

City of Carlsbad Energy Roadmap



Prepared through the SANDAG
Energy Roadmap Program

October 2014

This Program is a collaboration between SANDAG and San Diego Gas & Electric®



Energy Roadmap for the City of Carlsbad

Table of Contents

	Acknowledgements and Program Contacts	ii
	Introduction	1
SAVING ENERGY IN CITY GOVERNMENT OPERATIONS		
	1. Save Energy in City Buildings and Facilities	5
	2. Green the City Vehicle Fleet	11
	3. Develop Employee Knowledge of Energy Efficiency	23
	4. Implement a Commuter Benefits Program	25
SAVING ENERGY IN THE COMMUNITY		
	5. Leverage Planning and Development Authority	31
	6. Market Energy Programs to Local Residents, Schools, and Businesses	41
	7. Support Green Jobs and Workforce Training	49
	Looking Forward	53

APPENDICES (provided under separate cover)

- A. Municipal Energy Assessments: Phase 1 Energy Report Cards
- B. Municipal Energy Assessments: Priority Site List for Phase 2 Assessments
- C. Municipal Energy Assessments: Phase 2 Energy Audit Findings
- D. Alternative Fuel Options and Local Infrastructure Availability
- E. Transportation Demand Management Policies and Resources
- F. Sample Smart Growth Policies and Resources
- G. Sample Energy-Saving Policies and Resources
- H. Sample Clean and Efficient Transportation Policies and Resources

Acknowledgements and Program Contacts

Acknowledgements

The San Diego Association of Governments (SANDAG) would like to acknowledge and thank the following individuals for their contributions to this document.

City of Carlsbad

David Hauser
Elaine Lukey
Joe Garuba
Patrick McGarry
Bob Richardson
Tony Winney
Robert Ferris
Glen Boodry
Mike Grim

San Diego Gas & Electric Company®

Josh Brock
Kimberly Burke
Dinah Willier

The Energy Roadmap Program is a partnership between SANDAG and San Diego Gas & Electric Company (SDG&E). It is funded primarily by California utility customers under the auspices of the California Public Utilities Commission. Transportation components are funded by SANDAG.

Program Contacts

Energy Roadmap Coordinator

Allison Wood, SANDAG, allison.wood@sandag.org, (619) 699-1973

iCommute Program

Maria Filipelli, SANDAG, maria.filipelli@sandag.org, (619) 515-1177

SDG&E Energy Efficiency Programs

Josh Brock, JBrock@semprautilities.com, (858) 636-5733

SDG&E Account Representative

Dinah Willier, DWillier@semprautilities.com, (858) 654-1135

Building Energy Audits

John Woolsey, EFM Solutions, john.woolsey@efm-solutions.com, (951) 200-3178

Fleet Analysis

Kevin Wood, California Center for Sustainable Energy, kevin.wood@energycenter.org, (858) 244-7295

Introduction

This energy management plan, or “Energy Roadmap,” prepared by the San Diego Association of Governments (SANDAG) in consultation with city staff, provides a framework for the City of Carlsbad (City) to identify ways to save energy in government operations and in the community, resulting in municipal cost savings and benefits to the environment. These wide-ranging, cost-effective opportunities to save electricity, natural gas, and transportation fuel include:

The Carlsbad Energy Roadmap charts a path to saving energy in government operations and in the community.

- No-cost expert technical assistance, such as free energy audits of government buildings
- Help identifying and applying for energy efficiency rebates and innovative programs like zero-percent on-bill financing
- Energy-saving resources for cutting edge topics like general plan updates, electric vehicles, alternative fuels, and transportation demand management strategies to save energy and reduce Greenhouse Gas (GHG) emissions
- The latest information on critical subjects like financing energy efficiency projects, emerging technology demonstrations, and residential retrofit programs.

California’s Vision for Local Governments

By 2020, California’s local governments will be leaders in using energy-efficiency to reduce energy use and global warming emissions both in their own facilities and throughout their communities.

California Long-Term Energy Efficiency Strategic Plan

The Energy Roadmap also recognizes steps the City has taken to become more sustainable. In 2006, the City participated as a pilot city in the Sustainable Region Program. Through the program, the City received free technical and policy guidance, which identified energy saving opportunities in City facilities. In addition to building retrofits, the City has retrofitted its streetlights through an Energy Efficiency and Conservation Block Grant.

The Energy Roadmap builds upon the Sustainable Region Program and updates and identifies new opportunities for energy savings. The City is in the process of completing

a Climate Action Plan, which includes a GHG emissions inventory of both municipal and community-wide emissions and measures to reduce emissions into the future.

The Carlsbad website can be a portal for local residents and businesses to access energy-saving programs and rebates.

By building on its existing energy-saving efforts and taking advantage of some or all of the opportunities identified herein, the City can continue to demonstrate leadership in energy efficiency and work toward greater sustainability in municipal operations and throughout the community – saving money for taxpayers, households, and businesses, keeping the air clean, supporting green jobs, and improving quality of life for everyone in the City.

Section I. Saving Energy in City Government Operations

City government can be a significant user of energy in its own buildings, facilities, and equipment. City employees also play a role through their commute choices, equipment usage, and use of government vehicles. These and other energy-using activities required to operate city government provide the City with an opportunity to lead by example. The City can improve energy efficiency, and in the process, spend fewer taxpayer dollars on utilities and gasoline, contribute to cleaner air, and reduce GHG emissions. The City also can develop staff knowledge of energy efficiency and use its operations to showcase emerging energy-efficient technologies.

The section on saving energy in government operations identifies four distinct opportunities for the City to lead by example with its buildings and facilities, vehicles, and energy usage practices:

1. **Save Energy in City Buildings and Facilities**
2. **Green the City Vehicle Fleet**
3. **Develop Employee Knowledge of Energy efficiency**
4. **Promote Commuter Benefits to City Employees**

Section II. Saving Energy in the Community

Looking beyond its own operations, city government can play an important role in influencing the energy attitudes and actions of local residents and businesses. Opportunities for influence vary widely, from public education to adopting policies and implementing programs to save energy.

Energy use can be a major expense for households and businesses, and it is a predominant source of air pollution and GHG emissions. Saving energy benefits the

environment, puts money in the pockets of households and businesses, and supports growing economic opportunities including well-paying green jobs.

This section of the Energy Roadmap identifies the following opportunities to lead the community with innovative programs for energy efficiency and sustainability:

5. Leverage Planning and Development Authority

- a. Smart growth development policies
- b. Energy-efficient building upgrades
- c. Clean and efficient transportation options

6. Market Energy Programs to Residents, Schools, and Local Businesses

7. Support Green Jobs and Workforce Training

Potential Uses of the Energy Roadmap

Examples of activities this Energy Roadmap could assist the city with include:

- Reducing government spending on energy use such as utilities and gasoline
- Implementing measures from the City's Climate Action Plan to reduce GHG emissions from government operations and community activities
- Integrating sustainability, energy efficiency, or GHG reduction measures into planning processes
- Using government operations to demonstrate the feasibility of energy-efficient and sustainable practices to local residents and businesses
- Managing the City vehicle fleet
- Promoting energy efficiency programs through City communications such as newsletters, email, and website
- Training of employees that deal with energy issues
- Offering commuter information and alternative transportation incentives as part of the City's employee benefits package
- Staying on top of the latest developments, programs, and trends in energy efficiency
- Applying and qualifying for future funding opportunities related to energy efficiency

*Handouts on green jobs
and training opportunities
can be located at
City Hall.*

About the Energy Roadmap Program

The Energy Roadmap Program is a partnership between the SANDAG and San Diego Gas & Electric® (SDG&E) that offers local jurisdictions assistance in making their buildings and processes energy-efficient, implementing state energy codes through access to training and workshops, and being a conduit to their constituents on programs that help

reduce their energy bills, as well as the environmental impact on the community as a whole.

The program provides free energy assessments of government buildings and online tools to monitor electricity, natural gas, and transportation fuel use. It provides continued access to experts that can assist jurisdictions in taking the next steps to implement building improvements, petroleum reduction measures, and community outreach.

Each participating jurisdiction receives a customized Energy Roadmap that offers a comprehensive framework for saving energy at city government facilities and in the community. Each Energy Roadmap is consistent with the SANDAG Sustainable Communities Strategy (2011); Regional Energy Strategy (2009), which serves as the San Diego region's energy policy blueprint; and the Climate Action Strategy (2010), SANDAG's first ever guide on climate change. All strategies are available on the SANDAG website at www.sandag.org/energy.

The Energy Roadmap Program was developed based on existing, successful SDG&E local government partnerships with the Cities of Chula Vista and San Diego and the County of San Diego and pilot projects undertaken through the SANDAG Sustainable Region Program with the California Center for Sustainable Energy for the Cities of Carlsbad, Poway, and Solana Beach. The Energy Roadmap Program is funded primarily by California utility customers under the auspices of the California Public Utilities Commission. Transportation components are funded by SANDAG.

Save Energy in City Buildings and Facilities

Energy is a major operating cost for local governments. The City of Carlsbad (City) has already taken steps to reduce energy usage in its operations using Energy Efficiency and Conservation Block Grant funding to retrofit streetlights. By evaluating energy usage in municipal buildings and facilities (“sites”) and identifying additional energy-saving opportunities, the City can further reduce its energy-related operating costs and use the savings for other government services. This chapter highlights:

Carlsbad could save over \$76,000 each year from energy efficiency upgrades identified at municipal sites.

- Free site assessments provided to the City
- Energy-saving opportunities identified at each one
- Costs and paybacks to the city to undertake the energy-saving projects

Energy Assessments

Two types of energy assessment services were provided at no cost to the City: 1) preliminary energy assessments, called “Energy Report Cards,” of sites determined by municipal staff; and 2) more in-depth energy audits, called “Phase 2 Audits” for a subset of government buildings based on their Report Cards and direction from City staff.

Energy Report Cards were prepared for eighteen municipal sites (listed below). Each Energy Report Card is included in **Appendix A**. These preliminary assessments established each site’s baseline energy use and benchmarked it against similar building types in the country.

- | | |
|--|----------------------------|
| ▪ Calavera Hills Park | ▪ Fire Station 4 |
| ▪ Carlsbad City Library | ▪ Fire Station 5 |
| ▪ City Hall | ▪ Fleet Maintenance |
| ▪ Carlsbad Municipal Water District Administration | ▪ Harding Community Center |
| ▪ Cole Library | ▪ Monroe Street Pool |
| ▪ Faraday Center | ▪ Safety Center |
| ▪ Farmers Insurance Claims Building | ▪ Senior Center |
| ▪ Fire Station 1 | ▪ Stagecoach Park |
| ▪ Fire Station 2 | ▪ The Crossings |

Benchmarking is a useful tool for judging a site's energy performance compared to national or state averages, and it is a new requirement to participate in the San Diego Gas & Electric® (SDG&E) rebate and incentive programs. Two online tools were employed to help determine how "good" or "bad" a site was performing. The SDG&E *Energy Waves* program provided historical energy usage and will enable the City to continue monitoring energy consumption/site performance online. The United States Environmental Protection Agency's *Portfolio Manager* program identified how each site compared against national averages for similar facilities, and provided climate change information in carbon dioxide equivalent (CO₂e).

The preliminary energy assessments indicate that all the City municipal sites would benefit from lighting retrofits, so all sites were evaluated for indoor and outdoor lighting in the Phase 2 assessments. Five sites were targeted for additional evaluation in the form of a comprehensive energy audit, and two sites underwent a rate analysis. Sites were determined in response to a specific issue discovered through the site assessment process, or as instructed by city staff. The priority site list is provided as **Appendix B**.

The Phase 2 Energy Audits were to identify energy efficiency improvements in indoor/outdoor lighting; Heating, Ventilation, and Air Conditioning (HVAC); building controls; and overall building operations and performance. These engineering assessments included utility rate review, recommended retrofit projects, and rebate programs and costs. The Phase 2 utility rate analyses and energy audit findings are summarized here and included as **Appendix C**.

EFM Solutions, an engineering firm and small business in San Diego, performed all site assessments on behalf of SANDAG and provided the City with project results in the form of the Energy Report Cards, rate analyses, Phase 2 energy audit findings, and a master spreadsheet of energy conservation measures identified.

Energy Audit Findings

Carlsbad has the potential to realize over \$76,000 in annual savings on its utility bills by implementing the rate changes and energy conservation measures in the *Potential Savings by Energy Conservation Measure* table on the following page. The City could undertake upgrades at its audited municipal sites through the SDG&E On-Bill Financing Program. This could enable the City to avoid paying upfront capital costs associated with energy-saving retrofits through zero-percent interest loan(s) on its utility bill(s).

