Mayors' Toolkit for Energy Efficiency

By prioritizing energy efficiency, mayors can save money for their residents, offset some of the costs of city operations, help meet climate goals, and contribute to a healthier and more prosperous city and economy. In addition, energy efficiency remains the most environmentally friendly energy source because the greenest fuel is that which is never produced or burned.

Here are seven ways that mayors can improve the energy efficiency of their cities' economies:

1   Develop, implement, and communicate an energy efficiency vision for the city

Orlando Mayor Buddy Dyer assembled the city's first Office of Sustainability & Resilience to implement the Green Works Orlando initiative. This office coordinates with city departments and community stakeholders to ensure the effectiveness of sustainability planning efforts, including community-wide energy reductions of 45% below 2010 levels by 2040.

2   Increase the energy efficiency of local government operations

In 2014, Bemidji, Minnesota, which has a population of just over 15,000 people, took advantage of an energy service performance contract (ESPC) to upgrade eight city buildings, a wastewater treatment plant, and streetlights.

3   Scale up energy efficiency in existing buildings

In 2018, the Council of the District of Columbia adopted mandatory building energy performance standards for large buildings, including multifamily buildings.

4   Encourage energy efficiency in new construction

In 2018, Philadelphia became the third U.S. jurisdiction to adopt the 2018 International Energy Conservation Code (IECC). Mayor Jim Kenney said the city's commitment to the Paris Climate Agreement, as well as its efforts to ensure that buildings meet the highest standards of safety and quality, motivated the update.

5   Promote energy-efficient transportation

Los Angeles partnered with the Shared-Use Mobility Center and the California Air Resources Board to launch an electric vehicle (EV) carsharing project focused on serving low-income residents.

6   Prioritize transportation efficiency in zoning and development

Portland's zoning code encourages mixed-use development of vacant or underused properties along nearly all the city's main commercial streets and throughout most of its downtown, which serves as the region's business and cultural hub.

7   Leverage and maximize utility energy efficiency offerings

In 2014, Minneapolis entered a unique partnership with its two major utilities—Xcel Energy and CenterPoint Energy—to help the city achieve its clean energy goals.

Introduction

Regardless of a city's size or how far along it is on its clean energy journey, its mayor can be a catalyst for change. Mayors have the power to set policies and create cultures that help reduce and better value energy consumption. Beyond the direct benefits of reducing costs and carbon pollution, energy efficiency generates health benefits for residents, strengthens the resilience of the grid, complements equity goals, and spurs economic development and job creation.

Economic development was the most-discussed policy issue in the National League of Cities' analysis of 153 speeches delivered by mayors between January and April of 2019.[1] At a time when communities are losing well-paying jobs, energy efficiency has been the fastest growing job market in the energy sector.[2] Energy efficiency jobs are almost impossible to outsource, as most critical services require contractors and other professionals to work in and provide value to the local community.

More than 50% of the world's population lives in cities, which consume over two-thirds of global energy and contribute 70% of the global carbon pollution.[3] Ambitious energy reduction targets are not just for the largest cities with abundant resources; the Global Covenant of Mayors for Climate & Energy estimates that nearly half of all urban emissions reduction potential in 2030 will come from cities with populations *below* one million residents, with the vast majority of that potential coming from North American cities.[4] Cities are well positioned to innovate and promote energy-efficient practices as they understand the unique housing, transportation, and employment needs of their communities.

As this toolkit discusses, mayors can implement and improve energy efficiency in their cities by taking the following steps:

- Develop, implement, and communicate an energy efficiency vision for the city
- Increase the energy efficiency of local government operations
- Scale up energy efficiency in existing buildings
- Encourage energy efficiency in new construction
- Promote energy-efficient transportation
- Prioritize transportation efficiency in zoning and development
- Leverage and maximize utility energy efficiency offerings

1

Develop, Implement, and Communicate an Energy Efficiency Vision for the City

Mayors and their administrations can develop a vision for energy efficiency through prioritizing, planning, communication, and leadership. This process should include allocating both appropriate funding and enough staff to carry out the energy efficiency vision for the city.

ENGAGE THE COMMUNITY

Cities should engage and coordinate with members of their communities to establish a vision and goals that prioritize smart energy solutions. This should be a collaborative effort between city staff and different community stakeholders, from private business owners to local youth. The International City/County Management Association (ICMA) reports that 59% of jurisdictions indicate that public participation currently has *little or no impact* in shaping sustainability plans and strategies, pointing to a great need for public engagement on behalf of cities.[5] Community engagement can also be a powerful tool for elevating environmental justice and social equity outcomes in planning and formal decision-making processes.

CREATE A CITY ENERGY PLAN AND REDUCTION GOAL

Mayors have the opportunity to create, improve, and implement both goals and plans to reduce energy consumption and carbon pollution. The strategic energy plan can be a stand-alone document or part of a greater climate action or sustainability plan for the city. Such a plan is not a static document but rather a long-term blueprint to focus and guide actions toward a defined energy vision.[6]

The U.S. Department of Energy (DOE) identifies a 10-step process to undertake a Community Energy Strategic Plan:[7]

- Establish and charge a leadership team
- Identify and engage stakeholders
- Develop an energy vision
- Assess the current energy profile
- Develop energy goals and strategies
- Identify and prioritize actions
- Put together a funding and financing strategy
- Develop a blueprint for implementation
- Plan to evaluate
- Develop, adopt, and publicize the Community Energy Strategic Plan

Examining the reduction goals of 75 cities in ACEEE's *2019 City Clean Energy Scorecard* in terms of per capita emissions shows that 26 cities set an annual greenhouse gas (GHG) reduction per capita goal of at least 2%, and 17 of those cities are on target to meet their nearest-term goal.[8]

In 2017, Boston Mayor Marty Walsh announced a goal to reach carbon neutrality by 2050. Boston's 2019 Climate Action Plan (CAP) Update details specific actions the city will take over the next five years to significantly reduce emissions across the city.[9]

ESTABLISH STRONG LEADERSHIP TO ADVANCE THE ENERGY PLAN AND GOAL(S)

Beyond the administration taking a hands-on role to champion energy efficiency, mayors can task an employee or a team with implementing the city's energy plan and vision. These responsibilities should be assigned to work cross-functionally across municipal operations and the greater community to implement the city's energy plan.

