



**SF Environment**

**Our home. Our city. Our planet.**

A Department of the City and County of San Francisco

# SF Existing Commercial Buildings Ordinance

## Information as Energy Efficiency Accelerator

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Green Building Associate  
San Francisco Department of the Environment

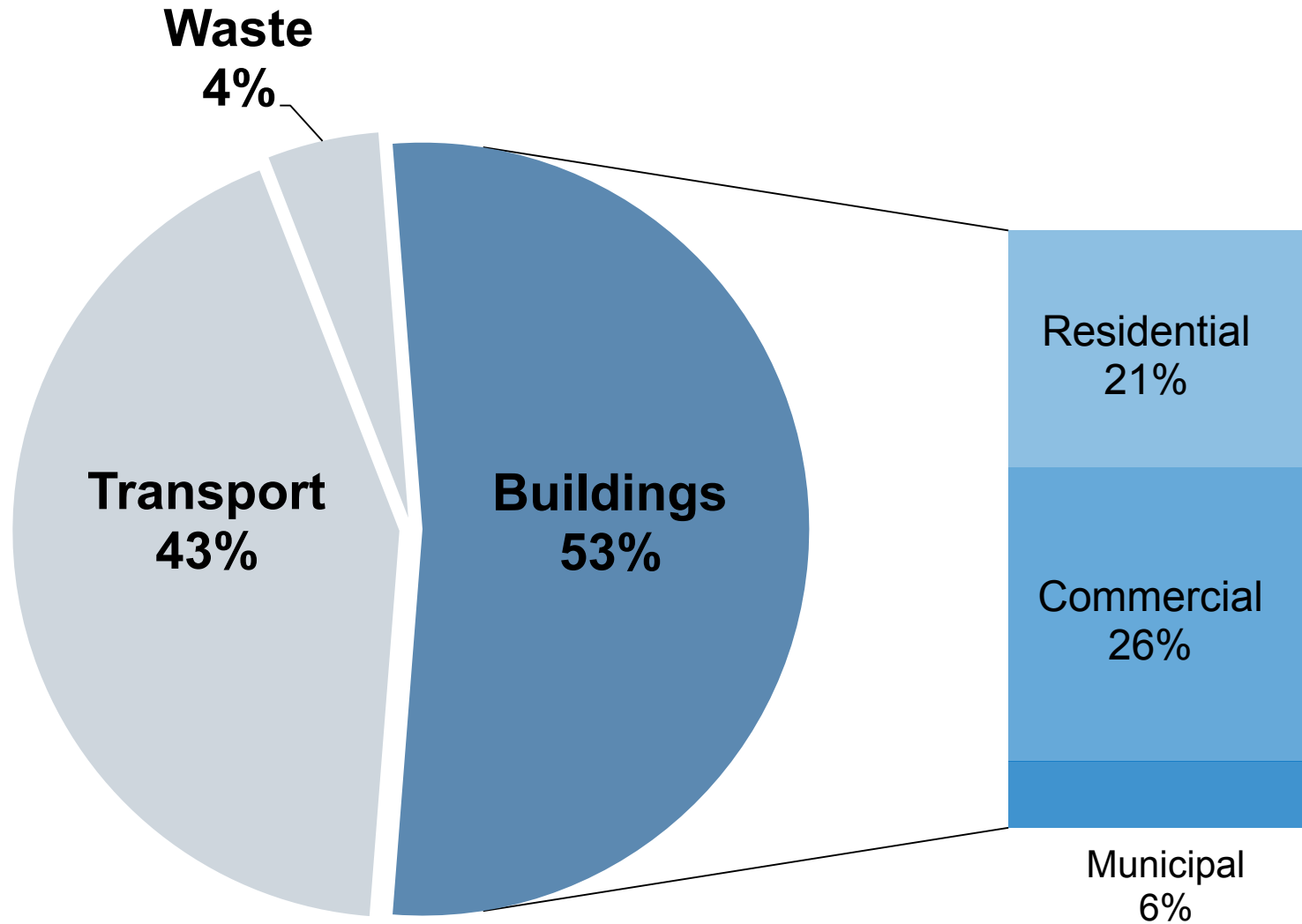


# Agenda



- Impetus for Existing Commercial Buildings Ordinance
- Requirements & implementation
- Early results
- Data challenges
- SF collaboration with DOE

