



ARIZONA STATE UNIVERSITY



## Walton Sustainability Solutions Initiatives

SOS 498/594: Urban Sustainability-Best Practices/Case Studies



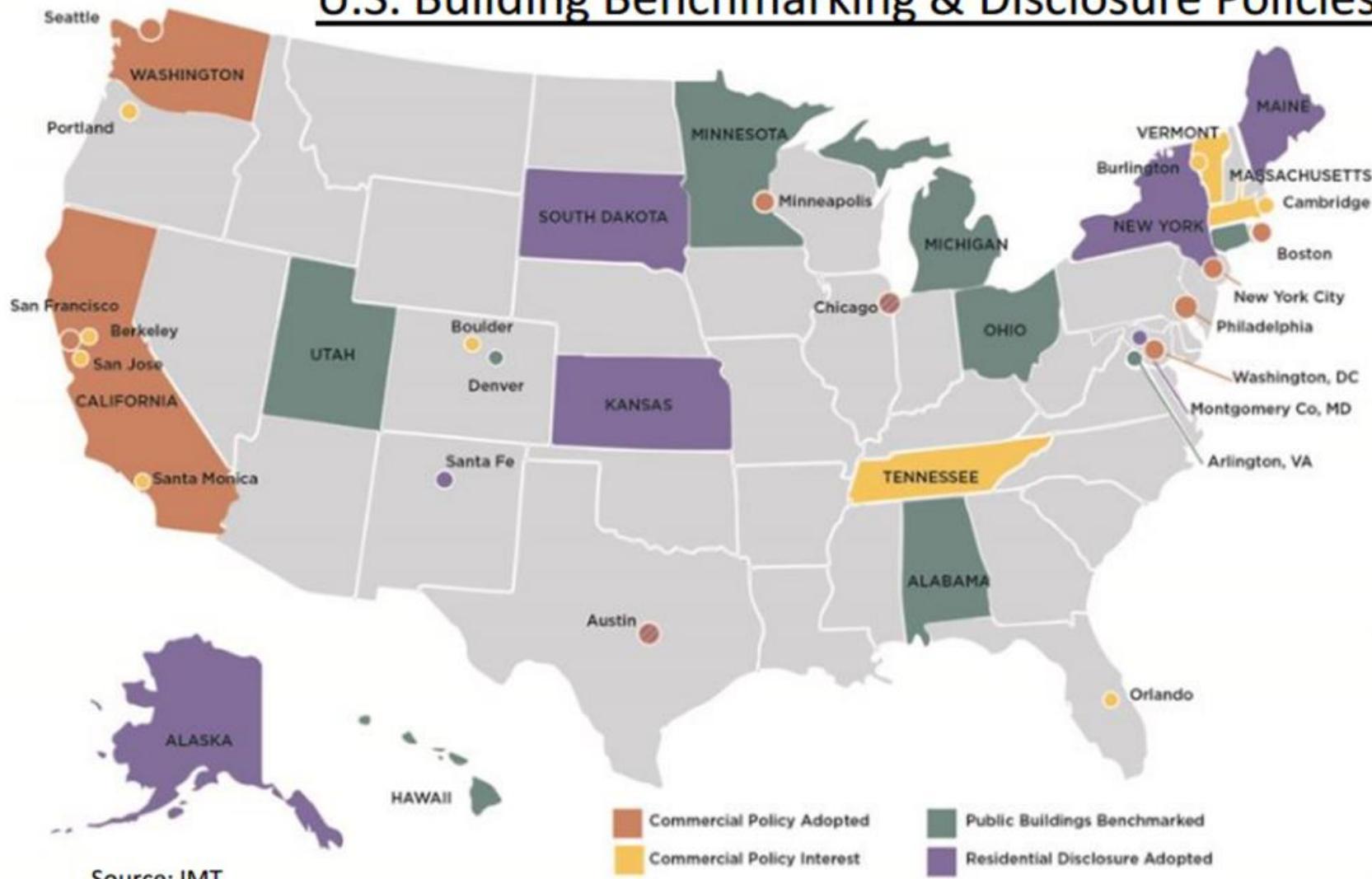
# Economic Impacts of Energy Use Disclosure Ordinances

Presented by  
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# Background

- Buildings account for over 40% of the total energy consumption in the U.S.
  - Energy efficient buildings will reduce carbon emissions and contribute to city sustainability goals
  - Currently, 28 cities, states, and counties are implementing energy ratings and disclosure ordinances for commercial buildings and other properties; and 10 other states and jurisdictions are considering policies
  - **BER&D** = building energy rating and disclosure

