ACEEE Policy Toolkit
American Council for an Energy-Efficient Economy

Local Government Energy Management Goals: Best Practices and Platforms
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Background

Local governments aiming to reduce their city's energy usage might begin by writing a strategic energy management plan for the local government operations. Within this plan, an energy usage reduction goal should be established. We call planning and goal setting of this nature "leading by example." By practicing energy efficiency and environmental stewardship across city operations, highly localized best practices may be developed for adoption by managers of single buildings or building portfolios within the city.

This memo provides guidance to an energy or environmental manager of a local government establishing a goal for reducing municipal energy use. This memo is most useful if the local government has begun using a building benchmarking software for a year or longer. To help an adopting city develop a goal that meets its needs, we present and discuss best practices in setting energy management goals. We also describe a variety of existing goal-setting platforms, which the city could use in its efforts. We end by describing some specific recommendations for an adopting city.

To meet the needs of a city, its policymakers, and its staff, we recommend that the energy usage reduction goal reflect four criteria:

- The goal should be *realistic,* reflecting on a modern and growing city as the backdrop.
- The goal should be *achievable,* empowering the associated departments to make meaningful strides toward the target.
- The goal should be *aggressive,* helping a city achieve energy and cost savings objectives.
- The goal should be *replicable,* establishing the adopting city as a national leader in environmental sustainability and an ambassador for its region.

Best Practices in Energy Management Goals

There are many factors to consider in goal setting. One way to organize the important considerations for goal setting is the five-criteria *SMART* acronym. ***SMART*** goals related to energy use should be specific, measurable, attainable, relevant, and time-bound.

Specific. The goal should be detailed enough to achieve its purpose, yet clear and easy to understand. To ensure specificity, we recommend the following.

- *Defined and consistent metric.* Energy usage can be measured using a variety of units such as kilowatt-hours (kWh), or proxies such as greenhouse gas emissions (GHGs) or carbon dioxide equivalents (CO_2e). A city should begin by measuring energy usage across its operations. Many energy usage measurement, hereafter "benchmarking", softwares are on the market for use by local governments. These softwares collect energy usage in terms of an energy unit, and/or cost. Some software normalizes by facility square footage. Data collected before a goal is set are called baseline data. These baseline data can be used to measure

progress toward goals after the first few years of collection. Goals can be formulated with a normalized metric, such as energy intensity (per square foot, per dollar of economic activity, etc.). Normalized goals can enable energy savings investments while actively encouraging economic activity. Unfortunately, normalized usage may be harder to measure because the units by which to normalize may not be obvious or data may be unavailable when accounting for multiple energy-using sectors.

- *Clearly stated and understandable scope.* It is critically important that the scope of the goal is clear. A city should first identify the agencies or sectors to which the goal is intended. Many cities begin by developing a goal applicable to local government operations, facilities, and fleets. The facilities under the applicable departmental umbrellas must be defined and held accountable. Each energy-using aspect must be considered. For example, does space leased by the city fall under the goal, or only buildings owned by the city? Though the goal statement may be simple, an appendix clearly stating the categories of assets to which the goal applies may be helpful.

Measurable. A goal cannot be achieved if it is not measured. The first step is institutionalizing an energy usage tracking system and collecting past data. A local government that has taken this step is poised and ready to achieve the "measurability" factor.

- *Data availability and format*. Understanding when and how facilities and/or vehicles use energy is the first step in managing and reducing usage. A benchmarking software collects building energy usage data and compiles them in a readable and easy-to-understand format (total kWh, kWh/sq ft, and cost). Measuring energy usage of the municipal fleet is also part of this process. Tracking fuel purchased and/or vehicle miles traveled (VMT) is required. In tracking progress, it is important to track data relevant to normalizing energy use by economic or service activity. Square footage for public buildings is most notable, but important indicators vary by sector (VMT, hours of lighting use, gallons of water for water treatment, etc.).
- *Tracking progress and delivering feedback.* The departments involved in the plan must be involved in energy usage measurement and reporting. Benchmarking software allows each department to input and analyze its own usage and costs. Keeping the plan representatives engaged in energy reporting will be key to staying on track throughout the process. We recommend standardizing reporting across the accountable departments to ensure consistency. Units and metrics should be uniform, as should reporting periods. Additionally, department-specific goals can also be established to improve feedback and accountability.

Attainable. It is difficult to motivate action if a goal is too aspirational to be achieved or too weak to make a difference. A local government should set a target that is meaningful, yet challenging to achieve. We recommend the following considerations to determine an attainable goal.

