

**SANDAG
(SAN DIEGO ASSOCIATION OF
GOVERNMENTS)
SUSTAINABLE REGION
PROGRAM ACTION PLAN**

CONSULTANT REPORT

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California Energy Commission

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Abstract

The Sustainable Region Program is designed to assist local governments in developing energy management plans and in implementing cost-saving energy measures. These goals are addressed for existing buildings through energy audits and for new construction through plan review and policies. The Sustainable Region Program action plan is meant to provide general guidance and to work along with the toolkit to achieve program success.

The action plan is targeted at local governments without full-time energy staff and that have had little or no participation in available energy efficiency programs. It contains recommendations, initial steps, information management techniques, planning and policy suggestions, and resources for the creation and implementation of energy management plans and cost-saving energy measures.

Keywords: SANDAG, kWickview, Energy Star®, Portfolio Manager, energy, savings, greenhouse gas, GHG, emissions, funding, resources, tools

Executive Summary

The original Sustainable Region Program (SRP) Pilot was a collaborative effort among San Diego Association of Governments (SANDAG), California Center for Sustainable Energy (CCSE), San Diego Gas & Electric (SDG&E), and the City of Carlsbad. SANDAG, through its Energy Working Group (EWG), targeted local governments that had not traditionally engaged in energy management. With assistance from the Energy Commission, SANDAG was able to continue the SRP Pilot and offer services to five member agencies.

The Sustainable Region Program helps continue SANDAG's partnership with local governments in developing energy management plans and implementing cost-saving energy measures for their municipal facilities. For each local government, the Sustainable Region Program focuses energy and greenhouse gas (GHG) reduction measures in existing municipally owned or occupied buildings, new municipal construction, and in the development of local government policies.

The Sustainable Region Program provides:

- Free technical and policy support to develop energy management plans.
- Assessment of municipal energy needs.
- Facilitated building energy audits at local government facilities.
- Assistance in project development for energy efficiency installations.
- Identifies appropriate rebate and financing programs available to the agencies.

While the state and local governments face challenging economic situations, the Sustainable Region Program Action Plan and accompanying SRP Toolkit offers ideas, solutions, and opportunities of value to local governments in terms of real savings to the extent energy conservation measures and policies are implemented.

CHAPTER 1:

Introduction and Program History

Energy is a major operating cost for most local governments; it also is a cost that can be reduced through planning and creating best practices. Local governments can achieve lower energy costs without adversely affecting their staff or their ability to serve their constituents through participation in the Sustainable Region Program (SRP).

The Sustainable Region Program is offered by SANDAG (San Diego Association of Governments), the San Diego region's Metropolitan Planning Organization (MPO), to its member agencies. The SRP was designed to assist local governments in developing energy management plans and in implementing cost-saving energy measures. SANDAG has facilitated the SRP in the San Diego region with the help of the [California Center for Sustainable Energy](#)¹ (CCSE) and [San Diego Gas & Electric](#) (SDG&E). The Sustainable Region Program addresses energy-saving measures for existing buildings through building energy audits and new construction through plan review, as well as energy and greenhouse gas (GHG) reducing policies. Policy measures can range from a recommendation for a green building program to ways to integrate energy efficiency and GHG reduction measures into general plans or municipal codes and standards. A final product for each local government is an energy management plan, or "energy roadmap," tailored to its needs.

SANDAG developed the Sustainable Region Program Action Plan and SRP Toolkit as part of its contract with the [California Energy Commission](#) (Energy Commission). The SRP Action Plan and SRP Toolkit were developed as resources for other Metropolitan Planning Organizations and councils of government (COGs) to use if they were interested in developing a similar energy-saving program in their region. This document also is distributed in the San Diego region to local governments interested in taking part in the Sustainable Region Program. The SRP Action Plan works along with the SRP Toolkit to provide both general guidance (SRP Action Plan) and specific tasks and templates (SRP Toolkit) to achieve program success.

Identifying and maintaining reliable funding is essential to long-term program sustainability and success. Local governments have responded to this need for consistent funding in a variety of traditional and creative ways. While there is fluctuation in the regional, state, and national economy, energy conservation, and climate change measures include economic benefits that accrue even for small investments.

1 SANDAG has used the services of the CCSE through a memorandum of understanding entered into in 2004 under the CCSE original name, the San Diego Regional Energy Office.

Sustainable Region Program Background

The SRP was designed to assist local governments in developing energy management plans (roadmaps) and implementing cost-saving energy measures. It has been targeted at local governments without full-time energy staff and that have had little to no participation in the myriad of energy-efficiency programs made available by the state's "public goods charge," a line item on ratepayer electric and gas bills that goes to energy efficiency programs through each utility.

For each local government, the SRP focuses energy and GHG reduction measures in three areas:

1. Existing municipally owned or occupied buildings.
2. New municipal construction.
3. Local government policies.

The SANDAG [Sustainable Region Program](#) began in 2005 with the City of Carlsbad pilot. With assistance from the Energy Commission, SANDAG was able to continue the SRP pilot and offer services to two more member agencies in 2008. Following the Energy Commission contract, the local utility, SDG&E, contributed additional staff and financial resources for SANDAG to again expand the SRP to two additional member agencies for a total of five since the program's start. The participating cities are Carlsbad (2005–2006), Poway (2007–2008), Solana Beach (2007–2008), Imperial Beach (2008–2009), and Coronado (2008–2009).

The original SRP Pilot was a collaborative effort among SANDAG, CCSE, SDG&E, and the City of Carlsbad. SANDAG facilitated the effort and sought input and direction from its Energy Working Group (EWG). It was targeted at local governments that traditionally had not engaged in energy management activities. The SRP Pilot:

- Provided free technical and policy support to develop an energy management plan.
- Assessed municipal energy needs.
- Facilitated building energy audits at local government facilities.
- Assisted in project development for energy efficiency installations.
- Identified appropriate rebate and financing programs available to the city.

Carlsbad received technical, policy, and educational assistance from SANDAG, California Center for Sustainable Energy (CCSE), and SDG&E and participated successfully in each aspect of the program. The SRP Pilot assessed Carlsbad's energy performance and identified almost \$200,000 in available energy savings from feasible measures on existing buildings and new construction. Policy education helped identify potential savings for the municipality. Since the SRP Pilot, the City of Carlsbad has saved 489,571 kilowatt-hour (kWh) in energy consumption through local energy efficiency programs like the CCSE Tax Exempt Customer program.

Except for the staff time of the SRP Pilot facilitator, the majority of staff time came from CCSE and SDG&E at no direct expense to SANDAG. The SRP Pilot's time fell within its respective PGC-funded program parameters for various energy efficiency, demand response, onsite generation, green building, renewable energy, and energy education programs. The SRP Pilot facilitator requested input from the EWG throughout the SRP Pilot development and as the SRP Pilot progressed.

