



SF Environment

Our home. Our city. Our planet.

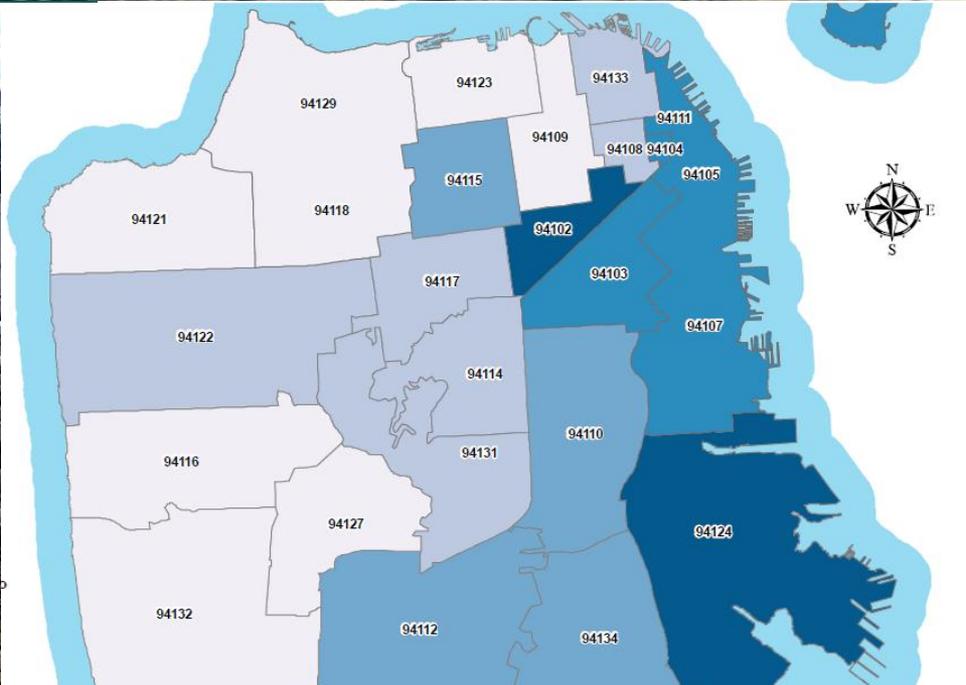
A Department of the City and County of San Francisco

Existing Commercial Buildings Energy Efficiency

March 18, 2014

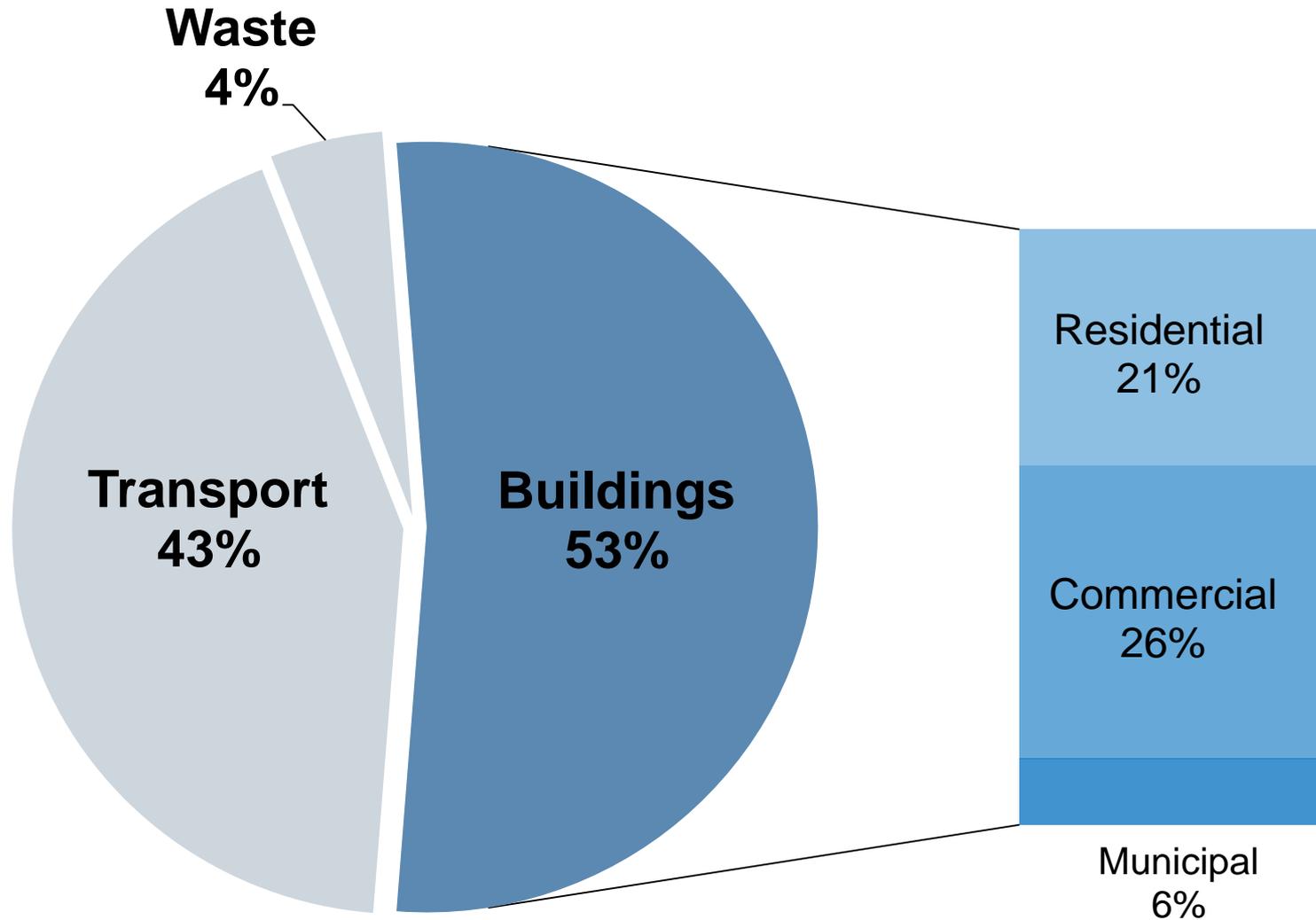
Barry Hooper, Green Building Coordinator
San Francisco Department of the Environment