Energy conservation measures can be funded through zero-percent interest loans in the On-Bill Financing Program from SDG&E.

Potential Savings by Energy Conservation Measure

Location	Measure	Annual Savings for City			
		Electricity (kWh)	Demand (kW)	Bill Savings	Greenhouse Gases (MTCO ₂ e)
All Sites	Replace Indoor Lighting	162,168	47.68	\$20,042	53.49
	Replace Outdoor HID Lighting	127,067	37.53	\$14,388	41.92
Cole Library	Install Turbocor Compressor	65,221	49.41	\$9,457	21.51
Monroe Street Pool	Install Pump Controls	34,502	0	\$3,572	11.38
Safety Center	Retrocommission HVAC	59,700	0	\$6,719	16.27
TOTALS		448,658	134.62	\$54,178	144.57

Notes:

1. kWh = kilowatt hours, MTCO₂e = metric tons of carbon dioxide equivalent.
2. Energy assessments included HVAC systems, indoor and outdoor lighting, and building controls.
3. No opportunities for natural gas savings were identified during the energy audits.

Potential Savings from Rate Changes

Location	Estimated Cost*	Annual Cost Savings	Simple Payback
Calaveras Hills Park	\$8,000	\$4,684	1.7
Stagecoach Park	\$10,000	\$17,885	0.6
TOTAL	\$18,000	\$22,570	0.8

*Includes costs associated with splitting existing electrical meter into two service meters.

Energy Conservation Measure Economics

Location	Measure	Gross Project Cost	Total SDG&E Incentives	Net Project Cost	Simple Payback (years)
All Sites	Replace Indoor Lighting	\$169,361	\$5,621	\$163,740	8.2
	Replace Outdoor HID Lighting	\$168,550	\$24,703	\$143,847	10.0
Cole Library	Install Turbocor Compressor	\$60,000	\$10,159	\$49,841	5.3
Monroe Street Pool	Install Pump Controls	\$1,200	\$600	\$600	0.2
Safety Center	Retrocommission HVAC	\$40,000	\$4,776	\$35,224	5.2
TOTALS		\$439,111	\$45,859	\$393,252	7.3

Notes: Gross and net installation and equipment costs are estimated and do not replace product specifications and contractor bids.

Finance Options for Energy Projects

SDG&E provides rebates, incentives, and financing options to pay for all or part of the costs of energy conservation measures. The SDG&E On-Bill Financing Program provides zero-percent financing for the installation of energy efficiency improvements meeting certain criteria. Financial assistance also is available from other agencies like the California Energy Commission (CEC).

No-cost assistance with rebates, incentives, and financing options is available to the City as part of the Energy Roadmap Program. Please contact your Energy Roadmap coordinator with requests for assistance or questions.

SDG&E Rebates and Incentives

As part of the energy audit findings, EFM Solutions identified the appropriate SDG&E rebates and incentives¹ for each municipal site. Generally, programs that apply to commercial businesses also apply to public agencies. To review all of the SDG&E rebate and incentive programs, see Chapter 6 of this Energy Roadmap or visit sdge.com/business/rebatesincentives/.

Zero-Percent Interest On-Bill Financing from SDG&E

Through its On-Bill Financing Program², SDG&E provides interest-free, unsecured financing to qualified commercial and taxpayer-funded customers for the installation of energy-efficient upgrades. Financed equipment must qualify for a rebate or incentive from the SDG&E rebate/incentive program(s). EFM Solutions have met with City staff and discussed on-bill financing. The program for public agencies includes:

- Zero-percent financing on qualifying measures for up to ten years
- Offsets to energy-efficient upgrade costs after rebates and incentives through SDG&E
- Loan amounts that range from a minimum of \$5,000 up to \$250,000 per meter
- Loan installments that are added to monthly SDG&E bills
- For more information, contact Kraig Akers at KWakers@semprautilities.com or visit sdge.com/obf.

¹ SDG&E programs are funded by California utility customers and administered by SDG&E under the auspices of the California Public Utilities Commission. Rebates and incentives are provided on a first-come, first-served basis until program funds are no longer available.

² The On-Bill Financing program is funded by California utility customers and administered by SDG&E under the auspices of the California Public Utilities Commission. The On-Bill Financing program may be modified or terminated without prior notice and is provided to qualified customers on a first-come, first-served basis until program funds are no longer available. Eligibility requirements apply.

Low-Interest Loans from the CEC

The Energy Efficiency Financing Program provides financing for local governments, schools, and hospitals through low-interest loans for feasibility studies and installation of energy-saving measures. As of September 2014, terms included an interest rate of one percent (fixed), a maximum loan of \$3 million per application, and a maximum loan term of 20 years. Again, EFM Solutions can assist the City with applying for this loan, if needed. For more program information, contact the CEC Special Projects Office, (916) 654-4104, email: pubprog@energy.state.ca.us, or energy.ca.gov/efficiency/financing.

Post-assessment assistance in identifying energy project financing and implementation is a service provided to the City through the Energy Roadmap Program. Contact your Energy Roadmap coordinator for further assistance.

Implementation Strategy for Energy and Cost Savings

1. Pursue energy retrofit projects that qualify for on-bill financing and/or have an immediate payback.
2. Seek approval from SDG&E to use its On-Bill Financing Program (zero-percent interest loans) to cover upfront costs for energy upgrades.
3. Undertake internal city processes to implement energy upgrade projects.
4. Monitor site performance to ensure energy and cost savings are achieved.

The Energy Roadmap team can assist the City with these implementation steps over the duration of the Roadmap Program (until December 2015).

This page left intentionally blank.

Green the City Vehicle Fleet

The City of Carlsbad (City) maintains a fleet of more than 250 vehicles and over 100 pieces of other equipment. These vehicles range from sedans and pick-up trucks to fire engines and other heavy-duty trucks. The City can achieve transportation-related energy savings through actions that promote fuel conservation, efficiency, and an increased use of clean, alternative fuels in its vehicle fleet.

The City has recognized that fleet operations contribute significantly to its total energy use and budget and has adopted practices to ensure the fleet is operated as efficiently as possible. As part of this effort, the City performs full suite of preventative maintenance on each vehicle and uses refined oil and recycled materials. This ensures that vehicles are running at maximum efficiency, and minimizes costly repairs as vehicles age. The City is dedicated to replacing older vehicles with hybrid units when most economically feasible, to help meet carbon emission reduction goals and build a more sustainable community. This Roadmap chapter offers tools and information that can support the City's efforts to maintain efficient fleet operations and meet its environmental goals through the use of advanced technology and alternative fuel vehicles.

The City of Carlsbad has adopted practices to ensure the fleet is operated as efficiently as possible.

California Goals for Transportation Fuels

The State of California has adopted several transportation fuel laws and goals, and the California Energy Commission (CEC) has been the responsible agency for the targets shown in the *California Goals for Transportation Fuels* table. In order to meet these goals the state allocates grant funds through the Assembly Bill 118 Program to help address barriers to the production and deployment of alternative fuels, vehicles, and infrastructure. Millions of dollars are available annually through 2015, for which the City and local businesses can apply. Additional information is provided later in this section.

California Goals for Transportation Fuels

Objective	State Goals and Milestones
Petroleum Reduction	Reduce petroleum fuel use to 15 percent below 2003 levels by 2020
Alternative Fuel Use	Increase alternative fuel use to 20 percent of on-road fuel demand by 2020 and 30 percent by 2030
In-State Biofuels Use	Increase biofuel use to one billion gasoline gallons equivalent (gge) by 2010, 1.6 billion gge by 2020, and two billion gge by 2050
In-State Biofuels Production	In-state production of 20 percent of biofuels used in California by 2010, 40 percent by 2020, 75 percent by 2050

The City's Fleet

The City's fleet supports the provision of essential public services such as police and fire protection, street services, park maintenance, and wastewater operations. Vehicles are replaced on regular schedules. Vehicle replacements offer the City the chance to adopt more efficient vehicles.

When replacing vehicles, City staff evaluates vehicle duty requirements and selects the most efficient vehicle that can do the job. The City currently operates the smallest trucks available for regular duty, including the Ford Ranger and Chevy Colorado. In recent years, the City purchased several hybrid vehicles as new or replacement units for the fleet. Currently 15 percent of the City's fleet is made up of hybrid vehicles. Hybrid vehicles are selected in cases where it makes the most economic and operational sense. The City has also replaced or retrofitted many of its heavy-duty diesel vehicles to meet the most stringent emissions standards.

Over the past few years, the City of Carlsbad has made substantial strides in reducing its overall fuel consumption and GHG emissions. The table *Fuel Use 2005, 2011, 2012* below outlines these changes.

Fuel Use 2005, 2011, 2012

	2005	2011	2012	% Change 2005 to 2012
Gasoline (Gallons)	207,286	167,345	128,897	-37%
Diesel (Gallons)	54,589	62,407	66,345	17%

Note:

Sources: Carlsbad Government Operations Greenhouse Gas Inventory Update – 2011 , California Center for Sustainable Energy estimates

Through the development of the City's General Plan *Envision Carlsbad*, the City is committed to moving towards integrating more alternative fuel and hybrid vehicles into its fleet. These vehicles could help the City further reduce its fuel consumption and emissions. With the rising cost of gas or diesel and a diesel, advanced and alternative fuel vehicles could help reduce fuel costs as well as emissions.

Online Fleet Planning Tools

The United States Department of Energy's (DOE) Petroleum Reduction Planning Tool (afdc.energy.gov/afdc/prep), at the Alternative Fuels and Advanced Vehicles Data Center, could supplement the City's current fleet management system by evaluating and calculating petroleum reductions through three categories of reduction measures including efficiency (e.g., fuel economy, idling reductions), conservation (e.g., VMT reductions), and alternative fuels (e.g., vehicles that run on electricity, compressed natural gas). A petroleum reduction goal (e.g., 10% savings) can be set and the free online tool can identify potential savings based on the fleet information entered and petroleum reduction measures selected. The Vehicle Cost Calculator (www.afdc.energy.gov/calc) uses basic information on driving habits to calculate total cost of ownership and emissions for makes and models of most vehicles, including alternative fuel and advanced technology vehicles.

Argonne National Lab has developed a more advanced model called the Alternative Fuel Life-Cycle Environmental and Economic Transportation (AFLEET) Tool (greet.es.anl.gov/afleet) for fleets to estimate petroleum use, Greenhouse Gas (GHG) emissions, air pollutant emissions, and total cost of ownership of light-duty and heavy-duty vehicles using a spreadsheet format. The AFLEET tool allows comparisons between vehicles using different fuel technologies and is customizable with fleet specific inputs.

The [FuelEconomy.gov](https://fuelconomy.gov) website is a partnership between DOE and the United States Environmental Protection Agency. It serves as the official United States government source for fuel economy information, and allows users to compare the efficiency of all vehicle models in production since 1984. It contains information on the energy and environmental performance of vehicles as well as tools to improve fuel economy.

When considering a new fleet vehicle purchase, the Cool Fleets website (coolfleets.com) has a free online calculator that can help the City identify the most cost-effective vehicle with the best environmental performance. It provides helpful information on a variety of indicators, including costs and GHG emissions. The user can compare each vehicle to itself or other models using different variables such as the lease term and average annual mileage scenarios. The user chooses the applicable fuel cost for their location and selects vehicles individually or by category.

The City also can reduce fuel use by encouraging employees to use fleet vehicles efficiently. This includes trip planning, efficient driving habits, and routine maintenance. Specific tips are described in **Appendix D**.

Alternative Fuels for Fleet Applications

Alternative fuel and vehicle selection may depend on several factors including:

- Vehicle cost
- Availability and proximity of refueling infrastructure
- Availability of grants and tax credits
- Whether new purchase or retrofit/conversion is being considered
- Vehicle maintenance

Descriptions of each type of alternative fuel and information on the availability of alternative fuel vehicles for a variety of fleet applications are provided in **Appendix D**. Opportunities for vehicle replacements specific to the City's fleet are described below.

Vehicle Replacement: Alternative Fuel Options for the City

SANDAG partnered with the California Center for Sustainable Energy (CCSE) to provide an assessment tailored to the City's fleet and vehicle replacement protocols.

The following *Potential Vehicle Replacements and Savings* table identifies conventional, advanced technology, and alternative fuel replacement options that could be suitable for vehicles in the City's fleet. The table identifies potential fuel and cost savings on an annual basis using mileage estimates provided by the City. Not all City vehicles have mileage as high as in the example, but would still accrue savings over their lifetimes.