While the state and local governments face financial constraints due to various factors, the SRP Action Plan and accompanying SRP Toolkit offer ideas, solutions, and opportunities of value to local governments in terms of real savings to the extent energy conservation measures and policies are implemented.

The Sustainable Region Program Today

In keeping with recommendations in the [2007 Energy Commission Integrated Energy Policy Report \(IEPR\)](#) and the [California Public Utilities Commission \(CPUC\) Energy Efficiency Strategic Plan](#), the SRP policy component now includes an assessment of energy and GHG reduction measures in general plan elements and coastal plans. This effort began in 2008 with the City of Imperial Beach. SANDAG requested long-term funding to expand the SRP to all of its member agencies and has been included in the local government partnership portfolio of SDG&E for the 2009–2011 program cycle. Local government partnerships are part of the programs funded by the public goods charge and regulated by the CPUC. The funding iterations of the SRP are detailed in Step 1 of the SRP Toolkit, “Financing an SRP for Local Governments.”

Recommended Initial Steps

Several initial steps can prepare a Metropolitan Planning Organization for a successful SRP rollout. They include the following tasks:

- Engage stakeholders.
- Set regional and local energy priorities.
- Educate the public about the goals and benefits of the program.
- Create feedback mechanisms to assess your success.

Engage Stakeholders

Engagement of local stakeholders is critical to SRP success. Utility-based and third-party energy programs will provide valuable support to the local government's energy retrofit project work. Relationships with staff in other municipalities will enable the local government to learn from peer experiences. Utility expertise in energy and load management, billing and accounts, and general familiarity with the energy business can prove invaluable in planning and

implementing the SRP. Third-party providers of energy efficiency and other energy saving programs are valuable resources outside of the utility that also can guide the local government through the energy management process. Utilities and third parties often offer incentives for energy installations and retrofits, reducing not only ongoing retrofit costs for the local government, but also the costs of developing an energy management program in the first place.

By leveraging existing program and staff resources, the SRP has been able to address a wider range of energy issues and a larger number of local governments. SANDAG has strong working relationships with the utility and the California Center for Sustainable Energy (CCSE) and has partnered with both to ensure appropriate technical assistance. CCSE is a nonprofit based in San Diego, but it runs some statewide energy programs and can be contracted to assist entities across the state.

Set Regional and Local Energy Priorities

A participating local government should form a cross-departmental energy team and conduct preliminary research on regional and local energy, climate, and/or sustainability goals. The “energy team” is further detailed in Chapter 2: Getting Started. Preliminary research can offer a clear sense of the energy picture in a service area and community and enable the local government to better articulate its energy goals and priorities.

In 2003, SANDAG adopted its [Regional Energy Strategy 2030](#) that set nine goals for saving energy and diversifying regional energy resources. SRP activities in each municipality are consistent with the Regional Energy Strategy. If no regional energy plan exists, beginning with the statewide *California Energy Efficiency Strategic Plan* would be valuable. Regional and local energy policy must be consistent with state law and policy. The [United States Department of Energy’s Energy Efficiency and Renewable Energy](#) website is another valuable resource.

Clearly defined goals will shape the structure of the local government’s energy roadmap, the structure of its energy team, and the resources needed. To be effective, the SRP should investigate:

- The larger vision and mission of the region and local government.
- Regional attitudes and behavior toward energy use.
- General information on energy efficiency, conservation, and clean onsite generation.
- Any previous energy programs pursued by the local government.
- Any existing resources, programs, and organizations that can be leveraged.

Public Education Process

To guarantee SRP success, the Metropolitan Planning Organization and the participating local government should gain and maintain public support for the effort. As part of the program, the local government should keep detailed information on energy savings and tangential benefits like utility bill reductions and associated GHG reductions. The SRP participants can compile that information into reports that can be disseminated to the appropriate local government staff,

including those that can present the information to the public. Staff members tasked with marketing and outreach functions should relay the program benefits in lay terms. Public education forums can showcase the progress and successes of the program. Methods of delivery could include:

- Issuing press releases with quarterly updates on savings achieved.
- Sending out E-bulletins.
- Conducting educational forums at chambers of commerce, economic development councils, other interregional agencies, out-of-region agencies, trade associations, education (K-12 and college) staff meetings, and other organizations.
- Making presentations to local government decision makers, including city councils and county boards of supervisors.
- Contacting local government partnerships.

Performance Indicators

The "energy roadmap" involves the details needed to measure the success or failure of the SRP while allowing the energy team to make decisions to address challenges and opportunities. The establishment of benchmarks or performance indicators as a way to track progress can include regional attitudes and behaviors towards energy, current energy efficiency rates, current conservation rates, and GHG rates.

CHAPTER 2: Getting Started

This action plan provides a framework for a local government to develop an energy roadmap or energy management plan as part of its participation in the Sustainable Region Program. The activities recommended will help set the course for effective and sustainable energy management, as well as provide flexibility to implement activities that best meet local government needs. The SRP Toolkit contains specific tasks and templates to assist in this process.

Forming an Energy Team

One challenge facing any energy program is obtaining staff buy-in, since this falls outside the focus of most or all participating staff. Meeting this challenge requires a team of key participants who can reach a unified vision of the energy activities the organization should undertake. This core group will form the local government's energy team.

Successful teams increase collaboration, help build consensus, and allow those who will be affected to participate in the decision-making process. The team can help avoid problems by identifying difficulties during the project development stage and by ensuring that everyone who may be affected by a project understands the anticipated benefits.

In addition to local government staff, it is essential to build long-term political support for the Sustainable Region Program by including elected officials in the process. This will help develop reliable, ongoing support for energy planning.

A successful team should involve personnel from different departments. A team leader also should be chosen. Key participants include representatives from the following:

- *Local Government Administration/Management Office* – To facilitate policy changes and communications, especially with top-level decision makers and among departments.
- *Facilities Management Specialist* – To provide experience with the local government's building stock and with current maintenance practices. This may be public works department staff.
- *Finance Department* – To provide budgetary, accounting, and economic analysis. For example, if finance pays the local government's energy bills, they can help identify buildings with the highest energy use.
- *Engineering Department* – To ensure high-levels of energy efficiency in facility planning, new construction and major retrofit projects, and to provide technology assessments.
- *Site/Project Planning Department* – To ensure that proposals are consistent with general plans, codes, and standards, or to identify any barriers to implementing energy

efficiency and renewable energy measures. For example, building height limits sometimes present obstacles to the use of renewable energy systems.