GHG Emissions from San Francisco



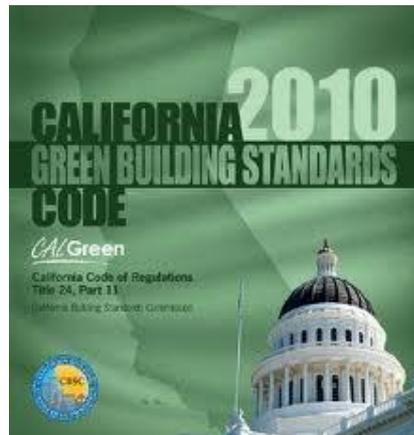
Sources: (2010) PG&E, Hetch Hetchy Water and Power, CA. Dept of Transportation, MTC, Muni, BART



GreenFinanceSF 
Saving You Money, Energy and Water



Pacific Gas and Electric Company[®]



Energy Compliance

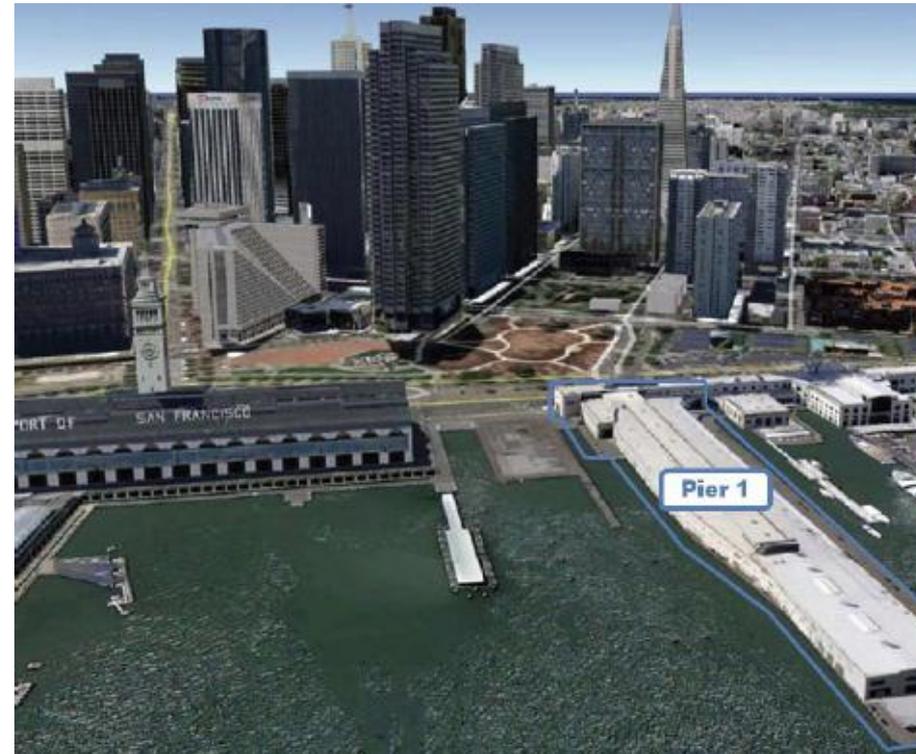


Pier 1: Prologis Headquarters

- \$1.4 million investment
- Positive cash flow from day 1
- 32% energy cost reduction

Projects Completed:

- Retrocommissioning
- Lighting
- 200kW photovoltaic array



Pier 1 Upgrade Project
Existing Energy Consumption vs. Post-Retrofit
Projection (month of July)



San Francisco Energy Watch – Since 2006



- Installed **10,500** efficiency projects
- **\$3,287** average annual cost savings
- Paid over **\$37 million** in incentives

