

CITY OF IRWINDALE

ENERGY ACTION PLAN

Strategic Plan Task 2.B, Deliverable #7

Funded by:
Southern California Edison Company
Local Government Strategic Plan Strategies Program

2010–2012 Program Period
under the auspices of the California Public Utilities Commission

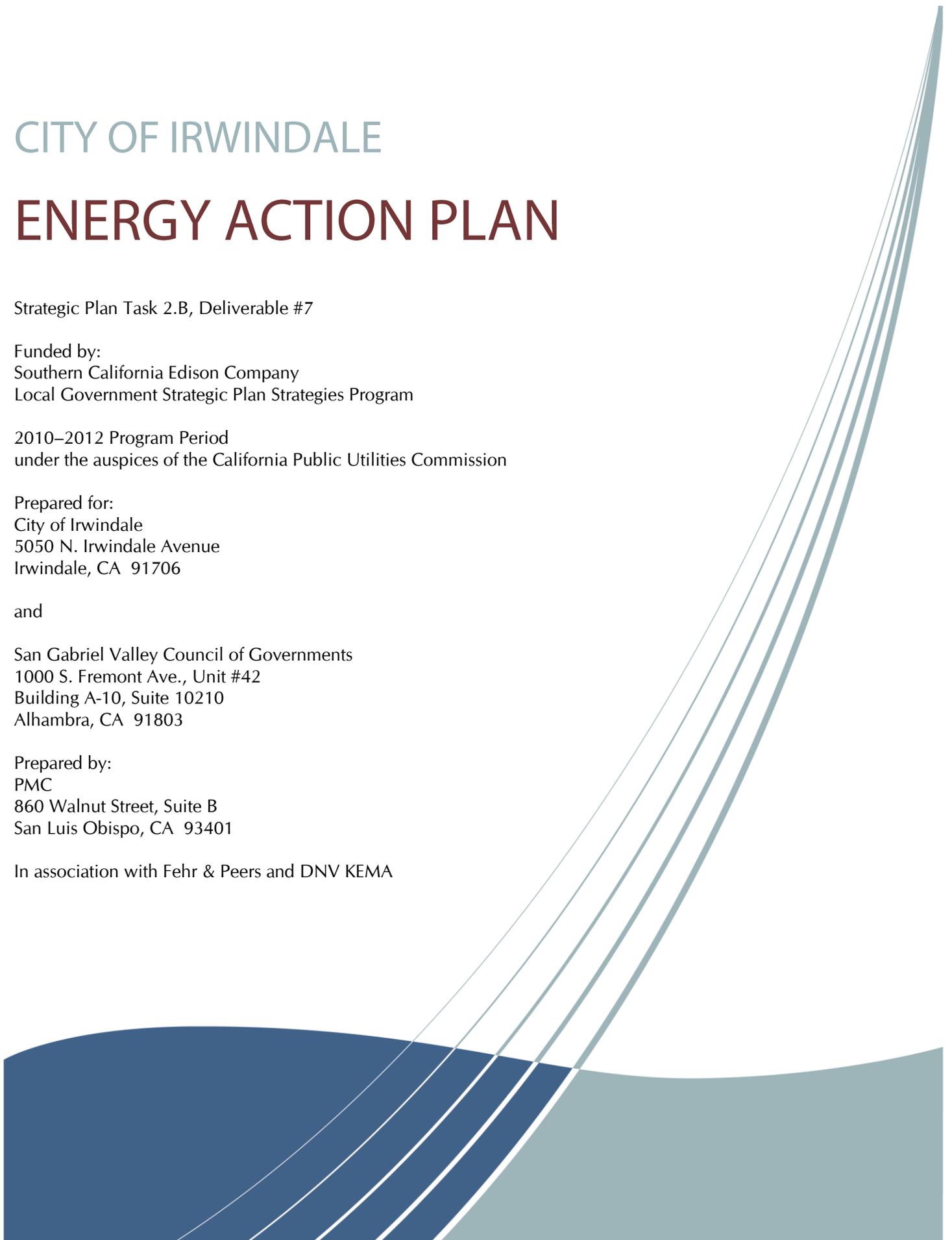
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ACKNOWLEDGEMENTS

This plan was prepared by PMC for the San Gabriel Valley Council of Governments and the City of Irwindale. The preparation of this plan was funded by Southern California Edison as part of the Local Government Strategic Plan Strategies Program funding for the 2010–2012 Program Period under the auspices of the California Public Utilities Commission.

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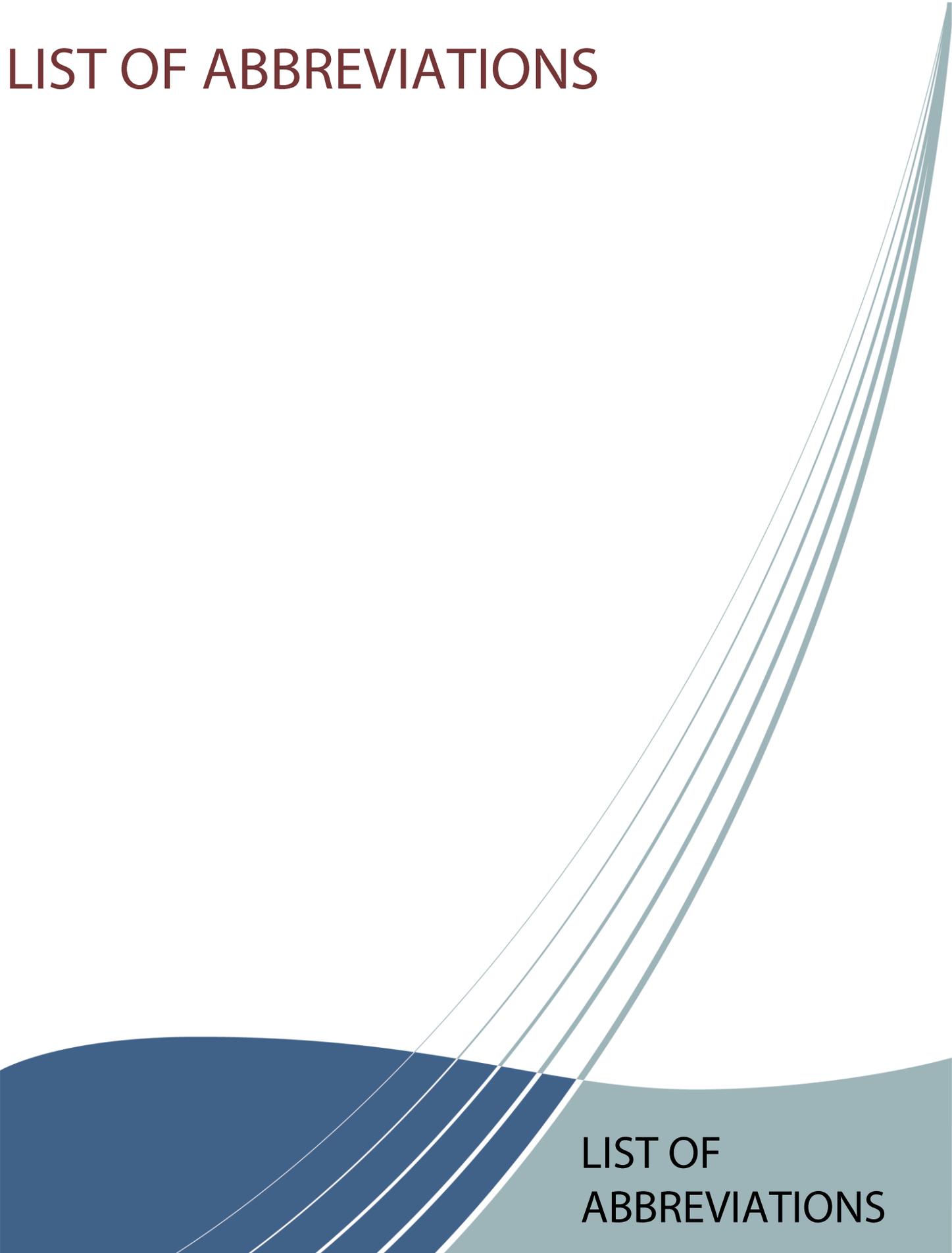
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Abbreviation	Definition
AB	Assembly Bill
ABAU	adjusted business-as-usual
AB 32	Assembly Bill 32, California Global Warming Solutions Act of 2006
AB 811	Assembly Bill 811, Contractual Assessments: Energy Efficiency Improvements
AB 1493	Assembly Bill 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 Officer's Association
CARB	California Air Resources Board
CCR	California Code of Regulations
CEC	California Energy Commission
CEESP	California Long-Term Energy Efficiency Strategic Plan
CEQA	California Environmental Quality Act
CFL	compact fluorescent light
CH ₄	methane
CIP	capital improvement program
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
COG	Council of Governments
CNG	compressed natural gas
CPUC	California Public Utilities Commission
CSI	California Solar Initiative
DR	demand response
EAP	Energy Action Plan
EE	energy efficiency
EECBG	Energy Efficiency and Conservation Block Grant
EECS	Energy Efficiency and Conservation Strategy
EEMIS	Energy Enterprise Management Information System
EENR	Energy, Environment, and Natural Resources Committee (of the San Gabriel Valley Council of Governments)
EIR	environmental impact report
ELP	Energy Leader Partnership

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Abbreviation	Definition
EO S-3-05	Executive Order S-3-05, Greenhouse Gas Emissions Reduction Initiative
ESP	Electric Service Provider
EUC	Energy Upgrade California
FTE	full-time equivalents
GHG	greenhouse gas
GWP	Global Warming Potential
HFC	hydrofluorocarbons
HPS	high pressure sodium
HVAC	heating, ventilation, and air conditioning
iDSM	integrated demand-side management
IOUs	investor-owned utilities
JPA	Joint Powers Authority
kW	kilowatt
kWh	kilowatt-hour
LEED	Leadership in Energy and Environmental Design
LGOP	Local Government Operations Protocol
MFD	multi-family dwelling
MG	million gallons
MPO	metropolitan planning organization
MT	metric ton
MTCO _{2e}	metric ton of carbon dioxide equivalent
N ₂ O	nitrous oxide
NAICS	North American Industry Classification System
PACE	property-assessed clean energy
PEAS	Personal Energy Action Survey
PFC	perfluorocarbons
PSC	Project Steering Committee
PV	photovoltaic
RCx	retro-commissioning
RPS	Renewables Portfolio Standard
RTP	Regional Transportation Plan
SCAG	Southern California Association of Governments
SCE	Southern California Edison
SCREC	Southern California Regional Energy Consortium
SF ₆	sulfur hexafluoride

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Abbreviation	Definition
SGVCOG	San Gabriel Valley Council of Governments
SGVEWP	San Gabriel Valley Energy Wise Partnership
SP	service population
TAZ	traffic analysis zones
US DOE	United States Department of Energy
US EPA	United States Environmental Protection Agency
USGBC	United States Green Building Council
VMT	vehicle miles traveled
VSD	variable-speed drive

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 Irwindale 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 and 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 timeframe, 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.