- *Redevelopment or Economic Development Functional Entities* – To ensure that staff engages the energy team from a business and economic perspective.

Other energy team members may be added on a project- or activity-specific basis. These members may be from legal, planning, human resources, purchasing and contracts, environmental, public works, and transportation and traffic departments. Outside of the local government team, additional members should include a utility account executive, relevant third-party energy efficiency program administrators, and/or other specialists and consultants. (For more information on forming a team, see SRP Toolkit Section 4, “Guide to Forming an Energy Team”)

Identifying an Energy Manager

The decision to hire an energy manager can happen after the SRP energy roadmap is completed or concurrently. Smaller local governments with few municipal facilities and relatively uncomplicated needs can often allocate their energy management activities to existing facilities maintenance staff. This approach can be successful with assistance from energy engineering consultants and the local utility. Larger local governments that occupy multiple facilities will benefit from hiring an energy manager.

An energy manager is a full-time staff member whose responsibilities include:

- Researching, evaluating, and developing recommendations to address local government energy use.
- Coordinating energy management activities within the local government’s sub-departments.
- Championing new energy policy development and implementation throughout the local government.
- Providing liaison with the local government’s energy providers.
- Reporting back to local government decision makers.

Typically, an energy manager will save more money through avoided energy costs than will be required to support the position. The best location within the local government for an energy manager is usually in a facilities management department, but there are examples of successful energy managers being located within other departments. However, it should be a prerequisite that the department where the energy manager is located is committed to actively supporting the local government’s energy goals.

Developing Energy Priorities and Goals

It is common for energy programs to have multiple priorities, such as reducing energy costs, saving energy, “greening a region,” improving local air quality, promoting renewable energy use, and conserving resources. While these priorities may change from year to year, the three priorities recommended for the Sustainable Region Program are:

- Reducing energy costs and increase efficiency by retrofitting existing facilities.
- Ensuring that all new facilities are built to a high standard of energy performance.
- Encouraging local governments take ownership of their energy future.

The challenge is to translate general priorities into specific program goals. Energy program goals should encompass what a local government wants to achieve from measured energy management efforts. Goal definitions are usually high-level and long-term; unfortunately, they often are defined so loosely that they appear abstract and open to interpretation. Clearly defined goals with metrics better serve an organization, for example:

“The Federal Government established an overall energy management goal that required all federal agencies to reduce the energy consumed in their buildings by 30 percent by the year 2005, and by 35 percent by 2010, compared to a 1985 baseline.”²

This goal defines the target area (all federal local government buildings), a quantified result (30 percent below the 1985 level), and provides a stated time period in which the goal is to be achieved (by 2005). It is important, however, to recognize that goals are only as good as the implementation programs that support them and make them happen.

Programs and Projects

To support an organization’s energy management goals, it will be necessary to set up individual energy projects or develop multi-project implementation programs. Through SRP participation, a local government is able to identify energy projects, timelines, and resource needs.

Implementation programs and projects focus on achieving a municipality’s energy goals through measurable terms, with defined periods for completion. When designing an energy program, it is important to clearly identify a strategic or long-term goal and short-term objectives. Typical quantifiable terms for measuring progress include: dollars saved, reductions in energy consumption and electric demand, the percentage of inefficient lights retrofitted, operation and maintenance time saved, program participation levels, and so on.

2 USDOE Order DOE 0 432.2A, April 15, 2002.

CHAPTER 3: Managing Energy Information

Developing a process to record, track, analyze, and report both the amount and cost of various energy resources is a critical component of local government energy management. Energy-related resources include electricity, electric demand, natural gas, propane, steam, compressed air, water and wastewater, and transportation fuels.

An effective energy accounting system can help identify areas with the greatest savings potential, indicate trends in energy use, help manage programs, measure progress toward goals, identify billing errors, and support better decision making. All of these items will help the energy program gain support. Two examples of energy tracking programs are [Energy Star® Portfolio Manager](#) and [kWickview](#), which are discussed under the Energy Bills subheading shortly.

There are three major categories of activities associated with energy accounting systems:

- Collecting and tracking data.
- Analyzing data.
- Reporting data.
-

Collecting and Tracking Data

The team leader should compile existing energy-related information from all available sources. The objective is to collect, track and maintain the following information:

- Energy bills.
- Building and facility data.
- Energy supply information.
- Local government policies and applicable government regulations

The tasks included in this section should be discussed in the Kickoff Meeting. They will involve interaction between the team leader, the energy engineer, and the utility representative. For a sample meeting agenda, see SRP Toolkit Section 5, “Kickoff Meeting.”

Energy Bills

The team leader should collect from the utility service provider the past one to three years of energy bills (more years if possible) for all facilities. The bills will provide information on energy use and costs, utility rates, and other charges, and utility metering practices. The team leader can contact the utility account representative or customer service department for assistance in interpreting the data. (See SRP Toolkit Appendix B. II. “Sustainable Region

Program Questionnaire” and B. III. “Preliminary Assessment Questions” for examples of collection procedure.)

The team leader should select a mechanism to track building energy use, costs, and savings. The California Center for Sustainable Energy assisted the local government in tracking and analyzing energy data. In the San Diego region, SDG&E offers a free on-line tracking program (kWickview) to graph and review historical energy use. The SRP and local governments in San Diego will be provided training on the Energy Star® Portfolio Manager once the SDG&E 2009-2011 energy efficiency programs are adopted by the CPUC. Portfolio Manager is an interactive energy management tool that allows one to track and assess energy and water consumption across an entire portfolio of buildings in a secure on-line environment. It can help identify underperforming buildings, verify efficiency improvements, and receive Environmental Protection Agency (EPA) recognition for superior energy performance.

Developing an energy accounting and tracking software program can be time-consuming, so consideration should be given to commercially available energy accounting software systems including those mentioned above. Most proprietary systems will track energy, as well as non-energy utilities such as water, wastewater, and municipal solid waste. Utilities and utility accounting software developers have responded to this problem by offering systems that enable utility billing data to be entered electronically into the energy accounting system. This simplifies the process of entering utility billing information and ensures that energy use and cost data are kept up to date.

To help a local government track and maintain energy data:

- Consider either network-based or proprietary desktop energy accounting systems. (See [Energy Calculators & Software](#) at USDOE.)
- Ensure that the new billing and energy use data is added to the historical database as it becomes available.
- Inquire about electronic data interchange (EDI) from the utility, which allows for the transfer of billing data electronically.
- In the San Diego region, use SDG&E kWickview service to review historical energy use.

Building and Facility Data

Building and facility data requirements include information on age, size, occupancy, energy equipment, building envelope, past energy assessments, renovations or equipment upgrades, and any future changes planned.