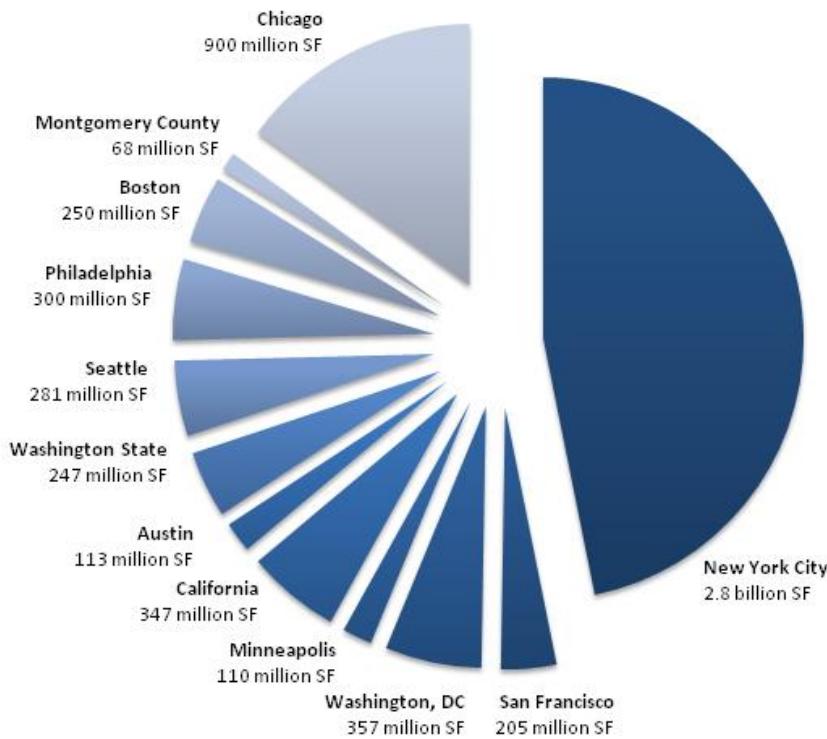
## U.S. Building Benchmarking & Disclosure Policies



Totaling  
approximately  
**5.8 billion SF**  
of floor space in  
major real estate  
markets



Building Area (in Square Feet) Covered Annually



Source: IMT

# Purpose & Objectives

The key data will be used to develop a **business case** directed towards city councils to explain the **benefits and impacts** of energy disclosure ordinances, and to support states and cities in the successful **development and implementation of policies** regarding energy rating and disclosure.

We aim to:

- Identify all the possible **economic value drivers**,
- Find **research** behind these drivers,
- Create an outline for an **economic impact assessment** that may be created over time and could essentially define a research agenda for this industry
- Determine the **best practices and challenges** of these ordinances

# Economic Value Drivers of Disclosure

- **Natural Market Effect –**  
Economics teaches that less efficient buildings will be less appealing, thus owners improve efficiency with **better management** and **capital investments** in equipment and building quality
- **Disclosure => Competition => Innovation and Improvements**
- **Business Development –**  
Disclose can **expose risks**, new strategic direction, and **reveal new opportunities** in products and services