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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 methods.
- **Appendix C: GHG Technical Methods and 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 kWh and GHG savings for each policy.
- **Appendix D: Energy Action Plan – Energy Leader Partnership Requirements Checklist** – Identifies the criteria in the EAP that will help the City progress in the Energy Leader Partnership Program.

CHAPTER 1: INTRODUCTION

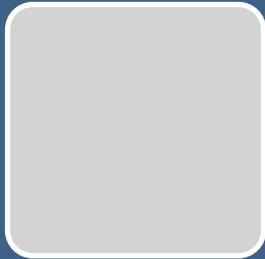
Chapter 1 provides a brief overview of the purpose and scope of this EAP and how this Plan was created in partnership with the San Gabriel Valley Council of Governments (SGVCOG) and Southern California Edison (SCE). The City has prepared this Plan not only to follow the guidance of California’s Long 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 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 chapter describes the community outreach conducted to provide input on this plan. Through the efforts of City staff, SGVCOG, and the consultant team, the primary outreach event completed in Irwindale is summarized in **Figure ES-1**.

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FIGURE ES-1: SUMMARY OF COMMUNITY OUTREACH EVENTS



Chamber of Commerce Breakfast — July 26, 2012

- Project information provided to attendees
- Personal Energy Action Surveys conducted
- Support generated for implementation of the EAP

CHAPTER 2: GREENHOUSE GAS INVENTORY AND FORECAST

The baseline greenhouse gas (GHG) 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 2008 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

Community

- Energy* – Electricity and natural gas consumed by residents and businesses in the city.
- 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.
- 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 of by the community.
- 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.
- 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 Waste* – Indirect emissions from the waste disposed of by employees and operations of the City.

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 2008, community activities generated approximately 221,540 MTCO_{2e}, while approximately 1,360 MTCO_{2e} were attributed to municipal operations. While municipal GHG emissions are typically considered a subset of community sources and represent 1% of total community

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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, 2008 (MTCO₂e)

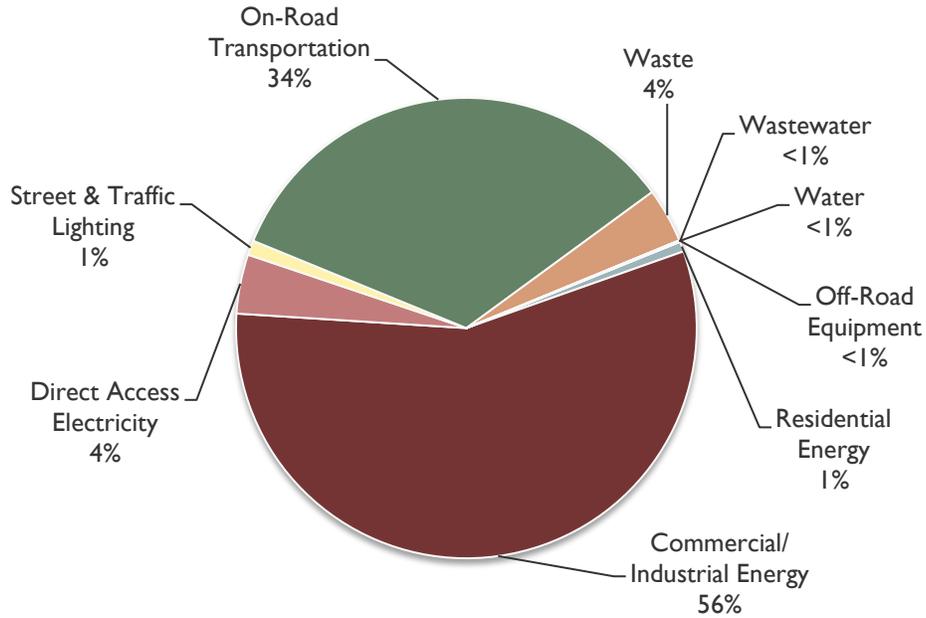
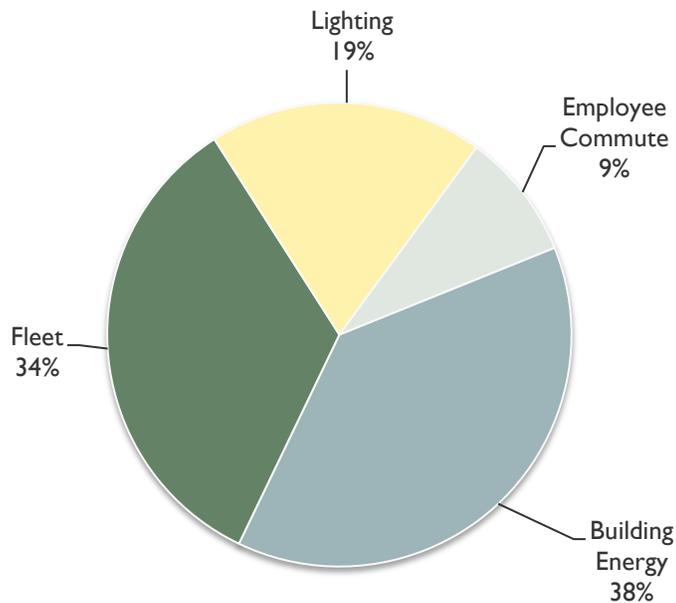


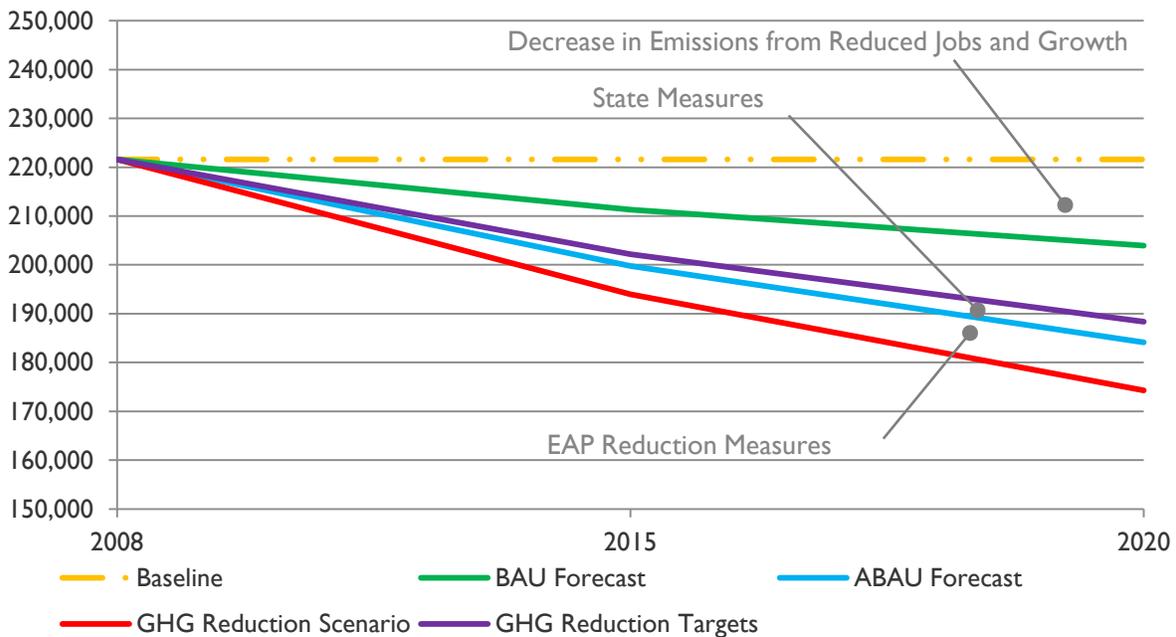
Figure ES-4: Municipal GHG Emissions by Sector, 2008 (MTCO₂e)



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Following the development of a baseline GHG emissions inventory, GHG emissions are forecasted 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 are included in an adjusted business-as-usual (ABAU) scenario and the recommended GHG reduction target to comply with Assembly Bill (AB) 32 are 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, 2008–2020 (MTCO₂e)



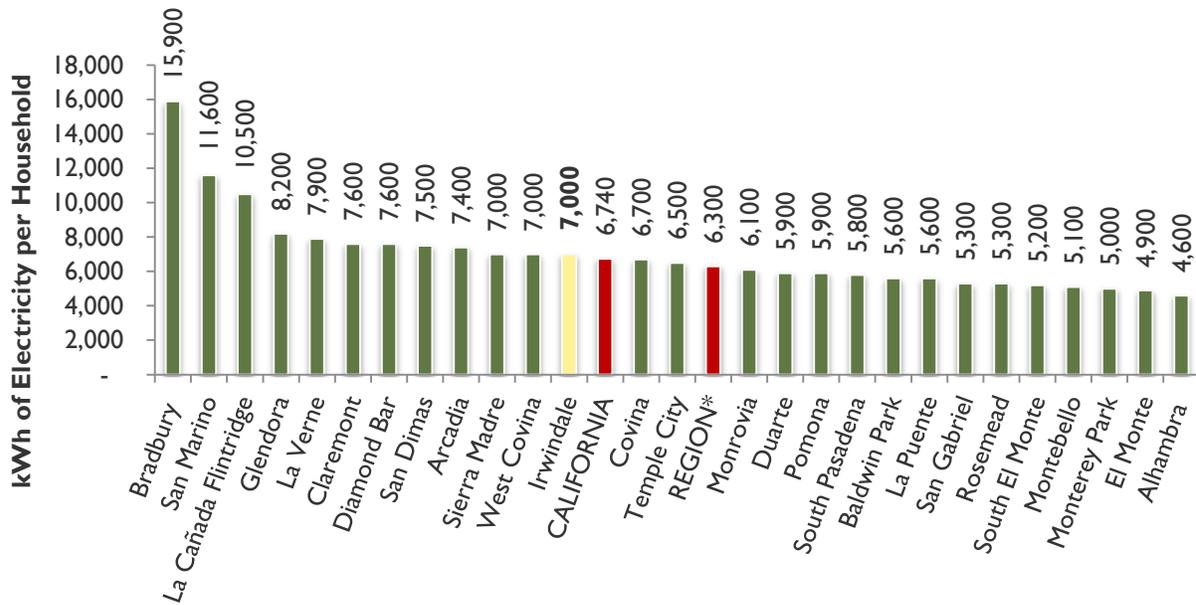
CHAPTER 3: ELECTRICITY PROFILE

The electricity profile describes the residential and nonresidential as well as municipal electricity use in the City of Irwindale. Electricity used in Irwindale’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.

