

CITY OF SAN GABRIEL

# ENERGY ACTION PLAN

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Prepared for:

City of San Gabriel  
425 S. Mission Drive  
San Gabriel, CA 91776

San Gabriel Valley Council of Governments  
1000 S. Fremont Ave., Unit #42  
Building A-10, Suite 10210  
Alhambra, CA 91803

Prepared by:

PMC



CITY OF SAN GABRIEL

# ENERGY ACTION PLAN

## **ACKNOWLEDGEMENTS**

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# LIST OF ABBREVIATIONS

AB	Assembly Bill
ABAU	adjusted business-as-usual
AB 32	Assembly Bill 32, California Global Warming Solutions Act of 2006
AB 811	Assembly Bill 811, Contractual Assessments: Energy Efficiency Improvements
AB 1493	Assembly Bill 1493, Clean Car Fuel Standard, also referred to as Pavley bill
ADC	alternative daily cover
AQMD	Air Quality Management District
ARRA	American Recovery and Reinvestment Act of 2009
BAU	business-as-usual
CAP	climate action plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CEC	California Energy Commission
CEESP	California Long Term Energy Efficiency Strategic Plan
CEQA	California Environmental Quality Act
CFL	compact fluorescent light
CH <sub>4</sub>	methane
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> e	carbon dioxide equivalent
COG	Council of Governments
CNG	compressed natural gas
CPUC	California Public Utilities Commission
CSI	California Solar Initiative
DA	Direct Access
DR	demand response
EAP	Energy Action Plan
EE	energy efficiency
EEMIS	Energy Enterprise Management Information System
EIR	environmental impact report
ELP	Energy Leader Partnership

# LIST OF ABBREVIATIONS

EO S-3-05	Executive Order S-3-05, Greenhouse Gas Emissions Reduction Initiative
EPA	United States Environmental Protection Agency
ESP	electric service provider
EWP	Energy Wise Partnership
GHG	greenhouse gas
GS-1	General Service Non-Demand-Rated Electricity Account
GS-2	General Service-Demand Rated Account
GWP	global warming potential
HFC	hydrofluorocarbons
HVAC	heating, ventilation, and air conditioning
iDSM	integrated demand-side management
kW	kilowatt
kWh	kilowatt-hour
LEED	Leadership in Energy and Environmental Design
LGOP	Local Government Operations Protocol
LS-1	Lighting-Street and Highway-Unmetered Service Company-Owned System Electricity Account
LS-2	Lighting-Street and Highway-Customer-Owned Installation-Unmetered Service Electricity Account
LS-3	Lighting-Street and Highway-Customer-Owned Installation-Metered Service Electricity Account
MT	metric ton
MTCO <sub>2e</sub>	metric ton of carbon dioxide equivalent
N <sub>2</sub> O	nitrous oxide
PACE	property assessed clean energy
PFC	perfluorocarbons
PSC	Project Steering Committee
RPS	Renewables Portfolio Standard
RTP	Regional Transportation Plan
SB 375	Senate Bill 375

# LIST OF ABBREVIATIONS

SCAG	Southern California Association of Governments
SCE	Southern California Edison
SCREC	Southern California Regional Energy Center
SF <sub>6</sub>	sulfur hexafluoride
SGVCOG	San Gabriel Valley Council of Governments
TC-I	Traffic Control Service Electricity Account
TOU-GS3	Time-of-Use-General-Service-Demand Metered Electricity Account
VMT	vehicle miles traveled



# EXECUTIVE SUMMARY

This Energy Action Plan (EAP) demonstrates the City’s commitment to pursue energy efficiency and reduce GHG emissions. The purpose of this EAP is to identify the City of San Gabriel’s long-term vision and commitment to achieve energy efficiency in the community and in municipal operations. Specifically, this EAP includes the following chapters:

- **Chapter 1: Introduction** – Provides an overview of the purpose and scope of the project, as well as the process and outreach efforts involved in developing this EAP.
- **Chapter 2: GHG Inventory & Forecast** – Summarizes the greenhouse gas (GHG) generating activities occurring within the community and through municipal operations.
- **Chapter 3: Electricity Profile** – Highlights the factors that influence electricity use within the community by comparing energy uses to regional averages and identifies top electricity uses within municipal accounts.
- **Chapter 4: Energy Efficiency Strategy** – Identifies a comprehensive set of electricity-related energy efficiency targets, goals, policies, and actions to help the community and the City become more energy-efficient.
- **Chapter 5: Implementation** – Provides policies and actions to assist with the implementation of energy efficiency strategy, and summarizes the policies, benefits, implementation time frame, and responsible departments for implementing the components of the energy efficiency strategy.
- **Chapter 6: Conclusion** – Reaffirms the City’s commitment to implementing energy efficiency projects, programs, and policies to support the goals of the California Energy Efficiency Strategic Plan and foster energy efficiency throughout the community.

To support the content found throughout the EAP, several technical appendices have been prepared to provide additional detail and information regarding GHG reductions and sources. This Plan includes the following appendices:

- **Glossary** – Defines the key terms used throughout the document.
- **References** – Provides a list of citations and sources used throughout the EAP.
- **Appendix A: Personal Energy Action Survey**: Includes a copy of the survey used to evaluate resident energy efficiency priorities and activities to inform the EAP regarding feasible community actions.
- **Appendix B: Greenhouse Gas Emissions Inventory Report** – Technical memorandum about GHG emissions inventory results and methodologies.
- **Appendix C: GHG Technical Methods & Assumptions Report** – Provides a list of the emissions factors utilized in calculation of GHG emissions as well as a summary of the sources and assumptions used to estimate the potential range of kilowatt-hours (kWh) and GHG savings for each policy.

## CHAPTER 1: INTRODUCTION

Chapter 1 provides a brief overview of the purpose and scope of this EAP and how this Plan was created in partnership with the San Gabriel Valley Council of Governments (SGVCOG) and Southern California Edison (SCE). The City has prepared this Plan not only to follow the guidance of California’s Long Term Energy Efficiency Strategic Plan (CEESP) but also to identify a clear path to successfully implementing actions, policies, and goals that will achieve the City’s reduction targets.

This project was funded through the technical assistance program of the CEESP, which aims to provide local governments with expertise and resources to achieve energy efficiency at municipal facilities and throughout the

# EXECUTIVE SUMMARY

community. In 2009, as part of CEESP implementation, the California Public Utilities Commission authorized SCE to use funding from the electricity public goods charge to complete strategic plan activities focused on energy efficiency. SCE is implementing the “Big Bold” strategies of the CEESP, and through this process, SCE awarded funding to the SGVCOG to provide funding and technical support for preparation of Energy Action Plans.

In addition to describing the funding source and collaboration involved in creating this Plan, the Introduction describes the community outreach conducted to provide input on this Plan. Through the efforts of City staff, SGVCOG, and the consultant team, a variety of outreach events were completed, as summarized in **Figure ES-1**.

**Figure ES-1: Summary of Community Outreach Events**



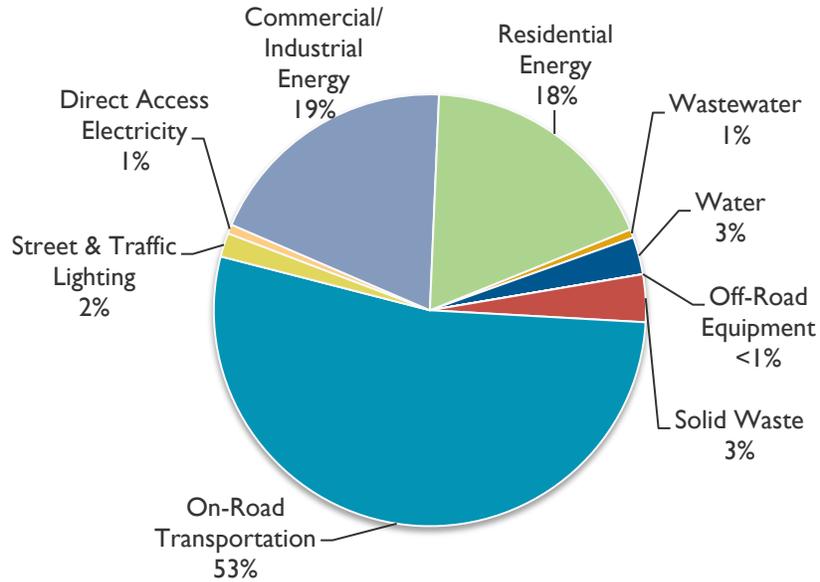
## CHAPTER 2: GREENHOUSE GAS INVENTORY & FORECAST

The baseline greenhouse gas inventory and forecast assess existing and future GHG emissions based on activities and energy consumption from community and municipal activities (see **Figure ES-2**). A baseline year of 2006 was selected for the inventory, and activity data for 2010 community sectors, including energy, transportation, waste, community off-road, wastewater, and water, were translated into GHG emissions to serve as a common benchmark that will allow for accurate comparison between all cities in the San Gabriel Valley participating in the Energy Action Plan process.

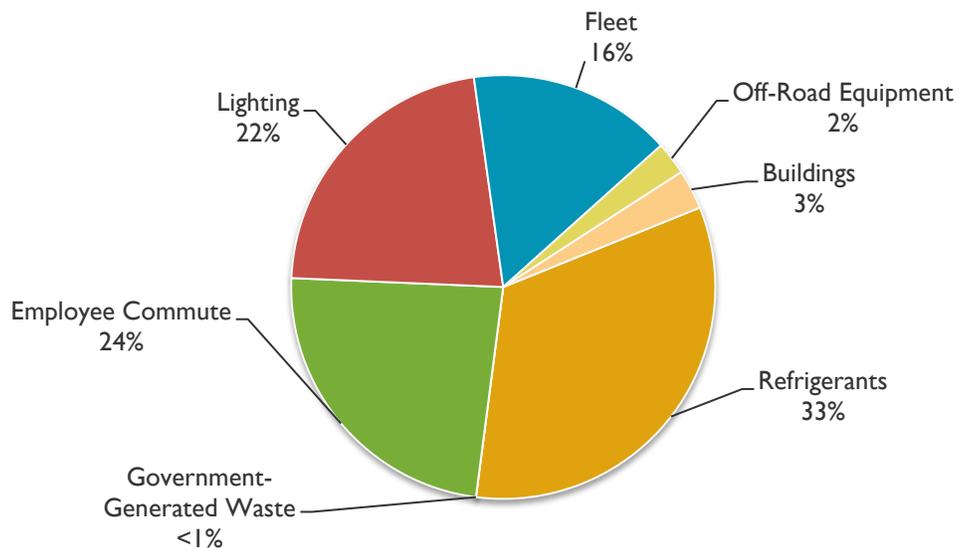
**Figure ES-2: Community and Municipal GHG Emissions Sources (2006)**

Inventories of GHG emissions from community-wide and municipal operations are described in Chapter 2 and are summarized in **Figure ES-3** and **Figure ES-4**, below. In 2006, community activities generated approximately 262,780 MTCO<sub>2</sub>e, while approximately 1,990 MTCO<sub>2</sub>e were attributed to municipal operations. While municipal GHG emissions are typically considered a subset of community sources and represent 1% of total community GHG emissions, they are included in this analysis as the City has a greater ability to influence municipal GHG emissions through changes to City facilities, purchasing policies, or other City-led efforts to reduce GHG emissions within City operations.

**Figure ES-3: Community-Wide GHG Emissions by Sector, 2006 (MTCO<sub>2</sub>e)**

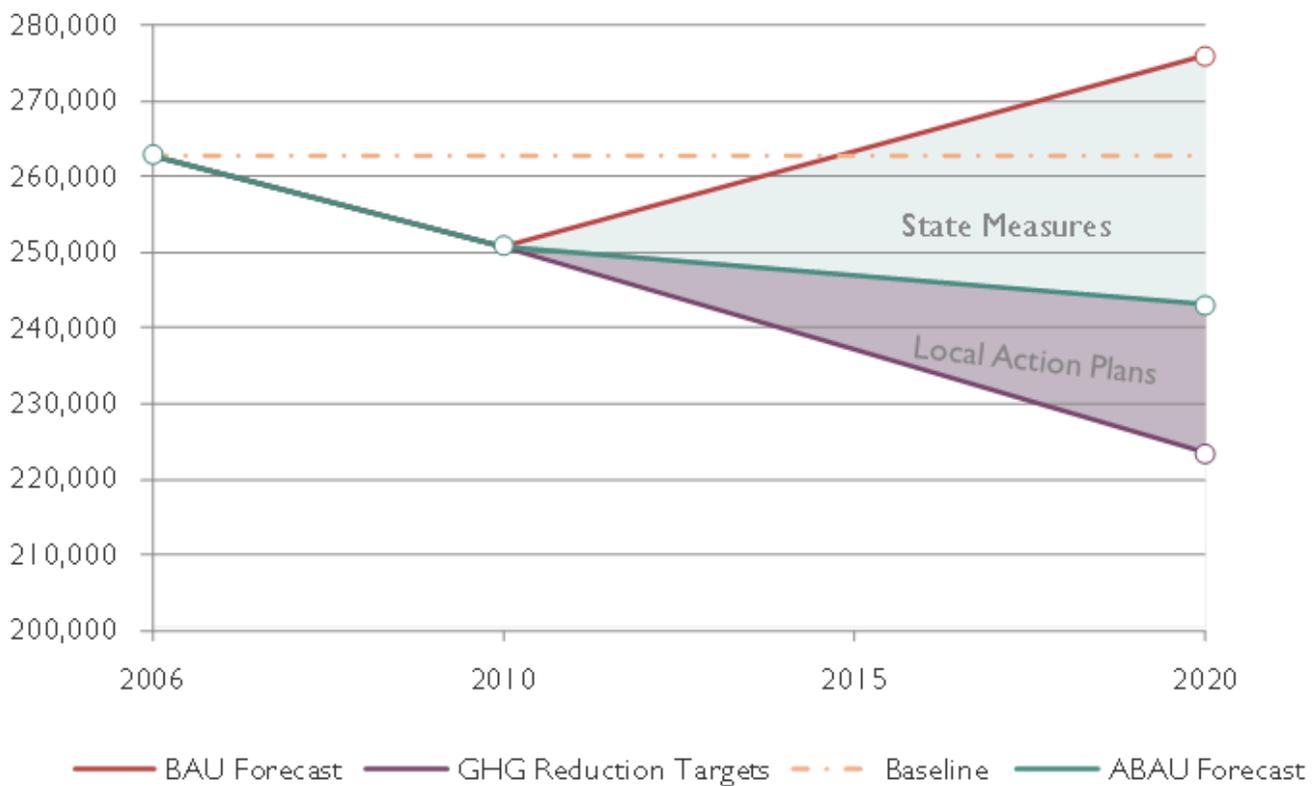


**Figure ES-4: Municipal GHG emissions by Sector, 2006 (MTCO<sub>2</sub>e)**



Following the development of a baseline GHG emissions inventory, GHG emissions are forecast to 2020 under a business-as-usual (BAU) scenario based on anticipated growth in the number of residents, jobs, and vehicle travel and the effect that growth will have on GHG emissions without political, technical, or social intervention to reduce GHG emissions. Additionally, the impact that state policies or legislation will have on local GHG emissions is calculated in an adjusted business-as-usual (ABAU) scenario. The recommended GHG reduction target to comply with Assembly Bill 32 is identified and described in **Figure ES-5** below and in more detail in **Chapter 2**.

**Figure ES-5: Comparison of BAU Forecast and Reduction Target, 2006–2020**

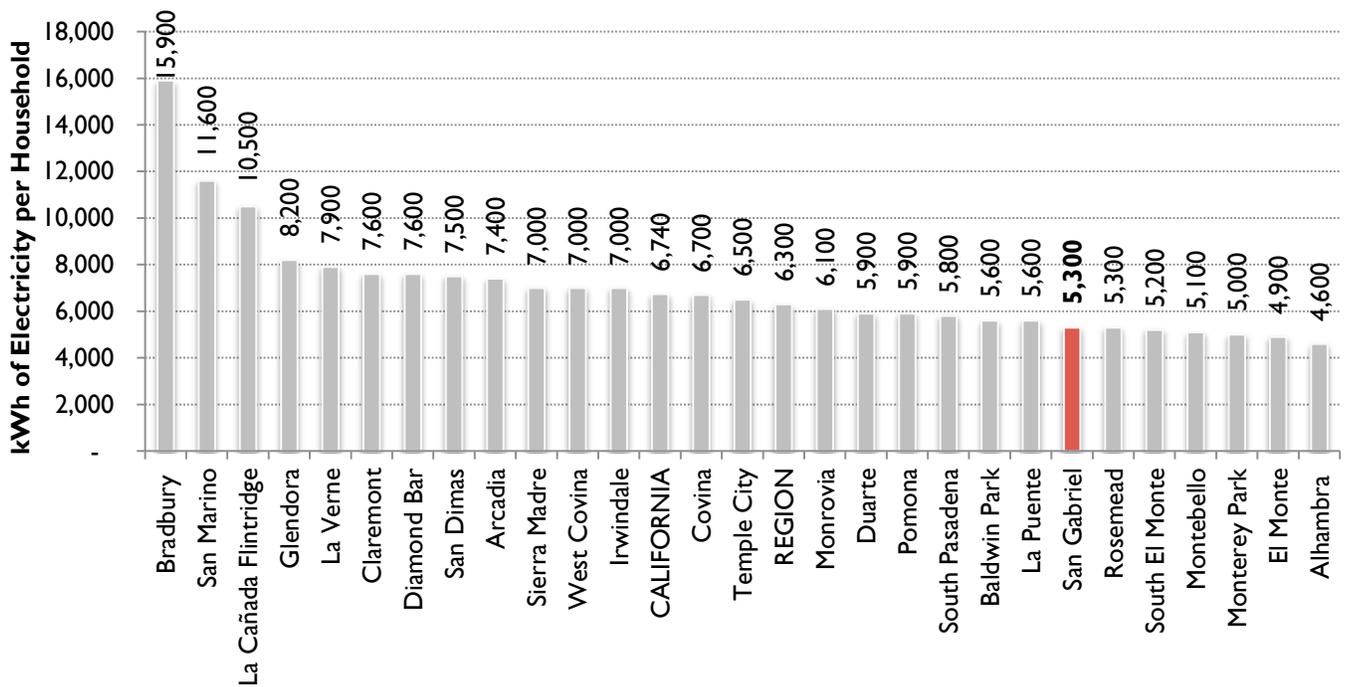


## CHAPTER 3: ELECTRICITY PROFILE

The electricity profile describes the residential, nonresidential, and municipal electricity use in the City of San Gabriel. Electricity used in San Gabriel’s homes and businesses is provided by Southern California Edison. SCE generates electricity from a mix of non-renewable sources, such as natural gas and coal, and renewable sources, such as biomass, geothermal, hydroelectric, solar, and wind.

San Gabriel’s electricity uses are tied to the built environment, which is characterized as a mature, largely built-out community with an aging housing stock (68% of all residences). As shown in **Figure ES-6**, each San Gabriel household used an average of 5,300 kilowatt-hours (kWh) of electricity in 2010. This amount is less than the California average of 6,740 kWh and less than the SGVCOG project average of 6,300 kWh.

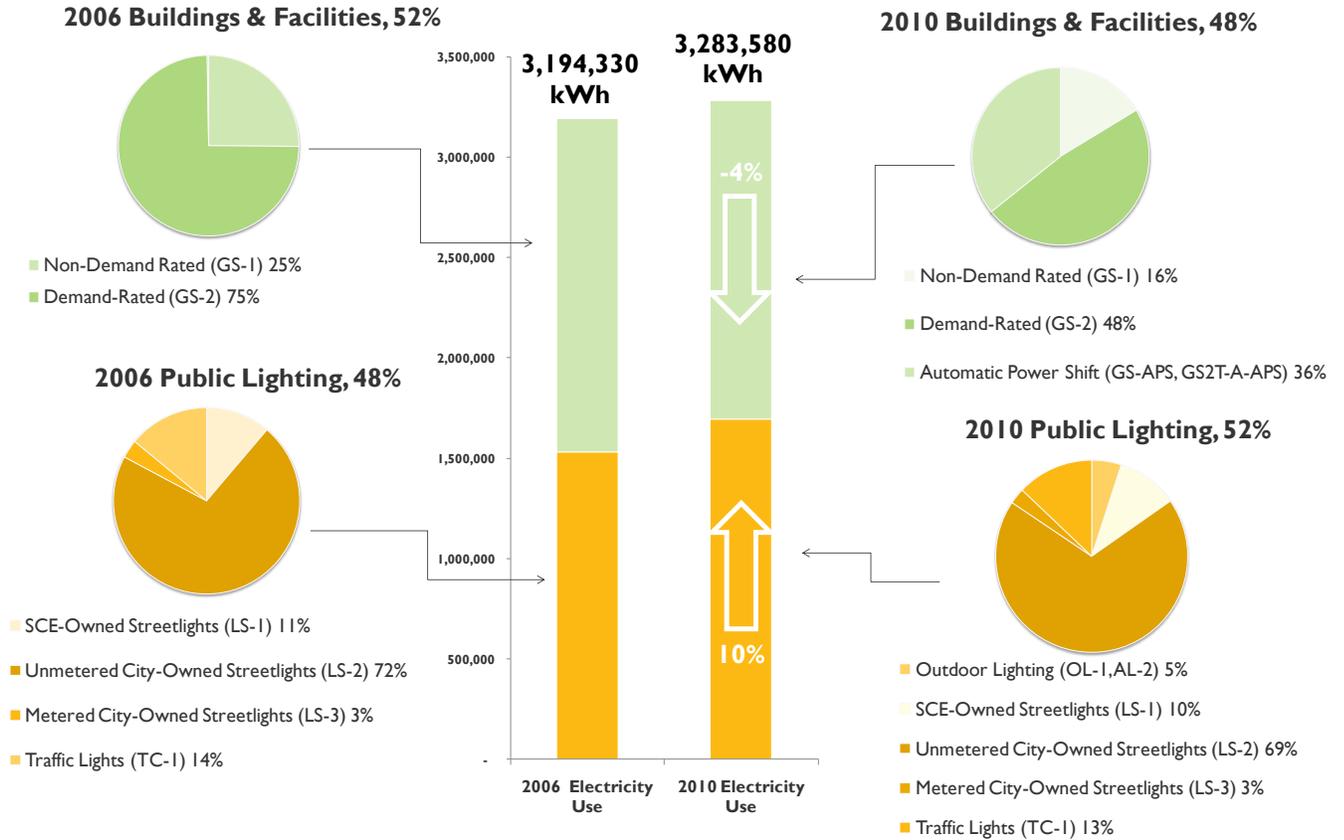
**Figure ES-6: Annual Electricity Use per Household, 2010 (kWh)**



\*Regional electricity numbers represent the San Gabriel Valley average for all 27 cities participating in the EAP project.

Municipal electricity use is also described in detail in Chapter 3 by depicting the changes in electricity use between the baseline year and 2010 (see **Figure ES-7**), identifying the largest electricity uses by account to highlight the energy efficiency actions already completed or under way at City facilities, and identifying the largest opportunities for reducing electricity use.

**Figure ES-7: Municipal Electricity Use by Account Type, 2006–2010**



**CHAPTER 4: ENERGY EFFICIENCY STRATEGY**

The City of San Gabriel has identified key electricity efficiency targets, shown in **Figure ES-8**, to support the goals of the Energy Leader Partnership and local planning priorities. To achieve the electricity reduction targets for each electricity sector, the City has identified a set of goals, policies, actions, and projects to be implemented, which are listed in Chapter 4.



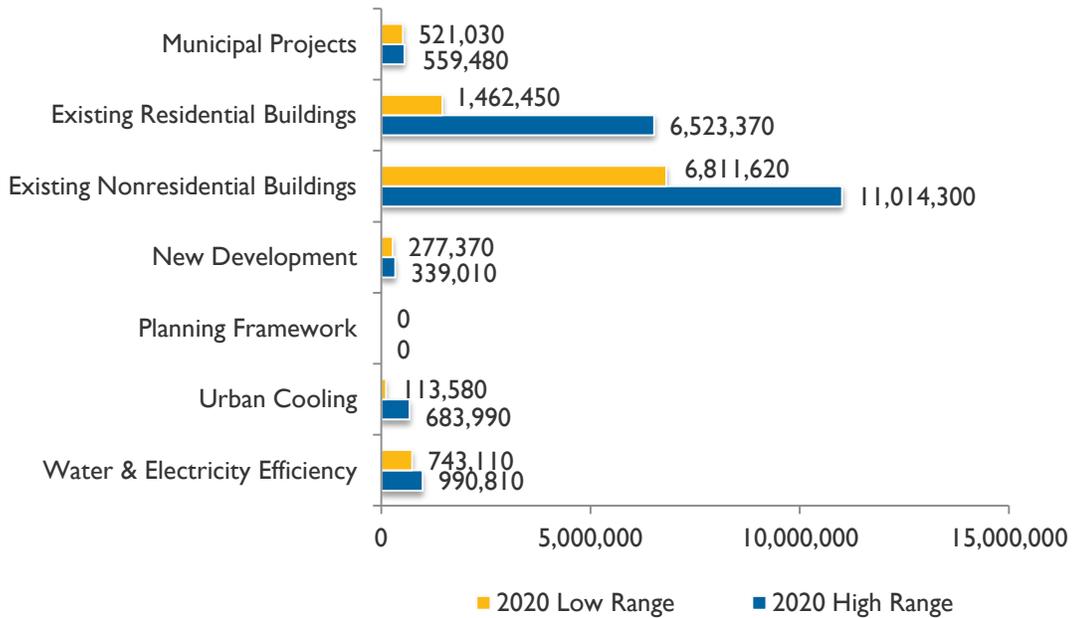
The actions included in this Plan build upon the City’s previous efforts and are a diverse mix of programs for both new and existing development. The final topic area of the energy efficiency strategy focuses on municipal electricity use by identifying the completed, near-term, and long-term projects or policies to achieve energy efficiency in municipal facilities. **Table ES-1** summarizes the near-term municipal projects to be implemented by the City. In addition to the municipal projects, this EAP identifies a clear path for San Gabriel to achieve the community-wide electricity reduction targets for both residential and nonresidential uses. **Figure ES-10** identifies the potential range of electricity savings (kWh) that may occur by 2020 through the implementation of this strategy.

**Table ES-1: Near-Term City-Government Energy Efficiency Projects**

Facility	Project	Initial Project Cost	SCE Incentive/ Rebate	Annual Electricity Reduction (kWh/year)	Estimated Annual Cost Savings	Milestone	Potential Funding Sources	Estimated Completion Date
City Hall – 425 South Mission Drive	Replace 60W halogen bulbs with 23W CFLs	\$130	\$10	160	\$20	Award of SCE incentive	CEC, SCREC, SCE, General Fund	FY 2012/2013
City Hall – 425 South Mission Drive	Server virtualization	\$10,000	\$1,000	9,860	\$1,380	City Council resolution accepting project completion	CEC, SCREC, SCE, General Fund	FY 2012/2013
City Hall and Recreation Center – 425 and 250 South Mission Drive	Desktop virtualization	\$18,000	\$1,680	13,100	\$1,840	City Council resolution accepting project completion	CEC, SCREC, SCE, General Fund	FY 2012/2013
City Hall – 425 South Mission Drive	Backup generator heat pump	\$5,000	\$1,560	15,330	\$2,150	City Council resolution accepting project completion	CEC, SCREC, SCE	FY 2012/2013
Streetlights throughout the city	Upgrade series 6.6 high voltage streetlights to low voltage 120 volt circuits and energy-efficient fixtures <sup>1</sup>				TBC <sup>1</sup>	TBC <sup>1</sup>	CEC, SCREC, SCE	FY 2013/2014
<b>Total</b>		<b>\$33,130</b>	<b>\$4,250</b>	<b>38,450</b>	<b>\$5,390</b>	<b>5.4</b>		

*1. To be confirmed. At the time of report preparation, estimated energy and GHG reductions were unavailable. The SGVCOG and SCREC are working to confirm project information.*

**Figure ES-10: Estimated 2020 Savings by Goal (kWh)**



## CHAPTER 5: IMPLEMENTATION

To ensure successful implementation of the EAP, several strategies and supporting actions have been included in Chapter 5, the implementation chapter. This chapter also includes an implementation matrix with details specific to each policy such as the electricity and GHG reductions that can be achieved. The implementation matrix will be a critical tool in monitoring the City’s progress toward implementing the EAP.

## CHAPTER 6: CONCLUSION

This EAP is an opportunity for the City to create and achieve a long-term vision for energy efficiency. The City of San Gabriel has developed this EAP as part of a regional framework that allows for close coordination and consistency between communities located in the San Gabriel Valley while responding to local community characteristics, values, and planning frameworks. Although the primary focus of this Plan is on reducing electricity and related GHG emissions, the policies and actions in this Plan also provide the ancillary benefits of improving air quality and the quality of life, enhancing natural areas, and stimulating the local economy through incentives in energy efficiency.



## CHAPTER 1

# INTRODUCTION

This Energy Action Plan (EAP) identifies an overarching vision that captures the City's long-term goals for energy efficiency. The intent of this Plan is to achieve optimal energy performance throughout the community, increasing operational productivity, cost savings, and the quality of life for residents, employees, and business owners. This Plan also identifies programs to achieve cost savings in City government facilities through energy reductions and more efficient maintenance and operational practices.

# INTRODUCTION

## PURPOSE & SCOPE

The purpose of this EAP is to identify the City of San Gabriel's long-term vision and goals to achieve energy efficiency in the community and in government operations. The rationale for San Gabriel's energy efficiency efforts includes demonstrating leadership in implementing cost-effective energy efficiency improvements, minimizing costs associated with energy and utilities, and protecting limited energy and natural resources.

Local governments play an important role in leading the community by example. This EAP shows the benefits of efficiency that the City will realize in government operations, providing a foundation for more comprehensive community-wide efficiency strategies. Strategies in this EAP provide a path toward optimizing energy use in the city, increasing the quality and comfort of homes and businesses, reducing utility costs, and maximizing operational productivity of local businesses.

The EAP is a stand-alone document that meets multiple objectives of the City and Southern California Edison. The EAP supports the City's status in the Energy Leader Partnership with SCE. In addition, the EAP serves as the equivalent of an electricity efficiency chapter of a climate action plan (EECAP). It is designed to integrate into a comprehensive climate action plan when the City's resources support the preparation of a climate action plan to address the reduction of greenhouse gas emissions from electricity, natural gas, waste, transportation, and other sectors.

Created in partnership with the San Gabriel Valley Council of Governments (SGVCOG) and Southern California Edison (SCE), this EAP identifies municipal and community-wide strategies to achieve the City's longer-term electricity efficiency goals. This integration of municipal and community-wide strategies allows the City to lead by example. Specifically, the objectives of this EAP are to:

- Create a long-term vision for energy efficiency.
- Provide and assess information related to energy use and greenhouse gas emissions.
- Establish reduction targets for energy efficiency.
- Identify goals, policies, and actions to achieve energy reductions.
- Provide a framework implementing the identified goals, policies, and actions.

## SOUTHERN CALIFORNIA EDISON & THE CALIFORNIA LONG TERM ENERGY EFFICIENCY STRATEGIC PLAN

The California Long Term Energy Efficiency Strategic Plan (CEESP) is the State's road map for achieving energy efficiency between 2009 and 2020 and beyond. The California Public Utilities Commission (CPUC) adopted the CEESP in 2008 following a collaborative planning effort of the CPUC, the state's investor-owned utilities, the Governor's Office, the

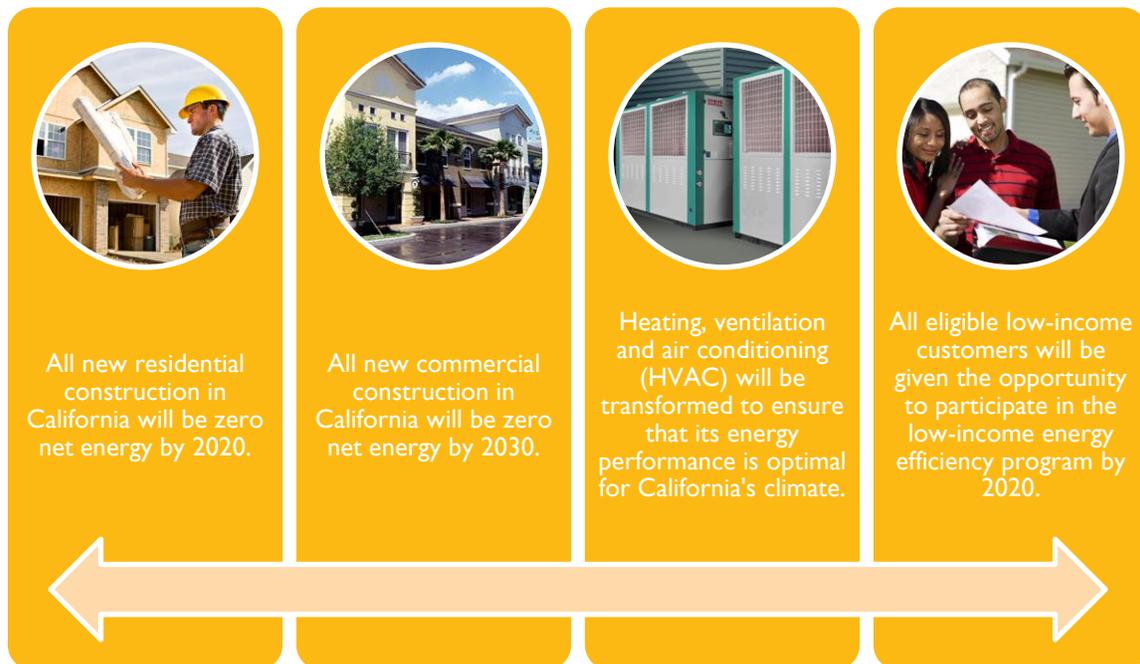
### Key Partners in Development of the EAP

San Gabriel Valley Council of Governments (SGVCOG): A Joint Powers Authority representing 31 incorporated cities and unincorporated areas in the San Gabriel Valley. The SGVCOG works with member agencies to collectively address transportation, housing, economic growth, and environment issues that are most effectively addressed at a regional scale.

Southern California Edison (SCE): An investor-owned utility that is the primary electricity provider to the San Gabriel Valley.

California Energy Commission (CEC), the California Air Resources Board (CARB), and more than 500 individuals and organizations. The CEESP provides a strategic menu list of options that local governments can use to address the “Big Bold” strategies found in the plan. These “Big Bold” strategies are shown in **Figure 1**.

**Figure 1: “Big Bold” Strategies of the CEESP**



In addition, the CEESP identifies two primary goals that this EAP seeks to achieve:

- CEESP Section 12.5 Goal 3: Local governments lead by example with their own facilities and energy usage practices.
- CEESP Section 12.5 Goal 4: Local governments lead their communities with innovative programs for energy efficiency, sustainability, and climate change.

The EAP meets these goals by providing goals, policies, and actions for municipal operations as well as community-wide activities. The CEESP also identifies a long-term vision and energy efficiency goals for California, as well as outlining specific near-term, mid-term, and long-term implementation strategies to assist each economic sector in achieving its energy efficiency goals.

The CPUC identified several policy tools to assist in the market transformation to more energy-efficient products or practices, including:

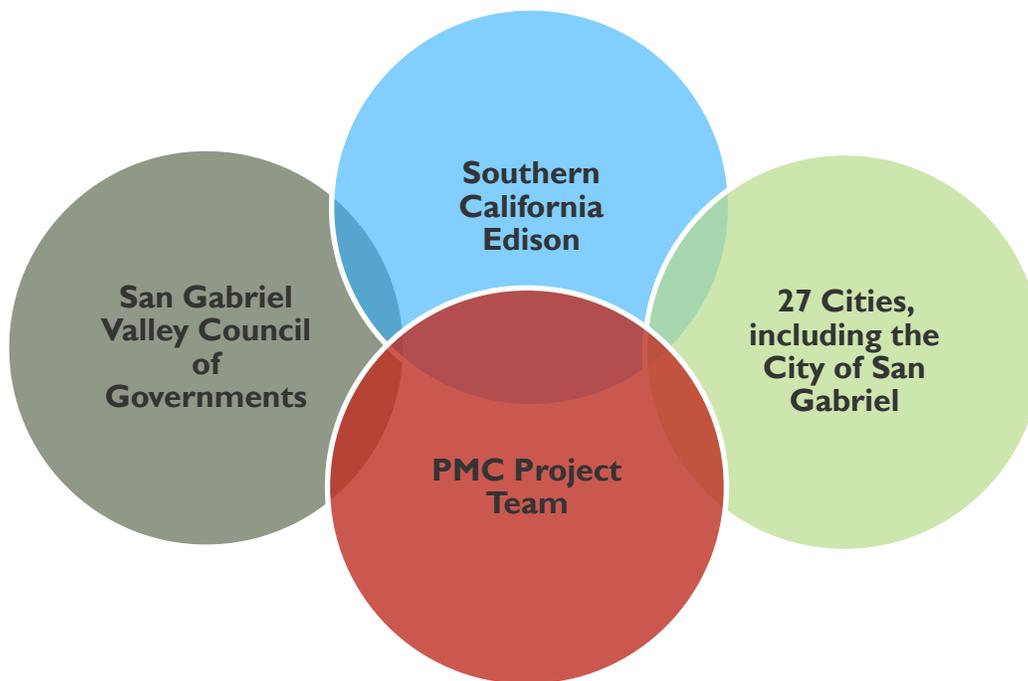
- Customer incentives;
- Codes and standards;
- Education and information;
- Technical assistance; and
- Emerging technologies.

# INTRODUCTION

The City prepared this EAP through the technical assistance program of the CEESP, which aims to provide local governments with the technical expertise and financial resources to achieve energy efficiency at municipal facilities and throughout the community. In 2009, as part of CEESP implementation, the CPUC authorized SCE to use funding from the electricity public goods charge to complete local strategic plan activities focused on energy efficiency. SCE is implementing the “Big Bold” strategies of the CEESP. Through this process, SCE awarded funding to the SGVCOG and participating cities to provide funding and technical support for preparation of a regional framework and tailored, city-specific EAPs through a regional planning process.

The SGVCOG managed the project through partnership with SCE, 27 member cities of the SGVCOG that receive electricity service from SCE, and the consultant team led by PMC. The project included preparation of customized EAPs for each participating city, including a comprehensive greenhouse gas (GHG) emissions inventory, forecast of community-wide activities and municipal operations, and longer-term goals, policies, and actions. This EAP has been prepared as part of a coordinated effort among the SGVCOG, SCE, the City of San Gabriel, and PMC (**Figure 2**).

**Figure 2: Partners in the EAP Planning Process**



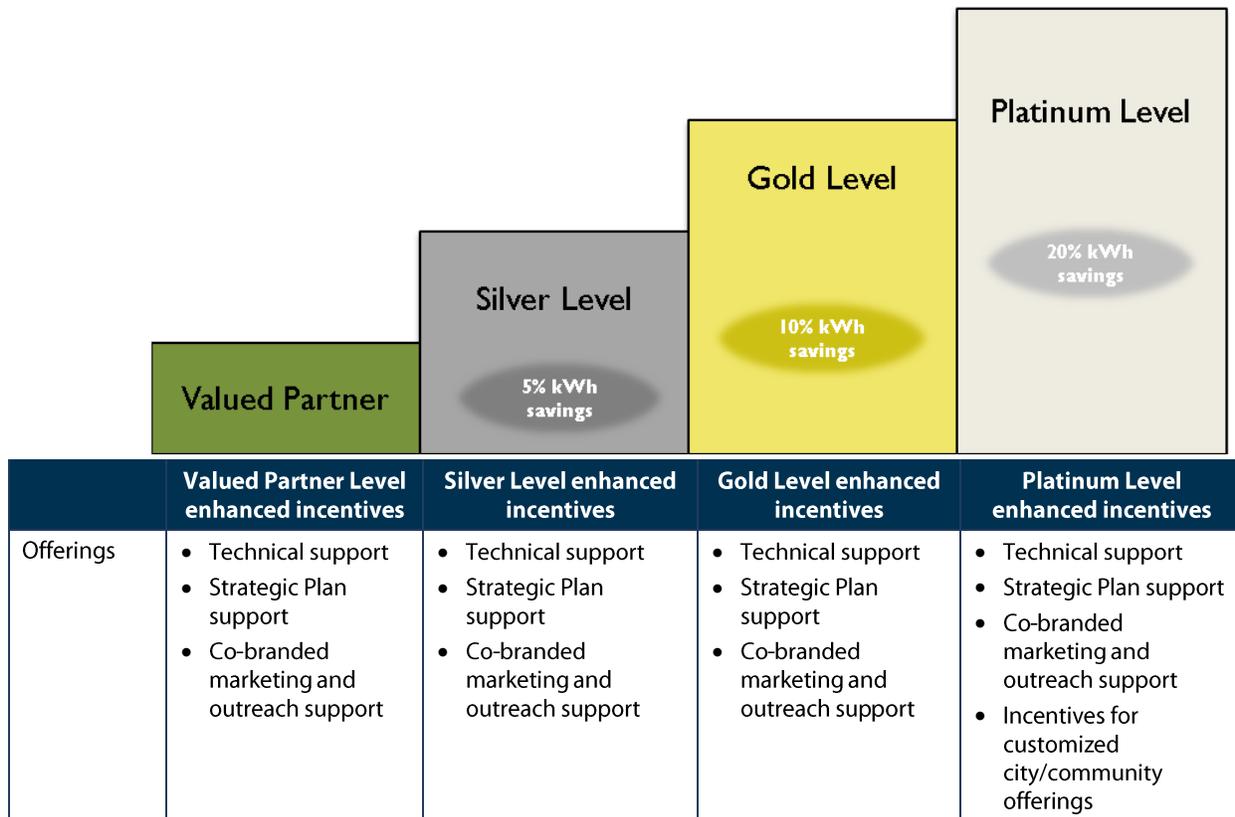
## SOUTHERN CALIFORNIA EDISON AND THE ENERGY LEADER PARTNERSHIP MODEL

SCE developed the Energy Leader Partnership (ELP) Model to provide support to local governments in identifying and implementing opportunities to improve energy efficiency in municipal facilities and promoting community awareness of demand side energy management opportunities. By participating in SCE’s Energy Leader Partnership, local governments are taking actions to support the California Long Term Energy Efficiency Strategic Plan while saving energy and fiscal

resources for their communities. In the San Gabriel Valley, the San Gabriel Valley Council of Governments is leading the implementation of the ELP with SCE and all 27 eligible cities of the 31 member cities in the SGVCOG.<sup>1</sup>

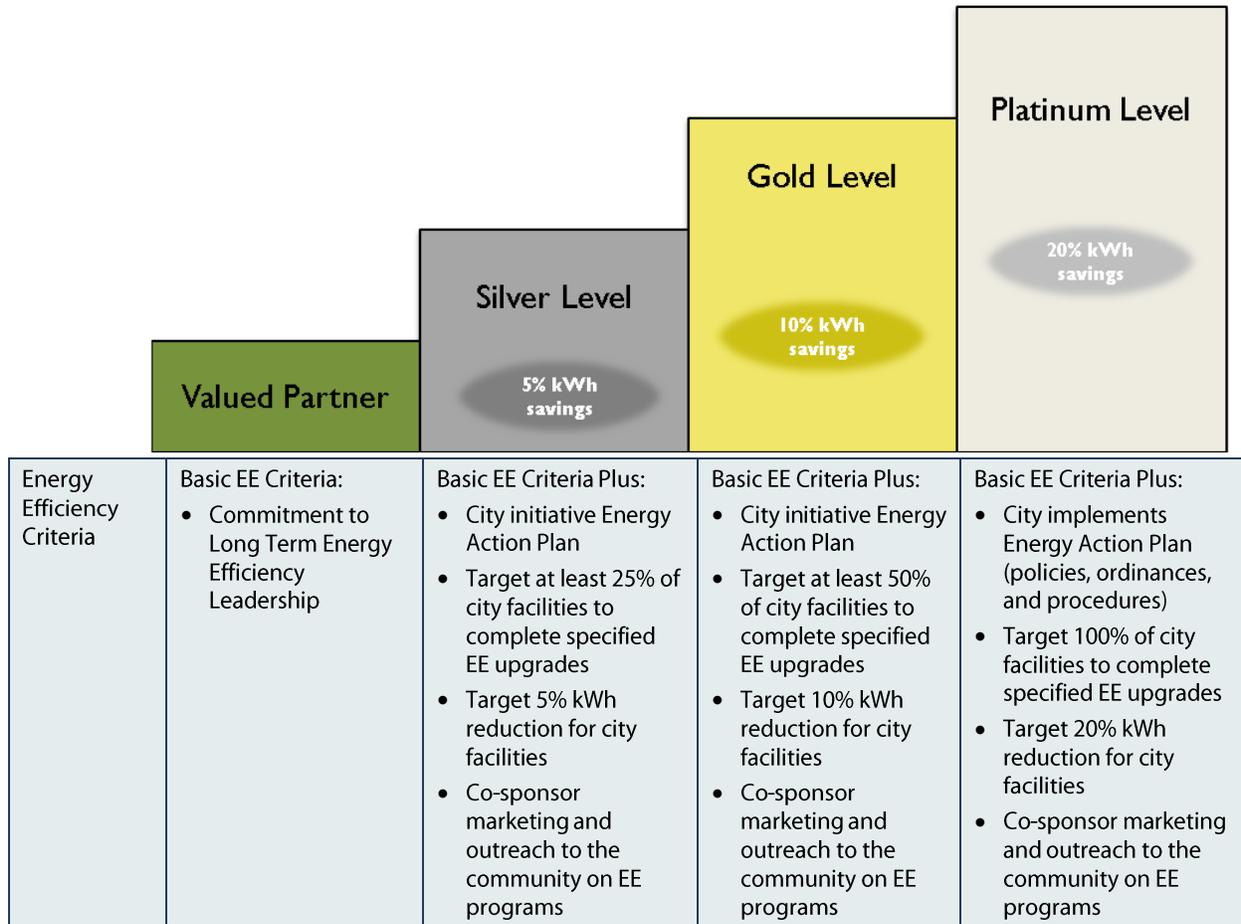
The ELP comprises four focus areas: (1) municipal retrofits, (2) demand response, (3) strategic plan support, and (4) energy efficiency program coordination. The ELP program has four incentive tiers for participating cities: (1) Valued Partner, (2) Silver, (3) Gold, and (4) Platinum. All cities participating in the ELP begin as a Valued Partner. To advance to the next incentive tier, each participating city must achieve the predetermined energy savings and requirements for city facilities and community-wide as shown in **Figure 3**. The City of San Gabriel is currently a Gold partner in the Energy Leader Partnership Model.