Energy Supply Information

Compile contractual and other information relating to the local government’s purchasing arrangement for energy commodities, water, sewer, and related services.

Local Government Policies and Government Regulations

The appropriate local government staff member should collect any policy or regulatory information pertaining to energy-related equipment purchases, building design codes and standards, and local government planning policies. All of the historical data should be tracked and recorded in an organized and accessible format.

Analyzing Data

Once data is compiled and being tracked, analyze it for opportunities for energy and cost savings. Most purchased utility billing software can be set up to provide the following formats and will help determine which buildings to focus on:

- Determine for each building (or by utility meter if this is different) the year-round base loads, seasonal loads, load factor, anomalies, and billing errors.
- Determine benchmark data and energy use intensities (that is, annual kilowatt-hours per square foot [kWh/sq ft-yr], watts per square foot [watt/sq ft], therms per square foot [therms/sq ft], and annual millions of British thermal units per square foot [MBTU/sq ft-yr]). Compare each facility against established energy use indices for similar facilities. This will give a preliminary indication of how well a building is performing.
- Review existing utility metering arrangement; assess its suitability for the local government's energy management needs. Additional metering could be needed to provide adequate information.

Reporting Data

Determine who currently reviews energy bills and related expenses and who should receive reports on energy use and related issues and devise a plan for reporting. This involves the following:

- Determine what information requires review and when that should occur.
- Consider how providing regular information on energy use and costs can help support the energy program.
- Adapt reports to the audience. For example: the finance department may need information regarding any sudden spikes in energy costs; building operators may require information about building efficiency compared to other similar buildings; building managers may want early warning on unexpected trends in energy use.
- Establish an organized filing system for keeping records and information relating to energy usage, energy rates and costs, technical information, equipment and facility status, energy assistance opportunities, and other key data.

CHAPTER 4:

Facility Energy Management

In many local governments, building energy costs are the second largest annual expense after employee salaries. In spite of this, some local governments do not know their energy cost data. Energy costs may be distributed across departmental budgets and not accumulated even at budget time. In addition, public agencies may budget energy cost as a fixed cost and not realize that there are opportunities to reduce that expense.

Energy costs can be managed through a range of energy conservation measures and initiatives. Most local governments initially focus their efforts on improving energy efficiency in their existing facilities. There are a number of major issues to consider when developing a program to retrofit existing buildings, including:

- Assessing existing facilities.
- Undertaking long-term assessment planning.
- Developing projects.
- Performing operation and maintenance.

Assessing Existing Facilities

Program facilitators should start the energy plan process by reviewing the local government's energy bills and keeping the 80/20 rule (Pareto Principle) in mind. In their experience, energy experts at the California Center for Sustainable Energy have found the Pareto Principle applies to energy usage at local government buildings: It is likely that less than 20 percent of the facilities are using 80 percent of the energy.

There is more than one way to consider possible projects. One option is to pick "low hanging fruit," for example, a gym that contains several dozen 500-watt incandescent lamps. This type of project can provide great savings with a short payback. With this approach, however, it is rarely cost-effective to pursue projects that have longer paybacks like chiller replacements. These projects with more upfront cost face a tougher time moving forward once the more economical projects have been completed.

An alternative and more cost-effective practice is to develop comprehensive projects where short payback projects can subsidize projects with longer payback periods. Comprehensive projects like these can provide an acceptable overall project payback time and will maximize the efficiency of all energy-using systems in the facility.

There are a number of steps in putting together a retrofit project. Apart from acquiring initial funding, these steps include: energy assessment, project design, construction, commissioning (implementing operational and maintenance improvements to insure energy improvements are working as expected), project evaluation, and assembling an appropriate operations and maintenance plan for all energy systems.

Assessments can be a key piece of the initial project selection process. There are different kinds of assessments, each equipping the energy manager for different kinds of decision-making. Basically, an energy manager assesses of the energy-using systems already in a building and then recommends what can be done to improve building performance. For a complete explanation of assessments, see SRP Toolkit Step 6, “Guide to Municipal Building Energy Assessments” and Step 7, “Assessment Report Meeting.”

Long-Term Assessment Planning

The assessment of a local government’s facilities will help identify energy conservation and self-generation opportunities and enable the local government to prepare a long-term plan to complete comprehensive energy retrofits of all its facilities. However, it is not necessary to delay getting started on energy retrofit projects at some facilities while others still are being audited. As mentioned above, an examination of the local government’s energy bills will quickly reveal the big energy users. Staff can complete assessments for the remainder of the local government’s facilities as resources become available.

A typical building energy audit includes recommendations on the following features:

- Heating, ventilation, and air conditioning (HVAC)
- Lighting
- Energy management systems (EMS)
- Building envelope (that is, the building’s parameters)
- Plumbing fixtures
- Self-generation opportunities
- Equipment scheduling
- Operation and maintenance improvements

The SRP Toolkit contains several templates in Appendix B that identify relevant energy efficiency opportunities and preliminary energy-assessment items. To prepare for energy audits or assessments, you will need to:

- Compile any previous assessments or surveys that have been performed.

- Contact building managers or maintenance personnel to arrange audit and interview times.

Developing Projects

Once a building's energy use and costs are well understood, the energy assessment is likely to reveal energy equipment upgrades that are good business decisions. The assessment recommendations may cover measures such as lighting system and HVAC upgrades, cool roof project potential, controls that save energy, or adding a renewable energy generating system. The energy manager can determine which measures make economic sense, are technically sound, and whether they will maintain or improve system performance and reliability. Having identified good retrofit measures, the following additional factors also should be considered as the project moves forward:

- Determine the funding availability for implementing the proposed project.
- Take advantage of utility, state, and regional technical assistance programs.
- Identify the projected lifetime and proposed future uses for the building.
- Identify any other potential projects that can be combined in the contract to reduce the overall project cost.
- Examine non-energy considerations, such as the presence of asbestos, that might affect the cost of the project.
- Determine who will be responsible for implementing the project.
- Consider the most appropriate contracting method. This might vary from a traditional design-spec-bid-construct contracting method, in which each of the required services is separately contracted out, to contracting out a whole project to an energy service company (ESCO) that will provide a complete 'turnkey' project.
- Identify available funding programs.
- Obtain the support of top management and include all departments affected by the project, including administration, finance, contracts, public works, engineering, maintenance, and planning.

The [Federal Energy Management Program](#) (FEMP) provides extensive information on developing energy projects, including downloadable software for identifying energy improvements, simulating energy use in buildings, identifying opportunities for renewable energy use, life cycle costing, and many others.

