How City-Led Efficiency Efforts Can Support State Energy Planning

energy.gov/eere/slsc/EEopportunities

About this Presentation

Slide Overview

- Summary
- Purpose and Benefits
- Current Status
- State and Local Role
- Partners
- Best Practices in Implementation
- Examples
- Cost-Effectiveness
- Evaluation, Measurement, & Verification (EM&V)
- DOE Support

This short presentation is intended to give states and their stakeholders a vision for what it would look like to include city-led energy efficiency programs in their energy plans.

City-Led Efficiency as an Emission Reduction Approach

Possible Leads

- City energy or sustainability office
- City general services office
- Municipal utility
- Community-based organizations

E-Savings

- Aggregate city-wide (municipal, industrial, commercial, residential) electricity savings compared to starting year consumption

Potential Program Components

- Building performance policies
- Voluntary building efficiency challenges
- Financing (property assessed clean energy [PACE], performance contracting)
- Municipal building efficiency
- Water/wastewater treatment facilities
- Streetlight upgrades
- Homeowner outreach

Activities	EM&V
Energy Savings Approaches	
City offices, utility, or community-based organizations generate energy savings from: • Training, outreach, enforcement of building efficiency policies • Outreach and technical assistance for voluntary programs • Installing energy upgrades to municipal buildings, water/ wastewater treatment facilities, streetlights	Recent resources provide guidance, including: • *DOE Benchmarking & Transparency Policy and Program Impact Evaluation Handbook* • *Evaluation of U.S. Building Energy Benchmarking and Transparency Programs* • *Assessment of Automated Measurement and Verification (M&V) Methods* • *Federal Energy Management Program M&V Guidelines Version 4*
State Policy Options	
• Enable cities to implement PACE • Provide guidance to utilities for streamlining energy data access for building benchmarking • Create state-led city programming (e.g., MA Green Communities)	

Why City-Led Efficiency?

By 2030, 87% of U.S. energy use will be in and around American cities (IEA). Cities are poised to impact energy use as asset owners, law makers, taxation authorities, and recognition providers.

How City-Led Efficiency Works

Cities can contribute to statewide energy and air emission reductions through:

1) Energy efficiency improvements in local government assets, such as municipal buildings, water/wastewater treatment facilities, and streetlights
2) Building performance policies to achieve energy savings in commercial buildings and homes
3) Voluntary programs in which local governments provide assistance for and recognition of efficiency in commercial, multifamily, and residential buildings

Benefits of City-Led Efficiency

- In addition to government cost savings from using less energy, non-energy benefits are often an important factor to state and local governments. Some of these include:
  - Economic development
  - Air quality improvements
  - Local jobs
  - Resilience and durability of building stock
  - Tax revenues