Irwindale’s electricity uses are tied to the built environment, which is predominantly characterized by a higher proportion of older homes than the state as a whole, of which more than 92% of homes in Irwindale are single-family detached homes. As shown in **Figure ES-6**, each Irwindale household used an average of 7,000 kilowatt-hours (kWh) in 2010. This amount is more than the California average of 6,740 kWh and more than the SGVCOG project average of 6,300 kWh.

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Figure ES-6: Annual Average kWh of Electricity Use per Household, 2010

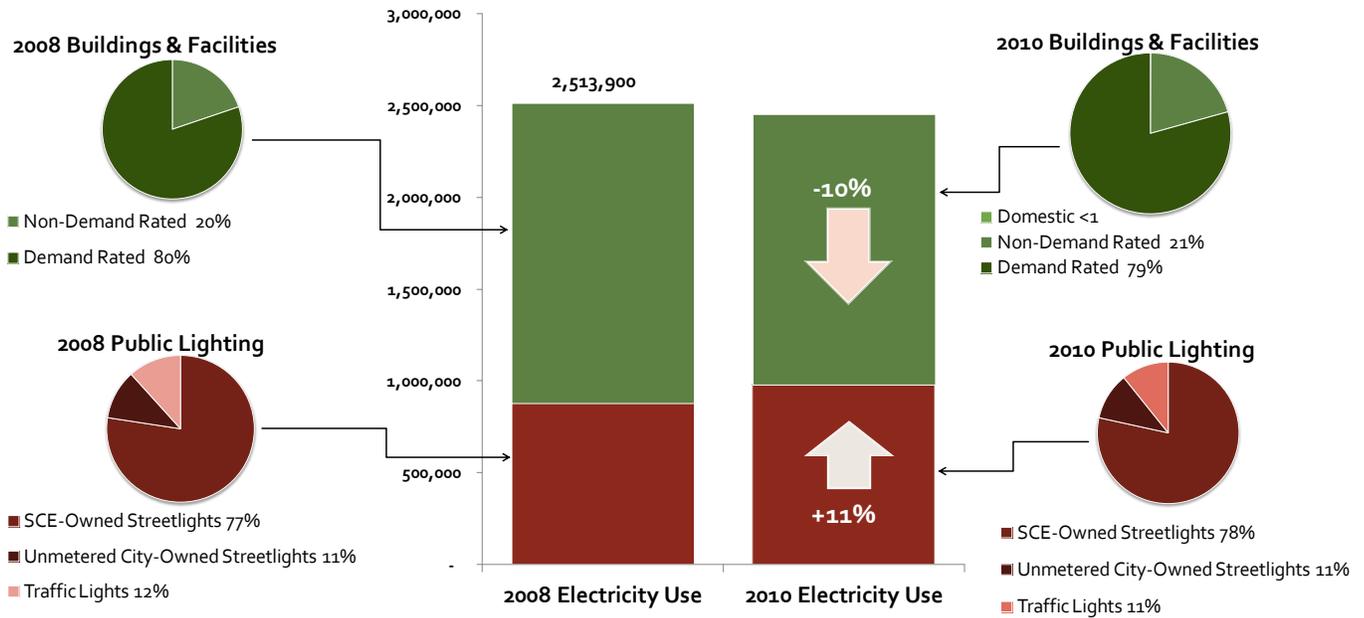


*Regional electricity numbers represent the San Gabriel Valley average for all 27 cities participating in the EAP project.

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**), and identifying the largest electricity uses by account to highlight the energy efficiency actions already completed or under way at City facilities and identify the largest opportunities for reducing electricity use.

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Figure ES-7: Municipal Electricity Comparison, 2008–2010

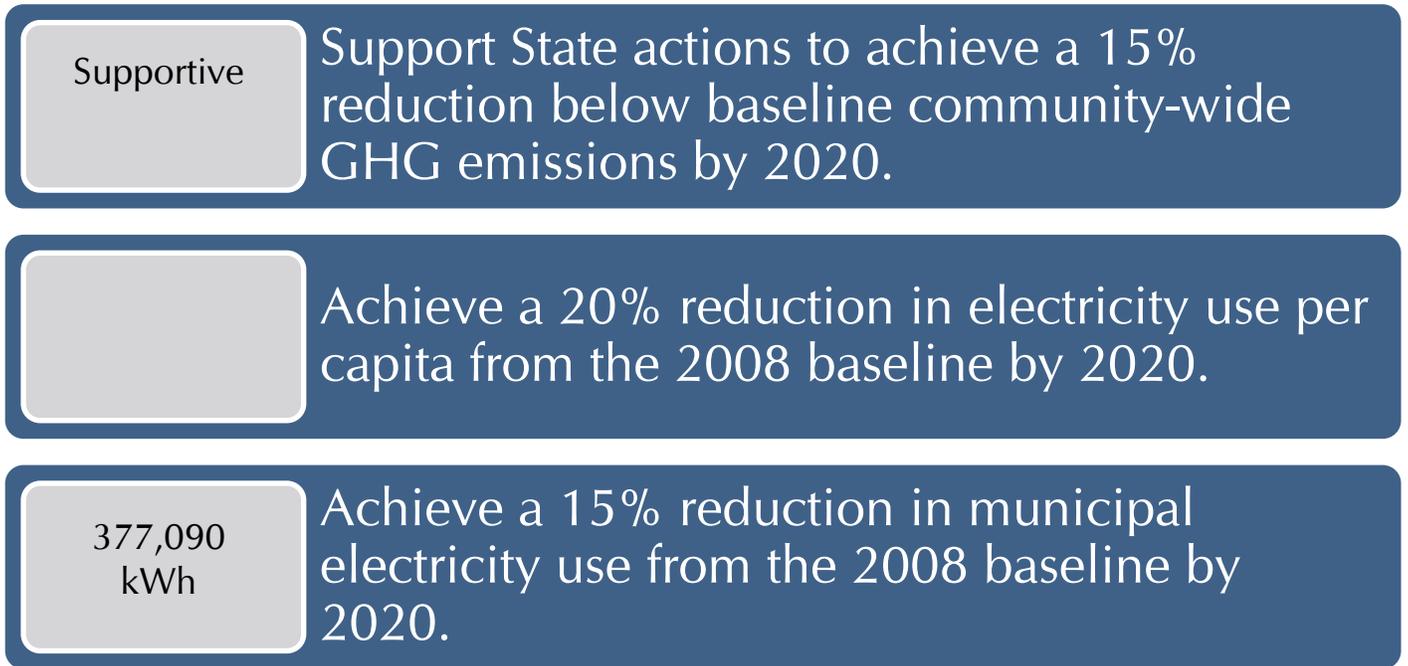


CHAPTER 4: ELECTRICITY ENERGY EFFICIENCY STRATEGY

The City of Irwindale 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 City’s greenhouse gas emissions reduction goal reflects the State’s goal established by the AB California Air Resources Board in the AB 32 Scoping Plan. While the City is expected to attain the AB 32 targets, this EAP presents a framework to ensure ongoing consistency with state guidance and programs. The City’s electricity reduction goals have been set at practical and achievable levels in order to demonstrate the City’s commitment to local reductions and support consistency with state energy efficiency goals. The EAP will also provide additional benefits to the community while strengthening the competitiveness of the business sector. Through actions and policies to bring about per capita energy use reductions, the City can help ensure that homeowners save money and that local businesses are identifying effective ways to reduce energy costs and remain cost-competitive to their neighbors. Further, by taking steps to conserve municipal electricity and to identify and execute energy efficiency measures in its own operations, the City will achieve energy and money savings. City actions also demonstrate energy benefits to the community.