To implement the Green Works Orlando initiative, Mayor Dyer created the Office of Sustainability & Resilience to coordinate city departments and community stakeholders; the goal was to ensure the effectiveness of sustainability planning efforts, including community-wide energy reductions of 45% below 2010 levels by 2040.[10]

TAKE ADVANTAGE OF PEER-LEARNING GROUPS AND NETWORKS

Around the world, many cities are working collaboratively to share resources and knowledge to reduce energy consumption and create a healthier environment. All cities can take advantage of the many accessible peer-learning groups and resources available.

Representing more than 700 million citizens and one-quarter of the global economy, mayors of the C40 Cities Climate Leadership Group (C40) are committed to delivering on the most ambitious goals of the Paris Agreement at the local level. Further, in the United States, national networks, such as the Urban Sustainability Directors Network (USDN), and regional networks, such as the Sustainable States Network (SSN), also offer tailored resources to help cities meet their energy efficiency goals.

DEVELOP THE WORKFORCE

When cities prioritize energy efficiency, they also experience a major co-benefit: the robust number of jobs that are needed in the clean energy economy. Currently, there are an estimated 2.38 million energy efficiency jobs in the United States, which is twice the number found in fossil fuel sectors.[11] Cities can augment this growth by administering an energy efficiency workforce development program or partnering with organizations that operate such programs. Cities running a workforce development program can concurrently implement programs and/or policies that make the acquired skills more desirable. Cities should ensure that these strategies include and benefit all residents, creating energy efficiency workforces that represent the unique diversity of their communities.

Build It Green is a partnership between the city of Chattanooga and a local nonprofit, green|spaces; it offers a 12-week leadership and workforce development training program intended to create pathways out of poverty for young adults in the green building field.[12] As of April 2020, the program has 43 graduates, with a graduation rate of 90% and an employment rate of 75% (C. Shackelford, program director, green|spaces, pers. comm., April 27, 2020).

EQUITY SPOTLIGHT: REDUCING THE ENERGY BURDEN IN LOW-INCOME COMMUNITIES

The benefits of energy efficiency investments should be equitably accessible to all. Some cities, such as Atlanta, Oakland, Pittsburgh and Saint Paul, use household energy burden—the percentage of income spent on energy bills—as an energy equity indicator.[13] They set goals to achieve citywide affordable energy burdens and create programs and initiatives to target households with disproportionately high energy burdens. On average, African American, Hispanic, low-income, multifamily, and renting households all spend a disproportionate amount of income on home energy bills compared to the average across all households.[14] ACEEE recommends low-income weatherization and retrofits as a high-impact solution to reducing high energy burdens in the long term. Strategies to ramp up weatherization include leveraging federal, state, and ratepayer funds, as well as streamlining health, housing, and energy interventions and funding. Weatherization implementers can improve and better target programs by partnering with the local community, addressing the needs of those with the highest burdens, and incorporating best practices around program design and delivery.[15]

Cincinnati's Green Cincinnati Plan has a quantitative goal to decrease household energy burden by 10% compared to current levels. As the city highlights, more than 60% of households are renters, who tend to experience higher energy burdens than homeowners. The plan also includes steps forward, such as educational and financing programs to accomplish this goal. As a result, in 2020 Cincinnati partnered with Duke Energy Ohio and three local implementation partners—Cincinnati-Hamilton County Community Action Agency, Greater Cincinnati Energy Alliance, and People Working Cooperatively—to launch a low-income multifamily energy efficiency pilot program. The program, called *Warm Up Cincy*, aims to address the city's high energy burdens by better serving renters in multifamily buildings, who make up an underserved market in the city. The program focuses on providing financial assistance and in-unit energy assessments and efficiency upgrades, and on hosting energy efficiency education workshops for tenants.[16]

RESOURCES TO DEVELOP, IMPLEMENT, AND COMMUNICATE AN ENERGY EFFICIENCY VISION

GUIDES FOR BUILDING ENERGY PLANS

- Environmental Protection Agency (EPA): Local Climate and Energy Program Design Guide: Enhancing Value and Creating Lasting Programs
- DOE: Cities Leading through Energy Analysis and Planning

RESOURCES AND TOOLS

- DOE: Local Energy Action Search
- Urban Sustainability Directors Network (USDN): From Community Engagement to Ownership: Tools for the Field with Case Studies of Four Municipal Community-Driven Environmental & Racial Equity Committees
- State and Local Energy Efficiency Action Network: Energy Efficiency Policy and Program Resources
- ACEEE: *Cities and Clean Energy Workforce Development* (topic brief)
- ACEEE: *Lifting the High Energy Burden in America's Largest Cities*
- ACEEE: Local Energy Planning Toolkit
- ACEEE: Self Scoring Tool
- ACEEE: State and Local Policy Database

PEER-LEARNING GROUPS AND NETWORKS

- C40 Cities
- Climate Mayors
- USDN
- USDN Regional Networks
- Southeast Sustainability Directors Network (SSDN)
- Sustainable States Network (SSN)
- Midwest Energy Efficiency Alliance (MEEA)

