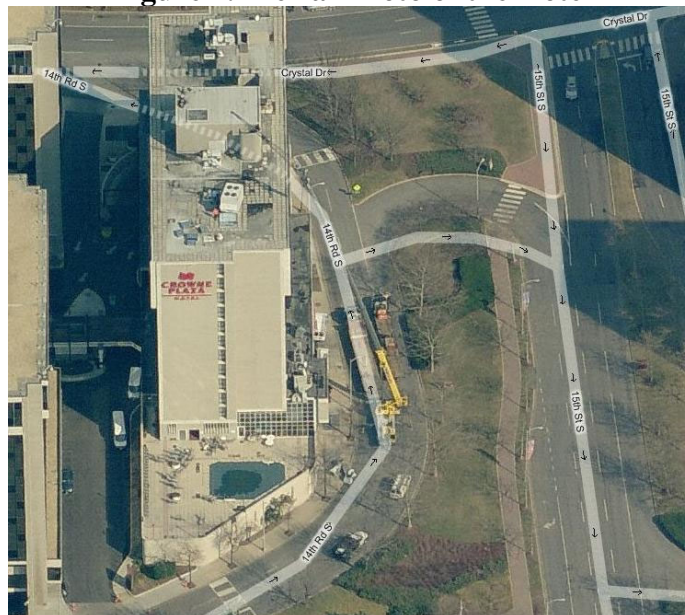
Background on the Project

The US DOE's CBP Program is providing technical assistance through several of DOE's National Laboratories to support energy efficient retrofit and new-construction projects being undertaken by about 20 private-sector companies (DOE 2010). The project goals are twofold: 1) to design and build new buildings that are 50% more energy efficient than the ASHRAE Standard 90.1-2004 building code requires, and 2) to retrofit existing buildings in a way that achieves a 30% reduction in energy consumption. Lessons learned from these projects will help the companies alter their design, construction, and building operation practices in the future.

PNNL is working with a major hotel company on both a new construction and retrofit project. The retrofit project, which is the subject of this paper, is a twelve-story, full-service hotel with over 300 guest rooms and gross floor area of 212,000 ft² (see Figure 1). Originally constructed in 1968, the hotel underwent a light renovation nearly 10 years ago. This minor renovation was primarily cosmetic, and there has been very little energy focus at this hotel until this project began. Building energy systems are somewhat outdated. The hotel has an energy management system (EMS) that is not connected to all building energy systems (e.g., the newly-installed chiller, exhaust fans) and is not being used in a fully-functional way. Also, single-pane windows and uninsulated exterior masonry walls result in a thermally-inefficient building envelope, and

most of the packaged terminal heat pumps (PTHP) serving the guest rooms are 7-years old or more (though they are gradually being replaced). There was no energy benchmarking or energy audit completed prior to commencement of this project.

Figure 1. Aerial Photo of the Hotel



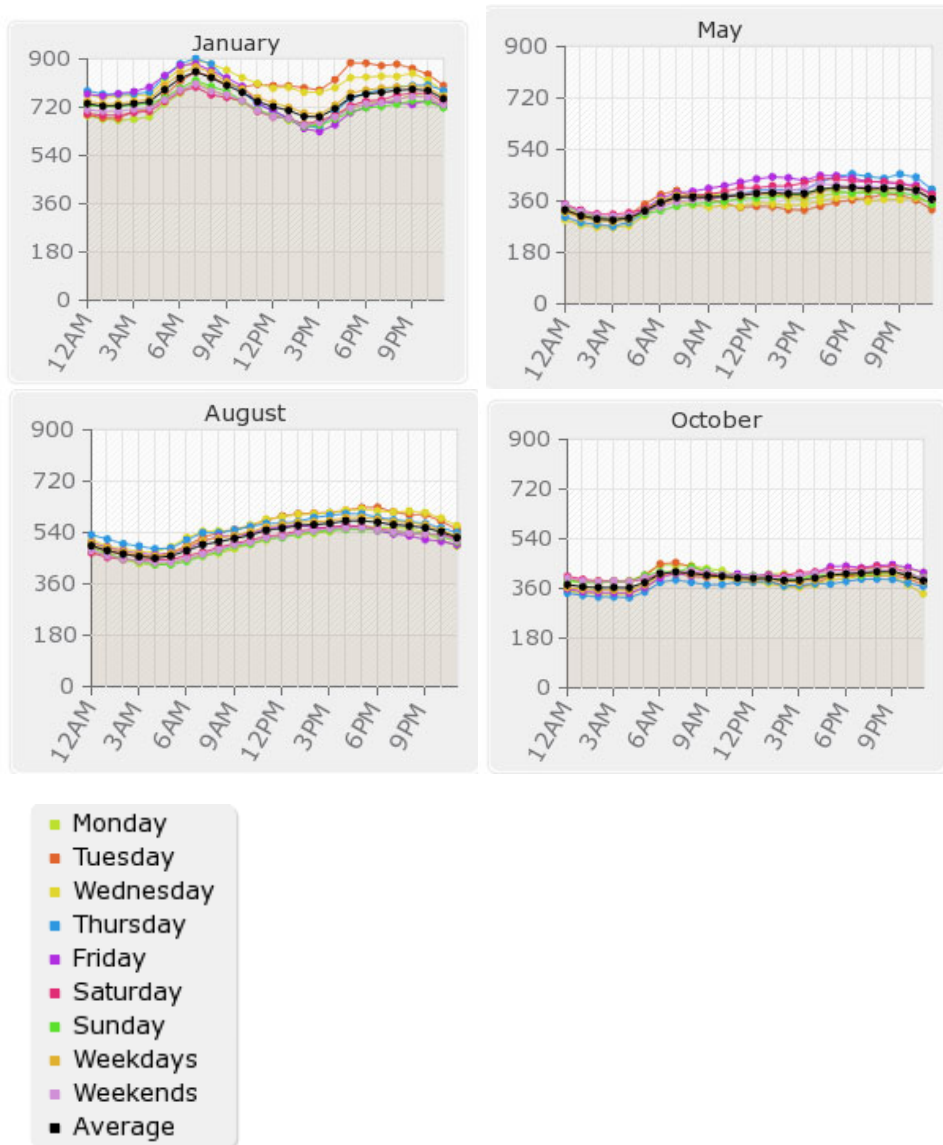
The first step of the project was to measure the baseline energy use and conduct a detailed study of the end-use energy consumption patterns in the hotel. Some information on energy end-use in hotels is available from sources such as the Commercial Building Energy Consumption Survey conducted by the Energy Information Administration (EIA 2005), Energy Star (EPA, 2010) and the California Commercial End-Use Study (CEC 2006). However, these sources are primarily aimed at benchmarking and are typically based on whole-building energy consumption data or modeled/estimated energy loads by end use. One published study monitored lighting in hotel guest rooms (Page and Siminovitch, 1999). The metering effort described here was designed to provide a detailed and accurate picture of energy consumption at this particular property to support building energy simulation modeling and the development and analysis of energy efficiency measures, leading to a 30% or more improvement in energy efficiency. However, the end-use consumption data reported in this paper are also generally useful for describing end-use patterns in the large hotel sector, because the guest room equipment and various other features of the hotel are typical of large hotels in the United States.