# GHG Emissions from San Francisco





**GreenFinanceSF**   
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**GreenFinanceSF**   
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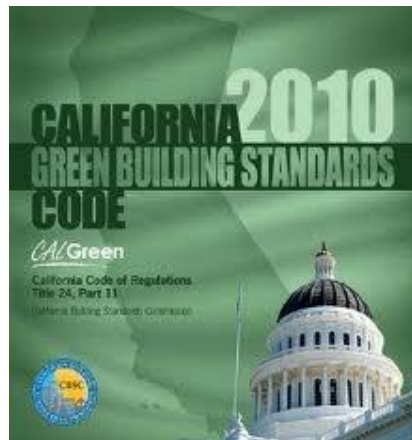




# GreenFinanceSF



Saving You Money, Energy and Water



Energy Compliance



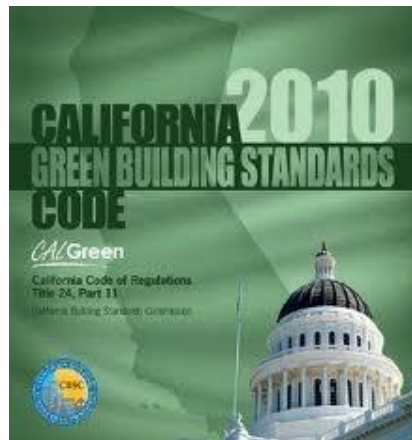
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***Pacific Gas and Electric Company***<sup>®</sup>



Energy Compliance



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

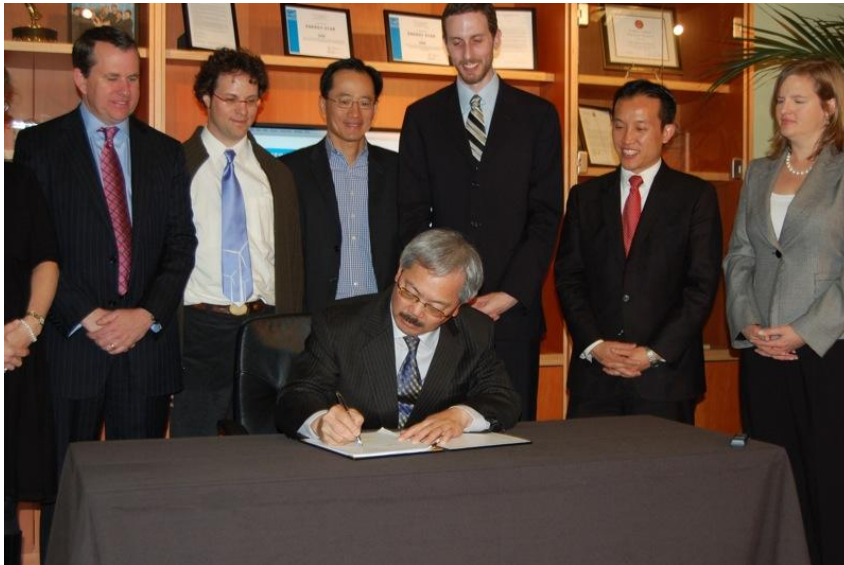
- Cost effective energy savings
- Minimum costs
- Measureable