- *Technical and economic potential*. What energy savings has the city achieved in the past? In what end uses were the savings achieved? What additional energy savings opportunities (from both capital and operations investments) have been identified? What savings have other cities achieved or identified? What other savings opportunities are likely but are not yet known?

- *Large nationwide energy savings potential.* Evidence from across the country suggests that local governments have only begun to harvest the energy savings possible in their operations. Research from 2013 estimates that only 30% of state and local government buildings in the South have been improved through energy-savings performance contracts (ESPCs).[1] ESPC projects have on average saved 21–28% of baseline energy use in state and local buildings.[2] Similar, if not larger, cost-effective opportunities are available in improvements to water and wastewater, vehicle fleets, and streetlights and other outdoor lighting.[3] Cities are recognizing these savings opportunities, and two-thirds are planning to expand their deployment of energy-efficient technology over the next five years.[4]
- *Customized research and data collection*. A city should collect as complete of an energy usage picture as possible. If the city has holes in its information about the potential for local energy savings, it could pursue a more detailed and localized analysis of energy efficiency potentials to identify the savings available and the most cost-effective opportunities. A tool like the Local Energy Efficiency Policy Calculator could be used to estimate savings potentials in certain end uses. Expanded and improved energy benchmarking, strategic city facility audits, and other energy use data collection will provide actionable insights for the city's energy-savings purposes.

- *Resources, funding, and finance*. What resources (human and financial) are or will be available to achieve these savings? Can the capital budget be used to prioritize efficiency investments? Is the city comfortable with using ESPCs? How quickly can measures realistically be implemented to begin to achieve energy savings?
  - Most analyses of available resources must be accomplished locally through self-assessment and stakeholder engagement using methods such as SWOT analysis.[5] Many resources on program funding and finance mechanisms are available for municipal implementation of efficiency initiatives.[6]
- *Leadership and political will*. What level of commitment and support is there from leaders and stakeholders to actively pursue goals and manage progress (as opposed to treating goals as symbolic)? Is energy management being integrated into organizational culture? Are

[1] Stuart, E., P. Larsen, C. Goldman, and D. Gillian. 2013. *Current Size and Remaining Market Potential of the U.S. Energy Service Company Industry*. Berkeley, CA: Lawrence Berkeley National Laboratory.

[2] DOE (United States Department of Energy). "EECBG & SEP Technical Assistance Program Energy Service Company Benchmarking Project." Accessed June 10, 2014.

[3] DOE (U.S. Department of Energy). "Alternative Fuels Data Center." Accessed June 10, 2014; Navigant Consulting Inc. 2011. *Energy Savings Estimates of Light Emitting Diodes in Niche Lighting Applications.* Prepared for Building Technologies Program: EERE US DOE; DOE (U.S. Department of Energy). "Solid State Lighting." Accessed June 10, 2014.

[4] Mayors Climate Protection Center. 2014. "Energy Efficiency and Technologies in America's Cities: A 288-City Survey." United States Conference of Mayors. Accessed June 10, 2014.

[5] DOE (U.S. Department of Energy). "Guide to Community Energy Strategic Planning, Step 4." Accessed June 10, 2014.

[6] Mackres, E., and S. Hayes. 2012. *Keeping it in the Community: Sustainable Funding for Local Energy Efficiency Initiatives.* Washington, DC: ACEEE; and DOE (U.S. Department of Energy). "State and Local Solution Center: Financing Solutions." Accessed June 10, 2014.

energy-savings actions being mainstreamed across departments and into their long-term operations?

- *Strategy prioritization and performance management*. What strategies/measures will be pursued to help achieve the goal? What are their costs, uncertainties, and time frames? Which actions will give the best "bang for the buck"? What systems are in place to assess performance and make adjustments in strategies, if needed?
    - To implement actions to achieve an energy goal, strategies should be prioritized using a systematic method.[7] Goal and strategy development should be iterative, and, in an ideal world, goals and strategies would be adjusted as new information becomes available. Firms sometimes call this process continuous energy improvement and pursue it using the ISO 50001 Energy Management Standard or a similar process. When dealing with uncertainty, however, it is important to adopt a challenging but achievable goal when possible, in part because setting a goal enables the collection of more complete information, allowing for better decisions in the future.
- *Experiences from other cities*. What goals have peer communities set? What progress have they made toward their goals? Although it is a best practice to frame goals in terms of local priorities, it is also helpful to learn from similar communities. A peer community's success in achieving its goal can inspire action elsewhere. In this vein, we present information on the energy-savings targets for the municipal operations of four peer communities: Austin, Boston, Kansas City, and San Jose.
    - The goals and progress these peer cities are presented in detail in Table 1. These cities developed energy-related goals that on average aim to achieve a 3.75% annual reduction in usage. Three of the four evaluated communities achieved deeper annual percentage reductions than they aimed for. We present the target and achieved percentages of usage reductions as well as the amount of emissions, for ease of comparison.