The property is a full-service hotel with sit-down restaurant, coffee shop, on-site laundry, offices, and conference/banquet rooms, making it a challenging project. Hotels have a wide diversity of energy uses, with spaces that may or may not be occupied on any given day, and guest rooms that are occupied by different guests with varying habits. As a result, the metering data collection for this project has been considerably more extensive and complicated compared to other projects in the CBP Program.

Initial analysis of the 2009 electricity interval data from the utility (Dominion Power) shows a relatively flat daily load curve in all seasons across all days of the week (Figure 2). The lack of variation between weekdays and weekends is not surprising, given the hotel has a very high occupancy rate and serves both tourists (including weekend stays) and business guests

(typically during the week). From these data, it appears that this hotel has almost 400 kW of base load. The peak cooling load is about 200 kW (see Figure 2, August) and the hotel has overall higher electricity use in the winter due to use of electric resistance heat¹ in the packaged terminal heat pumps (PTHPs) serving the guest rooms and the duct heaters serving common spaces.

Figure 2. Daily Electricity Consumption (kW) based on Utility Interval Data in Selected Months



In addition, the hotel uses natural gas for service water heating (a significant hotel load), as well as kitchen appliances and laundry equipment. Table 1 shows the monthly energy consumption for both electricity and natural gas in the year of 2009. At the site, electricity

¹ During the metering period, many of the PTHPs were heating in resistance mode due to a software control issue.

consists of 73% of the total energy consumption. Converting to “source” energy use, electricity consists of 89% of total Btus. The metering and monitoring effort was aimed at breaking down these totals by end use.

The effort to understand the breakdown of energy by end use load involved: (1) extensively metering various circuits and pieces of equipment in the hotel, (2) estimating loads using information about equipment capacity and use, and (3) building energy simulation modeling and calibration using EnergyPlus. This paper will discuss items (1) and (2); the energy simulation modeling is underway and will be described in a future paper.

Table 1. Monthly Energy Consumption, 2009

Month	Site Electricity Consumption		Site Natural Gas Consumption	
	kWh	Billion Btu	Therms	Billion Btu
January	563,995	1.92	4,118	0.41
February	394,642	1.35	4,876	0.49
March	342,010	1.17	6,103	0.61
April	258,781	0.88	5,441	0.54
May	273,499	0.93	5,390	0.54
June	318,592	1.09	4,773	0.48
July	350,831	1.20	4,313	0.43
August	391,549	1.34	3,829	0.38
September	276,165	0.94	3,360	0.34
October	280,615	0.96	4,447	0.44
November	316,914	1.08	3,995	0.40
December	506,513	1.73	4,016	0.40
Total	4,274,106	14.58	54,661	5.46

Electricity Metering Approach and Results

Approach

Since guest room loads were deemed important, approximately 10% of the rooms (32 rooms) were chosen for monitoring and evaluation. PNNL and its subcontractors installed plug-logging electricity meters (Educational Electronic Devices Watts-Up) to measure electricity consumption of plug loads and portable lighting fixtures, including the desk lamp with convenience outlet, floor lamp, two table lamps, the refrigerator, and the TV. In addition, Onset Computer (Hobo) light intensity data loggers were installed at the bathroom lights and wall sconces to determine the on-hours of these hard-wired fixtures. The PTHPs were instrumented with Hobo loggers measuring amperage draw, supply/return air temperatures, and relative humidity. To ensure metering accuracy, a “check-sum” approach was used. For the guest room plug loads the check sum metering was at the electrical panel where the individual breaker serving each room was monitored. For the PTHPs, the check sum was at the sub-panel serving the PTHPs. In both cases the panel-level monitoring was done using a combination of a pulse-output watt transducer (Continental Control Watt-Node) and a pulse collecting data logger (Madgetech Pulse 101). We also installed the same combination of watt transducers and pulse loggers on the two chillers, rooftop exhaust fans, the elevators and elevator HVAC, make-up

rooftop unit (to provide outdoor ventilation air to guest floor hallways), the three points (pre-heat, re-heat, and fan motor) for the nine air handling units (AHUs), and various kitchen, laundry, and other equipment circuits. For the lighting, we metered circuits serving various common areas and conference/ballrooms with a combination of Hobo data loggers and current transformers. In total, the metering devices include 96 watt-hour meters, 158 plug power meters, 91 temperature measurement devices, 32 relative humidity measurements, 109 current measurement devices, and 64 lighting level measurements for a total of 550 measurement devices. The installation was complete and tested on September 25, 2009. Data has been downloaded on a monthly basis.

Metering Results: End Use Loads

Figure 3 shows daily consumption for October 2009 for guest rooms [chart (a)], hotel heating, ventilation, and air conditioning (HVAC) systems [chart (b)], and other loads [chart (c)]. The charts also show average daily outdoor air temperature. Note that, for the purpose of developing an estimate of total load in the hotel, the data for the 32 guest rooms and guest hallway equipment (ice makers and vending machine) were scaled using guest occupancy rates in the 32 rooms versus the hotel as a whole. The PTHP load in Figure 3 (a) is highly correlated with average outside air temperature (R-squared is 92%). As currently configured, the balance point for the guest rooms is approximately 55°F; i.e., at 55°F, the minimum PTHP consumption occurs. Temperatures lower than 55°F result in significant heating loads, and at temperatures greater than 55°F, PTHP consumption increases due to cooling. The HVAC loads shown in Figure 3 (b) for the common areas in the hotel, including duct heaters, air handling units (AHU), and rooftop units (RTU), also indicate a high correlation between average outside air temperature and heating and cooling consumption. Here the balance temperature appears to be closer to 60°F, as the majority of the HVAC in this portion of the building is running continuously with 100% outside air. The “other loads” shown in Figure 3(c) are not correlated with outdoor temperature. Figure 4 shows monthly energy consumption by end use for the four metered months.