Potential Vehicle Replacements and Savings

Vehicle Model	Fuel Tech ¹	Annual Mileage	Gallons Fuel Reduced/ Displaced ²	Estimated Annual Savings	Years to Payback w/ incentives	Yearly GHG Savings MTCO2e)
Sedans (Replacing Ford Taurus)						
Ford Focus	Gas	6,000	109	\$402	-	1.0
Toyota Prius	HEV	9,000	282	\$1,086	5.1	2.5
Sedans (Replacing Honda Accord)						
Honda Accord Hybrid	HEV	10,000	235	\$916	5.5	2.1
Nissan Leaf	BEV	10,000	435	\$1,204	7.4	3.2
Compressed Natural Gas Vehicles						
Ford F150	CNG	15,000	1,250	\$2,028	2.5	2.0
Ford F250	CNG	10,000	909	\$1,543	3.2	1.7
Ford F250	CNG	5,000	455	\$771	6.5	0.8
Propane Vehicles						
Ford F150	LPG	15,000	1,250	\$1,715	6	1.8
Ford F250	LPG	10,000	909	\$1,215	8.5	1.3
Ford F250	LPG	5,000	445	\$607	17	0.6

Note:

1. BEV= battery electric vehicle, HEV= hybrid electric vehicle, CNG = compressed natural gas, LPG= liquefied petroleum gas (Propane)
2. Reducing/ displacing the use petroleum-based fuels is a goal of state policy and the federal Energy Policy Act and Energy Independence and Security Act.

Source: CCSE

The vehicle replacement analysis used current fuel prices, mileage, and fuel consumption of the City's vehicles, details of which are provided in **Appendix D**. This analysis showed that the CNG or LPG replacements for larger trucks could save \$700 to \$2000 a year per vehicle. Vehicles may see payback periods as low as two and a half years, including rebates. If alternative fuel replacements are considered, the vehicles with the highest mileage and high fuel consumption are the best candidates. The replacement of older Ford Taurus sedans with compact Ford Focus sedans could reduce fuel costs by \$400 dollars a year. Replacement of higher mileage sedans with hybrids could save more than \$1000; however the payback periods may be two to six years or more due to the incremental cost of hybrid technology over traditional vehicles.

CNG or LPG vehicles could offer savings of \$700 to \$2000 a year based on based on vehicle usage seen in the City

CNG or LPG vehicles can cost between \$10,000 and \$15,000 more than their gasoline- or diesel-fueled counterparts before rebates and could require additional fueling infrastructure. The substantial fuel savings that would be achieved from large trucks,

some of the biggest consumers of fuel, could offset the higher purchase costs within a few years when combined with available incentives. Currently the only public fueling stations for CNG is located approximately five miles away adjacent to the Encina Power Station

Electric vehicles offer the greatest greenhouse gas reduction benefits with savings of 3.2 MTCO₂e per year, followed by hybrids with reductions up to 2.5 MTCO₂e a year. LPG and CNG vehicles showed savings between 0.6 and 2 MTCO₂e. These savings could contribute to the City's environmental goals.

Biodiesel can be made from a variety of vegetable oils and fats. Biodiesel from waste vegetable oil is some of the lowest carbon fuel currently available. Blends of up to five percent biodiesel are compatible with all diesel vehicles, while blends of up to B20 can be used in most vehicles, although some special handling and maintenance requirements must be followed. The use of locally produced B20 from waste vegetable oil would reduce GHG emissions 15 to 18 percent. The table below shows the potential emissions reduction the use of B20 or B5 in a heavy duty vehicle and fleet wide.

Biodiesel Emissions Reduction Potential		
	Gallons	MTCO ₂ Reduced
Dump Truck B5	1,500	0.6
Dump Truck B20	1,500	2.8
Fleet-wide B5	66,345	27.2
Fleet-wide B20	66,345	122.1

The City should carefully evaluate all fuel types and available incentives when vehicle replacement decisions are made. California offers rebates and incentives for alternative fuel vehicles and infrastructure; currently available rebates are outlined later in this chapter.

Fuel Availability in the City

Additional fueling infrastructure throughout the region is needed for widespread adoption of alternative fuel vehicles. The City maintains its own fueling facility and also provides fuel to the Carlsbad Unified School District. Other available refueling sites near the City are identified in the *Summary of Alternative Fuel Infrastructure Availability* table below. **Appendix D** contains details on each location and the costs of installing each type of fueling infrastructure.

Summary of Alternative Fuel Infrastructure Availability

Fuel	Existing Fueling Sites within Ten Miles of Carlsbad Public Works Yard	Availability of Production-Distribution Infrastructure
Electricity	There are number of public charging locations in and near the City.	Existing electricity grid and distributed energy sources.
Biodiesel	One public access station in Kearny Mesa. Fuel could be delivered on site	Storage and blending terminals, port off-loading sites needed. Local producer is New Leaf Biofuel.
CNG	One public access station in the City.	Existing natural gas pipeline network.
Propane (LPG)	One public access station in the City.	Existing distribution by multiple vendors.
E85	One public access station in the City	Storage and distribution facilities needed in order to scale-up consumption.
LNG	No fueling sites in or near the City.	Existing.
Hydrogen	No fueling sites in or near the City.	Significant investment required.

Source: afdc.energy.gov/afdc/locator/stations.

Notes:

1. Site names, addresses, and distances are provided in **Appendix D**.
2. Contact your Energy Roadmap coordinator for information regarding the installation of publicly available EVSE at city government sites.

The infrastructure for alternative fuels is currently limited in the region, but is expanding slowly. As more fueling infrastructure becomes available, the alternative fuel vehicles could be more seriously considered.

The San Diego Regional Clean Cities Coalition, along with its members, have committed to addressing the need for more fueling choices across the region. The Coalition can provide more information on alternative fuel infrastructure and vehicles in the region.

State Grants and Rebates

The California Air Resources Board (ARB) and CEC offers grants and rebates for alternative fuel and advanced technology vehicles. Funding is allocated annually and the FY 2014-2015 budget for the CEC Alternative and Renewable Fuel and Vehicle Technology Program (energy.ca.gov/altfuels) is about \$100 million. ARB manages about \$30 million in rebates and projects through the Air Quality Improvement Program. (arb.ca.gov/msprog/aqip/aqip.htm). The 2013 passage of Assembly Bill 8 (AB 8) extends funding for the Carl Moyer Program, local diesel emission reduction programs, and Alternative and Renewable Fuel and Vehicle Technology Program through 2023. These programs accelerate the turnover of older vehicles and equipment and invest in the development and deployment of advanced clean emissions technology. Additionally,

AB 8 allocates \$20 million in funding toward the installation of hydrogen fueling infrastructure and supports the deployment of hydrogen fuel cell electric vehicles.

The CEC has allocated \$10.8 million in funding for light-, medium-, and heavy-duty natural gas vehicles that use. Natural gas trucks are gaining increased market attention due to their lower fuel costs, ability to reduce GHG emissions by 15 to 20 percent, and decreased nitrogen oxide emissions. Expanding alternative fuel infrastructure is another funding priority with allocations for electric vehicle charging stations and CNG station upgrades or expansions.

CEC Gaseous Vehicle Buydown Incentives

Gross Vehicle Weight in Pounds (lbs.)	Natural Gas
Up to 8,500	\$1,000
8,501 – 16,000	\$6,000
16,001 – 26,000	\$11,000
26,001 -33,000	\$20,000
33,001 & greater	\$25,000

Notes:

Buy-down funding must be secured through an eligible dealer.

CCSE manages ARB's Clean Vehicle Rebate Project (CVRP) (energycenter.org/cvrp), which provides rebates of up to \$2,500 for light duty battery electric and plug-in hybrid vehicle purchases. CCSE received approximately \$110 million in funding for FY 2014-2015. The *CVRP Rebate Amounts for Light-Duty Vehicles* table summarizes the rebates available.

CVRP Rebate Amounts for Light-Duty Vehicles

Vehicle Class	Maximum Incentive
Light duty zero emission vehicles (ZEV)	\$2,500
Plug-in hybrid electric vehicles (PHEV)	\$1,500
Zero emission motorcycles (ZEM)	\$900
Neighborhood electric vehicles (NEV)	\$900

Note: Eligible vehicles and associated rebate amounts are subject to change. Visit the CVRP program site for eligible vehicle models and associated rebates.

Rebates for commercial vehicles including trucks and buses are available through ARB's Hybrid Truck and Bus Voucher Incentive Project (HVIP) (californiahvip.org). As of September 2014, \$6.3 million of HVIP funding is remaining. A summary of the incentives available is provided in the *ARB HVIP Voucher Amounts for Trucks and Buses* tables on the following page.

HVIP Voucher Amounts for *Zero-Emissions* Trucks & Busses

Gross Vehicle Weight (in pounds)	
5,001 – 8,500 lbs	\$20,000
8,501 – 10,000 lbs	\$25,000
10,001 – 14,000 lbs	\$50,000
14,001 – 19,500 lbs	\$80,000
19,501 – 26,000 lbs	\$90,000
> 26,000 lbs	\$95,000

HVIP Voucher Amounts for *Hybrid* Trucks & Busses

Gross Vehicle Weight (in pounds)	
6,001 – 8,500 lbs (plug-in hybrids only)	\$8,000
8,500 – 10,000 lbs (plug-in hybrids only)	\$10,000
10,001 – 19,500 lbs	\$15,000
19,501 – 33,000 lbs	\$20,000
33,001 – 38,000 lbs	\$25,000
> 38,000 lbs	\$30,000

Note: The **first three vouchers** redeemed by a fleet are eligible for the following additional voucher amount:

\$2,000 per vehicle if below 8,500 lbs.;
 \$5,000 per vehicle if 8,501 to 10,000 lbs.;
 \$10,000 per vehicle if over 10,000 lbs.

Regional Electric Vehicle and Alternative Fuels Planning

Electric Vehicle Planning

Electric Vehicle (EV) adoption is increasing rapidly by consumers as well as fleets. The San Diego region was selected to take part in the largest EV rollout in United States history, through the EV Project (theevproject.com). In the San Diego region, work towards increasing EV infrastructure through the EV Project began in 2011 and continued through 2013, with more than 450 public charging stations installed. SANDAG and San Diego Gas & Electric® were local project partners provided in-kind assistance.

As a result of the project, many public sites throughout the region were identified as potential locations for EV charging stations including restaurants, community and regional shopping centers, large venue entertainment centers, transportation corridors, schools, hotels, airports, convenience retail, and retail shopping. A number of public chargers were installed in or near the City.

Most major automobile manufacturers have now introduced plug-in electric vehicles. Since December 2010, the Nissan Leaf and Chevrolet Volt have been available in San Diego. Additional plug-in vehicles are available from BMW, Fiat, Ford, Honda, Mitsubishi, Toyota, Tesla, and other manufacturers. There are more than 6,000

Through the EV Project, about 450 public EV chargers have been installed around San Diego County. More than 6,000 EVs are now on the road in the region

EVs on the road in the region, with that number increasing by approximately 100 per month. Regional infrastructure also continues to grow. NRG's eVGo subsidiary has recently installed a DC fast charge station in the City, as well as others along major regional transportation corridors

San Diego Regional Electric Vehicle Infrastructure Working Group

Through a grant from the CEC, SANDAG established the San Diego Regional Electric Vehicle Infrastructure Working Group (REVI) to develop a readiness plan for the San Diego region. The REVI has been meeting since March 2012 in order to share experiences to address regional barriers to PEV infrastructure and discuss potential best practices for incorporation into a PEV readiness plan. The City staff has participated as the North County Coastal representative on REVI.

Through earlier PEV planning and siting efforts, several barriers had been identified as obstacles to charging infrastructure installation and plug-in vehicle adoption. The REVI

has built upon these efforts and identified challenges, successes, and outstanding issues for continued PEV adoption and charging infrastructure deployment.

The San Diego Regional Plug-in Electric Vehicle Readiness Plan (Plan) was accepted by the SANDAG Board of Directors as a regional guide for use by local governments, public agencies, and others to support plug-in electric vehicle adoption and electric vehicle charging station deployment throughout the region. The Plan discusses and addresses barriers to the deployment of plug-in vehicle infrastructure in the San Diego region. This Plan is designed for local government officials, such as planners and building staff, as a resource to assist them in helping their local governments prepare their communities for a growing plug-in vehicle market. The Plan is available for download at: sandag.org/uploads/publicationid/publicationid_1817_17061.pdf

Alternative Fuels Planning

Building upon work done by the REVI, SANDAG has received a \$300,000 grant from the CEC to expand the EV planning effort and develop a regional readiness plan for all alternative fuels. Planning and related staff from the City and other local governments are encouraged to participate. SANDAG will be working with the San Diego Regional Clean Cities Coalition on this project that will assess the current state of alternative fuel vehicles and infrastructure in the region; create sector-specific tools and resources for fleet managers, local government staff, and other stakeholders; and prepare a regional readiness plan to help advance the use of alternative fuels and vehicles.