- Reduced **91,000 tons** of annual carbon emissions
- Annual savings equivalent to powering **44,000** homes in San Francisco

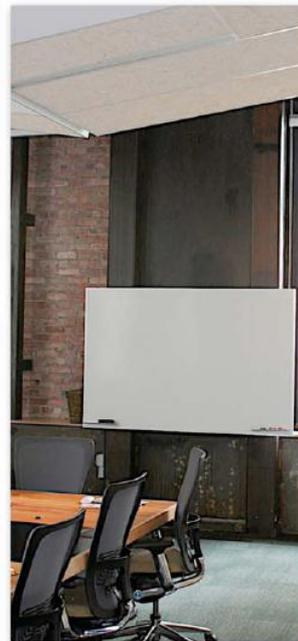
(Above numbers are dated; savings to date is greater.)



Mayor's Task Force
on
**Existing
Commercial
Buildings**

Final Report and
Recommendations For
The City and County of
San Francisco

December 2009



Scope

- Existing Commercial

Composition

- Owners' Representatives
- Property Managers
- Contractors
- Operators
- Engineers
- Architects
- Finance
- Utilities

The Task

- Cost effective energy savings
- Minimum costs
- Measureable



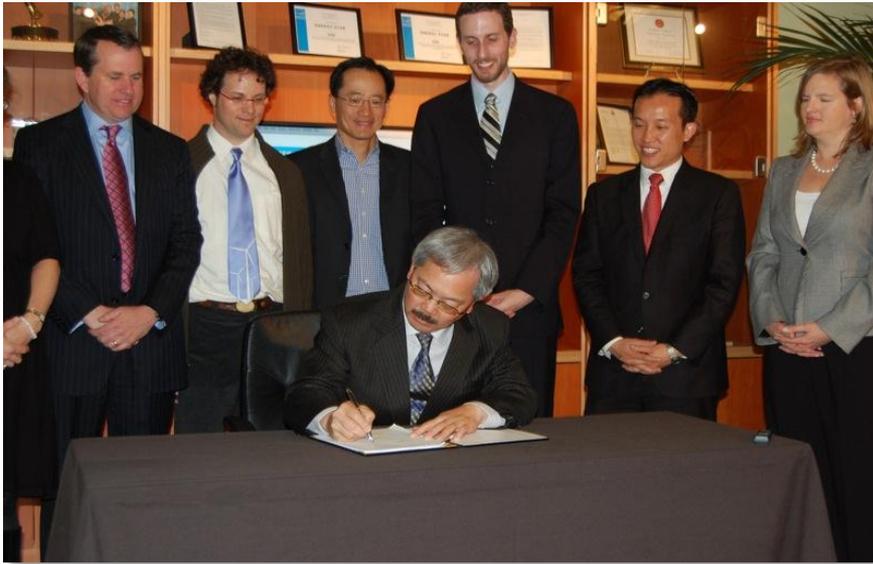
**What Is Measured
Gets Managed.**

- Peter Drucker

Existing Commercial Buildings Ordinance



All commercial buildings
must have:



A Benchmark
An Action Plan
Transparency

Summary of Existing Commercial Buildings Ordinance



| | Energy Benchmarking | | | Audit/Retrocommissioning |
|-------------------|---|------------------------------|------------------------------|---|
| Applies to | Non-residential buildings with 10,000 square feet or more of conditioned space | | | |
| Requires | All energy used by the building, and basic descriptive characteristics May be done in-house. | | | Assessment by a qualified professional identifying cost-effective opportunities to save energy. (May alternately be retrocommissioning.) |
| Tool | ENERGY STAR Portfolio Manager | | | ASHRAE <i>Procedures for ...Audits</i> "Level 2" for ≥50k sq ft "Level 1" for <50k sq ft |
| Frequency | Annually, starting: | | | Every 5 years |
| | >50k sq ft: Oct 2011 | 25k-50k sq ft: April 2012 | 10k-25k sq ft: April 2013 | Due dates randomly assigned over 3 years |
| Exemptions | New or unoccupied buildings, evidence of demolition (<i>de facto</i> : whole building transaction in prior calendar year) | | | Buildings that are new, unoccupied, in financial distress, earned LEED EB, or earned ENERGY STAR 3 of the past 5 years |

Energy Professional Minimum Qualifications

| | Certification or License | AND | Minimum Experience |
|-----|---|-----|--|
| (1) | Licensed Engineer (PE) OR PhD in Mechanical Engineering* | AND | 2 years experience performing energy efficiency audits or commissioning of existing buildings; OR Any certification in #2 below. |
| (2) | ASHRAE Building Energy Assessment Professional (BEAP); Association of Energy Engineers Certified Energy Manager (CEM); Association of Energy Engineers Existing Building Commissioning Professional (EBCP); Association of Energy Engineers Certified Building Commissioning Professional (CBCP)OR Northwest Energy Education Institute Energy Management Certification (EMC) | AND | 2 years experience performing energy efficiency audits or commissioning of existing buildings |
| (3) | BOC International Building Operator Certification Level II; OR International Union of Operating Engineers Certified Energy Specialist | AND | 10 years experience as a building operating engineer; OR 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 | | |
| | *Qualifications approved by Director of Department of Environment as equivalent | | |