Figure 3. Daily Metered End Use Loads versus Outdoor Temperature (T out) in October
(a) Guest Room Loads

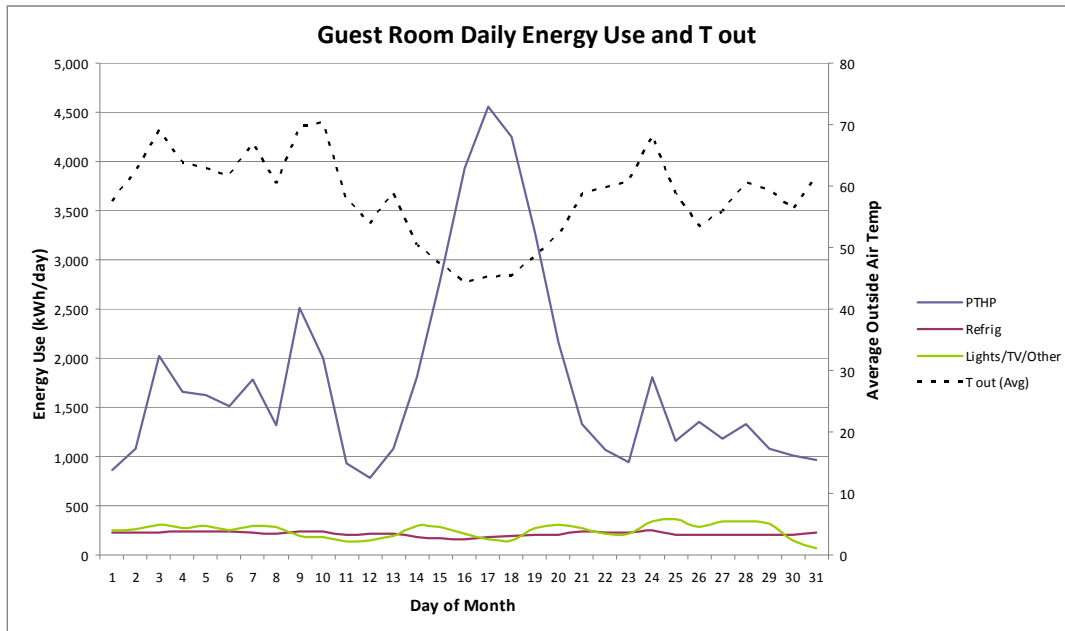
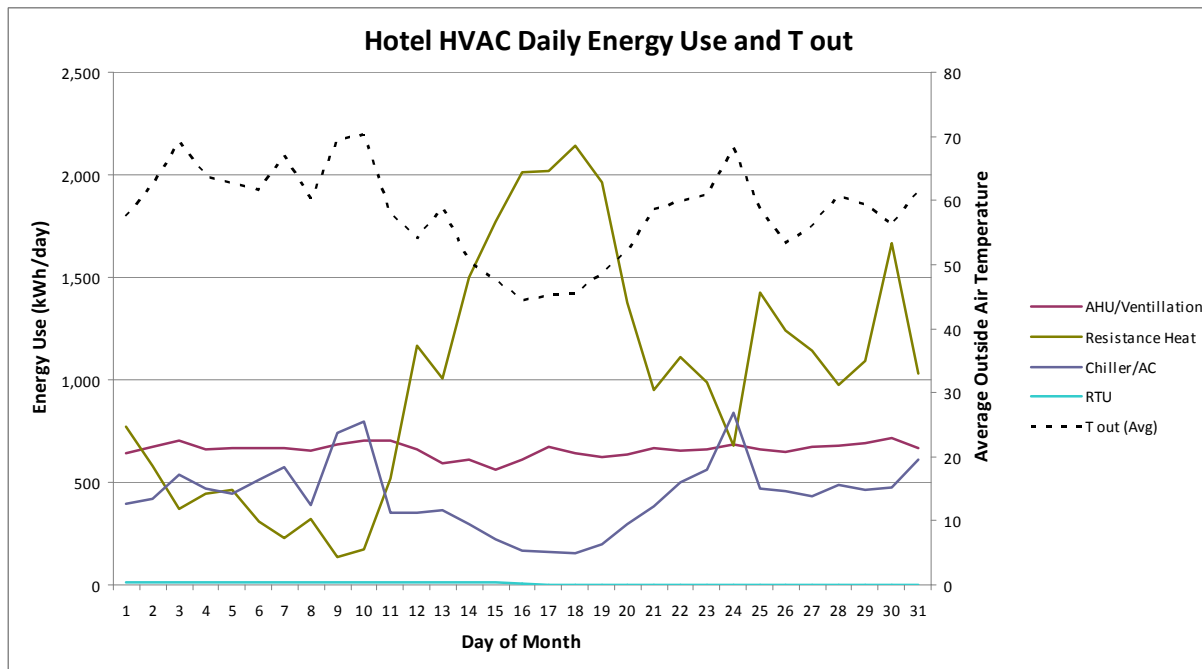


Figure 3 (continued). Daily Metered End Use Loads versus Outdoor Temperature (T out) in October
(b) HVAC Loads in Common Spaces