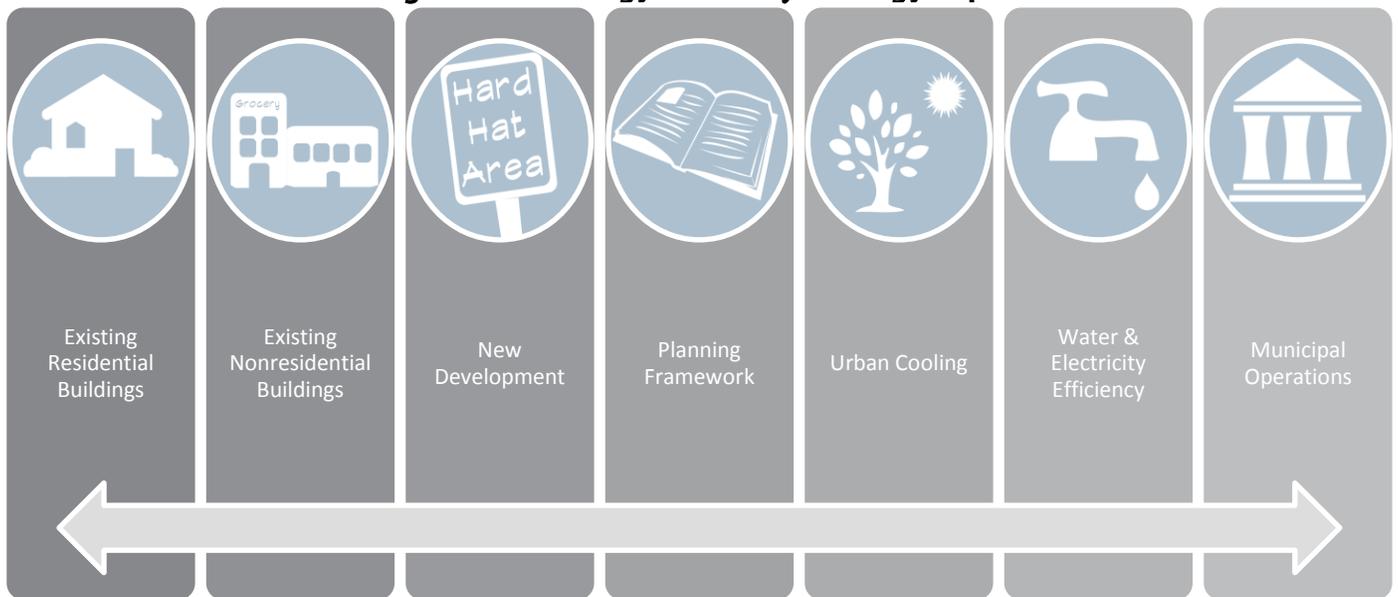
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Figure ES-8: Irwindale’s Energy Efficiency Targets



The City’s EAP is focused around seven strategic topics or goals, as shown in **Figure ES-9**, to support electricity reductions and energy efficiency within the community and municipal facilities.

Figure ES-9: Energy Efficiency Strategy Topics



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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 EE 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 as funding is available.

Table ES-1: Near-Term Municipal Projects¹

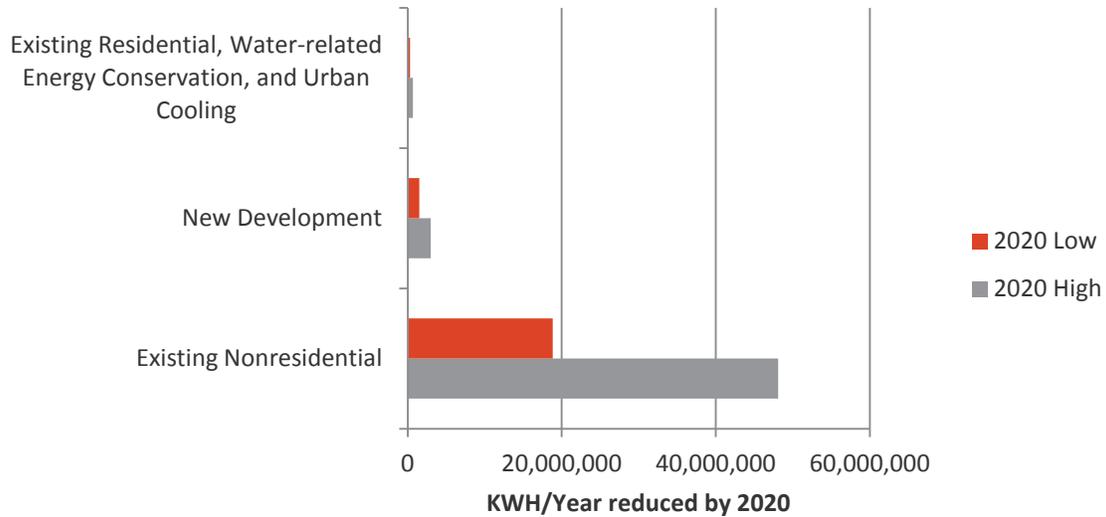
Location	Project	Annual Electricity Reduction (kWh/year)	Annual Cost Savings	Estimated SCE Incentive	Funding Opportunities
Meeting Room at 16116 Arrow Highway	Upgrade T-12 fluorescent lamps to energy-efficient models	To Be Confirmed			On-Bill Financing, SCREC, CEC Loans
Water pump with meter near the intersection of Los Angeles Street and Hornbook Avenue	Install a VSD pump and consider pump optimization	To Be Confirmed			On-Bill Financing, SCREC, CEC Loans
Park at City Hall	Retrofit park, walkway, and sport court lighting with energy-efficient models	To Be Confirmed			On-Bill Financing, SCREC, CEC Loans
City-wide	Replace the 96 HPS and 2 metal halide City-owned safety streetlights with LED or induction lamps	To Be Confirmed			On-Bill Financing, SCREC, CEC Loans
Total		To Be Confirmed			

1. At the time of report preparation, information regarding projected energy savings, cost savings, and estimated SCE incentives was unavailable.

In addition to the municipal projects, this EAP identifies a clear path for Irwindale 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.

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Figure ES-10: Estimates of 2020 kWh Savings by Goal



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 Irwindale 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 of Irwindale'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 facilities through energy reductions and more efficient maintenance and operational practices.

PURPOSE AND SCOPE

The purpose of this EAP is to identify the City of Irwindale's long-term vision and commitment to achieve energy efficiency in the community and in government operations. The rationale for Irwindale'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.

INTRODUCTION

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 (GHG) 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 AND THE CALIFORNIA LONG TERM ENERGY EFFICIENCY STRATEGIC PLAN

California's 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 CPUC, the state's investor-owned utilities, the Governor's Office, the 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 strategic plan and shown in **Figure 1**.

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 environmental 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.

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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 for 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:

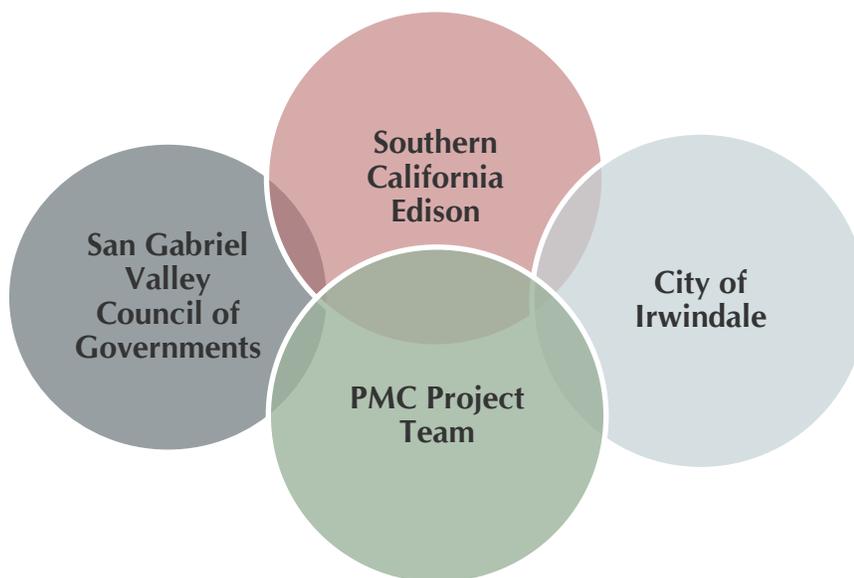
- Customer incentives.
- Codes and standards.
- Education and information.
- Technical assistance.
- Emerging technologies.

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.

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The SGVCOG managed the project, through partnership with SCE 27¹ member cities of the SGVCOG that receive electricity service from SCE, and the consultant team led by PMC. The project includes preparation of customized EAPs for each participating city, including a comprehensive 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 Irwindale and PMC (see **Figure 2**).

Figure 2: Partners in the EAP Planning Process



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 ELP, local governments are taking actions to support the CEESP while saving energy and fiscal resources for their communities. In the San Gabriel Valley, the SGVCOG is leading the implementation of the ELP with SCE and 27 of the 31 member cities in the SGVCOG.