2

Increase the Energy Efficiency of Local Government

Incorporating energy efficiency into local government operations is an essential part of reducing citywide energy consumption and municipal costs and of better allocating constituents' tax dollars. Actions that lead by example and improve energy efficiency across the city's operations are more than symbolic, as energy use accounts for an average of 10% of a local government's budget.[17]

COMMIT TO AN ENERGY AND/OR GHG EMISSIONS REDUCTION GOAL

To reduce energy use in local government operations, a mayor can set a significant energy and/or GHG emissions reduction goal. According to an ICMA survey, however, only 11% of governments have set GHG reduction targets for local government operations.[18]

In 2007, the Austin City Council approved a resolution to formally establish climate and energy reduction goals for Austin's municipal operations, including the goal of carbon neutrality by the end of 2020.[19]

BENCHMARK ENERGY USAGE IN MUNICIPAL FACILITIES

Benchmarking the energy performance of government buildings is considered a best practice to better understand and optimize a building's efficiency potential. Benchmarking allows a city to compare energy profiles of similar municipal buildings to assess and prioritize potential energy reduction projects.

Cities can partner with EPA's ENERGY STAR® program to begin the energy benchmarking process via its free Portfolio Manager Tool; this free starter kit outlines the steps cities can follow to get started.[20]

Under Mayor Bill Peduto's leadership, Pittsburgh recognized the importance of diligently tracking energy data (as part of its municipal data) to reach its ambitious goals to reduce energy and water use 50% by 2030. In the first *Pittsburgh Municipal Building Benchmarking Report*, the city shared energy data for 154 municipal facilities; it also noted the steps it will take to achieve its 2030 reduction goals and lower the $2.7 million spent on utility bills. These baseline data are crucial to shaping the city's future efforts to systematically retrofit all of its facilities.[21]

RETROFIT MUNICIPAL FACILITIES

Cities can use benchmarking results and additional assessments, including building energy audits, to help develop an energy-saving retrofit plan tailored to individual buildings and prioritize future capital investments. The energy efficiency opportunities a city can uncover through benchmarking and realize through retrofitting can significantly reduce energy use and costs.

Cities can run a successful retrofit plan internally or partner with an outside energy services company (ESCo) via an ESPC. With ESPCs, an ESCo designs projects, finances them, and oversees both their initial installation and ongoing maintenance. The ESPC structure can be appealing for two reasons: Many cities do not have the expertise to target efficiency upgrades internally, and an ESPC involves zero up-front costs; generally, the ESCo is paid from the actual energy and cost savings achieved over the length of the agreement.

The city of Bemidji, located in North Central Minnesota, has a population of just over 15,000 people. In 2014, it took advantage of an ESPC to upgrade eight city buildings, a wastewater treatment plant, and streetlights. The project focused on upgrades to lighting, energy management controls, and mechanical systems, resulting in energy savings of 14% and cost savings of $119,000 annually.[22] Bemidji's mayor, Rita Albrecht, cited cost savings and pressure from the city's sustainability committee as the key motivating factors for pursuing an ESPC.[23]

ESTABLISH AN ENERGY-EFFICIENT CITY FLEET PROCUREMENT POLICY

A city can reduce the fuel costs and GHG emissions of its municipal fleet by upgrading to advanced fuel-efficient vehicles. Cities can commit to a policy that requires all future vehicles to meet an efficiency standard aligned with their long-term energy reduction goals. The Climate Mayors Electric Vehicle Purchasing Collaborative is a cooperative effort among cities across the country that aims to leverage their collective purchasing power to accelerate the market demand and conversion of public fleets to EVs. Cities and counties have committed to purchase more than 2,100 EVs before the end of 2020.[24]

In April 2018, Seattle Mayor Jenny Durkan signed an executive order that accelerates the electrification of the city's municipal fleet and phases out fossil fuel use in city vehicles by 2030.[25] Seattle's updated Green Fleet Action Plan outlines the city's goals of a 50% GHG reduction by 2025 (using 2013 as a baseline) and the transition to a completely fossil fuel–free fleet by 2030.[26]

UPGRADE PUBLIC LIGHTING

Public lighting, which is a critical tool for improving public safety, accounts for a large proportion of municipal energy spending. LED lighting is far more efficient than conventional lighting sources and has a substantially longer useful life.

In a 2017 partnership with National Grid, the city of Worcester, Massachusetts, completed an LED conversion of 13,419 public streetlights. This project is expected to save $910,000 and more than six million kilowatt-hours (kWh) a year in electricity—a reduction of 60%.[27]

CONSIDER A TELECOMMUTE POLICY

On average, Americans spend just under 27 minutes each way commuting to and from work, and that number has been steadily rising since 1980.[28] Offering municipal employees the ability and resources to telecommute, or offering a flex-schedule policy, can reduce stress on a city's transportation infrastructure and can save energy in municipal operations. A telecommute policy offers the largest benefits to employees with long commutes, as they are not paid for their travel time. By necessity, the COVID-19 crisis required (and at the time of writing, still requires) many municipal operations to be run by remote employees. Cities can use lessons learned from this experience to explore when telecommuting makes sense on a long-term basis under business-as-usual circumstances.