Commercial Stakeholders:  
**‘We will manage what we measure.’**



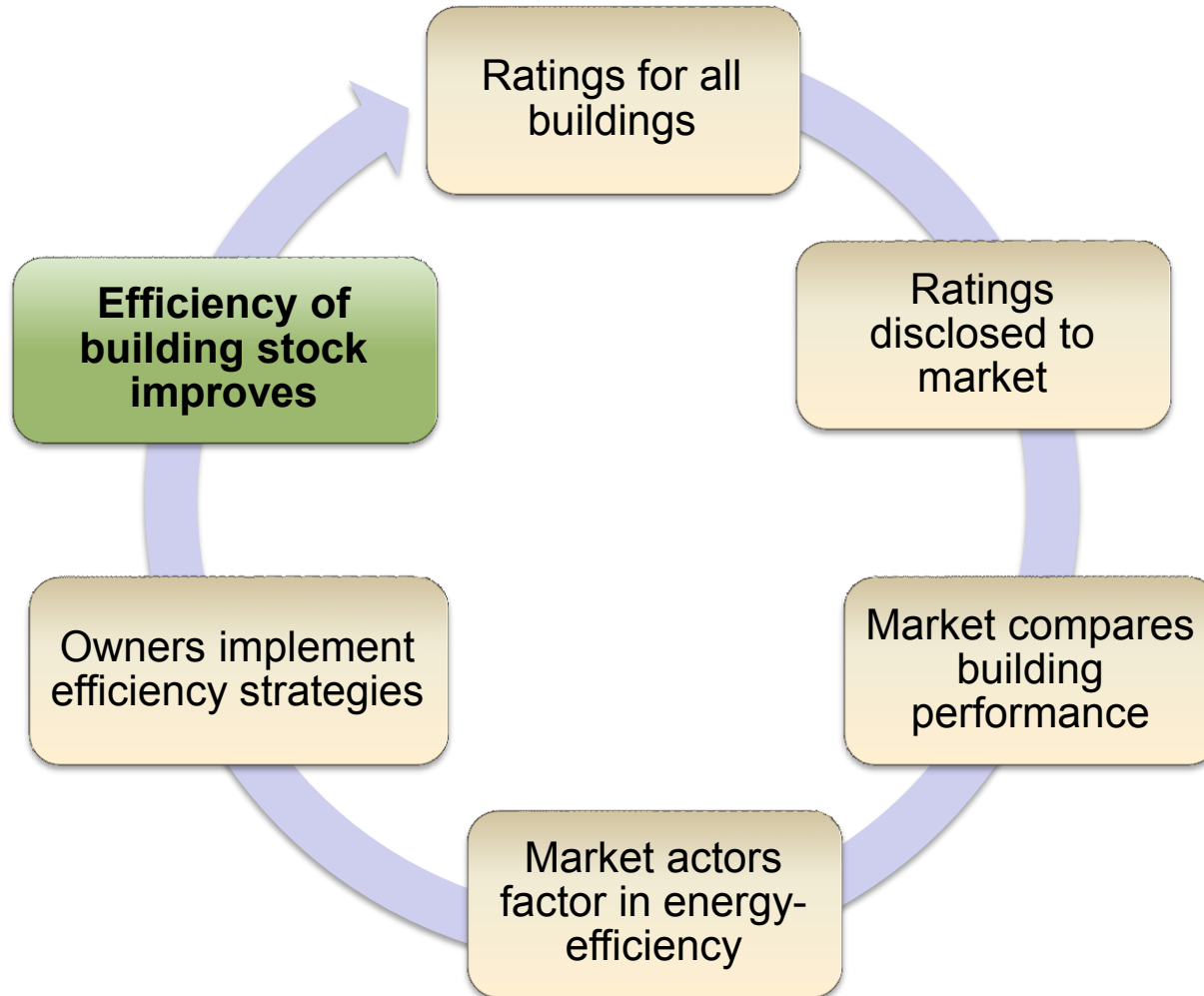
## Commercial Stakeholders: **‘We will manage what we measure.’**



Benchmark  
Action Plan  
Transparency



# Intent: cycle of improvement



# Existing Commercial Buildings Ordinance



3 year phase-in: 2011-2014

## Mandatory:

- Benchmarking with limited public disclosure (every year)
- Energy audits or retrocommissioning (every 5 years)

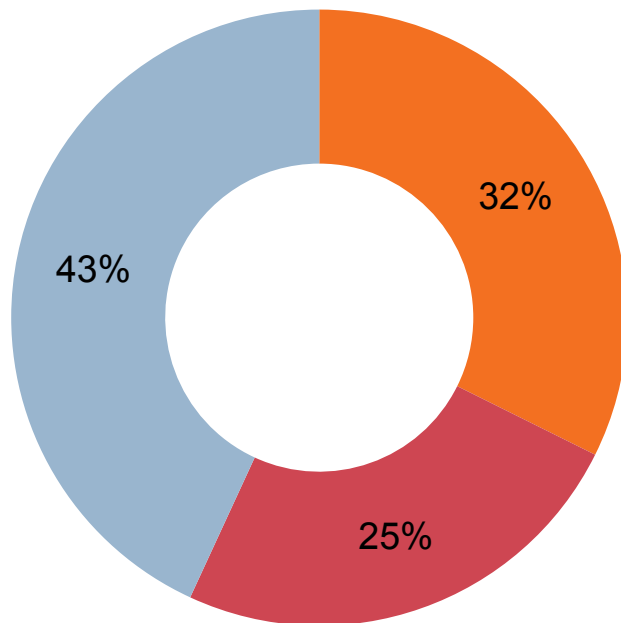
## Voluntary:

- Capital improvements
- Operations and calibration
- Tenant engagement
- Financing & incentives
- Policy as Customer Relationship Management