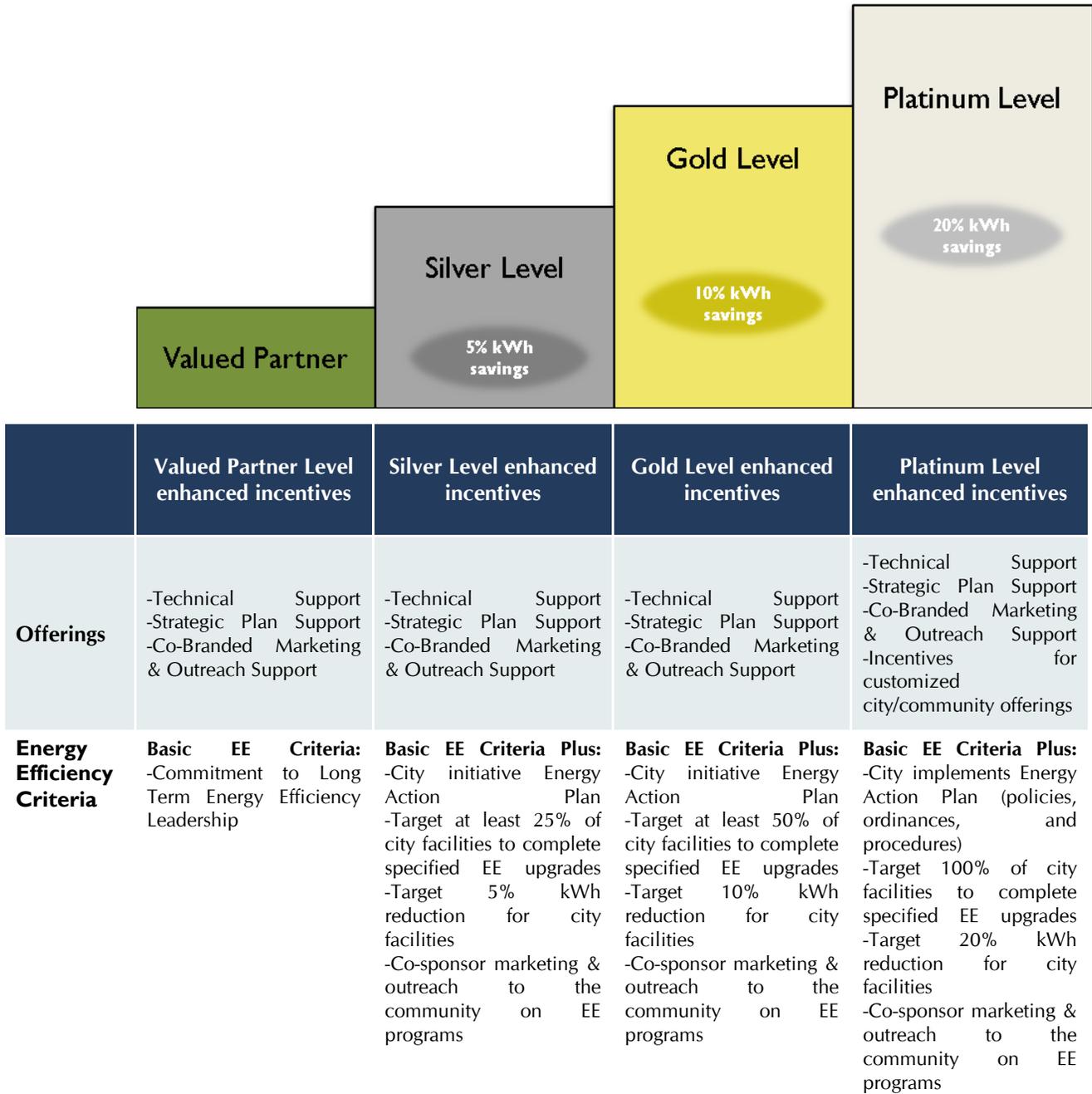
The ELP comprises four focus areas: (1) municipal retrofits, (2) demand response, (3) strategic plan support, and (4) energy efficiency programs coordination. The ELP program has four incentive tiers for participating cities: (1) Valued Partner, (2) Silver, (3) Gold, and (4) Platinum. Each city begins the program as a valued partner. To advance to the next incentive tier, each participating city needs to achieve the pre-determined energy savings and

¹ While there were 31 cities in the SGVCOG at the time of this project,, 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.

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requirements for city facilities and community-wide electricity use as shown in **Figure 3**. The City is currently a Valued Partner in the Energy Leader Partnership Model.

Figure 3: Energy Leader Partnership Model



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	Valued Partner Level enhanced incentives	Silver Level enhanced incentives	Gold Level enhanced incentives	Platinum Level enhanced incentives
Demand Response Criteria	Basic DR Criteria: -Enroll in California's Statewide Flex Alert and implement an internal educational campaign	Basic DR Criteria Plus: -At least one (1) eligible facility to participate in one (1) SCE Demand Response program -At least one (1) eligible facility to develop a Demand Reduction Action Plan to be followed during a Flex Alert event -Distribute Energy Solutions brochure to partner employees -Complete an integrated Demand Side Management (iDSM) audit at all eligible facilities	Basic DR Criteria Plus: -Have at least 25% of eligible facilities participate in an SCE Demand Response program -Conduct co-branded marketing and outreach to residential customers on SCE's Demand Response programs -At least one (1) eligible facility implement a DR measure recommended from the iDSM audit	Basic DR Criteria Plus: -At least one (1) eligible facility to participate in one (1) SCE Demand Response program -Have at least 50% of eligible facilities participate in an SCE Demand Response program and develop a Demand Reduction Action Plan for the participating facilities -Organize a local outreach event during the spring/summer season to promote Demand Response/iDSM

Source: Southern California Edison 2012

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 is unique in that it identifies the City's role in reducing electricity use, both as a steward of the community and 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.

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 GHG 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 by 2020. The local responsibility was identified in the Assembly Bill (AB) 32 Scoping Plan, which clarified the 1990 target is equivalent to a 15% reduction below baseline emissions by 2020. The Scoping Plan also identified a variety of measures, including regulations, 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

Assembly Bill 32 (AB 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.

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equivalent of the State-recommended reduction target. The EAP also allows the City to understand the GHG mitigation potential of the strategies outlined in this Plan.

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 comprehensive climate action plans or GHG reduction strategies, mitigation strategies in the EAP focus only on electricity efficiency. Nonetheless, this plan lays out the City's role in achieving State-recommended GHG reduction targets.

CITY PROFILE

SETTING

Irwindale is located in the middle of the San Gabriel Valley, about 20 miles east of the City of Los Angeles, in the County of Los Angeles. Irwindale is a relatively small city, with just over 370 households and 1,400 residents, making up 0.01% of the county's population, according to 2012 estimates by the Southern California Association of Governments (SCAG). The city is situated near the base of the San Gabriel Mountains and is bordered by the City of Baldwin Park to the south, the City of El Monte to the west, the City of Duarte to the north, and the City of Azusa to the north and east. Parts of the City of Irwindale are also bordered by unincorporated portions of Los Angeles County.

Originally known for its quarries, modern Irwindale has transformed into a business center. With over 13,000 employees working at Irwindale's businesses, according to SCAG reports from 2012, the workforce in Irwindale is almost 10 times the city's population. The two largest land users in Irwindale are the quarries and the Santa Fe Dam Recreational Area consisting of 1,631 acres and 1,920 acres, respectively. The largest topographical feature is the San Gabriel River which traverses the city in a north-to-south orientation and delineates the northern boundary of the city. **Table 1** provides a summary of existing land uses in Irwindale.

Table 1: Irwindale City Existing Land Uses, 2008

Land Use Characteristics	Acres	%	Source
Residential	60	1%	General Plan
Industrial	810	13%	General Plan
Commercial	160	3%	General Plan
Quarry	1,630	27%	General Plan
Public and Institutional	630	10%	General Plan
Santa Fe Dam	1,920	32%	General Plan
Other	880	14%	General Plan
Total	6,090	100%	

HISTORY

Irwindale was first settled during the 1850s by the families of Gregorio Fraijo and Fecundo Ayon. Received as a land grant from the Governor of Alta California, the large amount of rocks and sand made many people think the land was of little value. With the popularity of the automobile in the 1950s, however, the supply of rocks became a source of wealth for the city to support the construction of roadways. The city was incorporated in 1957, becoming the 56th city in Los Angeles County.

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In the 1970s, Irwindale took advantage of urban redevelopment laws and began to attract major industry to the area such as the 200-acre Miller Brewing Company plant. Although the sand and gravel industries are still a key part of the city's economy, the City's Chamber of Commerce records show Irwindale today as home to more than 700 businesses, including several well-known national companies like Ready Pac Produce, MillerCoors, and Charter Communications.

IRWINDALE TODAY

Mining and manufacturing are the dominant economic drivers in Irwindale. The city's other primary industries are in wholesale trade, information, accommodation and food services such as hotels, and administration and support, and waste management. Beyond the quarries, MillerCoors, SCE, and Ready Pac are the largest single-company employers in town. Residents work in a variety of sectors, with the largest percentage of residents working in sales and office occupations (27.2%), followed closely by service occupations (25.4%), and management, business, science, and arts occupations (25.4%) (see **Table 2** below).

Table 2: Employment of Irwindale Residents, 2010

Industry	Number of Jobs	Percentage of Jobs
Management, business, science, and arts occupations	150	25%
Service occupations	150	25%
Sales and office occupations	160	27%
Natural resources, construction, and maintenance occupations	50	8%
Production, transportation, and material moving occupations	80	14%
TOTAL	590	100%

Source: US Census Bureau

In general, the city has enjoyed relative economic stability. As of 2010, Irwindale had 11.4% of residents living below the poverty line, less than the rate of persons below the poverty line in the county (16%) and state (14%). The median household income in 2010 was just over \$59,000 per year; the median household income in Los Angeles County is only \$55,476 per year.

In the last 20 years, Irwindale has seen nominal population increases; however, with the reclamation of inactive quarries, land uses have considerably shifted from mining to other commercial and industrial activities. Some small residential developments have also been added. In addition, Irwindale is a community with deep roots with several residents tracing their heritages back to the original settlers in the area. The city's population today is estimated to be over 90% of Hispanic origin, made up of a diversity of races (see **Table 3** below).

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Table 3: Irwindale Racial and Ethnic Make-Up, 2010

Race/Ethnicity	%	Source
White	59%	US Census
Asian	2%	US Census
Black	1%	US Census
American Indian or Alaska Native	2%	US Census
Other	32%	US Census
Two or more races	4%	US Census
Total	100%	US Census

IRWINDALE'S RECENT SUSTAINABILITY EFFORTS

To date, Irwindale's sustainability policy has been focused on the residential sector. These policies are included in two key documents: the 2020 General Plan Update (completed in 2008) and the 2011 Housing Element Update.

The 2020 General Plan includes several policies related to residential developments by promoting plans that focus on both energy and water efficiency. The 2020 General Plan Update also identifies the need to locate lower-income developments closer to supporting services and public transportation to reduce the overall carbon footprint of the residents in these developments.

Building upon the 2020 General Plan Update, the Housing Element Update also addresses key issues such as water and energy efficiency. Prioritizing passive strategies such as daylighting in housing developments, cool roofs, and sun protective overhangs, Irwindale has identified several energy reduction strategies that are appropriate for the local climate. The Housing Element Update also prioritizes landscape and hardscape design that improves water conservation while also seeking to actively reduce the local heat island effect. The Housing Element Update then completes the proposed energy efficiency strategies by focusing on using Energy Star appliances, high efficiency lighting, and solar attic fans to reduce cooling loads.



Representatives of Kare Youth League present organizational energy efficiency efforts

However, beyond specific design elements, the Housing Element Update also includes information on how to implement the sustainability measures mentioned above. Firstly, the Housing Element Update notes the need to support the implementation of improvements in low-income households. Strategies presented to achieve this goal include partnering with private companies to provide free energy audits, financial assistance to weatherize homes, and education programs, and supporting new low-income developments to incorporate energy efficiency into their designs from the beginning. Secondly, on the broader scale, Irwindale has proposed incentives for energy-efficient retrofits to be conducted before the resale of a home, incentives for homes that exceed the requirements of California's Title 24 energy code, and a streamlining of the permitting process for housing that integrates green building standards and meets specific energy standards.