(c) Other Loads

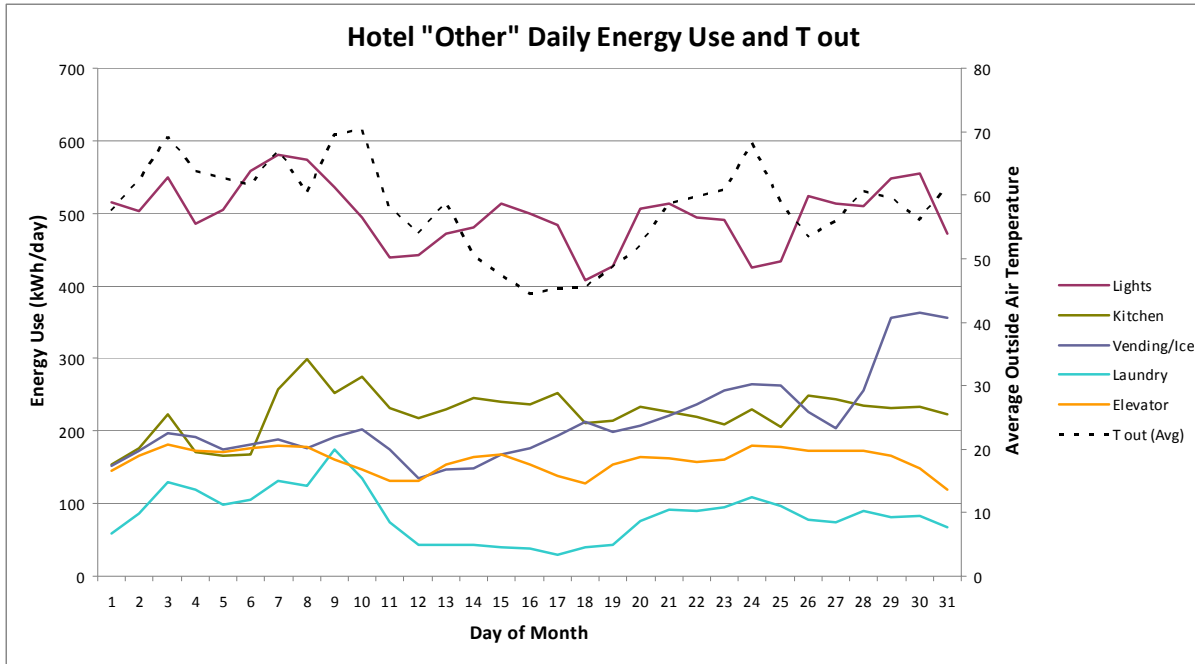
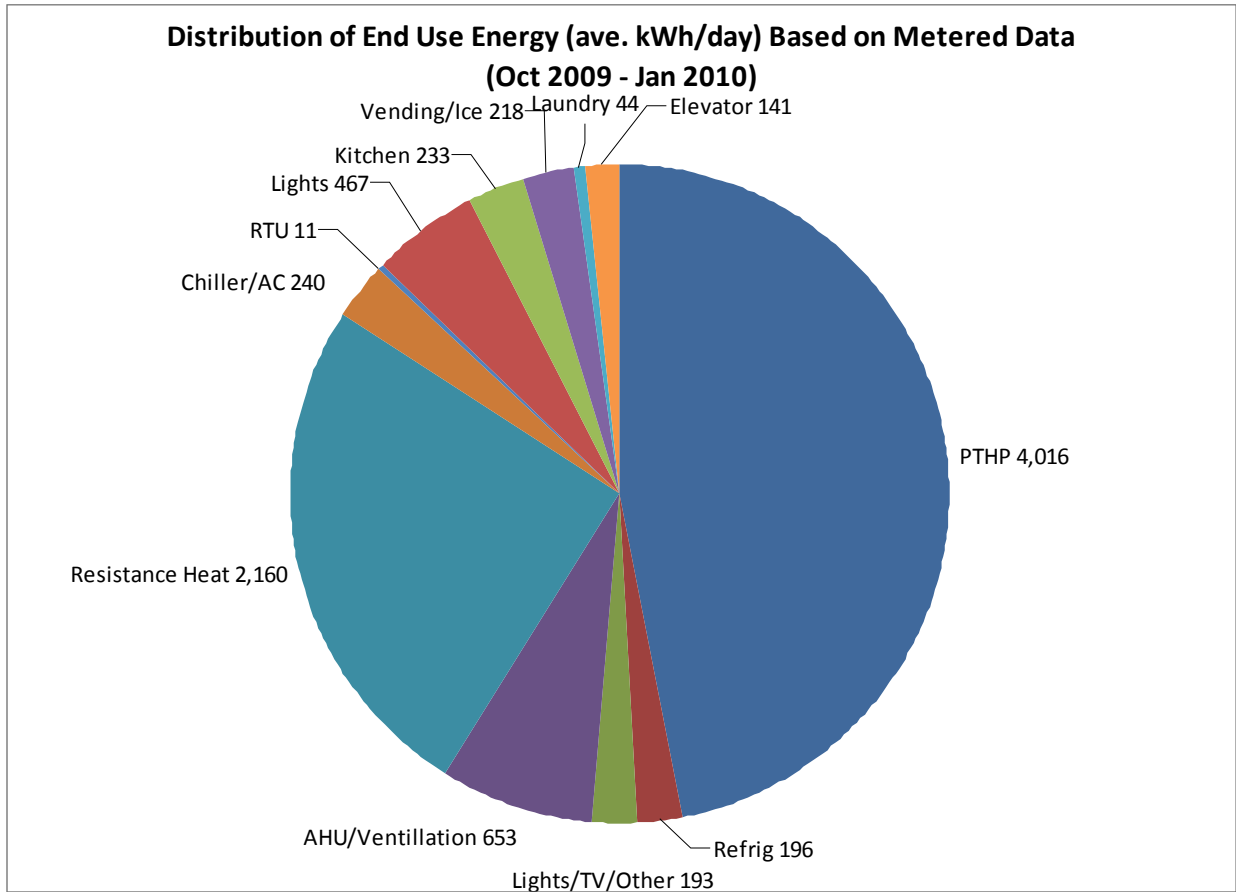


Figure 4. Monthly Electricity End-Use for the Four Metered Months (Combined)



Details on PTHP Energy Use

The PTHP energy consumption in 32 guest rooms was monitored using current measuring devices at 1-minute intervals. The current data was converted to power by multiplying with the one-time voltage measurement (277 volts and an assumed power factor of 0.95). The clouds of dots in Figure 5 shows the average daily power consumption (average Wh/h) as a function of the average daily difference between the outdoor and return air temperatures for selected rooms. The red lines in Figure 5 are the Loess² curve fits. Some of the 32 rooms were recently upgraded with new PTHPs, which are slightly more efficient than the older units. Figure 6 shows the comparison of Loess fits for all the 32 metered rooms. Note that the old units (blue lines) generally have higher slope than the new units (red lines), indicating new units are more efficiency than the old units.

² Loess in a nonparametric method for estimating local regression surfaces.