Existing Commercial Buildings Ordinance



3 year phase-in: 2011-2014

Mandatory:

- Benchmarking + limited public disclosure (annual)
- Energy audit or retrocommissioning (every 5 years)

Voluntary:

- Capital improvements
- Operations and calibration
- Tenant engagement
- Financing & incentives



Relation to California Law

| | SF ECB Ordinance | California AB1103 |
|----------------|---|--|
| Requires | Benchmark and Audit | Benchmark only |
| Trigger | Annual | Transaction (sale, lease, refinance of entire building) |
| Tool | ENERGY STAR Portfolio Manager | |
| Data required | Monthly energy consumption for the entire building and Basic characteristics (size, occupancy, use, hours of operation) | |
| Data Disclosed | Summary of annual energy performance: <ul style="list-style-type: none">• 1 to 100 rating• Energy use per sq ft per year• GHG emissions from operations | All |
| Disclosure : | Public | Counterparty in transaction (available to CEC) |

Municipal Facilities



2011 ENERGY BENCHMARKING REPORT

San Francisco Municipal Buildings

2012 ENERGY BENCHMARKING REPORT

San Francisco Municipal Buildings

September 2013



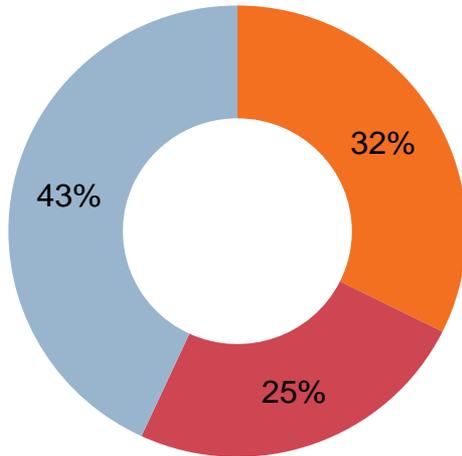
SFPUC 2012 Report:

- 446 buildings, 26 agencies, 46M sq ft
- 79% outperform national median
- Potential for ENERGY STAR:
 - 11 of 33 ratable buildings
 - 42 of 109 schools
- 5 sites rank in bottom 25% compared to national peers
- Carbon reduction:
 - 5% since 2011
 - 7% since 2009

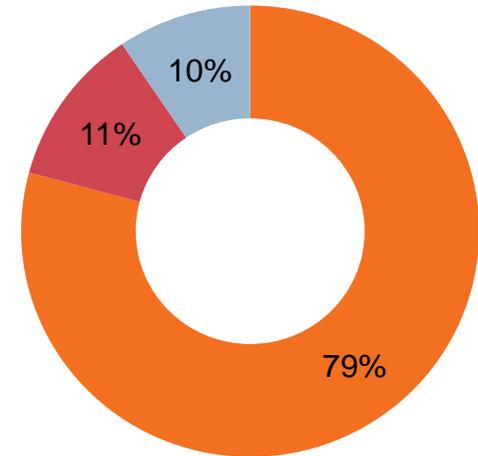
Private Sector Building Stock Affected



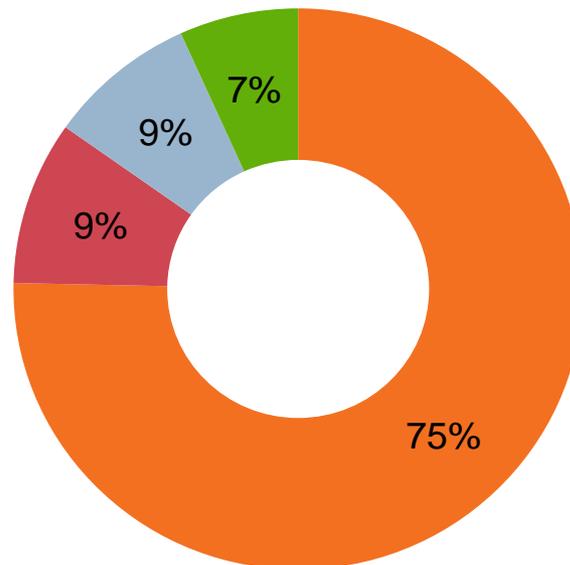
Buildings



Floor Area



Aggregate Energy Use (PG&E Proxy Benchmark)



Building Size
(square feet)