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To help encourage and reward sustainability in Irwindale’s important business sector, Irwindale’s Chamber of Commerce hosts a yearly Environmental Awards program that recognizes businesses and organizations which have implemented and achieved reduction in their carbon footprint as related to environmental concerns. Several of the city’s largest businesses participate and have been recognized, including the City of Hope, 3M Unitek, and MillerCoors.

On the municipal operations side, the City is in the process of receiving audits at City facilities and is beginning the process of benchmarking City facilities. Some lighting retrofits have been completed, such as replacing traffic signal and crosswalk signal lights with more efficient light-emitting diodes (LEDs). In addition, some computers were recently replaced with Energy Star models. The City is also beginning to install irrigation controls in parks and other City-owned land to increase water conservation. The energy reductions from projects already completed or in progress are unknown at this time.

THE EAP PLANNING PROCESS

The City of Irwindale worked through a five-step planning process, as depicted in **Figure 4**, 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.

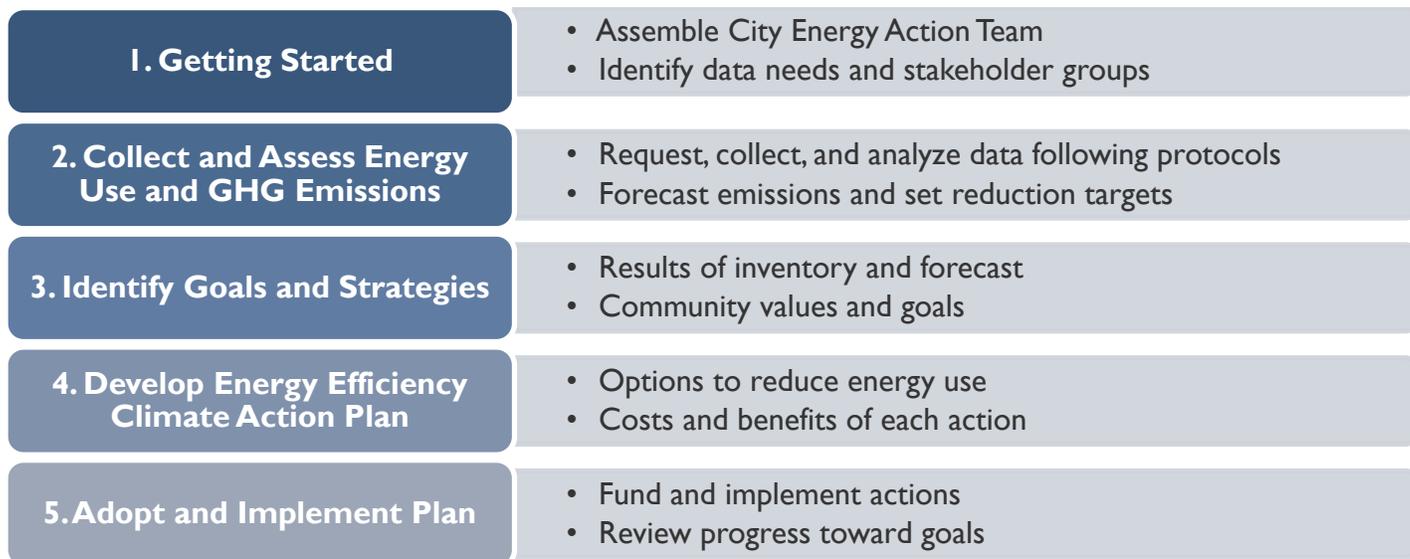
The development process for the EAP relied on a multi-pronged outreach strategy involving City staff, public stakeholders (residents, employees, and business owners), and guidance from a regional Project Steering Committee (PSC).



Irwindale's sustainable businesses receive recognition for reducing their carbon footprint

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Figure 4: EAP Development Process



PROJECT STEERING COMMITTEE

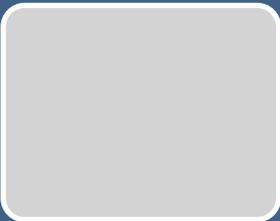
Along with staff representing other San Gabriel Valley cities taking part in the regional EAP project, City staff participated in a regional Project Steering Committee (PSC). The committee included representatives from all 27 cities participating in the project. The purpose of the PSC is to confirm a regional approach to EAP development, guide the project, share best practices among jurisdictions, and support tailored, local EAPs. The PSC convened approximately once a month from June 2011 through September 2012. During PSC meetings, representatives from SGVCOG staff and the technical consultant project team facilitated discussions and presentations to review options to achieve electricity efficiency.

PSC members regularly voted on topics through an instant polling tool, TurningPoint, to provide input on a variety of topics including the regional framework, GHG data collection process, GHG scopes and sources, reduction policies and programs, and engagement options for the EAPs. The polling tool collected 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. PSC members also presented case studies, sharing success stories and lessons learned from project implementation.

LOCAL OUTREACH EVENTS

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, the project team worked with the City project lead to develop a customized outreach strategy. Outreach efforts allowed the City to share ideas, collect input, and assess stakeholder preferences. The key outreach event is shown in **Figure 5** below.

Figure 5: Summary of Community-Wide Events



Chamber of Commerce Breakfast — July 26, 2012

- Project information provided to attendees
- Personal Energy Action Surveys conducted
- Support generated for implementation of the EAP

In addition to supporting development of the EAP, this event provided an opportunity to educate the business community about electricity use and efficiency opportunities. Outreach efforts helped business leaders to think about strategies to reduce electricity use and to improve the quality of their commercial efforts.

At the Chamber of Commerce Breakfast event, numerous attendees expressed an interest in learning more about energy efficiency opportunities for their businesses. One representative from the local SCE Energy Education Center provided information regarding the types of training and resources available at the center.

PERSONAL ENERGY ACTION SURVEY

As part of the regional partnership with the SGVCOG, the EAP team sought community input through interviews and distribution of a personal energy action survey about home energy use at events throughout the 27 participating cities, including at an Irwindale Chamber of Commerce Breakfast. A blank version of the survey is provided in **Appendix A**. Participation in the events and survey was voluntary. The feedback received helps to provide a useful snapshot of energy-related opinion and behavior; however, the results should not be interpreted as statistically valid.

Residents and employees from cities throughout the San Gabriel Valley attended these events and completed the survey in three languages (English, Korean, 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. Regionally, city residents, as opposed to business owners or commuter workers, were the majority of respondents. Most respondents owned their own home, while the remainder rented a house or apartment.

In addition to asking about personal actions already taken, the survey asked respondents what energy efficiency upgrades they would consider doing to their home or business in the future, both in the next year and in the next five years. When asked about what they would do in the next year, many respondents favored smaller-scale upgrades such as continuing to replace light bulbs and appliances with more energy-efficient models. Over a five-year time frame, respondents were willing to make greater investments and take actions such as installing solar water heaters and photovoltaic solar panels to generate electricity. The regional survey results indicate that many energy-saving actions are feasible in Irwindale and that the majority of participants are personally willing to consider them.

Regional survey results indicated good potential to implement residential energy efficiency policies and that residents were encouraged by financial incentives such as grants and lower utility bills.

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More detailed analysis and display of survey results will be reflected in the regional summary data that is being prepared separately through the EAP project. Responses will be assessed separately for the San Gabriel Valley cities that each respondent is from in each city's respective Energy Action Plan.

CHAPTER 2

GHG INVENTORY AND FORECAST

INVENTORY AND FORECASTING PURPOSE

This greenhouse gas (GHG) emissions inventory and forecast (Inventory) provides a detailed summary of community-wide and municipal GHG emissions. This information is used to create reduction strategies in the City of Irwindale'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.

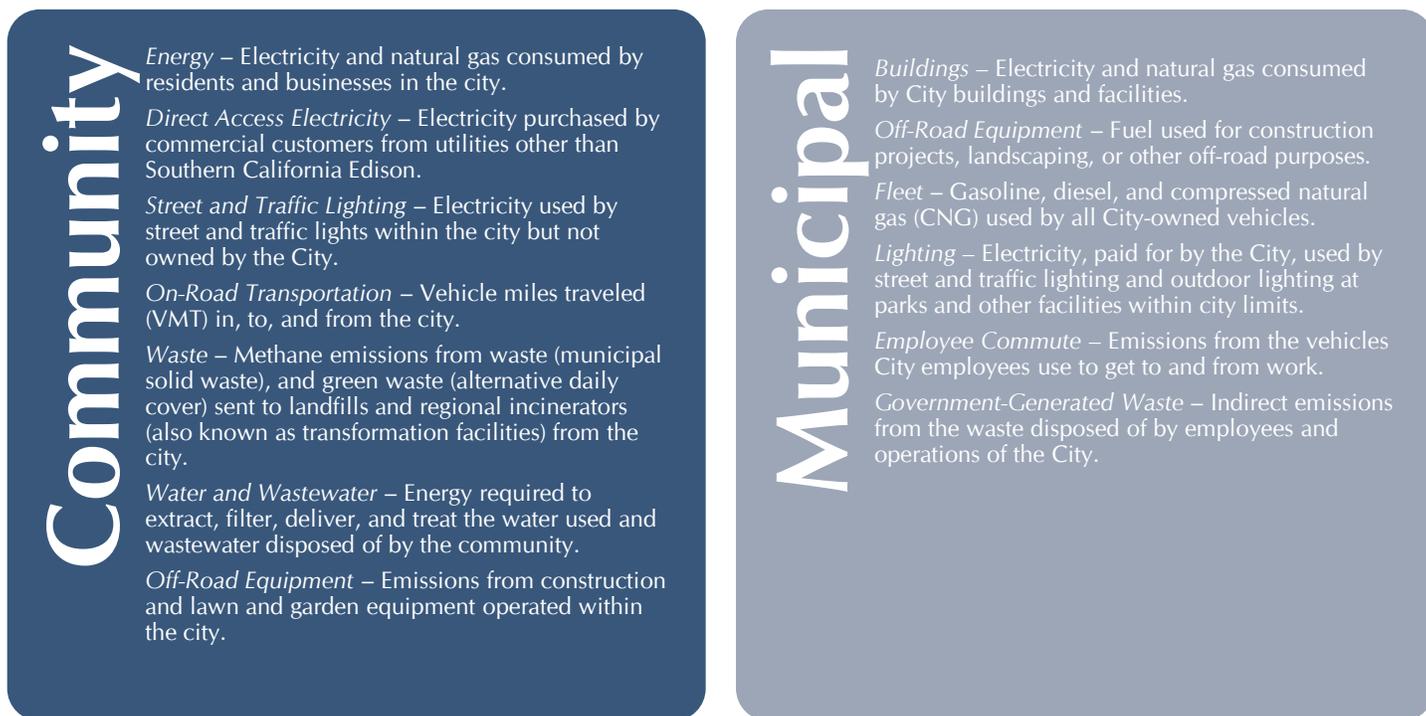
Specifically, the GHG Inventory:

- Presents GHG emissions from community-wide and municipal activities in calendar year 2008.
- 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).
- 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 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 6**. Refer to **Appendix B** for detailed activity data and emissions by sector and subsector and to **Appendix C** for activity data sources and specific emissions factors for each subsector.