This page intentionally left blank.

Develop Employee Knowledge of Energy Efficiency

Developing employee knowledge of energy efficiency is another way for the City of Carlsbad (City) to promote energy savings in city government operations and throughout the community.

Overview

This chapter identifies free educational seminars offered by San Diego Gas & Electric® (SDG&E) and the California Center for Sustainable Energy (CCSE) available to City employees at the SDG&E Energy Innovation Center (EIC), located in Clairemont Mesa. Additionally, local colleges and universities host educational programs. Professional certifications in the energy management field also are identified. If City staff is interested in one of these courses, your Energy Roadmap coordinator can help facilitate participation in certification programs and may be able to assist with enrollment costs.

Getting Started

As a first step in identifying educational, training, and certification opportunities, the City is asked to please identify the following:

- Staff positions or employees that could benefit from energy-related workshops and trainings such as those listed in this section
- Other workshops or trainings of interest (even if not listed here)
- Workshops or trainings that the City may be interested in hosting at a city facility

SDG&E and CCSE conduct hundreds of expert-facilitated seminars on a broad spectrum of energy topics at the EIC. Workshop costs are covered by California utility customers under the auspices of the California Public Utilities Commission, unless otherwise posted. An RSVP is generally requested for workshops to ensure that adequate space and food are provided. For more information on programs hosted by the EIC, contact SDG&E: seminars@sdge.com.

The following table identifies quarterly workshops offered at the EIC as well as energy-related training and certification programs that could benefit city employees.

Free Educational Seminars		Audience
Building Performance and Monitoring	▪ Energy management systems ▪ SDG&E's kWickview energy management tool ▪ Energy Star Portfolio Manager ▪ Benchmarking tools ▪ Building information modeling	Facilities, public works
General Energy Workshops	▪ Energy efficiency 101 ▪ Electricity 101 ▪ Basics of solar, basics of solar water heating ▪ Lunch and learn topics	Layperson
Best Practices and Programs	▪ ENERGY STAR best practices ▪ Rebate programs	Planning, public works, City administration
Training and Certification Programs		Audience
Building Code Inspector Training	SDG&E offers free inspector training for city employees. Curriculum includes equipment identification and compliance, residential and commercial California Energy Code documentation and compliance, building plan verification for energy efficiency standards, and 2010 California Green Building Code.	Code inspectors, planning staff
Building Operator Certification (BOC)	SDG&E offers BOC Level 1 and 2 trainings and certifications to city staff at a reduced rate. A BOC is a nationally-recognized training and certification program offering improved job skills and more comfortable energy-efficient facilities. The training is led by experienced, professional instructors.	Facilities, public works staff
Certified Energy Manager (CEM)	Certification is through the Association of Energy Engineers. CEM distinguishes high levels of competency and proficiency in energy management, demonstrating expertise in several areas ranging from standards, air quality, energy audits, lighting, procurement, and financing.	Facilities, public works staff
North American Technician Excellence (NATE) Certification Exam (HVAC)	SDG&E and the Institute of Heating and Air Conditioning Industries, Inc. co-sponsor seminars designed to help experienced HVAC professionals prepare for successfully completing the NATE Certification Exam.	Facilities, public works staff
LEED® Professional Credentials	The Leadership in Energy and Environmental Design® (LEED) designation acknowledges expertise in green planning, design, construction, operations, neighborhood development, and other sustainable practices. SDG&E will cover the cost of appropriate city employees to undergo training for a LEED Professional Credential.	City administration, planning, facilities, public works, environmental services
Online Workshop Calendar	To view upcoming workshops, visit sdge.com/seminars	

4

Implement a Commuter Benefit Program

The City of Carlsbad (City) can achieve transportation-related energy savings by promoting the City's commuter benefit program offered to its employees. Such programs provide alternative transportation choices to driving alone and incentives to use them. Support services from the SANDAG Transportation Demand Management Division, which oversees the iCommute program, are offered at no cost to the City as part of the Energy Roadmap. Services are customized to address the specific needs of your city and its employees. Needs are identified through City staff direction, a survey of employee commute habits and preferences, and the mapping of employee commutes so that iCommute can recommend to the City which commute choices may make sense to promote to staff.

How it Works

A Commuter Benefit Program provides employees with alternative transportation choices for their commute, as well as incentives for using them. A custom program could include everything from helping connect employees who want to carpool or vanpool with one another, to offering flexible or telework schedules, to providing free or reduced-cost transit passes.

iCommute services are offered at no cost to the City. Other programs are inexpensive for the City to implement, or come with subsidies sponsored by SANDAG. For example,

Commuter Program Benefits

By providing alternative transportation choices for its employees Carlsbad can:

- Improve traffic flow, and reduce employee parking congestion
- Set an example for residents and businesses
- Reduce commuter-related expenses, and add commuter benefits to employee compensation packages at little or no cost
- Measure and reduce petroleum consumption and carbon footprint

SANDAG provides a \$400 per month subsidy for qualifying vanpools. The Commuter Benefit Starter Kit for Employers, available through iCommuteSD.com, provides your city with the tools to get started, including an overview of options, sample policies, promotional materials, and tax benefit information.

iCommuteSD.com offers employees free and convenient ride matching and trip tracking tools. The website also provides the means to create a customized incentive program for

alternative transportation commuters. The website comes with a convenient reporting feature that details how many employees are participating, as well as measures the agency and employees financial and environmental savings including; the amount of air pollution and greenhouse gas emissions avoided, cost savings, and fuel savings.

Existing Commuter Trends

An employee commuter survey was conducted in 2009, with a total of 250 employees participating, and it revealed that 88 percent of employees drove alone, 2 percent carpooled, and 10 percent took other modes to work. When considering alternative transportation modes, employees responded with the most interest in carpooling, public transportation, and bicycling. Employee interest in alternative transportation mode choices is as follows:

- Carpooling (33%)
- Public Transit (26%)
- Bicycling (21%)
- Vanpooling (12%)

The survey also suggested that employees have a great interest in improved public transit choices and a telework option. The Commuter Program Recommendations section offers guidance and examples of iCommute programs that will assist the City with encouraging employees to utilize alternative modes of transportation.

Commuter Program Recommendations

According to the 2009 survey, the following programs have the greatest potential benefit for the City to reduce energy consumption, greenhouse gas emissions, and vehicle miles traveled by employees. Of those surveyed, 33 percent were interested in carpooling, and 12 percent were interested in the vanpool program. iCommuteSD.com has two tools that can help.

iCommuteSD.com

The City can reduce energy consumption and congestion by encouraging carpools, vanpools, and bicycling. The City has an established network within the iCommute website and employees can use the RideMatcher tool to find other employees who have similar commutes. With 88 percent of Carlsbad employees driving alone, but 33 percent expressing interest in carpooling, RideMatcher can assist an employee in finding a carpool, vanpool, or bike buddy.

TripTracker is an easy and convenient way for an employee to record trips made by alternative modes of transportation. It calculates the number of gallons of fuel saved,

monetary savings, pounds of carbon dioxide not emitted into the atmosphere, and how many miles an employee has not traveled alone. Tracking trips also enters the employee into the iCommute monthly prize drawing. Through TripTracker the City can implement its own incentive program to encourage alternative modes of transportation. For example, if an employee tracks 20 completed trips, or 10 roundtrips, in a month by an alternative mode they would receive a cash incentive. There are many ways to structure an incentive program, and iCommute offers free assistance to create the ideal incentive program for the City.

Regional Vanpool Program

For City employees that have longer distance commutes (20 miles or more), vanpools are a comfortable, cost-effective, and convenient way for groups of seven to fifteen people to share their commute. Employees or the employer, can lease a vehicle through one of the vanpool vendors contracted by iCommute, and receive up to \$400 per month to help offset the cost of the lease. On average, vanpool participants cut their commute costs by many hundreds of dollars per year. Typical savings to each passenger:

- 20 miles round-trip commute = \$1,000/year
- 50 miles round-trip commute = \$4,000/year

Guaranteed Ride Home

To support alternative modes, iCommute offers the Guaranteed Ride Home Program. Enrollment in this program allows for the use of a rental car or taxi in the case of:

- Personal or family illness or emergency
- Unscheduled overtime
- Your rideshare partner is unavailable

Employees who carpool, vanpool, take a Premium Express Bus, or the COASTER three or more times per week are eligible. In addition, commuters that walk or bike 75 percent or more of their trip, three or more days per week, are eligible. This program may be used up to three times per year, and requires a \$3.00 copay per use.

Transit

Carlsbad is well served by the North County Transit District transit system, with stations near multiple municipal facilities, including City Hall, the Maintenance and Operations facility, and the Faraday Center. To promote increased usage of public transportation, employer supplied transit passes and pretax incentives could be effective tools. With minimal cost to the City there is an option to subsidize part of the employees' commuting costs, allowing employees to pay for the remainder with pre-tax dollars. To further encourage participation in transit, the City could offer discounted monthly

transit passes to employees as part of the overall benefits package for employees. Additional information on specific routes and timetables can be found at gonctd.com. Employees that use transit to commute are also eligible for the pretax incentive.

Pre-tax Incentive

Employers can take advantage of employee and employer payroll tax savings offered through the IRS Commuter Fringe Benefit Program (IRS Section 132). The IRS allows employers to offer employees the opportunity to set aside a portion of their pre-tax salary to pay for transit and vanpooling. Bicyclist can also receive up to \$20 per month, but this cannot be combined with other incentives. Employers benefit by not paying payroll taxes on that money, while in effect adding value to their employee's compensation package. Consult with your payroll department to take full advantage of this option.

Telework and Flexible Schedules

Teleworking is a convenient solution that enables employees to work from home or a remote location one or more days per week. Flexible schedules offer hours outside of the traditional 9 a.m. to 5 p.m. schedule. For example, employees can work a 4/10 (4 days per week, 10 hours per day) or 9/80 schedule. Teleworking has been shown to help recruit and retain high performing employees, and help the employees become more productive and happier. The employee gain additional benefit from the reduction of commute-related expenses. Jobs that are most suited for teleworking are those that require reading, writing, researching, working with data, and talking on the phone, often referred to as "information-based jobs."

Bicycling

Bicycling is an excellent choice for commuting that will save employees money, reduce stress, and help the environment. iCommuteSD.com has resources and tools for commuters that help plan routes, provide safety information, track trips, find bike buddies, and to learn more information about bike-to-work events. Bicycling is also a first or last mile solution if transit is out of walking distance, as bicycles are allowed on the COASTER, SPRINTER, and buses. iCommute maintains bicycle lockers throughout San Diego County located at many transit stations and park and ride lots. Twenty-one percent of employees stated they would consider bicycling as an alternative to driving alone; the City could encourage bicycling to work by having bicycle lockers at the various City facilities, and by providing locker rooms with showers.

SchoolPool

SchoolPool is the iCommute ridematching service for parents of children who attend the same school. With this safe and secure service, you are matched with other parents in your neighborhood who are interested in sharing the driving responsibilities or would like to have their children bike or walk to school with other students and a parent leader. SchoolPool is available region-wide for all K-12 public and private schools. These alternative modes of transportation reduce congestion around schools while helping the environment. SchoolPool also puts an emphasis on safety, as safety events are held at various schools throughout the year

Getting Started

At any time, the City can request assistance from iCommute to develop a customized commuter benefit program to take full advantage of these no-to-low cost programs. The iCommute team can also help the City to engage employees in learning about alternative transportation choices, and to establish municipal commuter policies.

Actions could include:

- Meet with iCommute to review no cost online tools and functionality of the iCommute website
- Survey staff on their current commute habits and preferences
- Formalize a commuter benefit policy that outlines the commuter benefits that the City can offer (samples available on iCommuteSD.com)
- Include commuter benefit information in new employee orientation packets and link to iCommute on your intranet site
- Participate in and promote iCommute annual events such as Rideshare Week, Bike to Work Day, and Walk and Bike to School Day. Join the Rideshare Week and Bike to Work Corporate Challenges to showcase your commitment to sustainable commute choices.

For more information on iCommute programs and services, and to download the Commuter Benefit Starter Kit for Employers, visit iCommuteSD.com, or contact Goldin Doles at (619) 699-4814 or goldin.doles@sandag.org.

This page intentionally left blank.