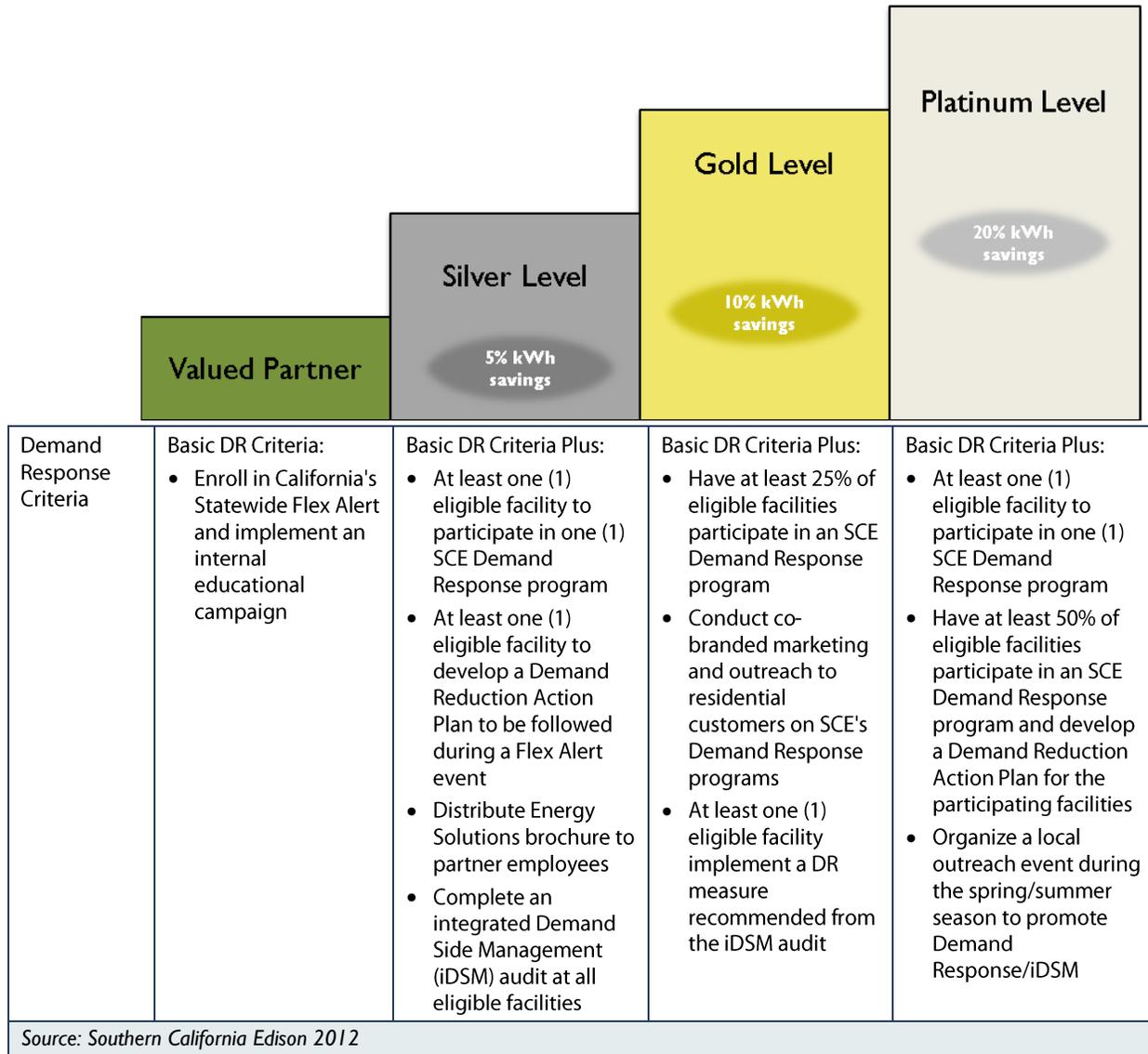
**Figure 3: Energy Leader Partnership Model**



<sup>1</sup> While there are 31 cities in the SGVCOG, the cities of Azusa and Pasadena are not eligible to participate in SCE-funded programs as they are their own electricity providers. Additionally, the cities of Industry and Walnut have elected to not participate in this planning process.

# INTRODUCTION





## ROLE OF THE EAP

The role of this EAP is to serve as a strategic plan to achieve electricity efficiency in the community. This Plan identifies the City's role in reducing electricity use, both as a steward of the community and as a leader through its own operations. Strategies in the EAP will shape the City's planning framework, prioritize ongoing outreach responsibilities, and guide government operations.

# INTRODUCTION

The City will use the EAP as a tool to facilitate electricity efficiency while achieving other local economic and planning objectives, refining the EAP as programs are implemented and tested over time. Strategies in this EAP will be an integral part of resource management, planning, and development in the community. The EAP is an analytical link for the City between electricity reduction targets, local development, and state and regional electricity planning efforts. The EAP provides the City with the added benefit of a foundation to assess local contributions to and impacts of climate change. While the primary focus of this EAP is electricity efficiency, the greenhouse gas emissions inventory in this Plan also provides the City with an understanding of the local equivalent of the State-recommended GHG emissions reduction target to achieve 1990 GHG emissions levels statewide by 2020. The local responsibility was identified in the Assembly Bill (AB) 32 Scoping Plan, which clarified that the 1990 target established in AB 32 is equivalent to a 15% reduction below baseline emissions by 2020. The Scoping Plan also identified a variety of measures, including regulations,

## AB 32 (Assembly Bill 32)

Establishes a comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, cost-effective reductions of greenhouse gases (GHG) for the State of California.

incentives, voluntary actions, and market-based approaches, to achieve the target reduction. The California Natural Resources Agency has also directed local governments to assess GHG emissions through the California Environmental Quality Act review process. The GHG inventory in this EAP allows the City to identify the local equivalent of the State-recommended reduction target. The EAP also allows the City to understand the GHG reduction potential of the strategies outlined in this Plan.

comprehensive climate action plans or GHG reduction strategies, mitigation strategies in the EAP focus only on electricity efficiency. Nonetheless, this Plan equips the City to understand its role in achieving State-recommended GHG reduction targets.

Based on the funding opportunity provided through the CEESP, the EAP's primary focus is electricity efficiency. While this EAP presents a comprehensive GHG emissions inventory and forecast, unlike more

## CITY PROFILE

### SETTING

The City of San Gabriel is situated at the base of the San Gabriel Mountains, 11 miles east of Downtown Los Angeles and bordered on the north by San Marino, on the west by Alhambra, on the south and southeast by Rosemead, and on the east by Temple City and unincorporated Los Angeles County. The city occupies an area of slightly over 4 square miles and is home to approximately 40,000 residents.

San Gabriel is one of the oldest communities in California. It is a mature, largely built-out city, serving as a fully built-out first-ring suburb of Los Angeles for more than 40 years. The historic buildout pattern leaves very little vacant developable land. The city has very few large-scale industrial developments, and industrial land accounts for less than 2% of the land uses today. The city's environment is largely urban, with over half of the land area consisting of developed residential neighborhoods.

The City's historic Mission District is home to the Mission San Gabriel Archangel, the second oldest building south of Monterey. The National Parks Service designated the district as an interpretive center for the De Anza National Historic Trail, a trail running from the Mexican border to San Francisco.

**HISTORY**

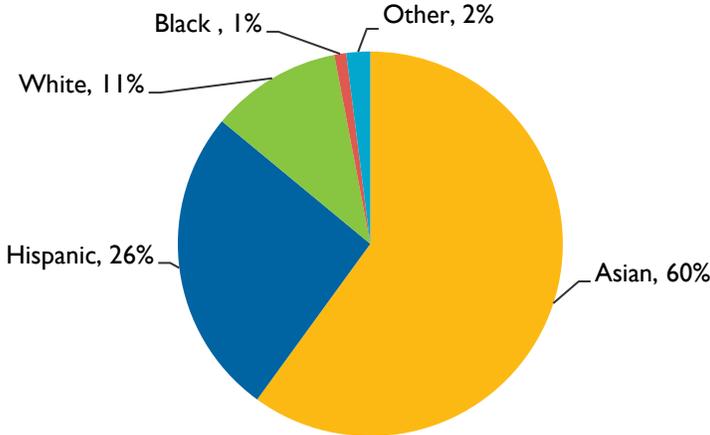
The oldest settlement in Los Angeles County and second oldest community in California, the first European San Gabriel settlement was established in 1771. Its mission, San Gabriel Archangel, was one of 21 missions established by the Spanish throughout Southern and Central California. The arrival of Spanish missionaries displaced the area's Native American inhabitants and established permanent settlements seated in a successful agricultural industry. Ranchers and farmers assumed prominence as the nineteenth century progressed. By 1852, San Gabriel had become one of the first townships in the County of Los Angeles. When the 1860 census was taken, there were only 586 persons listed as residents. The City of San Gabriel was incorporated on April 24, 1913, with a population of 1,500. A trickle of settlers heading west late in the century marked the beginning of unflagging expansion of San Gabriel's population in the 1900s, with a significant growth spurt in the 1940s. Suburban-style development flourished throughout the second half of the century. By 2000, San Gabriel had become a community of more than 40,000.

Asian immigrants first began to arrive in the mid-nineteenth century, along with Western Europeans, to work the agricultural fields or build the Pacific Railroad and other infrastructure. The City of San Gabriel became a primary center for new arrivals from Asia, including a diversity of Chinese, Japanese, Filipino, and South Asian immigrants. Consequently, from its earliest days San Gabriel has been a community for peoples of different cultures, beliefs, and values. By 2003, the city had the third highest percentage of Chinese population in the United States (37%) (Zhou, 2003).

**SAN GABRIEL TODAY**

Today, more than half of the city's population is Asian, followed by a significant Hispanic and white population (see **Figure 4**). This diversity shapes much of the character of the city. More than 50% of San Gabriel residents are foreign born, and 74% speak a language other than English at home.

**Figure 4: City of San Gabriel Racial and Ethnic Profile, 2010**



Source: Southern California Association of Governments 2010.

As of 2010, approximately 34% of the city's working residents were employed in management and professional occupations. A significant percentage of workers were employed in sales and office-related occupations, followed by service-related occupations such as food service and financial or banking services, as shown in **Table I**.

**Table 1: Employment in San Gabriel, 2010**

Occupation	Number	Percentage
Total employed	19,540	100%
Management, business, science, and arts occupations	6,640	34%
Sales and office occupations	5,340	27%
Service occupations	4,230	22%
Production, transportation, and material moving occupations	2,120	11%
Natural resources, construction, and maintenance occupations	1,200	6%

Source: US Census Bureau 2010

## SAN GABRIEL'S RECENT SUSTAINABILITY EFFORTS

During the past several years, the City has been analyzing ways to reduce its energy footprint and proactively implementing energy efficiency projects. In 2006, the City adopted the Valley Boulevard Neighborhoods Sustainability Plan, which provided a road map for the major arterial's development for greater sustainability. In 2008, the City of San Gabriel partnered with Southern California Edison (SCE) and Intergy Corporation to conduct an energy efficiency assessment of the San Gabriel municipal facilities to explore opportunities for reducing energy demand and utility costs. The City initiated upgrades based on the recommendations, including installation of energy-efficient office and stage lights. In 2009, the City replaced illuminated lamp fixture street signs with reflective street signs, using light from vehicles to illuminate the signs rather than electricity-generated internal light. The City anticipates saving \$61,000 annually from averted energy and maintenance costs after replacing lighted street signs and energy savings of up to 104,240 kilowatt-hours (kWh).

In 2009, the City adopted a green action strategy, San Gabriel Goes Green, that focuses on City-initiated best practices to promote sustainability. The strategy was developed in coordination among City departments and the Planning Commission. Its recommendations guide the City's approach to sustainability.

The City of San Gabriel has identified strategies for protection and conservation that are feasible given budget opportunities and limitations.

The City's actions in support of its sustainability commitment include plans for constructing a new energy-efficient Public Works Yard described in greater depth below. Consequently, it is the second city in the San Gabriel Valley to achieve the Gold-level partnership status with the ELP. However, the City has already achieved Platinum standards for energy efficiency, realizing 20% kWh savings from its 2004 citywide energy usage.

## THE CITY'S PLANS FOR FUTURE DEVELOPMENT

Redevelopment of Valley Boulevard is one of the major planning projects that San Gabriel is engaged in today. The Valley Boulevard Neighborhoods Sustainability Plan, or Valley Vision, completed in 2006, provides a road map of land use

### Recent Sustainability Milestones

2008: Energy Audits

2009: Adoption of the Sustainability Action Plan

2009–2011: Replacement of illuminated street signs with reflective signage, and energy-efficient upgrades to City facilities

2011: Attainment of SCE Gold-level status

development, building and site design, transportation, infrastructure, and streetscape strategies. The plan includes goals for more compact development, transit-oriented development, and more efficient building design and renewable energy installations. Redevelopment would include mixed-use multi-family residential and commercial along corridors and high-intensity commercial at key nodes.

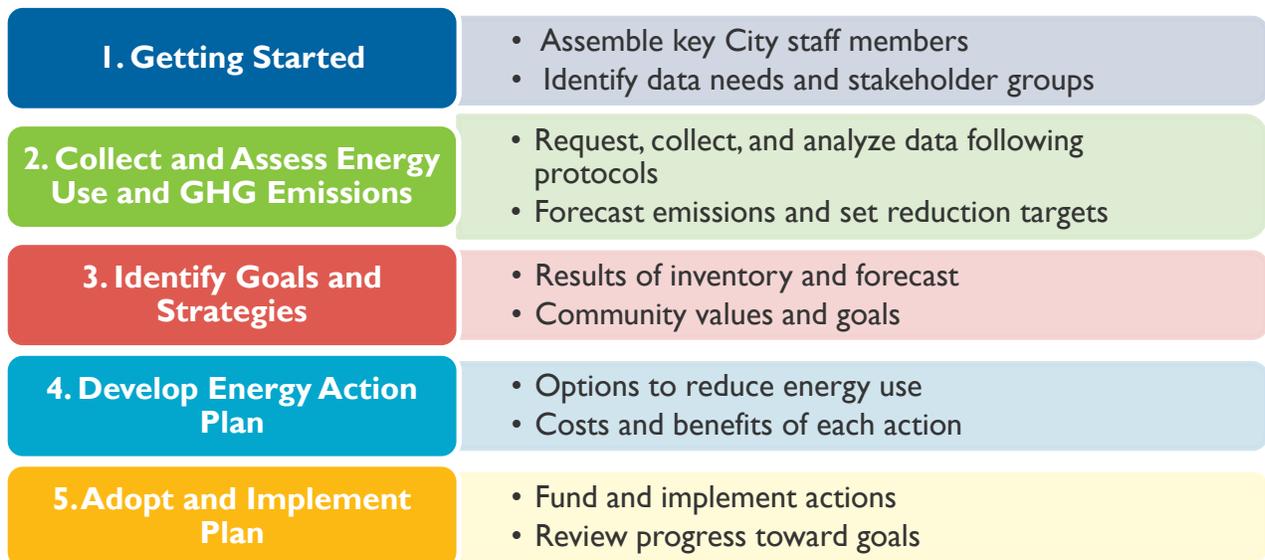
## THE EAP PLANNING PROCESS

The City of San Gabriel worked through a five-step planning process, as depicted in **Figure 5**, to develop and implement the EAP. Following this five-step process allows the City to adequately identify, collect, and analyze the relevant energy and GHG data prior to developing and implementing strategies to improve energy efficiency and reduce GHG emissions.

The EAP's outreach process engaged City staff, residents, business owners, and stakeholders in the identification and refinement of electricity efficiency issues and strategies. The goal of the outreach process was to help City staff make better decisions and develop effective local strategies for electricity efficiency. City staff also facilitated public outreach through an online survey.

The development process for the EAP relied on a multi-pronged outreach strategy involving City staff, public stakeholders (residents, employees, and business owners), and guidance from a regional Project Steering Committee (PSC), which is described in further detail below.

**Figure 5: EAP Planning Process**



## PROJECT STEERING COMMITTEE

Along with other San Gabriel Valley cities taking part in the regional EAP project, the City participated in a regional PSC throughout EAP development. The committee includes representatives from all 27 cities participating in the project. The purpose of the PSC is to confirm a regional approach to EAP development, guide the project, and share best practices among jurisdictions. Starting in July 2011, the PSC convened approximately once a month. During PSC meetings,

# INTRODUCTION

representatives from SGVCOG staff and the technical consultant project team facilitated discussions and presentations to review options to achieve electricity efficiency.

City staff regularly voted on topics through an instant polling tool, Turning Point, to provide input on a variety of topics, including the regional framework, GHG data collection process, GHG scopes and sources, reduction measures, and engagement options for the EAPs. The polling tool collected City staff responses, which were used to inform the recommendations that the project team used to prepare this EAP. Other PSC topics included options to conduct public outreach and engage City staff. City staff also presented case studies, sharing success stories and lessons learned from project implementation.

## COMMUNITY EVENTS

Throughout all steps of the process, the City has facilitated ongoing outreach and engagement efforts. Stakeholder engagement or public participation encompasses many levels of involvement, engagement, and collaboration among community members, key stakeholders and advocates, elected officials, and staff. As a first step for public participation, the project team worked with City staff to develop a customized outreach strategy. Outreach efforts allowed the City to share ideas, collect input, and assess community and stakeholder preferences. Outreach also builds local capacity for project implementation, helping to build consensus and momentum for implementation. A summary of these events is shown in **Figure 6**.

In addition to supporting development of the EAP, outreach also helped the City educate the community about electricity use and efficiency opportunities. Outreach efforts helped the community to think about strategies to reduce electricity use and improve the quality of homes and businesses.

**Figure 6: Summary of Community Events**



## PERSONAL ENERGY EFFICIENCY SURVEY

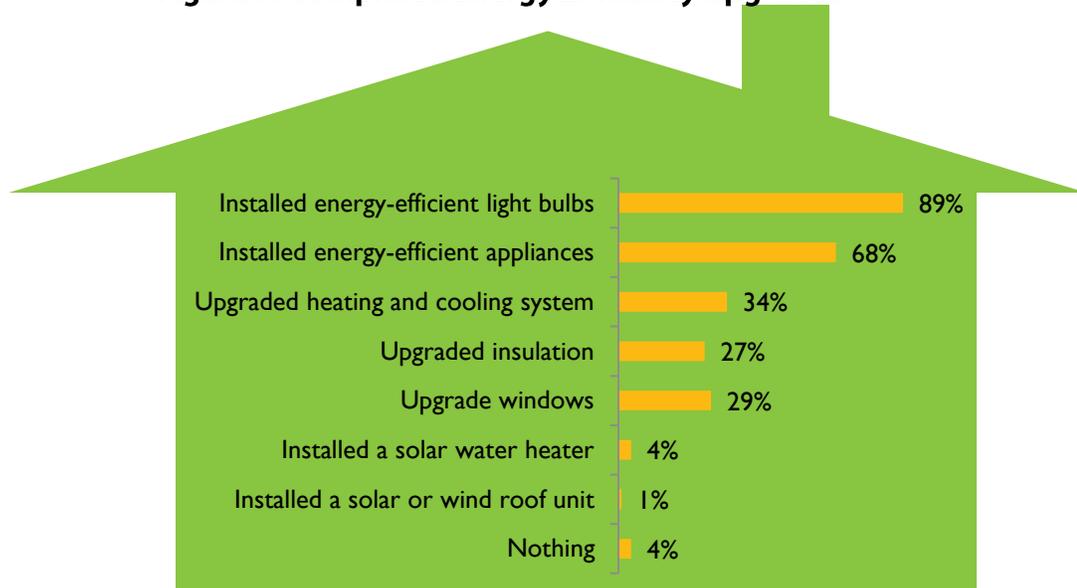
As part of the regional partnership with the SGVCOG, the City distributed the Personal Energy Action Survey on energy efficiency at public events and through the City’s website. A blank version of the survey is provided in **Appendix A**. Participation in the survey was voluntary. Survey results help to provide a useful snapshot of energy-related opinion and behavior; however, the results should not be interpreted as statistically valid. Approximately 145 people completed the survey in two languages (English and Chinese), providing feedback on improvements completed to their home or business, interest in completing additional improvements, and support for strategies to achieve electricity efficiency throughout the community. City residents were the majority of respondents, completing 105, or 76%, of the surveys. Other respondents included people who work in the city (38 surveys) and business owners (6 surveys).

Why would San Gabriel residents and business owners want to complete energy efficiency upgrades?

The results of the energy efficiency survey show that respondents would be motivated by lower utility bills, grants or incentives, and information on energy and financial savings. These primary motivators provided a foundation for policies and actions that the City will implement to reduce electricity use, as identified in Chapter 4 of this Energy Action Plan.

**Figure 7** reports the energy upgrades recorded by respondents. The results suggest that most of the respondents had already replaced inefficient light bulbs and appliances with more efficient models. The remaining results indicate that many households could benefit from upgraded heating and cooling systems, new insulation, and renewable energy sources. The results also indicated that most people are attempting some form of energy efficiency upgrade.

**Figure 7: Completed Energy Efficiency Upgrades**

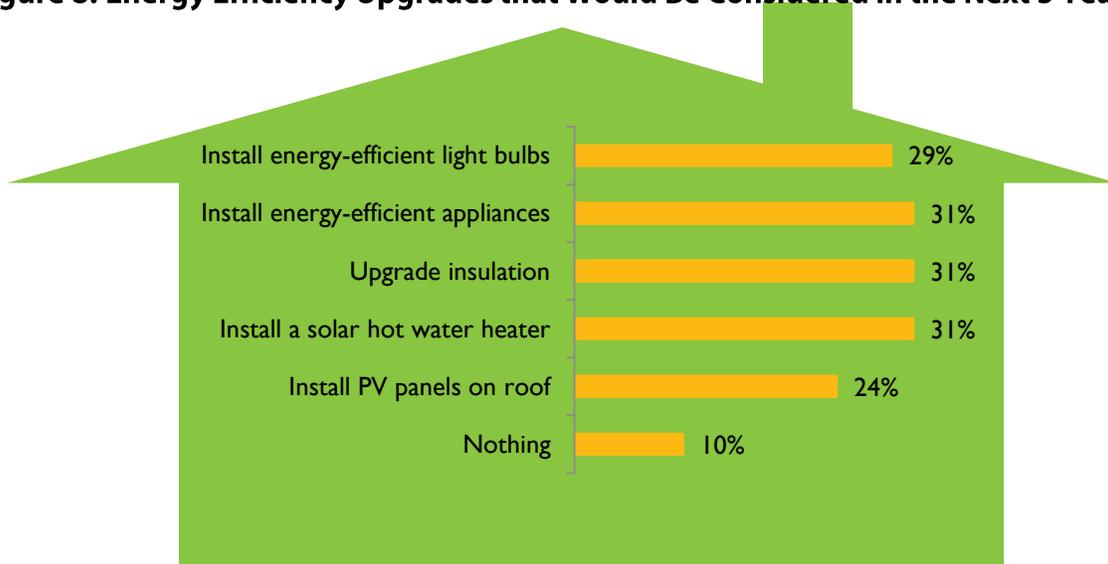


Note: Percentages in the figure above show the percentage of respondents that have completed each type of energy-efficient upgrade (e.g., 89% of respondents installed energy-efficient light bulbs and 68% installed energy-efficient appliances).

The survey asked participants which of the above energy efficiency opportunities they would consider in the next five years. As **Figure 8** reports, each of the options will be considered by approximately one-quarter to one-third of the

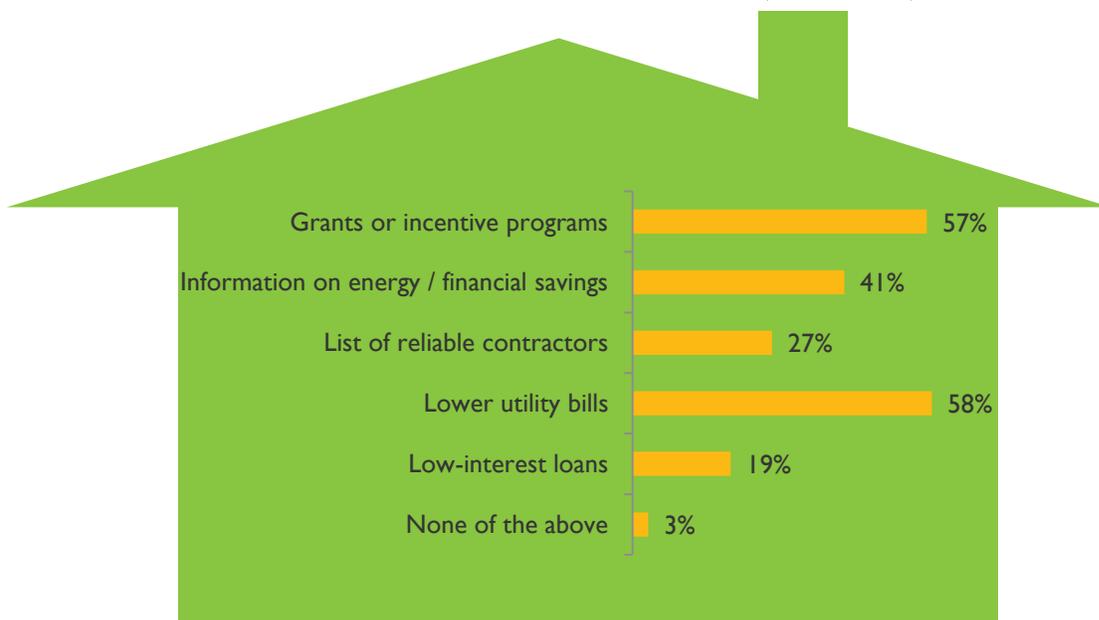
participants. The consistent response rates indicate that many of the energy-saving technologies in the survey may be appropriate for San Gabriel.

**Figure 8: Energy Efficiency Upgrades that Would Be Considered in the Next 5 Years**



Finally, the survey queried participants about incentives or motivators to install any of the technologies mentioned above. As **Figure 9** reports, financial incentives could be the most useful tools for encouraging energy-saving upgrades. Responses also indicate that educational campaigns, while not as useful as financial incentives, may have an impact on energy use in the city.

**Figure 9: Incentives or Motivators for Energy Efficiency Upgrades**



## CHAPTER 2

# GHG INVENTORY & FORECAST

This greenhouse gas emissions inventory (Inventory) and forecast shows the contribution of community activities to GHGs. Energy use represented just under half (40%) of all GHG emissions in 2006.

The analysis in this Inventory provides the technical foundation for the City of San Gabriel's Energy Action Plan, informing the City and the community of the largest sources of GHG emissions and electricity trends. This information helps the City to identify opportunities for reductions that respond to local characteristics.

# GHG INVENTORY & FORECAST

## INTRODUCTION

### INVENTORY AND FORECASTING PURPOSE

This greenhouse gas (GHG) emissions inventory and forecast (Inventory) provides a detailed summary of community-wide and municipal total GHG emissions, electricity-specific GHG emissions, and electricity use. This information is used to create reduction strategies in the City of San Gabriel's Energy Action Plan (EAP). The Inventory also provides a detailed summary of GHG emissions, which can be used as a foundation for future climate action planning projects.

Specifically, the Inventory:

- Presents total GHGs and electricity-specific emissions from community-wide and municipal activities for the baseline calendar year 2006;
- Provides a snapshot of total GHGs and electricity-specific emissions from community-wide and municipal activities in calendar year 2010;
- Forecasts how community-wide total emissions and electricity-specific emissions will increase by 2020 if no behavioral or regulatory changes are made (known as a business-as-usual scenario), allowing for comparison to AB 32's 2020 GHG reduction target in addition to the Southern California Association of Governments' (SCAG) regional planning targets for 2035 identified in Senate Bill 375 (SB 375);
- Adjusts the GHG forecasts to account for reduction efforts mandated by the State of California, such as new energy efficiency and vehicle standards; and
- Provides City staff, decision-makers, and stakeholders with adequate information to direct development of this EAP and to establish GHG emissions reduction and energy efficiency targets.

### DESCRIPTION OF RELEVANT EMISSIONS AND KEY CONCEPTS

The Inventory includes the major sources of GHGs caused by activities in the city. These sources are included based on a regionally consistent approach using statewide best practices and California Air Resources Board (CARB) recommendations. The Inventory analyzes GHG emissions from community and municipal sources as described in **Figure 10**. Refer to **Appendix B** for detailed activity data and emissions by sector and subsector and **Appendix C** for activity data sources and specific emissions factors for each subsector.

Figure 10: Community and Municipal GHG Emission Sources (2006)

## Community

- *Energy* – Electricity and natural gas consumed by residents and businesses in the city.
- *Direct Access Electricity* – Electricity purchased by commercial customers from energy service providers other than Southern California Edison.
- *Street and Traffic Lighting* – Electricity used by street and traffic lights within the city but not owned by the City.
- *On-Road Transportation* – Vehicle miles traveled (VMT) in, to, and from the city.
- *Waste* – Methane emissions from waste (municipal solid waste) and green waste (alternative daily cover) sent to landfills and regional incinerators (also known as transformation facilities) from the city.
- *Water and Wastewater* – Energy required to extract, filter, deliver, and treat the water used and wastewater disposed by the community.
- *Off-Road Equipment* – Emissions from construction and lawn & garden equipment operated within the city.

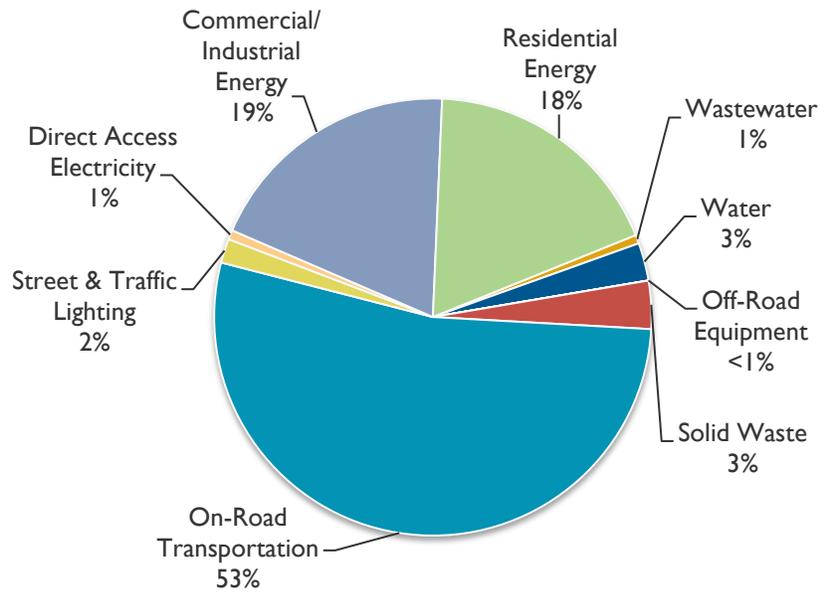
## Municipal

- *Buildings* – Electricity and natural gas consumed by City buildings and facilities.
- *Off-Road Equipment* – Fuel used for construction projects, landscaping, or other off-road purposes.
- *Fleet* – Gasoline, diesel, and compressed natural gas (CNG) used by all City-owned vehicles.
- *Lighting* – Electricity, paid for by the City, used by street and traffic lighting and outdoor lighting at parks and other facilities within city limits.
- *Employee Commute* – Emissions from the vehicles City employees use to get to and from work.
- *Government-Generated Solid Waste* – Indirect emissions from the waste disposed by employees and operations of the City.

## COMMUNITY-WIDE INVENTORY SUMMARY

The City of San Gabriel emitted approximately 262,780 metric tons of carbon dioxide equivalent (MTCO<sub>2e</sub>) in the baseline year 2006. As shown in **Figure 11** and **Table 2**, the transportation sector was the largest contributor to emissions (53%), producing approximately 139,300 MTCO<sub>2e</sub> in 2006. Commercial and industrial energy use was the next largest sector with 50,320 MTCO<sub>2e</sub>, or 19% of total emissions. Residential energy use followed closely with 47,750 MTCO<sub>2e</sub>, contributing 18% of total emissions. The solid waste sector comprised 3% of the total emissions (9,330 MTCO<sub>2e</sub>), and emissions from water comprised 3% of the total (7,340 MTCO<sub>2e</sub>). The remaining 4% of emissions consisted of street and traffic lighting, direct access electricity, wastewater electricity use, and off-road sources such as construction equipment. Combined, these remaining sectors contributed 8,740 MTCO<sub>2e</sub>. For a detailed description of activity data, such as the breakdown of residential electricity and natural gas uses, refer to **Appendix B**.

**Figure 11: Community-Wide GHG Emissions by Sector, 2006**



**Table 2: Community-Wide GHG Emissions by Sector, 2006 (MTCO<sub>2</sub>e)**

Sector	Activity Data	Unit	MTCO <sub>2</sub> e	Percentage of Total
Residential Energy	71,890,250	kWh	47,750	18%
	5,025,380	Therms		
Commercial/Industrial Energy	109,719,340	kWh	50,320	19%
	3,427,200	Therms		
Direct Access Electricity	4,445,770	kWh	1,800	1%
Street & Traffic Lighting	16,025,120	kWh	4,690	2%
Transportation	261,771,210	VMT	139,300	53%
Solid Waste	40,920	Tons of Waste	9,330	4%
	5,020	Tons of ADC		
	3,380	Tons Transformed		
Off-Road	12,790	Households	580	<1%
	40	Permits Issued		
Water	25,126,500	kWh	7,340	3%
Wastewater	5,701,000	kWh	1,670	1%
<b>Total*</b>			<b>262,780</b>	<b>100%</b>

\* Due to rounding, the total may not equal the sum of component parts.

## 2010 COMMUNITY EMISSIONS UPDATE

Activity data for 2010 was available for many community sectors, including energy, transportation, waste, community off-road, wastewater, and water. This information has been translated into greenhouse gas emissions for San Gabriel and all other participating cities and will serve as a common benchmark that will allow activities for accurate comparison between all cities in the San Gabriel Valley participating in the EAP process. This 2010 interim inventory will also help cities track the GHG and energy reductions from programs implemented since the baseline year.

**Table 3** summarizes activity data for 2010 and compares emissions from baseline and 2010 for the community of San Gabriel. Sectors that showed a decrease in emissions from 2006 to 2010 include residential electricity and natural gas, commercial/industrial electricity, transportation, municipal solid waste and transformed waste, off-road, water, and wastewater-indirect. The city has realized significant reductions in emissions associated with waste since the baseline year, including a 32% decrease in solid landfilled waste and a 99% reduction in transformed waste. Transformed waste is generally an option available to jurisdictions for waste incineration, which provides a waste diversion credit. However, this diversion method is often costly, and it is likely that the city's drop in transformed waste reflects achievement of mandatory waste diversion regulations, eliminating the incentive to pay for waste transformation. Declines in residential, commercial, and industrial energy use most likely reflect the regional slowing of the economy since 2006. The 37% decline in off-road construction emissions reflects an estimated decrease in construction activity, based on local permit activity and data from the California Air Resources Board OFFROAD 2007 model. The only sectors reported that did not show decreases in emissions are direct access electricity and alternative daily cover waste. The spike in direct access electricity use reflects an increase in the number of local commercial and industrial uses purchasing direct access electricity from a service provider other than Southern California Edison (SCE); these changes may simply show the redistribution of nonresidential electricity accounts from SCE to other service providers. Proxy data was used to estimate commercial/industrial natural gas for 2010, due to the unavailability of data. Using this data as a proxy, emissions from the community are estimated at 250,690 MT<sub>CO<sub>2</sub>e</sub>, a 5% decrease from baseline.

# GHG INVENTORY & FORECAST

**Table 3: 2010 Electricity Use and 2006 GHG Emissions Comparison<sup>1</sup>**

Sector	2006 Activity Data	2010 Activity Data	Percentage Change from 2006	Unit	2006 MTCO <sub>2</sub> e	2010 MTCO <sub>2</sub> e	Percentage Change from 2006
Residential Electricity	71,890,250	66,682,760	-7%	kWh	21,020	19,190	-9%
Residential Natural Gas	5,025,380	4,824,770	-4%	Therms	26,730	25,670	-4%
Commercial/Industrial Electricity	109,719,340	95,517,050	-13%	kWh	32,090	27,490	-14%
Commercial/Industrial Natural Gas <sup>1</sup>	3,427,200	3,427,200	0%	Therms	18,230	18,230	0%
Direct Access Electricity	4,445,770	7,250,880	63%	kWh	1,800	3,040	69%
Street & Traffic Lighting	16,025,120	16,469,250	3%	kWh	4,690	4,740	1%
On-Road Transportation	261,771,210	265,240,840	1%	VMT	139,300	137,300	-1%
Waste – Solid Waste	40,920	27,910	-32%	Tons of Waste	7,530	5,200	-31%
Waste – Green Waste	5,020	5,470	9%	Tons of ADC	770	840	9%
Waste – Transformed	3,380	20	-99%	Tons Transformed	1,030	10	-99%
Off-Road Equipment – Lawn & Garden	12,790	12,980	1%	Households	10	10	0%
Off-Road Equipment – Construction	40	10	-75%	Permits Issued	570	360	-37%
Water	25,126,500	23,999,300	-4%	kWh	7,340	7,010	-4%
Wastewater	5,701,000	5,445,300	-4%	kWh	1,670	1,600	-4%
				<b>Total<sup>2</sup></b>	<b>262,780</b>	<b>250,690</b>	<b>-5%</b>

1. Due to rounding, the total may not equal the sum of component parts.

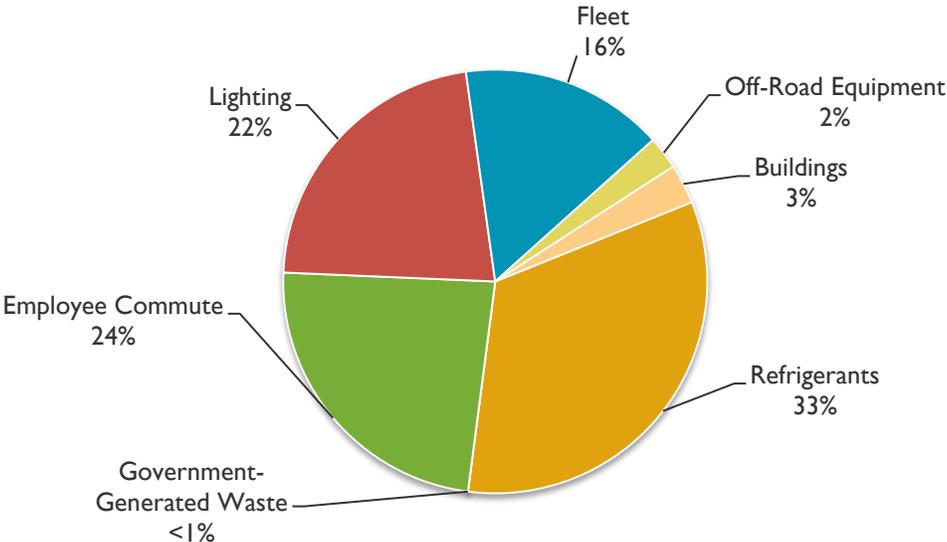
2. Activity data was not available at the time of this report. Baseline information is used as a proxy.

3. Direct access (DA) electricity is electricity that industrial and commercial customers secure from a competitive electric service provider (ESP) other than SCE. The CPUC allows nonresidential customers to purchase direct access electricity from ESPs, which may allow a customer to secure a more favorable rate. SCE estimates DA electricity used within city limits.

## MUNICIPAL INVENTORY SUMMARY

The municipal inventory includes GHG emissions from the operations and activities conducted by the City of San Gabriel. GHG emissions were calculated from activity data collected by the City. Operations and activities by the City in 2006 resulted in approximately 1,990 MTCO<sub>2</sub>e. **Figure 12** and **Table 4** depict the contribution of each activity to total GHG emissions. Buildings and fleet produced the majority of the City's emissions, with building energy use producing 660 MTCO<sub>2</sub>e and fleet fuel consumption resulting in 470 MTCO<sub>2</sub>e. Public lighting made up 22% and employee commute comprised a 16% share of total municipal emissions. Government-generated waste and refrigerants made up the final 6%, with each contributing about 3%. Off-road equipment use emitted less than 10 MTCO<sub>2</sub>e and less than 1% of total emissions.

**Figure 12: Municipal GHG Emissions by Sector, 2006**



**Table 4: Municipal GHG Emissions by Sector, 2006**

Sector	MTCO <sub>2</sub> e	Percentage
Buildings	660	33%
Off-Road Equipment	<10	<1%
Fleet	470	24%
Lighting	440	22%
Employee Commute	310	16%
Government-Generated Waste	50	3%
Refrigerants	60	3%
<b>Total*</b>	<b>1,990</b>	<b>100%</b>

\* Due to rounding, the total may not equal the sum of component parts.

**2010 MUNICIPAL EMISSIONS UPDATE**

As with the community data, municipal activity data was available for 2010 for the following sectors: buildings and facilities, lighting, and employee commute. Baseline emissions from off-road equipment, fleet, and government-generated waste were used as proxies to estimate 2010 data. This information, shown in **Table 5**, has been used to create a snapshot of 2010 municipal GHG emissions. Emissions from City government operations in 2010 were estimated at 2,010 MTCO<sub>2</sub>e, a 1% increase from baseline (see **Table 5**). SCE reported a slight decrease in building electricity use since 2006, largely due to energy efficiency projects at City facilities and reclassifications of electricity accounts. Data for 2010 also shows an overall increase in electricity use for outdoor and streetlights, including metered lighting for purposes other than street and highway lighting, such as parking lots, decorative areas, and sports and recreation areas.

# GHG INVENTORY & FORECAST

Overall, SCE reported an increase of approximately 10% for lighting. However, the increase largely reflects SCE's reclassification of accounts since 2006 and not increases in electricity use. For example, at least one of the City's top electricity accounts was billed at a general service rate class in 2006 (which typically excludes outdoor lighting), but was converted to an outdoor area lighting account by 2010. For more information on changes in municipal electricity use since 2006, refer to **Chapter 3**.

**Table 5: Comparison of Municipal GHG Emissions, 2006–2010**

Sector	Subsector	2006 Activity Data	2010 Activity Data	Percentage Change from 2006	Unit	2006 MTCO <sub>2</sub> e	2010 MTCO <sub>2</sub> e	Percentage Change from 2006
Buildings	Electricity	1,661,460	1,590,140	-4%	kWh	490	450	-8%
	Natural Gas	31,640	32,910	4%	Therms	170	180	6%
Off-Road Equipment <sup>1</sup>	Gasoline	300	300	0%	Gallons	<10	<10	0%
	Diesel	260	260	0%	Gallons	<10	<10	0%
Fleet <sup>1</sup>	Gasoline	35,170	35,170	0%	Gallons	310	310	0%
	Diesel	9,990	9,990	0%	Gallons	100	100	0%
	CNG	8,810	8,810	0%	Gallons	60	60	0%
Lighting	Streetlights	1,146,070	1,216,440	6%	kWh	330	350	6%
	Traffic Lights	214,810	218,400	2%	kWh	60	100	0%
	SCE-Owned Streetlights	171,990	174,060	1%	kWh	50	60	0%
	Other Public Lighting <sup>2</sup>	NA	84,540	NA	kWh	–	20	NA
	Employee Commute <sup>3</sup>	1,241,110	1,284,650	4%	VMT		320	3%
Government-Generated Waste <sup>1</sup>	Tons Disposed	250	250	0%	Tons	50	50	0%
Refrigerants <sup>1</sup>	Pounds of R-22	60	60	0%	Lbs	40	40	0%
	Pounds of 134-A	30	30	0%	Lbs	20	20	0%
<b>Total<sup>4</sup></b>						<b>1,990</b>	<b>2,010</b>	<b>1%</b>

1. Activity data for 2010 was not available at the time this plan was prepared. 2006 activity data was used as a proxy.

2. Changes since 2006 for outdoor area lighting reflects reclassifications of City accounts or changes in SCE reports, not an actual increase in outdoor area lighting activity. Outdoor area lighting includes metered lighting for purposes other than street and highway lighting, such as parking lots, decorative areas, and sports and recreation areas.