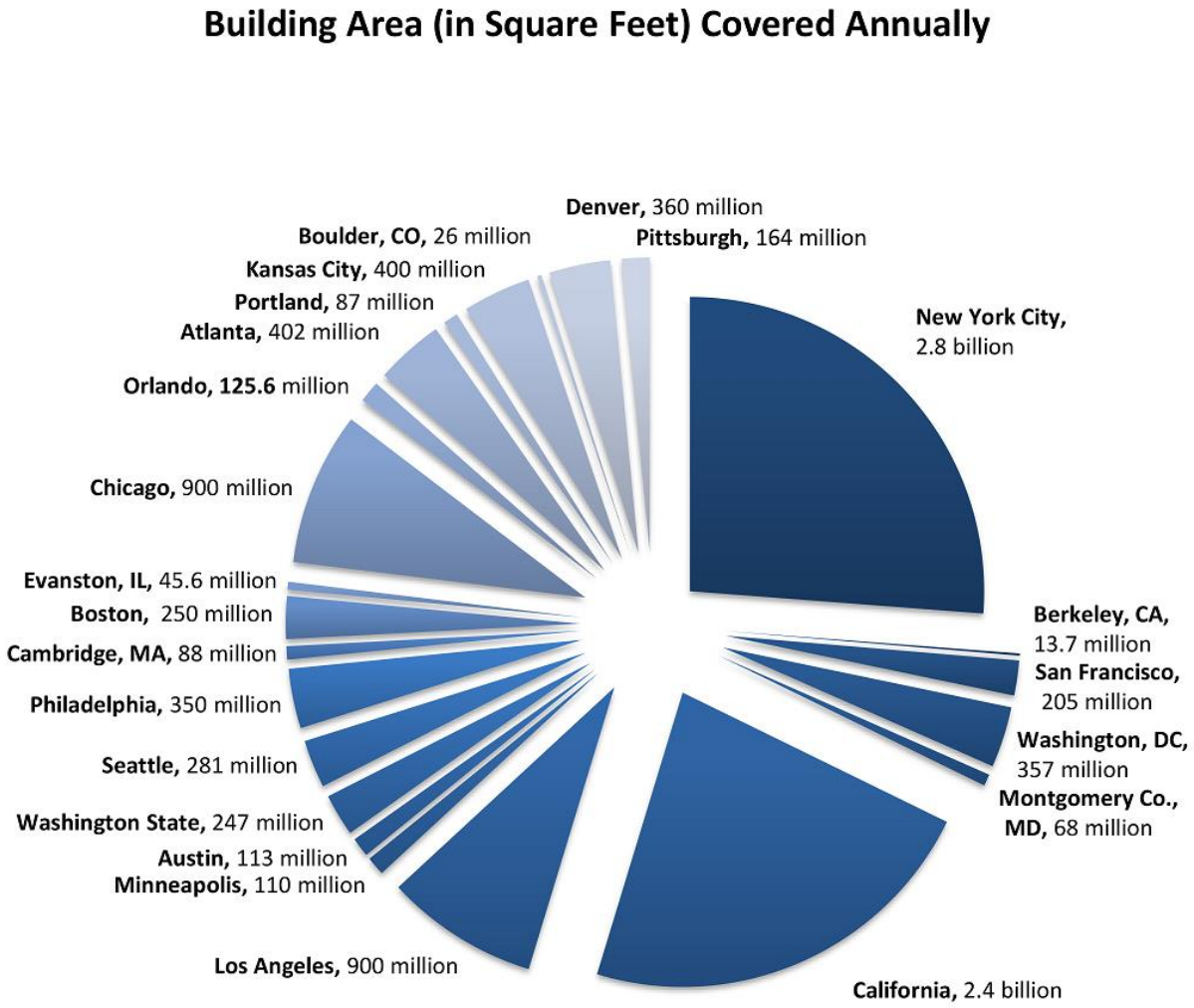
Current Status - Municipal Building Efficiency

45 local governments have committed to reducing energy use across their municipal building portfolio by at least 20% over a decade through the Better Buildings Challenge

Current Status – Building Performance Policies

Benchmarking and transparency policies:

As of January 2017, approximately 10.7 billion square feet of floor space across more than 20 cities, states, and counties is covered by a benchmarking and transparency policy (IMT)



Current Status – Voluntary Programs

- Local governments lead an estimated 50 energy efficiency challenge programs nationwide, which encourage building owners in their jurisdictions to adopt and pursue efficiency goals. These include:
  - *Kilowatt Crackdown in Minneapolis, Phoenix, Portland + others*
  - *ICLEI Green Business Challenge in Lexington, West Palm Beach + 14 others*
  - *Better Buildings Challenge programs in Atlanta, LA, Chicago + others*
  - *Salt Lake City Skyline Challenge*
  - *Envision Charlotte*

- Local governments help administer over 30 commercial property assessed clean energy (PACE) programs that facilitate energy efficiency loans for building owners. Local governments in three states also have active residential PACE programs.
  - As of mid-2017, an estimated 1,100 commercial PACE projects and 158,000 residential PACE projects ($4.16 billion invested) have been completed nationwide. (*Source: PACE Now*)