Montgomery County, Maryland, offers a telework program to increase employee productivity and morale, as well as to support the county's vision to provide a sustainable, greener work environment for the future. Montgomery County projects that employees who telework once a week, and who normally commute 40 miles a day, will save $206 in transportation costs and 32 hours in commute time over the course of a year.[29]

UPGRADE WASTEWATER AND WATER TREATMENT FACILITIES

A local government can have an immediate, direct impact on local energy performance by targeting water treatment facilities. Drinking water and wastewater plants are typically the largest energy consumers associated with local government operations, and they often account for 30–40% of total energy consumed. The actions of drinking water and wastewater utilities play an important role in a city's efficiency. By upgrading municipal water supply and wastewater systems with energy efficiency measures, municipalities and utilities can reduce energy consumption by 15–30%.[30]

Denver set a 2020 water quantity goal to reduce per capita potable water use by 22% relative to 2001 levels and has already achieved this goal. Denver Water has also implemented several energy efficiency initiatives at its pumping stations and has a goal in its comprehensive plan to reduce energy use by 5% annually.[31]

RESOURCES TO INCREASE ENERGY EFFICIENCY IN GOVERNMENT OPERATIONS

GUIDES TO INCREASE ENERGY EFFICIENCY IN GOVERNMENT OPERATIONS
- EPA: *Energy Efficiency in Local Government Operations*
- ACEEE: *Local Energy Planning in Practice: A Review of Recent Experiences*
- Smart Cities: Meeting Your Cities' Sustainability Goals through Fleet Electrification

RESOURCES AND TOOLS
- ENERGY STAR: Benchmarking Starter Kit for Portfolio Manager
- The Climate Mayors Electric Vehicle Purchasing Collaborative
- ACEEE: Reducing Energy Use in Public Outdoor Lighting
- ACEEE: Water and Wastewater Treatment Toolkit
- ACEEE: Government Lead by Example (resources)
- ACEEE: State and Local Policy Database

3

Scale Up Energy Efficiency in Existing Buildings

Because building energy generally accounts for 50–75% of a large city's overall energy consumption, mayors can work with residents and city staff to align policies that prioritize reductions in energy use and save residents and businesses serious money.[32] Generally, the larger and denser the city, the larger the proportion of building-sector energy use, as these types of cities tend to have more buildings, less industrial activity, and more accessible alternatives to personal vehicle transportation. Although some cities lack the authority to adopt energy efficiency requirements, voluntary adoption of efficiency measures can lead private buildings to lower their energy consumption.

BENCHMARKING AND TRANSPARENCY POLICY: COMMERCIAL AND MULTIFAMILY BUILDINGS

Benchmarking ordinances typically require owners to measure and report how much energy their buildings use. While cities can adopt an ordinance that meets their unique needs, a benchmarking ordinance tends to have the following common characteristics: 1) It uses ENERGY STAR Portfolio Manager for reporting and tracking energy use; 2) it targets larger commercial and multifamily buildings; and 3) it discloses its results to the public. Cities with benchmarking ordinances have reported a 3–8% reduction in energy use in their building stock over a two-to-four-year implementation period.[33]

In 2014, the Cambridge, Massachusetts, City Council enacted an energy-use disclosure requirement for commercial buildings of 25,000 square feet or more and multifamily buildings with 50 or more units.[34] The city has also worked with the local utility, Eversource, to set up a concierge service to help participating buildings improve their energy efficiency. Eversource staffs the program, which is paid for by energy efficiency program funds.[35]

RATE, ASSESS, OR DISCLOSE ENERGY USE IN RESIDENTIAL HOUSING

A small but growing number of local governments are adopting policies requiring residential energy ratings, assessments, or energy-use disclosures. These closely related options share a common objective: making home energy use, costs, and efficiencies visible to consumers and valued in residential real estate markets to guide home purchases and improve decision making.[36]

Portland, Oregon, has a policy that requires homes to receive a Home Energy Score when a property is put on the market, helping potential purchasers to factor energy efficiency into their purchase decisions. (The *Home Energy Score* is a 1–10 rating system developed by the DOE.[37])

REQUIRE BUILDING RETROFITS AND/OR RETROCOMMISSIONING

Retrofitting and retrocommissioning a building involves modifying existing buildings to increase energy savings. *Retrofitting* emphasizes equipment upgrades and building envelope improvements, whereas *retrocommissioning* is a process to improve the operations and maintenance of building equipment. Building and project priorities are often revealed during the energy benchmarking and audit phase, which generally precedes building retrofitting or retrocommissioning. A retrofit and retrocommission requirement can call for owners to upgrade buildings on a schedule, at various stages of the ownership cycle, and/or based on building type. The EPA estimates that

commercial buildings have a median retrocommissioning cost of $0.27 per square foot, energy savings of 15%, and a simple payback of just eight to nine months.[38] Comprehensive upgrades can reduce commercial building energy use by 20–50%.[39]

Established in 2016, Los Angeles's Existing Buildings Energy and Water Efficiency Program mandates energy auditing and retrofit requirements for large commercial and multifamily buildings. Privately owned buildings of 20,000 square feet or more and city-owned buildings of 15,000 square feet or more that are subject to the ordinance must submit energy audit and retrocommissioning reports initially and every five years thereafter.[40]

OFFER INCENTIVES

Cities can offer at least one of the following financial incentives to help residents afford energy improvements: tax abatement; permit fee reductions; or waivers, grants, and rebates. Nonfinancial incentives to encourage energy efficiency can also be offered, such as accelerating the sometimes-lengthy permitting process for developers who prove their designs go above and beyond building code requirements for energy efficiency.

The Seattle Department of Construction & Inspections' Priority Green Expedited program shortens the time it takes to obtain a new construction permit in exchange for meeting a green building standard (e.g., LEED Gold, Built Green 4-Star, or Passive House). The program sets high but achievable thresholds for energy efficiency, water conservation, waste reduction, and indoor air quality.[41] In 2019, 14% of the 781 submitted permits went through the Priority Green Expedited program and saved applicants approximately three to four months (J. Harris, green building program manager, Seattle Department of Construction and Inspections, pers. comm., April 14, 2020).