Figure 5. PHTP Average Power Consumption as Function of Average Daily Difference in Outdoor and Return Air Temperatures

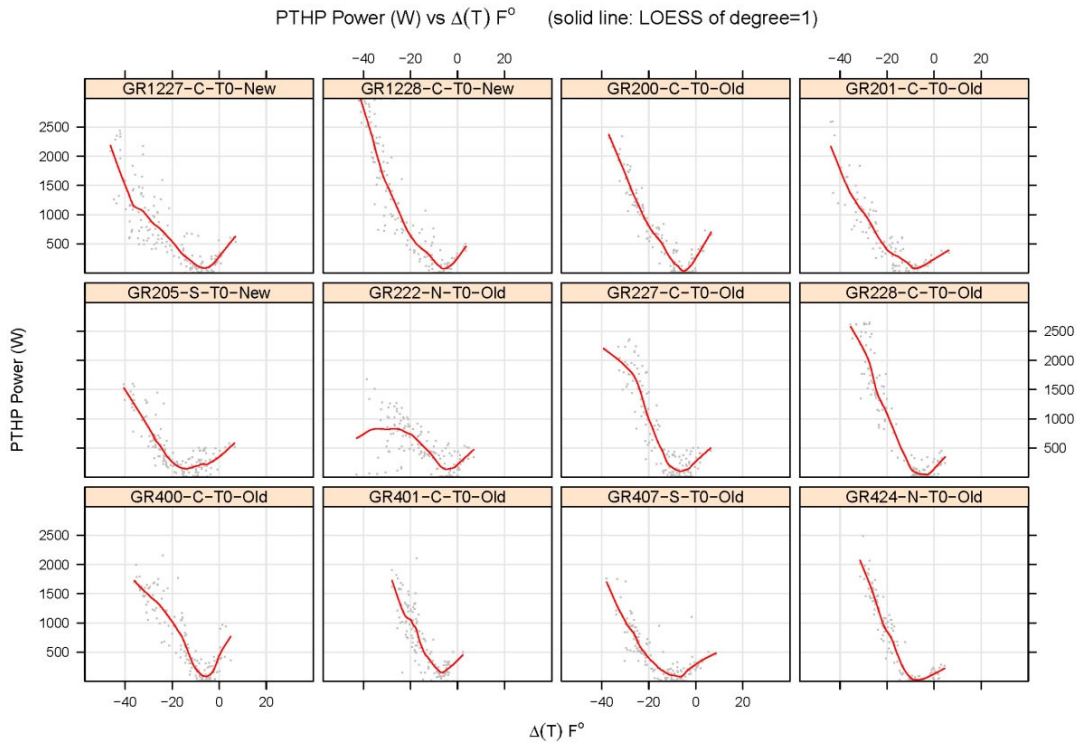
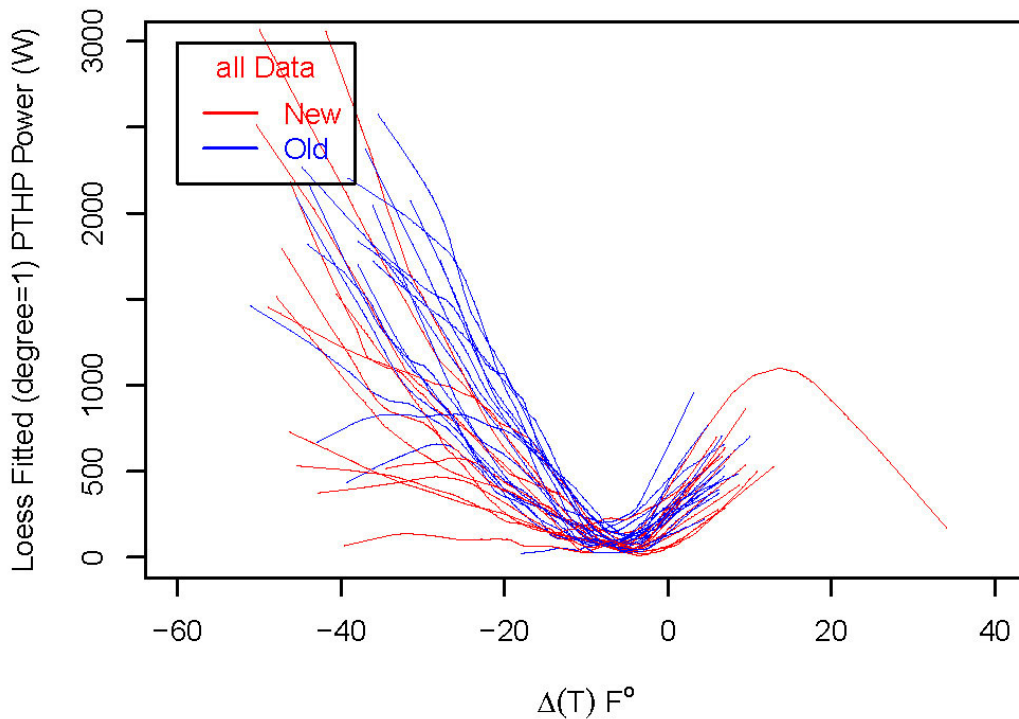


Figure 6. Comparison of Loess Fits for New and Old PHTP Units
Loess Fitted PHTP Power (W) vs $\Delta(T)$ F^o (All Data)



Unmetered Load Analysis

Figure 7 shows total daily average electricity consumption at the whole-building meter versus the sum of the metered loads in one month (December 2009). Over the entire period, on average, the individual meters capture about 62% of the total electricity consumption, but the percentage varies from 50% to 83% on any given day.

While the monitored electricity use follows the building level revenue meter very well, the analysis shows a significant unaccounted-for electricity use. To better understand this unmetered use, the following three analyses were conducted:

- Unmetered use as a function of occupancy
- Unmetered use as a function of outdoor air temperature
- Regression of both revenue metered and project monitored usage with outdoor air temperature

Independently, the unmetered loads do not show a strong correlation with either occupancy or outdoor air temperature. Through regression analysis, we correlated both the utility-supplied and project-monitored data with outside air temperature. The premise behind this analysis is that if one data set has an appreciably different relationship to outdoor air temperature, the resulting regression lines will not be parallel. As shown in Figure 8 the lines are, by-and-large, parallel. This consistency highlights the relative constant nature of the difference indicating this difference is not weather variant and is likely driven by miscellaneous base loads.