Figure 6: Community and Municipal GHG Emissions Sources, 2008



COMMUNITY-WIDE INVENTORY SUMMARY

The community of Irwindale emitted approximately 221,540 MTCO_{2e} in the baseline year 2008. As shown in **Figure 7** and **Table 4**, the largest source of emissions was energy use from commercial and industrial uses, which were responsible for 124,980 MTCO_{2e} (56% of community-wide emissions). This is reflective of Irwindale's industrial activities. Thirty-four percent of emissions (74,750 MTCO_{2e}) were a result of on-road transportation in the city. All other sources, including residential energy use, community-generated waste, off-road equipment, direct access electricity, water, and wastewater, amounted for a combined 21,810 MTCO_{2e}, or about 10% of community emissions. For a detailed description of activity data, such as the breakdown of residential electricity and natural gas uses, refer to **Appendix B**.

GHG INVENTORY AND FORECAST

Figure 7: Community-Wide GHG Emissions by Sector, 2008

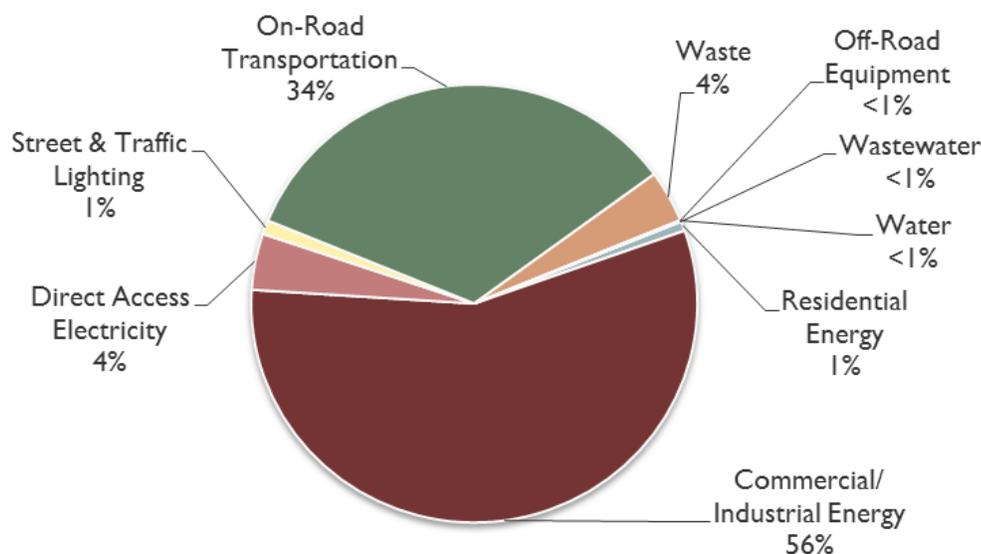


Table 4: Community-Wide GHG Emissions by Sector, 2008 (MTCO₂e)

Sector	MTCO ₂ e	Percentage of Total
Commercial/Industrial Energy	124,980	56%
On-Road Transportation	74,750	34%
Direct Access Electricity	9,210	4%
Community-Generated Waste	8,520	4%
Street & Traffic Lighting	2,280	1%
Residential Energy	1,560	1%
Off-Road Equipment	10	<1%
Water	190	<1%
Wastewater	40	<1%
Total*	221,540	100%

*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 GHG emissions for Irwindale 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 GHG and energy reductions from programs implemented since the baseline year.

GHG INVENTORY AND FORECAST

Table 5 summarizes community activity data for 2010 and compares emissions from baseline and 2010 for the community of Irwindale. Of the nine sectors with 2010 data, five saw a decrease in emissions, including residential natural gas, transportation, solid and transformed waste, and water use. 2010 data was unavailable for electricity use; therefore, 2008 numbers have been used as a proxy.

There were a number of significant changes between 2008 and 2010 that merit further discussion. Although the number of new building permits for Irwindale doubled from 2008 to 2010, resulting in a doubling of emissions from construction, the number of permits issued remained below 10 for both years. There was also a decline in emissions from wastewater that matches the decline in activity data, but this decrease does not show up in the table below due to rounding. Direct access electricity had a large 53% increase in electricity use and emissions likely related to the drop in commercial/industrial electricity as customers switched from SCE to direct access electricity, a method by which large commercial/industrial entities purchase energy directly from an energy service provider other than SCE. The second largest change in community activity was the amount of solid waste produced by the community, which declined dramatically from 2008 to 2010. The California Department of Resources Recycling and Recovery notes that an ordinance addressing recycling was implemented in 2009, which could explain the timing of this decrease.

Table 5: 2010 Activity Data and 2008 GHG Emissions Comparison

Sector	2010 Activity Data		2008 MTCO ₂ e	2010 MTCO ₂ e	Percentage Change
Residential Electricity**	2,430,570	kWh	760	700	-8%
Residential Natural Gas	143,150	Therms	800	760	-5%
Commercial/Industrial Electricity	170,144,390	kWh	59,440	59,440	-18%
Commercial/Industrial Natural Gas	12,837,600	Therms	65,540	68,290	4%
Direct Access Electricity	33,645,520	kWh	9,210	14,090	53%
Street & Traffic Lighting	8,082,220	kWh	2,280	2,330	2%
On-Road Transportation	143,303,990	VMT	74,750	74,190	-1%
Waste – Municipal Solid Waste	34,010	Tons of Waste	8,350	6,260	-33%
Waste – Alternative Daily Cover	460	Tons of ADC	60	70	14%
Waste – Transformed	330	Tons Transformed	110	100	-10%
Off-Road Equipment – Lawn & Garden	370	Households	<10	<10	0%
Off-Road Equipment – Construction	<10	Permits Issued	10	20	50%
Water	546,460	kWh	190	160	-19%
Wastewater	129,320	kWh	40	40	0%
Total			221,540	215,990	0%

* 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.

GHG INVENTORY AND FORECAST

MUNICIPAL INVENTORY SUMMARY

The municipal inventory includes GHG emissions from the operations and activities conducted by the city. Also, the City of Irwindale’s GHG emissions were calculated from activity data collected by the City. Operations and activities by the City in 2008 resulted in approximately 1,360 MTCO_{2e}. **Figure 8** and **Table 6** depict the contribution of each activity to total GHG emissions. Building energy use was the single largest source, responsible for 520 MTCO_{2e}, or 38% of total municipal emissions. Emissions from the City fleet were the second-largest sector, totaling about 460 MTCO_{2e}, or 34% of emissions. Outdoor and street & traffic lighting contributed 260 MTCO_{2e} (19% of emissions) and emissions from employee commute were 120 MTCO_{2e}, or 9% of all municipal emissions.

Figure 8: Municipal GHG Emissions by Sector, 2008

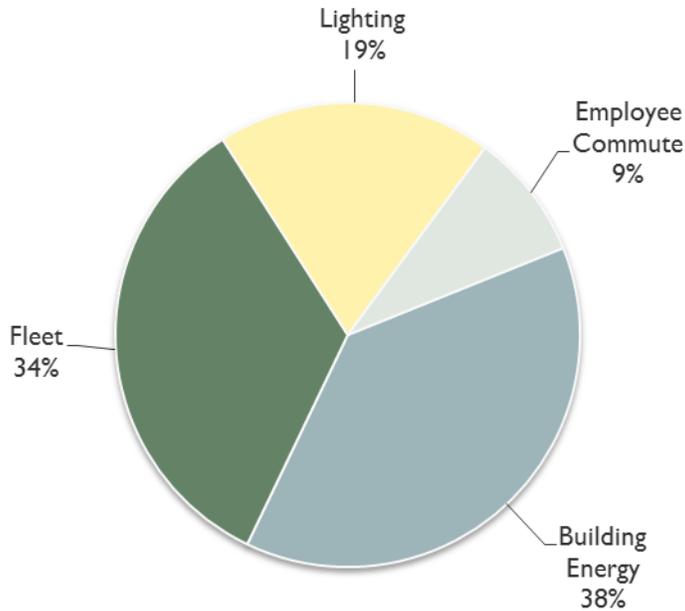


Table 6: Municipal GHG Emissions by Sector, 2008 (MTCO_{2e})

Sector	MTCO _{2e}	Percentage
Building Energy	520	38%
Fleet	460	34%
Lighting	260	19%
Employee Commute	120	9%
Total*	1,360	100%

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

GHG INVENTORY AND FORECAST

2010 MUNICIPAL EMISSIONS UPDATE

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 solid waste were used as proxies to estimate 2010 data. This information, shown in **Table 7**, has been used to create a snapshot of 2010 municipal GHG emissions. Emissions from city government operations in 2010 were estimated at 1,360 MTCO_{2e}, a zero net increase from baseline.