No-Cost and Low-Cost Modifications

In many cases, the assessment will identify no-cost or low-cost modifications to equipment or to its operation that can have immediate beneficial impact. These include providing instructions on office equipment shutdowns, thermostat settings, lighting use recommendations, better

switching or other controls, using motion sensors, and other such behavioral modifications that will not impact office productivity.

Operations and Maintenance

Improved operation and maintenance of the energy equipment in a building can provide energy-saving opportunities, often at low cost to the local government. It is not unusual for the operation and maintenance savings from a retrofit project to exceed the energy savings. Successful projects require that the team leader work closely with maintenance staff; this also may have the additional benefit of recruiting additional advocates for sound energy management practices.

Commission or Recommission Facilities

Commissioning a newly constructed building and recommissioning an existing building are procedures to ensure that building energy systems closely match the actual energy needs. The process provides significant opportunities to improve energy use and should be done on a periodic basis in conjunction with the building maintenance staff. Also, consider the following measures:

- Adjusting temperature set points and operation schedules of HVAC system.
- Testing and balancing the HVAC air distribution system.
- Performing recommended maintenance on HVAC systems.
- Removing or replacing outdated, inefficient light bulbs or redesigning the system.
- Performing building operation and maintenance proactively to speed energy improvements.

After recommissioning, there are often further energy and costs savings that can be obtained through a proactive building operation and maintenance program. The energy team should meet regularly with building operation and maintenance staff to explore improvements. Ideally, maintenance operations will progress from a preventive maintenance process to a predictive maintenance process, and from there to a reliability-centered maintenance program. Consider doing the following:

- Participate in utility demand reduction programs.
- Educate staff on workplace energy efficiency measures.
- Provide an effective employee operation and maintenance problem reporting procedure.
- Ensure that lights and equipment are turned off when not needed.
- Ensure HVAC and other equipment is properly maintained to minimize energy losses.

CHAPTER 5: Non-Building Infrastructure Recommendations

Energy management plans also should include local government infrastructure and other measures. When well-managed, these can reduce energy use as well as have environmental benefits. These opportunities include examination of exterior lighting, water and wastewater, and recycling programs-

Exterior Lighting

Measures to improve the energy efficiency of outdoor lighting near buildings, in parking lots, and along streets offer energy savings opportunities since these systems have significant costs for energy and operations and maintenance. Outdoor lighting also has a major effect on the appearance of a facility or of a neighborhood at night. These two issues – cost and appearance – are the key issues in outdoor lighting. In exterior lighting projects, also consider the following:

- *Traffic lights.* Use light-emitting diode (LED) lights for red, green, and flashing yellow lights. Consider battery backups at critical traffic intersections.
- *Streetlights.* Energy efficient compact fluorescent and LED fixtures suitable for lower wattage street lighting applications are now available. Induction and LED street-lighting demonstrations are being tested by SDG&E and the city of San Diego.
- *Parking lot lights.* In parking lots, consider bilevel (high/low) lighting with a motion sensor system and/or energy efficient compact fluorescent fixtures.
- *Small or remote lights and remote communications and call boxes.* Consider using photovoltaics with energy storage to supply lower wattage lights and those remote from the electric grid.

Water and Wastewater

There is a strong relationship between water and energy use. Water-related energy uses annually account for roughly 20 percent of the state's electricity consumption, one-third of non-power plant natural gas consumption, and about 88 million gallons of diesel fuel consumption. Any measure that saves water also saves energy and potentially funding. Agencies should consider the following measures:

- Review local government irrigation and landscaping systems. Overwatering of planted areas is common. Drought tolerant, low-water-use plants and xeriscaping should be used where possible.
- Explore shifting water-pumping operations to off-peak hours.

- Implement water conservation programs.
- Implement water conservation measures, such as porous parking lot design that allows water to soak into the ground rather than running off as wastewater, to provide for water infiltration and to lower ambient temperatures.
- Ensure that a leak reporting system is established and effective.
- Take advantage of state and utility programs to improve water and energy efficiency; references to these programs are available through the California Center for Sustainable Energy.
- Take advantage of incentives, rebates, and technical assistance available from local water authorities and other sources.

Recycling

Recycling programs have indirect energy and cost-saving benefits for local governments. In addition, they also can be a source of revenue. To increase the success of recycling programs:

- Encourage recycling through awareness programs.
- Provide clearly marked recycle material containers.
- Be aware that local governments can charge variable rates for garbage collection bins to reward recycling.
- Promote backyard composting programs.

CHAPTER 6: Land Use and Transportation Planning

California energy laws have a great effect on land use and transportation planning, since the majority of GHG emissions in California are the result of infrastructure and development decisions. Based on state and local policies, local governments should consider:

- How to build buildings and how to retrofit existing buildings.
- Where to locate buildings.
- The quality and types of infrastructure required to serve these buildings.
- Enhanced telecommunications infrastructure to support telecommuting (California Emerging Technology Fund).
- The development of business cases across industries (police, health care, education, and others) that demonstrate energy expense savings.
- Compatibility with the regional comprehensive plan or the regional blueprint plan.

The Energy and Climate Change Connection

The state's largest contributors to greenhouse gas (GHG) emissions are on-road transportation, electricity use, and natural gas use. The way local governments plan for transportation and land use, ranging from general plans to council policies to policies on local government energy usage, all have significant impacts on a local government's energy use choices and related GHG emissions. Therefore, addressing GHG reductions primarily is achieved from modifying energy choices and use. There are several state laws and Executive Orders from the California Governor that have been passed or issued with respect to energy conservation and climate change issues:

- Governor's [Executive Order S-03-05](#) – Created the [Climate Action Team](#).
- California Assembly Bill (AB) 32 (Núñez, Chapter 488, Statutes of 2006) – The "[Global Warming Solutions Act of 2006](#)," commits the state to GHG emissions to 1990 levels by 2020.
- California Senate Bill (SB) 97 (Chapter 185, Statutes of 2007) – Requires the Governor's Office of Planning and Research to develop California Environmental Quality Act (CEQA) guidance to local agencies to address the potential environmental effects of GHG emissions from proposed projects.
- California [Assembly Bill 811](#) (Levine, Chapter 159, Statutes of 2008) – California's Clean Energy Municipal Financing Law (AB 811) authorizes a legislative body to allow property owners to enter into contractual assessments to finance installation of energy

efficiency improvements and distributed generation renewable energy sources. Property owners would pay for the upfront costs of renewable and energy efficiency projects over 20 years as a line item on their property tax bills. If the property is subsequently sold, the repayment obligation remains on the property tax bill and transfers to the new owner.