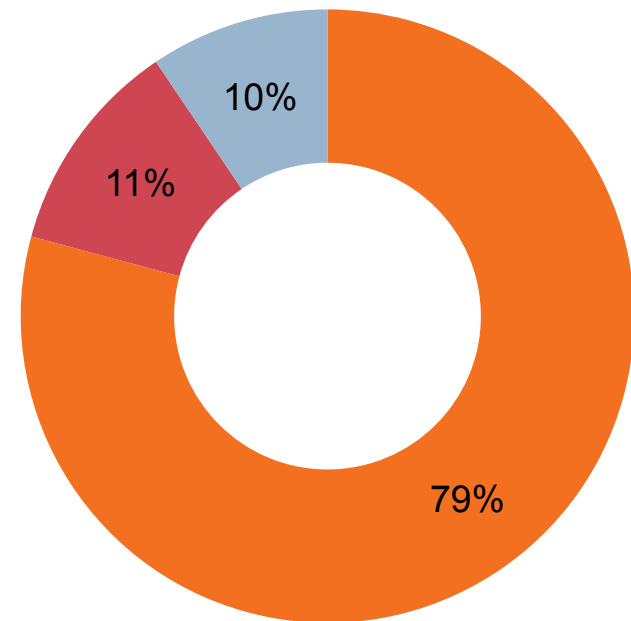
# Building stock affected



## Private Sector Buildings



## Private Sector Floor Area



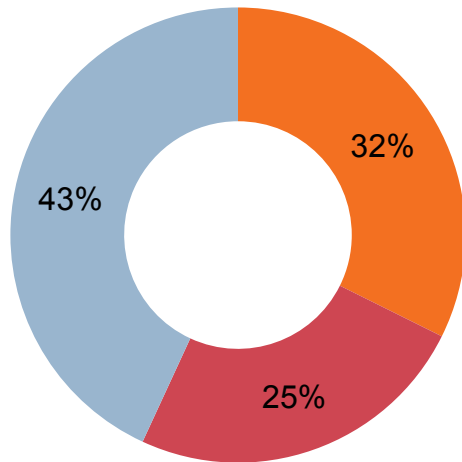
Building Size

■ 50K+ ■ 25-50K ■ 10-25K

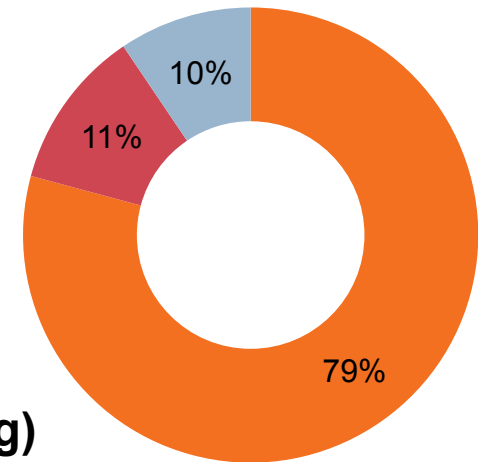
# Building stock affected



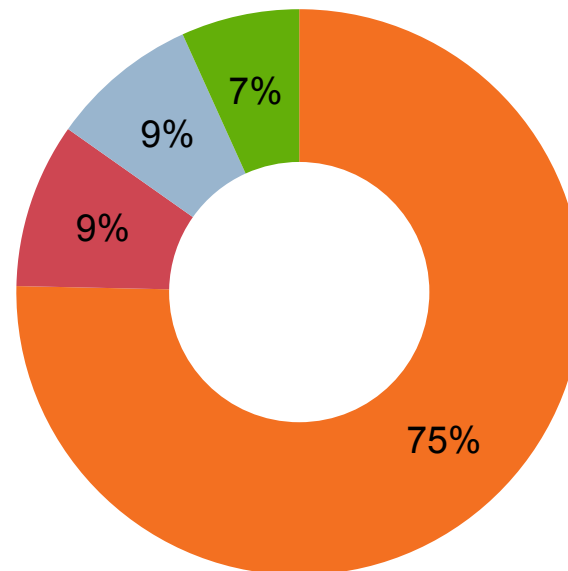
## Private Sector Buildings



## Private Sector Floor Area



## Aggregate Energy Use (PG&E Proxy Benchmarking)



Building Size

50K+ sqft

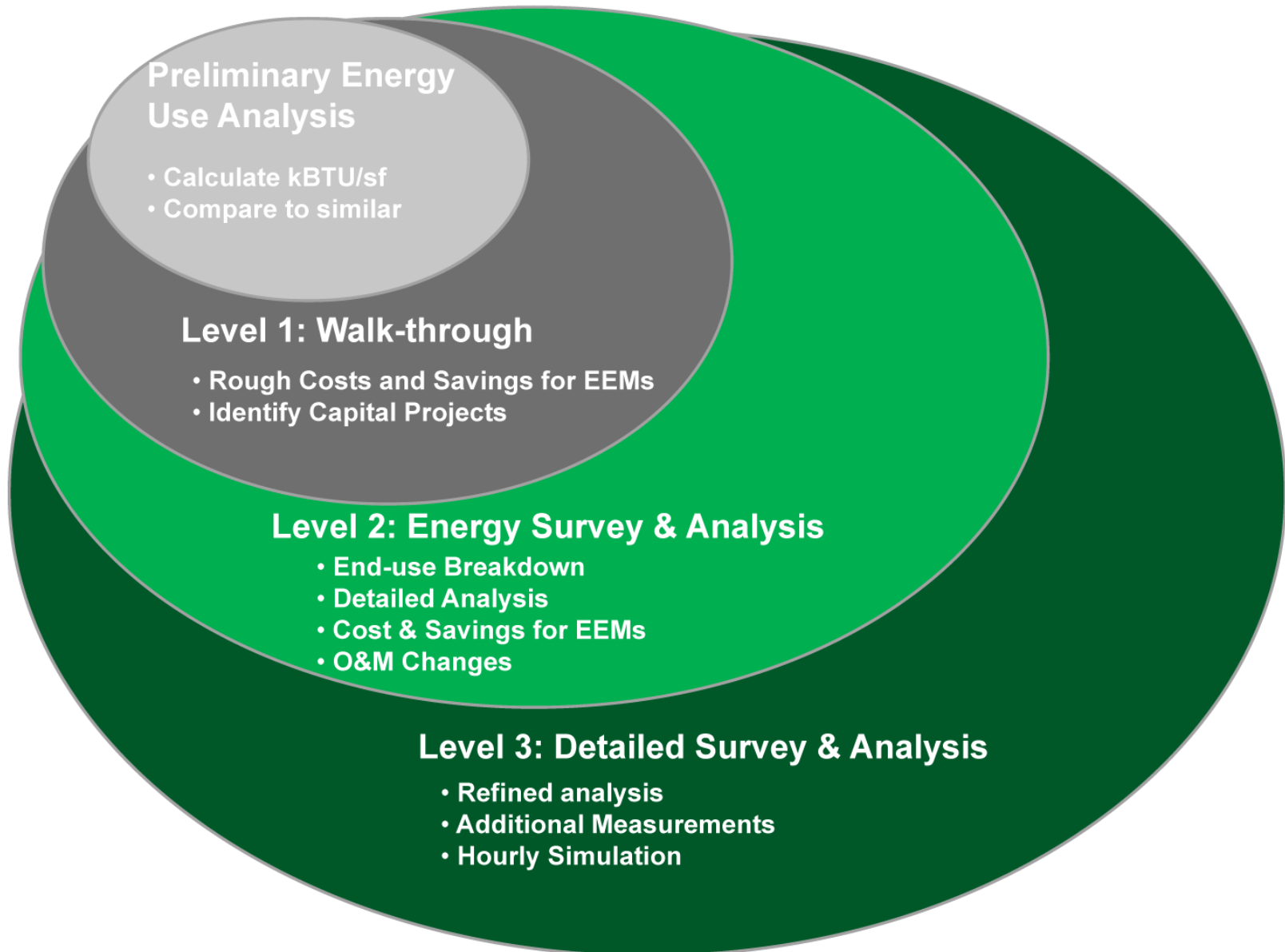
25-50K

10-25K

0-10K