State and Local Role in City-Led Efficiency

City-led efficiency requires state and local action

Policy Actions

State legislatures or public utility commissions can facilitate city savings through:

- Enabling policies that facilitate clean energy financing, such as PACE (e.g., Texas, Colorado, Missouri)
- Utility requirements to facilitate better access to energy data (e.g., California, Washington)
- Targeted city programming to encourage and provide technical and financial assistance for community-wide efficiency (e.g., Massachusetts)

Implementation Actions

City offices (e.g. General Services, Sustainability, Finance, Mayor's Office), municipal utilities, or community-based organizations generate energy savings from:

- Training, outreach, enforcement of building efficiency policies
- Outreach and technical assistance for voluntary efficiency programs
- Installing energy upgrades to municipal buildings, water/ wastewater treatment facilities, streetlights

Partners

Potential partners for successful city-based efficiency programs include:

- Capital providers to capitalize clean energy financing programs
- Utilities to provide data, information, and financial incentives
- Energy service companies (ESCOs) to execute building retrofits
- Business development organizations and real estate associations to assist with outreach to building owners
- National and local foundations to promote best practices and provide program funding for efficiency efforts

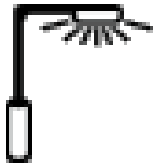
Best Practices in City-Led Efficiency

Savings Stream	Best Practice Resources
Municipal Buildings	DOE Commercial Buildings Integration Tools DOE Better Buildings Energy Savings Performance Contracting (ESPC) Toolkit ACEEE Energy Efficiency in Local Government Buildings
Streetlights	DOE Municipal Solid-State Street Lighting Consortium DOE Better Buildings Outdoor Lighting Accelerator Toolkit
Water/Wastewater Treatment	DOE Better Plants Water and Wastewater Initiative EPRI Electricity Use and Management in the Municipal Water Supply and Wastewater Industries
Building Performance Policies	SEE Action Commercial and Public Building Energy Efficiency IMT's Building Energy Performance Policy webpage
Voluntary Efficiency Challenges	Better Buildings Solutions on Private Sector Engagement
Property Assessed Clean Energy (PACE)	DOE State and Local Solution Center PACE webpage PACE Nation website

Energy Savings Examples

- Beaverton, OR, reduced energy use in its entire municipal buildings portfolio by 20% between 2009-2014
- Roanoke, VA, reduced energy use in its entire municipal buildings portfolio by 16% between 2009-2014

- Atlanta, GA reduced energy use by 36% and CO_2 by 9,200 metric tons annually in its water treatment plant



- LA replaced streetlights to reduce their energy consumption by 60%, saving 68,000 MWh, $7.5 million, and 40,500 tons of CO_2 annually

- In NYC, buildings subject to a suite of benchmarking, disclosure, and performance policies reduced energy use by 5.7% and CO_2 emissions by 9.9% in the first three years of the Greener, Greater Buildings Plan

- Participants in Atlanta's Better Buildings Challenge program, accounting for 100 million square feet of space, have reduced energy usage by an average of 12% over 5 years
- Massachusetts' Green Communities Act has led to reductions of fossil fuel power production of 33.9 TWh (5.8%), increases in renewables by 28.3 TWh (56.6%), and $1.2 billion net economic benefits in its first six years of implementation

11

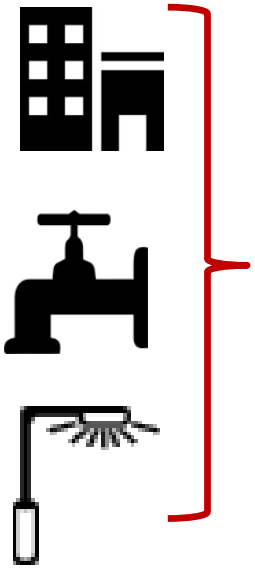
City-Led Efforts Are Cost-Effective and Lead to Other Benefits

- The cost-effectiveness of municipal building and infrastructure retrofits is well established.
  - Example: A lighting retrofit at the FDNY Fleet Services Shop in Queens cost $406,362 and will save the city $101,411 annually.
- Non-energy benefits are often an important factor for determining cost-effectiveness to local governments.
  - Example: In its first six years of implementation, non-energy benefits from the Massachusetts Green Communities Act included:
    - $1.2 billion (in 2013 net present value dollars) in net economic benefits to Massachusetts
    - State and local tax revenues of roughly $155 million (included in $1.2 billion)
    - More than 16,000 jobs
- For policies and voluntary programs, costs and benefits accrue to different parties and are difficult to track consistently due to differences in approach, scope, delivery, sector, etc.