- California [Senate Bill 375](#) (Steinberg, Chapter 728, Statutes of 2008) – SB 375 was signed into law by Governor Schwarzenegger on September 30, 2008, and requires the [California Air Resources Board](#) (ARB) to establish a Regional Targets Advisory Committee (RTAC) and to establish regional GHG remission reduction targets for agencies. The law requires the integration of regional transportation planning, regional housing needs assessment planning, and GHG planning while streamlining aspects of CEQA. The success of SB 375 with respect to the development of a sustainable communities strategy (SCS) will be public engagement akin to the Department of Transportation’s [Regional Blueprint Planning](#) process.
- California [Senate Bill 732](#) (Steinberg, Chapter 729, Statutes of 2008) – The law establishes the Strategic Growth Council and would, among other things, encourage sustainable land use planning including implementing energy efficiency planning.

There are many energy-related informational sources of interest to the local government including the [ICLEI](#) – Local Governments for Sustainability, an international association of local governments as well as national and regional local government organizations that have made a commitment to sustainable development. The [ARB Local Government Protocols](#) and the [State Attorney General’s Office \(Energy Efficiency\)](#) are also sources of information.

General Plans, Coastal Plans and Codes and Standards

Local governments have authority over land use within their boundaries, and land use decisions affect energy use. Integrated land use and transportation plans enable residents to use a variety of energy-efficient transportation options. In the Sustainable Region Program, SANDAG uses its blueprint plan, the [Regional Comprehensive Plan](#) (RCP), and its adopted regional [Smart Growth Concept Map](#), which was an outcome of the RCP, when assessing existing local plans. The RCP integrates regional land use and transportation planning with local land use and transportation plans to better plan for future growth in the region. To date, 16 Metropolitan Planning Organizations and 50 of 58 counties in California are participating in regional blueprint planning supported by the Department of Transportation to develop Regional Blueprints such as the SANDAG Regional Comprehensive Plan. The goal of regional blueprint planning is to better integrate land use and transportation planning in an open and broadly engaging process that preserves local land use authority while improving mobility, housing, air quality, farm and open space land preservation, resource use efficiency, and community quality of life.

The choices made by regions and local governments have energy consequences. For example, smart growth development that is by definition mixed-use and near mass transit nodes is

inherently more energy efficient by providing opportunities to conveniently walk, bike, or use mass transit. Consider the following smart growth practices to reduce transportation GHG emissions and energy consumption:

- Promote transit-oriented design (TOD) by increasing housing and job density near transit nodes.
- Promote mixed use development.
- Increase the connectivity of new developments, using techniques such as reducing the number of cul-de-sacs and increasing the number of through streets.
- Integrate safe bikeways and pedestrian paths into the transportation mix and provide bicycle parking and other facilities to encourage bicycling.

The SANDAG Regional Comprehensive Plan identifies various smart growth measures and densities for urban centers and university centers to main streets of smaller towns. Begun in 2008 as a pilot, SANDAG is working with the City of Imperial Beach and SDG&E to assess its general plan and coastal plan to identify ways to integrate energy efficiency and GHG reduction measures into various plan elements. As of March 2009, SANDAG and SDG&E have begun efforts with the cities of Santee and Encinitas in San Diego County to identify measures that integrate energy and climate change considerations into general plans. Additionally, in March 2008, the [City of San Diego adopted a General Plan Update](#) that included significant measures to address climate change and energy efficiency in its conservation element and other elements. Based on lessons learned over 2009, SANDAG will update the SRP Action Plan and SRP Toolkit to incorporate final results of land use planning efforts with the above-mentioned cities.

In January 2009, the Governor's [Office of Planning and Research](#) (OPR) issued *Preliminary Draft CEQA Guideline Amendments for Greenhouse Gas* per SB 97. The OPR is conducting public workshops on the draft document and is expected to send the final document to the Resources Agency for certification and approval before January 1, 2010. The final document, a technical advisory, will assist professional planners, land use officials, and CEQA practitioners with informal guidance to public agencies as they address the issue of climate change in their CEQA documents.

The [Local Government Commission](#) (LGC) has prepared guidelines on general plan measures to reduce community energy use. Local governments should consider the following energy-related elements of land-use planning and design that create cooler, more energy-efficient neighborhoods and reduce household energy consumption:

- Reduce the "heat island effect" through such measures as reducing street widths, limiting paved areas, and using light colored roofing and paving materials.
- Plant trees to shade houses.
- Orient streets and buildings for renewable energy systems and passive solar heating.

- Designate areas for higher density attached housing, which reduces the area of the building envelope that is exposed to the exterior climate.
- Site, design, and construct energy efficient school facilities with the Division of the State Architect.

Transportation Initiatives

Local jurisdictions are positioned to be leaders in adopting new technologies. The [USDOE Alternative Fuels Data Center](#) provides useful information. In the area of transportation initiatives, the following measures should be considered:

- Purchase alternatively powered vehicles, such as electric, hybrid electric, neighborhood electric vehicles, and natural gas vehicles.
- Install alternative fuel vehicle refueling stations.
- Consider making vehicles available for car and van pooling.
- Consolidate trips involving local government vehicles.
- Provide incentives for riding public transportation.
- Encourage telecommuting and teleconferencing.
- Promote the [“Safe Routes to Schools” Program](#)

SANDAG has a regional alternative fuels assessment underway that plainly identifies alternative fuel options for municipal vehicle classes, identifies funding and procurement options, and includes model ordinances. SANDAG will update the SRP Action Plan and SRP Toolkit to incorporate assessment results.

CHAPTER 7: Developing Energy Saving Policies

The policies and practices adopted by a local government can have a major influence on its energy use. In many instances, these policy measures can be implemented at little or no cost to the local government and can have an immediate and a sustained effect on energy use. The recommended policies and management actions described below are grouped into three categories:

- Energy program funding.
- Promoting energy efficiency and/or reducing GHGs.
- Adopting policies that impact energy supply.
-

Energy Program Funding

Identifying and maintaining reliable funding is essential to long-term program success. Local governments have responded to this need for consistent funding in a variety of ways. Some energy programs depend heavily on outside support from state agencies or local utilities. Others rely on the local government's own annual budgeting process. This can make the programs vulnerable to changes in perception of the importance of saving energy. Step 8 in the SRP Toolkit details these various ratepayer and local government funding mechanisms to implement conservation projects:

- *Public goods charge funds* are regulated by the California Public Utilities Commission (CPUC). The charge is a line item on ratepayer electric and gas bills that goes to funding energy efficiency programs (among others) at each utility across the state.
- *Utility on-bill financing* can cover the upfront capital costs of energy efficiency improvements by financing the improvements on a customer's utility bill over a certain number of years at low or zero-percent financing.
- *Revolving funds* are internal pools of money designed to recycle a portion of energy cost savings from energy efficiency improvements into capital for new projects. A local government can reinvest a certain percentage of documented annual energy savings into a revolving fund that would provide capital for future energy efficiency projects.
- *One percent for energy* imposes a fee of 1 percent on all local government energy bills to finance an energy management program for that local government's facilities.
- *State energy loans programs*, like the Energy Commission Energy Efficiency Financing Program, provide financing for schools, hospitals, and local governments through low-interest loans for feasibility studies and the installation of energy-saving measures.