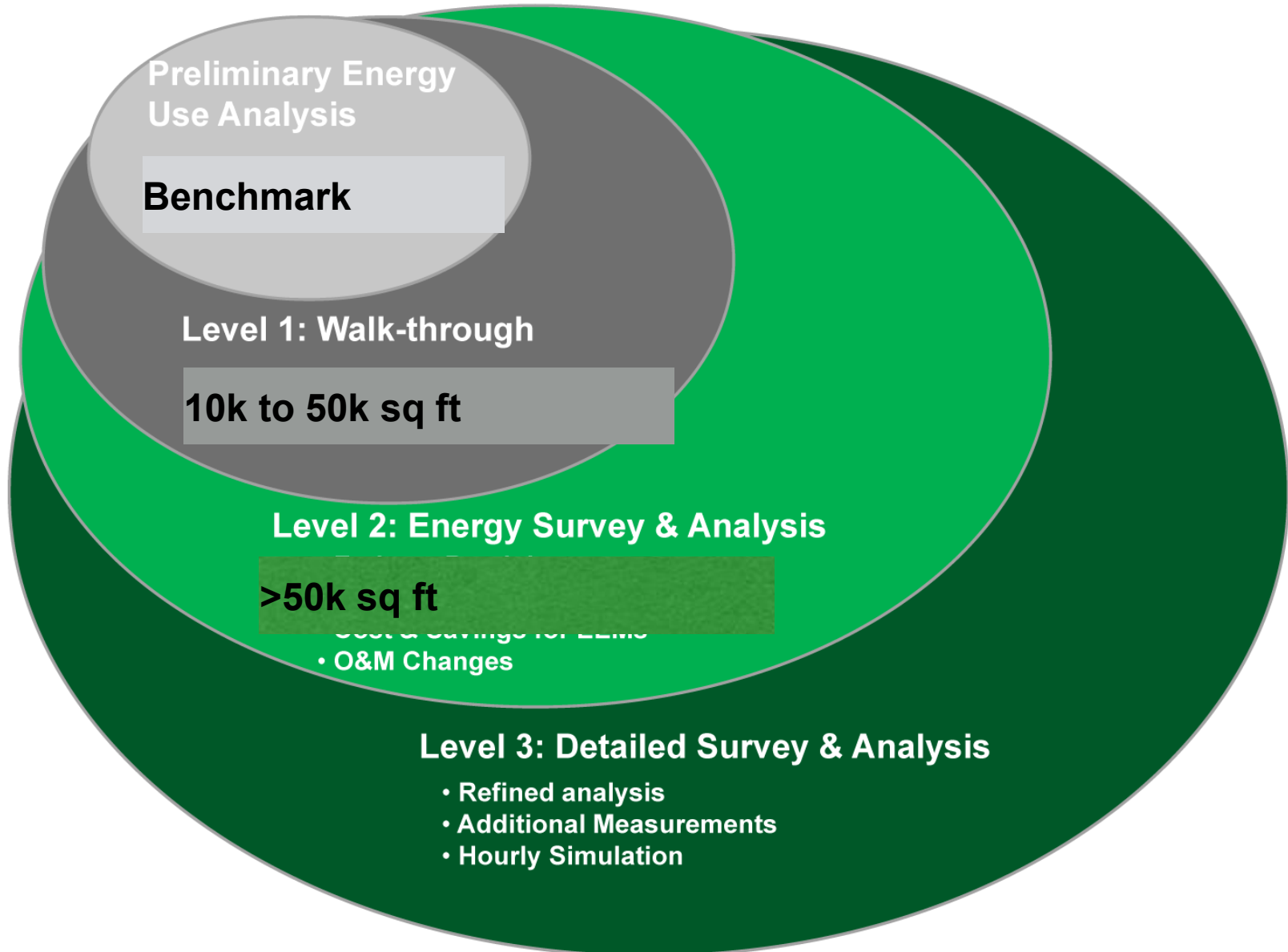


# ASHRAE levels of effort





# Audit requirements







# Audit example: Flood Building

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



Image : Joe Mabel



# Status (rough numbers)

## Benchmark: Compliance

Year Due	Compliance Rate
2011	78%
2012	75%
2013	33%

## Audits: Reported installed measures (Gross as of 5/5/2013)

kWh	Therms	Total Annual Cost Savings	First Cost	Rebates	Net Cost	Average Useful Life	Average payback
17,823,467	217,747	\$3,375,148	\$20,221,059	\$1,477,624	\$18,743,435	11.3	3.7 years



# Key data challenges

- City records
  - Tax assessor has records of properties, not buildings
  - Assessor's data only updated at time of sale
  - Square footage numbers often unreliable
  - Only contact info is for building owner
- Benchmarks
  - Individual tenant consent for every meter, no aggregation
  - Automated data upload not fool-proof
  - Data self-reported
- Audits
  - How to standardize/structure efficiency measure data
  - Reporting limited to summary of measures with short payback