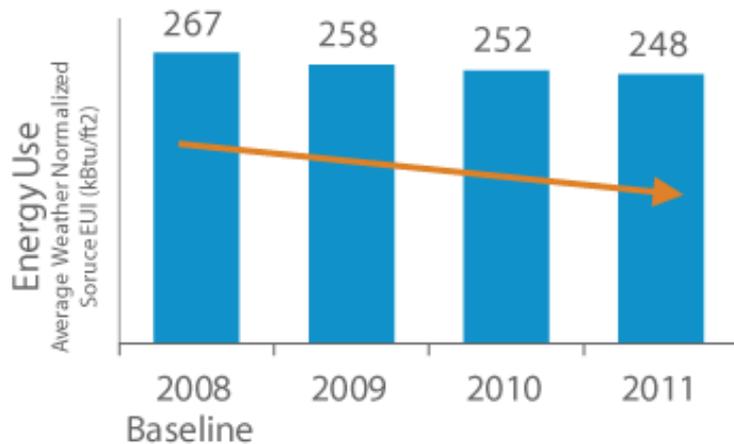
■ >50k

■ 25k - 50k

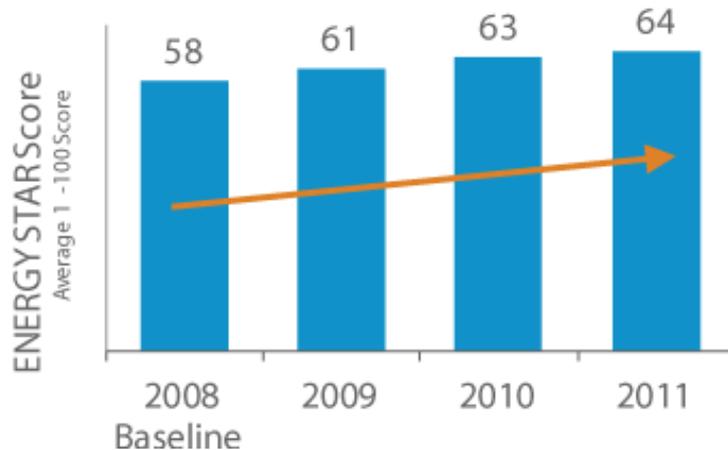
■ 10k-25k

■ 0-10k sq ft

Do Benchmarked Buildings Save Energy?



7%
Savings



6 point
increase

EPA Study:

35,000 buildings that benchmarked for 4 years

Average benefits:

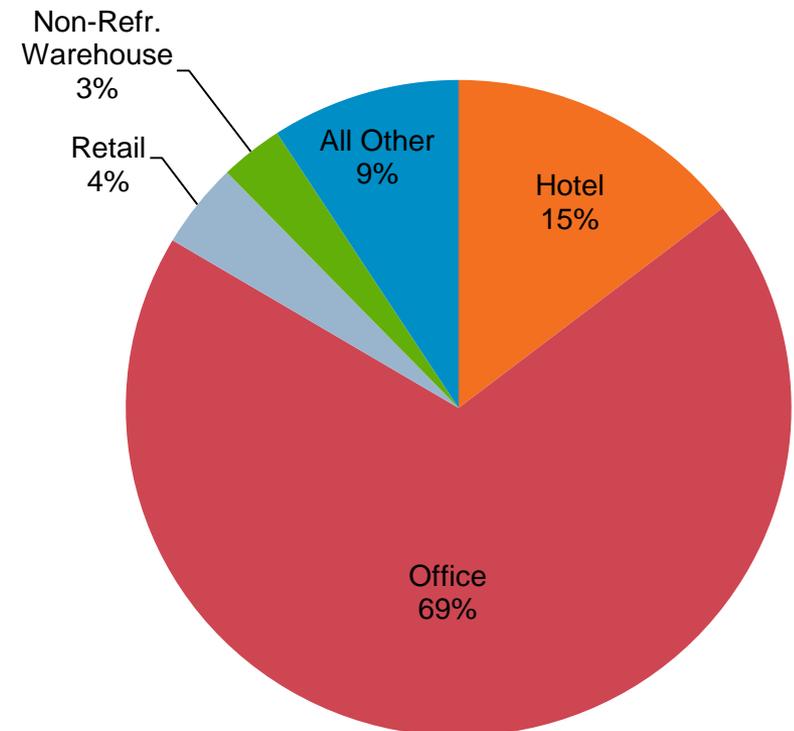
- 2.4% annual energy use reduction
- 7% average savings over 4 years
- Buildings with the lowest scores improved the most.