Promoting Energy Efficiency and/or Reducing Greenhouse Gases

A local government's general business practices and policies can have a powerful influence on energy use. It is important to identify potential practices that may have an effect on energy consumption and costs, or that present barriers to increased energy efficiency. If local government business practices or policies do not address reducing GHGs, the local government should work to incorporate saving energy and reducing GHG emissions into policies and business operations.

There are several organizations that can assist local governments in their GHG quantification including ICLEI and the ARB Local Government Protocols. When the CPUC approves the statewide energy efficiency programs for 2009 through 2011, a program with ICLEI, the Local Government Commission, and the Institute for Local Government will be run in each investor-owned utility service territory (SDG&E, PG&E, SCE, and SoCalGas) to provide help to local governments with addressing climate change.

Purchasing

The best-known program for promoting energy-efficient purchases is Energy Star®, originally developed as a joint government/industry marketing and labeling program. All Energy Star-labeled products are in a web-based list that is easily accessible. Local governments can choose to enact a policy that when purchasing any energy using equipment, the selection shall be made from the list of Energy Star products. The challenges in this sector now rest more on ensuring that the energy management features of Energy Star® equipment are properly enabled and fully operational. As part of the technical support for the Energy Star program, the [Energy Star](#) website is a powerful implementation tool, with downloadable software.

Short-Term Versus Long-Term Planning

When purchasing equipment that is not part of the Energy Star program, decisions should be made based on the total cost to purchase, operate, and maintain the equipment, rather than only the upfront capital cost. This type of life-cycle cost analysis assesses the relative costs of competing equipment choices over their anticipated lifetimes. Local governments should encourage or mandate the use of life cycle cost analysis to select high initial cost and/or high energy-using equipment and continue to search for other ways to encourage long-term thinking for all investment decisions.

Determining total equipment costs can be more difficult when first implementing life cycle cost assessments if the equipment purchased is funded out of a capital improvement budget, while the operation and maintenance costs are funded out of an annual departmental operating budget. The local government will need to recognize the budget impacts from both areas.

The fiscal climate to today clearly dictates that traditional financing mechanisms and asset management approaches to energy and GHG reductions will need to rely on mix of solutions and partnerships. Organizations like [California Forward](#), the [Legislative Analyst's Office](#)

(LAO), and the Center for a New Orange County can provide information and actions that can help local government move beyond conventional solutions.

New Construction

Many local governments are owner-occupiers of their buildings. As such, they have the opportunity to influence a building's performance during the design and construction phase and the incentive to minimize its long-term operating costs. There are a number of steps that can be taken to ensure a new facility is built to the highest standards of performance. For example, when selecting an architect and engineering team, local government should look for professionals with previous experience in the design of energy efficient buildings and make sure that the designers understand that operating efficiency is a priority for the new facility. Staff then should ensure that it remains a high priority as the design work moves forward and that this is reflected in the construction specifications. At the end of the design phase, the team should make sure that operating efficiency is not "value-engineered" out of the project, if unexpected budget constraints require cost cutting.

California's state energy code, [Title 24](#), already requires energy efficient construction standards in new residential and non-residential buildings. Local governments should consider enacting policies to require that their new facilities be designed to exceed the state code requirements, and take advantage of incentive programs designed to encourage higher performance. It also should be noted that there are design assistance programs available from the Energy Commission and utility companies that may or not have funds available for these purposes.

To enhance long-term building energy performance, local governments should consider adopting a comprehensive building performance approach that considers other design and operating factors for a new facility in addition to energy. One approach is to require [Leadership in Energy and Environmental Design](#) (LEED) certification (U.S. Green Building Council) or Energy Star certification for all new buildings or major retrofit projects. The LEED program provides third-party certification of building economic and environmental performance. The Cities of San Diego; Seattle, Washington; and Portland, Oregon, for example, have adopted LEED criteria for their new buildings.

If the local government leases or rents its buildings, the energy efficiency of a potential property should be one selection criteria. In some cases, building owners may be open to negotiating energy efficiency upgrades to the facility. For more information on New Construction guidelines, see SRP Toolkit Section 8, "New Construction Considerations."

Policies That Affect Energy Supply

In recent years, local jurisdictions have become increasingly concerned about issues of energy supply and reliability, especially for critical locations such as hospitals and emergency facilities. Local governments can promote policies that help ensure energy reliability to their facilities by examining issues of delivery reliability, security, price volatility, and the diversity of energy supplies.

Distributed Generation

A more diversified mix of energy supplies will generally increase supply reliability. Local governments should assess the potential for clean onsite generation at their facilities, particularly for critical/emergency uses. The SANDAG Regional Energy Strategy and the Energy Commission Integrated Energy Policy Report both emphasize the important role of renewable energy in meeting local and state energy goals. Other sources for information on distributed generation (DG) benefits are found on the California Center for Sustainable Energy website.

California [Assembly Bill 2466](#) (Laird, Chapter 540, Statutes of 2008) authorizes a local government entity to receive a credit on their electric bill for power generated from a renewable energy facility that generates more energy than is needed to serve the electrical load of governmental entity owned or controlled site where the facility is located. This option also could be useful to local governments.

One other option to consider is under the authority of AB 1659 (Farr, Statutes of 1984; [Local Government Commission](#)) that authorizes the formation of a community energy authority, whereby “local governments working alone or in concert with other local governments can access tax-exempt financing for energy efficiency or renewable energy projects.”

Aggregation and Municipalization

Local government agencies can explore how combining energy loads will affect rates and can evaluate the options for forming a municipal utility. Legislation and proceedings on [community choice aggregation](#) (CCA) have made it easier for cities and counties to gather together local consumers. The Local Government Commission has significant on-line resources about community choice aggregation. According to the Local Government Commission, aggregation enables California cities and counties – or groups of cities and counties – to supply electricity to the customers within their borders. Unlike a municipal utility, such as the Los Angeles Department of Water and Power or the Sacramento Municipal Utility District, a CCA does not own the transmission and delivery systems (the poles and wires). Instead, it is responsible for providing the energy commodity (the electrons themselves) to its constituents – which may or may not entail ownership of electric-generating resources. A high level of political commitment is necessary over the long term to successfully operate a CCA.