3. The estimated change in employee commute activity is based on the increase in employees from 2006 and 2010. Total annual employee commute VMT was calculated from the 2011 commute survey and adjusted to reflect anticipated activity for 2006 and 2010 based on changes in the numbers of employees. According to City records, the City of San Gabriel employed 171 employees in 2006 and 177 in 2010.

4. Due to rounding, the total may not equal the sum of component parts.

## BUSINESS-AS-USUAL GHG EMISSIONS FORECAST

### COMMUNITY BUSINESS-AS-USUAL INDICATORS

**Table 6** lists the various growth indicators and sources used in the forecasting of San Gabriel’s community-wide emissions. For a detailed explanation of the indicator method for all sectors, see **Appendix B**. Future energy use (including electricity) was forecast by assuming that the energy consumption per household and per job would stay roughly the same over time. For residential energy use, household growth rates are calculated and multiplied by the per-household energy use rate. Similarly, for commercial and industrial energy use, emissions are assumed to grow with the number of jobs. Despite recent years of relatively little growth, this forecast assumes long-term growth consistent with regional forecasts prepared by the Southern California Association of Governments. Alignment with regional forecasts allows for consistency with SCAG’s regional transportation planning efforts and SB 375 implementation.

**Table 6: Comparison of 2006 and 2010 Data to Forecasts of Jobs, Households, Population, and Transportation Trends**

Growth Indicator	Emissions Sector	2006	2010	2020	2035	Sources
Households	Residential Energy, Off-Road	12,790	12,540	13,800	14,800	2010 Census, SCAG 2012 RTP
Jobs	Commercial/Industrial Energy	14,430	14,330	15,000	15,700	2010 Census, SCAG 2012 RTP, SCAG 2003 RTP
Annual VMT	Transportation	261,771,210	265,240,840	274,131,050	288,068,640	Fehr & Peers Transportation Consultants, SCAG 2003 RTP
Service Population (Residents + Jobs)	Solid Waste, Water, Wastewater, Landfill	56,590	54,050	57,800	61,800	2010 Census, SCAG 2012 RTP

### COMMUNITY BUSINESS-AS-USUAL FORECAST

**Table 7** summarizes the growth forecast of GHG emissions by activity sector without any actions or policies in place to reduce GHG emissions. Under the BAU growth scenario, baseline emissions are estimated to grow by 5% in 2020 to 275,760 MTCO<sub>2e</sub>.

**Table 7: Comparison of Community-Wide BAU Forecasts by Sector to 2006 and 2010 Emissions (MTCO<sub>2</sub>e)**

Sector	2006	2010	2020	2035
Residential Energy	47,750	44,860	51,520	55,250
Commercial/Industrial Energy	50,320	45,720	52,330	54,770
Direct Access Electricity <sup>1</sup>	1,800	3,040	1,870	1,960
Street & Traffic Lighting	4,690	4,740	4,820	4,820
Transportation	139,300	137,300	145,880	153,290
Solid Waste	9,330	6,050	8,490	9,070
Off-Road	580	370	1,640	870
Water	7,340	7,010	7,500	8,020
Wastewater – Indirect	1,670	1,600	1,710	1,820
Wastewater – Direct <sup>2</sup>	Not Available	Not Available	Not Available	Not Available
<b>Total<sup>3</sup></b>	<b>262,780</b>	<b>250,690</b>	<b>275,760</b>	<b>289,870</b>
<b>Percentage Change from 2006</b>		<b>-5%</b>	<b>5%</b>	<b>10%</b>

1. Direct access (DA) electricity is electricity that industrial and commercial customers secure from a competitive electric service provider (ESP) other than SCE. The CPUC allows nonresidential customers to purchase direct access electricity from ESPs, which may allow a customer to secure a more favorable rate. SCE estimates DA electricity used within city limits.

2. Activity data was not available at the time preparation of this report.

3. Due to rounding, the total may not equal the sum of component parts.

## MUNICIPAL BUSINESS-AS-USUAL FORECAST

The City of San Gabriel’s municipal forecast assumes a no-growth scenario for municipal operations based on data received for 2006 and 2010. The small 1% growth in emissions seen in 2010 and the two forecast years occurred because of an increase in outdoor lighting electricity use. In 2006, the City rented space in a building located at 410 McGroaty to a non-City tenant. This space is approximately 3,300 square feet and does not have any air conditioning. The space was converted to City use in 2004. Although this facility represents an increase in City-occupied buildings, it had a negligible impact on building energy use, most likely due the facility’s lack of air conditioning.

**Table 8: Comparison of Municipal BAU Forecasts by Sector to 2006 and 2010 Emissions (MTCO<sub>2e</sub>)**

Sector	2006	2010	2020	2035
Buildings	660	630	630	630
Off-Road Equipment	<10	<10	<10	<10
Fleet	410	410	410	410
Lighting	440	480	480	480
Employee Commute	310	320	320	320
Government-Generated Waste	50	50	50	50
Refrigerants	60	60	60	60
<b>Total*</b>	<b>1,930</b>	<b>1,950</b>	<b>1,950</b>	<b>1,950</b>
<b>Percentage Change from 2006</b>		<b>1%</b>	<b>1%</b>	<b>1%</b>

\* Due to rounding, the total may not equal the sum of component parts.

## STATE ADJUSTED BUSINESS-AS-USUAL (ABAU) FORECAST

### STATE REDUCTIONS

The State has been a proactive force in reducing GHG emissions. Regulations affecting vehicle standards, building standards, and the renewable energy content of electricity will reduce GHG levels in the city. The state actions listed below are incorporated into the BAU forecast to create a more realistic estimate of San Gabriel's future emissions. For a detailed description of these actions, see **Appendix B**.

- Clean Car Fuel Standards (Assembly Bill 1493, Pavley). Requires carmakers to reduce GHG emissions from new passenger cars and light trucks beginning in 2011. CARB anticipates that the Pavley standards will reduce GHG emissions from California passenger vehicles by about 22% in 2012 and by about 30% in 2016.
- Renewables Portfolio Standard (RPS). Requires utility providers to increase the portion of energy that comes from renewable sources to 20% by 2010 and to 33% by 2020. Due to implementation issues, the ABAU forecast assumes that energy providers will achieve a 28% renewable portfolio by 2020.
- California Building Code Title 24. Requires each new home and business built in California to incorporate direct electricity, natural gas, and water savings.
- California Solar Initiative (CSI). A state program that provides cash rebates for the installation of an electric solar panel system.

### COMMUNITY ABAU FORECAST

All state programs highlighted above are included in the community-wide ABAU forecast. As shown in **Table 9** and **Table 10**, these state reduction efforts are anticipated to reduce BAU emissions by 32,880 MTCO<sub>2e</sub> in 2020. The majority of these reductions are from the AB 1493 (Pavley) standards and the Renewables Portfolio Standard. In comparison to the BAU scenario, 2020 emissions with state reduction measures are 8% below baseline 2006 levels rather than 7% above.

**Table 9: Impact of State Reductions on Community Emissions, 2020 (MTCO<sub>2e</sub>)**

State Reductions Summary	2020
Pavley I Reductions	-22,520
RPS Reductions	-8,560
CSI Reductions	-200
CA Building Code Reductions	-1,600
Total State Reductions	-32,880

**Table 10: Comparison of Community 2020 ABAU Forecast by Sector to 2006 and 2010 Emissions (MTCO<sub>2e</sub>)**

State Reductions Summary	2006	2010	2020
Growth Projection	262,780	250,690	275,760
Total State Reductions			-32,880
Adjusted BAU Forecast (2020, 2035)	262,780	250,690	242,880
Percentage Change from Baseline	-	-5%	-8%

## MUNICIPAL ABAU FORECAST

Only certain state reduction programs affect the municipal BAU forecast. These include the Renewables Portfolio Standard, the Pavley standards, and the Title 24 efficiency standards. The CSI is not applicable to municipalities and is not quantified. **Table 11** and **Table 12** show the effect of the included state reduction efforts on BAU emissions. Emissions are reduced by 220 MTCO<sub>2e</sub> in 2020. All of these reductions are from the AB 1493 (Pavley) standards and the Renewables Portfolio Standard. No reductions came from the Title 24 reductions because the City does not have any set plans to expand buildings in the future. Adjusted business-as-usual emissions are 10% below baseline in 2020 (1,730 MTCO<sub>2e</sub>).

**Table 11: Impact of State Reductions on Municipal Emissions, 2020 (MTCO<sub>2e</sub>)**

State Reductions Summary	2020
Pavley I Reductions	-110
RPS Reductions	-110
CA Building Code Reductions	-
Total State Reductions	-220

**Table 12: Comparison of Municipal 2020 ABAU Forecast by Sector to 2006 and 2010 Emissions (MTCO<sub>2</sub>e)**

State Reductions Summary	2006	2010	2020
Growth Projection	1,930	1,950	1,950
Total State Reductions	-	-	-220
Adjusted BAU Forecast (2020, 2035)	1,930	1,950	1,730
Percentage Change from Baseline	-	1%	-10%

## REDUCTION TARGETS

As previously mentioned, this EAP can serve as the foundation for future climate action planning projects. Community-wide GHG reduction targets have been included as an informational item. While this overall GHG emissions reduction target was consulted when establishing community wide and municipal electricity reduction targets, the two are not linked directly. For electricity-specific community-wide reduction goals, see Chapter 4 (Energy Efficiency Strategy).

## STATE-RECOMMENDED 2020 REDUCTION TARGETS

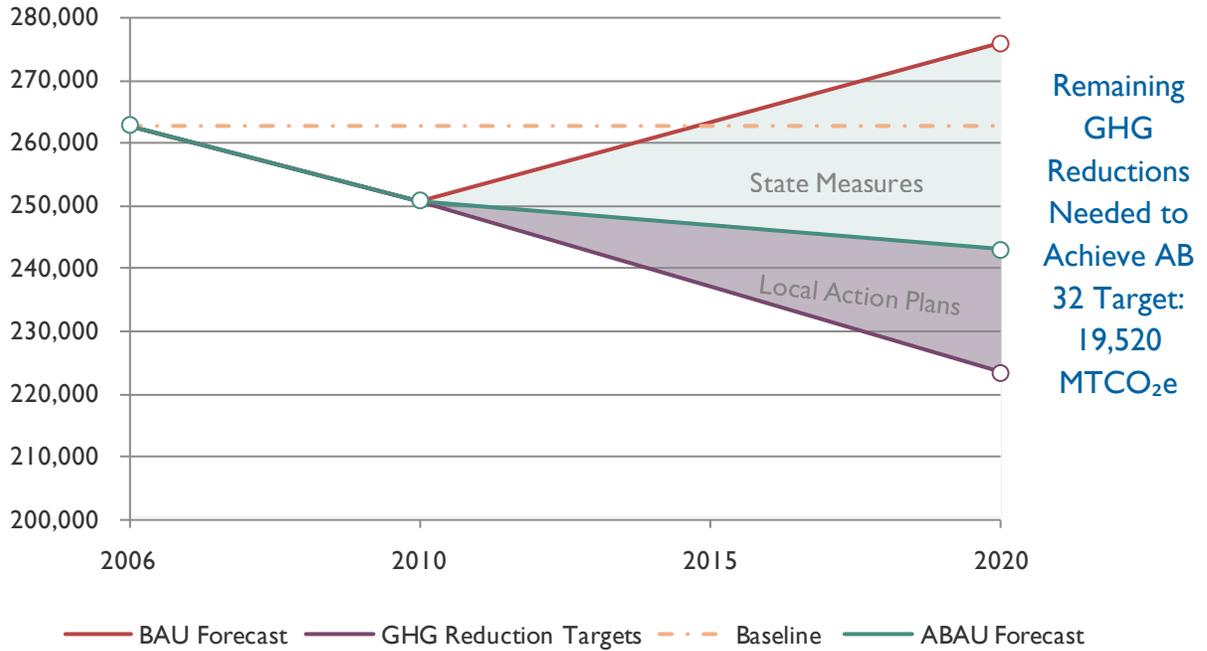
Assembly Bill 32 recommends that local governments adopt a GHG reduction target of 15% below baseline levels by 2020. The State has not adopted GHG reduction targets beyond 2020; however, in 2005, then-Governor Schwarzenegger signed Executive Order S-3-05, which created a goal to reduce GHG emissions to 1990 levels by 2020 and to 80% below 1990 levels by 2050. As shown in **Table 13**, the City would need to facilitate a reduction in emissions of 19,520 MTCO<sub>2</sub>e to meet the State-recommended AB 32 Scoping Plan goal of 15% below baseline levels by 2020.

**Table 13: State-Recommended 2020 Reduction Targets (MTCO<sub>2</sub>e)**

	2020
State-Recommended Reduction Targets (percentage below baseline)	15%
State-Recommended Emissions Goal (MTCO <sub>2</sub> e)	223,360
Adjusted BAU Forecast with State Reductions (MTCO <sub>2</sub> e)	242,880
Local Reduction Needed from Adjusted BAU (MTCO <sub>2</sub> e)	19,520

# GHG INVENTORY & FORECAST

**Figure 13: Comparison of BAU Forecast and Reduction Target, 2006–2020**



## CHAPTER 3

# ELECTRICITY PROFILE

The City of San Gabriel is the second oldest settlement in the state of California, with a built-out environment, mature residential neighborhoods, and a diverse mix of retail and commercial uses. These characteristics result in unique electricity trends in the city, along with opportunities for energy reductions and cost savings. In comparison to other cities in the San Gabriel Valley, the City of San Gabriel has older buildings, with significant opportunities for improvements in energy use that would also increase interior comfort levels and building quality.

# ELECTRICITY PROFILE

## INTRODUCTION TO ELECTRICITY & EFFICIENCY

Electricity used in San Gabriel’s homes and businesses is provided by Southern California Edison (SCE). SCE generates electricity from a mix of non-renewable sources, such as natural gas and coal, and renewable sources, such as biomass, geothermal, hydroelectric, solar, and wind. SCE operates the Big Creek Hydroelectric Plant and San Onofre Nuclear Generating Station in the region.

The amount of electricity used to power homes and businesses determines how much power SCE needs to generate and the quantity of greenhouse gases (GHGs) emitted. If the energy needed for daily activities is decreased, reductions can be achieved in the amount of electricity SCE needs to generate and transmit. In addition, the GHGs associated with electricity generation would decrease. The most common uses of electricity are for lighting and heating/cooling buildings, for powering appliances such as refrigerators, computers, and washing machines, and for pumping water around the city and into homes or to treatment plants. An example of a home with energy-efficient features is shown in **Figure 14**.

**Figure 14: Efficient Home Features**

### ACTIVITIES YOU CAN DO TO REDUCE ENERGY USE

#### Daily Actions for Energy Conservation

1. Turn off lights when not in use
2. Unplug appliances/electronics
3. Reduce use of electronic appliances
4. Use blinds, internal or external shades, or curtains to retain or repel heat

#### Energy Improvements

5. Replace older light bulbs with energy-efficient bulbs
6. Replace appliances/electronics with energy-efficient models
7. Replace heating/ventilation/air conditioning unit and/or water heater with energy-efficient model
8. Install shower controls to select and change water temperature
9. Use variable speed pool pump
10. Install skylights and/or light shelves to maximize natural lighting

#### Whole House/Office Strategies

11. Insulate attics, walls, and/or hot water pipes
12. Upgrade to more highly insulating, heat-reflective windows
13. Seal air and duct leaks
14. Install motion-sensor lighting to light areas only when in use
15. Use cool roof materials or heat-reflective paints to reduce building heat
16. Plant trees and vegetation to cool the building



### EVEN MORE WAYS YOU CAN GREEN YOUR HOME OR BUSINESS

#### Water Sense

17. Use low-flow showerheads and toilets
18. Landscape with drought-tolerant plants
19. Use drip irrigation or other water-conserving landscape irrigation systems
20. Capture rainwater and store on-site to water landscaped areas

#### Waste Reduction

21. Minimize waste sent to the landfill
22. Recycle/reuse materials
23. Compost organic waste
24. Use your own home-generated compost in the yard

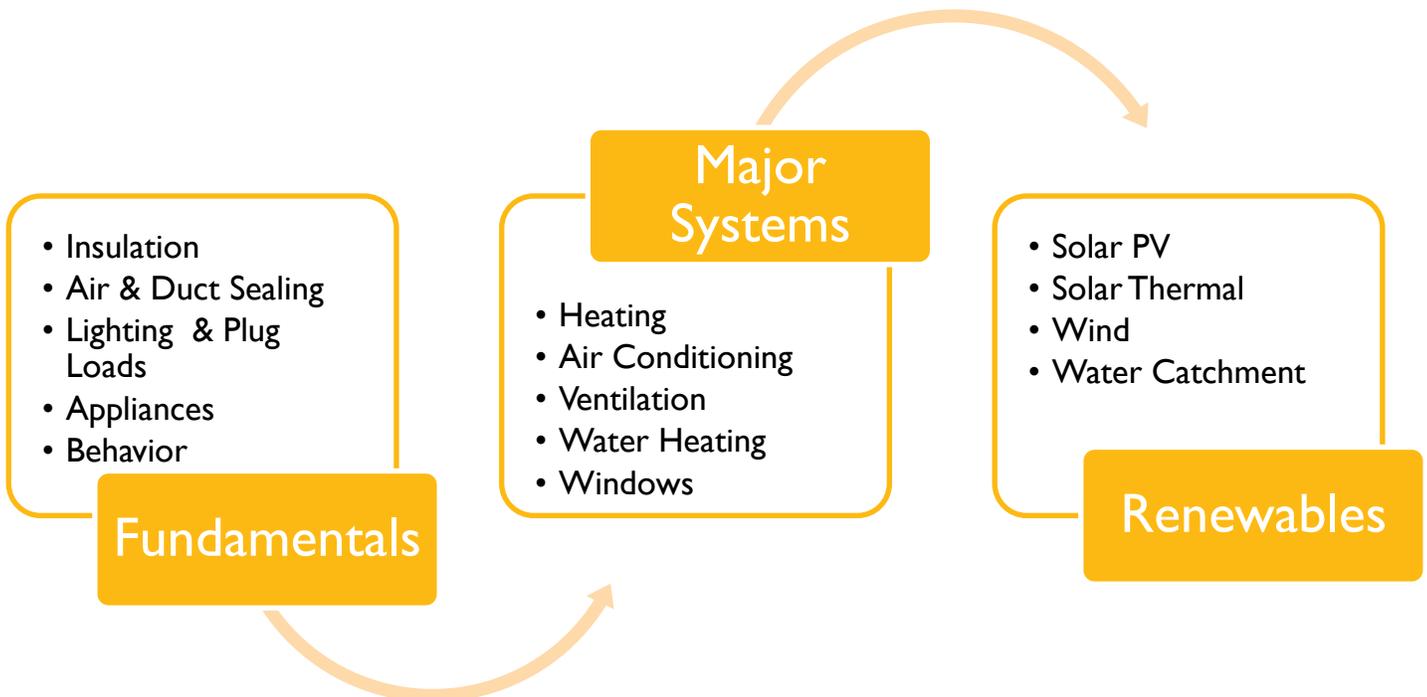
Source: PMC 2012

## THE ELECTRICITY REDUCTION LOADING ORDER

GHGs from electricity use can be reduced, primarily through increasing conservation (i.e., avoiding using electricity) and improving efficiency (i.e., using less electricity for the same activity) when conservation cannot be realized. Common conservation practices include unplugging appliances and electronics when not in use and turning off lights during the day or when the room is empty. Increasing energy efficiency means replacing incandescent light bulbs with compact fluorescent lights (CFLs) and inefficient or older models of appliances and electronics with new, preferably Energy Star (or other efficiency label) models in order to use less energy when it is necessary. Using small renewable solar panels can also reduce demand from SCE for daily electricity use. Reductions in electricity used for water pumping in the community can be achieved by using less water for irrigation and other household uses. More efficient toilets, showerheads, faucets, and drip irrigation systems can help conserve water. These are just some examples of energy efficiency and conservation. This Energy Action Plan (EAP) outlines programs and policies to support efficiency and conservation of electricity use in the community.

When completing energy efficiency retrofits to buildings, there is a loading order that should be followed to maximize energy savings while minimizing added costs. **Figure 15** depicts the recommended loading order for undertaking energy efficiency projects and retrofits.

**Figure 15: Retrofitting Loading Order**



## COMMUNITY ELECTRICITY DEMAND

Like many aspects of the city, much of San Gabriel’s built environment, and consequently much its energy use pattern, is related to its long history. San Gabriel can be characterized as being a mature, largely built-out city. In fact, the city’s land use pattern has been that of a fully built-out first-ring suburb for more than 40 years. The city’s historic buildout means that there is hardly any vacant developable land, leaving little room for additional greenfield development.

Nonresidential development consists of a mix of retail, commercial, and light manufacturing activities. The city has few large-scale industrial developments, which account for less than 2% of the land uses today.

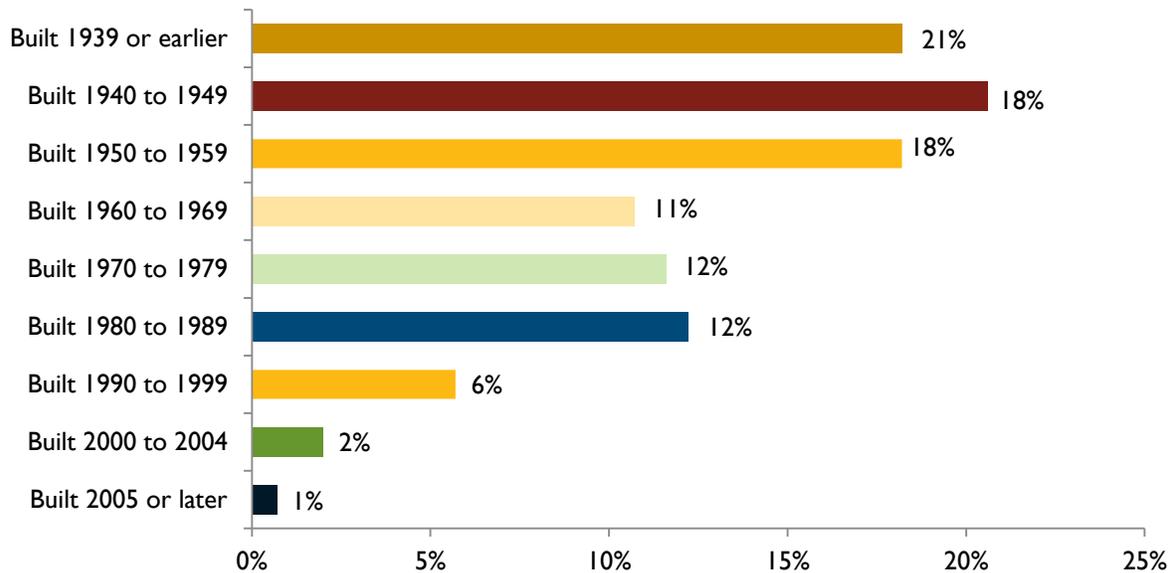
Just over half of the city’s land area comprises developed residential neighborhoods. Unlike many newer communities in California, San Gabriel retains a number of older single-family and multi-family residential neighborhoods that are fairly dense and walkable, with older, smaller single-family and multi-family homes. Perhaps because of the modest size of these homes, San Gabriel’s electricity use (5,300 kWh per household) and natural gas use (4,740 therms per household) are some of the lowest in Los Angeles County. Most residences, over 60%, are single-family, but a significant percentage are also attached or multiple-family (see **Table 14**). Nearly 50% of the city’s homes are owner-occupied. Owner-occupied households typically have a higher level of interest in completing home upgrades, because they directly reap the benefits of lowered utility bills and increased property values from efficiency improvements.

68% of the City of San Gabriel’s homes are over 30 years old, with significant opportunity for improvements in energy efficiency and reductions in utility bills.

**Table 14: San Gabriel’s Housing Units by Type, 2010**

Housing Type	Number of Units	Percentage
1-unit, detached	7,390	57%
1-unit, attached	1,410	11%
2 units	360	3%
3 or 4 units	410	3%
5 to 9 units	1,340	10%
10 to 19 units	990	8%
20 or more units	1,170	9%
Mobile home	0	0%
Boat, RV, van, etc.	10	<1%
<b>Total</b>	<b>13,080</b>	<b>100%</b>

Source: US Census Bureau 2010

**Figure 16: Age of San Gabriel's Housing Stock**

Source: US Census Bureau 2010

The city's long history means that housing is older. Based on the 2010 Census, nearly 70% of the city's housing stock (or approximately 9,000 units) is older than 30 years of age, the age at which housing typically begins to require major repairs. In 2000, Code Enforcement staff estimated that there may be over 3,000 substandard units in the city, representing nearly 24% of the housing stock. Even though household energy use is relatively low, the age of the housing stock means that most family residences could see significant energy use improvements from home improvements or appliance upgrades.

Despite some suburban development in and around the city limits, San Gabriel's housing stock has expanded at a slower rate than population growth over the last 20 years, in part because little vacant land is available. Consequently, overcrowding of units has become a significant challenge. The average household size is 3.16 persons, higher than in most of Los Angeles County and neighboring cities. A significant overcrowding challenge in the 1990s (34% of the city's renter-occupied households were overcrowded by 2000) has largely been rectified.<sup>2</sup> However, 14% of renter-occupied units remain overcrowded today. This higher concentration of residents in households may result in a greater intensity of electricity use in the city's renter-occupied units than average trends would suggest.

Much of the city's nonresidential development is located in the historic core near the mission along Del Mar Avenue and San Gabriel Boulevard or along Valley Boulevard. City staff have concluded that building stock along this corridor has energy-inefficient construction and design, resulting in high levels of energy consumption for building heating and cooling. City staff have also found that building walls and roofs typically only provide minimum

San Gabriel households paid an average of \$830 for electricity bills in 2010.

<sup>2</sup> The US Census Bureau considers a household to be overcrowded when there is more than one person per room, excluding bathrooms and kitchens.

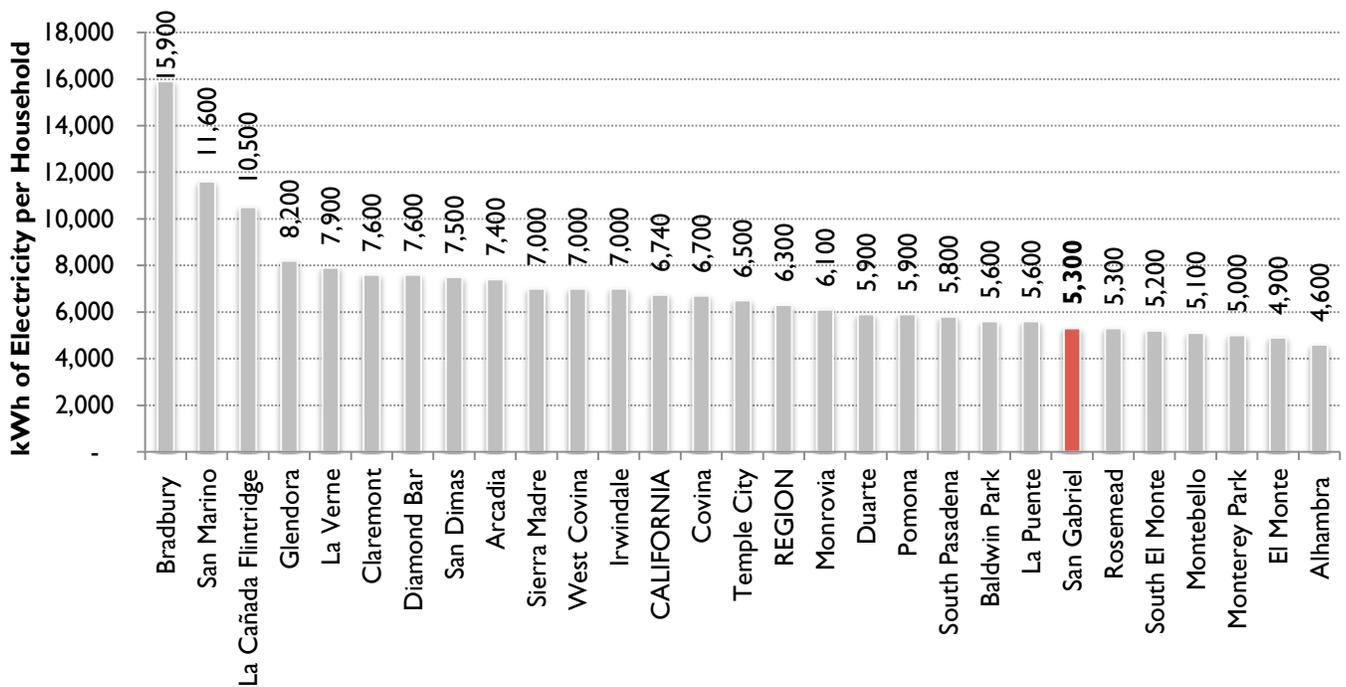
# ELECTRICITY PROFILE

code-required insulation, resulting in greater heat loss and gain. In addition, the Valley Boulevard Specific Plan (City of San Gabriel, 2006) notes that some examples of structure design within the Specific Plan area have inadequate building insulation, which may cause excessive heat gain or loss. These examples suggest opportunities to improve the insulation, roofing, and other aspects of structure design of existing structures to maximize energy efficiency.

## COMMUNITY COMPARISON TO REGIONAL AND STATEWIDE ELECTRICITY DEMANDS

To compare local trends to regional trends and other cities within the San Gabriel Valley, 2010 electricity data was assessed for all cities participating in the EAP process, regardless of each city’s inventory baseline year. Comparison of 2010 community-wide electricity use between all cities allowed for a common regional benchmark. It is important to understand how San Gabriel’s electricity use compares to regional and statewide electricity use. As shown in **Figure 17**, each household in the City of San Gabriel used an average of 5,300 kWh of electricity in 2010. This usage is below the California household average of 6,740 kWh and below the San Gabriel Valley regional average of 6,300 kWh. In fact, San Gabriel’s average per household energy use is in the bottom quarter of all participating San Gabriel Valley cities.

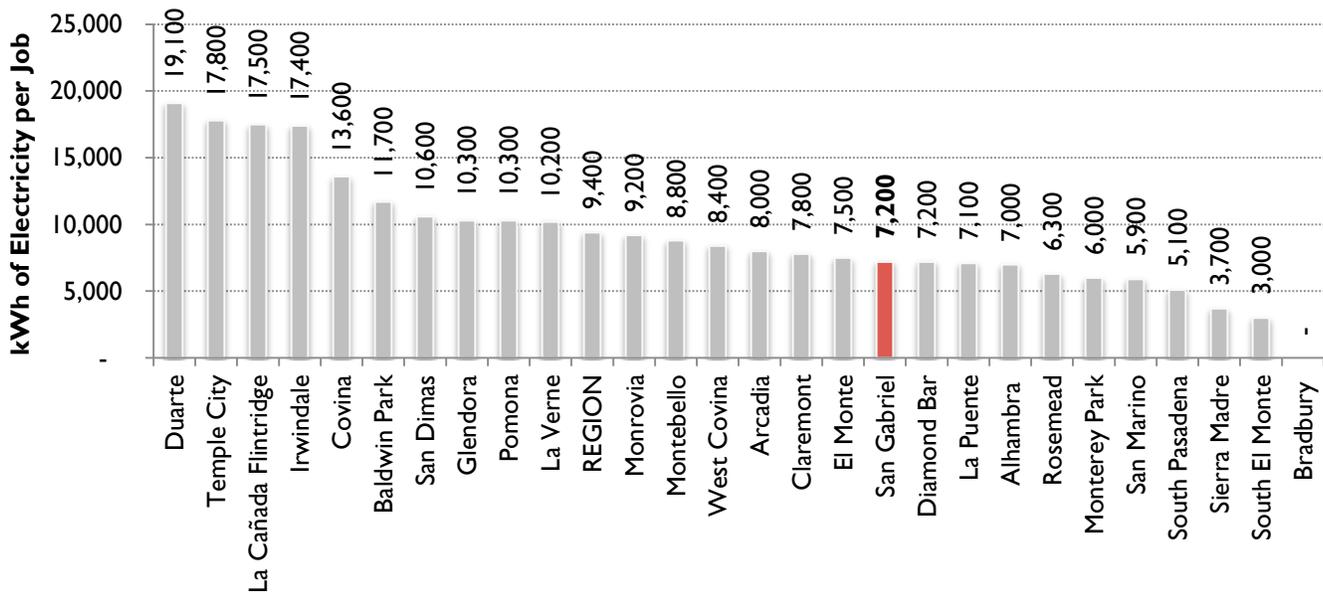
**Figure 17: Annual Electricity per Household, 2010 (kWh)**



\* Region electricity trends represent the San Gabriel Valley average for all 27 cities participating in the EAP project. Data in this figure is based on reports from SCE for San Gabriel Valley cities and Los Angeles County. The Project Steering Committee reviewed and confirmed this data comparison on March 28, 2012, and May 24, 2012. Comparison results are presented here based on the consent of participating cities and the direction of the Project Steering Committee.

San Gabriel also had below average energy use for nonresidential electricity consumption, with approximately 7,200 kWh per job. As shown in **Figure 18**, this usage is slightly below the energy intensity of other participating cities, which averaged 9,400 kWh in 2010. These trends reflect the less energy intense nature of the city’s businesses. The city’s retail and commercial uses, restaurants, and offices generally require less energy than more intense operations, such as industrial uses or heavy manufacturing.

**Figure 18: Annual Electricity use per Job, 2010 (kWh)**



\* Region electricity trends represent the San Gabriel Valley average for all 27 cities participating in the EAP project. Data in this figure is based on reports from SCE for San Gabriel Valley cities and Los Angeles County. The Project Steering Committee reviewed and confirmed this data comparison on March 28, 2012, and May 24, 2012. Comparison results are presented here based on the consent of participating cities and the direction of the Project Steering Committee.

## MUNICIPAL ELECTRICITY DEMAND

### 2006 ELECTRICITY USAGE

In 2006, the City of San Gabriel used 3,194,330 kilowatt-hours (kWh) in buildings, facilities, and lighting. **Table 15** depicts total municipal electricity use and provides detailed energy totals by rate class for 2006. This EAP uses two categories to classify San Gabriel’s municipal energy use: buildings and facilities, and lighting. Within each category are a series of rate groups.

The City has 43 accounts for buildings and facilities. Most of the City’s larger facilities and buildings are in the General Service-Demand GS-2 account category, including the police station, City Hall, and Smith Park Pool. Buildings and facilities used over half of the City’s electricity in 2006, or 1,661,460 kWh. Electricity at GS-2 accounts is used in facilities with a peak demand between 20 and 200 kW, and the cost of electricity is based on a tiered approach, with higher levels of energy use charged at a higher rate per every kWh used. Time-of-Use-General Service-Demand Metered TOU-GS-3 accounts include larger facilities that use between 200 and 500 kW, with higher rates charged for certain peak times that are known in advance and vary between the summer and winter seasons. The Mission Playhouse is a

# ELECTRICITY PROFILE

TOU-GS-3 account. General Service-Non-Demand (GS-1) electricity accounts include smaller buildings with lower levels of electricity use than GS-2 accounts, which are not charged based on a tiered approach like the GS-2 accounts. Examples of the City’s facilities captured in the GS-1 accounts include leased buildings and fire department headquarters.

The public lighting category includes 45 accounts that fall within four types of rate classes: SCE-owned streetlights (Lighting-Street and Highway-Unmetered Service Company-Owned System [LS-1]), unmetered City-owned streetlights (Lighting-Street and Highway-Customer-Owned Installation-Unmetered Service [LS-2]), metered City-owned streetlights (Lighting-Street and Highway-Customer-Owned Installation-Metered Service [LS-3]), and traffic signals and controllers (Traffic Control Service [TC-1]). Unmetered City-owned streetlights in San Gabriel used 1,097,190 kWh in 2006, 72% of the City’s total electricity use for lighting. This class consists of streetlights, public thoroughfares, and public parking lots that are not separately metered.

**Table 15: San Gabriel Municipal Electricity Use by Rate Class, 2006**

Buildings & Facilities <sup>1</sup>	2006 Annual kWh	Percentage of Total 2006 kWh
Non-Demand Rated (GS-1)	346,810	11%
Demand Rated (GS-2)	910,090	28%
Demand Rated Time of Use (TOU-GS-3)	404,560	13%
<b>Total Buildings &amp; Facilities</b>	<b>1,661,460</b>	<b>52%</b>
Lighting <sup>1</sup>	2006 Annual kWh	Percentage of Total 2006 kWh
SCE-Owned Streetlights (LS-1)	171,990	5%
Unmetered City-Owned Streetlights (LS-2)	1,097,190	34%
Metered City-Owned Streetlights (LS-3)	48,880	2%
Traffic Lights (TC-1)	214,810	7%
<b>Total Lighting</b>	<b>1,532,870</b>	<b>48%</b>
<b>Total All Municipal Accounts</b>	<b>3,194,330</b>	<b>100%</b>

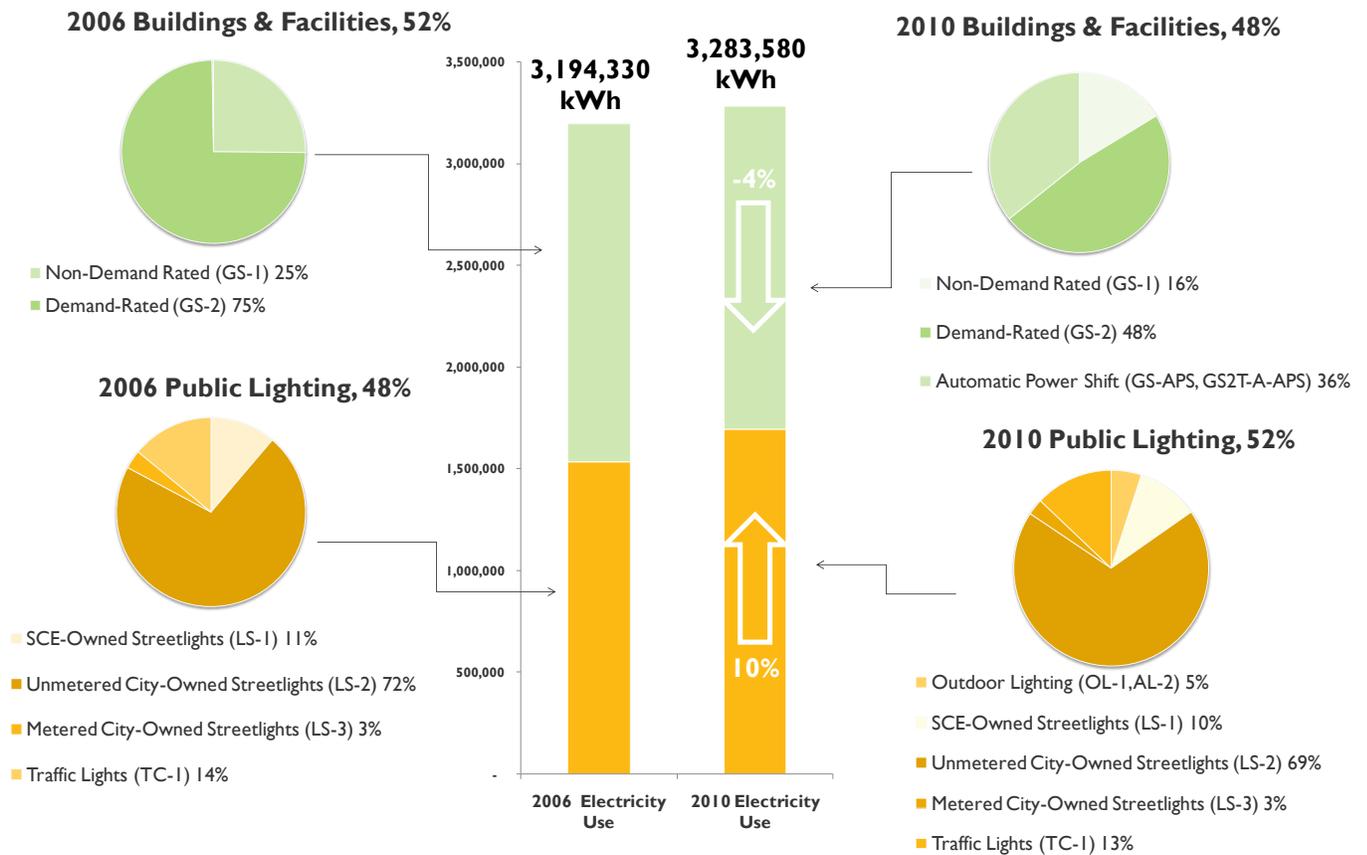
1. For additional explanation of accounts, refer to the Glossary.

## COMPARISON OF BASELINE YEAR TO 2010

From 2006 to 2010, the City’s total electricity use increased by 3%, from 3,194,330 kWh in 2006 to 3,283,580 kWh in 2010. The City experienced a 4% decrease in electricity use at buildings and facilities, while experiencing a 10% increase in electricity use for lighting. **Figure 19** shows these trends. Reclassifications of electricity accounts are largely responsible for the changes in electricity use since the baseline year. In 2006, SCE reclassified at least one of the City’s top electricity accounts from a GS-1 account category (for non-lighting activities) to an Outdoor Area Lighting (AL-2-A) account. The reclassification of this single account resulted in the elimination of approximately 46,000 kWh from the building sector, over half of the total decrease in building electricity use since 2006. Similarly, account reclassification

caused changes in lighting electricity use. Increases in lighting electricity use actually reflect SCE's reallocation of service account categories, because there have been no installations of new outdoor or streetlights since 2006.<sup>3</sup> SCE's billing discrepancies for lighting accounts mask real energy efficiency gains through lighting replacements and upgrades since 2006. These projects are discussed further in Chapter 3.

**Figure 19: Changes in Municipal Electricity Use, 2006–2010**



While energy use for all rate classes changed from 2006, the City has achieved energy reductions at buildings and facilities, as shown above. In 2010, the City also paid bills for buildings and facilities through a discounted rate class, the automatic power shift category (GS-APS, GS2T-A-APS), which provides discounted rates through the Summer Discount Program for GS-1 and GS-2 accounts. **Table 16** also shows that electricity use for street lighting may offer the largest opportunity for energy efficiency reductions. The City experienced a 10% increase in electricity use for lighting, including a 7% increase in unmetered City-owned streetlights and a significant increase in outdoor area lighting. The increase for outdoor area lighting does not reflect actual changes in energy use; rather, the increase in this category is likely due to reclassifications of City accounts or changes in SCE reports. Outdoor area lighting includes metered lighting for purposes other than street and highway lighting, such as parking lots, decorative areas, and sports and recreation areas.

<sup>3</sup> For instance, in 2006 service account 8457291 was billed as a GS-1 account for 42,247 kWh. In 2010, service account 8457291 was billed as an AI-2-A account for 46,134 kWh. The service address for this account, 599 W. Broadway, appears to be a parking lot.

# ELECTRICITY PROFILE

In contrast to 2006 electricity use, total electricity consumption at buildings and facilities decreased relative to lighting. Buildings and facilities used 52% of total municipal electricity in 2006, in comparison to 42% in 2010. Conversely, lighting used 48% of municipal electricity in 2006 and increased to 52% of municipal electricity in 2010. In both 2006 and 2010, unmetered City-owned streetlights (LS-2) were the highest user of electricity, contributing 34% of total municipal electricity use in 2006 and 36% in 2010. Demand-rated (GS-2) accounts and facilities were the second highest user of electricity in 2006 and 2010, at 28% of municipal electricity use in 2006 and 23% in 2010.

The top 13 municipal electricity users by account are provided in **Table 16**. These accounts provide opportunities for electricity reductions and cost savings with 33% of the City's municipal electricity taking place at these locations in 2010. In total, the City paid 30% of total electricity bills to just these top 13 electricity accounts. Between 2006 and 2010, 11 out of 13 facilities decreased electricity use and several of the facilities realized electricity savings in excess of 10%.

Electricity use in City Hall increased by 12% since 2006, which is expected to reflect changes in air conditioning behavior.<sup>4</sup> City Hall did not experience any additions or significant remodels since 2006 to explain the increase in energy use. However, the building has an inefficient air conditioning system with poor air circulation. The fluctuation in energy use since 2006 is likely a result of air conditioning inefficiencies, combined with the impact of hotter or cooler-than-average years. On average, building cooling is responsible for 21% of energy use in California office buildings. Opportunities for improved energy efficiency at City Hall are discussed further in Chapter 4.

The Mission Playhouse reduced electricity consumption by 39% and realized annual bill savings of \$9,187 in electricity bills, largely due to energy efficiency upgrades completed since the baseline year. For the two police station accounts listed in **Table 16**, the City realized total electricity savings of 25%, resulting in \$13,147 in annual bill savings. The Smith Park Pool also realized significant reductions, achieving a 28% reduction in electricity use and \$2,016 in annual bill savings. The projects and improvements completed or in progress that the City has implemented at these facilities to reduce electricity consumption are identified and described in more detail in Chapter 4.

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<sup>4</sup> Note that 2010 energy use at City Hall is consistent with 2011 energy consumption; while 2010 energy use is a 12% increase from 2006, 2011 energy use is a 7% increase from 2006. In 2011, City Hall consumed 200,700 kWh, in comparison to 209,010 kWh in 2010 and 186,870 kWh in 2006. While 2006 energy use is lower than both 2010 and 2011 consumption, similarities in 2010 and 2011 data suggest that 2006 energy use may be an outlier year for energy tracking.