## Rating and Disclosure 'Cycle of Improvement'



# Economic Value Drivers of Disclosure

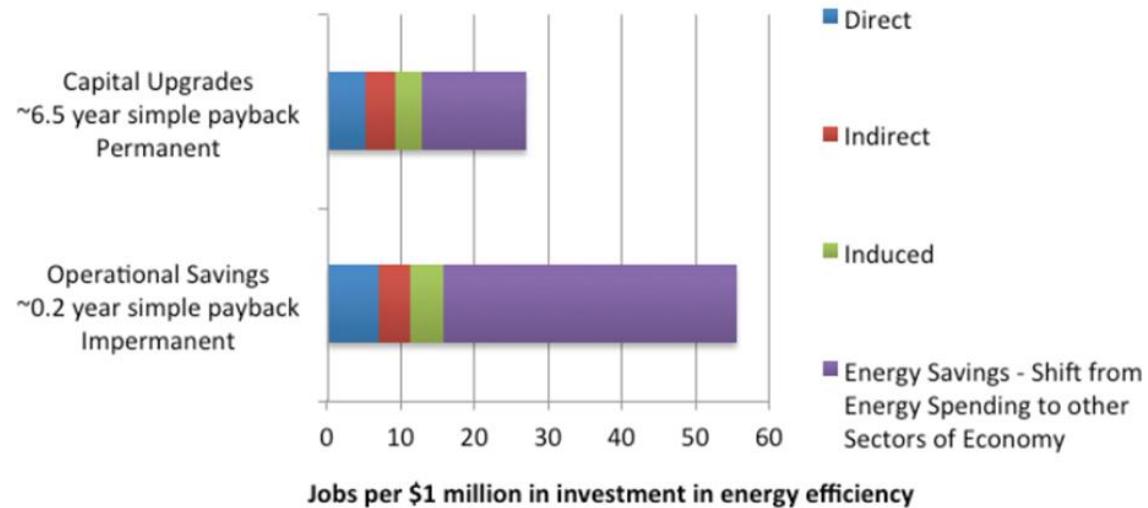
- **Indirect Value** – money funneled into related industries and businesses
- **Induced Value** – money spent in non-energy sectors from savings, higher earnings, and discretionary income in energy sector
- **Environmental Value** – avoided costs from carbon emissions for better air quality and fewer climate-change related risks
- **Owner Benefits**
  - **Lower Operating Costs** – **8-9% reduction** = \$3.8 billion through 2015, **\$18 billion through 2020**
  - **Higher sale prices** – up to **7.5% in sales price** for each dollar invested
  - **Higher rents** – Energy Star, LEED and Green Star-rated buildings typically command **rental premiums up to 17% higher**
- **National Security** – less Imported fuel used for electricity generation
- **Tourism & Marketing** – increased competitiveness, attractiveness

# Economic Value Drivers of Disclosure

- Open data increases **transparency** and makes government more responsive. The Federal government says transparency promotes **growth, efficiency**, and **social good**.
- **Local Jobs** – sustained market for **installations, audits, retrofits, appraisers**, etc.
  - In Massachusetts, projected that 23,000 new jobs created by 2015 & more than **59,000 jobs by 2020** resulting from increasing demand for energy efficient services and technologies and from reinvestment of energy cost saving by consumers and businesses into the economy
- **Talent recruiting** - sustainability is an important factor in acquiring talent and leads to higher levels of engagement on the job, particularly among millennials who want to make a difference through their work.
  - Johnson Controls found that **96%** of Generation Y respondents are **highly concerned about the environment** and **expect employers to take steps towards becoming more sustainable**

# Why Disclose? Job Creation

- Non-Residential repair
- New Industrial
- New Commercial
- Retro-commissioning
- Auditing
- Energy Management



**Figure 2-2 Employment in Different Energy Efficiency Improvements (Data: IMT & PERI 2012).** "Permanent" refers to upgrade measure that last the lifetime of the financial analysis. "Impermanent" measures last three years.

Nationally:

- **Retrofitting** 40% of the building sector can create **625,000 jobs**
- Better **tax incentives** and **grants** will create over **114,000 jobs**
- Hourly Mean Wage: **\$21.05**
- Annual Mean Wage: **\$43,790**

## U.S. Energy Efficiency Investments

(million \$)	Capital Upgrade Expenditures	Operational Improvement Expenditures	Total Expenditures	Energy Savings From Capital Upgrades	Energy Savings From Operational Improvements	Total Energy Savings
Sum: 2012-2035	15,975	17,506	\$33,481.23	\$23,286.84	\$71,819.82	\$95,106.66

## U.S. Employment From Improvements & Savings

	Multifamily		Commercial		Total
	Operational Improvement Expenditures (million \$)	Employment From Operational Improvements (# jobs)	Operational Improvement Expenditures (million \$)	Employment From Operational Improvements (# jobs)	Total Employment From Operational Improvements (# jobs)
Sum 2012-2035	\$ 1,328.59	20,907	\$ 16,177.28	254,566	275,472

	Multifamily		Commercial		Total
	Energy Savings (million \$)	Employment From Energy Savings (# jobs)	Energy Savings (million \$)	Employment From Energy Savings (# jobs)	Employment From Energy Savings (# jobs)
Sum 2012-2035	\$ 4,450.36	43,956	\$ 90,656.30	878,913	922,869

# Business Cases

- **New York City** – Commercial buildings account for 80% of the city's greenhouse gas emissions and \$15 billion each year in energy costs
  - **Greener, Greater Buildings Plan**
    - **save \$700 million** in energy costs annually
    - **create 17,800 construction-related jobs** in energy auditing, upgrading lighting, retro-commissioning, and maintaining equipment
- **Seattle** – 96% compliance with **savings of \$0.54 per sq. ft.** of operating costs after Energy Star certification
- **Minneapolis** – **51%** of energy efficiency opportunities could be achieved through **low- and no-cost energy management**
  - turning off lights,
  - closing outside doors,
  - altering hours of operations for off-peak energy pricing,
  - changing to CFLs,
  - adjusting building temperature
- **Austin** – Potential savings identified in the first year of ECAD audits includes savings of:
  - \$723,650
  - 7,788,000 kWh
  - 4,897 tons of carbon dioxide