Figure 7. Whole-Building Utility Data Versus Sum of Metered Data for December
Utility - Metered Data Comparison
December 2009

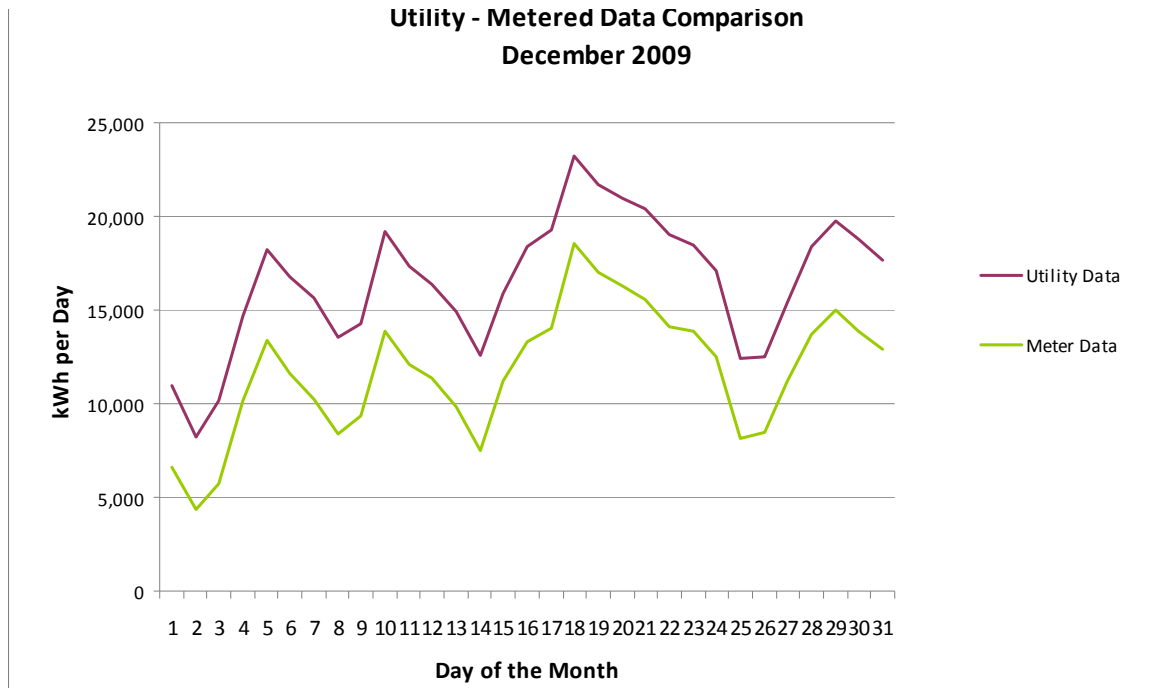
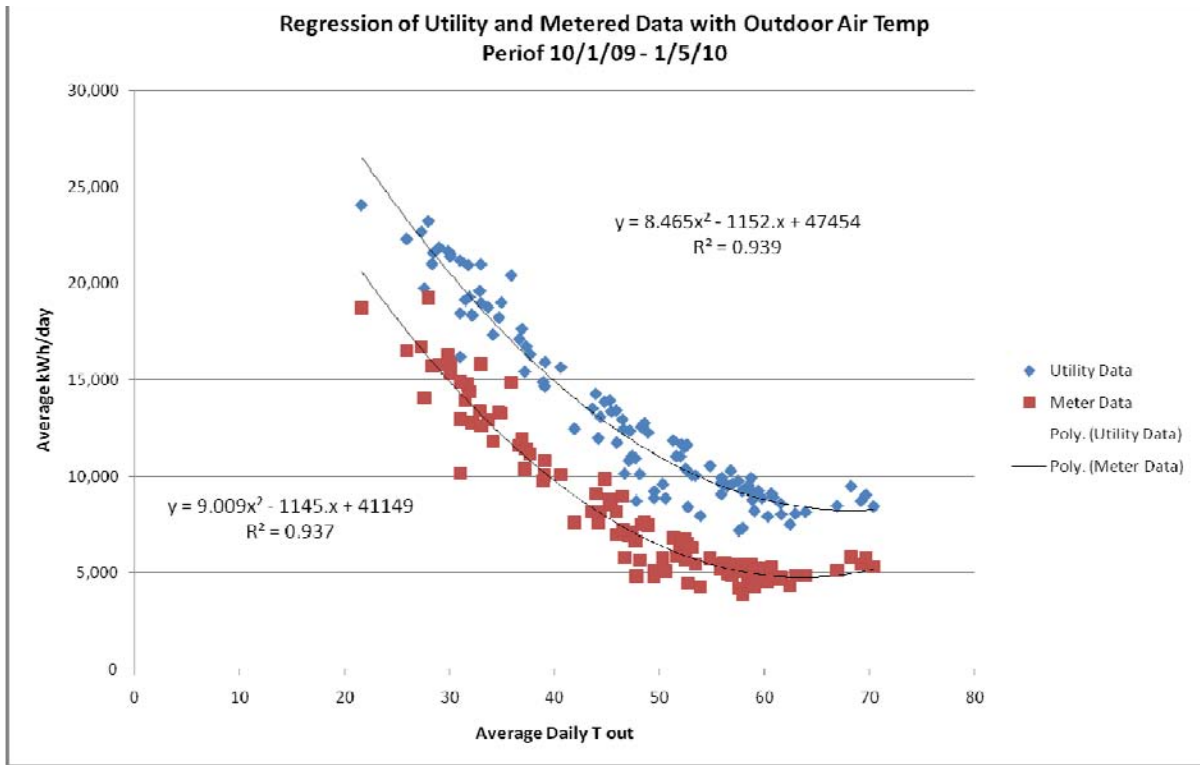