Additionally, it should be noted that there may be local economic development strategies and synergies that local governments can pursue not only to encourage green businesses to locate in a given region, but also to provide disincentives for GHG-producing industries or practices. Further review of the deliberations of the Regional Targets Advisory Committee (RTAC) under SB 375 will address economic development analysis of certain business clusters and the benefits of certain industries over others.

Cross-Sectoral Analysis

Local governments are tremendously diverse and may benefit from the use of existing planning efforts such as water management plans, regional blueprint plans, telecommunications plans,

and homeland security plans to name a few. Furthermore, there may be opportunities to leverage funding in these areas that contribute to SRP success.

CHAPTER 8: Providing Employee Education

Educating employees about how they can save energy can have a measurable impact on local government energy use at a fairly low cost to implement. The US Department of Energy has estimated that employee energy awareness programs can reduce energy consumption by up to 10 percent. These gains can be short-lived without consistent and continuing employee education. The team leader should consider these ways to train personnel and recognize their achievements:

- Employee education.
- Recognition and awards.
- Energy team training.

Employee Education

Staff members who have been educated in the importance of reducing energy use and equipped with the necessary resources can make a significant contribution to saving energy. Education also can play a vital role in linking together multiple energy reduction strategies into a local government-wide effort. Training in energy awareness that ties energy saving in the workplace to energy saving at home is likely to have a stronger and more lasting impact. It also will reduce community *and* employee energy costs. The team leader should consider the following when planning employee energy education:

- Determine the best way to communicate energy information to employees, which may include newsletters, posters, meetings, e-mail, and the web.
- Determine the level of information appropriate for the various audiences. Illustrate potential contributions from various groups. Give managers detailed energy use statistics, energy use trends in their departments, and information on how comparable facilities are doing.
- Train all local government employees on energy usage.
- Conduct energy training for staff involved in project permitting.

Staff resources to assist with energy education are available from USEPA, USDOE, local nonprofits, and the local utility.

Recognition and Awards

Employees can be recognized in the form of awards or ceremonies that:

- Recognize departments and individual key personnel responsible for energy savings.
- Publicize successful energy projects or measures, including cost savings and environmental benefits.
- Sponsor contests to promote saving energy and energy awareness and reward the winners with simple prizes.

These actions can provide a further incentive for managers to encourage energy efficiency by their staff. In addition, some local governments tie departmental energy performance into the manager's and/or individual's annual personnel evaluation.

Team Training

A program to provide continuous learning for members of the energy team is important for their effectiveness and motivation. Members of the energy team should be encouraged to consider the following opportunities:

- Send key employees to energy seminars; workshops are often held by the region's utility.
- Use the USDOE "*Energy Savers Virtual Tour*" for staff training and as an individual's personal reminder of simple energy-saving measures they can implement themselves. For copies of the CD, call (877) 337-3463.
- Join and participate in energy industry trade associations, such as the [Association of Energy Engineers](#) (AEE) and [American Society of Heating, Refrigerating and Air Conditioning Engineers](#) (ASHRAE), and in green building associations like the [U.S. Green Building Council](#) (USGBC).
- Establish a building energy monitor program where one person who works in the building is responsible for monitoring energy practices and is responsible for correcting wasteful practices. These monitors should receive basic levels of energy management training.
- Obtain professional certification for energy management leaders such as the AEE's Certified Energy Manager designation or the LEED Accredited Professional designation.

CHAPTER 9: Additional Resources

Various cities' Climate Action Plans are located at the [Cool Cities](#) website.

The [Institute for Local Government](#) (ILG) has instituted a program that provides information about the latest climate action resources, case studies, and best practices.

The nonprofit group Natural Capitalism Solutions (NCS) has developed an online [Climate Protection Manual for Cities](#). NCS states that its mission is "to educate senior decision-makers in business, government, and civil society about the principles of sustainability."

In cooperation with USEPA, the Local Government Commission has produced a booklet discussing the benefits of density and providing case studies of well-designed, higher density projects throughout the nation. [Creating Great Neighborhoods: Density in Your Community](#) (2003).

The Pew Center on Global Climate Change was established in 1998 as a nonprofit, non-partisan, and independent organization. The Pew Center has published a series of reports called [Climate Change 101](#). These reports cover climate science and impacts, technological solutions, business solutions, international action, recent action in the U.S. states, and action taken by local governments.

In 2007, USEPA issued the report, [Measuring the Air Quality and Transportation Impacts of Infill Development](#), which summarized three regional infill development scenarios in Denver, Boston, and Charlotte. The analysis shows how standard transportation forecasting models currently used by Metropolitan Planning Organizations can be modified to capture at least some of the transportation and air quality benefits of brownfield and infill development. More compact and transit oriented development was projected to substantially reduce vehicle miles traveled. As the agency found, "the results of this analysis suggest that strong support for infill development can be one of the most effective transportation and emission-reduction investments a region can pursue."

In 2007, The Urban Land Institute (ULI) produced a report entitled, "[Growing Cooler: The Evidence on Urban Development and Climate Change](#)," which reviews existing research on the relationship between urban development, travel, and GHG emitted by motor vehicles. It further discusses the emissions reductions that can be expected from compact development and how to make compact development happen.

The [California Department of Housing and Community Development](#) has many useful resources related to housing policy and housing elements and specific recommendations for creating higher density and affordable communities.

In May 2008, the [California Transportation Commission](#) (CTC) adopted an [Addendum to the 2007 Regional Transportation Plan Guidelines: Addressing Climate Change and GHG Emissions](#).

The California Energy Commission's [Public Interest Energy Research](#) (PIER) Program supports energy research, development, and demonstration projects designed to bring environmentally safe, affordable, and reliable energy services and products to the marketplace.

The [California Air Pollution Control Officers Association](#) (CAPCOA) has a climate change website with documents such as a white paper entitled "CEQA and Climate Change" (January 2008).

The Department of Justice [Office of Attorney General's Global Warming](#) website includes a section on CEQA and the Attorney General's public comment letters.

The [SANDAG](#) website includes numerous planning documents and resources including the Regional Comprehensive Plan, Regional Energy Strategy, Smart Growth Concept Map, smart growth visual simulations. Smart Growth Design Guidelines are under development as part of the Smart Growth Tool Box to assist local jurisdictions.

Additional Energy Websites

California "Flex Your Power"

www.fypower.org/

California Department of Community Services and Development and LIHEAP

www.csd.ca.gov

Lawrence Berkeley National Laboratory – Buildings Technology Department

<http://btech.lbl.gov/>

Minnesota Sustainable Design Guide

www.sustainabledesignguide.umn.edu

Savings By Design

www.savingsbydesign.com