12

EM&V Methods for City-Led Efficiency

Savings measured through benchmarking based on metered energy use (or streetlight fixture wattage) before and after the policy or program is implemented



Resources:

- International Performance Measurement and Verification Protocol
- FEMP M&V Guidelines
- Actual savings as captured in Portfolio Manager (if able to verify)

Savings measured through analysis of collected energy data from participating buildings

- DOE Benchmarking & Transparency Policy and Program Impact Evaluation Handbook
  - References IPMVP methods
  - Actual savings as captured in Portfolio Manager
  - Quasi-experimental methods

DOE Programs and Partnerships for City-Led Efficiency

- Better Buildings Challenge – best practices, solutions, and case studies to achieve efficiency in municipal and commercial buildings
- Better Communities Alliance – a collaboration to improve the prosperity of American communities through energy technologies and solutions
- Better Buildings Accelerators – targeted, short-term, partner-focused activities designed to demonstrate innovative policies and approaches
  - Energy Savings Performance Contracting
  - Outdoor Lighting
  - Energy Data
  - Clean Energy for Low-Income Communities
  - Wastewater Infrastructure
  - Zero Energy Districts
- Municipal Solid-State Street Lighting Consortium – technical information and experiences related to LED street and area lighting
- Standard Energy Efficiency Database (SEED) Platform Collaborative – a strategic effort to help cities and states successfully manage building energy performance data and identify opportunities for efficiency improvements in their jurisdictions

DOE Resources and Analytical Tools for City-Led Efficiency

- State and Local Solution Center – resources for states and local governments to advance successful, high-impact clean energy policies, programs, and projects
- State and Local Energy Efficiency Action Network – decision making information for state and local governments and utility regulators on policy and program strategies for energy efficiency in public and private commercial buildings
- Benchmarking & Transparency Policy and Program Impact Evaluation Handbook – strategic planning framework and standard methodologies to determine the energy and non-energy benefits of benchmarking and transparency policies and programs
- Cities Leading Through Energy Analysis and Planning (Cities LEAP) – standardized energy data and analysis that enables cities to integrate strategic energy analysis into decision making
- Energy Data Access Toolkit – collection of resources to enable utilities and communities to work together so building owners can get access to whole-building energy usage data for the purpose of benchmarking their buildings

Get More Information on This Pathway and Others

Visit: energy.gov/eere/slsc/EEopportunities

How Energy Efficiency Programs Can Support State Energy Planning

Overview and individual presentations on features and benefits associated with including energy efficiency in state energy plans, covering:

- National and state-level energy savings potential estimates for 2030
- Current activity at the national and state levels, best practices, energy savings examples, cost-effectiveness, measurement approaches, and DOE support for:
  - Building energy codes
  - City-led efficiency efforts
  - Combined heat and power
  - Energy savings performance contracting
  - Industrial efficiency, including superior energy performance
  - Ratepayer-funded programs
  - Residential energy efficiency
  - Low income energy efficiency
- Technical assistance available

Guide for States: Energy Efficiency as a Least-Cost Strategy to Reduce Greenhouse Gases and Air Pollution, and Meet Energy Needs in the Power Sector

State and Local Energy Efficiency Action Network (SEE Action) resource presents pathways thru:

- Case studies of successful regional, state, and local approaches
- Resources to understand the range of expected savings from energy efficiency
- Common protocols for documenting savings
- Sources for more information