Figure 8. Regression of Utility and Metered Data with Outdoor Air Temperature

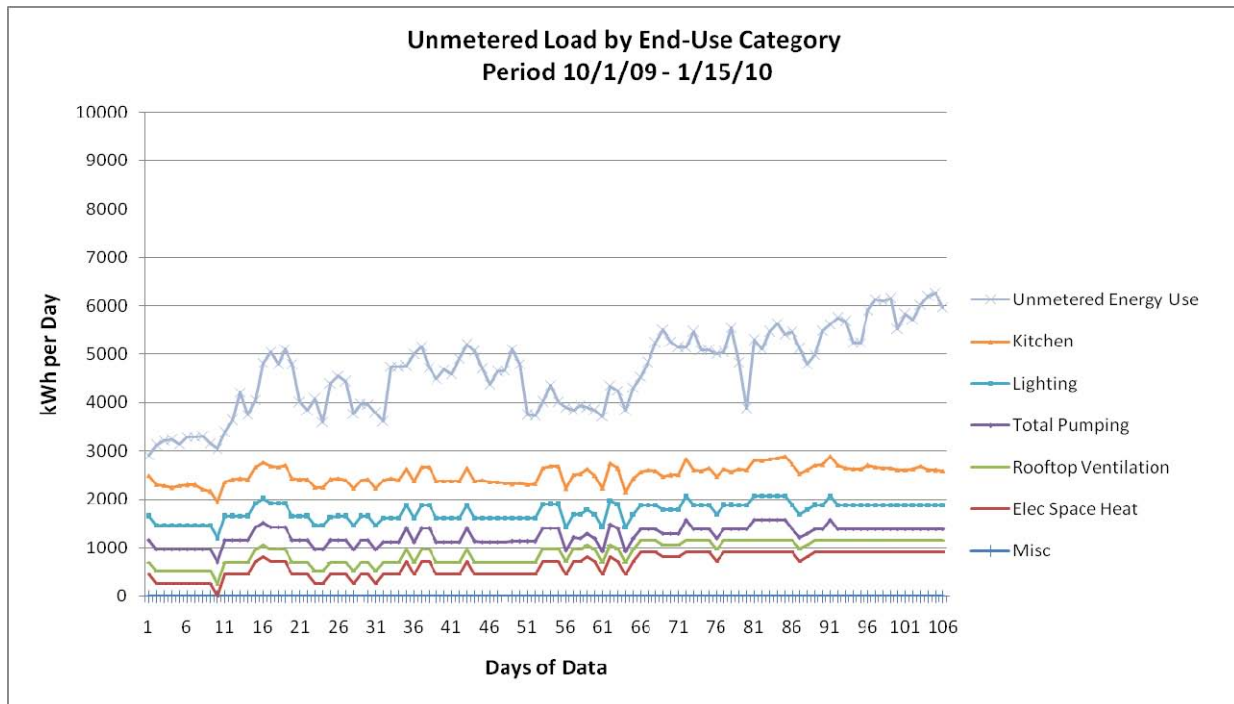


The estimation of unmetered loads began with a thorough review of audit notes, various equipment lists, and installed metering points. Once all major loads were identified, they were reconciled as being metered or not; those not metered were listed for inclusion in the estimation exercise. The five main categories of unmetered loads are as follows:

- **Pumping.** Includes all domestic cold water pumps, chilled water and condenser water pumps, domestic hot water recirculation pumps, and the pool pump. Chiller, condenser water, and pool pump energy use were scaled based on metered equipment run times; domestic water pumps were calculated based on schedule.
- **HVAC.** Includes unmetered exhaust fans and a variety of electric space heaters. It is likely that this group has additional, yet-to-be discovered, electrical heating loads - possibly including other space heat and pre/reheat coils. (Note: the pool is unheated.)
- **Lighting.** Includes all unmetered lighting loads categorized using a detailed lighting audit.
- **Kitchen.** Unmetered kitchen energy use was derived based on an audit done by PNNL's kitchen subcontractor. To prevent double counting, these values were input and then reduced by the metered kitchen loads.
- **Miscellaneous Equipment.** Includes miscellaneous appliance and equipment at the on-site Starbucks, the restaurant bar, the back office, and in the engineering areas.

Once identified, these loads were researched for rated energy use and schedule to estimate whole building impact. The results of this effort are shown in Figure 9.

Figure 9. Unmetered Load by End-Use Category



Note that, in this figure, the top series represents the total unmetered load, and the series below are cumulative, such that they “build up” the estimated unaccounted load. The remaining unaccounted-for load increases with time, indicating a potential for missing heating/ventilation loads, as the outdoor temperature was generally decreasing over the analysis period.

Given the magnitude and complexity of energy use in this hotel, unaccounted-for electric loads are expected. The above analysis reduced the average aggregate unaccounted-for loads from 37.9% to 16.4%. The resulting breakdown of energy use is shown in Figure 10. (Note: average over the four months was 13,285 kWh/day.) Further analysis is being conducted to reduce the percentage of unaccounted-for energy use.

Natural Gas Consumption

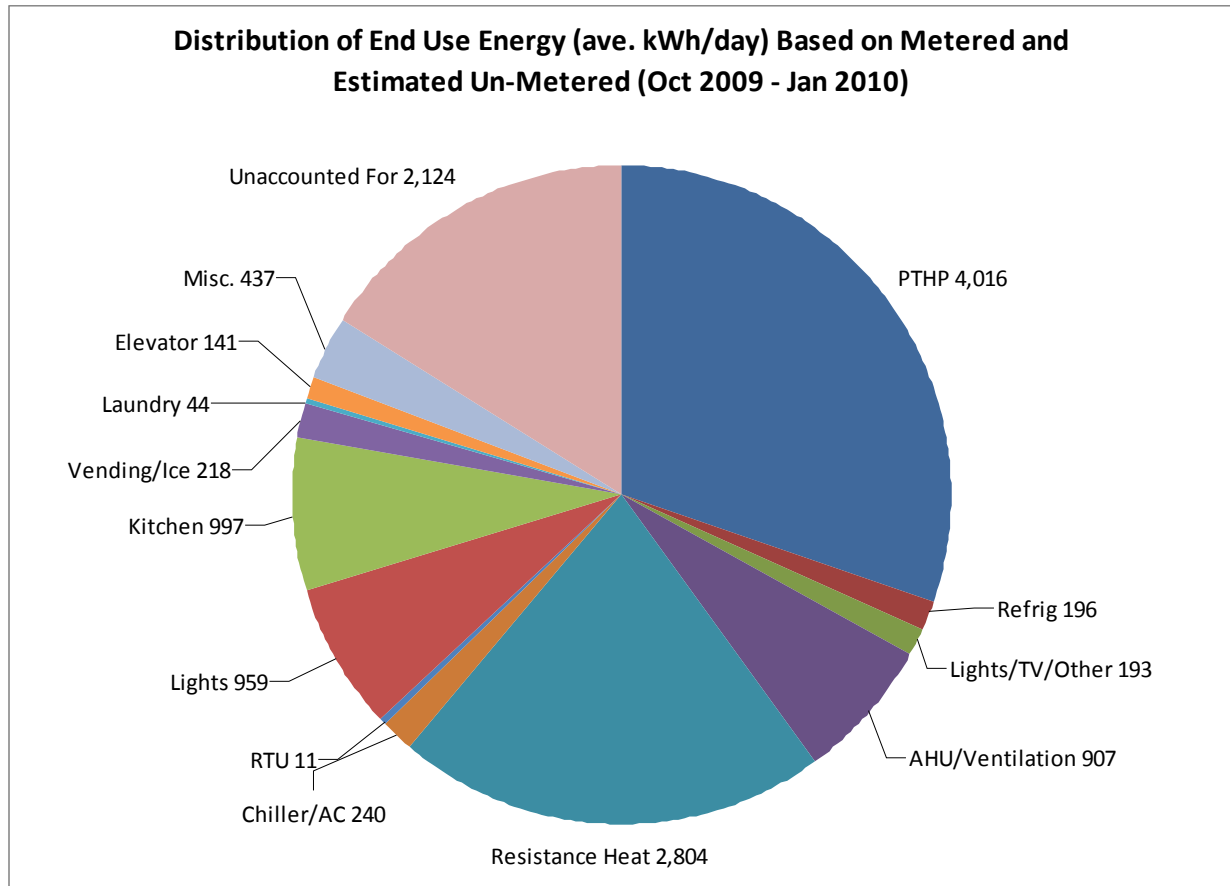
Natural gas use at the hotel is confined to three areas:

- The penthouse where gas is used in three boilers and one water heater to generate domestic hot water.
- The laundry area where gas is used in two water heaters to generate hot water for clothes washers, in three clothes dryers, and in one ironer (known in industry as a “flat iron”).
- The kitchen where gas is used in a variety of cooking and warming equipment.

The challenge of this activity was disaggregating the various gas using devices listed above and developing these into relative shares of the whole-building use. While end-use metering of each device was desirable, the cost, complexity, and relative intrusiveness of gas metering made this impractical.

Gas is metered at the building service entrance via a utility-owned rotary style gas meter. Gas bills from this meter were reviewed. In November 2009, the utility meter was retrofitted with a pulse output device with full safety isolation. These pulses were now collected by a data logger at 5-minute interval and downloaded on monthly basis.

Figure 10. Metered plus Estimated Electricity End-Use for October through January



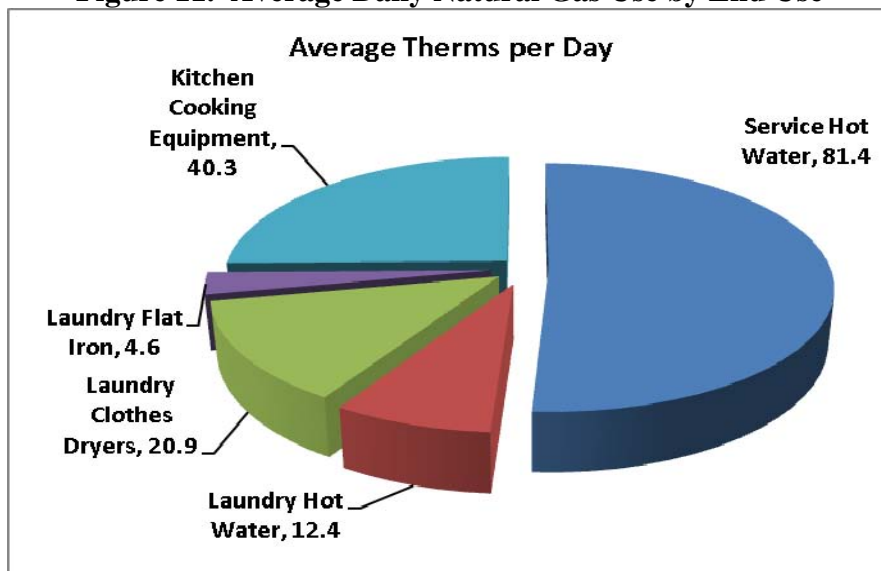
To estimate gas use for the domestic hot water and laundry systems, a number of proxy measurement techniques were employed. Predominantly, these relied on temperature measurements of products-of-combustion either in exhaust stacks (boilers, water heaters, iron) or combustion chambers (clothes dryers). In addition, flow (via a non-intrusive ultrasonic flow meter) and temperature measurements were made in the Penthouse to assess gas used in domestic hot water generation.

By its nature, proxy metering does not measure the variable of interest, rather a surrogate for that variable. As such, the potential for inaccuracy can be significant. To minimize these potential inaccuracies and to improve confidence in the result, secondary measurements or calculations are always recommended. For this activity, all proxy measurements were verified with secondary calculations – typically based on manufacturer-provided energy-use intensities.

Gas use for the kitchen was calculated by a team from the Halton Inc. Figure 11 presents the proxy measurement results by major end-use. Service hot water accounts for 51% of the gas use, with kitchen and laundry accounting for about 25% each.

A comparison was completed whereby the “sum of the parts” gas use (i.e., domestic hot water, laundry, and kitchen) was compared to the “whole” (i.e., the average annual daily gas use). The result was that the former was calculated to be 6.3% greater than the latter. This difference is well within the expected accuracy of a proxy analysis.

Figure 11. Average Daily Natural Gas Use by End Use



Conclusions

The work to date in this project, i.e., to measure, monitor, and estimate end-use energy consumption in a 1970-era full-service hotel in the Middle Atlantic region, was a challenging undertaking and provided a rich source of information about the major energy end uses in hotels. A few major conclusions from the study include:

- Heating of the guest rooms and the public areas is by far the largest consumer of electricity, accounting for almost 60% of total electricity consumption, in the autumn and winter months in this large hotel in the Washington, D.C. area, and would likely be the dominant seasonal load in any hotel in a similar climate zone. For new construction projects, more efficient approaches for heating the guest rooms, instead of PTHPs, should be evaluated. In a retrofit situation like the project described here, replacement of PTHPs with the most efficient products available on the market is warranted and is likely to have a significant impact on total energy use. The fact that the PTHPs were not operating properly in this hotel and the energy management system is not fully functional probably resulted in a somewhat higher heating load than would be seen in newer hotels with fully functional energy management systems. For heating of public spaces, alternatives to electric resistance heat and better control systems will be examined in the next phase of this project.

- Not surprisingly, energy consumption in both PTHPs and the other HVAC equipment in the hotel is correlated with outside temperature. This study shows that the correlation is very strong.
- The rest of the loads in this hotel (and most hotels) are diverse, making the development of an energy efficiency improvement strategy complicated. The kitchen consumes about 8% of the electricity and a quarter of the natural gas, hence about 10% of total energy use in the winter (the percentage would be higher in the summer). Unlike office buildings or some other commercial building types, lighting loads in a large hotel account for a fairly modest percentage of electricity consumption (about 7% in the winter and a somewhat higher percentage in the summer). Water heating consumes somewhat less than lighting at about 6%.
- Despite a rigorous metering campaign and subsequent analysis using calculations and proxy measures, we could account for only 84% of the electricity load in this hotel. This underscores the need for better understanding of miscellaneous electricity loads in commercial buildings, including hotels. This issue will be further studied in subsequent work.

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