**Table 16: San Gabriel Top Electricity Users by Account, 2006–2010<sup>1</sup>**

	Facility	Address	2006 Annual kWh	2010 Annual kWh	Percentage Change (kWh)	2006 Annual Cost	2010 Annual Cost	Percentage Change (Cost)
1	Mission Playhouse	320 S Mission Dr	404,560	248,730	-39%	\$62,320	\$53,130	-15%
2	Police Station <sup>2</sup>	625 S Del Mar Ave	219,440	201,040	-8%	\$28,570	\$25,210	-12%
3	Police Station <sup>2</sup>	625 S Del Mar Ave	205,040	119,040	-42%	\$27,590	\$17,800	-35%
4	City Hall	425 S Mission Dr	186,870	209,010	12%	\$29,910	\$31,690	6%
5	Fire Department <sup>2</sup>	1303 S Del Mar Ave	75,080	64,920	-14%	\$10,570	\$9,370	-11%
6	Smith Park Pool	232 W Broadway	61,960	44,630	-28%	\$11,080	\$9,060	-18%
7	Adult Recreation Center	324 S Mission Dr	58,840	56,240	-4%	\$11,680	\$11,840	1%
8	Community Recreation Center	250 S Mission Dr	53,130	49,820	-6%	\$9,670	\$9,620	-1%
9	Leased Building	599 West Broadway <sup>3</sup>	43,250	46,130	7%	\$6,790	\$7,000	3%
10	Fire Station #2	115 N Del Mar Ave	34,400	30,060	-13%	\$5,780	\$4,780	-17%
11	McKinley William Elementary School <sup>4</sup>	1425 S Manley Ave	27,220	NA	NA	\$9,880	NA	NA
12	Leased Building	121 S Mission Dr	26,060	24,340	-7%	\$4,200	\$3,810	-9%
13	Fire Department Headquarters <sup>1</sup>	1303 S Del Mar Ave	25,180	25,050	-1%	\$4,310	\$4,000	-7%
	<b>Total</b>		<b>1,421,030</b>	<b>1,119,010</b>	<b>-21%</b>	<b>\$222,350</b>	<b>\$187,310</b>	<b>-16%</b>

1. Facilities in this table are sorted from highest to lowest 2006 baseline energy use.

2. Numerous City facilities have multiple SCE accounts. Each service account is listed separately, even if multiple accounts exist for the same address.

3. SCE reported the service account for 2006 but not for 2010.

4. While the City continues to pay bills for the McKinley William Elementary School, due to changes in the service meter number, 2010 data comparable to the 2006 baseline was unavailable.



## CHAPTER 4

# ENERGY EFFICIENCY STRATEGY

The energy efficiency strategy in this Energy Action Plan presents reduction targets for electricity use and greenhouse gas emissions. These targets focus on both community-wide activities and municipal operations. The strategy includes a diverse mix of incentive-based, outreach, and regulatory programs for both new and existing development. The goals, policies, and actions in this chapter identify the City's role to achieve electricity efficiency in each sector to avoid reliance on any one strategy or sector to achieve the target.

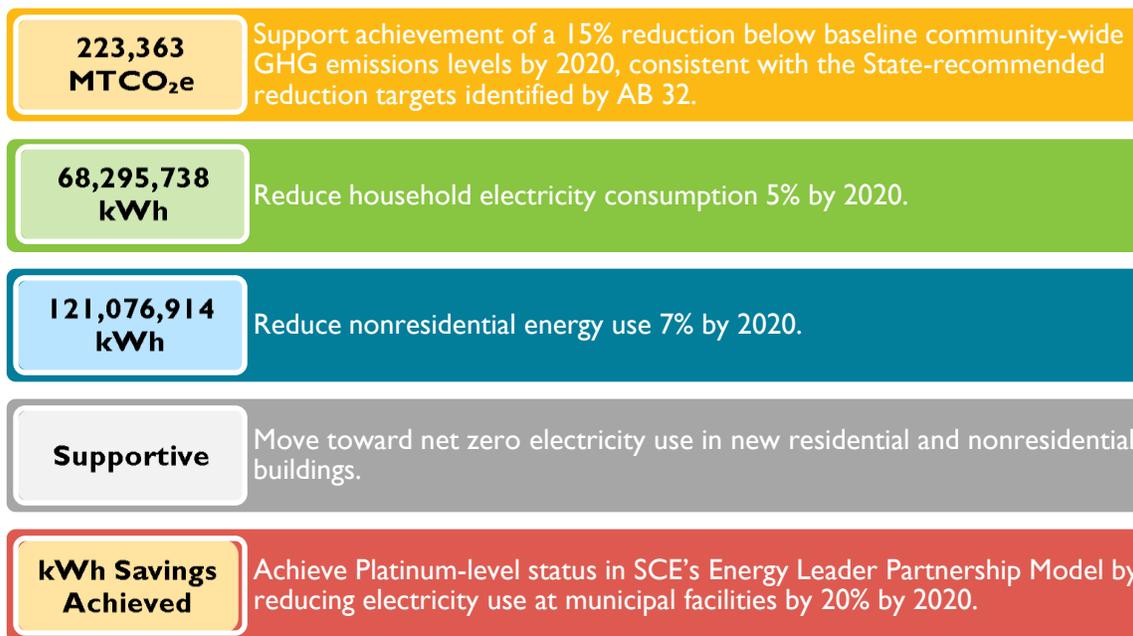
# ENERGY EFFICIENCY STRATEGY

## EAP REDUCTION TARGETS

The City of San Gabriel identified key energy efficiency targets that support the goals of the Energy Leader Partnership (ELP) and local planning priorities. Consistent with the targets of the California Long Term Energy Efficiency Strategic Plan (CEESP) (refer to Chapter 1, **Figure 1**), the focus of this Plan is electricity efficiency. Electricity efficiency also provides the added benefit of reducing greenhouse gas (GHG) emissions. Accordingly, the Energy Action Plan (EAP) also presents the State-recommended GHG reduction target of 15% below baseline emissions levels by 2020 as a supportive target. While the 15% reduction is not a state requirement, it is consistent with state guidance established by Assembly Bill (AB) 32 and supports local compliance with the California Environmental Quality Act (CEQA) Guidelines for GHG emissions. This approach equips the City to understand the relative impact of electricity efficiency within the overall regulatory framework related to GHG emissions.

In addition to the State-recommended reduction target of 15% below baseline GHG emissions, this chapter presents an electricity reduction target for each electricity sector, as shown in **Figure 20**. Each reduction target is supported by a series of goals, policies, and actions.

**Figure 20: San Gabriel’s Energy Efficiency Targets**



## REDUCTION STRATEGY STRUCTURE

To achieve the target electricity reductions by 2020, the City of San Gabriel will seek to implement the goals, policies, and actions set forth in this chapter. The City’s strategy is structured around seven key topic areas, as depicted in **Figure 21**.

**Figure 21: Reduction Strategy Structure**



Each topic area includes corresponding goals, policies, and supporting actions that are necessary for successful implementation. Together, the goals, policies, and actions provide the City’s “strategy” to achieve the electricity efficiency targets of this Plan. Each of these pieces has a unique function, but they work together collectively to reduce electricity use:

- **Goal:** The desired end state or expected outcome related to electricity reductions. Each goal corresponds to one of the seven topic areas of this Plan.
- **Policy:** A statement that guides decision-making and indicates a commitment to achieve the specified outcomes of the goal. Policies provide the foundation for quantification of electricity reduction potentials.
- **Implementation Action:** An action, procedure, program, or strategy to achieve the electricity reductions of a policy. Action items provide interim steps or supporting strategies and the range of opportunities to increase the electricity reduction potential of a policy.

## POLICY CRITERIA AND EVALUATION

Each policy is assessed for its reduction of electricity use in government operations or community activities. In addition to electricity reductions, this EAP also identifies estimated costs, savings, responsibility for implementation, additional benefits, or co-benefits, resulting from the implementation of each policy. (Refer to Chapter 5, **Table I**, for a policy summary and associated implementation details. See **Appendix C** for detailed methods and sources for quantified policies).

This assessment recognizes the broad value of electricity efficiency for the community and the City of San Gabriel. Not only will electricity efficiency actions reduce utility bills, but they also provide an opportunity to improve the quality homes and businesses, improve the indoor comfort of buildings, and reduce ongoing maintenance costs. Through energy efficiency projects such as improvements to insulation or heating and cooling system upgrades, property owners will be able to improve building quality. Large-scale energy efficiency projects also have the potential to increase property and resale value. Actions in City government facilities also fulfill the City's requirements for participation in the Energy Leader Partnership (ELP) Model, helping to qualify the City for additional financial incentives from Southern California Edison (SCE).

Electricity efficiency results from a change in operation, activity, or efficiency. In general, there are three primary methods for reducing electricity-related GHG emissions: (1) conservation, (2) greater efficiency, and (3) change in energy source.

The following information was evaluated and identified in this EAP for each policy:

- GHG reduction estimates, presented in ranges, for the year 2020.
- kWh reduction estimates, presented in ranges, for the year 2020.
- Co-benefits that will likely occur through the implementation of each policy or action.

The baseline GHG inventory and forecast serve as the foundation for quantifying the City's policies. Activity data from the inventory, kilowatt-hours (kWh) of electricity, is combined with the performance targets and indicators identified in this EAP to calculate the estimated reduction benefit of each policy. This approach ensures that the City's electricity reductions are tied to the baseline and anticipated trends which will occur in San Gabriel. Details on assumptions, methods, and citations used in the electricity reduction quantification can be found in **Appendix C**.

## COMMUNITY-WIDE ELECTRICITY EFFICIENCY STRATEGIES

The following goals, policies, and actions are aimed to reduce electricity use within the community.

### GOAL 1: OPTIMIZE THE ENERGY EFFICIENCY OF THE CITY'S HOUSING STOCK, WITH A FOCUS ON ENHANCING THE ENERGY EFFICIENCY OF THE CITY'S HOMES CONSTRUCTED PRE-1970.

#### POLICY 1.1: EDUCATE THE COMMUNITY ON OPPORTUNITIES FOR BEHAVIORAL CHANGES.

##### Actions

- Work with the Energy Leader Partnership (ELP) and investigate options to partner with local school districts and other organizations to encourage creation of student energy efficiency ambassadors tasked with sharing energy efficiency information at events or through outreach.
- Continue energy efficiency outreach with the Energy Leader Partnership (ELP) at community events.
- Work with the Energy Wise Partnership (EWP) to expand the City's energy efficiency education efforts and regularly update energy-efficient resources on the City's website. Potential outreach options include hosting the Los Angeles County Energy Upgrade California kiosk.

**POLICY 1.1**  
**2020 kWh Reduction:**  
57,320–107,900  
**2020 MTCO<sub>2</sub>e Reduction:**  
10–30  
**Co-Benefits:**  
Reduces Peak Energy Demand

#### POLICY 1.2: SUPPORT RESIDENTIAL UPGRADES TO MORE ENERGY-EFFICIENT APPLIANCES AND EQUIPMENT.

##### Actions

- Promote rebate programs for refrigeration units, home kitchen appliances, washers and dryers, and other home equipment as programs become available, including rebates from the California Energy Commission and the South Coast Air Quality Management District.
- Participate in energy-efficient lighting exchanges with the Energy Leader Partnership (ELP) at community events and programs.
- Provide educational information on the use of smart-grid integrated appliances through the City's website and distribution of Energy Leader Partnership (ELP) materials, and encourage participation in in-home monitoring programs provided by Southern California Edison (SCE).

**POLICY 1.2**  
**2020 kWh Reduction:**  
454,800–909,610  
**2020 MTCO<sub>2</sub>e Reduction:**  
110–230  
**Co-Benefits:**  
Reduces Peak Energy Demand,  
Reduces Monthly Utility Costs,  
Provides Permanent Energy  
Reduction

# ENERGY EFFICIENCY STRATEGY

## **POLICY 1.3: SUPPORT RETROFITS IN 1% OF THE CITY'S SINGLE-FAMILY HOUSING STOCK BY 2014, 5% BY 2017, AND 7% BY 2020 THROUGH A CUSTOMIZED LOCAL OUTREACH EFFORT THAT SUPPORTS REGIONAL EFFORTS, SUCH AS ENERGY UPGRADE CALIFORNIA.**

### Actions

- Create an energy efficiency awards program to recognize and award prizes to homeowners that have achieved energy efficiency improvements in their homes to market opportunities to the community.
- Continue to partner with the San Gabriel Valley Council of Governments to promote rebate and funding opportunities for residential retrofits, including Energy Upgrade California.
- Seek out local community groups to champion energy efficiency in the residential building stock and benefit from program incentives that may be available for community-based organizations through regional programs.
- Work with the Energy Leader Partnership (ELP) to prepare local case studies of successful projects and share online and at community events.

## **POLICY 1.4: ENCOURAGE HOME ENERGY BENCHMARKING.**

### Actions

- Consider updating the City's development review and building permit forms to request voluntary Home Energy Rating System (HERS) ratings for homes.
- Promote energy and green building labeling as a tool to increase property values in partnership with the Energy Leader Partnership (ELP) and Los Angeles County, including programs such as the Green Building Labeling pilot program, through which Los Angeles County is providing financial incentives for remodels or addition projects that achieve a GreenPoint Rated label.
- Work with homeowner and realtor groups to share the benefits of home energy labeling and promote regional financial incentives to offset program costs.
- Support the impact of market-based energy efficiency efforts, including the tracking and promotion of appreciation of local home values through participation in green building labeling, including the Green Building Labeling pilot program.

### **POLICY 1.3**

**2020 kWh Reduction:**

773,300–4,833,150

**2020 MTCO<sub>2</sub>e Reduction:**

190–1,210

### **Co-Benefits:**

Reduces Peak Energy Demand, Provides Permanent Energy Reduction, Reduces Maintenance Costs, Supports Community Education, Improves Indoor Environmental Quality, Reduces Monthly Utility Costs, Supports Local Economy & Job Creation, Fulfills ELP Program Requirements

### **POLICY 1.4**

**2020 kWh Reduction:**

Supportive Policy

**2020 MTCO<sub>2</sub>e Reduction:**

Supportive Policy

### **Co-Benefits:**

Reduces Peak Energy Demand, Provides Permanent Energy Reduction, Reduces Maintenance Costs, Improves Indoor Environmental Quality, Reduces Monthly Utility Costs, Supports Local Economy & Job Creation

**POLICY 1.5: INCREASE ENERGY EFFICIENCY AND IMPROVE THE QUALITY AND VALUE OF THE CITY’S RENTAL HOUSING STOCK BY ENCOURAGING RETROFITS IN 5% OF THE CITY’S RENTER-OCCUPIED HOUSING STOCK BY 2017 AND 8% BY 2020 THROUGH PROPERTY OWNER EDUCATION AND PROMOTION OF ENERGY EFFICIENCY FINANCING.**

**Actions**

- Work with the Energy Wise Partnership (EWP) to create outreach materials to multi-family and apartment complex building owners, including promotion of Los Angeles County Property Assessed Clean Energy (PACE) financing and Energy Upgrade California.
- Distribute information on energy efficiency financing to multi-family landlords and property management firms through local chambers of commerce and targeted outreach efforts.
- Work with the Energy Leader Partnership (ELP), the Southern California Regional Energy Center (SCREC), and Los Angeles County to encourage development of regional mechanisms to finance bulk purchasing efforts or revolving loans for renter-occupied units, building on the SCREC’s efforts for municipal bulk purchasing and the revolving loan funding of the Los Angeles County Housing Innovation Fund (LAHICEF).
- Upon receipt of grant funding for affordable housing improvements, such as Community Development Block Grant (CDBG) funds or other programs, dispense grant money to property owners such as the Los Angeles County Housing Authority to cover the cost of retrofits, including both labor and equipment.

**POLICY 1.5**  
**2020 kWh Reduction:**  
 117,030–672,710  
**2020 MTCO<sub>2</sub>e Reduction:**  
 40–170  
**Co-Benefits:**  
 Reduces Peak Energy Demand, Provides Permanent Energy Reduction, Reduces Maintenance Costs, Supports Community Education, Improves Indoor Environmental Quality, Reduces Monthly Utility Costs, Supports Local Economy & Job Creation, Fulfills ELP Program Requirements

**GOAL 2: ACHIEVE A VIBRANT ENERGY-EFFICIENT ECONOMY THAT MAXIMIZES BUSINESS REVENUE AND REDUCES OPERATIONAL COSTS.**

**POLICY 2.1: INTEGRATE ENERGY EFFICIENCY INTO THE CITY’S LONG-TERM BUSINESS DEVELOPMENT STRATEGY.**

**Actions**

- Task the business advisory committee with ongoing review and assessment of energy efficiency benefits for business development.
- Update the business permit process to include a checklist for consideration of energy efficiency programs, resources, and opportunities, such as Southern California Edison’s (SCE’s) Energy Management Solutions or Direct Install programs.
- Work with the Energy Wise Partnership (EWP), the Southern California Regional Energy Center (SCREC), and Southern California Edison (SCE) to create a prioritized list of publicly visible and/or energy-intense

**POLICY 2.1**  
**2020 kWh Reduction:**  
 Supportive Policy  
**2020 MTCO<sub>2</sub>e Reduction:**  
 Supportive Policy  
**Co-Benefits:**  
 Reduces Peak Energy Demand, Reduces Maintenance Costs, Supports Community Education, Improves Indoor Environmental Quality, Reduces Monthly Utility Costs, Supports Local Economy & Job Creation

# ENERGY EFFICIENCY STRATEGY

businesses to target for additional education for retrofits, based on nonresidential energy efficiency markets identified by SCE and the highest opportunity sectors for efficiency, based on regional programs and successes.

- Work with the City of San Gabriel Chamber of Commerce to use non-monetary incentives to encourage green remodels and business operations through creation of an energy-wise business certification, recognition, and awards program.

## **POLICY 2.2: SUPPORT THE USE OF ENERGY-EFFICIENT APPLIANCES AND EQUIPMENT IN THE NONRESIDENTIAL BUILDING STOCK.**

### Actions

Promote rebates for manufacturing and commercial activities, including Southern California Edison (SCE) rebates through the Energy Management Solutions Program for cooking and refrigeration appliances, lighting, and manufacturing equipment.

- Provide materials to encourage business participation in energy monitoring programs through Southern California Edison (SCE) or programs such as the Energy Star Portfolio Manager (ESPM), to help businesses understand and track the impact of appliances on energy use.

### **POLICY 2.2**

**2020 kWh Reduction:**  
5,708,260–8,562,380

**2020 MTCO<sub>2</sub>e Reduction:**  
1,470–2,210

#### **Co-Benefits:**

Reduces Peak Energy Demand,  
Provides Permanent Energy  
Reduction, Reduces Monthly  
Utility Costs

## **POLICY 2.3: EDUCATE BUSINESSES ABOUT FINANCING OPPORTUNITIES FOR ENERGY EFFICIENCY IMPROVEMENTS TO ACHIEVE RETROFITS IN 5% OF THE NONRESIDENTIAL BUILDING STOCK BY 2015 AND 8% BY 2020.**

### Actions

- Educate local building owners about free financial assistance for energy efficiency, and use local pilot efforts for ongoing education efforts. Potential programs to promote include Southern California Edison's (SCE's) Direct Install program for free energy efficiency improvements and Los Angeles County's Building Performance Partnership, which provides up to \$250,000 in free engineering services.
- Promote nonresidential financing options for energy efficiency improvements, including Los Angeles County Property Assessed Clean Energy (PACE) financing.
- Partner with the San Gabriel Chamber of Commerce to educate property owners on other feasible options for energy efficiency financing, including integration of energy efficiency projects into capital lease structures, mortgage refinancing, and agreements with energy savings performance companies (ESCOs).

### **POLICY 2.3**

**2020 kWh Reduction:**  
1,103,360–2,451,920

**2020 MTCO<sub>2</sub>e Reduction:**  
290–630

#### **Co-Benefits:**

Reduces Peak Energy Demand,  
Provides Permanent Energy  
Reduction, Reduces  
Maintenance Costs, Supports  
Community Education,  
Improves Indoor Environmental  
Quality, Reduces Monthly  
Utility Costs, Supports Local  
Economy & Job Creation,  
Fulfills ELP Program  
Requirements

- Use existing administrative procedures to promote energy efficiency in the existing nonresidential building stock, by distributing a packet with information on nonresidential financing and opportunities in annual business licensing letters.

## **POLICY 2.4: SUPPORT REGIONAL BUSINESS COLLABORATION AND COST-SHARING TACTICS TO REDUCE OPERATIONAL COSTS AND ENHANCE PROFITABILITY.**

### Actions

- Work with regional entities such as the Southern California Regional Energy Center (SCREC) and Los Angeles County to create a revolving loan fund to pay the cost of nonresidential retrofits that are not covered by utility rebates or other existing incentives.
- Work with local business leaders to support development of a regional energy economic forum for business owners to share lessons learned, case studies, and resources.
- Partner with the San Gabriel Chamber of Commerce to highlight available energy efficiency programs to property owners.

## **POLICY 2.5: PROVIDE TOOLS THAT SUPPORT THE ENERGY EFFICIENCY IMPROVEMENTS OF RENTER-OCCUPIED BUSINESSES.**

### Actions

- Provide sample tenant-landlord agreements and pledges to integrate energy efficiency improvements into leases and contract provisions.
- Work with the San Gabriel Chamber of Commerce and the Energy Wise Partnership (EWP) to develop a model lease that allows tenants and owners to share the costs of capital investments in energy efficiency and operational benefits through energy aligned leases for commercial properties, which would support shared landlord-tenant agreements that facilitate shared financing of energy efficiency retrofits to renter-occupied buildings.

### **POLICY 2.4**

**2020 kWh Reduction:**

Supportive Policy

**2020 MTCO<sub>2</sub>e Reduction:**

Supportive Policy

### **Co-Benefits:**

Reduces Peak Energy Demand,  
Provides Permanent Energy  
Reduction, Supports  
Community Education,  
Supports Local Economy & Job  
Creation

### **POLICY 2.5**

**2020 kWh Reduction:**

Supportive Policy

**2020 MTCO<sub>2</sub>e Reduction:**

Supportive Policy

### **Co-Benefits:**

Reduces Peak Energy Demand,  
Provides Permanent Energy  
Reduction, Supports  
Community Education,  
Supports Local Economy & Job  
Creation

# ENERGY EFFICIENCY STRATEGY

## GOAL 3: SUPPORT THE CONSTRUCTION OF NEW BUILDINGS THAT WILL HAVE NO NET IMPACT ON COMMUNITY-WIDE ENERGY DEMAND BY 2020.

### POLICY 3.1: THE CITY WILL MAXIMIZE THE ENERGY EFFICIENCY OF NEW BUILDINGS.

#### Actions

- Support net zero energy consumption through the use of innovative alternative building materials and designs that improve building energy efficiency.
- Adopt the model San Gabriel Valley voluntary energy efficiency guidelines to help applicants identify cost-effective policies for their projects (see **Appendix B**, Policy 3.2, Policy 4.1, and Policy 6.3).
- Encourage new nonresidential projects to participate in Southern California Edison's (SCE's) Savings By Design, a program that provides financial incentives, design assistance, and resources for new development to exceed minimum energy efficiency standards.

#### POLICY 3.1

**2020 kWh Reduction:**  
277,370–339,010

**2020 MTCO<sub>2</sub>e Reduction:**  
70–90

#### Co-Benefits:

Reduces Peak Energy Demand,  
Provides Permanent Energy  
Reduction, Reduces  
Maintenance Costs, Improves  
Indoor Environmental Quality,  
Reduces Monthly Utility Costs

### POLICY 3.2: ENCOURAGE THE USE OF SMART GRID AND ENERGY STAR APPLIANCES IN NEW DEVELOPMENT.

#### Actions

- Use the model energy efficiency code identified in Policy 3.1 to support the use of smart-grid and Energy Star appliances in new development, including energy-efficient equipment such as refrigeration units (see **Appendix B**, Policy 3.1, Policy 4.1, and Policy 6.3).
- Promote funding sources for residential appliances as available, including state and federal rebate programs.
- Provide educational information on the use of smart-grid integrated appliances through the City's website and distribution of Energy Wise Partnership (EWP) materials.
- Update the City's CEQA Guidelines and/or discretionary review guidance to identify the use of smart-grid integrated appliances as preferred energy efficiency mitigation policies or conditions of approval for new development.

#### POLICY 3.2

**2020 kWh Reduction:**  
Supportive Policy

**2020 MTCO<sub>2</sub>e Reduction:**  
Supportive Policy

#### Co-Benefits:

Reduces Peak Energy Demand,  
Provides Permanent Energy  
Reduction, Reduces  
Maintenance Costs, Improves  
Indoor Environmental Quality,  
Reduces Monthly Utility Costs

## **POLICY 3.3: WORK WITH REGIONAL PARTNERS TO DEVELOP AN EFFECTIVE APPROACH TO ACHIEVE ENERGY EFFICIENCY IN NEW DEVELOPMENT.**

### Actions

- Collaborate with the Energy Wise Partnership (EWP) and the Los Angeles Chapter of the US Green Building Council to provide local training and workshops for energy-efficient building opportunities.
- Support development of a regional energy manager position that could serve as an advisor to project applicants interested in achieving energy efficiency. As necessary, rely on the Energy Wise Partnership (EWP), regional energy management efforts, and Los Angeles County to permit and review energy-efficient building projects.
- Work with San Gabriel Valley cities to identify the most effective options to achieve energy efficiency in new development. By 2014, confirm the feasibility of adopting regionally consistent, mandatory standards for new development to exceed mandatory Title 24 energy efficiency standards, such as adoption of Los Angeles County's green building code.

### **POLICY 3.3**

#### **2020 kWh Reduction:**

Supportive Policy

#### **2020 MTCO<sub>2</sub>e Reduction:**

Supportive Policy

#### **Co-Benefits:**

Reduces Peak Energy Demand,  
Provides Permanent Energy  
Reduction, Reduces Monthly  
Utility Costs

# ENERGY EFFICIENCY STRATEGY

## GOAL 4: CREATE A LOCAL BUSINESS AND REGULATORY ENVIRONMENT THAT FOSTERS, INCENTIVIZES, AND PRIORITIZES ENERGY EFFICIENCIES.

### POLICY 4.1: INTEGRATE ENERGY EFFICIENCY INTO THE CITY'S DISCRETIONARY PERMIT REVIEW FRAMEWORK.

#### Actions

- Adopt the model voluntary energy efficiency code to help applicants identify voluntary and feasible energy efficiency improvements for additions or remodels (see **Appendix B**, Policy 3.1, Policy 3.2, and Policy 6.3).
- Use the voluntary energy efficiency guidelines as a tool during plan review and Design Review Commission review of applications to encourage integration of cost-effective policies to improve the energy efficiency of projects.
- Update the City's website with a summary of the model energy efficiency guidelines and local programs.
- Update the City's CEQA Guidelines and/or discretionary review guidance to identify zero net energy for new development as a preferred greenhouse gas emissions mitigation measure for new development.
- By 2015, evaluate compliance with voluntary energy efficiency standards and consider adoption of mandatory energy efficiency standards that exceed the minimum standards of the Title 24 code.
- Work with the Energy Wise Partnership (EWP) to create residential and nonresidential energy efficiency packets with information on financing and resources, for distribution during pre-application meetings and at the planning counter. Packets will include information on residential financing programs such as Energy Upgrade California, on energy efficiency loans, and on Property Assessed Clean Energy (PACE) financing for nonresidential properties.
- Update the City's Tenant Improvement checklist and informational materials to identify energy efficiency actions and building energy performance.

### POLICY 4.2: CREATE DEVELOPMENT INCENTIVES TO ENCOURAGE ENERGY EFFICIENCY IMPROVEMENTS AND NET ZERO ENERGY IN NEW DEVELOPMENT AND REMODELS.

#### Actions

- Consider adoption of incentives for buildings to achieve net zero energy, such as allowing for a reduction of permit fees by 1% for every 1% improvement over Title 24 energy efficiency standards.
- Work with the Energy Wise Partnership (EWP) to use regional funding resources to offset reductions in permit fees.

#### POLICY 4.1

2020 kWh Reduction:

Supportive Policy

2020 MTCO<sub>2</sub>e Reduction:

Supportive Policy

#### Co-Benefits:

Reduces Peak Energy Demand,  
Provides Permanent Energy  
Reduction, Supports  
Community Education

#### POLICY 4.2

2020 kWh Reduction:

Supportive Policy

2020 MTCO<sub>2</sub>e Reduction:

Supportive Policy

#### Co-Benefits:

Reduces Peak Energy Demand,  
Provides Permanent Energy  
Reduction, Reduces Monthly  
Utility Costs

## **POLICY 4.3: DIVERSIFY THE CITY'S TAX BASE THROUGH WORKFORCE DEVELOPMENT AND FOSTERING LOCAL FINANCING PROGRAMS FOR ENERGY EFFICIENCY RETROFITS.**

### Actions

- Work with the Energy Wise Partnership (EWP) and the Southern California Regional Energy Center (SCREC) to identify local funding institutions to provide energy efficiency financing to residential projects.
- Help local businesses to benefit from the energy efficiency market by promoting local financing programs for energy efficiency and locally licensed contractors with energy efficiency credentials, including Building Performance Institute (BPI) training.
- Work with the Energy Wise Partnership (EWP) and other regional partners, such as the Los Angeles County Workforce Investment Board, to support local contractor training and certification for energy efficiency retrofits, including Building Performance Institute (BPI) training or other workforce development programs.

### **POLICY 4.3**

**2020 kWh Reduction:**

Supportive Policy

**2020 MTCO<sub>2</sub>e Reduction:**

Supportive Policy

### **Co-Benefits:**

Reduces Peak Energy Demand,  
Provides Permanent Energy  
Reduction, Supports  
Community Education,  
Supports Local Economy & Job  
Creation

## **POLICY 4.4: COLLABORATE WITH HISTORIC BUILDING OWNERS IN THE MISSION DISTRICT AND THROUGHOUT THE CULTURAL RESOURCE AREAS DESIGNATED IN THE GENERAL PLAN TO IMPROVE THE ENERGY EFFICIENCY OF HISTORIC PROPERTIES WITHOUT COMPROMISING THE CHARACTER AND INTEGRITY OF THE BUILDING.**

### Actions

- Work with regional partners to train planning and building staff on appropriate energy efficiency policies for historic properties.
- Develop and integrate energy efficiency guidance into the City's design guidelines to include guidance and examples of appropriate energy-efficient improvements for historic properties.
- Develop and disseminate information regarding energy efficiency upgrades and retrofits appropriate for historic buildings through brochures, websites, and local partnerships.
- Provide waivers or reduced fees for building permit applications to complete energy efficiency upgrades and building repairs consistent with the Secretary of the Interior Standards for Rehabilitation.
- Revise the City's Mills Act Historic Property Preservation Agreement Application to encourage property owners to identify projects that maintain the historic integrity of the building while improving energy efficiency.
- Encourage Mills Act participants to integrate energy efficiency policies into building renovations.
- Monitor and encourage energy efficiency projects in the Mission District, connecting building owners to regional resources and promoting results as a pilot project.

### **POLICY 4.4**

**2020 kWh Reduction:**

Supportive Policy

**2020 MTCO<sub>2</sub>e Reduction:**

Supportive Policy

### **Co-Benefits:**

Reduces Peak Energy Demand,  
Provides Permanent Energy  
Reduction, Supports  
Community Education

# ENERGY EFFICIENCY STRATEGY

- Provide waivers or reduced fees for building permit applications to complete energy efficiency upgrades consistent with the Secretary of the Interior Standards for Rehabilitation.
- Integrate energy efficiency standards into planning and building permit applications to renovate historic buildings.
- Consider requiring Mills Act requests to include upgrades that will improve the energy efficiency of the building without compromising the historic integrity.

## GOAL 5: MAXIMIZE USE OF SHADING AND COOLING TO SUSTAIN A COMFORTABLE AND ENERGY-EFFICIENT URBAN ENVIRONMENT.

### POLICY 5.1: MAXIMIZE THE COOLING OF BUILDINGS THROUGH TREE PLANTING AND SHADING TO REDUCE BUILDING ELECTRICITY DEMANDS.

#### Actions

- Prepare local case studies and promote creative options to achieve building shading through awnings, architectural features, and other techniques consistent with the City’s historic and design guidelines.
- Update the Zoning Code to encourage tree planting standards or covered parking/shade structure, to achieve shading of a minimum of 30% of parking lots within 15 years and 40% of public spaces within 15 years.
- By 2015, consider strengthening the passive design guidance of the Valley Boulevard Neighborhoods Sustainability Plan to require building and structure shading. Evaluate the impact of the voluntary energy efficiency code on building shading, and consider adopting mandatory standards for urban cooling.

**POLICY 5.1**  
**2020 kWh Reduction:**  
50,400–403,210  
**2020 MTCO<sub>2</sub>e Reduction:**  
10–100  
**Co-Benefits:**  
Reduces Peak Energy Demand,  
Provides Permanent Energy  
Reduction, Reduces Urban Air  
Temperatures

### POLICY 5.2: REDUCE BUILDING ELECTRICITY DEMANDS THROUGH VOLUNTARY STANDARDS AND OUTREACH TO PROMOTE COOL ROOFS AND SURFACES.

#### Actions

- Showcase the benefits and opportunities to install cool roofs at community events, and update the City’s website to provide links to Cool California resources.
- Provide non-monetary support to energy-efficient ambassadors and community organizations to lead cool roof “work days” to re-paint traditional roofs at schools or public facilities with cool paint materials.
- Through use of the voluntary energy efficiency guidelines, promote cost-effective opportunities to install cool roofs, light-colored paved surfaces, and permeable pavement. Cool materials come in all colors and materials, such as cool asphalt shingles.

**POLICY 5.2**  
**2020 kWh Reduction:**  
63,180–280,780  
**2020 MTCO<sub>2</sub>e Reduction:**  
20–90  
**Co-Benefits:**  
Reduces Peak Energy Demand,  
Provides Permanent Energy  
Reduction, Supports  
Community Education, Reduces  
Urban Air Temperatures

**GOAL 6: INTEGRATE WATER AND ENERGY CONSERVATION AND EFFICIENCY PRACTICES IN NEW AND EXISTING DEVELOPMENT TO REDUCE ELECTRICITY USE FOR WATER PUMPING, TREATMENT, AND CONVEYANCE.**

**POLICY 6.1: PROMOTE WATER-EFFICIENT PRACTICES THROUGH EDUCATIONAL EFFORTS TO PROMOTE THE CONSERVATION OF ELECTRICITY FOR WATER PUMPING AND TREATMENT.**

Actions

- Become an Environmental Protection Agency (EPA) Water Sense Partner to obtain additional water conservation resources and promote water conservation to the community. The EPA’s Water Sense is a free program that provides reputable water conservation resources, including guidelines and tools for high-performance and water-efficient products.
- Update the City’s website to promote water conservation.

**POLICY 6.1**  
**2020 kWh Reduction:**  
 Supportive Policy  
**2020 MTCO<sub>2</sub>e Reduction:**  
 Supportive Policy  
**Co-Benefits:**  
 Reduces Peak Energy Demand, Conserves Water, Supports Community Education

**POLICY 6.2: ENCOURAGE THE USE OF ENERGY- AND WATER-EFFICIENT WATER FIXTURES FOR INDOOR WATER USE TO REDUCE ELECTRICITY USE FOR WATER PUMPING.**

Actions

- Encourage local water providers to provide water conservation kits and surveys to customers.
- Promote and distribute Southern California Edison’s (SCE’s) energy efficiency kit, which includes low-flow showerheads and faucet aerators.

**POLICY 6.2**  
**2020 kWh Reduction:**  
 Supportive Policy  
**2020 MTCO<sub>2</sub>e Reduction:**  
 Supportive Policy  
**Co-Benefits:**  
 Reduces Peak Energy Demand, Provides Permanent Energy Reduction, Conserves Water

**POLICY 6.3: SUPPORT WATER-EFFICIENT LANDSCAPING TO REDUCE THE ELECTRICITY DEMAND FOR WATER TRANSPORT AND TREATMENT.**

Actions

- Adopt and use a model energy efficiency code and guidelines to encourage drought-tolerant landscaping and the use of water-efficient irrigation systems (see **Appendix B**, Policy 3.1, Policy 3.2, and Policy 4.1).
- By 2015, work with other San Gabriel Valley cities to consider adoption of mandatory water-efficient standards that exceed state requirements, such as CALGreen Tier I standards for water efficiency.

**POLICY 6.3**  
**2020 kWh Reduction:**  
 743,110–990,810  
**2020 MTCO<sub>2</sub>e Reduction:**  
 190–250  
**Co-Benefits:**  
 Reduces Peak Energy Demand, Provides Permanent Energy Reduction, Conserves Water

# ENERGY EFFICIENCY STRATEGY

## MUNICIPAL ELECTRICITY EFFICIENCY STRATEGIES

### ENERGY EFFICIENCY PROJECTS

#### Completed Projects

A key objective of this EAP is to identify prioritized, actionable, turnkey strategies and projects. The EAP also identifies future opportunities for municipal energy efficiency projects. To evaluate potential energy efficiency projects, the City conducted audits at several key facilities, reviewed audit results and opportunities at other facilities, and identified near-term projects to be implemented.

The City has committed to prioritizing the implementation of projects with a payback period of four years or less that yield cost savings and enhance municipal operations. Based on the payback period, annual cost savings, and reductions in both electricity use and GHG emissions, the City believes that these priority short-term actions will help the City advance towards ELP targets and long-term energy efficiency objectives. Several of these projects have been implemented since the baseline year of 2006 and have already yielded reductions in municipal energy use. These recently completed projects are identified in **Table 17**.

**Table 17: Energy Efficiency Projects Completed Since 2006**

Location	Project	Status	Annual Electricity Reduction (kWh/year)	Annual MTCO <sub>2e</sub> Reduction
Citywide street signs	Replace illuminated street signs T12 to reflective sheeting	Completed 2010	77,330	22
Pedestrian traffic signals	Replace signals with LED	Completed 2010	272,970	79
Traffic signals	Retrofit amber lights & turn signals with LEDs	Completed 2012	112,000	32
Citywide streetlights	Retrofit inefficient models	Completed 2012	11,020	3
Traffic signals	Phase 2 to retrofit amber lights and turn signals with LEDs	Under development	47,710	14
<b>Total</b>			<b>521,030</b>	<b>150</b>

#### Near-Term Projects

The City is also identifying additional near-term projects to implement in close coordination with the San Gabriel Valley Council of Governments (SGVCOG) and SCE (see **Table 18**). It is anticipated that these priority short-term actions will help the City further advance toward Platinum-level ELP targets and long-term energy efficiency objectives. The City has prioritized these projects based on the payback period, annual cost savings, and available financial incentives from SCE and the SGVCOG. For purposes of the Energy Leader Partnership Model, **Table 18** also identifies milestones for each project that will progress toward EAP implementation. In partnership with the SGVCOG, the City is conducting

additional audits at City facilities to identify additional near-term opportunities for electricity efficiency. Facilities with audits under way include the North and South Fire Stations. The City will assess these audits to identify feasible and actionable strategies with short-term payback periods that yield annual cost savings and reductions in electricity use.

**Table 18: Near-Term City-Government Energy Efficiency Projects**

Facility	Project	Initial Project Cost	SCE Incentive/ Rebate	Annual Electricity Reduction (kWh/year)	Estimated Annual Cost Savings	Milestone	Potential Funding Sources	Estimated Completion Date
City Hall – 425 South Mission Drive	Replace 60W halogen bulbs with 23W CFLs	\$130	\$10	160	\$20	Award of SCE incentive	CEC, SCREC, SCE, General Fund	FY 2012/2013
City Hall – 425 South Mission Drive	Server virtualization	\$10,000	\$1,000	9,860	\$1,380	City Council resolution accepting project completion	CEC, SCREC, SCE, General Fund	FY 2012/2013
City Hall and Recreation Center – 425 and 250 South Mission Drive	Desktop virtualization	\$18,000	\$1,680	13,100	\$1,840	City Council resolution accepting project completion	CEC, SCREC, SCE, General Fund	FY 2012/2013
City Hall – 425 South Mission Drive	Backup generator heat pump	\$5,000	\$1,560	15,330	\$2,150	City Council resolution accepting project completion	CEC, SCREC, SCE	FY 2012/2013
Streetlights throughout the city	Upgrade series 6.6 high voltage streetlights to low voltage 120 volt circuits and energy-efficient fixtures <sup>1</sup>				TBC <sup>1</sup>	TBC <sup>1</sup>	CEC, SCREC, SCE	FY 2013/2014
<b>Total</b>		<b>\$33,130</b>	<b>\$4,250</b>	<b>38,450</b>	<b>\$5,390</b>	<b>5.4</b>		

*1. To be confirmed. At the time of report preparation, estimated energy and GHG reductions were unavailable. The SGVCOG and SCREC are working to confirm project information.*

## LONG-TERM MUNICIPAL POLICIES

In addition to the near-term projects, the City has identified additional policies and programs to be implemented in the next eight years to achieve Platinum-level status in SCE's ELP program by achieving a 20% reduction in electricity use below 2006 electricity levels at City facilities. The City has already achieved this level of reduction, as required for the Platinum incentive tier levels in the ELP. The additional policies and actions identified below provide the City with additional direction to remain on a long-term energy efficiency trajectory.

The City's General Plan is an important document that helps guide the growth and development of the city. By incorporating energy efficiency and other sustainable practices into the General Plan, the City can ensure that such policies are systematically and consistently incorporated into plans, programs, policies, and development within the city. The City of San Gabriel is committed to integrating the Energy Action Plan into the next update of the General Plan.

### **GOAL 7: ACHIEVE OPTIMAL ENERGY PERFORMANCE WITH A FOCUS ON MAXIMIZING THE COST NEUTRALITY AND OPERATIONAL EFFICIENCIES OF CITY FACILITIES AND INFRASTRUCTURE AS RESOURCES BECOME AVAILABLE.**

#### **POLICY 7.1: LEAD THE COMMUNITY BY EXAMPLE THROUGH PILOTING COST-SAVING ENERGY MANAGEMENT PRACTICES.**

##### Actions

- The City will work with the San Gabriel Valley Council of Governments (SGVCOG) to prepare an energy information display that highlights how residents and businesses can improve energy efficiency. The display would be intended for use at community events and City facilities as appropriate, such as City Hall.
- Assess the energy use and savings of facilities, or energy benchmarking, on a regular basis, and share results and improvements through the City's website and City publications.

#### **POLICY 7.2: IMPLEMENT AN ENERGY-EFFICIENT PROCUREMENT POLICY (EPPP) TO ENSURE THE PURCHASE OF EFFICIENT EQUIPMENT THAT WILL RESULT IN ENERGY COSTS SAVINGS WHICH OUTWEIGH ADDITIONAL UP-FRONT COSTS.**

##### Actions

- Adopt an energy efficient procurement policy, such as the Energy Wise Partnership's model energy-efficient procurement policy (EPPP), to guide each department to consider energy efficiency and long-term operation and maintenance costs in the procurement process.
- Work with the San Gabriel Valley Council of Governments (SGVCOG) and regional partners to reduce the costs of energy-efficient appliances and equipment through bulk purchases.

## **POLICY 7.3: IMPROVE INDOOR EQUIPMENT AND INSTALL CONTROLS TO REDUCE UNNECESSARY ENERGY USE AND COSTS WITHIN CITY BUILDINGS.**

### Actions

- Install office control equipment, including plug load sensors, at all City buildings.
- Install motion control sensors on water fountains to optimize the efficiency of water fountain compressors.
- Install lighting controls, photo cells, time clocks, or sensors to automatically turn off electrical systems and lighting when not in use. This action will target all facilities, but the greatest opportunities for energy reductions may be at City Hall (including offices, common spaces, supply closets), in addition to bathrooms and offices at the Mission Playhouse.

## **POLICY 7.4: IMPROVE THE BUILDING ENVELOPE OF EXISTING CITY FACILITIES WHILE ENHANCING HISTORIC CHARACTER.**

### Actions

- Replace the glass of inefficient windows at City facilities to optimize energy efficiency.
- Complete audits at all City facilities to create a prioritized list of potential retrofits, ranked by payback period and potential to reduce maintenance costs.
- As grant or other funds become available, complete the retrofits identified in the prioritized list.
- Consider setting aside municipal savings from energy efficiency projects to fund additional energy efficiency projects.
- Investigate the value and opportunity of creating a municipal revolving loan fund.
- Highlight and share energy efficiency projects and savings with City decision-makers, staff, and the community as a means to demonstrate cost-effective energy efficiency projects.

## **POLICY 7.5: DEVELOP A LONG-RANGE PLAN TO INCREASE THE ENERGY EFFICIENCY OF HEATING, VENTILATION, AND AIR CONDITIONING (HVAC) EQUIPMENT AT LARGE ENERGY-CONSUMING FACILITIES, INCLUDING CITY HALL, THE MISSION PLAYHOUSE, THE POLICE DEPARTMENT, AND FIRE STATION FACILITIES.**

### Actions

- Work with the San Gabriel Valley Energy Wise Partnership to secure funding and complete additional audits of HVAC units at the City's largest energy-consuming facilities.
- Upgrade, replace, and relocate HVAC units based on audit recommendations for optimal energy efficiency. In addition to mechanical and equipment upgrades, improvements should also include installation of micro-climate controls and programmable thermostats.
- Together with Southern California Edison (SCE) and the Energy Wise Partnership (EWP), pursue the installation of electricity service meters at HVAC units to allow for separate tracking and monitoring.