[7] DOE (U.S. Department of Energy). "Guide to Community Energy Strategic Planning, Step 6." Accessed June 10, 2014.

Table 1. Energy savings plans, target annual reductions, and actual reductions of four peer communities.

Peer community	Energy-savings plan(s)	Goal language	Target annual usage reduction percentage and emissions level	Actual annual usage reduction percentage and actual emissions level
Austin, TX	Resolution 20070215-023	Make all City of Austin facilities, fleets, and operations totally carbon-neutral by 2020.	8% (2007–2020) 17,385 mt CO2e	13% (2007–2012) 30,200 mt CO2e
Boston, MA	A Climate of Progress Designation as a Massachusetts Green Community	Reduce municipal GHG emissions 7% by 2012, 80% by 2050 from a 1990 baseline (through executive order). Reduce energy use by 20% by 2014, relative to a 2009 baseline.	2% (2005–2050) 3,365 mt CO2e (for 2050 goal)	4% (2005–2012) 7,208 mt CO2e
Kansas City, MO	Climate Protection Plan	Reduce municipal emissions from 2000 levels 10% by 2010, 20% by 2015, 30% by 2020.	2% (2000–2020) 4,797 mt CO2e (for 2020 goal)	1% (2000–2005) 4,378 mt CO2e
San Jose, CA	Green Vision	50% reduction in municipal energy usage from 2007 levels by 2022.	3% (2007–2022) 12.8 million kWh	4% (2007–2011) 13.8 million kWh

Relevant. The energy management goal should be in line with a city's overall vision. An energy reduction goal helps a city achieve many benefits such as energy and cost savings and emission reductions. An appropriate goal enables short-term success and helps to build a foundation for long-term improvements in energy management.

- *Vision and objectives.* Reducing energy usage allows a city to "lead by example." within an energy and environmental focus area. The goal will inform the policies and programs developed in the future. Success of an energy reduction goal could lead to the creation of a related community-wide goal. Failure to make significant progress toward the goal could have the opposite effect and reduce the interest and political will to pursue broader or deeper goals.
- *Audience and actors*. Goals should be defined to be relevant to those who will need to take action to achieve the goal. Because departmental leaders are expected to drive action within their departments, it may make sense to translate the overall goal into goals that are specific to, and the responsibility of, each department. This will help to make the overall goal directly relevant to the responsibilities of the departmental staff.
- *Achieving co-benefits.* Many co-benefits can be achieved in progressing toward an energy reduction target. Quantifiable benefits include reduced energy bills, emissions, and maintenance costs. Harder to quantify benefits include increased livability, employee productivity, competitiveness, and energy security. Each benefit may be more or less compelling to each involved stakeholder or department. Continual involvement and

communication with the groups ensures that the goal will be beneficial to the broadest audience and that they understand how the city's progress is providing benefits that matter to them.

Time-bound. A goal exists within a time frame. A baseline year sets the standard by which progress is measured and the target year bounds the end point of the goal. Along the way, mid-term targets can help progress stay on track and manage feasibility. If a mid-term target is missed or exceeded, program implementation (or the end goal) may need adjustment.