Leverage Planning and Development Authority



Local governments can promote energy efficiency in their communities by leveraging their authority over local land use and development activity. This chapter addresses ways in which energy considerations can be integrated into local land use and transportation planning. These energy efficiency

and/or petroleum reduction measures are consistent with regional and state energy policies, and fall under the following categories:

1. **Smart growth development policies**
2. **Energy efficiency planning and permitting**
3. **Clean and efficient transportation planning**

The Planning Role of Local and Regional Governments

Regional energy consumption is strongly related to urban form – i.e., the physical features and composition of the built environment. Local governments and SANDAG can influence the built environment, including the amount of energy consumed, through regulations, incentives, collaborative planning, and infrastructure investments that affect land use patterns, the transportation system, and other public facilities.

State law specifically vests local governments with authority over land use and development activities within their jurisdictions in accordance with their general plans and other policy documents that address land use, circulation (transportation), housing, public facilities, environmental management (open space, conservation, safety, scenic highways), and economic development. Local governments develop regulations and programs to implement their planning policies and goals.

Sustainable Communities Strategy

Pursuant to Senate Bill 375 (Steinberg 2008), SANDAG and regional planning agencies across the state are required to develop a Sustainable Communities Strategy (SCS) in order to reduce per capita Greenhouse Gas (GHG) emissions from passenger vehicles consistent with targets set by the California Air Resources Board (CARB). The following

table, *GHG Reductions in the SANDAG Sustainable Communities Strategy*, presents the assigned CARB targets and the projected GHG reductions and Vehicle Miles Traveled (VMT) reductions projected in the SCS. On October 28, 2011, SANDAG became the first metropolitan planning organization in the state to adopt an SCS as part of its 2050 Regional Transportation Plan (RTP). SANDAG is using this strategy as the foundation for updating its Regional Comprehensive Plan (RCP), which provides a long-term strategic planning framework for the region based on “smart growth” and “sustainability.” These principles are described in the next section.

GHG Reductions in the SANDAG Sustainable Communities Strategy			
Average Weekday Per Capita CO ₂ and VMT Reductions for Cars and Light Trucks from 2005			
Target Year	CARB Target	GHG	VMT
2020	7%	14%	12%
2035	13%	13%	10%

Notes: CO₂ = carbon dioxide.
CARB identifies CO₂ as the GHG whose concentration is being most affected directly by human activities. CO₂ also serves as the reference to compare all other GHGs.

SB 375 also provides an opportunity for streamlining the California Environmental Quality Act (CEQA) process for certain local redevelopment projects, if they are consistent with the SCS as either a “residential/mixed use project” or as a “Transit Priority Project” (TPP). Environmental review of a residential/mixed use project consistent with the SCS would not need to consider growth-inducing impacts or increases in GHG emissions from passenger cars and light trucks. For a TPP, the project would need to be at least 50 percent residential with a density of at least 20 units per acre and be within a one-half mile of a major transit stop or a high quality transit corridor included in the 2050 RTP. **Appendix F** contains larger definitions for what projects could qualify for this type of CEQA streamlining.

SANDAG, working closely with all local jurisdictions, is undertaking a combined update to its RCP and RTP/SCS, called San Diego Forward: The Regional Plan (the Regional Plan). The Regional Plan is scheduled for adoption in 2015, and will include a review of smart growth designated areas in relation to the SCS.

Envision Carlsbad

In order to inform the City of Carlsbad’s (City) General Plan Update, the City undertook a visioning process to gain input from residents on developing the core values for their community. The result was the City’s Community Vision, adopted in 2010, which among other core values, calls for the City to be a leader in sustainability. The City also adopted a series of Sustainability Guiding Principles that describe ways for the City to be a model community, create a sustainable system, engage Carlsbad residents, take a proactive

approach to sustainability in city policy, recognize the local and global impacts of decision making, and develop a sustainable community based on cost effective programs.

**Envision Carlsbad – Community Vision Core Value
Sustainability**

“Build on the City’s sustainability initiatives to emerge as a leader in green development and sustainability. Pursue public/private partnerships, particularly on sustainable water, energy, recycling, and foods.”

In February 2014, the City released its draft General Plan Update, and the theme of sustainability is resonated throughout the General Plan. In particular, the Land Use and Community Design Element establishes sustainable development patterns that seek to decrease dependency on the automobile. The Mobility Element emphasizes balanced transportation choices and improving connectivity within the City. The City also developed a Climate Action Plan (CAP) concurrently with the General Plan. The CAP includes specific targets and programs for GHG reductions in the City.

1. Smart Growth Development Policies

Smart growth can be defined as a compact, efficient, and environmentally sensitive pattern of development that provides people with additional travel, housing, and employment choices by focusing future growth away from rural areas and closer to existing and planned job centers and public facilities, while preserving open space and natural resources. Smart growth policies fit into the broader context of sustainability by guiding development to preserve access to natural resources. The principles of sustainability are based on achieving conservation goals and objectives in three broad areas: a prosperous economy, a healthy environment, and social equity. With the adoption of SB 375, the state is recognizing the influence that smart growth policies have on long term sustainability.

The SANDAG Smart Growth Concept Map, last updated in 2012, identifies locations of existing, planned, and potential smart growth areas. One example of an existing/planned smart growth area in the City is the Carlsbad Village COASTER Station.

Carlsbad Village COASTER Station, located at Grand Avenue and State Street, consists of the Village Master Plan area, and the City's Barrio. The City has taken steps to encourage residential/retail development near the commuter rail service and approved revisions to the development standards to increase flexibility for mixed-use, parking, and higher-density



residential development. The Barrio is a smart growth opportunity area where the City allows for medium and high-density infill residential development while being sensitive to historic and cultural resources.

The City will continue to focus its smart growth planning efforts in its downtown. In April 2014, the City initiated a comprehensive update to the Village Master Plan and Design Manual to support the Community Vision and implement the new General Plan. Specific objectives of the update are to: unify the Village and Barrio areas; incentivize and attract smart growth, mixed-use developments; foster better transit; support non-vehicular access and emphasize the pedestrian through design, uses, and the streetscape; recognize and be sensitive to historic and cultural resources; support future housing needs for all income groups; and encourage quality design.

Funding for Smart Growth Planning

SANDAG manages the *TransNet* Smart Growth Incentive Program (SGIP), which funds transportation and transportation-related infrastructure improvements and planning efforts that support smart growth development. The SGIP awards two percent of the annual *TransNet* revenues to local governments through a competitive grant program. For more information on the SGIP, and upcoming funding cycles, visit sandag.org/smartgrowth.

The City's draft General Plan policies call for prioritizing capital funding in infill, transit priority, and smart growth areas (Policy 2-page 57), as well as to actively pursue grant funding such as SANDAG's Active Transportation Grant and SGIP programs to improve non-automotive connectivity in the city (Policy 3-page 30).

In addition to the policies in the draft General Plan update, **Appendix F** contains further sample policies that encourage smart growth development. The City could determine which measures are most appropriate for it to consider. This appendix also contains the

existing and potential “smart growth opportunity areas” that the City provided SANDAG for inclusion in the adopted Smart Growth Concept Map (2012).

2. Energy Efficient Building Upgrades

On a statewide scale, three decades of energy efficiency programs have saved Californians \$65 billion and avoided the need for 30 additional power plants. In addition, most energy efficiency measures boost the local economy since retrofits must be performed by a local labor force. In 2012, California-based clean-energy startups brought in nearly \$9 billion in investments over the previous three years, enough to surpass the sum of activity in all 49 other states.

Energy Codes and Permits Review

Through building codes, local governments require a minimum level of protections to occupants on many fronts. Fire safety and electrical codes save lives. Energy codes improve indoor air quality, make homes and offices more comfortable, and reduce utility bills.

The City’s draft General Plan Sustainability Element contains goals and policies to promote energy efficiency and conservation, through green building programs and sustainable energy projects (Goal 9-page 3, Policy 9-page 12, Policy 9-page 13). The draft Climate Action includes measures to encourage energy efficiency retrofits in residential, commercial, and city facilities (Measures D-F).

The state’s framework for energy efficiency strategies is the *California Long Term Energy Efficiency Strategic Plan (LTEESP)*, prepared by the California Public Utilities Commission’s (CPUC). The LTEESP identifies the following areas where local government authority can influence energy use in new and existing buildings:

1. Ensuring compliance and enforcement of the Title 24 energy code for residential and commercial buildings.
2. Adopting and implementing voluntary and mandatory “reach” (enhanced energy efficiency) codes beyond Title 24’s energy requirements (and potentially other “green” requirements).
3. Supporting highly efficient projects that voluntarily exceed minimum energy codes through favorable fee structures, fast-tracked permitting and other innovative and locally appropriate approaches.
4. Enacting ordinances with point-of-sale or other approaches that spur efficiency actions in existing, privately-owned buildings.
5. Applying efficiency-related “carrots” and “sticks” using local zoning and development authority.

If the City has interest in learning more about code, permit and compliance options, the Energy Roadmap coordinator and San Diego Gas & Electric® (SDG&E) can provide assistance. For example, the City can receive free energy code compliance training for local building inspectors, or receive materials needed to consider adoption of voluntary reach codes, which go beyond the traditional minimum code requirements to make buildings more energy efficient.

Energy Upgrade California – Home Retrofit Programs

Energy Upgrade California (EUC) (www.energyupgradeca.org) is a statewide comprehensive retrofit program for residential and small commercial buildings. The program coordinates federal, state, utility, and local retrofit program outreach, incentives, training, and qualifications. Locally, the California Center for Sustainable Energy (CCSE) is collaborating with SDG&E to coordinate the EUC program. CCSE manages additional rebates offered in San Diego County; as well as workforce training that qualifies local contractors to perform the work.

The EUC program promotes a “whole house” performance approach to efficiency that focuses on the elements within a home that affect energy use, how they interact, and how they influence health and safety. This approach diverges from the traditional “widget” approach to energy efficiency program delivery, which targets only one building aspect at a time, such as lighting, air conditioners, or insulation. To determine the best approach for improvements to an individual home, a home energy assessment is done. The assessment can pinpoint exactly what upgrades can be made, the costs, and the rebates or incentives that may apply. The home assessments and retrofit projects are performed by licensed building contractors that have been trained for the EUC program. (More information on workforce development programs is contained in Chapter 7.)

The San Diego Regional Energy Partnership (SDREP) has tasked CCSE with continuing several local EUC programs that were previously funded through American Recovery and Reinvestment Act grants from the City of Chula Vista, City of San Diego and County of San Diego and expanding them regionally. Those jurisdictions, along with SANDAG, have dedicated grant funds to the SDREP to provide additional EUC resources to all local jurisdictions in San Diego County through 2014. The SANDAG contribution is to:

“Further develop and support regional EUC implementation and the broader existing home retrofit market to facilitate “deep energy retrofits” (both in terms of high energy savings and untapped markets in existing residential buildings) for member jurisdictions.”

City residents can take advantage of this program to reduce their energy consumption, while improving the comfort of their homes, and municipal staff is encouraged to participate in the planning and implementation of these programs through a regional Retrofit Advisory Council (RAC). **Appendix G** includes details about the RAC and the region-wide projects underway through the SDREP.

Property Assessed Clean Energy Programs

Property Assessed Clean Energy (PACE) is a financing mechanism that allows property owners to pay for energy and water efficiency upgrades and renewable energy improvements without having to pay the costs upfront. PACE affords a qualifying home or business owner a loan for eligible upgrades or improvements, which is paid back via their tax bill. Assembly Bill 811 and Senate Bill 555 serve as legislative authority for PACE operations. These two legislative actions enable the use of PACE as a financing tool, but provide slightly different structures.

PACE participation throughout the San Diego region varies by jurisdiction, and several companies offer PACE programs. The City has joined three PACE programs, allowing residents and businesses to participate in CaliforniaFIRST, HERO, and Figtree financing. HERO, a residential PACE program, has taken over 200 applications from the San Diego region's participating cities with over \$7.5 million worth of energy retrofit projects under review for financing. CaliforniaFIRST has 16 active commercial applications in the

Envision Carlsbad – Community Vision

Walking, biking, public transportation and connectivity

“Increase travel options through enhanced walking, bicycling and public transportation systems. Enhance mobility through increased connectivity and intelligent transportation management.”

region valued at over \$16.5 million which should be funded in summer 2014. More information on PACE programs including which jurisdictions are participating is available in **Appendix G**.

3. Clean and Efficient Transportation Options

Saving energy through clean and efficient transportation options includes reducing petroleum use by reducing single occupancy driving and increasing use of electric vehicles and alternative fuels. This section describes the City's current efforts to promote clean and efficient transportation options and additional resources for active transportation, transportation demand management (TDM), and alternative fueling infrastructure.