## **POLICY 7.6: IMPROVE OUTDOOR LIGHTING TO ACHIEVE OPTIMAL LEVELS OF PUBLIC SAFETY WHILE REDUCING MAINTENANCE AND OPERATIONAL COSTS.**

### Actions

- Install selective light dimming at parks and parking lots consistent with public safety standards.
- Install light and motion sensors for outdoor lights at City facilities.
- Continue to identify opportunities to upgrade older series 6.6 high voltage streetlights to low voltage 120 volt circuits and energy-efficient fixtures, allowing the City to reduce ongoing operational and maintenance costs and achieve lower Southern California Edison (SCE) billing rates.

## **POLICY 7.7: CONSERVE WATER USE AT CITY FACILITIES TO CONSERVE ELECTRICITY FOR WATER PUMPING AND MODEL BEST PRACTICES TO THE COMMUNITY.**

### Actions

- Install irrigation controls that are more efficient users of electricity and conserve water.
- Pilot water-conserving practices at public parks or other visible places, accompanied with signage or other information that will help to educate the community.

## **POLICY 7.8: WORK WITH THE SAN GABRIEL VALLEY COUNCIL OF GOVERNMENTS (SGVCOG) TO USE REGIONAL PARTNERS FOR CREATION OF AN ENERGY MANAGEMENT POSITION TO TRACK ENERGY USE AT CITY FACILITIES, IDENTIFY OPPORTUNITIES FOR EFFICIENCIES AND COST SAVINGS, AND HELP EACH DEPARTMENT IMPLEMENT ENERGY EFFICIENCY PROJECTS.**

### Actions

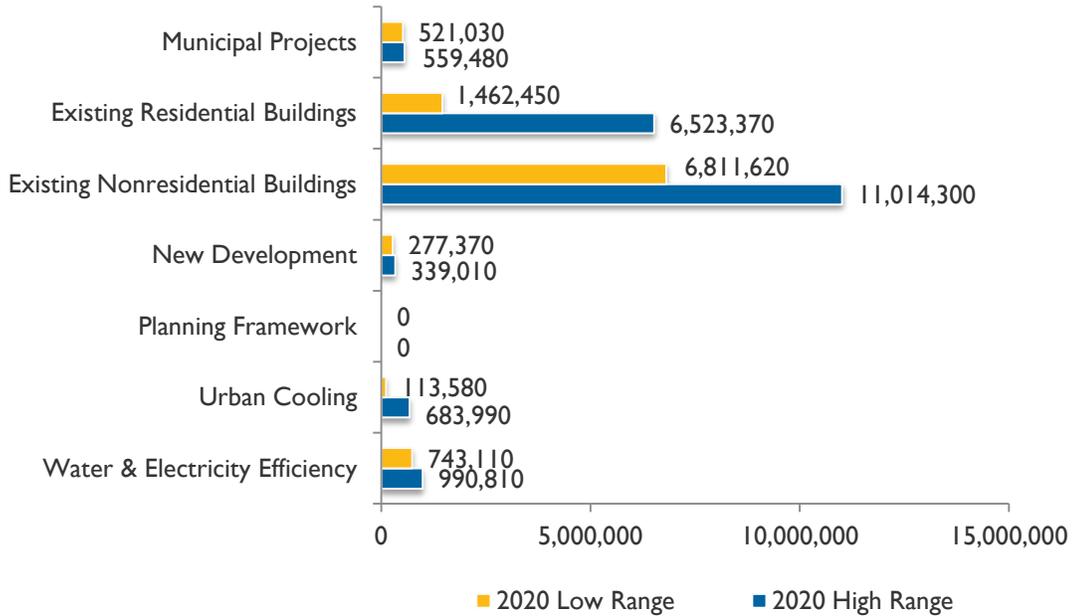
- Continue to support City staff participation in regional planning efforts and trainings related to energy efficiency.
- Encourage creation of a regional energy manager position through the San Gabriel Valley Council of Governments (SGVCOG) to coordinate the City of San Gabriel's efficiency efforts and help departments implement energy-reduction activities.

## REDUCTION SUMMARY

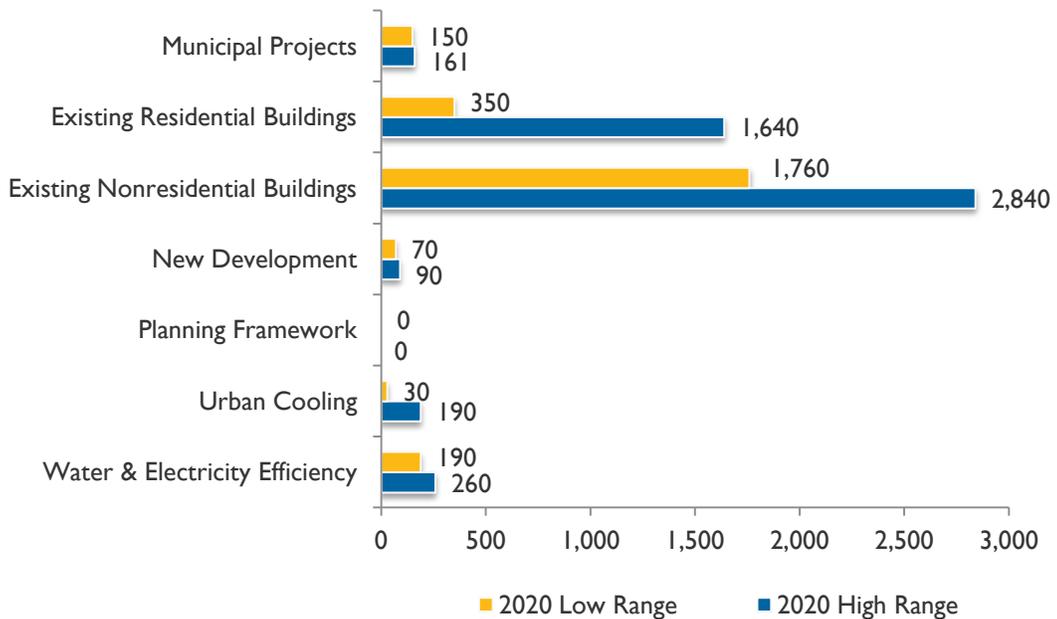
This EAP identifies a clear path for the City to work towards the community-wide electricity reduction targets and demonstrate progress toward AB 32. The City has also reduced municipal energy use through SCE-approved projects, achieving the Platinum target for energy efficiency. In total, state programs and the mid-range impact of policies in this EAP will reduce GHG emissions by 3,705 MTCO<sub>2e</sub> and 14,479,800 kWh. **Figures 22** and **23** illustrate the kWh and GHG reductions achieved by goal for 2020, respectively.

Including the impact of all near-term projects and long-term policies, the City may be able to use this EAP to support a community-wide reduction of GHG emissions 9% below baseline emissions levels. This mid-range level of GHG reductions through electricity would help to close the gap between forecast emissions and the AB 32 State-recommended target for GHGs, a 15% reduction below total baseline emissions by 2020. In addition, strategies in this EAP identify a potential range of action to achieve a 5% reduction in community-wide residential electricity use by 2020 (see **Figure 22**). The mid-range potential of residential policies may yield a 7% reduction below baseline residential electricity use. More aggressive implementation of residential policies may result in up to an 11% decrease below baseline residential kWh. Further, the mid-range potential of nonresidential policies results in a 7% decrease in baseline nonresidential electricity use by 2020, with more aggressive implementation of policies yielding up to a 9% decrease by 2020 (see **Figure 23**).

**Figure 22: Estimated 2020 Savings by Goal (kWh)**



**Figure 23: Estimated 2020 Savings by Goal (MTCO<sub>2</sub>e)**



## CHAPTER 5

# IMPLEMENTATION

This chapter outlines a path for the City to implement the strategies described in this Energy Action Plan (EAP) and monitor overall progress toward achieving the EAP reduction targets.

# IMPLEMENTATION

## IMPLEMENTATION PLAN

The City will work with the San Gabriel Valley Council of Governments (SGVCOG), the San Gabriel Valley Energy Wise Partnership (EWP), and other partners as appropriate, such as Los Angeles County, the Los Angeles Regional Collaborative (LARC), and the Southern California Regional Energy Center (SCREC), to identify effective procedures to track the status of energy efficiency projects without increasing the level of effort from existing City staff. A designated City staff lead will monitor plan implementation and will support ongoing regional collaboration. This City staff lead will work to identify regional resources available to streamline the implementation process. City staff will work closely with the SGVCOG to monitor EAP success.

## INTEGRATION WITH EXISTING WORK EFFORTS

The City of San Gabriel is committed to achieve the targets identified in this Plan. To ensure achievement of electricity reduction targets, the City will integrate the goals and policies of this Plan into other local and regional plans, programs, and activities. As the City moves forward with Zoning Code updates, design guidelines, specific plans, Housing Element updates, and other planning documents, staff will ensure that these documents support and integrate recommendations of the EAP. City staff will also work to update development review tools and other administrative tools to align day-to-day planning and building activities.

Implementation will involve coordination among diverse public and private stakeholders. Development of a regional energy manager position will greatly support the City's ability to successfully track both short- and long-term progress toward EAP targets. The SGVCOG is currently developing a regionally uniform method to collect, track, and report on EAP metrics and project outcomes. The City will work with the SGVCOG and the energy manager to benefit from these regional tools and standardize reporting processes.

## IMPLEMENTATION POLICIES

EAP implementation will require City leadership to execute these actions and report on the progress of their implementation. Successful implementation also requires regular reporting. Staff will monitor the EAP's implementation with the SGVCOG and progress on an annual basis and report to the City Council on the progress made each year. Development of an implementation and monitoring tool will assist in tracking progress. The following policies are presented to ensure the City is successful in the implementation of the EAP.

## MONITORING AND UPDATING THE EAP

The City will use the Implementation Program in this chapter to track, monitor, and update the EAP. As the City reports on progress in implementing the EAP, staff will evaluate the effectiveness of each policy to ensure anticipated electricity and GHG reductions are occurring. In the event reductions do not occur as expected, the City will be able to modify and add further policies to the EAP to ensure the City meets its reduction targets.

## **IMPLEMENTATION POLICY 1: ANNUALLY MONITOR AND REPORT THE CITY'S PROGRESS TOWARD ACHIEVING THE REDUCTION TARGET.**

- Facilitate implementation of policies and actions related to municipal operations.
- Prepare an annual progress report for review and consideration by the City Council, with the support of the San Gabriel Valley Council of Governments
- Utilize the EAP monitoring and reporting tool to assist with annual reports.
- Work with the San Gabriel Valley Council of Governments to identify key City staff responsible for annual reporting and monitoring.

## **IMPLEMENTATION POLICY 2: REGULARLY REVIEW AND UPDATE THE CITY'S GHG INVENTORY, ENERGY PROFILE, AND EAP.**

- Conduct an annual review of electricity usage and associated GHG emissions.
- Re-inventory community-wide and municipal GHG emissions every 5 years if there is financial support.
- Update the Plan to incorporate new technology, programs, and policies as available to achieve electricity efficiency.
- Consider updating and amending the Plan, as necessary, should the City find that policies and actions are not meeting the intended electricity reductions.
- When City resources are available, integrate the EAP into a comprehensive climate action plan or greenhouse gas reduction plan to incorporate GHG and energy/fuel reduction targets to address energy supply, natural gas demand, transportation, waste, wastewater, and other sectors as applicable.

## **IMPLEMENTATION POLICY 3: CONTINUE TO DEVELOP COLLABORATIVE PARTNERSHIPS THAT SUPPORT IMPLEMENTATION OF THE EAP.**

- Continue collaboration with the SGVCOG and participate as an active member of the Energy Wise Partnership (EWP).
- Participate in other SGVCOG-sponsored programs, projects, and events to help meet the goals described in this EAP.

## **IMPLEMENTATION POLICY 4: SUPPORT REGIONAL FUNDING EFFORTS TO IMPLEMENT THE EAP.**

- Work with the SGVCOG to identify regional funding sources to support policies in this EAP.
- Ensure implementation through the inclusion of policies and actions in department budgets, the capital improvement program, and other plans as appropriate.
- Pursue local, regional, state, and federal grants as appropriate to support implementation.

# IMPLEMENTATION

## IMPLEMENTATION AND MONITORING TOOLS

### MONITORING CALCULATOR AND REPORTING TEMPLATE

To determine whether the City is on track to meet the adopted target, it is important that the City monitor implementation progress on a regular basis and identify whether the policies as implemented are achieving their intended reductions or if additional policies will need to be implemented to meet the target.

The implementation and financial metrics identified in this EAP have been calculated using an Excel-based workbook. This workbook calculates energy savings, GHG reductions, and financial costs and savings based on the key metrics identified in the Plan. These performance metrics include information such as the average energy reduction per household, the number of trees planted, or the square feet of facilities retrofitted.

To support City staff's reporting efforts on the progress of EAP implementation, the workbook includes a reporting template and space for staff to enter the actual performance of each policy based on the key metrics identified. Once the information is entered for each year, updated energy savings, GHG reduction, and monetary costs or savings will be incorporated into the report template that can easily be exported and used to present EAP progress to City advisory bodies, assist in annual fiscal budget planning, and highlight City and community success in reducing energy use through City newsletters and online media.

### IMPLEMENTATION PROGRAM

The information in this implementation program provides an overall, planning-level framework for achieving the reductions in this Plan. **Table 19** below presents indicators for the implementation of each policy. These indicators represent the level of participation and energy reductions that would achieve the midrange of the high and low electricity reductions in this Plan. The electricity metrics show the total number of participating households, nonresidential square footage, and energy reduction per participant necessary to achieve each policy's midrange reduction potential. In addition, this table presents milestones for each policy that will demonstrate City's launch of policies or progress toward policy implementation. These milestones may be used to help the City document progress toward the Platinum level targets in the Energy Leader Partnership.

Financial metrics associated with implementation are shown as descriptive word ranges. Costs and savings are presented on an average annualized basis. The metrics for costs represent the total community costs for participants averaged on an annual basis through 2020. Costs will typically require a one-time, upfront investment, but are shown on an annualized basis for comparative purposes. Homeowners, business owners, and others will typically invest in project costs upfront on an individual basis.

Also presented below are the average annual savings per participant. These annual savings are achieved after the initial upfront investment, and yield ongoing annual savings even after initial project costs. Additional information on the range of potential costs and savings are presented in **Appendix C**, including the estimated cost per participant based on a range of implementation potential. Metrics for supportive policies or for actions without direct case studies and resources are shown as "Unknown" or "Not Applicable." The costs and savings of many of these supportive policies support the higher range of reductions shown for the primary, quantified policies. **Appendix C** also presents the approach to quantification, including the analytical process for identifying appropriate regional reductions, costs, and financial benefits.

**Table 19: Implementation Program Table**

Policy	2020 Electricity Reductions (MTCO <sub>2e</sub> ) <sup>1</sup>	Participant Type	Average kWh Reduction per Participant	2020 Performance Target	Total Cost/ Participant	Yearly Dollar Savings/ Participant	Beginning Time Frame	Responsible Department	Milestones and Launch Indicators	Supporting Departments & Organizations
1.1 Energy Efficiency Education	-82,610	Households	140 kWh	580 participating households	Unknown	Low	Near-Term	Community Development	City-hosted energy efficiency workshops and events	SGVCOG, EWP
1.2 Residential Appliances	-682,210	Households	170 kWh	3,230 participating single-family households; 1,570 participating multi-family households	High	Low	Near-Term	Community Development	Appliance rebates publicized on the City website or through other materials at City Hall	SGVCOG, EWP, SCE, CEC, South Coast Air Quality Management District
1.3 Single-Family Retrofits	-2,803,230	Households	1860 kWh	1,290 participating households	High	High	Mid-Term	Community Development	Participation of single-family households in utility rebates or programs for energy efficiency retrofits	SGVCOG, EWP, Los Angeles County

Range for total community costs are presented as an average, annualized total for all community investment: High = >\$500,000, Medium = \$100,000–\$500,000, Medium-Low = \$50,000–\$100,000; Low = <\$50,000

Range for yearly savings are presented as average annual savings per participant: High = >\$200; Medium = \$100–\$200; Low = <\$50

n/a = not applicable

# PLAN IMPLEMENTATION

Policy	2020 Electricity Reductions (MTCO <sub>2e</sub> ) <sup>1</sup>	Participant Type	Average kWh Reduction per Participant	2020 Performance Target	Total Cost/Participant	Yearly Dollar Savings/Participant	Beginning Time Frame	Responsible Department	Milestones and Launch Indicators	Supporting Departments & Organizations
1.4 Home Energy Benchmarking	Supportive	Households	n/a	n/a	Unknown	Unknown	Mid-Term	Community Development	City building permits and outreach materials to provide and request Home Energy Rating System information	SGVCOG, EWP, Los Angeles County
1.5 Residential Rental Retrofits	-424,870	Multi-family household units	960 kWh	420 participating multi-family housing units	Medium	Medium	Mid-Term	Community Development	Participation of multi-family households in utility rebates or programs for energy efficiency	SGVCOG, EWP, Los Angeles County, SCREC, LAHICEF

Range for total community costs are presented as an average, annualized total for all community investment: High = >\$500,000, Medium = \$100,000–\$500,000, Medium-Low = \$50,000–\$100,000; Low = <\$50,000

Range for yearly savings are presented as average annual savings per participant: High = >\$200; Medium = \$100–\$200; Low = <\$50

n/a = not applicable

# PLAN IMPLEMENTATION

Policy	2020 Electricity Reductions (MTCO <sub>2e</sub> ) <sup>1</sup>	Participant Type	Average kWh Reduction per Participant	2020 Performance Target	Total Cost/Participant	Yearly Dollar Savings/Participant	Beginning Time Frame	Responsible Department	Milestones and Launch Indicators	Supporting Departments & Organizations
2.1 Business Development	Supportive	Businesses	n/a	n/a	Unknown	Unknown	Long-Term	Community Development	Recommendation or integration by Business Advisory Committee of energy efficiency strategies into business development efforts	SGVCOG, EWP, SCE, City of San Gabriel Chamber of Commerce
2.2 Nonresidential Appliances	-7,135,320	Businesses	6% reduction per participating business	511,900 nonresidential square feet	Unknown	Unknown	Mid-Term	Community Development	Appliance rebates publicized on the City website or through other materials at City Hall	SGVCOG, EWP, SCE
2.3 Nonresidential Retrofits	-1,777,640	Businesses	19% reduction per participating business	273,050 nonresidential square feet	Unknown	Unknown	Long-Term	Community Development	Participation of nonresidential properties in utility rebates or programs for energy efficiency	SGVCOG, EWP, SCE

Range for total community costs are presented as an average, annualized total for all community investment: High = >\$500,000, Medium = \$100,000–\$500,000, Medium-Low = \$50,000–\$100,000; Low = <\$50,000

Range for yearly savings are presented as average annual savings per participant: High = >\$200; Medium = \$100–\$200; Low = <\$50

n/a = not applicable

# PLAN IMPLEMENTATION

Policy	2020 Electricity Reductions (MTCO <sub>2e</sub> ) <sup>1</sup>	Participant Type	Average kWh Reduction per Participant	2020 Performance Target	Total Cost/Participant	Yearly Dollar Savings/Participant	Beginning Time Frame	Responsible Department	Milestones and Launch Indicators	Supporting Departments & Organizations
2.4 Regional Business Collaboration	Supportive	Businesses	Supportive	Supportive	n/a	n/a	Mid-Term	Community Development	Participation of San Gabriel businesses in regional energy efficiency programs	SGVCOG, EWP, Los Angeles County, SCREC, City of San Gabriel Valley Chamber of Commerce
2.5 Renter-Occupied Business Education	Supportive	Businesses	Supportive	Supportive	n/a	n/a	Near-Term	Community Development	Sample tenant-landlord areements for energy efficiency on the City website or in other City materials	SGVCOG, EWP, SCE, City of San Gabriel Chamber of Commerce
3.1 Energy-Efficient New Development	-308,190	New buildings (nonresidential and residential)	200 kWh per new household; 5% kWh reduction per new nonresidential building	All housing units and nonresidential buildings built between 2014 and 2020	Unknown	Unknown	Mid-Term	Community Development	Adoption of the model energy efficiency guidelines (Appendix C)	SGVCOG, EWP, SCE, City of San Gabriel Chamber of Commerce

Range for total community costs are presented as an average, annualized total for all community investment: High = >\$500,000, Medium = \$100,000–\$500,000, Medium-Low = \$50,000–\$100,000; Low = <\$50,000

Range for yearly savings are presented as average annual savings per participant: High = >\$200; Medium = \$100–\$200; Low = <\$50

n/a = not applicable

# PLAN IMPLEMENTATION

Policy	2020 Electricity Reductions (MTCO <sub>2e</sub> ) <sup>1</sup>	Participant Type	Average kWh Reduction per Participant	2020 Performance Target	Total Cost/Participant	Yearly Dollar Savings/Participant	Beginning Time Frame	Responsible Department	Milestones and Launch Indicators	Supporting Departments & Organizations	
3.2	Appliances in New Development	Supportive	New buildings (nonresidential and residential)	Supportive	Supportive	N/a	N/a	Long-Term	Community Development	Appliance rebates publicized on the City website or through other materials at City Hall	SGVCOG, EWP, SCE
3.3	Regional Coordination for New Development Standards	Supportive	n/a	Supportive	Supportive	n/a	n/a	Long-Term	Community Development	City participation in SGVCOG, SCREC, or other regional programs for building standards	SGVCOG, EWP, SCE
4.1	Permit Review Framework	Supportive	n/a	Supportive	Supportive	n/a	n/a	Mid-Term	Community Development	Adoption of the model energy efficiency guidelines (Appendix C)	SGVCOG, EWP, SCE, Los Angeles Chapter of the US Green Building Council

Range for total community costs are presented as an average, annualized total for all community investment: High = >\$500,000, Medium = \$100,000–\$500,000, Medium-Low = \$50,000–\$100,000; Low = <\$50,000

Range for yearly savings are presented as average annual savings per participant: High = >\$200; Medium = \$100–\$200; Low = <\$50

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# PLAN IMPLEMENTATION

Policy	2020 Electricity Reductions (MTCO <sub>2e</sub> ) <sup>1</sup>	Participant Type	Average kWh Reduction per Participant	2020 Performance Target	Total Cost/ Participant	Yearly Dollar Savings/ Participant	Beginning Time Frame	Responsible Department	Milestones and Launch Indicators	Supporting Departments & Organizations
4.2 Incentives for Energy-Efficient Projects	Supportive	n/a	Supportive	Supportive	n/a	n/a	Long-Term	Community Development	Adoption of incentives in the Municipal Code for development that integrates energy efficiency	SGVCOG, EWP
4.3 Energy-Efficient Workforce Development	Supportive	n/a	Supportive	Supportive	n/a	n/a	Mid-Term	Community Development	City promotion pieces of local businesses providing energy efficiency services	SGVCOG, EWP
4.4 Energy Efficiency in Historic Structures	Supportive	n/a	Supportive	Supportive	n/a	n/a	Mid-Term	Community Development	City materials or guidelines that provide energy efficiency information for historic structures	SGVCOG, EWP, SCREC, Los Angeles County Workforce Investment Board

Range for total community costs are presented as an average, annualized total for all community investment: High = >\$500,000, Medium = \$100,000–\$500,000, Medium-Low = \$50,000–\$100,000; Low = <\$50,000

Range for yearly savings are presented as average annual savings per participant: High = >\$200; Medium = \$100–\$200; Low = <\$50

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# PLAN IMPLEMENTATION

Policy	2020 Electricity Reductions (MTCO <sub>2e</sub> ) <sup>1</sup>	Participant Type	Average kWh Reduction per Participant	2020 Performance Target	Total Cost/ Participant	Yearly Dollar Savings/ Participant	Beginning Time Frame	Responsible Department	Milestones and Launch Indicators	Supporting Departments & Organizations
5.1 Tree Plantings for Reduced Energy Use	-226,810	Households	40kWh	1,590 participating households. 461,890 participating nonresidential square feet.	Low	Low	Long-Term	Community Development	Adoption of the energy efficiency guidelines (Appendix C), or other standards that encourage shading to cool buildings	SGVCOG, EWP
5.2 Cool Roofs	-171,980	Paved surface in the city	n/a	4% portion of paved surfaces in the city to be replaced with cool, reflective materials	n/a	n/a	Long-Term	Community Development	Adoption of the energy efficiency guidelines (Appendix C) or other standards that encourage cool roofs	SGVCOG, EWP
6.1 Water Efficiency Education	Supportive	Supportive	Supportive	Supportive	n/a	n/a	Mid-Term	Community Development	City participation as an EPA Water Sense Partner	SGVCOG, EWP
6.2 Water-Efficient Fixtures	Supportive	Supportive	Supportive	n/a	n/a	n/a	Mid-Term	Community Development	Materials online or at City Hall to promote water-efficient fixtures	SGVCOG, EWP, EPA

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Policy	2020 Electricity Reductions (MTCO <sub>2e</sub> ) <sup>1</sup>	Participant Type	Average kWh Reduction per Participant	2020 Performance Target	Total Cost/Participant	Yearly Dollar Savings/Participant	Beginning Time Frame	Responsible Department	Milestones and Launch Indicators	Supporting Departments & Organizations
6.3 Water-Efficient Landscaping	-866,960	Gallons of water consumed in the city	Unknown	Unknown	N/a	N/a	Mid-Term	Community Development	Adoption of the energy efficiency guidelines (Appendix C)	SGVCOG, EWP, SCE
7.1 Municipal Energy Leadership	Supportive	Supportive	Supportive	Supportive	n/a	n/a	Near-Term	Community Development	Preparation of annual energy reports on municipal energy use, or participation in an energy benchmarking program	SGVCOG, EWP
7.2 Energy-Efficient Procurement Policy	Supportive	Supportive	Supportive	Supportive	n/a	n/a	Near-Term	Public Works, Finance	Adoption of an Energy-Efficient Procurement Policy	SGVCOG, EWP
7.3 Indoor Equipment	Supportive	Supportive	Supportive	Supportive	n/a	n/a	Mid-Term	Public Works	Execution of a contract for energy-efficient indoor equipment	SGVCOG, EWP, CEC
7.4 Energy Efficiency in Existing	Supportive	Supportive	Supportive	Supportive	n/a	n/a	Mid-Term	Public Works	Completion of audits and implementation	SGVCOG, EWP, CEC

Range for total community costs are presented as an average, annualized total for all community investment: High = >\$500,000, Medium = \$100,000–\$500,000, Medium-Low = \$50,000–\$100,000; Low = <\$50,000

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Policy	2020 Electricity Reductions (MTCO <sub>2e</sub> ) <sup>1</sup>	Participant Type	Average kWh Reduction per Participant	2020 Performance Target	Total Cost/Participant	Yearly Dollar Savings/Participant	Beginning Time Frame	Responsible Department	Milestones and Launch Indicators	Supporting Departments & Organizations
Buildings									of recommendations for existing buildings	
7.5	HVAC Upgrades	Supportive	Supportive	Supportive	n/a	n/a	Long-Term	Public Works	Installation of new HVAC systems, controls, or preparation of audits with HVAC recommendations	SGVCOG, EWP, CEC
7.6	Outdoor Lighting	Supportive	Supportive	Supportive	n/a	n/a	Mid-Term	Public Works	Execution of a contract for streetlight enhancements, or invoices for purchase of energy-efficient streetlights	SGVCOG, EWP, CEC

Range for total community costs are presented as an average, annualized total for all community investment: High = >\$500,000, Medium = \$100,000–\$500,000, Medium-Low = \$50,000–\$100,000; Low = <\$50,000

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Policy	2020 Electricity Reductions (MTCO <sub>2e</sub> ) <sup>1</sup>	Participant Type	Average kWh Reduction per Participant	2020 Performance Target	Total Cost/Participant	Yearly Dollar Savings/Participant	Beginning Time Frame	Responsible Department	Milestones and Launch Indicators	Supporting Departments & Organizations
7.7 Water Conservation for Municipal Electricity Efficiency	Supportive	Supportive	Supportive	Supportive	n/a	n/a	Mid-Term	Public Works	Installation of irrigation controls at facilities	SGVCOG, EWP
7.8 Regional Energy Management	Supportive	Supportive	Supportive	Supportive	n/a	n/a	Mid-Term	Community Development, Public Works	City participation in a regional energy manager program	SGVCOG, EWP, SCREC

Range for total community costs are presented as an average, annualized total for all community investment: High = >\$500,000, Medium = \$100,000–\$500,000, Medium-Low = \$50,000–\$100,000; Low = <\$50,000

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## CONTINUED PARTNERSHIP OPPORTUNITIES

One component to the successful implementation of the City's EAP will be the sharing of resources through continued communication and collaboration with other cities in the region. Continued collaboration will foster a more supportive environment to share best practices, and potentially coordinate future requests for funding and/or implementation. Efforts to implement programs and policies on a regional scale will provide consistency in the energy efficiency market and leverage economies of scale. The City of San Gabriel will continue to participate in SGVCOG discussions and events related to energy efficiency such as the Energy Wise Partnership, the Energy Environment and Natural Resource Committee, and other SGVCOG-sponsored events to help meet the goals described in this EAP.



## CHAPTER 6

# CONCLUSION

This Energy Action Plan allows the City to identify and achieve a long-term vision for energy efficiency. The City of San Gabriel has stepped forward as a leader, demonstrating the benefits and feasibility of electricity efficiency through its own practices and efforts to reduce electricity use. The City recognizes the tremendous value of energy efficiency as a tool to support local values and objectives.

Policies and actions in this Plan provide a road map for the City to reduce electricity use. Building on the foundation of electricity reductions, the Plan also helps the City improve the quality of the existing built environment, reduce household costs, and enhance the spending power of local businesses. Energy efficiency allows the community of San Gabriel to protect limited resources while more effectively powering the community. The City is committed to achieving the reductions in this Plan and working with partners and the local community throughout implementation. Living outside of the traditional planning framework, this Plan will function as a dynamic tool for City staff. The vision for energy efficiency in this Plan is based on the City's priorities of protecting limited fiscal resources and serving as a steward to the community.



# GLOSSARY OF TERMS

# GLOSSARY OF TERMS

## GLOSSARY OF KEY TERMS

### **Adjusted Business-as-Usual (ABAU) Forecast**

An emissions forecast that accounts for actions and legislation implemented by the State of California to reduce greenhouse gas emissions statewide that will also have a measureable beneficial impact for local jurisdictions' emissions.

### **Advanced Lighting Technologies**

Components and systems with improved performance attributes that contribute toward efficiency enhancement and best practices. Examples (in 2010) include specialty CFLs, LEDs, cold cathode, and high-efficiency incandescents.

Source: California Long Term Energy Efficiency Strategic Plan

### **American Recovery and Reinvestment Act (ARRA)**

Commonly referred to as the Stimulus Plan or Recovery Act, ARRA is an economic stimulus package enacted by the federal government in 2009. The intent of the stimulus is to create jobs and promote investment and consumer spending during the economic recession. On February 13, 2009, Congress passed ARRA as a direct response to the economic crisis. The Recovery Act has three immediate goals:

- Create new jobs and save existing ones.
- Spur economic activity and invest in long-term growth.
- Foster unprecedented levels of accountability and transparency in government spending.

### **Assembly Bill 32 (AB 32), California Global Warming Solutions Act of 2006**

Establishes a comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, cost-effective reductions of greenhouse gases for the State of California. Makes the California Air Resources Board (CARB) responsible for monitoring and reducing statewide greenhouse gas emissions, with a target to reduce emissions to 1990 levels by 2020.

### **Assembly Bill 811 (AB 811)**

California Assembly Bill 811 (authored by Assembly member Lloyd Levine and signed by Governor Arnold Schwarzenegger on July 21, 2008) authorizes California cities and counties to designate areas within which willing property owners could enter into contractual assessments to finance the installation of energy efficiency improvements and/or distributed renewable energy generation.

Source: California Long Term Energy Efficiency Strategic Plan

### **Assembly Bill 1109 (Huffman Bill)**

California Assembly Bill 1109 (authored by Assembly member Jared Huffman and signed by Governor Arnold Schwarzenegger on October 12, 2007) prohibits the manufacturing for sale or the sale of certain general purpose lights that contain hazardous substances, and requires the California Energy Commission to adopt energy efficiency standards for general purpose lights.

Source: California Long Term Energy Efficiency Strategic Plan

### **Baseline Inventory**

The base year for assessment of energy trends against which future progress can be measured for a single calendar year (2005–2008), consistent with legislative guidance and the Assembly Bill 32 Scoping Plan.

## **Best Practice**

Coordinated technologies, systems, and design approaches, which (through research and experience) demonstrate the ability to consistently achieve above standard results while avoiding negative environmental impacts. Best practices change over time as improved components, technologies, systems, and design approaches become available.

Source: California Long Term Energy Efficiency Strategic Plan

## **Building Envelope**

All components of a building that enclose conditioned space and separate it from unconditioned space or the outdoors.

## **Buildout; Build-out**

Development of land to its full potential or theoretical capacity as permitted under current or proposed planning or zoning designations.

## **Business as Usual (BAU)**

A scenario that assumes that no specific actions will be taken to reduce emissions and growth coming from the expansion of activity and services within the city. All forecasts are based on this scenario.

## **California Air Pollution Control Officers Association (CAPCOA)**

An association of air pollution control officers representing the 35 local air quality agencies throughout California.

## **California Air Resources Board (CARB)**

A part of the California Environmental Protection Agency that reports directly to the Governor's Office in the Executive Branch of California State Government. CARB's mission is to promote and protect public health, welfare, and ecological resources through the effective and efficient reduction of air pollutants while recognizing and considering the effects on the economy of the state.

Source: California Long Term Energy Efficiency Strategic Plan

## **California Building Code (Title 24, Part 6)**

California Code of Regulations, Title 24, also known as the California Building Standards Code (composed of 12 parts). Title 24, Part 6 sets forth California's energy efficiency standards for residential and nonresidential buildings and was established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods.

Source: Southern California Edison

## **California Environmental Quality Act**

A state law requiring state and local agencies to regulate activities with consideration for environmental protection. If a proposed activity has the potential for a significant adverse environmental impact, an environmental impact report (EIR) must be prepared and certified as to its adequacy before action can be taken on the proposed project. General plans require the preparation of a program EIR.

## **California Global Warming Solutions Act of 2006**

See Assembly Bill 32.

# GLOSSARY OF TERMS

## **California Green Building Code (CALGreen, Title 24, Part 11)**

Refers to CALGreen component of the California Building Code. See California Building Code.

## **California Long Term Energy Efficiency Strategic Plan (CEESP)**

A plan adopted by the California Public Utilities Commission in 2008 that presents a single road map to achieve maximum energy savings across all major groups and sectors in California. This comprehensive plan for 2009 to 2020 is the state's first integrated framework of goals and strategies for saving energy, covering government, utility, and private sector actions, and holds energy efficiency to its role as the highest priority resource in meeting California's energy needs.

## **California Solar Initiative (CSI)**

Allows the California Public Utilities Commission to provide incentives to install solar technology on existing residential, commercial, nonprofit, and governmental buildings if they are customers of the state's investor-owned utilities: Pacific Gas & Electric, San Diego Gas & Electric, or Southern California Edison.

## **Carbon Dioxide Equivalent (CO<sub>2</sub>e)**

A metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential (GWP). The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by the associated GWP. For example, the GWP for methane is 21. This means that emissions of one million metric tons of methane are equivalent to emissions of 21 million MTCO<sub>2</sub>e.

## **Clean Car Fuel Standard (AB 1493 – Pavley)**

Signed into law in 2002 and commonly referred to as Pavley standards. Requires carmakers to reduce greenhouse gas emissions from new passenger cars and light trucks beginning in 2011. CARB anticipates that the Pavley standards will reduce greenhouse gas emissions from new California passenger vehicles by about 22% in 2012 and about 30% in 2016, all while improving fuel efficiency and reducing motorists' costs.

## **Climate Change (global climate change)**

The term "climate change" is sometimes used to refer to all forms of climatic inconsistency, but because the earth's climate is never static, the term is more properly used to imply a significant change from one climatic condition to another. In some cases, climate change has been used synonymously with the term "global warming"; scientists, however, tend to use the term in the wider sense to also include natural changes in climate.

## **Community-Wide Greenhouse Gas Inventory**

Looks at greenhouse gas emissions caused by all activities within a city's geographic boundary. Typical sectors include residential, commercial, and industrial energy use, transportation, off-road equipment, waste generation, and energy associated with water delivery and treatment.

## **Cool California**

A State-operated website that provides tools and information to residents, businesses, schools, and local governments to take action related to climate change. The website links and resources related to energy efficiency, cool roofs, grant programs, and more. The website is available at <http://www.coolcalifornia.org/>.

## **Daylighting**

Building assemblies (such as use of windows, skylights, light tubes, and reflective surfaces) designed to introduce daylight into a building for the purpose of illumination and view, and to reduce a building's reliance on electric lighting.

Source: California Energy Efficiency Strategic Plan

## Demand Response

Mechanism for managing end user electricity consumption in response to energy supply conditions. A demand-responsive system is one that can be controlled (either directly or remotely) to reduce electricity consumption during times of increased energy demand and/or constrained energy availability.

Source: California Long Term Energy Efficiency Strategic Plan

## Direct Access Electricity

Direct access service is an optional choice that customers can select to purchase electricity and other services from an electric service provider (ESP), instead of from Southern California Edison. An ESP is an entity that contracts directly with its customers to provide electric service and is responsible for arranging an adequate supply of electricity. ESPs are required to meet certain requirements with the California Public Utilities Commission in addition to meeting financial and technical requirements with Southern California Edison.

## Electricity Accounts

See also General Service-Non-Demand (GS-1) Electricity Accounts, General Service-Demand (GS-2) Accounts, Time of Use-General Service-Demand Metered (TOU-GS-3) Electricity Accounts, Lighting-Street and Highway-Unmetered Service Company-Owned System (LS-1), Lighting-Street and Highway-Customer-Owned Installation-Unmetered Service (LS-2), Lighting-Street and Highway-Customer-Owned Installation-Metered Service (LS-3), and Traffic Control Service (TC-1).

Southern California Edison (SCE) bills each city for municipal electricity use through distinct tariffs and associated rate classes. Facilities with electricity service accounts are grouped generally into the categories of buildings and facilities, lighting, and water pumping. SCE defines rate classes based on account type and total kW demand. The City of San Gabriel has the following types of electricity service accounts:

- **Buildings and Facilities Accounts**

**General Service-Non-Demand (GS-1):** Applicable to general service with a monthly maximum demand of 20 kW or less.

**General Service-Demand (GS-2) Electricity Accounts:** Applicable to general service accounts whose monthly maximum demand is above 20 kW and below 200 kW. The cost of electricity is based on a tiered approach, with higher levels of energy use charged at a higher rate for every kWh used.

**Time of Use-General Service-Demand Metered (TOU-GS-3):** Applicable to general service accounts for larger facilities with monthly demand between 200 and 500 kW, with higher rates charged for certain peak times that are known in advance and vary between the summer and winter seasons.

- **Lighting Accounts**

**Lighting-Street and Highway-Unmetered Service Company-Owned System (LS-1):** Applicable to SCE-owned service accounts for the lighting of streets, highways, and publicly owned and publicly operated automobile parking lots which are open to the general public where SCE owns and maintains the street lighting equipment and associated facilities. These accounts are not metered (not based on actual energy use) and are charged based on SCE's monthly rate per lamp.

**Lighting-Street and Highway-Customer-Owned Installation-Unmetered Service (LS-2):** Applicable to unmetered service for the lighting of streets, highways, other public thoroughfares, and publicly owned and publicly operated automobile parking lots which are open to the general public, where

# GLOSSARY OF TERMS

the customer owns the street lighting equipment including, but limited to, the pole, mast arm, luminaire and lamp, and all connecting cable in a streetlight system. These accounts are not metered (not based on actual energy use) and are charged based on SCE's monthly rate per lamp.

**Lighting-Street and Highway-Customer-Owned Installation-Metered Service (LS-3):** Applicable to metered service for the lighting of streets, highways, directional highway signs served in conjunction with street and highway lighting, other public thoroughfares, and publicly owned and publicly operated automobile parking lots which are open to the general public, where the customer owns the street lighting equipment operated within the period from dusk to dawn. Electricity charges are based on metered electricity use.

**Traffic Control Service (TC-1):** Applicable to single- and three-phase service: for traffic directional signs or traffic signal systems located on streets, highways and other public thoroughfares, and to railway crossing and track signals; for public thoroughfare lighting that is utilized 24 hours per day or is not controlled by switching equipment, such as tunnel or underpass lighting; and to public authorities for the illumination of bus stop shelters located in the dedicated road right-of-way where such service is combined with other traffic control service as defined above.

Source: Southern California Edison

## **Electricity Sectors**

The EAP groups electricity use into four key topics, based on the type of activity that consumes electricity and causes greenhouse gas emissions. The electricity sectors consist of existing residential, existing nonresidential, new development (residential and nonresidential), and City government operations.

## **Emissions Forecast**

Baseline emissions are forecast to future years based on projected increases in population, jobs, households, and other local trends. Forecasts will show two scenarios: (1) outcomes if no behavioral or regulatory changes are made (a business-as-usual scenario), and (2) outcomes to account for reduction efforts mandated by the State of California, such as new vehicle standards and fuel standards.

## **Emissions Standard**

The maximum amount of pollutant legally permitted to be discharged from a single source, either mobile or stationary.

## **Energy Conservation**

Methods of reducing energy waste, such as turning off lights or heating when not needed.

## **Energy Efficiency**

Doing the same or more work with less energy, such as replacing incandescent light bulbs with compact fluorescent light bulbs, using appliances that use less electricity to run than older models, or utilizing a vehicle that can travel farther using the same amount of gasoline.

## **Energy Efficiency and Conservation Block Grant**

The Energy Efficiency and Conservation Block Grant program was funded through the American Recovery and Reinvestment Act and managed by the US Department of Energy to assist cities, counties, states, and territories to develop, promote, and implement energy efficiency and conservation programs and projects.

## **Energy Environment and Natural Resource Committee**

The San Gabriel Valley Council of Government's Energy, Environment, and Natural Resources Committee coordinates environment-related efforts among the valley's many jurisdictions, pursues funding opportunities for the valley, and promotes beneficial policies to its member agencies.

## **Energy Leader Partnership Model**

Southern California Edison (SCE) has developed the Energy Leader Partnership (ELP) Model to provide support to local governments in identifying and implementing opportunities to improve energy efficiency in municipal facilities and promoting community awareness of demand side energy management opportunities. By participating in SCE's Energy Leader Partnership, local governments are taking actions to support the California Long Term Energy Efficiency Strategic Plan while saving energy and fiscal resources for their communities. In the San Gabriel Valley, the San Gabriel Valley Council of Governments (SGVCOG) is leading the implementation of the ELP with SCE and 27 of the 31 member cities in the SGVCOG. The ELP comprises four focus areas: municipal retrofits, demand response, strategic plan support, and energy efficiency programs coordination. The ELP program has four incentive tiers for participating cities: (1) Valued Partner, (2) Silver, (3) Gold, and (4) Platinum. Each city begins the program as a valued partner, and to advance to the next incentive tier, each participating city must achieve the predetermined energy savings and requirements in the community and in city facilities.

## **Energy Star**

A joint program of the US Environmental Protection Agency and the US Department of Energy to provide consumers with information and incentives to purchase the most energy-efficient products available.

## **Energy Upgrade California**

Energy Upgrade California is a new statewide program that offers incentives to homeowners who complete select energy-saving home improvements on a single-family residence. These incentive packages encourage customers to take a "whole house" approach by combining several related improvements at once to increase a home's overall energy efficiency and achieve greater savings. By working with participating contractors, homeowners can choose from two incentive options, the Basic Upgrade Package or the Advanced Upgrade Package, based on their improvement needs and budget.

Source: Southern California Edison

## **Enterprise Energy Management Information Systems**

The San Gabriel Valley Council of Governments (SVGCOG) has funded and created a program to set up a "utility manager" computer program to track municipal usage and identify need for sub-metering to plan, budget, and manage bills for each city facility. The SGVCOG is collaborating with the County of Los Angeles to implement the County's Enterprise Energy Management Information System (EEMIS) utility manager to track municipal energy usage, enabling participating San Gabriel Valley municipalities to access facility energy consumption, archive billing data, and report and analyze energy consumption data via the Internet. The County's EEMIS project was developed in 2000 and has been adapted to assist cities in the SGVCOG with monitoring, forecasting, and budgeting for energy use at city facilities.

## **First Cost**

Immediate purchase and installation cost. First costs do not include life-cycle or long-term operating costs, which may result in long-term cost savings from increased efficiency, reduced maintenance, and other factors.

Source: California Long Term Energy Efficiency Strategic Plan

# GLOSSARY OF TERMS

## **Goal**

The desired end state or expected outcome related to electricity reduction targets in the Energy Action Plan (EAP). Each goal corresponds to one of the EAP's seven topic areas: existing residential buildings, existing nonresidential buildings, new development, planning framework, urban cooling, water and electricity efficiency, and municipal operations.

## **Graywater (also recycled water, reclaimed water)**

Treated or recycled wastewater of a quality suitable for non-potable uses such as landscape irrigation; not intended for human consumption.

## **Green Building**

Sustainable or "green" building is a holistic approach to design, construction, and demolition that minimizes the building's impact on the environment, the occupants, and the community.