- *Baseline method.* Baseline method consistency is important for tracking savings. There are at least three possible baseline methods for energy management: single year (a single year in the past), rolling average (the average of several immediately previous years), and annual (the immediately previous year). A baseline method must be identified, yet choosing among the three aforementioned is up to the city. A rolling average minimizes influence of year-to-year energy use fluctuations that may be unrelated to energy management activities. However, a rolling average can be difficult to communicate. Rolling average baselines make tracking progress difficult due to a shifting goal. It can be difficult to achieve significant energy savings if the goal is missed in one or more years. A year of limited progress raises the next year's baseline. Single-year baselines and a target-year goal (rather than an annual goal) can be easier to communicate and track. This type of goal formulation addresses concerns about exogenous year-to-year fluctuations because the fluctuations are averaged over the multiple years during which the goal is pursued.
- *Target years.* Target years are the end or interim points that mirror the beginning of the goal in the baseline year. There are at least three types of target year formulations: annual, interim, and end-year. For example, a goal with interim and end-year targets could state: "energy usage intensity in operations, facilities, and fleets across the five identified departments will be reduced by 5% by 2015 and 20% by 2020 from a 2010 baseline." In this case, a city would aim to reduce energy usage per measure of activity/service through 2020 with an interim target in 2015 to assess progress. The end goal in 2020 is the final measure of success for the goal period.
- *Time frames enabling success in the near, medium, and long-term.* Achieving a goal increases the confidence of both participants and stakeholders. Near-term success builds support for long-term energy management. Beginning with a low-level target and then building to a more aggressive target eases stakeholders into the process and allows for positive reinforcement along the way. Mid-term targets provide a benchmark for progress and a chance to reevaluate strategies along the way. Finally, setting long-term targets can send the message that the objectives being pursued should continue to be strategic priorities for many years to come and can help ensure continuity in the face of leadership and staff changes. For example, requiring a 5% reduction after 5 years, 20% after 10 years, and 50% after 20 years enables an increase in momentum and allows savings to be quantified and proven beneficial.

Energy Goal Platforms

Local governments can choose among a variety of existing platforms to develop and adopt energy management goals. These platforms can be valuable because they provide a standardized

approach to goal development and management. They also often provide related technical resources and access to a network of other communities pursuing similar goals.

U.S. Department of Energy's Better Buildings Challenge (Focus: energy use in buildings relative to building area). The Better Buildings Challenge is a partnership between the Department of Energy and private and public organizations from many sectors, including local governments. In this program, each partner pledges to reduce energy usage intensity (EUI) across its building stock by a minimum of 20% over 10 years and to share its strategies and results. As of spring 2014, participants had averaged a 2.5% improvement in EUI annually.[8] The process begins with a building stock assessment and an identification of energy efficiency opportunities. Next, the members complete a showcase project and share the data and tools used to achieve energy savings. During the 10-year span, DOE supports the partner through technical assistance, connects the leaders to a network of peers and allies, and continually recognizes partners for their successes.

Alliance to Save Energy's Energy 2030 (Focus: energy use relative to economic activity). The Alliance Commission on National Energy Policy developed a goal and roadmap to double U.S. energy productivity (the economic output per unit of energy used) by 2030. The Energy 2030 campaign encourages adoption of the goal by federal, state, and local governments. To achieve the goal, the campaign suggests three strategy areas: unleashing investment, modernizing regulations, and educating and engaging the public.

Architecture 2030's 2030 Challenge for Planning (Focus: level of carbon-based energy use in buildings and community-wide). Architecture 2030 aims to enable a transition in the construction market so that by 2030 new buildings and existing buildings undergoing major renovations use zero greenhouse gas–emitting energy. Additionally, for existing buildings and neighborhoods, the 2030 Challenge aims for a 50% reduction in energy and water use in buildings and transportation. To get there, it establishes three five-year incremental goals for 2015, 2020, and 2025. Architecture 2030 offers many tools and resources to educate its adopters in implementing energy-saving design strategies and procuring or generating renewable power. The 2030 Challenge was endorsed by the U.S. Conference of Mayors (Resolution #50) in June 2006. Of the peer communities, Austin, TX, is a signatory. Public-private partnerships in Seattle, Cleveland, and Pittsburgh have developed 2030 Districts to help them achieve these goals.

U.S. Conference of Mayors' Climate Protection Agreement (Focus: level of community-wide greenhouse gas emissions). In 2005, the U.S. Conference of Mayors presented the Climate Protection Agreement, which aims to enable local governments to help the United States achieve reductions called for in the Kyoto Protocol (7% reduction in greenhouse gas emissions from 1990 levels by 2012). Though this agreement lapsed in 2012, the framework is still a useful reference. In the end, 1,060 mayors have signed on, including Mayors Wynn from Austin, Funkhouser from Kansas City, Gonzales from San Jose, and Menino from Boston. Among other goals, the agreement urges signatories to inventory emissions in city operations, make energy efficiency a

[8] US DOE. 2014. "Better Buildings Challenge: Progress Update, Spring 2014."

priority, and increase fuel efficiency in municipal fleet vehicles. Many communities have used the agreement as a platform to develop localized plans and goals. In 2009, the Mayors' Climate Protection Center released a report of best practices. For more information, see the Additional Resources section, below.