ADMINISTER A FINANCING PROGRAM

Energy efficiency upgrades can entail up-front expenses that are cost prohibitive to many home and building owners. Accessible, affordable, and accountable financing can reduce this barrier and incentivize residents to invest in reducing their property's energy use. Cities can play a role in this process by administering financing programs for eligible projects that reduce energy use. Examples include property assessed clean energy financing (PACE), tax increment financing (TIF), and revolving loan funds.[42]

In 2014, Stephanie Rawlings-Blake, who was Baltimore's mayor at that time, announced the Baltimore Energy Initiative (BEI), a three-year, $52 million program to assist residents and businesses in lowering their energy bills. The City Energy Office partners with two local nonprofit organizations—the Reinvestment Fund and Healthy Neighborhoods, Inc.—to provide low-interest loans to nonprofit and for-profit small businesses that support a strong, stable, and growing future for Baltimore.[43]

ADMINISTER VOLUNTARY PROGRAMS

Cities can also administer voluntary programs to encourage building owners to take energy efficiency actions. Although voluntary programs have less power, they can be a valuable tool to engage local businesses and increase awareness and excitement about energy efficiency opportunities. For cities with limited authority, these voluntary programs may be an effective option.

Through the DOE's Better Building Challenge, more than 360 leading businesses, manufacturers, cities, states, universities, and school districts have voluntarily committed to improving the energy efficiency of their building portfolios by a minimum of 20% over 10 years; they have also committed to sharing their strategies and results. Since the program began in 2012, energy data have been shared for more than 40,000 properties across the country, collectively saving more than $3.8 billion.[44]

SET BUILDING PERFORMANCE STANDARDS

Mandatory building performance standards are one approach that cities are taking to meet their long-term energy reduction and climate goals. Such standards require existing buildings to meet a performance benchmark (such as energy or carbon intensity, or a performance rating).

In 2019, the Council of the District of Columbia adopted mandatory building energy performance standards for large buildings, including multifamily buildings. The legislation requires buildings with a floor area of 50,000 square feet or more to meet energy performance standards by January 1, 2026; the standard extends to buildings of 25,000 square feet or more on January 1, 2028, and to buildings of 10,000 square feet or more on January 1, 2031. The performance standards are part of the District's efforts, as specified in the legislation, to reduce GHG emissions 50% by 2032 and to achieve carbon neutrality by 2050.[45]

EQUITY SPOTLIGHT: RENTAL PROPERTY EFFICIENCY STANDARDS

Lower-income individuals, younger populations, and people of color are more likely to rent versus own their homes and face a disproportionally higher energy burden than their home-owning counterparts.[46] Energy efficiency upgrades tend to be more difficult to complete in rental properties due to the common scenario in which owners are responsible for the up-front costs of efficiency upgrades, but the residents reap the cost savings because they are responsible for the monthly utility bills. One method a city can use to reduce this problem is to implement a rental property efficiency standard or an energy disclosure requirement.

Adopted in 2010, Boulder, Colorado's SmartRegs policy requires all long-term licensed rental properties to meet or exceed minimum efficiency standards before they can receive their rental licenses. The program is funded through the city's Climate Action Plan tax and fees collected from noncompliant rentals.[47] By the end of 2019, approximately 22,500 of Boulder's approximately 23,000 licensed rental units were in compliance with SmartRegs.[48] The average upgrade cost has been $3,022 per unit, of which an average of $579 was paid by rebates. As of the end of 2018, the city estimated that the program had saved about 1.9 million kWh of electricity, 460,000 therms of natural gas, $520,000 in energy costs, and 3,900 million metric tons of carbon dioxide.[49]

ADDRESS THE URBAN HEAT ISLAND EFFECT

Dense urban areas made up of buildings, parking lots, and streets absorb more heat than their rural counterparts, where green and vegetated surfaces release water vapor and provide shade. There are many solutions available to alleviate this urban heat island effect. Cities can set goals and create policy and programs aimed at reducing the temperature of impermeable surfaces, in conjunction with increasing the urban tree canopy, deploying cool or green roofs, and expanding wetlands.

Chicago's Tree Planting Program plants trees along the public right-of-way at residents' request. Chicago property owners who want a new tree planted on their parkways can submit a request through the city's website. These efforts, among others, have led to Chicago being recognized as a "Tree City USA" by the Arbor Day Foundation for the 37th year in a row.[50]

RESOURCES TO SCALE UP ENERGY EFFICIENCY IN EXISTING BUILDINGS

GUIDES TO INCREASING ENERGY EFFICIENCY IN BUILDINGS

- World Resource Institute: *Accelerating Building Efficiency: Eight Actions for Urban Leaders*
- DOE: Commercial PACE Fact Sheet for State and Local Governments
- DOE: *Benchmarking and Transparency: Resources for State and Local Leaders*
- Rocky Mountain Institute: *Better Rentals, Better City—Smart Policies to Improve Your City's Rental Housing Energy Performance*

RESOURCES AND TOOLS

- DOE: Better Buildings Challenge
- ACEEE: *Home Energy Policies: Ratings, Assessments, Labels, and Disclosure* (policy brief)
- ACEEE: *Commercial and Multifamily Building Energy Benchmarking, Transparency, and Labeling in US Cities* (policy brief)
- ACEEE: *Mandatory Building Performance Standards: A Key Policy for Achieving Climate Goals* (forthcoming white paper)
- ACEEE: *Cool Policies for Cool Cities: Best Practices for Mitigating Urban Heat Islands in North American Cities* (report)
- ACEEE: Strategies for Energy Savings in Buildings
- ACEEE: Building Policies
- ACEEE: Local Policy Database

4

Encourage Energy Efficiency in New Construction

UPDATE BUILDING ENERGY CODES

Updating to a more modern and efficient energy code is one of the most cost-effective strategies for achieving energy savings. Although not all municipalities have the legal authority to adopt stretch codes—that is, more stringent building codes that result in higher energy savings—cities can still advocate at the state and national level for energy codes that mandate practices that lower costs and reduce energy use and the city's carbon footprint. The Energy-Efficient Codes Coalition offers resources on the benefits of energy codes, as well as steps a city can take to update its energy codes.