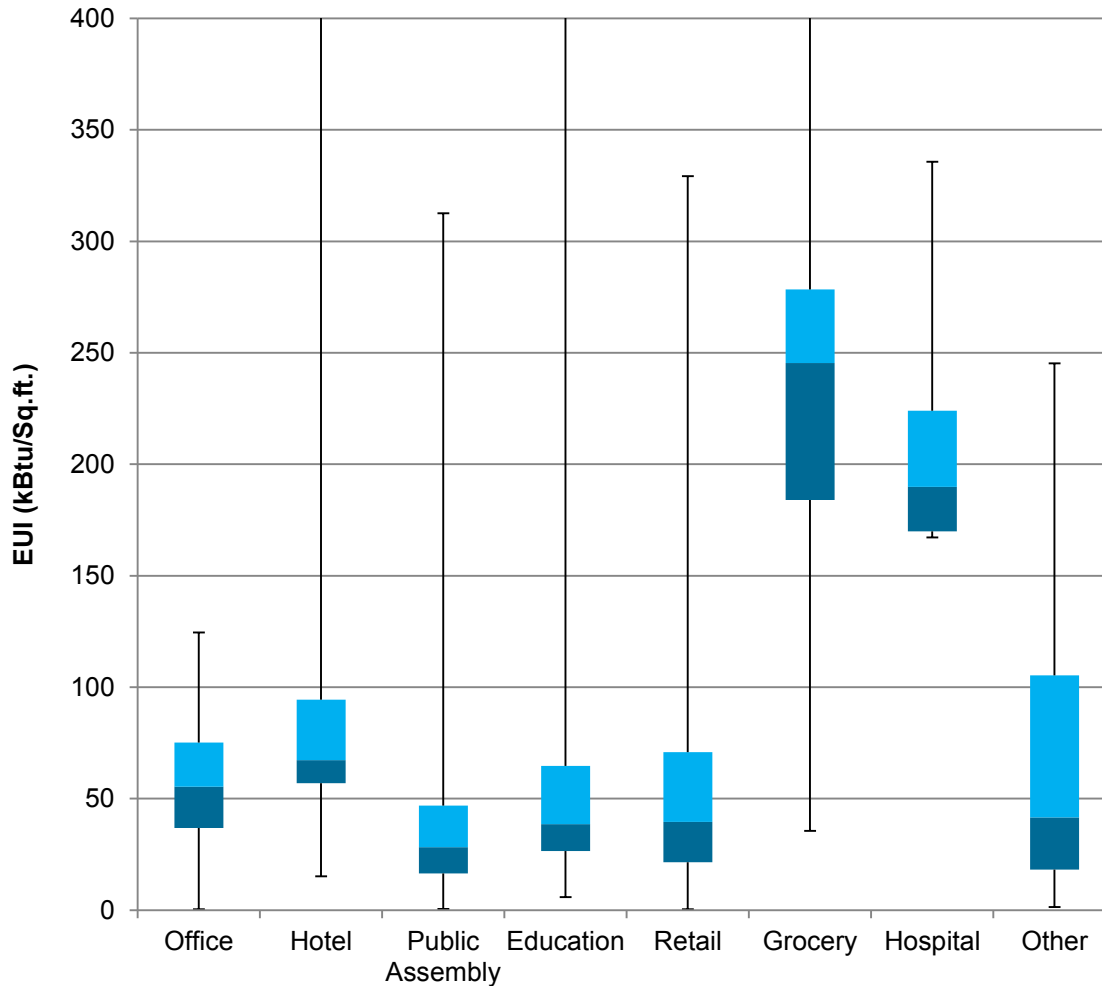
# San Francisco collaboration with DOE

- Building Energy Data Exchange Specification (BEDES)
  - Basis for classification of measures reported in SF audit submittals
  - Ensures SF audit and building asset data comparable to other cities
- Standard Energy Efficiency Data (SEED) platform
  - Benchmarking data cleansing, tracking and reporting
  - Each city can manage and publish its own data
- Building Performance Database (BPD)
  - Central data repository for cities nationwide
- SEE Action ECB Working Group
  - Benchmark and audit policy design guidelines

# DOE data cleansing & analysis (preliminary)



## SF Commercial Building EUI by Facility Type



	Peak-median variation
Office	6.2
Hotel	2.6
Public Assembly	5.3
Education	4.0
Retail	6.7
Grocery	1.4
Hospital	1.2
Other	8.4

Learn more



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# 2011 ENERGY BENCHMARKING REPORT

## San Francisco Municipal Buildings

October 2012



San Francisco  
**Water Power Sewer**

Services of the San Francisco Public Utilities Commission





# Relation to California Law

	<b>SF ECB Ordinance</b>	<b>California AB1103</b>
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"><li>• 1to100 rating</li><li>• Energy use per sq ft per year</li><li>• GHG emissions from operations</li></ul>	All
Disclosure :	Public	Counterparty in transaction (available to CEC)