Active Transportation

Active transportation includes biking and walking as a means of getting from one place to another. Having facilities to support active transportation offers multiple travel choices for residents, fosters healthy lifestyles, and provide sustainable transportation options. The Carlsbad Community Vision calls for increasing travel options through enhanced pedestrian and bicycling systems, and the draft General Plan Mobility Element contains a number of policies that support active transportation. Recently, the City has taken steps to provide more options for walking, hiking, running, and biking, by updating the Trails Master Plan and developing a Comprehensive Active Transportation Strategy.

To support the City's active transportation plans and projects, the City received four *TransNet* Active Transportation grants in 2012 totaling \$1.25 million. The grants include the following projects:

- \$800,000 to construct a roundabout at the Carlsbad Boulevard-State Street intersection and reconfigure existing right-of-way to include bicycle lanes on each side of the street, a sidewalk on the east side of the street, and the Coastal Rail Trail on the west side of the street.
- \$267,000 for the Active Village Campaign to boost awareness of bicycling and walking opportunities in the Carlsbad Village. The City is partnering with several organizations including Urban Place, the Carlsbad Village Association, WalkSanDiego, the San Diego County Bicycle Coalition and local schools to encourage people to use active transportation.
- \$150,000 to develop and implement a citywide Active and Livable Streets Strategy for Active Transportation.
- \$33,000 for 80 new custom bicycle racks and six bike corrals, consisting of seven racks each, to improve access for bicyclists in northwestern Carlsbad.

TDM

TDM is the application of strategies to reduce single occupancy vehicle travel by encouraging alternative transportation options. Including TDM measures in the development review process may offer developers creative, affordable, and effective ways to reduce vehicle trips and their impacts. TDM measures also contribute toward Leadership in Energy and Environmental Design® certification.

The City's draft General Plan and Climate Action Plan support transportation and parking demand programs. Draft Mobility Element policies call for developing flexible parking requirements and providing development incentives to implement TDM programs (Policies 3-page 34 through 3-page 37). Similarly, the draft Climate Action Plan calls for preparation of a citywide TDM plan and ordinance to reduce GHG emissions (Measure K). Through its capital improvement program, the City will develop a multimodal infrastructure plan to expand transportation choices for the coastal

corridor. The plan will focus on transit accessibility, “first mile-last mile” solutions, low-emission and zero-emission travel, and viable alternatives to single-occupant driving.

The iCommute program offers free assistance to regional businesses and agencies in establishing and implementing customized TDM policies and programs that reduce traffic congestion, fuel use, air pollution, and GHG emissions. SANDAG recently completed a TDM tool for city planners: Integrating Transportation Demand Management into the Planning and Development Process - A Reference for Cities. The report is available as part of the SANDAG smart growth toolbox at the following link: sandag.org/uploads/publicationid/publicationid_1663_14425.pdf.

Another TDM strategy is parking management that provides parking options to reduce the amount of driving. Parking strategies can be effective in, and complement smart growth areas with compact land use patterns and alternative travel options. Parking policies complement many TDM efforts, and normally have included incentives or disincentives for fewer spaces per unit of development (parking maximums rather than minimums), encourage shared parking among land uses (retail and office for example), and/or a fee per parking space. In 2010, SANDAG published Parking Strategies for Smart Growth: Planning Tools for the San Diego Region and continues to work with local governments on innovative parking policies. The parking report is available at: sandag.org/uploads/publicationid/publicationid_1499_11603.pdf.

Alternative Fueling Infrastructure

As automakers offer greater numbers of vehicles powered by a variety of fuels, infrastructure must keep up to enable this market growth. For example, Cadillac, Chevrolet, Daimler, Fiat, Ford, Honda, Mitsubishi, Nissan, Tesla, and Toyota all offer plug-in electric vehicles today. Also, Honda, Toyota, General Motors, Daimler, Hyundai, and Nissan have stated they plan to bring hydrogen fuel cell vehicles to market in the 2015 to 2017 timeframe.

In order to keep pace with the market and reach state petroleum reduction targets, regional planning and actions are necessary to incorporate alternative fuel infrastructure (e.g., fueling stations and Electric Vehicle [EV] chargers) where little to none exist today. Requests for availability of EV chargers and other fueling infrastructure will grow in the near future.

The City’s draft Climate Action Plan promotes increased use of Zero-emission Vehicle (ZEV) travel through development of a charging station siting plan and action program to install alternative fueling stations, adopting ZEV parking standards, and updating the

City's fleet management program to increase the use of alternative fuel vehicles in City operations (Measure L).

Recognizing these factors, the SANDAG Board included several recommended actions in the 2050 RTP/SCS (2011) to begin planning for an increase in alternative fuel vehicles. Specifically, Sustainable Communities Strategy Actions 21, 22, and 24 addressed alternative fuels, the transportation network, and the need for adequate infrastructure.

21. Support planning and infrastructure development for alternative fueling stations and plug-in EV chargers.
22. Develop or facilitate a regional approach to long-term planning for alternative fuel infrastructure that includes the continued development of public-private strategic alliances.
24. Integrate alternative fuel considerations into the development of the regional transportation network by, for example, integrating infrastructure for EV charging into regional park-and-ride lots and transit stations.

Siting alternative fueling stations is important to provide customers like fleet managers and the general public with a level of certainty that infrastructure will be available to support their investment in an alternative fuel vehicle. Support for alternative fuel infrastructure also can help attract private investment associated with alternative transportation to the region. The San Diego Regional Clean Cities Coalition, along with its members including the County, SANDAG, local cities, the Airport Authority, the Port of San Diego, and CCSE have committed to addressing the need for more fueling choices across the region. A list of both publicly and privately available alternative fueling stations is included in **Appendix D**.

SANDAG received a \$200,000 Energy Commission grant in 2012 to work with local governments and stakeholders to prepare a regional readiness plan for electric vehicles. Subsequently, SANDAG has received a \$300,000 grant to expand the EV planning effort and develop a regional readiness plan for all alternative fuels. Planning and related staff from the City and other local governments are encouraged to participate. The San Diego Regional EV Readiness Plan was accepted by the SANDAG Board in January 2014 and the alternative fuel readiness plan is to be completed in summer 2016. Factsheets and best practices on permitting EV chargers, parking accessibility, types of chargers, and other topics are included in the San Diego Regional Plug-in EV Readiness Plan available at: sandag.org/uploads/publicationid/publicationid_1817_17061.pdf.

Market Energy Programs to Local Residents, Schools, and Businesses

This chapter provides the City of Carlsbad (City) with internet links to existing energy efficiency and fuel-saving resources that the City could include on its website, newsletters, and email alerts. This would enable the City to serve as a conduit to its constituents on energy-saving residential, commercial, and school programs. The City could help promote messages of sustainability that foster a greater local understanding of the connection between energy/fuel use and environmental impacts. The City also could become a local government partner with national energy-saving educational campaigns like *ENERGY STAR*® and *WaterSense*.

California's Vision for Marketing, Education, and Outreach

Californians will be engaged as partners in the state's energy-efficiency, demand-side management, and clean energy efforts by becoming fully informed of the importance of energy-efficiency and their opportunities to act.

California Long-Term Energy Efficiency Strategic Plan

The following five outreach mechanisms are provided as sample ways in which the City can engage residents and businesses in energy programs:

1. Provide summary descriptions and links to San Diego Gas & Electric® (SDG&E) programs and rebates and related resources on the Carlsbad – Sustainable City website.
2. Include articles about opportunities to save energy with links to existing programs and community resources, like the California Center for Sustainable Energy (CCSE), in City newsletters (print or email) or similar media.
3. Provide educational materials on saving energy at City venues such as the permit desk, parks and recreation areas, and city hall. SDG&E, CCSE, and SANDAG iCommute can provide materials about programs and services for residents and businesses.
4. Invite SDG&E, SANDAG iCommute and/or CCSE to host an information booth on energy-saving programs or commuter programs at community events.
5. Help coordinate presentations by SDG&E and SANDAG iCommute to community organizations such as a neighborhood planning group or local chamber of commerce.

Comprehensive Energy Program Websites

Residential Energy-Saving Programs	sdge.com/residential/rebates.shtml
Commercial Energy-Saving Programs	sdge.com/business/rebatesincentives
Educational Resources for All	SDG&E and CCSE conduct hundreds of expert-facilitated seminars on a broad spectrum of energy topics at two locations in central San Diego, the Energy Innovation Center (EIC). The online calendar lists workshops from both organizations and venues. sdge.com/energy-innovation-center/seminars
SANDAG iCommute	Free online gateway to commuter choices in the San Diego region; hosted by SANDAG. Includes 511, transit trip planner, online ride matching service, and cost of commute calculator. icommutesd.com
Energy Upgrade California	energyupgradecalifornia.org

Local Educational Resources

SDG&E Energy Innovation Center

In January 2012, SDG&E opened the EIC, which was designed to be one of San Diego's first Leadership in Energy and Environmental Design® Platinum buildings open to the public. The EIC is a community resource to explore the latest green technologies and learn about energy efficiency. It hosts a variety of workshops and includes a Food Service Demonstration Kitchen that hosts free seminars on energy-efficient cooking, equipment, lighting, and food safety. Additionally the CCSE hosts workshops related to renewable energy at the EIC.

The EIC is located at 4760 Clairemont Mesa Blvd, San Diego, California 92117. Call (800) 411-7343 or visit sdge.com/eic. For information related to solar programs and workshops, contact CCSE at (858) 244-1177 or visit energycenter.org.

SANDAG iCommute Programs for the Community

In addition to supporting City-employee commuter programs like those identified in Chapter 5, the City could help educate its residents and local businesses about alternatives to driving alone in the community. The City could:

- Provide information on commuting resources at the Civic Center, libraries and other public sites, and/or on municipal websites and newsletters. Include links to the 511

transit trip planner, iCommute online ridematching service, and an online cost-of-commute calculator.

- Participate in annual events and campaigns that encourage commute alternatives to driving alone such as Bike to Work Day, Dump the Pump, Rideshare Week, Walk and Bike to School Day:
 - Adopt proclamations and celebrate these events in your community.
 - Participate in the Bike to Work and Rideshare Week Corporate Challenges to demonstrate your commitment to sustainable commute choices.
 - Host a Bike to Work Day pit stop(s)
- Recognize and/or honor local commuters and employers who have demonstrated a commitment to sustainable commute choices.

SANDAG SchoolPool Program

SchoolPool is iCommute’s free ridematching service for parents of children who attend the same school anywhere in the region. With this safe and secure service, parents are matched with other parents in their neighborhood who are interested in sharing the driving responsibilities or would like to have their kids bike or walk to school with other students and a parent leader. The City could:

- Encourage the school district and/or individual schools to enroll in SchoolPool, a secure online ridematching service administered by SANDAG for parents with children in kindergarten through 12th grade. SchoolPool can be a transportation solution for parents who live in districts where school bus services have been cut.
 - SchoolPool enables parents of children who attend the same school and live in the same neighborhood to share responsibilities of getting their children to and from school.
 - SchoolPool helps parents connect their children with bike buddies and “walking school buses” – groups that ride their bikes or walk to school together with one or more adults.
 - Parents who use SchoolPool to find bike buddies and walking school buses can receive a free helmet for each child who bikes and a free baseball cap for each child who walks. All children who either bike or walk can receive reflective backpacks. Safety vests are provided for parent leaders.

Through SchoolPool, parents can receive a free helmet for each child who bikes and a free baseball cap for each child who walks. All children who bike or walk can receive reflective backpacks, and safety vests are provided for parent leaders.

National Educational Resources



ENERGY STAR Government Partnerships

In addition to appliance labeling, the ENERGY STAR program seeks partnerships with local businesses, congregations, industries, schools, and others. By becoming a Government ENERGY STAR Partner, a local government can receive recognition nationally and can co-brand local energy-saving initiatives with ENERGY STAR. More information is available at energystar.gov.

The United States Environmental Protection Agency and United States Department of Energy also host an annual ENERGY STAR Awards ceremony to honor organizations that have made outstanding contributions to protecting the environment through energy efficiency. For more information on government partnerships, visit energystar.gov/index.cfm?c=government.bus_government.

WaterSense® WaterSense Promotional Partners

WaterSense helps consumers identify water-efficient products and programs that meet WaterSense water efficiency and performance criteria. Products carrying the WaterSense label perform well, help save money, and encourage innovation in manufacturing. More information is available at epa.gov/watersense.

Local governments, utilities, and other organizations can become WaterSense Promotional Partners to help provide outreach on water-efficiency measures. Jurisdictions can receive recognition nationally and can co-brand local water-saving initiatives with WaterSense as a promotional partner. For more information on promotional partners, visit epa.gov/watersense/partners/promotional.html.