In 2018, Philadelphia became the third U.S. jurisdiction to adopt the 2018 IECC. In discussing the motivations for the code update, Mayor Jim Kenney referenced Philadelphia's commitment to the Paris Climate Agreement and its own efforts to ensure that buildings meet the highest standard of safety and quality. In Pennsylvania, only the state government is authorized to adopt updated building codes; given this, the state legislature had to pass a bill to create a one-time legal exemption authorizing Philadelphia to jump ahead to the 2018 code for commercial construction.[51]

VOTE FOR MORE-EFFICIENT CODES

By registering a membership with the International Codes Council, mayors and city officials from all over the country influenced the 2021 IECC by voting for new requirements that will make buildings more energy efficient. New buildings will use 10% less energy than buildings compliant with the 2018 IECC; this is a significant achievement, as energy efficiency grew only 1–2% from the 2012 to the 2018 IECC for residential properties.[52]

IMPROVE BUILDING ENERGY CODE COMPLIANCE

City agencies are usually responsible for energy code compliance, enforcement, and training. Enforcement of the local or state energy code primarily targets the permitting process, and enforcement stringency greatly varies from city to city. Cities can improve their code compliance by having staff dedicated to energy code enforcement, city-administered mandatory code compliance strategies, and up-front support for developers and builders for energy code compliance.[53]

The DOE Building Energy Codes Program provides a variety of technical assistance resources to support state and local code implementation, including software tools and training for code officials. Properly staffing and funding a city permitting office with qualified professionals is crucial to ensure that local architects and engineers follow the energy code and that the benefits are passed along to residents.

RESOURCES TO ENCOURAGE ENERGY EFFICIENCY IN NEW CONSTRUCTION

GUIDES TO INCREASE ENERGY EFFICIENCY IN ZONING AND CODES
- Southwest Energy Efficiency Project: EV-Ready Building Code Primer
- Great Plains Institute: *Summary of Best Practices in Electric Vehicle Ordinances*
- ACEEE: *Pathways to Zero Energy Buildings through Building Codes* (white paper)

RESOURCES AND TOOLS
- Building Codes Assistance Project
- Energy-Efficient Codes Coalition: Resources
- DOE: Building Energy Codes Program
- New Building Institute: Stretch Codes
- ACEEE: Local Energy Code Policy Database

5

Promote Energy-Efficient Transportation

Transportation was responsible for 28.8% of U.S. energy use in 2016.[54] Prioritizing more-efficient transportation options is critical to reducing a city's energy consumption while simultaneously transforming the city into a more livable, equitable place for its people to live and work.

CREATE AN EFFICIENT TRANSPORTATION PLAN AND TARGETS

Personal vehicles account for 87% of daily trips and 91% of work commutes.[55] Investment in city transportation infrastructure has historically prioritized personal vehicles, which has led to increased traffic congestion and a huge proportion of cities' carbon pollution. To improve the efficiency of a city's transportation system, cities can set goals, track progress, and create policies that encourage other modes of transportation such as public transportation, ride sharing, walking, bicycling, and other last-mile solutions.

A sustainable transportation plan that encourages equitable and multimodal transportation options can lead to a system of more-efficient transportation options for city residents. Such plans often outline multiple strategies, including improved transit, location efficiency, and multimodal options to reduce vehicle miles traveled (VMTs) and/or GHG emissions.

With community input in mind, Washington, DC's Move DC Multimodal Long-Range Transportation Plan aims to make DC more livable, sustainable, prosperous, and attractive through exceptional travel choices. As the city's population is expected to grow by 170,000 people by 2040, Move DC will guide investment and plan a 25-year vision for a more robust and equitable transportation system.[56]

INCREASE PUBLIC TRANSIT USE AND ACCESS

Well-connected public transit networks reduce residents' need to drive and therefore decrease VMT and transportation-related emissions in metropolitan areas. Although much transportation funding comes from federal- and state-level entities, a number of municipalities across the United States have come up with inventive funding mechanisms to foster transit development with local funds, indicating their interest in promoting public transit as a reliable means of transportation.[57]

To increase transit ridership and improve overall transit access, local agencies can work to boost service frequency and ensure coordination among modes and routes so that the transit system is efficient, usable, and attractive to potential customers. Other strategies to increase transit ridership include price reductions and educational initiatives that highlight the benefits of using public transit.[58]

Phoenix's voter-approved Transportation 2050 initiative expands investment in the city's streets, buses, and light rail system through 2050. Funding is generated by a 0.7% sales tax, which became effective January 1, 2016. Over the life of the 35-year plan, revenues from the sales tax are estimated to generate about $16.7 billion.[59]

ADOPT A COMPLETE STREETS POLICY

Complete streets policies focus on street interconnectivity to provide safe, easy access for pedestrians, bicyclists, motorists, and public transportation users. Complete streets create a network of roads, sidewalks, and bicycle lanes that connect to transit facilities, making people less likely to drive, thereby lowering a community's fuel consumption and GHG emissions.