Sources: [www.nyc.gov/ggbp](http://www.nyc.gov/ggbp), 2012 Seattle Building Energy Benchmarking Analysis Report, [www.fresh-energy.org](http://www.fresh-energy.org),

# Development & Implementation Costs

- **Reporting Tools**
  - **EPA's Energy Star Portfolio Manager (FREE)** – most common with 40-50% of U.S. commercial building space benchmarked using this tool
  - **EnergyIQ** – "action-oriented" benchmarking tool providing a standardized opportunity assessment and decision-support information to help refine action plans
- **Retro-commission** – inspecting and calibrating equipment and systems to operate correctly and looking for major building energy issues
  - Avg. Cost: \$0.20 – \$1.00/ sq. ft.
  - Avg. Payback: 0.5 – 2 years
- **ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) Audits** – Levels I-III
  - Avg. Cost: \$0.12 – \$0.70/ sq. ft.
  - Avg. Payback: 1 – 5 years

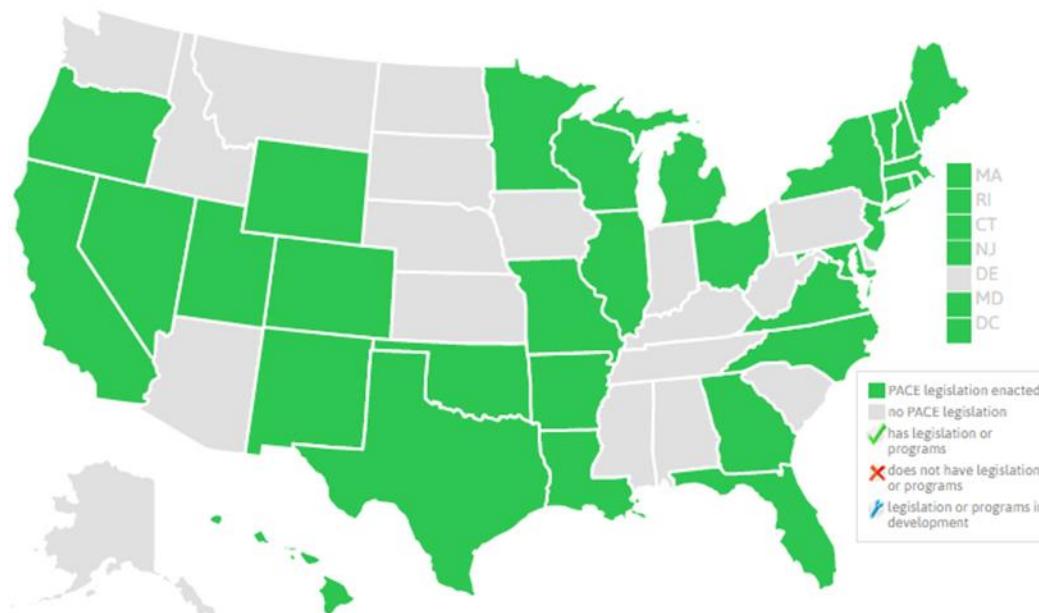
Challenge	Solution
<b>SPLIT INCENTIVE</b>  One person pays and one person benefits	<b>INCENTIVE STRUCTURE or RECOGNITION PROGRAM</b>  Reward utilities, builders, owners, and operators for going above and beyond; Increase the impact of tax and ratepayer dollars; Analyze ratings to identify building efficiency trends in order to create more effective policies and incentives
<b>PRIVACY ISSUE</b>  Who has information? Is it public?	<b>OUTREACH, EXPLANATION</b>  Americans tend to disclose large amounts of personal information every day, knowingly and unknowingly. Energy usage is arguably less personal than many other types of information

Challenge	Solution
<b>POLICY SUPPORT FROM UTILITIES</b>	<b>ENGAGE LOCAL UTILITIES</b>
Political will and influence by utilities	Show them benefits - Coupling billing data with building characterization information gives utilities a deeper understanding of their end users and new opportunities.
<b>COST OF MAINTAINING &amp; ENFORCING POLICIES</b>	<b>PACKAGE LAWS APPROPRIATELY</b>
	New York City and Washington state – BER&D policies are being applied as a package of laws, making rating and disclosure part of a larger strategy with auditing and upgrade requirements