Early Observations



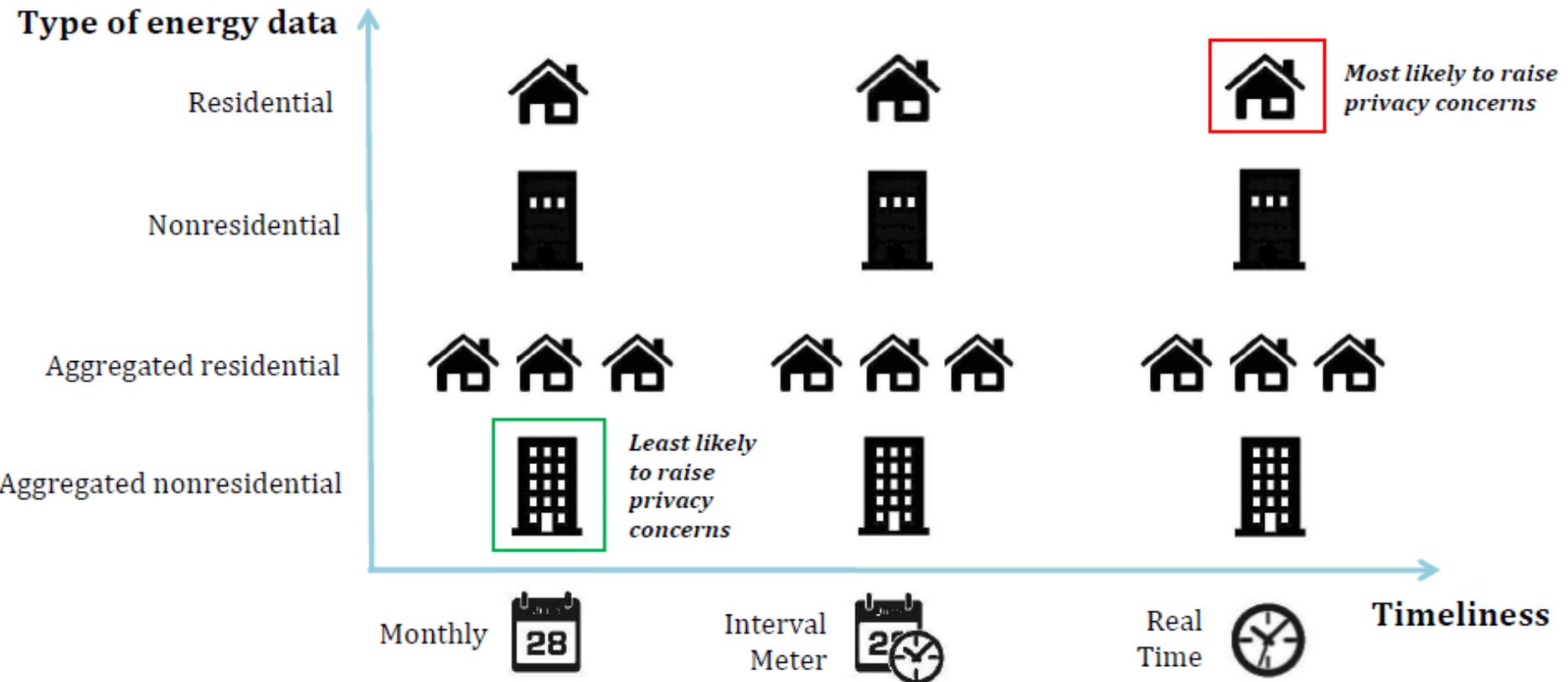
- Office dominates
- Median office ENERGY STAR score >80
 - 93% of floor area reporting a score >75 is 3rd party verified via
 - Audit
 - ENERGY STAR certification
 - LEED EB

Floor area reporting to date by sector:



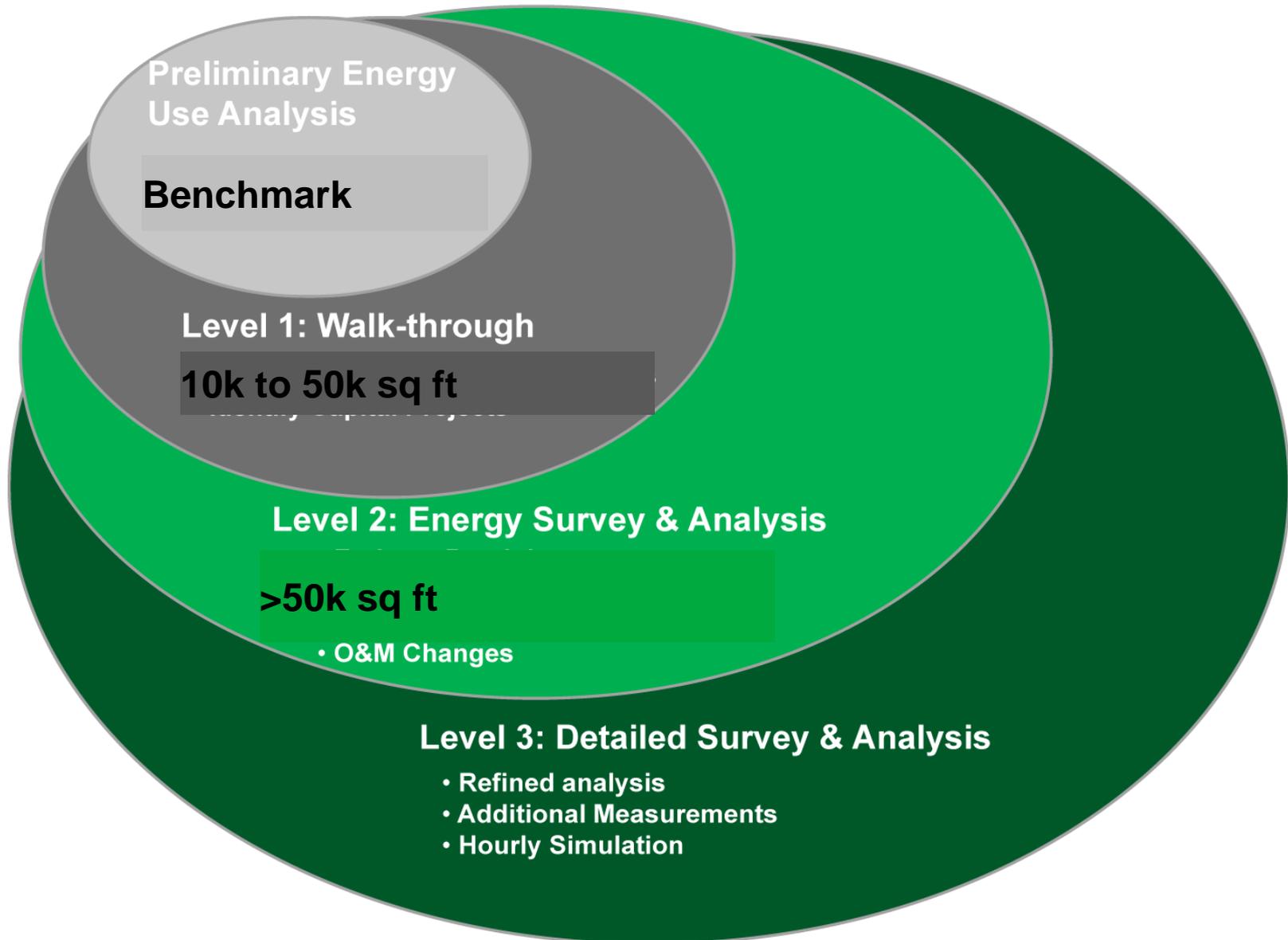


Key Challenge: Access to Data



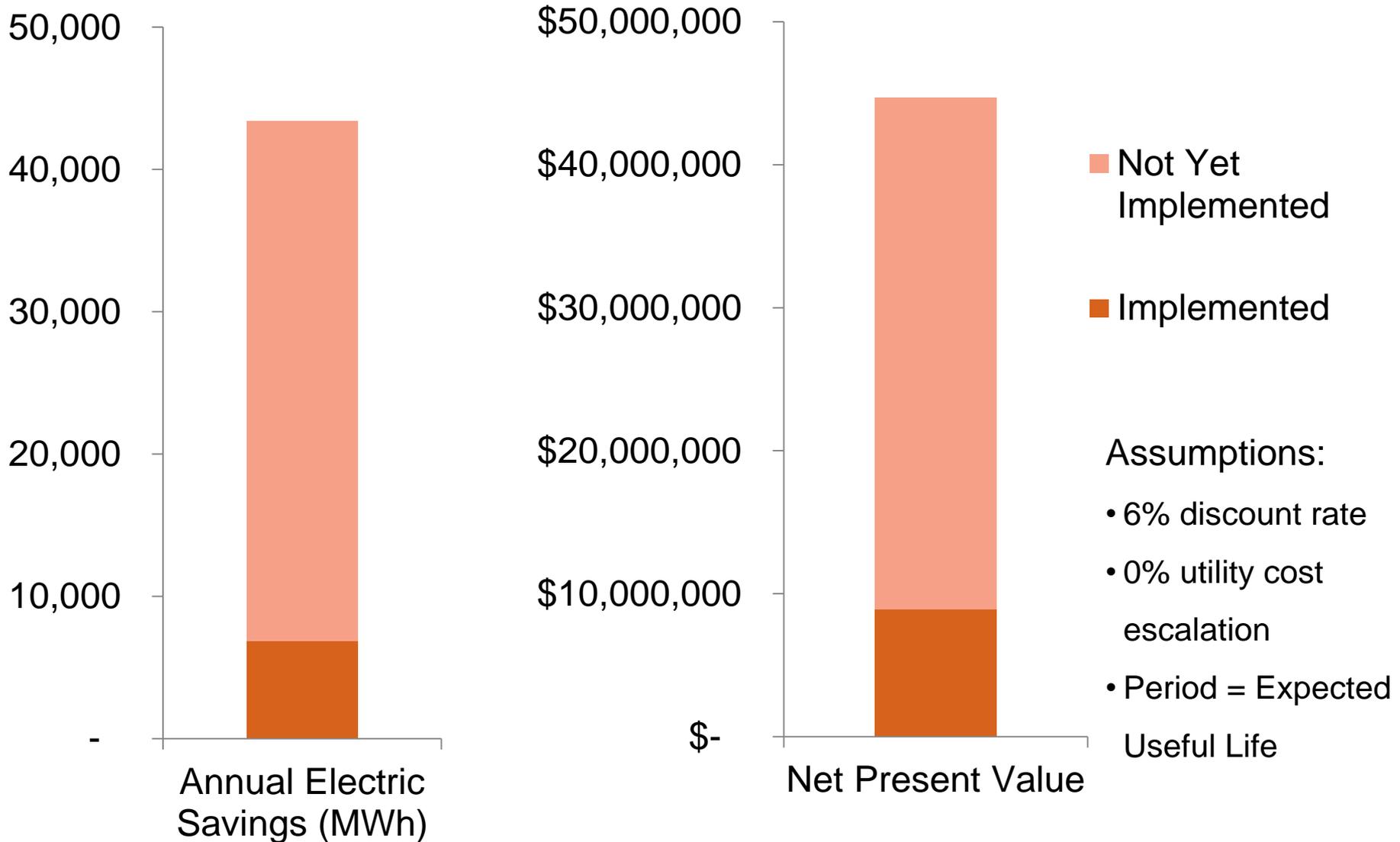
Source: Institute for Market Transformation