Cleveland Heights, Ohio, which has a population of approximately 45,000 people, received the highest score in Smart Growth America's *Best Complete Street Policies 2018* report for its Green Streets Policy. The Cleveland Heights policy earned the highest score for its emphasis on equity, attention to detail, and binding language to spur implementation. As of December 2018, 1,477 U.S. communities had adopted complete streets policies.[60]

IMPLEMENT LAST-MILE SOLUTIONS

A robust network of public transportation can succeed only if residents have the means to conveniently get to the train or bus stop. Many residents do not live within reasonable walking distance of a train or bus stop. *Last-mile solutions* are exactly what the term implies—a solution to get people that last mile, whether it be their office, home, school, or other location. Last-mile solutions can optimally leverage micromobility initiatives, such as bikeshare programs.

Last-mile solutions should be planned and designed with equity in mind, ensuring that the benefit can be utilized by all residents. In 2015, Philadelphia created the Indego bikeshare system, which is focused on three pillars: increasing mobility for Philadelphians, financial sustainability, and equal access. Indego's network stretches into both affluent and low-income neighborhoods and offers affordable transport for everyone in the city.[61]

OFFER EFFICIENT VEHICLE INCENTIVES

As the International Council on Clean Transportation showed, major U.S. markets need to increase workplace and public fast-charging stations by 400% in the next five years to service the number of new EVs expected to be on the road by 2025.[62] A key barrier to entry in the market for fuel-efficient, advanced-technology vehicles is the high initial cost. To encourage consumers to purchase these vehicles—and the necessary charging infrastructure—incentives such as tax credits, rebates, and sales tax exemptions are important policy levers.

Washington DC offers a tax credit for 50% of the equipment and labor costs directly attributable to the purchase of alternative fuel vehicle (AFV) charging infrastructure. The maximum credit is $1,000 per residential EV charging station, and $10,000 per publicly accessible AFV fueling station.[63]

EQUITY SPOTLIGHT: CLEAN, EFFICIENT TRANSPORTATION FOR LOW-INCOME COMMUNITIES

As cities have sprawled and jobs have moved away from urban cores, many low-income communities have become geographically isolated and are now inadequately served by affordable, efficient transportation. Cities can use a number of policy levers to improve and/or subsidize access to mobility options for low-income communities.

Los Angeles partnered with the Shared-Use Mobility Center and the California Air Resources Board to launch an EV carsharing project focused on serving low-income residents. The service is based in *disadvantaged communities* as defined by the state model that accounts for income and air pollution exposure. The Blue LA EV Carshare pilot celebrated its one-year anniversary in 2019 and resulted in more than 12,000 trips by nearly 2,000 members, avoiding 260 metric tons of CO_2.[64]

RESOURCES TO PROMOTE ENERGY-EFFICIENT TRANSPORTATION

GUIDES TO INCREASE ENERGY EFFICIENCY IN TRANSPORTATION

- National Association of City Transportation Officials: *Urban Street Design Guide*
- ACEEE: *Improving Travel Efficiency at the Local Level* (policy toolkit)
- ACEEE: *Encouraging Access to Technology-Enabled Transportation Data for Passenger Mobility in US Cities* (policy brief)
- ACEEE: *Strategies for Integrating Electric Vehicles into the Grid*

RESOURCES AND TOOLS

- Smart Growth America: Complete Streets Basic Resources
- ACEEE: Transportation System Efficiency
- ACEEE: Local Policy Database

6

Prioritize Transportation Efficiency in Zoning and Development

CRAFT ZONING CODES FOR LOCATION-EFFICIENT DEVELOPMENT

Traditional zoning practices segregate industrial and residential land use while also investing in and prioritizing highway-focused development. This segregation has led to an environment in which many cities are designed so that their residents often live far from where they work, shop, go to school, and enjoy recreation. Well-crafted zoning codes, by contrast, promote the creation of walkable, mixed-use, location-efficient communities that moderate overall VMT and energy use. Changes to municipal zoning regulations can direct investment and development toward high-density, mixed-use construction near existing transit facilities and allow residents to reduce their commute times.

Portland's zoning code encourages mixed use and development, particularly of vacant and underused areas, along nearly all the city's main commercial streets and throughout most of its downtown, which serves at the region's business and cultural hub. Portland's zoning map is consistent with the regional growth plan, Metro 2040, which the city's Metro Council adopted in 1995.[65]

DECOUPLE PARKING FROM HOUSING

As cities across the country face a housing crisis—largely due to limited supply and increased costs of living— rethinking parking policy, and how it affects housing, can be a tool to help solve the problem. Historically, minimum parking requirements have been embedded in almost every city's zoning code, and this has led to many unintended consequences. These minimum parking requirements, which typically require one parking spot per unit, give a hidden subsidy to cars, increase traffic, and raise rents for all residents, regardless of whether they drive a car. Parking spaces are expensive to build and take up a lot of space; these costs are passed on to residents and constitute an opportunity cost because more dwelling units could have been built instead.

In 2017, the Hartford Planning & Zoning Commission in Connecticut voted for a revised zoning law that no longer requires builders to include car parking in new construction. The reforms are expected to reduce housing costs, cut traffic, and reduce harmful runoff.[66]

MANDATE ELECTRIC VEHICLE READINESS

Including EV charging infrastructure during new construction is significantly less expensive than a building retrofit scenario. Adding an EV infrastructure requirement minimum in the building code for all new construction projects offers one of the most effective and low-cost strategies to encourage residents to switch to an EV. A San Francisco study found that the estimated cost to install EV infrastructure was $920 per parking spot during new construction or $3,710 per parking spot during a retrofit.[67] Cities that are restricted from making local updates to their building codes can pass an ordinance that requires a percentage of parking spots to incorporate the necessary EV charging infrastructure.