Energy Programs for Residential and Business Audiences

Renewable Energy Programs

Self-Generation Incentive Programs	energycenter.org/index.php/incentive-programs/self-generation-incentive-program
The California Solar Initiative (CSI)	energycenter.org/index.php/incentive-programs/california-solar-initiative
CSI Thermal Program (Solar Water Heating)	energycenter.org/index.php/incentive-programs/solar-water-heating
Sustainable Communities Program	sdge.com/environment/sustainable-communities-overview
SDG&E Solar Initiative	sdge.com/clean-energy/going-solar/solar-rebate-programs
Net Energy Metering	sdge.com/nem

Energy and Water

20-Gallon Challenge	The 20-Gallon Challenge is a call for residents and businesses to reduce our region's water use on average by 20 gallons per person, per day. Hosted by the San Diego County Water Authority. 20gallonchallenge.com
---------------------	--

Smart Grid

SDG&E Smart Grid Program	Smart meter and smart grid technologies are being deployed throughout the San Diego region and across the state. sdge.com/smartgrid
--------------------------	--

Clean Transportation and Petroleum Reduction Programs

Clean Vehicle Rebate Project	energycenter.org/cvrp
SANDAG iCommute	icommutesd.com
SDG&E Clean Transportation	sdge.com/cleantransportation
The EV (Electric Vehicle) Project	theevproject.com
SANDAG SchoolPool Program	icommutesd.com/Schoolpool

Energy Programs and Assistance for Local Businesses

Energy efficiency and Demand Response

Business Incentives	sdge.com/business/rebatesincentives
Critical Peak Pricing	sdge.com/cpp
Technical Assistance and Technology Incentives	sdge.com/tati
Project Management Builder Services	sdge.com/builderservices
Summer Saver	sdge.com/vendor/summersaver
On-Bill Financing	sdge.com/obf
Energy Savings Bid	sdge.com/bid
Energy Challenger (energy audit tool)	sdge.com/save-money/no-cost-audits/business-energy-assessment-program
Energy efficiency Seminars	sdge.com/training
PACE Financing: CaliforniaFIRST	californiafirst.org

New Construction

Savings by Design	sdge.com/clean-energy/savings-design/savings-design
Sustainable Communities Program	sdge.com/environment/sustainablecommunities

Energy Programs and Assistance for Residents

Comprehensive Residential Websites

SDG&E's Residential Rebates and Services	All SDG&E residential programs can be accessed from this website. sdge.com/saveenergy
Energy Upgrade California (EUC)	EUC is a statewide brand for all energy-saving building retrofit programs. EUC coordinates federal, state, utility, and local retrofit program outreach, incentives, training, and qualifications. Locally, CCSE is collaborating with SDG&E to coordinate the program. energyupgradeca.org
Property Assessed Clean Energy (PACE) and Assembly Bill (AB) 811 Programs	PACE or AB 811 programs are intended to give cities and counties the ability to offer low-interest loans for energy efficiency and solar energy projects to commercial and/or residential property owners. *Residential PACE programs are currently on hold nationwide. Commercial programs are emerging. pacenow.org

Energy efficiency and Demand Response

Advanced Home Program	californiaadvancedhomes.com
Air Conditioning Tune-Ups	actimeprogram.com/ProjectCenter
Summer Saver Program	sdge.com/summersaver
Refrigerator-Freezer Recycling Program	arcaincutility.com/CA/SDGE/Step2_ZipCode.cfm?ServiceCompany=43
Clothes Washer Rebate Program	20gallonchallenge.com/programs_residential.html or (888) 376-3314
Residential Energy Survey	sdge.com/energy-efficiency-survey-0 (800) 411-SDGE (7343)
Lighting Turn in Program	sdge.com/lighting
Tax Credits	energytaxincentives.org

New Construction Programs

Advanced Home Program	californiaadvancedhomes.com
New Solar Homes Partnership	sdge.com/clean-energy/going-solar/applying-solar-rebates

Low Income Assistance

Residential Rate Assistance Program	sdge.com/residential/assistance/assistServCare.shtml
The Energy Team Program	sdge.com/energy-savings-assistance-program
Programs for Customers with Special Needs	sdge.com/available-assistance-programs
Multi-Family Affordable Solar Housing	energycenter.org/index.php/incentive-programs/multifamily-affordable-solar-housing

Energy and Water

WECalc Home Water-Energy-Climate Calculator	Free online tool from the Pacific Institute that estimates home water-related energy use and associated greenhouse gas emissions. wecalc.org
SoCal Water Smart for Residential Customers	Available water efficiency product rebates. socalwatersmart.com
Clothes Washer Rebate Program	20gallonchallenge.com/programs_residential.html or (888) 376-3314

This page intentionally left blank.

7

Support Green Jobs and Workforce Training

California's Vision for Workforce Education and Training

By 2020, California's workforce is trained and fully engaged to provide the human capital necessary to achieve California's economic, energy efficiency, and demand-side management potential.

California Long-Term Energy Efficiency Strategic Plan

The City of Carlsbad (City) can increase local awareness of workshops, training, and employment resources available to its constituents. It can make this information more widely available by including it on its website and/or providing handouts at local libraries and city hall.

Training and Education Resources

Sample Green Job Fields	Sample Green Jobs
• Building retrofitting • Smart grid • Wind power • Solar power • Advanced biofuels • Alternative transportation vehicles and infrastructure	Electricians, heating, ventilation and air conditioning installers, carpenters, construction workers and managers, home builders, roofers, building inspectors, engineers (civil, mechanical, environmental, electrical), welders, metal fabricators, assemblers, transit and truck drivers, dispatchers, software engineers, technicians, machinists, power line installers and repairers, iron and steel workers, sheet metal workers, equipment operators, chemists, chemical technicians, agricultural workers, farm product purchasers, agricultural inspectors



San Diego Miramar College's Advanced Transportation Technology and Energy Center

Advanced Transportation Technology and Energy (ATTE) Centers were created as a means for keeping California competitive as a national leader in advanced transportation and energy technologies, and to transform the workforce in the rapidly developing, technology-driven transportation and energy industries. San Diego Miramar College's ATTE Center is the regional center for San Diego County.

Courses, assistance, and outreach programs are tailored to the needs of regional employers and employees in California. The ATTE Center provides students, technicians, faculty, public, and other initiative centers with the education, training, and resources they need to effectively learn, teach, and work with advanced transportation and energy technologies, including:

- Electric, hybrid, and hydrogen fuel cell programs
- Gaseous fuel programs for light and/or heavy duty vehicles
- Intelligent transportation systems programs
- Railroad operation programs
- Light rail maintenance aeronautics and flight
- Technology programs and energy programs
- Motorcycle maintenance programs
- Automotive clean-air car emissions programs

The Miramar College ATTE Center is located at 10440 Black Mountain Road, San Diego, California 92126. Call (619) 388-7673 or visit attemiramar.com for more information.



C U Y A M A C A
· C O L L E G E ·

**Cuyamaca Community College's San Diego Green
Building Training Collaborative**

The Grossmont-Cuyamaca Community College District (GCCCCD) was awarded American Recovery and Reinvestment Act (ARRA) funds to launch the San Diego Green Building Training Collaborative under California's Clean Energy Workforce Training Program. The collaborative trains unemployed or underemployed workers with previous construction experience to be building analyst professionals, water auditors, solar photovoltaic installers, and solar thermal installers.

Trainings serve all of San Diego County and are offered at Cuyamaca College in Rancho San Diego and Palomar College in San Marcos. Certificates of Achievement are awarded upon program completion. GCCCCD plans to continue the green building training collaborative after ARRA funds are expended. Cuyamaca College already offers green workforce training certificates and degrees in water/wastewater technology, environmental health and safety, sustainable landscaping, and renewable energy. For more information, visit cuyamaca.edu/preview/cleanenergy.

The San Diego Workforce Partnership

The San Diego Workforce Partnership (sandiegowork.com) works with public and private agencies, local businesses, and educational institutions to create workforce solutions for the San Diego region. It provides services for employers and job seekers, online access to workforce training and resource, and has ten One-Stop Career Centers

located throughout San Diego County. The Workforce Partnership serves as this region's Workforce Investment Board.

The nearest One-Stop Career Center to the City is:

- North County Coastal Career Center, located at 1949 Avenida del Oro, Suite 106, Oceanside California, 92056. For more information, visit northcountycareercenters.com

San Diego Gas & Electric Energy Innovation Center

The Energy Innovation Center (EIC) hosts a variety of workshops and includes a Food Service Demonstration Kitchen that hosts free seminars on energy-efficient cooking, equipment, lighting, and food safety. The EIC is located at 4760 Clairemont Mesa Boulevard, San Diego, California 92117. Contact (800) 411-7343 or visit sdge.com/eic.

Statewide Resources for Training and Education



Grid Alternatives

Grid Alternative (gridalternatives.org) offers volunteer opportunities to gain hands-on solar experience and network with others interested in renewable energy, the environment, and our communities.



Solar Training Institute

The Solar Training Institute (trainingforsolar.com) provides accelerated training classes for contractors, electricians, engineers, solar energy entrepreneurs, sales people and anyone who is considering a career change to the growing solar industry.



California Community Colleges Economic and Workforce Development

The California Community Colleges Economic and Workforce Development (CCCEWD) program provides industry-specific workforce education, training, and consulting services to help California businesses compete. CCCEWD (cccewd.net) is the state program from which the local ATTE Center, San Diego Workforce Partnership, and One-Stop Career Centers stem.

This page intentionally left blank.

Looking Forward

This Energy Roadmap provides the City of Carlsbad (City) with a framework for continued efforts to save energy in government operations and the community that supports the broad energy conservation goals articulated in its General Plan and Climate Action Plan. After the City participates in the SANDAG Energy Roadmap Program, there may be local, state, and federal funding opportunities for the City to continue energy-saving activities, either on its own or in partnership with SANDAG. These funding sources are described below, followed by non-financial resources.

Energy-Saving Funding Opportunities

Local Government Partnerships with San Diego Gas & Electric

The SANDAG Energy Roadmap Program is primarily funded through a local government partnership with San Diego Gas & Electric® (SDG&E). The utility manages several local government energy efficiency partnerships in the region for jurisdictions, public agencies, and the California Center for Sustainable Energy. The duration is typically three years, and they are approved by the California Public Utilities Commission (CPUC).

Prior to the start of new program cycles, SDG&E announces a request for abstracts for future local government partnership programs. The next program cycle, to be determined by the CPUC, will likely begin in January 2016. Using its Energy Roadmap as a guide, the City can decide if it would like to propose to SDG&E its own local government partnership, have SANDAG continue to serve as a mechanism to provide added energy efficiency services, or take a different course of action.

Local Government Energy efficiency Partnerships have three focus areas:

1. Identify energy efficiency savings in municipal sites
2. Utilize core energy efficiency programs
3. Engage the community on energy efficiency

The County of San Diego, City of Chula Vista, and the City of San Diego have their own local government partnerships with SDG&E. Examples of programs funded through these partnerships include:

- Municipal facility retrofit for energy efficiency improvements
- Strengthened building energy codes and code enforcement

- Land use planning and design
- Education and outreach
- Green building, permit expedite, and fee reduction programs
- Peer-to-peer best practices and networking
- Staff training programs
- Energy plan development

Emerging Cities Program with SDG&E

SDG&E has developed a smaller grant program that cities can apply to for funding to implement specific components of their Energy Roadmaps that cannot be funded through the SANDAG Local Government Partnership. The program is available through 2015, and your Energy Roadmap coordinator can arrange a meeting with the appropriate SDG&E program staff to learn about this grant opportunity. In 2014, activities funded at local cities include:

- Expansion of a green business program
- Assessment of property assessed clean energy programs for City consideration
- Greenhouse gas inventory
- Energy chapters for a Climate Action Plan
- Energy-related implementation measures for an adopted Climate Action Plan



State Energy Program Grants and Energy efficiency and Conservation Block Grants

The United States Department of Energy (DOE) and California Energy Commission release State Energy Program solicitations that support transportation, residential, commercial, agricultural, industrial, institutional energy efficiency, and renewable energy programs.

Both agencies also release Energy Efficiency and Conservation Block Grants (EECBG) solicitations. The EECBG provides local government grants to reduce fossil-fuel emissions, reduce total energy use, and improve energy efficiency and conservation in the transportation and building sectors. Grants originate from DOE and are released from both the Energy Commission and DOE. For program opportunities, visit energy.ca.gov/contracts/index.html.