Challenge	Solution
<b>COST OF IMPLEMENTATION</b> Access to funds for capital improvement projects	<b>CREATE FINANCING SCHEME</b> <ul style="list-style-type: none"><li>• <b>Clean Energy Sacramento</b> provides financing to commercial property owners for renewable and energy efficient upgrades, repayable over long term via property taxes</li><li>• <b>Green Finance San Francisco</b> uses an “open market” in which property owners negotiate project financing, interest rate and repayment term, with qualified lenders</li></ul>

# Policy Suggestions & Lessons Learned

- **Property Assessed Clean Energy (PACE)** – used to fund energy efficiency and clean energy improvements in 31 states and District of Columbia



# Policy Suggestions & Lessons Learned

- **IF YOU CAN'T MANDATE, LEAD** - If passing legislation is not possible, lead-by-example laws are an option for government agencies
- The **Department of Energy** is supporting pilot-programs in Alabama, Massachusetts & Washington that provide access to energy scoring tools and upgrade info from qualified experts
- **Virginia's Local Energy Alliance Program (LEAP)** is increasing reporting by working directly with real estate agents who then provide their clients with energy efficiency expertise. LEAP aims to encourage mandatory energy efficiency reporting.

# Best Practices

## Engage with Local Utilities

- Aid building owners with their compliance obligation by providing aggregate building energy consumption records and transfer the data that is directly compatible for upload into ESPM
- Better energy efficiency information about their clients helps them to prioritize programs
- Play an important outreach role in encouraging compliance and providing information on rating and disclosure rules to clients

# Best Practices

## Use Trusted Ratings Systems

- Market actors must believe that ratings accurately reflect the relative performance of buildings and trust that these ratings have been produced honestly
- Energy Star Portfolio Manager (ESPM) is the predominant rating tool in the U.S. with over 260,000 building ratings performed to date. Most trusted benchmarking tool for both mandatory and voluntary energy rating initiatives.
- Buildings and building performance easily compared and measured over time

## Clear Messaging

- Information disclosed in a rating or audit report must be clearly and easily understood by the average consumer

# Best Practices

## Link Rating Results to Action

- Promote cost effective energy savings in buildings and assist consumers with appropriate energy efficiency improvements, provide financial analyses, referral to government or utility incentives and financing opportunities
- **Austin** is heavily engaged in tailoring its incentive programs and audit process to promote upgrades both prior to and following property sales, attempting to identify key trigger points that spur owners to act.
- **Austin, New York City & Washington State** require mandatory upgrades of cost effective measures identified in audits for public facilities through lead by example legislation

# Best Practices

## Know Building Stock

- **Austin & New York** both consider the specific nature of existing buildings before designing the BER&D laws

## Ensure Timely Disclosure

- Ratings should be available early in the process and ideally in all advertising. If buyers only receive info toward the end of the process they will not be able to use that information effectively and the policy will have forfeited its opportunity to influence the marketplace.
- **Austin** learned the impacts of untimely energy rating disclosure recognizing the missed opportunity to impact sales and rental decisions. Legislation was amended to ensure ratings are available before the sale closes and ideally while the property is still being shown

# Best Practices

## Careful Monitoring and Enforcement

- Rating and disclosure rely on high compliance rates to be effective.
- Combination of strong incentives credible enforcement and dissuasive penalties are essential to ensuring success.
- Fines should be the final step in a longer effort to engage and educate property owners.
- Assign an administrative agency with resources and mandate to build support for the BER&D rules, coordinate information campaigns and track compliance data have a greater impact than imposing fines and penalties.

# Recommendations

- Use **IMPLAN** (a highly accurate and adaptable economic model) to calculate direct, indirect, and induced employment and related benefits
- **DEVELOP OUTREACH PROGRAM** – contact business owners directly, partner with local/regional organizations, provide continuous training and assistance, develop website and online media resources
- **CREATE AN APP WITH REAL-TIME FEEDBACK** – mobile technology is a must
  - Utility-sponsored for building manager and operators
  - Local government-sponsored for apartment seekers

# Challenges

- In terms of larger financial impacts of benchmarking and transparency policies, unfortunately most policies haven't been in place long enough for there to be a consensus, or even statistically significant information, on how big the impact has been. New York City's latest report has some interesting year over year information for the last few years (though again, **it's too soon to conclude long-term patterns from these short term results**).
- Caroline Keicher, MSc  
Associate Director, Policy and Engagement  
Building Energy Performance Policy  
Institute for Market Transformation

Manage  
what you  
Measure  
...then  
Improve!