In 2017, Atlanta passed an ordinance requiring that all new residential homes and public parking facilities accommodate EVs. The ordinance—which was introduced by Mayor Keisha Lance Bottoms when she was a council member—requires that 20% of the spaces in all new commercial and multifamily parking structures be EV-ready.[68]

EQUITY SPOTLIGHT: END EXCLUSIONARY ZONING

For the better part of the last century, many cities have had exclusionary zoning policies that made it illegal to build anything other than single-family homes; this remains true in approximately 75% of residential land in most American cities.[69] These exclusionary zoning polices have been a catalyst to drive up housing costs, keeping low-income individuals and people of color out of these neighborhoods. Eliminating exclusionary zoning is a strategy to make housing more affordable, reduce segregation and urban sprawl, and lower GHG emissions.

In October 2019, the Minneapolis City Council adopted a resolution to approve Minneapolis 2040, a plan that the city will use to inform decision making that affects its long-term future in relation to the built, natural, and economic environments. Notably, Minneapolis 2040 will update zoning restrictions to eliminate single-family zoning and allow for residential structures with up to three dwelling units. This policy will have many long-term carbon pollution reduction benefits due to the more-efficient housing that can now be built and the reduction in urban sprawl and traffic congestion.[70]

RESOURCES TO PRIORITIZE TRANSPORTATION EFFICIENCY IN ZONING AND DEVELOPMENT

RESOURCES AND TOOLS
- Great Plains Institute: *Summary of Best Practices in Electric Vehicle Ordinances*
- Center for Neighborhood Technology: Location Efficiency Hub
- ACEEE: Location Efficiency Policy Database

7

Leverage and Maximize Utility Energy Efficiency Offerings

Although utility policy is most influenced at the state, regional, and federal levels, cities can work alongside or partner with their utilities to save energy and money for their shared constituents and customers. These actions can take several forms and can proceed regardless of the utility's ownership structure. Some cities have developed formal partnership agreements with their energy utilities, while others advocate for regulatory reform that incentivizes greater energy efficiency. Cities served by municipally owned energy utilities generally have some influence over the investment levels and types of efficiency programs offered.

CREATE FORMAL CITY–UTILITY PARTNERSHIPS

Many cities partner directly with their utilities to improve delivery of energy efficiency programs to residents and businesses and thus support the energy reduction and/or climate goals of both the city and the utility. These partnerships should be mutually beneficial, with cities gaining additional resources and expertise to help meet their energy goals, while utilities achieve greater customer satisfaction, higher participation in their energy efficiency program(s), and progress toward their policy objectives. There is no one-size-fits-all option for a utility partnership; such partnerships vary greatly based on the goals and desired outcomes of both the city and utility.

In 2014, Minneapolis entered into a unique Clean Energy Partnership (CEP) with its two major utilities, Xcel Energy and CenterPoint Energy. The CEP is led by a joint city/utility board that reviews and approves work plans focused on helping Minneapolis achieve its energy goals. These work plans are designed to leverage statewide policies, city municipal regulatory authority, community relationships, and utility expertise; the goals are to increase the penetration rate of energy efficiency and renewable energy, as well as increase education about and focus on the reliability and equity of the city's energy services.[71]

MAKE ENERGY USAGE DATA ACCESSIBLE

Accessible energy usage data can unlock energy savings in several ways. Easily accessible data can help residents and businesses achieve savings by better managing energy use in homes, large buildings, and entire communities. Tools such as Green Button offer a consistent platform for delivering these data, although utilities might not implement Green Button without a directive from regulators.[72]

One example of a utility making data accessible is San Diego Gas & Electric (SDG&E), which provides automated benchmarking services. The utility uses the Green Button data-sharing platform to give customers access to 17 historical months of energy consumption data upon registration. San Diego has been working with SDG&E through the California's Energy Data Access Committee to improve data accessibility.[73]

ENGAGE WITH THE STATE'S PUBLIC UTILITY COMMISSION

Cities can further their energy reduction and climate goals by engaging with state public utility commission (PUC) regulatory proceedings. The National Council on Electricity Policy's *Local Government Engagement with Public Utility Commissions* guide identifies key areas in which local governments can engage with PUCs, the potential impacts of local government engagement with PUCs, and opportunities to make regulatory processes more accessible for city staff.[74]

The New York Mayor's Office of Sustainability worked through the rate case processes for both Con Edison and National Grid to rate base the development of web-based, automated benchmarking services that push data directly to customers' ENERGY STAR Portfolio Manager accounts. As a result, these services are available to every building in New York; National Grid has also rolled the services out to customers in its other service territories across the Northeast. The Mayor's Office of Sustainability has driven the issue of data access in filings with the state's PUC and Joint Utilities.

RESOURCES TO LEVERAGE AND MAXIMIZE UTILITY ENERGY EFFICIENCY OFFERINGS

- Rural Electric Cooperative Clean Energy Toolkit
- Institute for Market Transformation: Utilizing City-Utility Partnership Agreements to Achieve Climate and Energy Goals
- National Council on Electricity Policy: Local Government Engagement with Public Utility Commissions Mini Guide
- ACEEE: Energy Usage Data Access (toolkit)
- ACEEE: Local Government-Utility Partnership Strategies
- ACEEE: Local Policy Database
- ACEEE: Supporting Rural Electric Co-Op Members with Energy Efficiency (fact sheet)

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