## **Greenhouse Gases**

Gases which cause heat to be trapped in the atmosphere, warming the earth. Greenhouse gases are necessary to keep the earth warm, but increasing concentrations of these gases are implicated in global climate change. The majority of greenhouse gases come from natural sources, although human activity is also a major contributor. The principal greenhouse gases that enter the atmosphere because of human activities are:

- **Carbon Dioxide (CO<sub>2</sub>):** Carbon dioxide is a colorless, odorless gas that occurs naturally in the earth's atmosphere. Carbon dioxide also enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees, and wood products, and as a result of other chemical reactions (e.g., manufacture of cement). Carbon dioxide is also removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.
- **Methane (CH<sub>4</sub>):** Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
- **Nitrous Oxide (N<sub>2</sub>O):** Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
- **Fluorinated Gases:** Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful greenhouse gases that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances (i.e., chlorofluorocarbons, hydrochlorofluorocarbons, and halons). These gases are typically emitted in smaller quantities, but because they are potent greenhouse gases, they are sometimes referred to as high global warming potential gases ("high GWP gases").

## **Greenhouse Gas Inventory**

A greenhouse gas inventory provides estimates of the amount of greenhouse gases emitted to and removed from the atmosphere by human activities. A city or county that conducts an inventory looks at both community emissions sources as well as emissions from government operations. A base year is chosen and used to gather all data from that year. Inventories include data collection from such things as vehicle miles traveled (VMT), energy usage from electricity and gas, and waste. Inventories include estimates for carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), sulfur hexafluoride (SF<sub>6</sub>), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs), which are referred to as the six Kyoto gases.

## **Green Teams**

A formal or informal group of people in a company who are passionate about environmental issues. The groups brainstorm solutions and promote ways in which their company's practices can become more environmentally sustainable, often creating sustainability plans and approaching management for funding to meet plans.

Source: California Long Term Energy Efficiency Strategic Plan

## **Green Waste**

Refers to lawn, garden, or park plant trimmings and materials and can be used in home composts or picked up curbside by municipal waste haulers.

## **General Service-Non-Demand (GS-1) Electricity Accounts**

See Electricity Accounts.

## **General Service-Demand (GS-2) Electricity Accounts**

See Electricity Accounts.

## **Heating, Ventilation, and Air Conditioning (HVAC)**

Systems that help maintain good indoor air quality through adequate ventilation with filtration and provide thermal comfort.

## **Implementation Action**

An action, procedure, program, or strategy to achieve the electricity reductions of a policy. Action items may provide interim steps or supporting strategies. Actions may also indicate the range of opportunities to increase the electricity reduction potential of a policy.

## **Incentive**

See SCE Incentive.

## **Integrated Systems**

Lighting systems that include components, assemblies, and controls designed to work together effectively.

## **Kilowatt-Hour (kWh)**

A unit of energy equivalent to one kilowatt (kW) of energy used for an hour. For example, if an appliance requires a kW of energy to function, leaving the appliance on for one hour would consume one kWh of energy.

Source: California Long Term Energy Efficiency Strategic Plan

## **Leadership in Energy and Environmental Design**

A green building standard and set of rating systems established by the US Green Building Council.

## **Life-Cycle Cost**

Cost of a component, technology, or system over its entire lifespan, including not just first costs but also operating, maintenance, and disposal costs.

## **Lighting-Street and Highway-Unmetered Service Company-Owned System (LS-1)**

See Electricity Accounts.

# GLOSSARY OF TERMS

## **Lighting-Street and Highway-Customer-Owned Installation-Unmetered Service (LS-2)**

See Electricity Accounts.

## **Lighting-Street and Highway-Customer-Owned Installation-Metered Service (LS-3)**

See Electricity Accounts.

## **Method**

A consistent body of methods or procedures to approach a given task; in terms of a greenhouse gas emissions inventory and forecast, refers to an internally consistent approach to quantify greenhouse gas emissions that supports the principles of inventories identified in the Local Government Operations Protocol: relevance, completeness, consistency, transparency, and accuracy.

## **Mixed Use**

Properties on which various uses such as office, commercial, institutional, and residential are combined in a single building or on a single site in an integrated development project with significant functional interrelationships and a coherent physical design. A “single site” may include contiguous properties.

## **Municipal Operations Greenhouse Gas Inventory**

Looks at greenhouse gas emissions caused by City operations. Typical sectors include energy associated with City facilities, vehicle fleets, equipment, waste generation, employee commutes, and more.

## **Participating Municipality**

Those jurisdictions or member cities that: (i) are located in Southern California Edison’s (SCE) service territory; and (ii) have been selected by SCE and the SGVCOG to participate in the program as set forth in the Statement of Work. Includes 27 participating cities (Alhambra, Arcadia, Baldwin Park, Bradbury, Claremont, Covina, Diamond Bar, Duarte, El Monte, Glendora, Irwindale, La Canada-Flintridge, La Puente, La Verne, Monrovia, Montebello, Monterey Park, Pomona, Rosemead, San Dimas, San Gabriel, San Marino, Sierra Madre, South El Monte, South Pasadena, Temple City, and West Covina).

Source: Southern California Edison

## **Performance Indicators**

Specific, measureable, actionable, realistic and time-specific requirements that will directly and measurably contribute to the City’s Energy Action Plan goals.

Source: Southern California Edison

## **Personal Energy Action Survey**

As part of the regional partnership with the SGVCOG, the City distributed the personal energy action survey on energy efficiency at public events and through the City website. A blank version of the survey is provided in **Appendix B**. Participation in the survey was voluntary. Survey results help to provide a useful snapshot of energy-related opinion and behavior; however, the results should not be interpreted as statistically valid.

## **Policy**

A statement that guides decision-making and indicates a commitment to achieve the specified outcomes of the goal. Policies provide the foundation for quantification of electricity reduction potentials in the Energy Action Plan.

## **Project Steering Committee**

Along with other San Gabriel Valley cities taking part in the regional Energy Action Plan (EAP) project, the City participated in a Project Steering Committee (PSC) throughout EAP development. The purpose of the PSC is to confirm a regional approach to EAP development, guide the project, and share best practices among jurisdictions. Starting in July 2011, the PSC convened approximately once a month. During PSC meetings, representatives from San Gabriel Valley Council of Governments staff and the technical consultant project team facilitated discussions and presentations to review options to achieve electricity efficiency.

## **Property Assessed Clean Energy (PACE)**

A form of financing that creates municipal finance districts to provide loans to homeowners and businesses for energy-efficient retrofits and renewable energy system installations. Loans are repaid through an annual surcharge on property tax assessments. Governor Schwarzenegger signed the nation's first law allowing PACE financing in 2008.

Source: California Long Term Energy Efficiency Strategic Plan

## **Public Goods Charge**

The public goods charge consists of funds collected from electric utility ratepayers pursuant to Section 381 of the California Public Utilities Code for public purpose programs, including energy efficiency programs approved by the California Public Utilities Commission. The funds that make up Southern California Edison's budget for this project come from the public goods charge.

Source: Southern California Edison

## **Reach Codes**

Codes that direct contractors to construct buildings significantly more energy efficient than required by conventional building codes.

Source: California Long Term Energy Efficiency Strategic Plan

## **Rebate**

Offered by the state, utility, or local government to promote the installation of renewables and energy efficiency projects.

## **Renewable Energy**

Energy from sources that regenerate and are less damaging to the environment, such as solar, wind, biomass, and small-scale hydroelectric power.

## **Renewables Portfolio Standard**

Requires utility providers to increase the portion of energy that comes from renewable sources to 20% by 2010 and to 33% by 2020. Due to potential implementation issues, the adjusted business-as-usual forecast assumes that energy providers will achieve a minimum 28% renewable portfolio by 2020.

## **San Gabriel Valley Council of Governments (SGVCOG)**

A Joint Powers Authority representing 31 incorporated cities and unincorporated areas in the San Gabriel Valley. The SGVCOG works with member agencies to collectively address transportation, housing, economic growth, and environment issues that are most effectively addressed at a regional scale.

# GLOSSARY OF TERMS

## **San Gabriel Valley Energy Wise Partnership**

An alliance between the San Gabriel Valley Council of Governments (SGVCOG) and Southern California Edison (SCE) to bring energy savings to the San Gabriel Valley through innovative public education and energy efficiency projects. Through this program, the SGVCOG and SCE work with local governments throughout the San Gabriel Valley to leverage resources, share information, educate local governments concerning energy efficiency opportunities, and implement energy efficiency projects.

## **Savings by Design (SBD)**

California's nonresidential new construction energy efficiency program, administered statewide and funded by energy utility customers through the Public Purpose Programs surcharge applied to gas and electric services. Projects participating in SBD receive services including design assistance, owners incentives, design team incentives, and energy design resources. Services begin in the project design phase and continue through construction completion.

Source: Southern California Edison

## **SCE Energy Leader Partnership**

A program run by Southern California Edison (SCE) that provides support to local governments and institutions to assist them in achieving a joint vision of sustainability. SCE works closely with partners to address key issues that are barriers to achieving this vision and develop a long-term energy efficiency strategy. For local governments, SCE provides support to identify and address energy efficiency opportunities in municipal facilities, take actions supporting the California Long Term Energy Efficiency Strategic Plan, and increase community awareness and participation in demand side management opportunities. A key goal in SCE's local government partnerships is helping cities and counties lead by example in addressing energy efficiency first in their own municipal facilities.

## **SCE Incentive (financial incentive)**

Provisions issued by Southern California Edison (SCE) in order to promote the installation of energy efficiency and renewable projects in the utility territory. There are a variety of types of incentives, including rebates, loans, and alternative rates. The incentives are paid through the statewide Public Good Charge.

## **Senate Bill 375**

Requires the California Air Resources Board to develop regional greenhouse gas emissions reduction targets to be achieved from the automobile and light truck sectors for 2020 and 2035. The regional targets adopted by the Southern California Association of Governments (SCAG) are an 8% reduction in per capita transportation emissions by 2020 and a conditional 13% reduction by 2035 which will be achieved through the development of a Sustainable Communities Strategy as part of the 2012 Regional Transportation Plan update.

## **Sectors**

Emissions are grouped by the type of activity that generated the emissions, such as transportation, residential energy use, or commercial energy use.

## **Simple Payback Period**

Amount of time required to recover an initial investment.

Source: California Long Term Energy Efficiency Strategic Plan

## **Smart Lighting**

Lighting that is dynamically responsive to end-user needs based on daylighting, occupancy, scheduling, and demand response requirements.

Source: California Long Term Energy Efficiency Strategic Plan

## **South Coast Air Quality Management District (SCAQMD)**

The air pollution control agency for all of Orange County and the urban portions of Los Angeles, Riverside, and San Bernardino counties, the smoggiest region of the United States. SCAQMD's goal is to protect the health of residents, while remaining sensitive to businesses.

## **Southern California Edison (SCE)**

An investor-owned utility that is the primary electricity provider to Southern California and the San Gabriel Valley.

## **Southern California Regional Energy Consortium**

Los Angeles County program that will bundle like projects for economies of scale after city energy efficiency projects have been identified.

## **Standard Practice**

As opposed to best practices, standard practices include techniques, policies, methodologies, procedures, technologies, and systems that are typically employed by practitioners and generally do not achieve optimal results (in terms of energy efficiency, demand-responsiveness, high quality, environmental sustainability, smart-grid connectedness, and integration with renewable energy generation sources).

Source: California Long Term Energy Efficiency Strategic Plan

## **Sustainability**

Community use of natural resources in a way that does not jeopardize the ability of future generations to live and prosper.

## **Sustainable Development**

Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Source: Report of the World Commission on Environment and Development: Our Common Future, also known as the Brundtland Commission or Brundtland Report

## **Tariff**

Electricity rates set by the utility and approved by the California Public Utilities Commission to recover costs. Customers may be placed in different rate classes based on a combination of parameters such as level of demand, end-use applications, or economic situation.

## **Time-of-Use General Service-Demand Metered (TOU-GS-3)**

See Electricity Accounts.

## **Title 24**

See California Building Code.

# GLOSSARY OF TERMS

## **Traffic Control Service (TC-I)**

See Electricity Accounts.

## **Vehicle Miles Traveled (VMT)**

A key measure of overall street and highway use. Reducing VMT is often a major objective in efforts to reduce vehicular congestion and achieve regional air quality goals.

## **Water Conservation**

Reducing water use, such as turning off taps, shortening shower times, and cutting back on outdoor irrigation.

## **Water Efficiency**

Replacing older technologies and practices in order to accomplish the same results with less water; for example, by replacing toilets with new low-water-using models and by installing “smart controllers” in irrigated areas.

## **Zero Net Energy**

For buildings, use of no more energy over the course of a year than can be generated on site through renewable resources such as solar, wind, or geothermal power.

Source: California Long Term Energy Efficiency Strategic Plan

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# REFERENCES

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APPENDIX A

PERSONAL ENERGY ACTION SURVEY

# APPENDIX A: PERSONAL ENERGY ACTION SURVEY

## PERSONAL ENERGY ACTION SURVEY: SAN GABRIEL VALLEY COUNCIL OF GOVERNMENTS ENERGY ACTION PLAN

Your City is initiating an Energy Efficiency Plan to achieve determine the City's existing and future energy use and to meet the City's energy reduction goals.

This survey is an important way to assist City staff and provide input into the project planning process. It should take about 10 minutes to fill out.

This project has been funded by Southern California Edison (SCE) as part of the California Long-Term Energy Efficiency Strategic Plan to develop a Regional Framework and individual energy efficiency chapters of climate action plans (EECAP) for cities in the San Gabriel Valley Council of Governments (SGVCOG). If you would like more information regarding the project, please contact Marisa Creter, at [mcreter@sgvcog.org](mailto:mcreter@sgvcog.org) or (626) 457-1800.

1. What City do you live and/or work in the most?

- Alhambra
- Arcadia
- Baldwin Park
- Bradbury
- Claremont
- Covina
- Diamond Bar
- Duarte
- El Monte
- Glendora
- Irwindale
- La Cañada Flintridge
- La Puente
- La Verne
- Monrovia
- Montebello
- Monterey Park
- Pomona
- Rosemead
- San Dimas
- San Gabriel
- San Marino
- Sierra Madre
- South El Monte
- South Pasadena
- Temple City
- Walnut
- West Covina

2. What do you identify with most when thinking of the City chosen above?

- Resident
- Business Owner
- Work
- Other

3. Which of the following ranges includes your age?

- 24 or under
- 25 to 34

# APPENDIX A: PERSONAL ENERGY ACTION SURVEY

- 35 to 44
  - 45 to 54
  - 55 to 64
  - 65 to 74
  - 75 and above
4. If you do not reside in the city you chose above, in what city do you reside?
- Please choose a city from the list or enter a city below.
  - Other (please specify)
5. Do you rent or own your home?
- Rent house
  - Rent apartment
  - Own
6. How many people live in your household (including yourself)?
- 1
  - 2
  - 3
  - 4 or more
7. What have you already done in your home or business to reduce energy use? (Select all that apply)
- Replaced older light bulbs with more energy efficient bulbs
  - Replaced appliances with more energy efficient models
  - Replaced or upgraded heating and cooling system
  - Upgraded insulation
  - Upgraded to more energy efficient windows
  - Installed a solar hot water heater
  - Installed solar or wind systems on my roof or property
  - I have not done anything to my home or business to reduce energy use
  - Other
8. Which of the following would you be ready to do in the next year to reduce energy use in your home or business? (Select all that apply)
- Replace older light bulbs with more energy efficient bulbs
  - Replace appliances with more energy efficient models
  - Replace or upgrade heating and cooling system
  - Upgrade insulation
  - Upgrade to more energy efficient windows

# APPENDIX A: PERSONAL ENERGY ACTION SURVEY

- Install a solar hot water heater
- Install solar or wind systems on my roof or property
- Nothing
- Other

9. Which of the following would you be ready to do in the next five (5) years to reduce energy use in your home or business? (Select all that apply)

- Replace older light bulbs with more energy efficient bulbs
- Replace appliances with more energy efficient models
- Upgrade insulation
- Install a solar hot water heater
- Install Photovoltaic Solar Panels on roof
- Nothing
- Other

10. What would encourage you to install any of the technologies mentioned in the previous questions? (Select all that apply)

- More information on the energy / financial savings
- Grants or incentive programs to offset costs
- Low-interest loans
- List of reliable contractors or installers
- Lower utility bills
- None of the above
- Other

11. In general, which of the following strategies do you support to achieve energy efficiency? (Select all that apply)

- Voluntary, incentive-based policies for individuals, businesses, and the City to achieve energy efficiency.
- Mandatory requirements for individuals, businesses, and the City to achieve energy efficiency.

For more information, please visit: [www.sqvenergywise.org/energyplan](http://www.sqvenergywise.org/energyplan)

APPENDIX B

GREENHOUSE GAS EMISSIONS  
INVENTORY REPORT

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

## INVENTORY AND FORECAST PURPOSE

This greenhouse gas emissions inventory and forecast (Inventory) will act as a foundation for the City of San Gabriel's Energy Action Plan (EAP) by informing the City and community of the largest sources of GHG emissions, and thus the largest opportunities for reduction. The Inventory identifies the major and minor sources of GHG emissions to help in the process of creating reduction strategies in the EAP in response to local emissions characteristics.

Specifically, the Inventory does the following:

- Presents GHGs from community-wide and municipal activities in calendar year 2006.
- Forecasts how community-wide emissions will increase by 2020 and 2035 if no behavioral or regulatory changes are made (known as a business-as-usual scenario).
- Adjusts the GHG forecasts to account for reduction efforts mandated by the state of California, such as new energy efficiency and vehicle standards.
- Provides City staff, decision-makers, and stakeholders with adequate information to direct development of an EAP and to establish GHG emissions reduction and energy efficiency targets, if desired.

## RELEVANT EMISSIONS

The Inventory includes the major sources of GHGs caused by activities in the City of San Gabriel per best practice and consistent with the methods outlined in the Best Practices Memo, the Regional Framework and those recommended by the California Air Resources Board (CARB). The Inventory analyzes the following community and municipal emissions sources:

### COMMUNITY

- **Energy** – Electricity and natural gas consumed by residents and businesses in the city in 2006.
- **Direct Access Electricity** – Electricity purchased by commercial customers from utilities other than Southern California Edison.
- **Street and Traffic Lighting** – Electricity used by street and traffic lights within the city but not owned by the City of San Gabriel.
- **On-Road Transportation** – Vehicle miles traveled (VMT) in, to, and from the city in 2006.
- **Waste** – Methane emissions from waste, also known as municipal solid waste, and green waste (alternative daily cover) sent to landfills and regional incinerators (also known as transformation facilities) from the city in 2006.
- **Water and Wastewater** – The energy required to extract, filter, deliver, and treat the water used and wastewater disposed by the community in 2006.

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

- **Off-Road Equipment** – Emissions from construction and lawn and garden equipment operated within the city.

## MUNICIPAL

- **Buildings** – Electricity and natural gas consumed by City buildings and facilities in 2006.
- **Off-Road Equipment** – Fuel used for construction projects, landscaping, or other off-road purposes in 2006.
- **Fleet** – Gasoline, diesel and compressed natural gas (CNG) used by all City-owned vehicles in 2006.
- **Lighting** – Electricity, paid for by the City, used by street and traffic lights within city limits.
- **Employee Commute** – Emissions from the vehicles City employees use to get to and from work.
- **Government-Generated Solid Waste** – Indirect emissions from the waste disposed of by employees and operations of the City.

## KEY CONCEPTS

The following terms are used throughout the Inventory and are fundamental to understanding the contents of the greenhouse gas inventory and forecast:

- **Baseline year** – Emissions are quantified for the baseline year of 2006, which is consistent with the baseline year definition of Assembly Bill (AB) 32, the California Global Warming Solutions Act. This baseline year allows the City to track and observe the impact of its actions taken to date and better inform future GHG reduction strategies.
- **Business-as-usual (BAU)** – The scenario on which all forecasts are based. Assumes no specific actions are taken to reduce emissions and growth comes from the expansion of activity and services within the city.
- **Carbon dioxide equivalent (CO<sub>2</sub>e)** – Represents the three main GHGs (carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O) in comparable terms, since all three gases trap heat in the atmosphere differently. Greenhouse gases are reported in metric tons of CO<sub>2</sub>e (MTCO<sub>2</sub>e).
- **Sectors** – Emissions are grouped by the type of activity that generated the emissions, such as transportation, residential energy use, or commercial energy use.

## COMMUNITY-WIDE INVENTORY

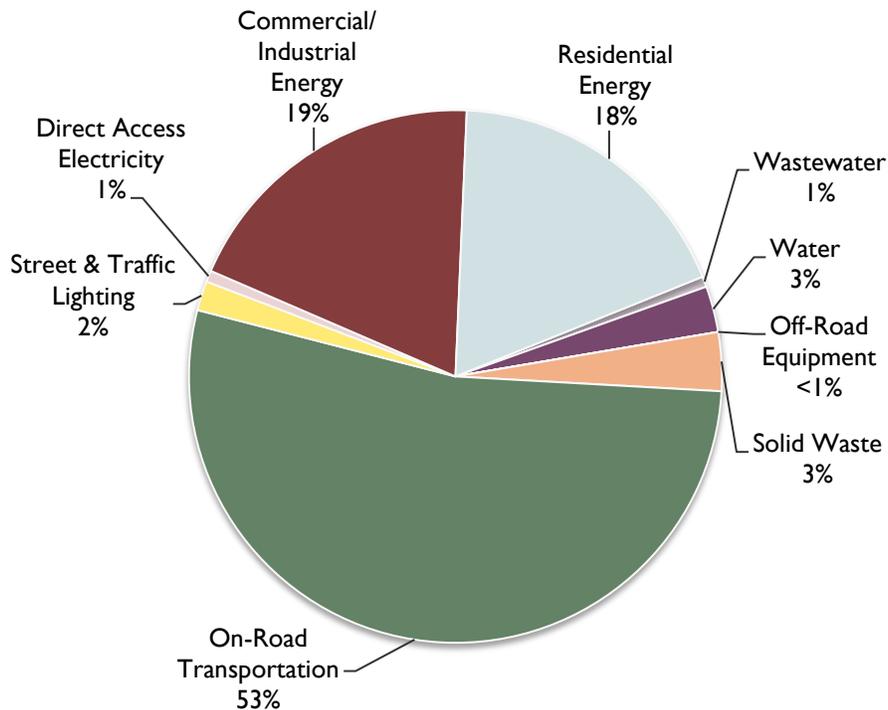
### COMMUNITY SUMMARY

The City of San Gabriel emitted approximately 262,780 MTCO<sub>2</sub>e in the baseline year 2006. As shown in **Table B-I** and **Figure B-I**, the transportation sector was the largest contributor to emissions (53%), producing approximately 139,300 MTCO<sub>2</sub>e in 2006. Commercial and industrial energy use is the next largest sector with 50,320 MTCO<sub>2</sub>e, or 19% of total

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

emissions. Residential energy use followed closely with 47,750 MTCO<sub>2</sub>e, contributing 18% of total emissions. The solid waste sector comprised 3% of the total emissions (9,330 MTCO<sub>2</sub>e), and emissions from water comprised 3% of the total (7,340 MTCO<sub>2</sub>e). The remaining 4% of emissions consisted of street and traffic lighting, direct access electricity, wastewater electricity use, and off-road sources such as construction equipment. Combined, these remaining sectors contributed 8,740 MTCO<sub>2</sub>e.

**Figure B-1: Community-Wide GHG Emissions by Sector**



# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

**Table B-1: Community-Wide GHG Emissions by Sector**

Sector	MTCO <sub>2</sub> e	Percentage of Total
Residential Energy	47,750	18%
Commercial/Industrial Energy	50,320	19%
Direct Access Electricity	1,800	1%
Street & Traffic Lighting	4,690	2%
On-Road Transportation	139,300	53%
Solid Waste	9,330	3%
Off-Road Equipment	580	<1%
Water	7,340	3%
Wastewater	1,670	1%
<b>Total</b>	<b>262,780</b>	<b>100%</b>

\* Due to rounding, the total may not equal the sum of component parts.

## DETAILED ANALYSIS BY SECTOR

Each sector in the community inventory consists of multiple sub-sectors that contribute to the total emissions. **Table B-2** summarizes activity data and GHG emissions for each community sector and subsector. This information shows the individual impact of each activity included in summary **Table B-1**. For example, the residential energy category in **Table B-1** consists of emissions below from residential electricity and residential natural gas.

**Table B-2: Detailed Activity Data and GHG Emissions**

Sector	Activity Data	Unit	MTCO <sub>2</sub> e
Residential Electricity	71,890,250	kWh	21,020
Residential Natural Gas	5,025,380	Therms	26,730
Commercial/Industrial Electricity	109,719,340	kWh	32,090
Commercial/Industrial Natural Gas	3,427,200	Therms	18,230
Direct Access Electricity	4,445,770	kWh	1,800
Street & Traffic Lighting	16,025,120	kWh	4,690
Transportation	261,771,210	VMT	139,300
Waste – Municipal Solid Waste	40,920	Tons of Waste	7,530
Waste – Alternative Daily Cover	5,020	Tons of ADC	770
Waste – Transformed	3,380	Tons Transformed	1,030
Off-Road Equipment – Lawn and Garden	12,790	Households	10
Off-Road Equipment – Construction	40	Permits Issued	570
Water	25,126,500	kWh	7,340
Wastewater	5,701,000	kWh	1,670
<b>Total*</b>			<b>262,780</b>

\* Due to rounding, the total may not equal the sum of component parts.

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

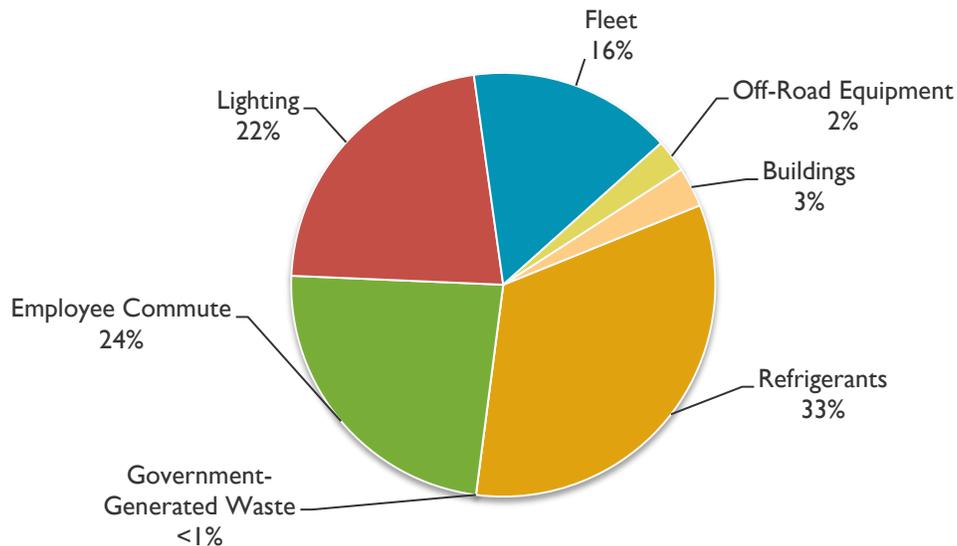
## MUNICIPAL INVENTORY

### MUNICIPAL SUMMARY

The municipal Inventory includes GHG emissions from the operations and activities conducted by the City of San Gabriel. GHG emissions were calculated from activity data collected by the City using methods consistent with the Best Practices Memo, the Regional Framework and those recommended by CARB through the Local Government Operations Protocol, version 1.1 (LGOP, v 1.1).

Operations and activities by the City of San Gabriel in 2006 resulted in approximately 1,990 MTCO<sub>2</sub>e. **Figure B-2** and **Table B-3** depict the contribution of each activity to the total GHG emissions. Buildings and fleet caused the majority of the City's emissions with building energy use producing 660 MTCO<sub>2</sub>e and fleet resulting in 470 MTCO<sub>2</sub>e. Public lighting made up 22% and employee commute with a 16% share of total municipal emissions. Government-generated waste and refrigerants made up the final 6% with each contributing about 3%. Off-road equipment use emitted less than 10 MTCO<sub>2</sub>e and less than 1% of total emissions.

**Figure B-2: Municipal GHG Emissions by Sector**



# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

**Table B-3: Municipal GHG Emissions by Sector**

Sector	MTCO <sub>2</sub> e	Percentage of Total
Buildings	660	33%
Off-Road Equipment	<10	<1%
Fleet	470	24%
Lighting	440	22%
Employee Commute	310	16%
Government-Generated Waste	50	3%
Refrigerants	60	2%
<b>Total</b>	<b>1,990</b>	<b>100%</b>

\* Due to rounding, the total may not equal the sum of component parts.

## DETAILED ANALYSIS BY SECTOR

Much like the community Inventory, the municipal Inventory has multiple subsectors that are included in each sector reported in **Table B-3**. Detailed activity data for each municipal subsector and their individual contribution to GHG emissions are shown below in **Table B-4**.

**Table B-4: Detailed Municipal Activity Data and GHG Emissions**

Sector	2006 Activity Data	Unit	2006 MTCO <sub>2</sub> e	Percentage of Total
Buildings – Electricity	1,661,460	kWh	490	25%
Buildings – Natural Gas	31,640	Therms	170	9%
Off-Road Equipment – Gasoline	300	Gallons	<10	<1%
Off-Road Equipment – Diesel	260	Gallons	<10	<1%
Fleet – Gasoline	35,170	Gallons	310	16%
Fleet – Diesel	9,990	Gallons	100	5%
Fleet – CNG	8,810	Gallons	60	3%
Lighting – Streetlights	1,146,070	kWh	330	17%
Lighting – Traffic Lights	214,810	kWh	60	3%
Lighting – SCE-Owned Streetlights	171,990	kWh	50	3%
Lighting – Other Public Lights	–	kWh	–	16%
Employee Commute	1,241,110	VMT	310	3%
Government-Generated Solid Waste	250	Tons	50	2%
Refrigerants – R-22**	60	Lbs	40	1%
Refrigerants – 134A**	30	Lbs	20	25%
		<b>Total*</b>	<b>1,990</b>	<b>100%</b>

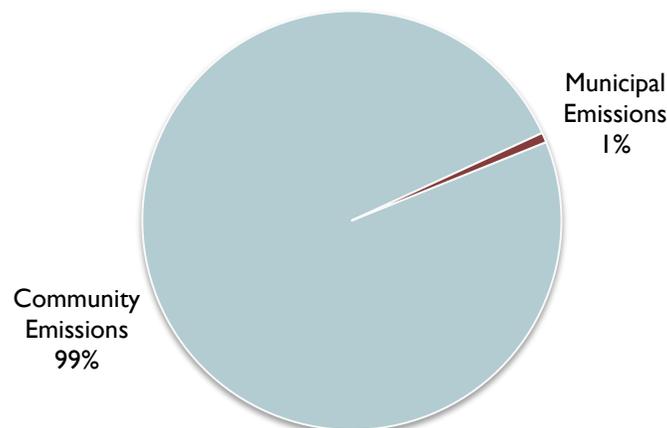
\* Due to rounding, the total may not equal the sum of component parts.

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

## RELATION TO COMMUNITY-WIDE INVENTORY

Municipal emissions account for approximately 1% of community-wide emissions, as shown in **Figure B-3**. Municipal GHG emissions are considered a subset of community-wide GHG emissions since the majority of municipal activities occur within the boundaries of the City of San Gabriel. This means that all municipal operations are included in the commercial, industrial, transportation, waste, or other categories of this community-wide inventory as applicable. For example, electricity use by City buildings is part of the community-wide commercial energy sector. Similar to the way in which businesses and factories perform their own facility-scale GHG inventories, the City municipal operations emissions inventory analyzes municipal emissions in more detail in order to help the City assess and identify its major sources of GHGs. **Figure B-3** is more for informational purposes and to show the relative scale of municipal and community-wide emissions.

**Figure B-3: Municipal and Community GHG Emissions**



## 2010 EMISSIONS ASSESSMENT

Activity data for 2010 was available for many community and several municipal sectors including energy, transportation, waste, community off-road, wastewater, and water. This information has been translated into greenhouse gas emissions for San Gabriel and all other participating cities and will serve as a common benchmark that will allow activities for accurate comparison between all cities in the San Gabriel Valley participating in the EAP. This 2010 interim inventory will also help cities track the GHG and energy reductions from programs implemented since the baseline year.

**Table B-5** below summarizes activity data for 2010 and compares emissions from baseline and 2010 for the community of San Gabriel. Sectors that showed a decrease in emissions from 2006 to 2010 include residential electricity and natural gas, commercial/industrial electricity, transportation, municipal solid waste and transformed waste, off-road, water and wastewater-indirect. The only sectors reported that did not show decreases in emissions are direct access electricity and alternative daily cover waste. Commercial/industrial natural gas for 2010 was not available at the time of preparation of this report. The exclusion of 2010 natural gas data from the analysis suggests an inaccurate 12% decrease in

## APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

community emissions in 2010. Using baseline commercial/industrial natural gas usage as a proxy for 2010, emissions from the community are estimated at 250,690 MTCO<sub>2</sub>e, a 5% decrease from baseline. The City will receive an updated version of this report once this 2010 natural gas data becomes available.

**Table B-5: Baseline and 2010 Community Activity Data and Emissions**

Sector	2006 Activity Data	2010 Activity Data	Percentage Change 2006–2010	Unit	2006 MTCO <sub>2</sub> e	2010 MTCO <sub>2</sub> e	Percentage Change 2006–2010
Residential Electricity	71,890,250	66,682,760	-7%	kWh	21,020	19,190	-9%
Residential Natural Gas	5,025,380	4,824,770	-4%	Therms	26,730	25,670	-4%
Commercial/Industrial Electricity	109,719,340	95,517,050	-13%	kWh	32,090	27,490	-14%
Commercial/Industrial Natural Gas**	3,427,200	3,427,200	0%	Therms	18,230	18,230	0%
Direct Access Electricity	4,445,770	7,250,880	63%	kWh	1,800	3,040	69%
Street & Traffic Lighting	16,025,120	16,469,250	3%	kWh	4,690	4,740	1%
On-Road Transportation	261,771,210	265,240,840	1%	VMT	139,300	137,300	-1%
Waste – Solid Waste	40,920	27,910	-32%	Tons of Waste	7,530	5,200	-31%
Waste – Green Waste	5,020	5,470	9%	Tons of ADC	770	840	9%
Waste – Transformed	3,380	20	-99%	Tons Transformed	1,030	10	-99%
Off-Road Equipment – Lawn and Garden	12,790	12,980	1%	Households	10	10	0%
Off-Road Equipment – Construction	40	10	-75%	Permits Issued	570	360	-37%
Water	25,126,500	23,999,300	-4%	kWh	7,340	7,010	-4%
Wastewater	5,701,000	5,445,300	-4%	kWh	1,670	1,600	-4%
				<b>Total*</b>	<b>262,780</b>	<b>250,690</b>	<b>-5%</b>

\* Due to rounding, the total may not equal the sum of component parts.

\*\* Activity data was not available at the time of this report. Baseline information is used as a proxy.

Municipal activity data for certain sectors, namely electricity, natural gas and employee commute, was also available for 2010. A summary of this information and the changes in emissions from 2006 to 2010 are summarized in **Table B-6**

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

below. Note that activity data for off-road equipment, fleet, government-generated waste, and refrigerants was not available, and baseline information is reported as a proxy.

**Table B-6: 2010 Municipal Activity Data and Emissions**

Sector	2006 Activity Data	2010 Activity Data	Percentage Change 2006–2010	Unit	2006 MTCO <sub>2</sub> e	2010 MTCO <sub>2</sub> e	Percentage Change 2006–2010
Buildings – Electricity	1,661,460	1,590,140	-4%	kWh	490	450	-8%
Buildings – Natural Gas	31,640	32,910	4%	Therms	170	180	6%
Off-Road Equipment – Gasoline**	300	300	0%	Gallons	<10	<10	0%
Off-Road Equipment – Diesel**	260	260	0%	Gallons	<10	<10	0%
Fleet – Gasoline**	35,170	35,170	0%	Gallons	310	310	0%
Fleet – Diesel**	9,990	9,990	0%	Gallons	100	100	0%
Fleet – CNG**	8,810	8,810	0%	Gallons	60	60	0%
Lighting – Streetlights	1,146,070	1,216,440	6%	kWh	330	350	6%
Lighting – Traffic Lights	214,810	218,400	2%	kWh	60	60	0%
Lighting – SCE-Owned Streetlights	171,990	174,060	1%	kWh	50	50	0%
Lighting – Other Public Lights	–	84,540	n/a	kWh	–	20	n/a
Employee Commute	1,241,110	1,284,650	4%	VMT	310	320	3%
Government-Generated Solid Waste**	250	250	0%	Tons	50	50	0%
Refrigerants – R-22**	60	60	0%	Lbs	40	40	0%
Refrigerants – 134A**	30	30	0%	Lbs	20	20	0%
				<b>Total*</b>	<b>1,990</b>	<b>2,010</b>	<b>1%</b>

\* Due to rounding, the total may not equal the sum of component parts.

\*\* Activity data was not available at the time of this report. Baseline information is used as a proxy.

## BUSINESS-AS-USUAL FORECAST

A business-as-usual (BAU) forecast is an estimate of how GHG emissions will grow over time without influence from state, regional and local reduction efforts. This BAU emissions forecast assumes 2006 energy consumption, waste disposal and energy efficiency rates and focuses on two target years: 2020 and 2035. The 2020 target year is estimated for consistency with AB 32 targets and 2035 is studied for consistency with the Senate Bill 375 horizon.

## COMMUNITY BAU INDICATORS

**Table B-7** below lists the various growth indicators and sources used in the forecasting of San Gabriel’s community-wide emissions. All indicators for 2020 and 2035, except those used for transportation, are from the Southern California Association of Government (SCAG) Proposed Final 2012 Regional Transportation Plan (RTP). Residential energy use is tied to the number of households within City limits for the target years. Similarly, commercial and industrial energy use

## APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

emissions are assumed to grow with the number of jobs. Growth in waste emissions is based on the total service population of San Gabriel as this includes projected residential, commercial, and industrial growth. Fehr & Peers Transportation Consultants used SCAG's 2003 RTP travel model to forecast the growth in transportation activity (vehicle miles traveled, or VMT). Fehr & Peers compared population, household, and jobs forecasts from the 2003 RTP model with comparable data sources to confirm the accuracy of the VMT forecasts. Since the 2003 RTP travel model forecasts were less than Fehr & Peers' 5% adjustment margin of error, Fehr & Peers did not modify the City's VMT forecasts based on the US Census and the 2008 SCAG RTP model.

**Table B-7:BAU Growth Indicators and Affected Sectors**

Growth Indicator	Emissions Sector	2006	2010	2020	2035	Sources
Jobs	Nonresidential Energy	14,430	14,330	15,000	15,700	2010 Census, SCAG 2012 RTP, SCAG 2003 RTP
Service Population (Residents + Jobs)	Solid Waste, Water, Wastewater	56,590	54,050	57,800	61,800	2010 Census, SCAG 2012 RTP
Households	Residential Energy, Off-Road	12,790	12,540	13,800	14,800	2010 Census, SCAG 2012 RTP
Annual VMT	Transportation	261,771,210	265,240,840	274,131,050	288,068,640	Fehr & Peers, SCAG 2003 RTP

### COMMUNITY BUSINESS-AS-USUAL FORECAST

**Table B-8** and **Figure B-4** summarize the growth forecast of GHG emissions by activity sector without any actions or policies in place to reduce GHG emissions. Under the BAU growth scenario, emissions are estimated to grow by 5% to 275,760 in 2020 and by 10% from baseline to 289,870 MTCO<sub>2e</sub> in 2035. Sectors that showed a decrease in activity data from 2006 to 2010 were forecasted from 2010.

**Table B-8:Community BAU Emissions by Sector**

Sector	2006 MTCO <sub>2e</sub>	2010 MTCO <sub>2e</sub>	2020 MTCO <sub>2e</sub>	2035 MTCO <sub>2e</sub>
Residential Energy	47,750	44,860	51,520	55,250
Commercial/Industrial Energy**	50,320	45,720	52,330	54,770
Direct Access Electricity	1,800	3,040	1,870	1,960
Street & Traffic Lighting	4,690	4,740	4,820	4,820
Transportation	139,300	137,300	145,880	153,290
Solid Waste	9,330	6,050	8,490	9,070
Off-Road	580	370	1,640	870

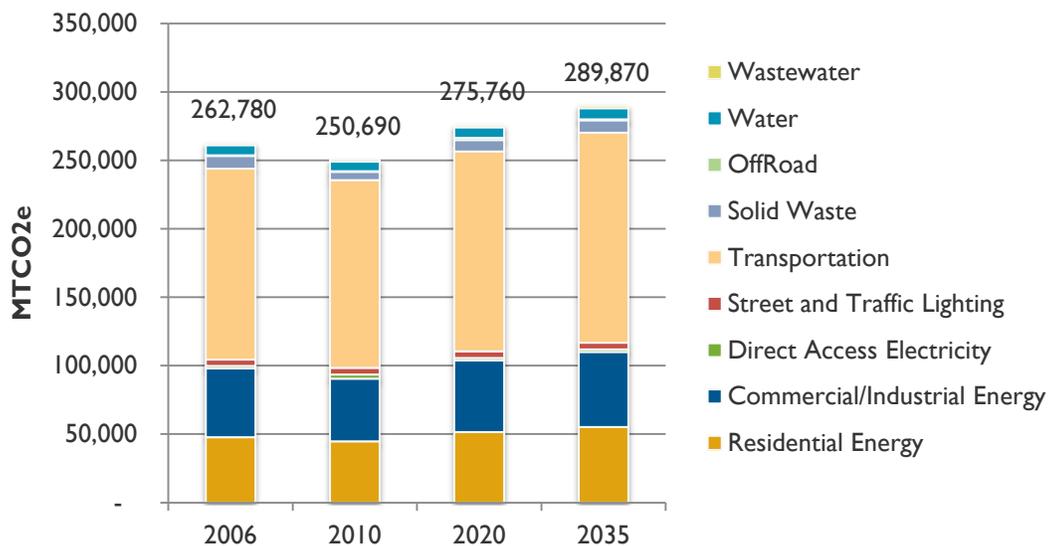
# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

Sector	2006 MTCO <sub>2</sub> e	2010 MTCO <sub>2</sub> e	2020 MTCO <sub>2</sub> e	2035 MTCO <sub>2</sub> e
Water	7,340	7,010	7,500	8,020
Wastewater	1,670	1,600	1,710	1,820
<b>Total*</b>	<b>262,780</b>	<b>250,690</b>	<b>275,760</b>	<b>289,870</b>
<b>% Change from Baseline</b>		<b>-5%</b>	<b>5%</b>	<b>10%</b>

\* Due to rounding, the total may not equal the sum of component parts.

\*\* Activity data for commercial/industrial natural gas was not available at the time of this report. 2006 data is used as a proxy.

**Figure B-4: Community BAU Emissions by Sector**



## MUNICIPAL BUSINESS-AS-USUAL FORECAST

The City of San Gabriel’s municipal forecast assumes a no-growth scenario for municipal operations in the forecast years. The BAU forecast assumes a zero percent growth in emissions and activity data based on data received for 2006 and 2010. The small 1% growth in emissions seen in 2010 and the two forecast years occurred because the City added an outdoor lighting account that was not present in the baseline year. The small decrease in 2010 building emissions does not continue into the forecast years because the forecast assumes that the fluctuations are based on accounting and billing discrepancies, not actual decreases in municipal operations. Lighting emissions change from baseline to 2010 and 2010 to 2020 due to the addition of new accounts in 2010, and the assumed baseline emissions in the remaining lighting subsectors.

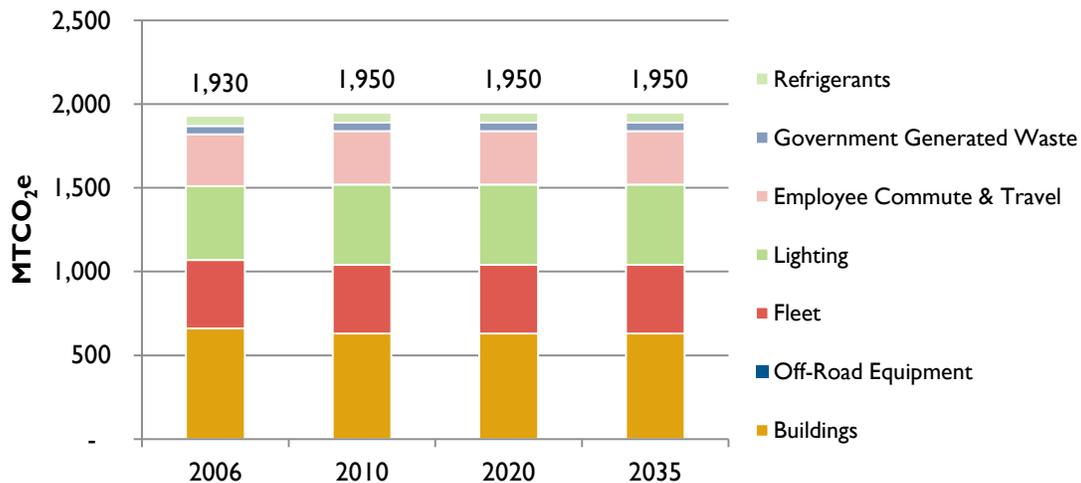
# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

**Table B-9: Municipal BAU Emissions by Sector**

Sector	2006 MTCO <sub>2</sub> e	2010 MTCO <sub>2</sub> e	2020 MTCO <sub>2</sub> e	2035 MTCO <sub>2</sub> e
Buildings	660	630	630	630
Off-Road Equipment	<10	<10	<10	<10
Fleet	410	410	410	410
Lighting	440	480	460	460
Employee Commute	310	320	310	310
Government-Generated Waste	50	50	50	50
Refrigerants	60	60	60	60
Total	1,930	1,950	1,950	1,950
% Change from 2006		1%	1%	1%

\* Due to rounding, the total may not equal the sum of component parts.