# Energy Professional qualifications

	<b>Certification or License</b>	<b>AND</b>	<b>Minimum Experience</b>
(1)	Licensed Engineer (PE) OR PhD in Mechanical Engineering*	AND	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"> <li>•ASHRAE Building Energy Assessment Professional (BEAP);</li> <li>•Association of Energy Engineers Certified Energy Manager (CEM);</li> <li>•Association of Energy Engineers Existing Building Commissioning Professional (EBCP);</li> <li>•Association of Energy Engineers Certified Building Commissioning Professional (CBCP)* OR</li> <li>•Northwest Energy Education Institute Energy Management Certification (EMC)</li> </ul>	AND	At least 2 years experience performing energy efficiency audits or commissioning of existing buildings
(3)	<ul style="list-style-type: none"> <li>•BOC International Building Operator Certification Level II; OR</li> <li>•(B) International Union of Operating Engineers Certified Energy Specialist</li> </ul>	AND	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		
	*Qualifications approved by Department of Environment as equivalent		

# Existing Commercial Buildings Ordinance



	Energy Benchmarking			Audit/Retrocommissioning
<b>Applies to:</b>	Applies to: All non-residential buildings with 10,000 square feet or more of conditioned (heated or cooled) space			
<b>Requires</b>	Annual Energy Benchmark summarizes all energy used by the building, and basic descriptive characteristics.  May be done in-house.			Audit is an assessment by a qualified professional identifying cost-effective opportunities to save energy. (May alternately be retrocommissioning.)
<b>Tool:</b>	Uses ENERGY STAR Portfolio Manager, a free online resource from US EPA			Uses ASHRAE <i>Procedures</i> . “Level of Effort 2” for >50k sq ft “Level 1” for buildings <50k sqft
<b>Frequency :</b>	Annually, starting:			Once every 5 years
	>50k sq ft: Oct 2011	25k-50k sq ft: April 2012	10k-25k sq ft: April 2013	Due date assigned to each building: November 2012; April 2013; or April 2014
<b>Exempt:</b>	New or unoccupied buildings, (And: Demolition permit or entitlement to be replaced, or whole building transaction in prior calendar year)			Exempt: Buildings that are new, unoccupied, in financial distress, earned LEED EB (once), or have earned ENERGY STAR 3 of the past 5 years

“Benchmarking is crucial. Energy management has become a passion of mine.”

— Garry Cook, Chief Engineer, 500 Washington

“Keep in mind that your competition is benchmarking and auditing; not doing so puts you at a competitive disadvantage.”

– Blake Peterson, Senior Property Manager, Orrick Building

“Knowing current performance is my starting point to improving energy efficiency.”

— Doug Peterson, Chief Engineer, Transamerica Pyramid

“PG&E’s auto benchmarking program takes the heavy lifting out of data entry, and frees you up to look for better ways to operate.”

— Danny Murtagh, Director of Engineering, Embarcadero Center

“We’re constantly finding new ways to save energy. We benchmark using ENERGY STAR Portfolio Manager, and have a lot of energy efficient systems in place such as our new energy efficient chiller, economizer, LEDs, and motion sensors.”

— Dana Boyd, Tenant Coordinator, 343 Sansome

“Benchmarking helps me identify equipment that is drawing a lot of energy and isn’t working properly.”

— Jessie Orozco, Chief Engineer, Rincon Center

“I can’t say enough good things about benchmarking.”

— James Smith, Chief Engineer, 455 Market

“Efficient operation of a modern high rise is as much an art as a science. The only efficient way to determine if you’re effective is benchmarking.”

— Jerry Ferguson, Chief Engineer, 425 Market

“If you do not measure where you are, you cannot reach your goals for conserving energy, water, and waste. We cannot become complacent until we reach zero waste and use of our resources.”

— Ed Perinoni, Chief Engineer, Post-Montgomery Center



# Building stock affected

Building Size	Number of Buildings			Floor Area (sq ft)		
	Private Sector	Municipal	Total	Private Sector	Municipal	Total
50K+	705	74	779	123,737,250	39,789,131	163,526,381
25K	535	22	557	17,772,305	732,512	18,504,817
10-25K	940	91	1,031	14,759,074	1,454,161	16,213,235
<b>TOTAL</b>	2,180	187	2,367	156,268,629	41,975,804	198,244,433