Audit Requirements



Uncovering Value

The first 120 Level II audits:



Savings Potential To Date



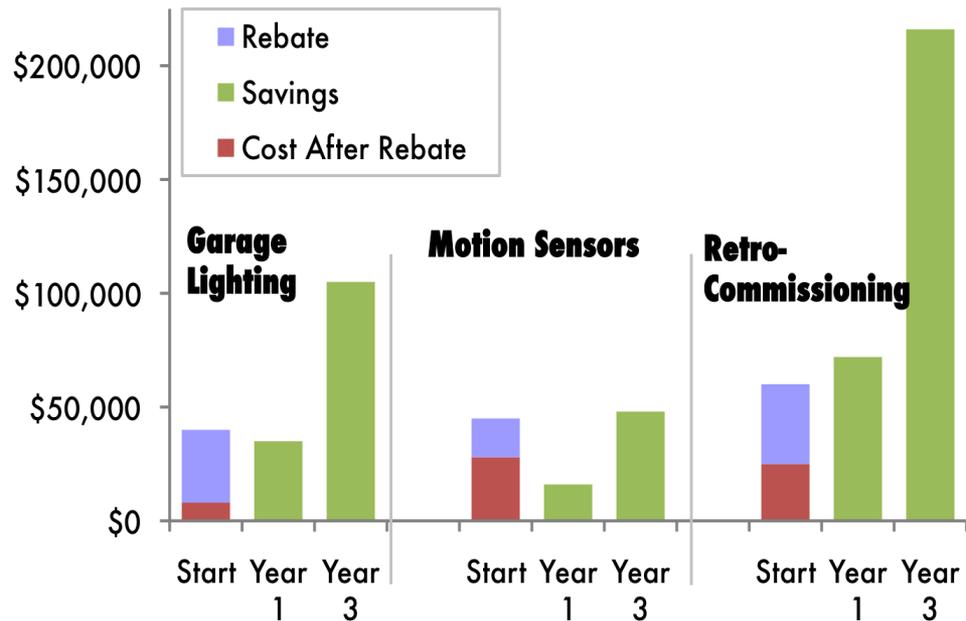
| | |
|---------|------------------------------|
| 608 MW | Demand reduction |
| 60 GWh | Annual electric savings |
| 789,000 | Annual therms |
| \$11M | Annual energy cost savings |
| \$6M | Estimated rebate eligibility |
| 4.4 | Year average simple payback |

Potential reported by auditors as of February 2014

New(er) Buildings

“By benchmarking and identifying inefficiencies through an audit, we maximized savings without sacrificing our customers’ experience.”

Peter Koehler
General Manager
InterContinental San Francisco



Historic Buildings



- 290,000 sq ft historic landmark
- Level 2 Audit in Q3 2012
- Updated lighting and HVAC controls
- \$1.2M estimated lifetime savings

Sources: Carbon Lighthouse, Flood Building management



Image : Joe Mabel

Supporting Resources from US DOE



SEE Action

STATE & LOCAL ENERGY EFFICIENCY ACTION NETWORK

The State and Local Energy Efficiency Action Network (SEE Action) is a state- and local-led effort facilitated by the U.S. Department of Energy and the U.S. Environmental Protection Agency to take energy efficiency to scale and achieve all cost-effective energy efficiency by 2020. SEE Action offers [publications](#), [events](#), and [technical assistance](#) to state and local decision makers as they provide low-cost, reliable energy to their communities through energy efficiency.

Energy Benchmarking, Rating, and Disclosure

- [Benchmarking and Disclosure: State and Local Policy Design Guide and Sample Policy Language](#)
- [Energy Benchmarking, Rating, and Disclosure for Local Governments Fact Sheet](#)
- [Energy Benchmarking, Rating, and Disclosure for State Governments Fact Sheet](#)
- [Energy Benchmarking, Rating, and Disclosure for Regulators of Ratepayer-Funded Programs Fact Sheet](#)
- [Utility Regulator's Guide to Data Access for Commercial Building Energy Performance Benchmarking](#)

Learn more



www.sfenvironment.org/ecb