State-level Energy Efficiency Resource Standards (EERS) (Focus: percentage of utility energy savings relative to demand). Twenty-five states have policies that establish specific energy-savings targets for utility-sector energy efficiency programs over a multiyear period. When annualized, these savings targets range from 0.2% to 2.6% per year. While these are state policies, they may also be relevant to local governments interested in developing energy-savings targets because they provide an example based on comparing measured savings from efficiency investments with actual consumption. A recent ACEEE report finds that states with these policies are largely on track to meet their targets.[9]

Recommendations

Based on the objectives of the draft *Strategic Energy Management Plan* and the considerations presented in this memo, we offer the following recommendations.

Establish an energy intensity or use reduction goal at levels demonstrated as achievable. The five above peer communities have established a 3% annual energy or greenhouse gas reduction goal, on average, and have been able to realize a 5.5% average annual reduction. Participants in the Better Buildings Challenge have committed to a 2% average annual reductions in energy intensity over a 10-year span. To date, participants have achieved average annual reductions of 2.5%. If a local government has achieved past energy savings, the new goal should be considered with a mind to those savings.

Develop a goal for a 10+-year period using multiple benchmark years. A mid- to long-term goal is important to foster a culture of continuous energy improvement, but nearer-term goals are also important for tracking progress. We therefore recommend a goal time frame of 10 years or more, which includes at least one interim goal in addition to the end-year goal. This will enable annualized progress to be measured every year, but with less need for concern about inter-year variation and not hitting the target in some years. If a goal for a 10-year period is adopted, it could read along the lines of, "Reduce energy usage intensity in operations, facilities, and fleets by 10% by 2018 and 25% by 2023 from a 2013 baseline."

Adopt a single "normal" baseline year. We recommend choosing a baseline year that is representative of an average year. Choose a recent year that saw normal growth, no economic shocks, and average weather patterns. Measuring progress against an abnormal year may make gains look too small or too large to be representative of larger trends.

Assign departmental responsibility. We recommend establishing a lead agency for plan implementation and responsibilities specific to other departments from the beginning. To

[9] Downs and Cui. 2014. *Energy Efficiency Resource Standards: A New Progress Report on State Experience*.

improve accountability, each of the affiliated departments should be assigned subgoals specific to its efforts and asked to develop plans to meet them.

Collect data to enable normalization. Good energy management practices requires collection of data beyond energy consumption and other energy characteristics. The ability to normalize energy usage in multiple ways is essential to tracking and managing energy use: over account levels, individual buildings, and square footage of buildings. We recommend a city use a software of choice for tracking building energy use data. Additionally, the city should make an effort to collect non-energy data, such as building square footage, to increase the accuracy of EUI figures. Other energy end uses—such as vehicles, outdoor lighting, and water/wastewater—may need even more attention to identify metrics and develop data collection practices that enable accurate normalization.

Additional Resources

DOE (U.S. Department of Energy). 2013. *Guide to Community Energy Strategic Planning.* Washington DC: DOE. http://www1.eere.energy.gov/wip/solutioncenter/pdfs/cesp_guide.pdf
This guide offers a step-by-step process for both community-wide and local government strategic energy planning. Step 5 is the most discussed step in this memo.

Mackres, E., and B. Kazerooni. 2012. *Local Energy Planning in Practice: A Review of Recent Experiences*. Washington, DC: American Council for an Energy-Efficient Economy. http://aceee.org/research-report/e123
This report reviews the planning process and local energy plans from 30 U.S. communities. Practices evaluated in this report include supporting community visions, prioritizing actions, leveraging sustainable funding, and tracking progress. Peer communities evaluated in this report include Austin, TX, and Kansas City, MO.

Mayors Climate Protection Center. 2009. *Mayors and Climate Protection Best Practices.* United States Conference of Mayors.
http://www.usmayors.org/pressreleases/uploads/ClimateBestPractices061209.pdf
The guide lists best practices from both large and small cities. The guide defines a large city as having a population over 100,000. We recommend adapting aspects from the following listed programs:

- Charleston, SC's Comprehensive Building Energy & Water Efficiency Plan
- Chattanooga, TN's Local Climate Action Plan
- Stamford, CT's City Actions to Reduce Greenhouse Gas Emissions
- Louisville, KY's Challenge to Engage Commercial Building Owners in Energy Efficiency Improvement