**Figure B-5: Municipal BAU Emissions by Sector**



## STATE ADJUSTED FORECAST

### State Reduction Programs

The State has been a proactive force in reducing GHG emissions. Regulations affecting vehicle standards, building standards, and the renewable energy content of electricity will reduce GHG levels in the city. The state actions summarized below are incorporated into the BAU forecast to create a more realistic estimate of the city's future emissions.

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**Assembly Bill 1493 (Pavley).** Signed into law in 2002, AB 1493 requires carmakers to reduce GHG emissions from new passenger cars and light trucks beginning in 2011. Regulations were adopted by CARB in 2004 and took effect in 2009 with the release of a waiver from the U.S. Environmental Protection Agency granting California the right to implement the bill. CARB anticipates that the Pavley standards will reduce GHG emissions from California passenger vehicles by about 22% in 2012 and by about 30% in 2016, all while improving fuel efficiency and reducing motorists' costs.<sup>5</sup> The car industry is well on its way to meeting these efficiency targets.

**Renewables Portfolio Standard.** Established in 2002 in Senate Bill 1078, the Renewables Portfolio Standard (RPS) targets utility providers to increase the portion of energy that comes from renewable sources to 20% by 2010 and to 33% by 2020. A June 2009 report from the California Public Utilities Commission indicated that it is unlikely that the state and its investor-owned utilities will be able to reach the RPS goal of 33% by 2020; according to state assessments, the forecast assumes that energy providers will achieve a 28% renewable portfolio by 2020.<sup>6</sup>

**California Building Code Title 24.** Title 24 of the California Code of Regulations mandates how each new home and business is built in California. It includes requirements for the structural, plumbing, electrical, and mechanical systems of buildings and for fire and life safety, energy conservation, green design, and accessibility in and about buildings. The 2010 triennial edition of Title 24 pertains to all occupancies that applied for a building permit on or after January 1, 2011, and remains in effect until the effective date of the 2013 triennial edition. This Inventory focuses on two sections of Title 24: Part 6 (the California Energy Code) and Part 11 (the California Green Building Standards Code). These two sections require direct electricity, natural gas, and water savings for every new home or business built in California. Title 24 is a statewide standard applied at the local level by local agencies through project review.

This Inventory incorporates the net energy benefit of new Title 24 requirements that did not exist in the baseline year. These estimates are based on California Energy Commission studies that compare each new update of Title 24 to its former version. The AB 32 Scoping Plan calls for ongoing triennial updates to Title 24 that yield regular increases in mandatory energy and water savings for new construction. As such, the GHG forecast also includes a conservative estimate of the energy and water reductions due to future updates of Title 24 based on historic growth rates. The energy reductions quantified in the forecast from Part 6 Energy Code updates are based on the assumption that the triennial updates to the code will yield regular decreases in the maximum allowable amount of energy used from new construction.

**Low Carbon Fuel Standard (LCFS).** The Low Carbon Fuel Standard (LCFS) calls for CARB to achieve a reduction of at least 10% in the carbon intensity of California's transportation fuels by 2020. A preliminary injunction was issued in December 2011, which required implementation of the LCFS to be put on hold. CARB is currently appealing the decision. Until the legal standing of the program has been resolved, LCFS will not be considered in the ABAU forecast.

**California Solar Initiative.** The California Solar Initiative (CSI) is a state program that provides cash rebates for the installation of an electric solar panel system. In order to qualify, the customer must buy electricity from one of California's three investor-owned utilities (Southern California Edison, Pacific Gas and Electric, or San Diego Gas & Electric).

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<sup>5</sup> California Air Resources Board 2010.

<sup>6</sup> California Public Utilities Commission 2009.

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

## Community ABAU Forecast

All state programs highlighted above are included in the community-wide ABAU forecast. As shown in **Table B-10**, **Table B-11**, and **Figure B-6**, these state reduction efforts are anticipated to reduce BAU emissions by 32,880 MTCO<sub>2</sub>e in 2020 and 52,940 MTCO<sub>2</sub>e in 2035. The majority of these reductions are from the AB 1493 (Pavley) standards and the Renewables Portfolio Standard. In comparison to the BAU scenario, 2020 emissions with state reduction measures are 8% below baseline 2006 levels rather than 5% above. Similarly, 2035 emissions went from 10% above baseline levels in the business-as-usual scenario to 10% below after state efforts are taken into account.

**Table B-10: Impact of State Policies on Community GHG Emissions**

State Reductions Summary	2020 MTCO <sub>2</sub> e	2035 MTCO <sub>2</sub> e
Pavley Reductions	-22,520	-35,460
RPS Reductions	-8,560	-14,340
CA Building Code Reductions	-1,600	-2,960
CSI Reductions	-200	-180
<b>Total State Reductions*</b>	<b>-32,880</b>	<b>-52,940</b>

*\*Due to rounding, the total may not equal the sum of component parts.*

**Table B-11: Comparison of Community BAU and ABAU Forecast**

State Reductions Summary	2006 MTCO <sub>2</sub> e	2010 MTCO <sub>2</sub> e	2020 MTCO <sub>2</sub> e	2035 MTCO <sub>2</sub> e
Growth Projection	262,780	250,690	275,760	289,870
Total State Reductions			-32,880	-52,940
Adjusted BAU Forecast (2020, 2035)	262,780	250,690	242,880	236,930
Percent Change from 2006	–	-5%	-8%	-10%

*\*Due to rounding, the total may not equal the sum of component parts.*

State reductions from baseline and 2010 were not quantified because the effects of those programs are already reflected in the activity data collected. For example, the efforts to increase the amount of clean energy in electricity through RPS are already captured in the emissions coefficients used to translate electricity use into MTCO<sub>2</sub>e.

## Municipal ABAU Forecast

Only certain state reduction programs affect the Municipal BAU forecast. These include the Renewables Portfolio Standard, the Pavley standards and the Title 24 efficiency standards. The CSI is not applicable to municipalities and is not quantified. **Table B-12** and **Table B-13** shows the effect of the included state reduction efforts on BAU emissions. Emissions in 2020 are reduced by 220 MTCO<sub>2</sub>e in 2020 and 350 MTCO<sub>2</sub>e in 2035. All of these reductions are from the

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

AB 1493 (Pavley) standards and the Renewables Portfolio Standard. No reductions came from the Title 24 reductions because the City does not have any set plans to expand buildings in the future. 2020 ABAU emissions are 11% below baseline (1,730 MTCO<sub>2e</sub>) and 17% below baseline in 2035 (1,630 MTCO<sub>2e</sub>).

**Table B-12: Impact of State Policies on Municipal GHG Emissions**

State Reductions Summary	2020 MTCO <sub>2e</sub>	2035 MTCO <sub>2e</sub>
Pavley Reductions	-110	-170
RPS Reductions	-110	-180
CA Building Code Reductions	0	0
CSI Reductions	0	0
<b>Total State Reductions*</b>	<b>-220</b>	<b>-350</b>

*\*Due to rounding, the total may not equal the sum of component parts.*

**Table B-13: Comparison of Municipal BAU and ABAU Forecast**

State Reductions Summary	2006 MTCO <sub>2e</sub>	2010 MTCO <sub>2e</sub>	2020 MTCO <sub>2e</sub>	2035 MTCO <sub>2e</sub>
Growth Projection	1,930	1,950	1,950	1,950
Total State Reductions	0	0	-220	-350
Adjusted BAU Forecast (2020, 2035)*	1,930	1,950	1,730	1,600
Percentage Change from 2006		1%	-10%	-17%

*\*Due to rounding, the total may not equal the sum of component parts.*

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

## REDUCTION TARGETS

The next step is for the City is to determine energy reduction targets for 2020 and 2035. The new energy reduction targets will be the goal of the EAP and a quantitative way of measuring the plan’s success. The EAP’s energy reduction targets will set the groundwork for any GHG reduction targets found in a future climate action plan.

### STATE-RECOMMENDED 2020 AND 2035 REDUCTION TARGETS

While the state reductions represent a significant decrease in emissions, AB 32 recommends that local governments adopt a GHG reduction target of 15% below baseline levels by 2020. The state has not adopted GHG reduction targets beyond 2020; however, in 2005, then-Governor Schwarzenegger signed Executive Order S-3-05, which created a goal to reduce GHG emissions to 1990 levels by 2020 and to 80% below 1990 levels by 2050. While not legislatively mandated, it is anticipated that the state will adopt targets similar to those included in Executive Order S-3-05 after the state’s achievement of the 2020 target can be better evaluated.

As shown in **Table B-14**, the City would need to facilitate a reduction in emissions of 19,520 MTCO<sub>2e</sub> to meet the state-recommended AB 32 Scoping Plan goal of 15% below baseline levels by 2020. Similarly, to be on a trajectory toward the Executive Order S-3-05 target for 2050, the City would need to reduce emissions 118,680 MTCO<sub>2e</sub> in 2035.

**Table B-14: GHG Emissions and State-Recommended Reduction Targets**

	2020	2035
State-Recommended Reduction Targets (Percent below baseline)	15%	55%
State-Recommended Emissions Goal (MTCO <sub>2e</sub> )	223,360	118,250
Adjusted BAU Forecast with State Reductions (MTCO <sub>2e</sub> )	242,880	236,930
<b>Local Reduction Needed from Adjusted BAU (MTCO<sub>2e</sub>)</b>	19,520	118,680

The State-recommended reduction targets for community-wide GHG emissions can also be applied to municipal operations. **Table B-15** below outlines the State-recommended reduction targets and necessary reductions the City would need to facilitate in order to meet the recommended goals for 2020 and 2035. Municipal emissions in San Gabriel are forecasted to reach 90 MTCO<sub>2e</sub> above the state-recommend reduction targets for 2020. It is important to remember however, that State reduction programs are not guaranteed to be fully implemented, much like the LCFS. Local action by city facility and fleet managers are the best way to guarantee a 15% reduction below baseline levels in 2020.

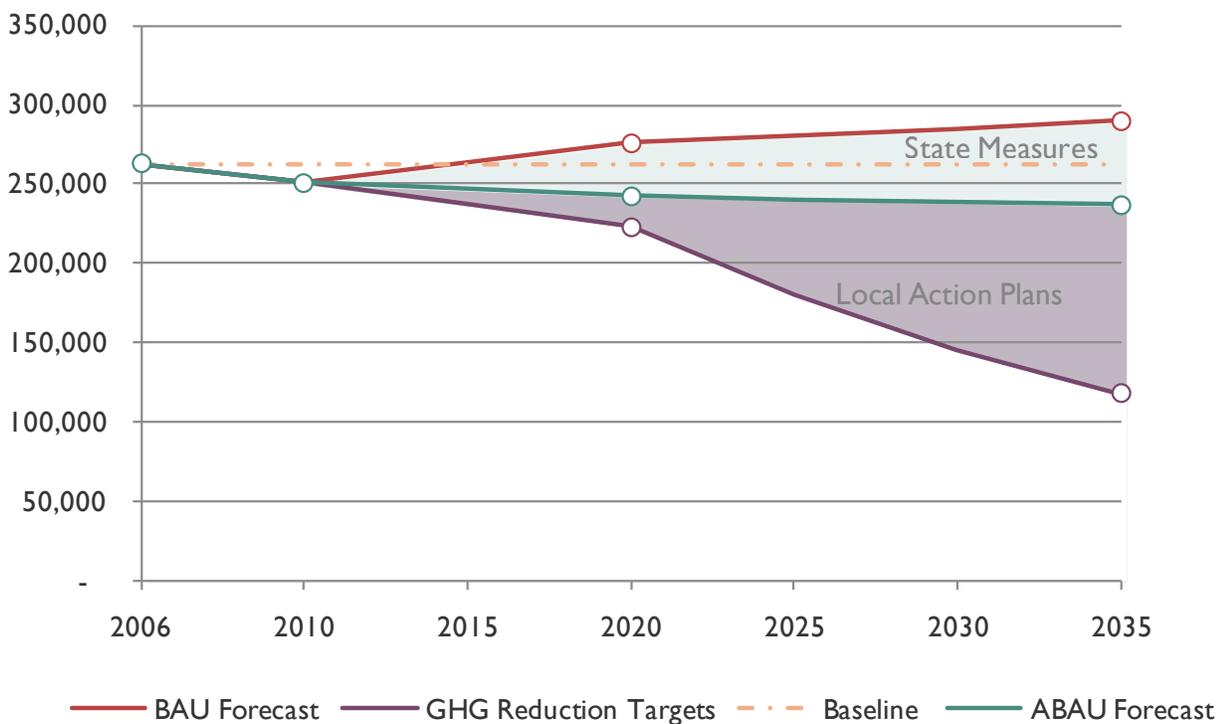
**Table B-15: Municipal GHG Emissions and State-Recommended Reduction Targets**

	2020	2035
State-Recommended Reduction Targets (percent below baseline)	15%	55%
State-Recommended Emissions Goal (MTCO <sub>2e</sub> )	1,641	869
ABAU Forecast with State Reductions (MTCO <sub>2e</sub> )	1,730	1,600
<b>Local Reduction Needed from Adjusted BAU (MTCO<sub>2e</sub>)</b>	90	732

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

**Figure B-6** shows the City’s BAU and ABAU forecasts in relation to baseline and recommended 2020 and 2035 reduction targets. The blue shaded area represents the reductions San Gabriel is estimated to see through state GHG reduction programs such as RPS and CSI. The purple section shows the GHG reductions that fall under local jurisdictions. The intent of the Energy Action Plan, and all future GHG reduction plans, is to close the gap represented by the purple area through energy efficiency projects and GHG reduction efforts.

**Figure B-6: GHG Forecast and State-Recommended Reduction Target Summary**



## CONCLUSION AND NEXT STEPS

The community and municipal inventories are an important milestone for assessing and mitigating the City of San Gabriel’s impact on climate change from the activities of the people, businesses, and industry. The Inventory also provides data that will shape the development of the EAP by providing a justifiable basis for the City’s analysis of its impact on climate change. The next step will be for the City to review and confirm Inventory findings and determine how the community will achieve the desired 2020 GHG reduction target through development of the EAP.

APPENDIX C

GHG METHODS & ASSUMPTIONS  
REPORT

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

This technical appendix provides a summary of the data sources, assumptions, and performance metrics utilized in this EAP to quantify the estimated kWh savings, GHG reductions, and costs. The sources and metrics are organized by policy and rely on four primary types of data and research: (1) the city’s GHG emissions inventory and forecast, (2) government agency tools and reports, (3) case studies in similar jurisdictions, and (4) scholarly research.

The baseline GHG inventory and forecast serve as the foundation for quantifying the City’s GHG reduction measures. Activity data from the inventory, e.g., vehicle miles traveled and kilowatt-hours (kWh) of electricity, is combined with the performance targets and indicators identified in this Plan to calculate the reduction benefit of each measure. This approach ensures that the City’s kWh savings and GHG reductions are tied to the baseline and future activities that are actually occurring in the city.

Whenever possible, emissions reduction estimates are based on tools and reports provided by government agencies such as the US Environmental Protection Agency (EPA), California EPA, California Energy Commission (CEC), California Air Resources Board (CARB), California Air Pollution Control Officers Association (CAPCOA), and local air districts. If accurate reduction estimates are not available through these tools, a case study may be used if the case study is comparable to the conditions in the city. Finally, for reduction measures that lack actual on-the-ground testing or analysis, current scholarly and peer-reviewed research is combined with knowledge of existing city practices to create an estimate of potential kWh and GHG reductions.

**Table C-1: Sources for Community Inventory Activity Data**

Subsector	Source
Residential Electricity	Southern California Edison
Residential Natural Gas	Southern California Gas Company
Commercial/Industrial Electricity	Southern California Edison
Commercial/Industrial Natural Gas	Southern California Gas Company
Direct Access Electricity	Southern California Edison
Street & Traffic Lighting	Southern California Edison
On-Road Transportation	Fehr & Peers Transportation Consultants; SCAG 2003 RTP
Waste – Solid Waste	CalRecycle online Disposal Reporting System
Waste – Green Waste	CalRecycle online Disposal Reporting System
Waste – Transformed	CalRecycle online Disposal Reporting System
Off-Road Equipment	California Air Resources Board's OFFROAD2007 model
Water	PMC's San Gabriel Valley Regional Water Model
Wastewater	PMC's San Gabriel Valley Regional Water Model

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**Table C-2: Sources for Municipal Inventory Activity Data**

Subsector	Source
Buildings – Electricity	Southern California Edison
Buildings – Natural Gas	Southern California Gas Company
Buildings – Stationary Diesel	City records
Off-Road Equipment Fuel Use	City records
Fleet Fuel Use	City records
Public Lighting Electricity	Southern California Edison
Water and Wastewater Pumping Electricity	Southern California Edison
Employee Travel	City records
Employee Commute	Online City survey completed by City employees
Government-Generated Solid Waste	City records

**Table C-3: Emissions Factors and Sources for 2006 Baseline Inventory**

Subsector	Original Emissions Factor		Source	Final Emissions Factor	
SCE Electricity	641.26	lbs CO <sub>2</sub> /MWh	LGOP v1.1, Table G.6	0.00029	MTCO <sub>2</sub> e/kWh
	0.031	lbs CH <sub>4</sub> /MWh	LGOP v1.1, Table G.7		
	0.009	lbs N <sub>2</sub> O/MWh	LGOP v1.1, Table G.7		
Direct Access Electricity	889.75	lbs CO <sub>2</sub> /MWh	LGOP v1.1, Table G.7	0.00041	MTCO <sub>2</sub> e/kWh
	0.031	lbs CH <sub>4</sub> /MWh	LGOP v1.1, Table G.7		
	0.009	lbs N <sub>2</sub> O/MWh	LGOP v1.1, Table G.7		
SoCal Gas – Natural Gas	53.06	kg CO <sub>2</sub> /MMBtu	LGOP v1.1, Table G.1	0.00532	MTCO <sub>2</sub> e/therm
	0.005	kg CH <sub>4</sub> /MMBtu	LGOP v1.1, Table G.3		
	0.0001	kg N <sub>2</sub> O/MMBtu	LGOP v1.1, Table G.3		
Stationary Diesel	10.21	lbs CO <sub>2</sub> /gallon	LGOP v1.1, Table G.1	0.01027	MTCO <sub>2</sub> e/gallon
	0.0015	lbs CH <sub>4</sub> /gallon	LGOP v1.1, Table G.4		
	0.0001	lbs N <sub>2</sub> O/gallon	LGOP v1.1, Table G.4		
Fleet Gasoline	8.78	kg CO <sub>2</sub> /gallon	LGOP v1.1, Table G.11	0.00878	MTCO <sub>2</sub> /gallon
	.0107–.4090	g CH <sub>4</sub> /mile*	LGOP v1.1, Table G.12	.0107–.4090	g CH <sub>4</sub> /mile*
	.0038–.1726	g N <sub>2</sub> O/mile*	LGOP v1.1, Table G.12	.0038–.1726	g N <sub>2</sub> O/mile*

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

Subsector	Original Emissions Factor		Source	Final Emissions Factor	
Fleet Diesel	10.21	kg CO <sub>2</sub> /gallon	LGOP v1.1, Table G.11	0.01021	MTCO <sub>2</sub> /gallon
	.0005-.0051	g CH <sub>4</sub> /mile*	LGOP v1.1, Table G.12	.0005-.0051	g CH <sub>4</sub> /mile*
	.0012-.0048	g N <sub>2</sub> O/mile*	LGOP v1.1, Table G.12	.0012-.0048	g N <sub>2</sub> O/mile*
Fleet CNG	0.054	kg CO <sub>2</sub> /scf	LGOP v1.1, Table G.11	0.000054	MTCO <sub>2</sub> /scf
	0.737	g CH <sub>4</sub> /mile	LGOP v1.1, Table G.13	0.000031	MTCO <sub>2</sub> e/mile
	0.05	g N <sub>2</sub> O/mile	LGOP v1.1, Table G.13		
Fleet LPG	5.59	kg CO <sub>2</sub> /gallon	LGOP v1.1, Table G.11	0.00559	MTCO <sub>2</sub> /Gallon
	0.037	g CH <sub>4</sub> /mile	LGOP v1.1, Table G.13	0.000022	MTCO <sub>2</sub> e/mile
	0.067	g N <sub>2</sub> O/mile	LGOP v1.1, Table G.13		
On-Road Transportation	505.5	g CO <sub>2</sub> /mile	EMFAC 2011	0.00053	MTCO <sub>2</sub> e/mile
	1.05	CO <sub>2</sub> e/CO <sub>2</sub>	Fehr & Peers Transportation Consultants		
Off-Road Construction	825	tons CO <sub>2</sub> /day in LA County	OFFROAD2007	273,900	MTCO <sub>2</sub> e/year in LA County
	0.0989	tons CH <sub>4</sub> /day in LA County	OFFROAD2007		
	0.0007	tons N <sub>2</sub> O/day in LA County	OFFROAD2007		
Off-Road Lawn and Garden	8.03	tons CO <sub>2</sub> /day in LA County	OFFROAD2007	3,410	MTCO <sub>2</sub> e/year in LA County
	0.0148	tons CH <sub>4</sub> /day in LA County	OFFROAD2007		
	0.0063	tons N <sub>2</sub> O/day in LA County	OFFROAD2007		
* Dependent on vehicle's model year and size.					

**Table C-4: Emissions Factors and Sources for 2010 Inventory**

Subsector	Original Emissions Factor		Source	Final Emissions Factor	
SCE Electricity*	630.89	lbs CO <sub>2</sub> /MWh	LGOP v1.1, Table G.6	0.00029	MTCO <sub>2</sub> e/kWh
	0.029	lbs CH <sub>4</sub> /MWh	LGOP v1.1, Table G.7		
	0.01	lbs N <sub>2</sub> O/MWh	LGOP v1.1, Table G.7		
Direct Access Electricity*	919.64	lbs CO <sub>2</sub> /MWh	LGOP v1.1, Table G.7	0.00042	MTCO <sub>2</sub> e/kWh
	0.029	lbs CH <sub>4</sub> /MWh	LGOP v1.1, Table G.7		
	0.01	lbs N <sub>2</sub> O/MWh	LGOP v1.1, Table G.7		
SoCal Gas – Natural Gas	53.06	kg CO <sub>2</sub> /MMBtu	LGOP v1.1, Table G.1	0.00532	MTCO <sub>2</sub> e/therm
	0.005	kg CH <sub>4</sub> /MMBtu	LGOP v1.1, Table G.3		
	0.0001	kg N <sub>2</sub> O/MMBtu	LGOP v1.1, Table G.3		

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

Subsector	Original Emissions Factor		Source	Final Emissions Factor	
Stationary Diesel	10.21	lbs CO <sub>2</sub> /gallon	LGOP v1.1, Table G.1	0.01027	MTCO <sub>2</sub> e/gallon
	0.0015	lbs CH <sub>4</sub> /gallon	LGOP v1.1, Table G.4		
	0.0001	lbs N <sub>2</sub> O/gallon	LGOP v1.1, Table G.4		
Fleet Gasoline	8.78	kg CO <sub>2</sub> /gallon	LGOP v1.1, Table G.11	0.00878	MTCO <sub>2</sub> /gallon
	.0107-.4090	g CH <sub>4</sub> /mile**	LGOP v1.1, Table G.12	.0107-.4090	g CH <sub>4</sub> /mile**
	.0038-.1726	g N <sub>2</sub> O/mile**	LGOP v1.1, Table G.12	.0038-.1726	g N <sub>2</sub> O/mile**
Fleet Diesel	10.21	kg CO <sub>2</sub> /gallon	LGOP v1.1, Table G.11	0.01021	MTCO <sub>2</sub> /gallon
	.0005-.0051	g CH <sub>4</sub> /mile**	LGOP v1.1, Table G.12	.0005-.0051	g CH <sub>4</sub> /mile**
	.0012-.0048	g N <sub>2</sub> O/mile**	LGOP v1.1, Table G.12	.0012-.0048	g N <sub>2</sub> O/mile**
Fleet CNG	0.054	kg CO <sub>2</sub> /scf	LGOP v1.1, Table G.11	0.000054	MTCO <sub>2</sub> /scf
	0.737	g CH <sub>4</sub> /mile	LGOP v1.1, Table G.13	0.000031	MTCO <sub>2</sub> e/mile
	0.05	g N <sub>2</sub> O/mile	LGOP v1.1, Table G.13		
Fleet LPG	5.59	kg CO <sub>2</sub> /gallon	LGOP v1.1, Table G.11	0.00559	MTCO <sub>2</sub> /gallon
	0.037	g CH <sub>4</sub> /mile	LGOP v1.1, Table G.13	0.000022	MTCO <sub>2</sub> e/mile
	0.067	g N <sub>2</sub> O/mile	LGOP v1.1, Table G.13		
On-Road Transportation	491.8	g CO <sub>2</sub> /mile	EMFAC 2011	0.00052	MTCO <sub>2</sub> e/mile
	1.05	CO <sub>2</sub> e/CO <sub>2</sub>	Fehr & Peers Transportation Consultants		
Off-Road Construction	879	tons CO <sub>2</sub> /day in LA County	OFFROAD2007	291,660	MTCO <sub>2</sub> e/year in LA County
	0.0853	tons CH <sub>4</sub> /day in LA County	OFFROAD2007		
	0.0007	tons N <sub>2</sub> O/day in LA County	OFFROAD2007		
Off-Road Lawn and Garden	8.97	tons CO <sub>2</sub> /day in LA County	OFFROAD2007	3,690	MTCO <sub>2</sub> e/year in LA County
	0.0144	tons CH <sub>4</sub> /day in LA County	OFFROAD2007		
	0.0061	tons N <sub>2</sub> O/day in LA County	OFFROAD2007		
* 2010 factors not available. 2007 factors used as a proxy.					
** Dependent on vehicle's model year and size.					

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

## QUANTIFICATION OF GHG AND ELECTRICITY REDUCTIONS

Policy	Policy 1.1: Educate the community on opportunities for behavioral changes.
Actions:	<ul style="list-style-type: none"> <li>• Work with the Energy Leader Partnership (ELP) and investigate options to partner with local school districts and other organizations to encourage creation of student energy efficiency ambassadors tasked with sharing energy efficiency information at events or through outreach.</li> <li>• Continue energy efficiency outreach with the Energy Leader Partnership (ELP) at community events.</li> <li>• Work with the Energy Wise Partnership (EWP) to expand the City's energy efficiency education efforts and regularly update energy-efficient resources on the City's website. Potential outreach options include hosting the Los Angeles County Energy Upgrade California kiosk.</li> </ul>
Applicable Reduction Target:	Reduce household electricity consumption 20% by 2020.
kWh Reduction (2020):	57,320 to 107,900
MTCO <sub>2</sub> e Reduction (2020):	10 to 30
Assumed Reduction per Participant:	110 kWh to 170 kWh
Performance Target(s) (2020):	510 to 640 participating households
Implementation Time Frame:	Near-Term
Implementation Department(s):	Community Development
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

Policy	<b>Policy 1.2: Support residential upgrades to more energy-efficient appliances and equipment.</b>
Actions:	<ul style="list-style-type: none"> <li>Promote rebate programs for refrigeration units, home kitchen appliances, washers and dryers, and other home equipment as programs become available, including rebates from the California Energy Commission and the South Coast Air Quality Management District.</li> <li>Participate in energy-efficient lighting exchanges with the Energy Leader Partnership (ELP) at community events and programs.</li> <li>Provide educational information on the use of smart-grid integrated appliances through the City’s website and distribution of Energy Leader Partnership (ELP) materials, and encourage participation in in-home monitoring programs provided by Southern California Edison (SCE).</li> </ul>
Applicable Reduction Target:	Reduce household electricity consumption 20% by 2020.
kWh Reduction (2020):	454,800 to 909,610
MTCO <sub>2</sub> e Reduction (2020):	110 to 230
Assumed Reduction per Participant:	90 kWh to 250 kWh
Performance Target(s) (2020):	2,150 to 4,310 participating single-family households 1,050 to 2,090 participating multi-family households
Implementation Time Frame:	Near-Term
Implementation Department(s):	Community Development
Reduction Method:	Using the California Residential Appliance Saturation Study, the most common appliances and their yearly average electricity use were combined to create a model of how much electricity is used by appliances in San Gabriel households. Assumed high and low reductions were then applied with assumed participation rate ranges for both owner-occupied units and renter-occupied households. Renter-occupied households were assumed to have lower participation rates than owner-occupied units.
Reduction Sources:	KEMA, Inc. 2010. 2009 California Residential Appliance Saturation Study, Volume 2: Results. CEC-200-2010-004.

Policy	<b>Policy 1.3: Support retrofits in 1% of the city’s single-family housing stock by 2014, 5% by 2017, and 7% by 2020 through a customized local outreach effort that supports regional efforts, such as Energy Upgrade California.</b>
Actions:	<ul style="list-style-type: none"> <li>Create an energy efficiency awards program to recognize and award prizes to homeowners that have achieved energy efficiency improvements in their homes to market opportunities to the community.</li> <li>Continue to partner with the San Gabriel Valley Council of Governments to promote rebate and funding opportunities for residential retrofits, including Energy Upgrade California.</li> <li>Seek out local community groups to champion energy efficiency in the residential</li> </ul>

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

<b>Policy</b>	<b>Policy 1.3: Support retrofits in 1% of the city’s single-family housing stock by 2014, 5% by 2017, and 7% by 2020 through a customized local outreach effort that supports regional efforts, such as Energy Upgrade California.</b>
	<p>building stock and benefit from program incentives that may be available for community-based organizations through regional programs.</p> <ul style="list-style-type: none"> <li>• Work with the Energy Leader Partnership (ELP) to prepare local case studies of successful projects and share online and at community events.</li> </ul>
Applicable Reduction Target:	Reduce household electricity consumption 20% by 2020.
kWh Reduction (2020):	773,300 to 4,833,150
MTCO <sub>2</sub> e Reduction (2020):	190 to 1,210
Assumed Reduction per Participant:	900 kWh to 2,810 kWh
Performance Target(s) (2020):	860 to 1,720 participating households
Implementation Time Frame:	Mid-Term
Implementation Department(s):	Community Development
Reduction Method:	Using electricity use from the San Gabriel Inventory and Forecast Report, the number of household reported by the California Department of Finance, and the percentage of owner-occupied and renter-occupied households from the 2010 Census, an average electricity use per owner-occupied household and renter-occupied household was created for the 2006 baseline. Assumed high and low reductions were then applied to assumed participation rate ranges for both owner-occupied units and renter-occupied households. Renter-occupied households were assumed to have lower participation rates than owner-occupied units. Reductions were only applied to non-appliance electricity use to avoid double counting with Policy 1.2.
Reduction Sources:	<p>Building Doctors. 2011. Los Angeles CA Home Energy Performance Assessment.</p> <p>Residential Energy Assessment Services (REAS), Inc. 2011a. Encino CA Home Energy Assessment.</p> <p>Residential Energy Assessment Services (REAS), Inc. 2011b. San Fernando CA Home Energy Performance Assessment.</p>

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Policy	<b>Policy 1.4: Encourage home energy benchmarking.</b>
Actions:	<ul style="list-style-type: none"> <li>• Consider updating the City’s development review and building permit forms to request voluntary Home Energy Rating System (HERS) ratings for homes.</li> <li>• Promote energy and green building labeling as a tool to increase property values in partnership with the Energy Leader Partnership (ELP) and Los Angeles County, including programs such as the Green Building Labeling pilot program, through which Los Angeles County is providing financial incentives for remodels or addition projects that achieve a GreenPoint Rated label.</li> <li>• Work with homeowner and realtor groups to share the benefits of energy home labeling and promote regional financial incentives to offset program costs.</li> <li>• Support the impact of market-based energy efficiency efforts, including the tracking and promotion of local home values through participation in green building labeling, including the Green Building Labeling pilot project.</li> </ul>
Applicable Reduction Target:	Reduce household electricity consumption 20% by 2020.
kWh Reduction (2020):	Supportive
MTCO <sub>2</sub> e Reduction (2020):	Supportive
Assumed Reduction per Participant:	110 kWh to 170 kWh
Performance Target(s) (2020):	510 to 640 participating households
Implementation Time Frame:	Mid-Term
Implementation Department(s):	Community Development
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable
Policy	<b>Policy 1.5: Increase energy efficiency and improve the quality and value of the city’s rental housing stock by encouraging retrofits in 5% of the city’s rental-occupied housing stock by 2017 and 8% by 2020 through property owner education and promotion of energy efficiency financing.</b>
Actions:	<ul style="list-style-type: none"> <li>• Work with the Energy Wise Partnership (EWP) to create outreach materials to multi-family and apartment complex building owners, including promotion of Los Angeles County Property Assessed Clean Energy (PACE) financing and Energy Upgrade California.</li> <li>• Distribute information on energy efficiency financing to multi-family landlords and property management firms through local chambers of commerce and targeted outreach efforts.</li> <li>• Work with the Energy Leader Partnership (ELP), the Southern California Regional Energy Center (SCREC), and Los Angeles County to encourage development of regional mechanisms to finance bulk purchasing efforts or revolving loans for renter-occupied units, building on SCREC’s efforts for municipal bulk purchasing and the revolving loan funding of the Los Angeles County Housing Innovation Fund (LAHICEF).</li> </ul>

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

<b>Policy</b>	<b>Policy 1.5: Increase energy efficiency and improve the quality and value of the city’s rental housing stock by encouraging retrofits in 5% of the city’s rental-occupied housing stock by 2017 and 8% by 2020 through property owner education and promotion of energy efficiency financing.</b>
	<ul style="list-style-type: none"> <li>Upon receipt of grant funding for affordable housing improvements, such as Community Development Block Grant (CDBG) funds or other programs, sub grant money to property owners such as the Los Angeles County Housing Authority to cover the cost of retrofits, including both labor and equipment.</li> </ul>
Applicable Reduction Target:	Reduce household electricity consumption 20% by 2020.
kWh Reduction (2020):	117,030 to 672,710
MTCO <sub>2e</sub> Reduction (2020):	40 to 170
Assumed Reduction per Participant:	840 kWh to 1,070 kWh per multi-family housing unit
Performance Target(s) (2020):	210 to 630 participating multi-family housing units
Implementation Time Frame:	Mid-Term
Implementation Department(s):	Community Development
Reduction Method:	Obtained a range of reductions from several multi-family retrofit project case studies (primarily for HVAC replacement, and HVAC distribution system retrofits). A high and low average reduction per unit was applied to the target participation rate to calculate community-wide reductions Note that the case studies are for 2- to 3-unit buildings. Reductions may have wide variability in other types of multi-family housing developments.
Reduction Sources:	EECGB Project Summary. 2012. Elk Grove Multi Family Retrofit Projects (not published).

<b>Policy</b>	<b>Policy 2.1: Integrate energy efficiency into the City’s long-term business development strategy.</b>
Actions:	<ul style="list-style-type: none"> <li>Task the business advisory committee with ongoing review and assessment of energy efficiency benefits for business development.</li> <li>Update the business permit process to include a checklist for consideration of energy efficiency programs, resources, and opportunities, such as Southern California Edison’s (SCE’s) Energy Management Solutions or Direct Install programs.</li> <li>Work with the Energy Wise Partnership (EWP), the Southern California Regional Energy Center (SCREC), and Southern California Edison (SCE) to create a prioritized list of publicly visible and/or energy-intense businesses to target for additional education for retrofits, based on nonresidential energy efficiency markets identified by SCE and the highest opportunity sectors for efficiency, based on regional programs and successes.</li> <li>Work with the San Gabriel Chamber of Commerce to use non-monetary incentives to encourage green remodels and business operations through creation of an energy-wise business certification, recognition, and awards program.</li> </ul>
Applicable Reduction Target:	Reduce nonresidential electricity use 15% by 2020.
kWh Reduction (2020):	Supportive

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Policy	Policy 2.1: Integrate energy efficiency into the City's long-term business development strategy.
MTCO <sub>2</sub> e Reduction (2020):	Supportive
Assumed Reduction per Participant:	Not applicable
Performance Target(s) (2020):	Not applicable
Implementation Time Frame:	Long-Term
Implementation Department(s):	Community Development
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable

Policy	Policy 2.2: Support the use of energy-efficient appliances and equipment in the nonresidential building stock.
Actions:	<ul style="list-style-type: none"> <li>Promote rebates for manufacturing and commercial activities, including Southern California Edison (SCE) rebates through the Energy Management Solutions Program for cooking and refrigeration appliances, lighting, and manufacturing equipment.</li> <li>Provide materials to encourage business participation in energy monitoring programs through Southern California Edison (SCE) or programs such as the Energy Star Portfolio Manager (ESPM), to help businesses understand and track the impact of appliances on energy use.</li> </ul>
Applicable Reduction Target:	Reduce nonresidential electricity use 15% by 2020.
kWh Reduction (2020):	5,708,260 to 8,562,380
MTCO <sub>2</sub> e Reduction (2020):	1,470 to 2,210
Assumed Reduction per Participant:	5% to 7% reduction in total kWh per business
Performance Target(s) (2020):	341,300 to 682,500 nonresidential square feet
Implementation Time Frame:	Mid-Term
Implementation Department(s):	Community Development
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable

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Policy	<b>Policy 2.3: Educate businesses about financing opportunities for energy efficiency improvements to achieve retrofits in 5% of the nonresidential building stock by 2015 and 8% by 2020.</b>
Actions:	<ul style="list-style-type: none"> <li>• Educate local building owners about free financial assistance for energy efficiency, and use local pilot efforts for ongoing education efforts. Potential programs to promote include Southern California Edison’s (SCE’s) Direct Install program for free energy efficiency improvements and Los Angeles County’s Building Performance Partnership, which provides up to \$250,000 in free engineering services.</li> <li>• Promote nonresidential financing options for energy efficiency improvements, including Los Angeles County Property Assessed Clean Energy (PACE) financing.</li> <li>• Partner with the San Gabriel Chamber of Commerce to educate property owners on other feasible options for energy efficiency financing, including integration of energy efficiency projects into capital lease structures, mortgage refinancing, and agreements with energy savings performance companies (ESCOs).</li> <li>• Use existing administrative procedures to promote energy efficiency in the existing nonresidential building stock, by distributing a packet with information on nonresidential financing and opportunities in annual business licensing letters.</li> </ul>
Applicable Reduction Target:	Reduce nonresidential electricity use 15% by 2020.
kWh Reduction (2020):	1,103,360 to 2,451,920
MTCO <sub>2e</sub> Reduction (2020):	290 to 630
Assumed Reduction per Participant:	16% to 21% reduction in total kWh per business
Performance Target(s) (2020):	204,800 to 341,300 nonresidential square feet
Implementation Time Frame:	Long-Term
Implementation Department(s):	Community Development
Reduction Method:	<p>Using the California End-Use Survey (CEUS), the average percentage of electricity used on the building envelope and lighting (heating, cooling, and lighting) was applied to the overall nonresidential electricity kWh used in San Gabriel. Citywide kWh nonresidential consumption by retrofit item was calculated by applying the CEUS figures for percentage of electricity consumed by each fixture. These kWh figures were then multiplied by the Brown et al. (2008) reduction by fixture estimates to calculate total kWh reductions by item, which were then summed to calculate overall reductions. A utilization rate was applied to the overall reductions because it is unlikely that each participant will upgrade every component of their building.</p>
Reduction Sources:	<p>Brown, Rich, Sam Borgeson, Jon Koomey, and Peter Biermayer. 2008. U.S. Building-Sector Energy Efficiency Potential. Ernest Orlando Lawrence Berkeley National Laboratory, University of California. <a href="http://enduse.lbl.gov/info/LBNL-1096E.pdf">http://enduse.lbl.gov/info/LBNL-1096E.pdf</a>.</p> <p>ICLEI - Local Governments for Sustainability. 2012. Climate and Air Pollution Planning Assistant (CAPPA) Version 1.5.</p> <p>Itron, Inc. 2007. California Commercial End-Use Survey – Results Page. <a href="http://capabilities.itron.com/CeusWeb/Chart.aspx">http://capabilities.itron.com/CeusWeb/Chart.aspx</a>.</p> <p>Los Angeles County Office of the Assessor. 2012. Los Angeles County Parcel Viewer. <a href="http://maps.assessor.lacounty.gov/mapping/viewer.asp">http://maps.assessor.lacounty.gov/mapping/viewer.asp</a>.</p>

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

Policy	<b>Policy 2.4: Support regional business collaboration and cost-sharing tactics to reduce operational costs and enhance profitability.</b>
Actions:	<ul style="list-style-type: none"> <li>• Work with regional entities such as the Southern California Regional Energy Center (SCREC) and Los Angeles County to create a revolving loan fund to pay the cost of nonresidential retrofits that are not covered by utility rebates or other existing incentives.</li> <li>• Work with local business leaders to support development of a regional energy economic forum for business owners to share lessons learned, case studies, and resources.</li> <li>• Partner with the San Gabriel Chamber of Commerce to highlight available energy efficiency programs to property owners.</li> </ul>
Applicable Reduction Target:	Not Applicable
kWh Reduction (2020):	Supportive
MTCO <sub>2</sub> e Reduction (2020):	Supportive
Assumed Reduction per Participant:	Not Applicable
Performance Target(s) (2020):	Not Applicable
Implementation Time Frame:	Mid-Term
Implementation Department(s):	Community Development
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable

Policy	<b>Policy 2.5: Provide tools that support the energy efficiency improvements of renter-occupied businesses.</b>
Actions:	<ul style="list-style-type: none"> <li>• Provide sample tenant-landlord agreements and pledges to integrate energy efficiency improvements into leases and contract provisions.</li> <li>• Work with the San Gabriel Chamber of Commerce and the Energy Wise Partnership (EWP) to develop a model lease that allows tenants and owners to share the costs of capital investments in energy efficiency and operational benefits through energy aligned leases for commercial properties, which would support shared landlord-tenant agreements that facilitate shared financing of energy efficiency retrofits to renter-occupied buildings.</li> </ul>
Applicable Reduction Target:	Reduce nonresidential electricity use 15% by 2020.
kWh Reduction (2020):	Supportive
MTCO <sub>2</sub> e Reduction (2020):	Supportive
Assumed Reduction per Participant:	Not Applicable
Performance Target(s) (2020):	Not Applicable
Implementation Time Frame:	Near-Term
Implementation Department(s):	Community Development
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

Policy	Policy 3.1: The City will maximize the energy efficiency of new buildings.
Actions:	<ul style="list-style-type: none"> <li>• Support net zero energy consumption through the use of innovative alternative building materials and designs that improve building energy efficiency.</li> <li>• Adopt the model San Gabriel Valley voluntary energy efficiency guidelines to help applicants identify cost-effective measures for their projects (see Appendix B, Policy 3.2, Policy 4.1, and Policy 6.3).</li> <li>• Encourage new nonresidential projects to participate in Southern California Edison’s (SCE’s) Savings By Design, a program that provides financial incentives, design assistance, and resources for new development to exceed minimum energy efficiency standards.</li> </ul>
Applicable Reduction Target:	Move toward net zero electricity use in new residential and nonresidential buildings by 2020.
kWh Reduction (2020):	277,370 to 339,010
MTCO <sub>2</sub> e Reduction (2020):	70 to 90
Assumed Reduction per Participant:	200 kWh per new household 5% kWh reduction per new nonresidential building
Performance Target(s) (2020):	All housing units and nonresidential buildings built between 2014 and 2020.
Implementation Time Frame:	Mid-Term
Implementation Department(s):	Community Development
Reduction Method:	Quantifies the reductions that will occur in new buildings built between 2014 and 2020. Uses mandatory Title 24 reductions that will occur in addition to those quantified in the ABAU greenhouse gas inventory and forecast as a proxy for reductions that will occur as the result of this policy’s actions.
Reduction Sources:	<p>Brook, M., B. Chrisman, P. David, T. Ealey, D. Eden, K. Moore, K. Rider, P. Strait, G. D. Taylor, and J. Wu. 2011. Draft Staff Report: Achieving Energy Savings in California Buildings (11-IEP-1F). California Energy Commission, Efficiency and Renewables Division. Publication number: CEC-400-2011-007-SD.</p> <p>California Energy Commission. 2012. 2013 Building Energy Efficiency Standards. <a href="http://www.energy.ca.gov/title24/2013standards/rulemaking/documents/2012-5-31-Item-05-Adoption_Hearing_Presentation.pdf">http://www.energy.ca.gov/title24/2013standards/rulemaking/documents/2012-5-31-Item-05-Adoption_Hearing_Presentation.pdf</a>.</p>

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

Policy	<b>Policy 3.2: Encourage the use of smart grid and Energy Star appliances in new development.</b>
Actions:	<ul style="list-style-type: none"> <li>• Use the model energy efficiency code identified in Policy 3.1 to support the use of smart-grid and EnergyStar appliances in new development, including energy-efficient equipment such as refrigeration units (see Appendix B, Policy 3.1, Policy 4.1, and Policy 6.3).</li> <li>• Promote funding sources for residential appliances as available, including state and federal rebate programs.</li> <li>• Provide educational information on the use of smart-grid integrated appliances through the City's website and distribution of Energy Wise Partnership (EWP) materials.</li> <li>• Update the City's CEQA Guidelines and/or discretionary review guidance to identify the use of smart-grid integrated appliances as preferred energy efficiency mitigation measures or conditions of approval for new development.</li> </ul>
Applicable Reduction Target:	Move toward net zero electricity use in new residential and nonresidential buildings by 2020.
kWh Reduction (2020):	Supportive
MTCO <sub>2</sub> e Reduction (2020):	Supportive
Assumed Reduction per Participant:	Not Applicable
Performance Target(s) (2020):	Not Applicable
Implementation Time Frame:	Long-Term
Implementation Department(s):	Community Development
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable

Policy	<b>Policy 3.3: Work with regional partners to develop an effective approach to achieve energy efficiency in new development.</b>
Actions:	<ul style="list-style-type: none"> <li>• Collaborate with the Energy Wise Partnership (EWP) and the Los Angeles Chapter of the US Green Building Council to provide local training and workshops for energy-efficient building opportunities.</li> <li>• Support development of a regional energy manager position that could serve as an advisor to project applicants interested in achieving energy efficiency. As necessary, rely on the Energy Wise Partnership (EWP), regional energy management efforts, and Los Angeles County to permit and review energy-efficient building projects.</li> <li>• Work with San Gabriel Valley cities to identify the most effective options to achieve energy efficiency in new development. By 2014, confirm the feasibility of adopting regionally-consistent, mandatory standards for new development to exceed mandatory Title 24 energy efficiency standards, such as adoption of Los Angeles</li> </ul>

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

Policy	<b>Policy 3.3: Work with regional partners to develop an effective approach to achieve energy efficiency in new development.</b>
	County's green building code.
Applicable Reduction Target:	Move toward net zero electricity use in new residential and nonresidential buildings by 2020.
kWh Reduction (2020):	Supportive
MTCO <sub>2</sub> e Reduction (2020):	Supportive
Assumed Reduction per Participant:	Not Applicable
Performance Target(s) (2020):	Not Applicable
Implementation Time Frame:	Long-Term
Implementation Department(s):	Community Development
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable

Policy	<b>Policy 4.1: Integrate energy efficiency into the City's discretionary permit review framework.</b>
Actions:	<ul style="list-style-type: none"> <li>• Adopt the model voluntary energy efficiency code to help applicants identify voluntary and feasible energy efficiency improvements for additions or remodels (see Appendix B, Policy 3.1, Policy 3.2, and Policy 6.3).</li> <li>• Use the voluntary energy efficiency guidelines as a tool during plan and Design Review Commission review of applications to encourage integration of cost-effective measures to improve the energy efficiency of projects.</li> <li>• Update the City's website with a summary of the model energy efficiency guidelines and local programs.</li> <li>• Update the City's CEQA Guidelines and/or discretionary review guidance to identify zero net energy for new development as a preferred greenhouse gas emission mitigation measure for new development.</li> <li>• By 2015, evaluate compliance with voluntary energy efficiency standards and consider adoption of mandatory energy efficiency standards that exceed the minimum standards of the Title 24 code.</li> <li>• Work with the Energy Wise Partnership (EWP) to create residential and nonresidential energy-efficiency packets with information on financing and resources, for distribution during pre-application meetings and at the planning counter. Packets will include information on residential financing programs such as Energy Upgrade California, on energy efficiency loans, and on property assessed clean energy (PACE) financing for nonresidential properties.</li> <li>• Update the City's Tenant Improvement checklist and informational materials to identify energy efficiency actions and building energy performance.</li> </ul>
Applicable Reduction Target:	Supportive of residential and nonresidential reduction targets.
kWh Reduction (2020):	Supportive
MTCO <sub>2</sub> e Reduction (2020):	Supportive

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

Policy	<b>Policy 4.1: Integrate energy efficiency into the City’s discretionary permit review framework.</b>
Assumed Reduction per Participant:	Not applicable
Performance Target(s) (2020):	Not applicable
Implementation Time Frame:	Mid-Term
Implementation Department(s):	Community Development
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable

Policy	<b>Policy 4.2: Create development incentives to encourage energy efficiency improvements and net zero energy in new development and remodels.</b>
Actions:	<ul style="list-style-type: none"> <li>Consider adoption of incentives for buildings to achieve net zero energy, such as allowing for a reduction of permit fees by 1% for every 1% improvement over Title 24 energy efficiency standards.</li> <li>Work with the Energy Wise Partnership (EWP) to use regional funding resources to offset reductions in permit fees.</li> </ul>
Applicable Reduction Target:	Supportive of residential and nonresidential reduction targets.
kWh Reduction (2020):	Supportive
MTCO <sub>2e</sub> Reduction (2020):	Supportive
Assumed Reduction per Participant:	Not Applicable
Performance Target(s) (2020):	Not Applicable
Implementation Time Frame:	Long-Term
Implementation Department(s):	Community Development
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable

Policy	<b>Policy 4.3: Diversify the City’s tax base through workforce development and fostering local financing programs for energy efficiency retrofits.</b>
Actions:	<ul style="list-style-type: none"> <li>Work with the Energy Wise Partnership (EWP) and the Southern California Regional Energy Center (SCREC) to identify local funding institutions to provide energy efficiency financing to residential projects.</li> <li>Help local businesses to benefit from the energy efficiency market by promoting local financing programs for energy efficiency and locally licensed contractors with energy efficiency credentials, including Building Performance Institute (BPI) training.</li> <li>Work with the Energy Wise Partnership (EWP) and other regional partners, such as the Los Angeles County Workforce Investment Board, to support local contractor training and certification for energy efficiency retrofits, including Building Performance Institute (BPI) training or other workforce development programs.</li> </ul>

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

Policy	<b>Policy 4.3: Diversify the City’s tax base through workforce development and fostering local financing programs for energy efficiency retrofits.</b>
Applicable Reduction Target:	Supportive of residential and nonresidential reduction targets.
kWh Reduction (2020):	Supportive
MTCO <sub>2</sub> e Reduction (2020):	Supportive
Assumed Reduction per Participant:	Not applicable
Performance Target(s) (2020):	Not applicable
Implementation Time Frame:	Mid-Term
Implementation Department(s):	Community Development
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable

Policy	<b>Policy 4.4: Collaborate with historic building owners in the Mission District and throughout the cultural resource areas designated in the General Plan to improve the energy efficiency of historic properties without compromising in character and integrity of the building.</b>
Actions:	<ul style="list-style-type: none"> <li>• Work with regional partners to train planning and building staff on appropriate energy efficiency measures for historic properties.</li> <li>• Develop and integrate energy efficiency guidance into the City’s design guidelines to include guidance and examples of appropriate energy-efficient improvements for historic properties.</li> <li>• Develop and disseminate information regarding energy efficiency upgrades and retrofits appropriate for historic buildings through brochures, websites, and local partnerships.</li> <li>• Provide waivers or reduced fees for building permit applications to complete energy efficiency upgrades and building repairs consistent with the Secretary of the Interior Standards for Rehabilitation.</li> <li>• Revise the City’s Mills Act Historic Property Preservation Agreement Application to encourage property owners to identify projects that maintain the historic integrity of the building while improving energy efficiency.</li> <li>• Encourage Mills Act participants to integrate energy efficiency measures into building renovations.</li> <li>• Monitor and encourage energy efficiency projects in the Mission District, connecting building owners to regional resources and promoting results as a pilot project.</li> <li>• Provide waivers or reduced fees for building permit applications to complete energy efficiency upgrades consistent with the Secretary of the Interior Standards for Rehabilitation.</li> <li>• Integrate energy efficiency standards into planning and building permit applications to renovate historic buildings.</li> <li>• Consider requiring Mills Act requests to include upgrades that will improve the energy efficiency of the building without compromising the historic integrity.</li> </ul>

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

<b>Policy</b>	<b>Policy 4.4: Collaborate with historic building owners in the Mission District and throughout the cultural resource areas designated in the General Plan to improve the energy efficiency of historic properties without compromising in character and integrity of the building.</b>
Applicable Reduction Target:	Supportive of residential and nonresidential reduction targets.
kWh Reduction (2020):	Supportive
MTCO <sub>2</sub> e Reduction (2020):	Supportive
Assumed Reduction per Participant:	Not applicable
Performance Target(s) (2020):	Not applicable
Implementation Time Frame:	Mid-Term
Implementation Department(s):	Community Development
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable

<b>Policy</b>	<b>Policy 5.1: Maximize the cooling of buildings through tree plantings and shading to reduce building electricity demands.</b>
Implementation Actions:	<ul style="list-style-type: none"> <li>• Prepare local case studies and promote creative options to achieve building shading through awnings, architectural features, and other techniques consistent with the City's historic and design guidelines.</li> <li>• Update the Zoning Code to encourage tree planting standards or covered parking/shade structure, to achieve shading of a minimum of 30% of parking lots within 15 years and 40% of public spaces within 15 years.</li> <li>• By 2015, consider strengthening the passive design guidance of the Valley Boulevard Neighborhoods Sustainability Plan to require building and structure shading. Evaluate the impact of the voluntary energy-efficiency code on building shading, and consider adopting mandatory standards for urban cooling.</li> </ul>
Applicable Reduction Target:	Supportive of residential and nonresidential reduction targets.
kWh Reduction (2020):	50,400 to 403,210
MTCO <sub>2</sub> e Reduction (2020):	10 to 100
Assumed Reduction per Participant:	Reduction of 0.1 to 0.2 kWh of electricity per shade tree planted
Performance Target(s) (2020):	1,060 to 2,120 participating households, and 341,260 to 682,520 participating nonresidential square feet
Implementation Time Frame:	Long-Term
Implementation Department(s):	Community Development
Reduction Method:	Shade trees can have a direct impact on decreasing the air conditioning load in buildings. This occurs when a tree's shade prevents the building from heating up throughout the day from the sunlight hitting windows and exterior walls. Using end-use surveys for both residential and commercial buildings, the average air conditioner electricity use was calculated for both homes and businesses. This average was applied to the community-

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

Policy	<b>Policy 5.1: Maximize the cooling of buildings through tree plantings and shading to reduce building electricity demands.</b>
	wide electricity use to estimate the total amount of electricity used in the city for air conditioning. A range of percentage reductions to cooling-related energy use per shade tree, taken from ICLEI's CAPP tool, were applied to a 2020 assumed tree planting goal to obtain a range of electricity reductions.
Reduction Sources:	<p>ICLEI - Local Governments for Sustainability. 2012. Climate and Air Pollution Planning Assistant (CAPP) Version 1.5.</p> <p>Itron, Inc. 2007. California Commercial End-Use Survey – Results Page. <a href="http://capabilities.itron.com/CeusWeb/Chart.aspx">http://capabilities.itron.com/CeusWeb/Chart.aspx</a>.</p>

Policy	<b>Policy 5.2: Reduce building electricity demands through voluntary standards and outreach to promote cool roofs and surfaces.</b>
Actions:	<ul style="list-style-type: none"> <li>• Showcase the benefits and opportunities to install cool roofs at community events, and update the City's website to provide links to Cool California resources.</li> <li>• Provide non-monetary support to energy-efficient ambassadors and community organizations to lead cool roof "work days" to re-paint traditional roofs at schools or public facilities with cool paint materials.</li> <li>• Through use of the voluntary energy efficiency guidelines, promote cost-effective opportunities to install cool roofs, light-colored paved surfaces, and permeable pavement. Cool materials come in all colors and materials, such as cool asphalt shingles.</li> </ul>
Applicable Reduction Target:	Supportive of residential and nonresidential reduction targets.
kWh Reduction (2020):	63,180 to 280,780
MTCO <sub>2</sub> e Reduction (2020):	20 to 90
Assumed Reduction per Participant:	Not Applicable
Performance Target(s) (2020):	2% to 5% portion of paved surfaces in the city to be replaced with cool, reflective materials
Implementation Time Frame:	Long-Term
Implementation Department(s):	Community Development
Reduction Method:	<p>Urban roadways and parking lots built or replaced with high-albedo pavements increase reflectivity, reduce urban temperatures, and can decrease building energy use. A percentage of urban surfaces were assumed to have an increase in reflectivity, in turn reducing the amount of electricity used in buildings in the community.</p>
Reduction Sources:	<p>Akbari, Hashem. Energy Savings Potentials and Air Quality Benefits of Urban Heat Island Mitigation. <a href="http://heatisland.lbl.gov/">http://heatisland.lbl.gov/</a>.</p> <p>California Building Standards Commission. 2010. California Code of Regulations, Title 24: Part 11: California Green Building Standards Code. <a href="http://www.documents.dgs.ca.gov/bsc/CALGreen/2010_CA_Green_Bldg.pdf">http://www.documents.dgs.ca.gov/bsc/CALGreen/2010_CA_Green_Bldg.pdf</a>.</p> <p>US Environmental Protection Agency. 2005. Reducing Urban Heat Island Compendium of Strategies: Cool Pavements. <a href="http://www.epa.gov/heatisd/resources/pdf/CoolPavesCompendium.pdf">http://www.epa.gov/heatisd/resources/pdf/CoolPavesCompendium.pdf</a>.</p>

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

Policy	<b>Policy 6.1: Promote water-efficient practices through educational efforts to promote the conservation of electricity for water pumping and treatment.</b>
Actions:	<ul style="list-style-type: none"> <li>• Become an Environmental Protection Agency (EPA) Water Sense Partner to obtain additional water conservation resources and promote water conservation to the community. The EPA's Water Sense is a free program that provides reputable water conservation resources, including guidelines and tools for high-performance and water-efficient products.</li> <li>• Update the City's website to promote water conservation.</li> </ul>
Applicable Reduction Target:	Supportive of residential and nonresidential reduction targets.
kWh Reduction (2020):	Supportive
MTCO <sub>2</sub> e Reduction (2020):	Supportive
Assumed Reduction per Participant:	Not Applicable
Performance Target(s) (2020):	Not Applicable
Implementation Time Frame:	Mid-Term
Implementation Department(s):	Community Development
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable

Policy	<b>Policy 6.2: Encourage the use of energy- and water-efficient water fixtures for indoor water use to reduce electricity use for water pumping.</b>
Actions:	<ul style="list-style-type: none"> <li>• Encourage local water providers to provide water conservation kits and surveys to customers.</li> <li>• Promote and distribute Southern California Edison's (SCE's) energy efficiency kit, which includes low-flow showerheads and faucet aerators.</li> </ul>
Applicable Reduction Target:	Supportive of residential and nonresidential reduction targets.
kWh Reduction (2020):	Supportive
MTCO <sub>2</sub> e Reduction (2020):	Supportive
Assumed Reduction per Participant:	Not Applicable
Performance Target(s) (2020):	Not Applicable
Implementation Time Frame:	Mid-Term
Implementation Department(s):	Community Development
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

Policy	<b>Policy 6.3: Support water-efficient landscaping to reduce the electricity demand for water transport and treatment.</b>
Actions:	<ul style="list-style-type: none"> <li>Adopt and use a model energy efficiency code and guidelines to encourage drought-tolerant landscaping and the use of water-efficient irrigation systems (see Appendix B, Policy 3.1, Policy 3.2, and Policy 4.1).</li> <li>By 2015, work with other San Gabriel Valley cities to consider adoption of mandatory water-efficient standards that exceed state requirements, such as CALGreen Tier 1 standards for water efficiency.</li> </ul>
Applicable Reduction Target:	Supportive of residential and nonresidential reduction targets.
kWh Reduction (2020):	743,110 to 990,810
MTCO <sub>2</sub> e Reduction (2020):	190 to 250
Assumed Reduction per Participant:	Unknown
Performance Target(s) (2020):	Unknown
Implementation Time Frame:	Mid-Term
Implementation Department(s):	Community Development
Reduction Method:	California Senate Bill (SB) x7-7 requires cities to reduce per capita water use 20% below baseline levels. This measure assumed the city will meet the 20% by 2020 target. The reductions attributed to indoor water use from existing buildings are calculated in this measure.
Reduction Sources:	Heaney, J. P., et al. Nature of Residential Water Use and Effectiveness of Conservation Programs – Table 1. <a href="http://bcn.boulder.co.us/basin/local/heaney.html">http://bcn.boulder.co.us/basin/local/heaney.html</a> .

Policy	<b>Policy 7.1: Lead the community by example through piloting cost-saving energy management practices.</b>
Actions:	<ul style="list-style-type: none"> <li>The City will work with the San Gabriel Valley Council of Governments (SGVCOG) to prepare an energy information display that highlights how residents and businesses can improve energy efficiency. The display would be intended for use at community events and City facilities as appropriate, such as City Hall.</li> <li>Assess the energy use and savings of facilities, or energy benchmarking, on a regular basis, and share results and improvements through the City’s website and City publications.</li> </ul>
Applicable Reduction Target:	Achieve Platinum-level status in SCE’s Energy Leader Partnership Model by reducing electricity use at municipal facilities by 20% by 2020..
kWh Reduction (2020):	Supportive
MTCO <sub>2</sub> e Reduction (2020):	Supportive
Assumed Reduction per Participant:	Not applicable
Performance Target(s) (2020):	Not applicable
Implementation Time Frame:	Near-Term
Implementation Department(s):	Community Development

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

<b>Policy</b>	<b>Policy 7.1: Lead the community by example through piloting cost-saving energy management practices.</b>
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable

<b>Policy</b>	<b>Policy 7.2: Implement an energy-efficient procurement policy (EPPP) to ensure the purchase of efficient equipment that will result in energy costs savings which outweigh additional up-front costs.</b>
Actions:	<ul style="list-style-type: none"> <li>• Adopt an energy efficient procurement policy, such as the Energy Wise Partnership’s model energy-efficient procurement policy (EPPP), to guide each department to consider energy efficiency and long-term operation and maintenance costs in the procurement process.</li> <li>• Work with the San Gabriel Valley Council of Governments (SGVCOG) and regional partners to reduce the costs of energy-efficient appliances and equipment through bulk purchases.</li> </ul>
Applicable Reduction Target:	Achieve Platinum-level status in SCE’s Energy Leader Partnership Model by reducing electricity use at municipal facilities by 20% by 2020..
kWh Reduction (2020):	Supportive
MTCO <sub>2</sub> e Reduction (2020):	Supportive
Assumed Reduction per Participant:	Not applicable
Performance Target(s) (2020):	Not applicable
Implementation Time Frame:	Near-Term
Implementation Department(s):	Public Works, Finance
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable

<b>Policy</b>	<b>Policy 7.3: Improve indoor equipment and install controls to reduce unnecessary energy use and costs within City buildings.</b>
Actions:	<ul style="list-style-type: none"> <li>• Install office control equipment, including plug load sensors, at all City buildings.</li> <li>• Install motion control sensors on water fountains to optimize the efficiency of water fountain compressors.</li> <li>• Install lighting controls, photo cells, time clocks, or sensors to automatically turn off electrical systems and lighting when not in use. This action will target all facilities, but the greatest opportunities for energy reductions may be at City Hall (including offices, common spaces, supply closets), in addition to bathrooms and offices at the Mission Playhouse.</li> </ul>
Applicable Reduction Target:	Achieve Platinum-level status in SCE’s Energy Leader Partnership Model by reducing electricity use at municipal facilities by 20% by 2020..

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

Policy	<b>Policy 7.3: Improve indoor equipment and install controls to reduce unnecessary energy use and costs within City buildings.</b>
kWh Reduction (2020):	Supportive
MTCO <sub>2</sub> e Reduction (2020):	Supportive
Assumed Reduction per Participant:	Not applicable
Performance Target(s) (2020):	Not applicable
Implementation Time Frame:	Mid-Term
Implementation Department(s):	Public Works
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable

Policy	<b>Policy 7.4: Improve the building envelope of existing City facilities while enhancing historic character.</b>
Actions:	<ul style="list-style-type: none"> <li>• Replace the glass of inefficient windows at City facilities to optimize energy efficiency.</li> <li>• Complete audits at all City facilities to create a prioritized list of potential retrofits, ranked by payback period and potential to reduce maintenance costs.</li> <li>• As grant or other funds become available, complete the retrofits identified in the prioritized list.</li> <li>• Consider setting aside municipal savings from energy efficiency projects to fund additional energy efficiency projects.</li> <li>• Investigate the value and opportunity of creating a municipal revolving loan fund.</li> <li>• Highlight and share energy efficiency projects and savings with City decision-makers, staff, and the community as a means to demonstrate cost-effective energy efficiency projects.</li> </ul>
Applicable Reduction Target:	Achieve Platinum-level status in SCE's Energy Leader Partnership Model by reducing electricity use at municipal facilities by 20% by 2020..
kWh Reduction (2020):	Supportive
MTCO <sub>2</sub> e Reduction (2020):	Supportive
Assumed Reduction per Participant:	Not applicable
Performance Target(s) (2020):	Not applicable
Implementation Time Frame:	Mid-Term
Implementation Department(s):	Public Works
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

<b>Policy</b>	<b>Policy 7.5: Develop a Long-Range Plan to Increase the Energy Efficiency of Heating, Ventilation, and Air Conditioning (HVAC) Equipment at Large Energy-consuming Facilities, including City Hall, The Mission Playhouse, the Police Department, and Fire Station Facilities.</b>
Actions:	<ul style="list-style-type: none"> <li>• Work with the San Gabriel Valley Energy Wise Partnership to secure funding and complete additional audits of HVAC units at the City's largest energy-consuming facilities.</li> <li>• Upgrade, replace, and relocate HVAC units based on audit recommendations for optimal energy efficiency. In addition to mechanical and equipment upgrades, improvements should also include installation of micro-climate controls and programmable thermostats.</li> <li>• Together with Southern California Edison (SCE) and the Energy Wise Partnership (EWP), pursue the installation of electricity service meters at HVAC units to allow for separate tracking and monitoring.</li> </ul>
Applicable Reduction Target:	Achieve Platinum-level status in SCE's Energy Leader Partnership Model by reducing electricity use at municipal facilities by 20% by 2020..
kWh Reduction (2020):	Supportive
MTCO <sub>2</sub> e Reduction (2020):	Supportive
Assumed Reduction per Participant:	Not applicable
Performance Target(s) (2020):	Not applicable
Implementation Time Frame:	Long-Term
Implementation Department(s):	Public Works
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable
<b>Policy</b>	<b>Policy 7.6: Improve outdoor lighting to achieve optimal levels of public safety while reducing maintenance and operational costs.</b>
Actions:	<ul style="list-style-type: none"> <li>• Install selective light dimming at parks and parking lots consistent with public safety standards.</li> <li>• Install light and motion sensors for outdoor lights at City facilities.</li> <li>• Continue to identify opportunities to upgrade older series 6.6 high voltage streetlights to low voltage 120 volt circuits and energy-efficient fixtures, allowing the City to reduce ongoing operational and maintenance costs and achieve lower Southern California Edison (SCE) billing rates.</li> </ul>
Applicable Reduction Target:	Achieve Platinum-level status in SCE's Energy Leader Partnership Model by reducing electricity use at municipal facilities by 20% by 2020..
kWh Reduction (2020):	Supportive
MTCO <sub>2</sub> e Reduction (2020):	Supportive
Assumed Reduction per Participant:	Not applicable

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

Policy	<b>Policy 7.6: Improve outdoor lighting to achieve optimal levels of public safety while reducing maintenance and operational costs.</b>
Performance Target(s) (2020):	Not applicable
Implementation Time Frame:	Mid-Term
Implementation Department(s):	Public Works
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable

Policy	<b>Policy 7.7: Conserve water use at City facilities to conserve electricity for water pumping and model best practices to the community.</b>
Actions:	<ul style="list-style-type: none"> <li>• Install irrigation controls that are more efficient users of electricity and conserve water.</li> <li>• Pilot water-conserving practices at public parks or other visible places, accompanied with signage or other information that will help to educate the community.</li> </ul>
Applicable Reduction Target:	Achieve Platinum-level status in SCE’s Energy Leader Partnership Model by reducing electricity use at municipal facilities by 20% by 2020..
kWh Reduction (2020):	Supportive
MTCO <sub>2</sub> e Reduction (2020):	Supportive
Assumed Reduction per Participant:	Not applicable
Performance Target(s) (2020):	Not applicable
Implementation Time Frame:	Mid-Term
Implementation Department(s):	Public Works
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable

Policy	<b>Policy 7.8: Work with the SGVCOG to use regional partners for creation of an energy management position to track energy use at City facilities, identify opportunities for efficiencies and cost savings, and help each department implement energy efficiency projects.</b>
Actions:	<ul style="list-style-type: none"> <li>• Continue to support City staff participation in regional planning efforts and trainings related to energy efficiency.</li> <li>• Encourage creation of a regional energy manager position through the San Gabriel Valley Council of Governments (SGVCOG) to coordinate the City of San Gabriel’s efficiency efforts and help departments implement energy-reduction activities.</li> </ul>
Applicable Reduction Target:	Achieve Platinum-level status in SCE’s Energy Leader Partnership Model by reducing electricity use at municipal facilities by 20% by 2020..
kWh Reduction (2020):	Supportive

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

<b>Policy</b>	<b>Policy 7.8: Work with the SGVCOG to use regional partners for creation of an energy management position to track energy use at City facilities, identify opportunities for efficiencies and cost savings, and help each department implement energy efficiency projects.</b>
MTCO <sub>2</sub> e Reduction (2020):	Supportive
Assumed Reduction per Participant:	Not applicable
Performance Target(s) (2020):	Not applicable
Implementation Time Frame:	Mid-Term
Implementation Department(s):	Community Development
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

## QUANTIFICATION OF COSTS

### Policy 1.1: Educate the community on opportunities for behavioral changes.

Residential – Upfront Cost per Household:	Unknown
Residential – Estimated Incentives per Household:	Unknown
Residential – Total Cost per Household:	Unknown
Residential – Yearly Savings per Household:	\$18 to \$27
Residential – Simple Payback Period (years):	Unknown

#### Costing Method:

The Bonneville Power Administration (BPA) report includes a series of programs and their associated costs. A range was assembled based on similar outreach programs, in this case, for a low-cost citywide normative information distribution program.

#### Costing Sources:

Bonneville Power Administration (BPA). 2011. Residential Behavior Based Energy Efficiency Program Profiles 2011. [http://www.bpa.gov/Energy/n/pdf/BBEE\\_Res\\_Profiles\\_Dec\\_2011.pdf](http://www.bpa.gov/Energy/n/pdf/BBEE_Res_Profiles_Dec_2011.pdf).

### Policy 1.2: Support residential upgrades to more energy-efficient appliances and equipment.

Residential – Upfront Cost per Household:	Not Applicable
Residential – Estimated Incentives per Household:	Not Applicable
Residential – Total Cost per Household:	\$1,090 incremental cost for all quantified appliances
Residential – Yearly Savings per Household:	\$10 to \$40 saved from appliance upgrades
Residential – Simple Payback Period (years):	27 to 55 years

#### Costing Method:

Multiplied Climate and Air Pollution Planning Assistance (CAPPA incremental cost estimates for energy-efficient dishwashers, water heaters, clothes washers, and water heaters by the number of participating homes to find total community cost.

#### Costing Sources:

ICLEI – Local Governments for Sustainability. 2012. Climate and Air Pollution Planning Assistant (CAPPA) Version 1.5.  
 KEMA, Inc. 2010. 2009 California Residential Appliance Saturation Study, Volume 2: Results. CEC-200-2010-004.

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

## Policy 1.3: Support retrofits in 1% of the city’s single-family housing stock by 2014, 5% by 2017, and 7% by 2020 through a customized local outreach effort that supports regional efforts, such as Energy Upgrade California.

Residential – Upfront Cost per Household:	Not Applicable
Residential – Estimated Incentives per Household:	Not Applicable
Residential – Total Cost per Household:	\$2,000 to \$5,000
Residential – Yearly Savings per Household:	\$150 to \$460
Residential – Simple Payback Period (years):	10 to 13 years

### Costing Method:

High and low total project costs were obtained from Los Angeles County Energy Upgrade California projects. These were multiplied by target participation rates to find total community cost.

### Costing Sources:

- Building Doctors. 2011. Los Angeles CA Home Energy Performance Assessment.
- Residential Energy Assessment Services (REAS), Inc. 2011a. Encino CA Home Energy Assessment.
- Residential Energy Assessment Services (REAS), Inc. 2011b. San Fernando CA Home Energy Performance Assessment.

## Policy 1.4: Encourage home energy benchmarking.

Residential – Upfront Cost per Household:	Not Applicable
Residential – Estimated Incentives per Household:	Not Applicable
Residential – Total Cost per Household:	Not Applicable
Residential – Yearly Savings per Household:	Not Applicable
Residential – Simple Payback Period (years):	Not Applicable

### Costing Method:

Not Applicable

### Costing Sources:

Not Applicable

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

## Policy 1.5: Increase energy efficiency and improve the quality and value of the city’s rental and affordable housing stock by encouraging retrofits in 5% of the city’s rental-occupied housing stock by 2017 and 8% by 2020 through property owner education and promotion of energy efficiency financing.

Residential – Upfront Cost per Household:	Not Applicable
Residential – Estimated Incentives per Household:	Not Applicable
Residential – Total Cost per Multi-Family Unit:	\$3,300 to \$5,000
Residential – Yearly Savings per Household:	\$140 to \$170
Residential – Simple Payback Period (years):	24 to 29 years
Commercial – Upfront Cost per Business:	Not Applicable
Commercial – Estimated Incentives per Business:	Not Applicable
Commercial – Total Cost per Business:	Not Applicable
Commercial – Yearly Savings per Business:	Not Applicable
Commercial – Simple Payback Period (years):	Not Applicable

### Costing Method:

Obtained a range of costs from several multi-family retrofit project case studies (primarily for HVAC replacement, and HVAC distribution system retrofits). A high and low average cost per unit was applied to the target participation rate to calculate community-wide costs. Note that the case studies are for 2- to 3-unit buildings. Costs may have wide variability in other types of multi-family housing developments.

### Costing Sources:

ECCGB Project Summary. 2012. Elk Grove Multi Family Retrofit Projects (not published).

## Policy 2.1: Integrate energy efficiency into the City’s long-term business development strategy.

Commercial – Upfront Cost per Business:	Not Applicable
Commercial – Estimated Incentives per Business:	Not Applicable
Commercial – Total Cost per Business:	Not Applicable
Commercial – Yearly Savings per Business:	Not Applicable
Commercial – Simple Payback Period (years):	Not Applicable

### Costing Method:

Not Applicable

### Costing Sources:

Not Applicable

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

## Policy 2.2: Support the use of energy-efficient appliances and equipment in the nonresidential building stock.

Commercial – Upfront Cost per Business:	Unknown
Commercial – Estimated Incentives per Business:	Unknown
Commercial – Total Cost per Business:	Unknown
Commercial – Yearly Savings per Business:	5% reduction in total kWh per business
Commercial – Simple Payback Period (years):	Unknown
Costing Method:	Not Applicable
Costing Sources:	Not Applicable

## Policy 2.3: Educate businesses about financing opportunities for energy efficiency improvements to achieve retrofits in 5% of the nonresidential building stock by 2015 and 8% by 2020.

Commercial – Upfront Cost per Business:	Unknown
Commercial – Estimated Incentives per Business:	Unknown
Commercial – Total Cost per Business:	Unknown
Commercial – Yearly Savings per Business:	16% to 21% reduction in total kWh per business
Commercial – Simple Payback Period (years):	Unknown
Costing Method:	Unknown
Costing Sources:	Unknown

## Policy 2.4: Support regional business collaboration and cost-sharing tactics to reduce operational costs and enhance profitability.

Commercial – Upfront Cost per Business:	Not Applicable
Commercial – Estimated Incentives per Business:	Not Applicable
Commercial – Total Cost per Business:	Not Applicable
Commercial – Yearly Savings per Business:	Not Applicable
Commercial – Simple Payback Period (years):	Not Applicable
Costing Method:	Not Applicable
Costing Sources:	Not Applicable

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

## Policy 2.5: Provide tools that support the energy efficiency improvements of renter-occupied businesses.

Commercial – Upfront Cost per Business:	Not Applicable
Commercial – Estimated Incentives per Business:	Not Applicable
Commercial – Total Cost per Business:	Not Applicable
Commercial – Yearly Savings per Business:	Not Applicable
Commercial – Simple Payback Period (years):	Not Applicable

Costing Method:

Not Applicable

Costing Sources:

Not Applicable

## Policy 3.1: The City will maximize the energy efficiency of new buildings.

Residential – Upfront Cost per Household:	Not Applicable
Residential – Estimated Incentives per Household:	Not Applicable
Residential – Total Cost per Household:	Not Applicable
Residential – Yearly Savings per Household:	Not Applicable
Residential – Simple Payback Period (years):	Not Applicable
Commercial – Upfront Cost per Business:	Unknown
Commercial – Estimated Incentives per Business:	Unknown
Commercial – Total Cost per Business:	Unknown
Commercial – Yearly Savings per Business:	5% reduction in kWh per new nonresidential building
Commercial – Simple Payback Period (years):	Unknown

Costing Method:

Unknown

Costing Sources:

Unknown

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

## Policy 3.2: Encourage the use of smart grid and Energy Star appliances in new development.

Residential – Upfront Cost per Household:	Not Applicable
Residential – Estimated Incentives per Household:	Not Applicable
Residential – Total Cost per Household:	Not Applicable
Residential – Yearly Savings per Household:	Not Applicable
Residential – Simple Payback Period (years):	Not Applicable
Commercial – Upfront Cost per Business:	Not Applicable
Commercial – Estimated Incentives per Business:	Not Applicable
Commercial – Total Cost per Business:	Not Applicable
Commercial – Yearly Savings per Business:	Not Applicable
Commercial – Simple Payback Period (years):	Not Applicable

Costing Method:

Not Applicable

Costing Sources:

Not Applicable

## Policy 3.3: Work with regional partners to develop an effective approach to achieve energy efficiency in new development.

Residential – Upfront Cost per Household:	Not Applicable
Residential – Estimated Incentives per Household:	Not Applicable
Residential – Total Cost per Household:	Not Applicable
Residential – Yearly Savings per Household:	Not Applicable
Residential – Simple Payback Period (years):	Not Applicable
Commercial – Upfront Cost per Business:	Not Applicable
Commercial – Estimated Incentives per Business:	Not Applicable
Commercial – Total Cost per Business:	Not Applicable
Commercial – Yearly Savings per Business:	Not Applicable
Commercial – Simple Payback Period (years):	Not Applicable

Costing Method:

Not Applicable

Costing Sources:

Not Applicable

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

## Policy 4.1: Integrate energy efficiency into the City's discretionary permit review framework.

Residential – Upfront Cost per Household:	Not Applicable
Residential – Estimated Incentives per Household:	Not Applicable
Residential – Total Cost per Household:	Not Applicable
Residential – Yearly Savings per Household:	Not Applicable
Residential – Simple Payback Period (years):	Not Applicable
Commercial – Upfront Cost per Business:	Not Applicable
Commercial – Estimated Incentives per Business:	Not Applicable
Commercial – Total Cost per Business:	Not Applicable
Commercial – Yearly Savings per Business:	Not Applicable
Commercial – Simple Payback Period (years):	Not Applicable

### Costing Method:

Not Applicable

### Costing Sources:

Not Applicable

## Policy 4.2: Create development incentives to encourage energy efficiency improvements and net zero energy in new development and remodels.

Residential – Upfront Cost per Household:	Not Applicable
Residential – Estimated Incentives per Household:	Not Applicable
Residential – Total Cost per Household:	Not Applicable
Residential – Yearly Savings per Household:	Not Applicable
Residential – Simple Payback Period (years):	Not Applicable
Commercial – Upfront Cost per Business:	Not Applicable
Commercial – Estimated Incentives per Business:	Not Applicable
Commercial – Total Cost per Business:	Not Applicable
Commercial – Yearly Savings per Business:	Not Applicable
Commercial – Simple Payback Period (years):	Not Applicable

### Costing Method:

Not Applicable

### Costing Sources:

Not Applicable

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

## Policy 4.3: Diversify the City’s tax base through workforce development and fostering local financing programs for energy efficiency retrofits.

Residential – Upfront Cost per Household:	Not Applicable
Residential – Estimated Incentives per Household:	Not Applicable
Residential – Total Cost per Household:	Not Applicable
Residential – Yearly Savings per Household:	Not Applicable
Residential – Simple Payback Period (years):	Not Applicable
Commercial – Upfront Cost per Business:	Not Applicable
Commercial – Estimated Incentives per Business:	Not Applicable
Commercial – Total Cost per Business:	Not Applicable
Commercial – Yearly Savings per Business:	Not Applicable
Commercial – Simple Payback Period (years):	Not Applicable
Costing Method:	
Not Applicable	
Costing Sources:	
Not Applicable	

## Policy 4.4: Collaborate with historic building owners in the Mission District and throughout the cultural resource areas designated in the General Plan to improve the energy efficiency of historic properties without compromising the character and integrity of the building.

Residential – Upfront Cost per Household:	Not Applicable
Residential – Estimated Incentives per Household:	Not Applicable
Residential – Total Cost per Household:	Not Applicable
Residential – Yearly Savings per Household:	Not Applicable
Residential – Simple Payback Period (years):	Not Applicable
Commercial – Upfront Cost per Business:	Not Applicable
Commercial – Estimated Incentives per Business:	Not Applicable
Commercial – Total Cost per Business:	Not Applicable
Commercial – Yearly Savings per Business:	Not Applicable
Commercial – Simple Payback Period (years):	Not Applicable
Costing Method:	
Not Applicable	
Costing Sources:	
Not Applicable	

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

## Policy 5.1: Maximize the cooling of buildings through tree planting and shading to reduce building electricity demands.

Residential – Upfront Cost per Household:	Not Applicable
Residential – Estimated Incentives per Household:	Not Applicable
Residential – Total Cost per Household:	\$200
Residential – Yearly Savings per Household:	\$2 to \$9
Residential – Simple Payback Period (years):	10 to 20 years
Commercial – Upfront Cost per Business:	Not Applicable
Commercial – Estimated Incentives per Business:	Not Applicable
Commercial – Total Cost per Business:	\$200
Commercial – Yearly Savings per Business:	Unknown
Commercial – Simple Payback Period (years):	Unknown

### Costing Method:

The average estimated cost of a mature shade tree with installation is \$200.

### Costing Sources:

ICLEI – Local Governments for Sustainability. 2012. Climate and Air Pollution Planning Assistant (CAPPA) Version 1.5.

## Policy 5.2: Reduce building electricity demands through voluntary standards and outreach to promote cool roofs and surfaces.

Total Cost to City:	\$163,700 to \$842,800
Residential – Upfront Cost per Household:	Not Applicable
Residential – Estimated Incentives per Household:	Not Applicable
Residential – Total Cost per Household:	Not Applicable
Residential – Yearly Savings per Household:	Not Applicable
Residential – Simple Payback Period (years):	Not Applicable
Commercial – Upfront Cost per Business:	Not Applicable
Commercial – Estimated Incentives per Business:	Not Applicable
Commercial – Total Cost per Business:	Not Applicable
Commercial – Yearly Savings per Business:	Not Applicable
Commercial – Simple Payback Period (years):	Not Applicable

### Costing Method:

Multiplied Cool Pavement Report cost estimates by the low and high estimates of paved surfaces to be replaced.

### Costing Sources:

Cambridge Systematics, Inc. 2005. Cool Pavement Report EPA Cool Pavements Study – Task 5.

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

## Policy 6.1: Promote water-efficient practices through educational efforts to promote the conservation of electricity for water pumping and treatment.

Residential – Upfront Cost per Household:	Not Applicable
Residential – Estimated Incentives per Household:	Not Applicable
Residential – Total Cost per Household:	Not Applicable
Residential – Yearly Savings per Household:	Not Applicable
Residential – Simple Payback Period (years):	Not Applicable
Commercial – Upfront Cost per Business:	Not Applicable
Commercial – Estimated Incentives per Business:	Not Applicable
Commercial – Total Cost per Business:	Not Applicable
Commercial – Yearly Savings per Business:	Not Applicable
Commercial – Simple Payback Period (years):	Not Applicable

Costing Method:

Not Applicable

Costing Sources:

Not Applicable

## Policy 6.2: Encourage the use of energy- and water-efficient water fixtures for indoor water use to reduce electricity use for water pumping.

Annual Cost to City:	Not Applicable
Residential – Upfront Cost per Household:	Not Applicable
Residential – Estimated Incentives per Household:	Not Applicable
Residential – Total Cost per Household:	Not Applicable
Residential – Yearly Savings per Household:	Not Applicable
Residential – Simple Payback Period (years):	Not Applicable
Commercial – Upfront Cost per Business:	Not Applicable
Commercial – Estimated Incentives per Business:	Not Applicable
Commercial – Total Cost per Business:	Not Applicable
Commercial – Yearly Savings per Business:	Not Applicable
Commercial – Simple Payback Period (years):	Not Applicable

Costing Method:

Not Applicable

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

## Policy 6.2: Encourage the use of energy- and water-efficient water fixtures for indoor water use to reduce electricity use for water pumping.

Costing Sources:

Not Applicable

## Policy 6.3: Support water-efficient landscaping to reduce the electricity demand for water transport and treatment.

Residential – Upfront Cost per Household:	Not Applicable
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Residential – Estimated Incentives per Household:	Not Applicable
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Residential – Total Cost per Household:	Not Applicable
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Residential – Yearly Savings per Household:	Not Applicable
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Residential – Simple Payback Period (years):	Not Applicable
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Commercial – Upfront Cost per Business:	Not Applicable
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Commercial – Estimated Incentives per Business:	Not Applicable
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Commercial – Total Cost per Business:	Not Applicable
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Commercial – Yearly Savings per Business:	Not Applicable
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Commercial – Simple Payback Period (years):	Not Applicable
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Costing Method:

Not Applicable

Costing Sources:

Not Applicable

## Policy 7.1: Lead the community by example through piloting cost-saving energy management practices.

Municipal– Upfront Cost	Not Estimated
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Municipal – Estimated Incentives	Not Estimated
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Municipal– Total Cost	Not Estimated
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Municipal– Yearly Savings	Not Estimated
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Municipal– Simple Payback Period (years):	Not Estimated
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Costing Method:

Not Applicable

Costing Sources:

Not Applicable

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

## Policy 7.2: Implement an energy-efficient procurement policy (EPP) to ensure the purchase of efficient equipment that will result in energy costs savings which outweigh additional up-front costs.

Municipal– Upfront Cost	Not Estimated
Municipal – Estimated Incentives	Not Estimated
Municipal– Total Cost	Not Estimated
Municipal– Yearly Savings	Not Estimated
Municipal– Simple Payback Period (years):	Not Estimated

Costing Method:

Not Applicable

Costing Sources:

Not Applicable

## Policy 7.3: Improve indoor equipment and install controls to reduce unnecessary energy use and costs within City buildings.

Municipal– Upfront Cost	Not Estimated
Municipal – Estimated Incentives	Not Estimated
Municipal– Total Cost	Not Estimated
Municipal– Yearly Savings	Not Estimated
Municipal– Simple Payback Period (years):	Not Estimated

Costing Method:

Not Applicable

Costing Sources:

Not Applicable

## Policy 7.4: Improve the building envelope of existing City facilities while enhancing historic character.

Municipal– Upfront Cost	Not Estimated
Municipal – Estimated Incentives	Not Estimated
Municipal– Total Cost	Not Estimated
Municipal– Yearly Savings	Not Estimated
Municipal– Simple Payback Period (years):	Not Estimated

Costing Method:

Not Applicable

Costing Sources:

Not Applicable

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

**Policy 7.5: Develop a long-range plan to increase the energy efficiency of heating, ventilation, and air conditioning (HVAC) equipment at large energy-consuming facilities, including City Hall, the Mission Playhouse, the Police Department, and fire station facilities.**

Municipal– Upfront Cost	Not Estimated
Municipal – Estimated Incentives	Not Estimated
Municipal– Total Cost	Not Estimated
Municipal– Yearly Savings	Not Estimated
Municipal– Simple Payback Period (years):	Not Estimated
Costing Method:	
Not Applicable	
Costing Sources:	
Not Applicable	

**Policy 7.6: Improve outdoor lighting to achieve optimal levels of public safety while reducing maintenance and operational costs.**

Municipal– Upfront Cost	Not Estimated
Municipal – Estimated Incentives	Not Estimated
Municipal– Total Cost	Not Estimated
Municipal– Yearly Savings	Not Estimated
Municipal– Simple Payback Period (years):	Not Estimated
Costing Method:	
Not Applicable	
Costing Sources:	
Not Applicable	

**Policy 7.7: Conserve water use at City facilities to conserve electricity for water pumping and model best practices to the community.**

Municipal– Upfront Cost	Not Estimated
Municipal – Estimated Incentives	Not Estimated
Municipal– Total Cost	Not Estimated
Municipal– Yearly Savings	Not Estimated
Municipal– Simple Payback Period (years):	Not Estimated
Costing Method:	

# APPENDIX B: GREENHOUSE GAS EMISSIONS INVENTORY

## **Policy 7.7: Conserve water use at City facilities to conserve electricity for water pumping and model best practices to the community.**

Not Applicable

Costing Sources:

Not Applicable

## **Policy 7.8: Work with the SGVCOG to use regional partners for creation of an energy management position to track energy use at City facilities, identify opportunities for efficiencies and cost savings, and help each department implement energy efficiency projects.**

Municipal– Upfront Cost	Not Estimated
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Municipal – Estimated Incentives	Not Estimated
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Municipal– Total Cost	Not Estimated
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Municipal– Yearly Savings	Not Estimated
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Municipal– Simple Payback Period (years):	Not Estimated
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Costing Method:

Not Applicable

Costing Sources:

Not Applicable