Clean Vehicle Rebate Project

The Clean Vehicle Rebate Project is funded by the California Air Resources Board and administered statewide by the California Center for Sustainable Energy (CCSE). A total of \$63.7 million was appropriated for FY 2009-2013 to promote the production and use of zero-emission vehicles, including electric, plug-in hybrid electric, and fuel cell vehicles. Rebates of up to \$2,500 per light-duty vehicle are available for individuals and business owners who purchase or lease new eligible zero-emission or plug-in hybrid electric vehicles. The program received funds for 2014 and is expected to be funded in future years.



California Energy Commission Assembly Bill 118: Alternative and Renewable Fuel & Vehicle Technology Program

Assembly Bill 118 (AB 118): Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP) authorized the California Energy Commission (CEC) to develop and deploy alternative and renewable fuels and advanced transportation technologies to help attain the state's climate change policies. The program runs through 2024 and the CEC has an annual program budget of approximately \$100 million to support projects that:

- Develop and improve alternative and renewable low-carbon fuels.
- Optimize alternative and renewable fuels for existing and developing engine technologies.
- Produce alternative and renewable low-carbon fuels in California.
- Decrease, on a full fuel cycle basis, the overall impact and carbon footprint of alternative and renewable fuels and increase sustainability.
- Expand fuel infrastructure, fueling stations, and equipment.
- Improve light-, medium-, and heavy-duty vehicle technologies.
- Retrofit medium- and heavy-duty on-road and non-road vehicle fleets.
- Expand infrastructure connected with existing fleets, public transit, and transportation corridors.
- Establish workforce training programs, conduct public education and promotion, and create technology centers.

Additional information on the ARFVTP and the associate investment plan can be found on the CEC website: energy.ca.gov/altfuels.



TransNet: Smart Growth Incentive Program and Active Transportation Grants

The *TransNet* Smart Growth Incentive Program (SGIP) funds transportation-related infrastructure improvements and planning efforts that support smart growth development. The SGIP awards two percent of the annual *TransNet* revenues for the next 40 years to local governments through a competitive grant program to support projects that will help better coordinate transportation and land use in the San Diego region. Additional information on the current funding cycle is available at sandag.org/smartgrowth.

The goal of the Active Transportation Grant Program is to encourage local jurisdictions to plan and build facilities that promote multiple travel choices for residents and connectivity to transit, schools, retail centers, parks, work, and other community gathering places. The grant program also encourages local jurisdictions to provide bicycle parking, education, encouragement, and awareness programs that support pedestrian and bicycle infrastructure. More information on current funding opportunities is available at sandag.org/active.

Non-Financial Resources for Local Governments



ENERGY STAR® Government Partnerships

In addition to appliance labeling, the ENERGY STAR program seeks partnerships with local businesses, congregations, industries, schools, and others. By becoming a Government ENERGY STAR Partner, a local government can receive recognition nationally and can co-brand local energy-saving initiatives with ENERGY STAR. More information is available at energystar.gov.

The United States Environmental Protection Agency (EPA) and United States Department of Energy also host an annual ENERGY STAR Awards ceremony to honor organizations that have made outstanding contributions to protecting the environment through energy efficiency. For more information on government partnerships, visit energystar.gov/index.cfm?c=government.bus_government.

WaterSense® WaterSense Promotional Partners

The EPA also promotes water conservation efforts through its WaterSense program that helps consumers identify water efficient products and programs that meet EPA's water efficiency and performance criteria. Products carrying the WaterSense label perform

well, help save money, and encourage innovation in manufacturing. More information is available at epa.gov/watersense.

Local governments, utilities, and other organizations can become WaterSense Promotional Partners to help provide outreach on water-efficiency measures. Jurisdictions can receive recognition nationally and can co-brand local water-saving initiatives with WaterSense as a promotional partner. For more information on promotional partners, visit epa.gov/watersense/partners/promotional.html.



The Beacon Award

The Institute for Local Governments' California Climate Action Network (CCAN) has created the Beacon Award to recognize cities and counties that reduce Greenhouse Gas (GHG) emissions and save energy. To receive a silver, gold, or platinum Beacon Award, jurisdictions must achieve measurable GHG reductions and energy savings in agency facilities, and achieve measurable GHG reductions and promote energy conservation activities in the community.

Once a local government applies, it is designated as a Beacon Award program participant, and will then begin working toward achieving the first Beacon Award level. There is no deadline to apply; applications will be accepted on an ongoing basis.

Becoming a Beacon Award participant is a simple process. Agencies at every step of the climate action journey are welcome to consider applying. To be accepted as a Beacon Award participant, cities and counties will complete a simple application form and do the following:

- Adopt a resolution by the governing body committing the agency to participate in the program
- Designate a lead staff person as a point of contact
- Prepare, or commit to prepare, a baseline GHG emissions inventory for agency facilities and the community as a whole (previously completed inventories using a commonly accepted methodology will be accepted)
- Prepare, or commit to prepare, a climate action plan that includes actions in each of the Best Practice Areas (previously completed plans using a commonly accepted methodology will be accepted)
- Demonstrate compliance with Assembly Bill 939, the California Integrated Waste Management Act of 1989

Visit ca-ilg.org/BeaconAward for more information.

SDG&E

As described in previous chapters, SDG&E (sdge.com) manages a variety of energy-saving programs that:

- Promote energy efficiency, demand response, and conservation programs, services, and resources
- Provide energy education and outreach to the community



California Center for Sustainable Energy

The CCSE (energycenter.org) works with local governments on several initiatives including:

- The San Diego Regional Retrofit Advisory Committee, that includes several local jurisdictions, SANDAG, and SDG&E
- The Energy Upgrade California program
- San Diego Regional Electric Vehicle Infrastructure Working Group, in partnership with SANDAG, that includes representatives from local jurisdictions, regional agencies, SDG&E, workforce training partners, and electric vehicle and equipment manufacturers
- San Diego Regional Clean Cities Coalition
- California Clean Vehicle Rebate Project



Energy Policy Initiatives Center

The Energy Policy Initiatives Center (EPIC) is a nonprofit academic and research center of the University of San Diego, School of Law that studies energy policy issues affecting the San Diego region and California. EPIC serves as a source of legal and policy expertise, and provides information on the development of sustainable solutions that meet the region's future energy needs. For more information, contact (619) 260-4589 or visit sandiego.edu/epic.



San Diego Association of Governments

SANDAG Energy and Climate Change Planning Program staff is knowledgeable about federal, state, regional, and local issues and can be a resource for jurisdictions after its Energy Roadmaps are completed. For more information on SANDAG energy and climate change planning, contact Susan Freedman at (619) 699-7387, susan.freedman@sandag.org or visit sandag.org/energy.



SANDAG iCommute Program

The SANDAG iCommute team can assist local governments with staff commuter programs, Transportation Demand Management (TDM) ordinances, online tools, and outreach on alternative transportation options for the commute. For more information, contact Kimberly Weinstein at (619) 699-0725, kimberly.weinstein@sandag.org, or visit icommutesd.com.



Statewide Energy Efficiency Best Practices Coordinator

Patrick Stoner serves as the Statewide Local Government Energy Efficiency Best Practices coordinator. The position is part of the CPUC 2010 through 2012 statewide energy efficiency programs. Like SANDAG is available to you locally, Mr. Stoner is a statewide resource. The statewide coordinator develops and distributes best practices case studies, provides information and examples of energy efficiency policies and programs, provides materials that may help local governments implement climate action plans, and serves as a resource to help local government energy programs achieve success. Mr. Stoner is housed at the Local Government Commission (LGC) and has been part of the LGC since 1993. He can be reached at (916) 448-1198, extension 309 or email pstoner@lgc.org.

Statewide Energy Efficiency Collaborative

The Statewide Energy Efficiency Collaborative (SEEC) was formed in 2010 as an alliance to help cities and counties reduce greenhouse gas emissions and save energy. SEEC (californiaseec.org) serves as a statewide local government partnership and is an alliance among the Local Government Commission, ICLEI – Local Governments for Sustainability, the Institute for Local Government, and California's four investor-owned utilities, including San Diego Gas & Electric. Resources provided by these agencies are described below.

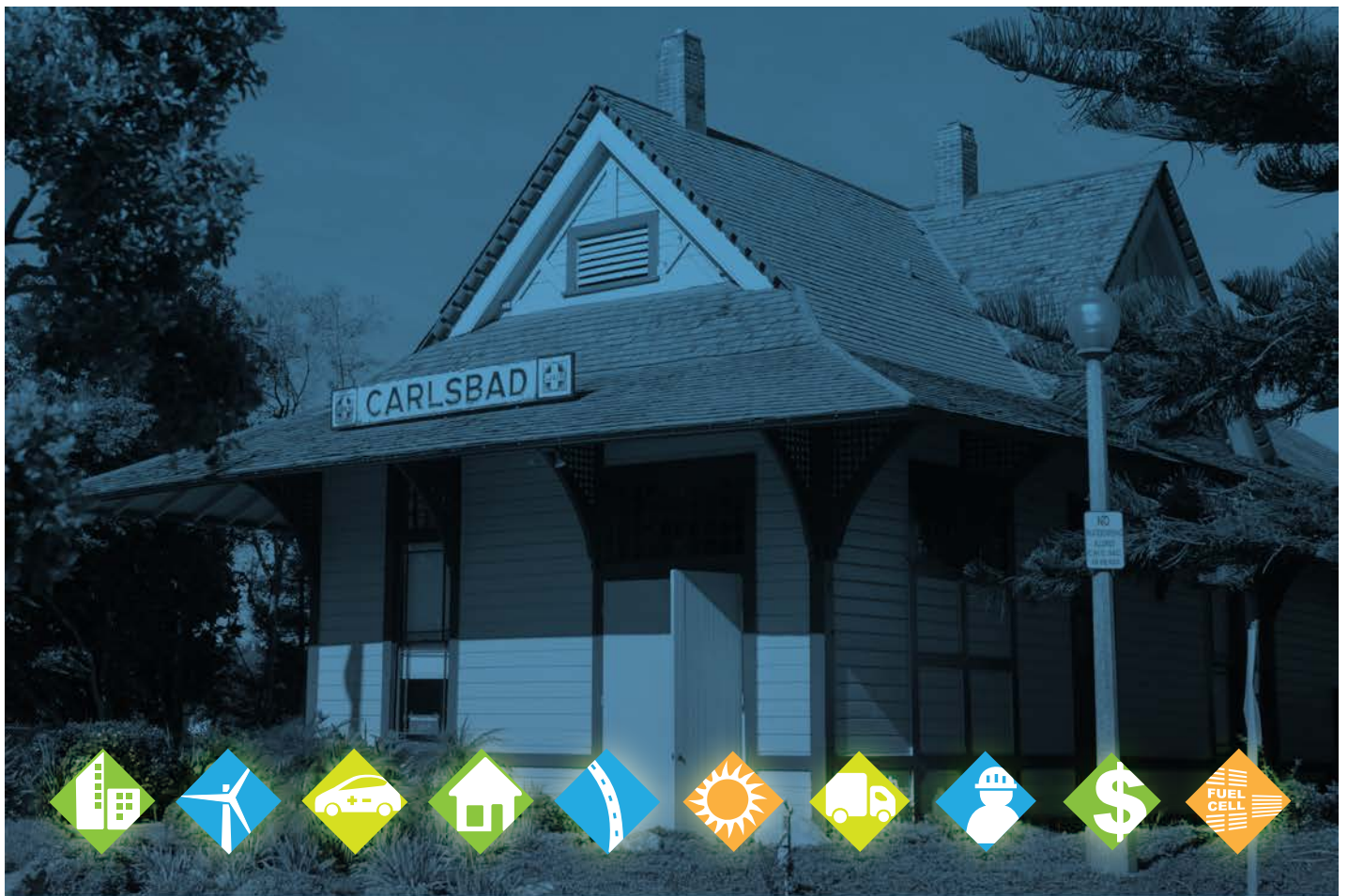
- Local Government Commission provides free webinars, holds an annual statewide conference, and provides peer-to-peer networking opportunities
- ICLEI is conducting a series of workshops and trainings for local governments on taking key steps to reduce GHG emissions
- Institute for Local Governments' CCAN is providing recognition for cities and counties through the Beacon Award



San Diego Regional Clean Cities Coalition

The San Diego Regional Clean Cities Coalition is the local affiliate of the DOE's Clean Cities program. Coordinated by the CCSE, the Clean Cities Coalition brings together stakeholders in the public and private sectors to increase the use of alternative fuel and alternative fuel vehicles. The Clean Cities Coalition holds educational events on a regular basis and board of directors meets monthly. More information and a calendar of events can be found at sdcleancities.org.

This page intentionally left blank.



www.sandag.org/energy

This Program is a collaboration between SANDAG and San Diego Gas & Electric®