Table 7: Comparison of Municipal GHG Emissions, 2008–2010

Sector	Subsector	2010 Activity Data		2008 MTCO _{2e}	2010 MTCO _{2e}
Buildings	Electricity	1,471,590	kWh	470	430
	Natural Gas	13,710	Therms	50	70
	Stationary Diesel**	–	Gallons	–	–
Fleet**	Gasoline	52,630	Gallons	460	460
	Diesel	160	Gallons	< 10	< 10
Lighting**	City-Owned Streetlights	106,010	kWh	30	30
	Traffic Lights	105,570	kWh	30	30
	SCE-Owned Streetlights	769,510	kWh	200	220
	Other Public Lighting	–	kWh	–	–
Employee Commute		290,040	VMT	120	120
Total				1,360	1,360

* 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 where possible.

BUSINESS-AS-USUAL GHG EMISSIONS FORECAST

COMMUNITY BUSINESS-AS-USUAL (BAU) INDICATORS

Table 8 lists the various growth indicators and sources used in the forecasting of Irwindale’s community-wide emissions. For a detailed explanation of indicator methods 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.

GHG INVENTORY AND FORECAST

Table 8: Comparison of 2008 and 2010 Data to Forecasts of Households, Jobs, Population, and Transportation Trends

Growth Indicator	Emissions Sector	2008	2010	2020	Sources
Households	Residential Energy, Off-Road	400	370	400	2010 Census, SCAG 2012 Regional Transportation Plan
Jobs	Commercial/Industrial Energy	13,400	13,100	11,500	2010 Census, SCAG 2012 Regional Transportation Plan
Annual VMT	Transportation	142,589,120	143,303,990	146,933,550	Fehr & Peers, SCAG 2003 Regional Transportation Plan
Service Population (Residents + Jobs)	Solid Waste, Water, Wastewater, Landfill	14,800	14,520	13,100	2010 Census, SCAG 2012 Regional Transportation Plan

COMMUNITY BUSINESS-AS-USUAL FORECAST

Table 9 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 decrease by 8% in 2020 to 203,870 MTCO_{2e}.

Table 9: Comparison of Community-Wide BAU Forecasts by Sector, 2008 and 2020 (MTCO_{2e})

Sector	2008	2010	2020
Residential Energy	1,560	1,460	1,560
Commercial/Industrial Energy	124,980	117,270	107,260
Direct Access Electricity	9,210	14,090	7,900
Street and Traffic Lighting	2,280	2,330	2,330
On-Road Transportation	74,750	74,190	77,030
Community-Generated Waste	8,520	6,430	7,540
Off-Road Equipment	10	20	40
Water	190	160	170
Wastewater	40	40	40
Total	221,540	215,990	203,870
Percentage Change from 2008	-	-3%	-8%

GHG INVENTORY AND FORECAST

MUNICIPAL BUSINESS-AS-USUAL FORECAST

The City of Irwindale’s municipal forecast assumes a no-growth scenario for municipal operations based on data received for 2008 and 2010, as shown in **Table 10**. This forecast assumes 2010 employment numbers in order to be consistent with other participating communities. As Irwindale is not a water provider, changes to the service population do not affect municipal emissions. Due to these factors, annual emissions are expected to remain constant at 2010 levels in 2020.

Table 10: Municipal GHG Emissions (2008, 2010) and BAU Forecast for 2020 (MTCO_{2e})

Sector	2008	2010	2020
Building Energy	520	500	500
Fleet	460	460	460
Lighting	260	280	280
Employee Commute & Travel	120	120	120
TOTAL	1,360	1,360	1,360
Percentage Change from 2008	–	0%	0%

STATE ADJUSTMENTS TO BUSINESS-AS-USUAL FORECAST

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 the City’s future emissions. For a detailed description of these actions, see **Appendix B**.

- *Clean Car Fuel Standard (AB 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 approximately 22% of emissions in 2012 and by about 30% of emissions in 2016.
- *Renewables Portfolio Standard (RPS)*. Requires utility providers to increase the portion of energy that comes from renewable sources to 20% of sources by 2010 and to 33% of sources by 2020. Due to potential implementation issues, the adjusted business-as-usual (ABAU) forecast assumes that energy providers will achieve a minimum 28% renewable portfolio by 2020.
- *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.

COMMUNITY ADJUSTED BUSINESS-AS-USUAL (ABAU) FORECAST

All state programs highlighted above are included in the community-wide ABAU forecast. As shown in **Table 11**, these state reduction efforts are anticipated to reduce BAU emissions by 19,790 MTCO_{2e} in 2020. The majority of these reductions are from the Pavley standards and the RPS. In comparison to the BAU scenario, 2020 emissions with state reduction measures are 17% below baseline 2008 levels rather than 8% below baseline 2008 levels (see **Table 12**).

GHG INVENTORY AND FORECAST

Table 11: Impact of State Reductions on Community Emissions, 2020 (MTCO_{2e})

State Reductions Summary	2020
Pavley I Reductions	-11,890
RPS Reductions	-7,790
CSI Reductions	-130
Total State Reductions	-19,810

Table 12: Comparison of Community 2020 ABAU Forecast to 2008 and 2010 Emissions (MTCO_{2e})

State Reductions Summary	2008 MTCO _{2e}	2010 MTCO _{2e}	2020 MTCO _{2e}
Growth Projection	221,540	215,990	203,870
Total State Reductions			-19,810
Adjusted ABAU Forecast	221,540	215,990	184,060
Percentage Change from 2008	-	-3%	-17%

MUNICIPAL ABAU FORECAST

Only certain state reduction programs affect the municipal BAU forecast. These include the RPS, the Pavley standards, and the Title 24 efficiency standards. The primary reductions will occur from the Pavley standards and the RPS (see **Table 13**). The CSI is not applicable to municipalities and is not quantified. **Table 14** shows the effect of the included state reduction efforts on BAU emissions. Emissions in 2020 are expected to be reduced by 170 MTCO_{2e} in 2020. 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 13% below baseline (reduced to 1,190 MTCO_{2e}).

Table 13: Impact of State Reductions on Municipal Emissions, 2020 (MTCO_{2e})

State Reductions Summary	2020
Pavley I Reductions	-90
RPS Reductions	-80
Total State Reductions	-170

Table 14: Comparison of Municipal 2020 ABAU Forecast to 2008 and 2010 Emissions (MTCO_{2e})

State Reductions Summary	2008 MTCO _{2e}	2010 MTCO _{2e}	2020 MTCO _{2e}
Growth Projection	1,360	1,360	1,360
Total State Reductions			-170
Adjusted ABAU Forecast	1,360	1,360	1,190
Percentage Change from 2008	-	0%	-13%

GHG INVENTORY AND FORECAST

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.

STATE RECOMMENDED REDUCTION TARGETS

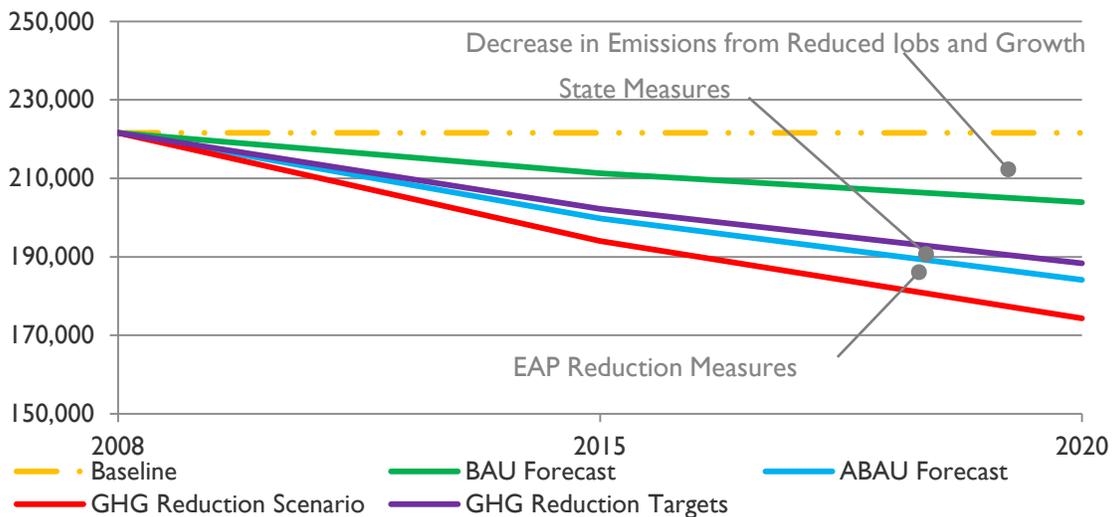
AB 32 recommends that local governments adopt a GHG reduction target of 15% below baseline levels by 2020. The State has not adopted GHG reduction targets beyond 2020; however, in 2005, then-Governor Schwarzenegger signed Executive Order S-3-05, which created a goal to reduce GHG emissions to 1990 levels by 2020 and to 80% below 1990 levels by 2050.

As shown in **Table 15** and **Figure 9**, the City will exceed the State-recommended AB 32 Scoping Plan goal of 15% below baseline levels by 2020 due to a reduction in the BAU emissions caused by the lack of projected growth in the city, and due to the impact of state-level efforts that will reduce emissions. If the City implements the GHG reduction scenario included in this EAP, then the City can exceed the state’s reduction target and reach 21% below baseline levels by 2020.

Table 15: Comparison of BAU Forecast and Reduction Target, 2008–2020

	2020
AB 32 Target % Reduction from Baseline	15%
State-Recommended Emissions Goal (MTCO _{2e})	188,310
Adjusted BAU Forecast with State Reductions (MTCO _{2e})	184,060
Local Reduction Needed from Adjusted BAU (MTCO _{2e})	-4,080

Figure 9: Summary of Forecasts and Reduction Targets, 2008–2020 (MTCO_{2e})



CHAPTER 3

ELECTRICITY PROFILE

Electricity used in Irwindale’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 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 10** below.

ELECTRICITY PROFILE

Figure 10: 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

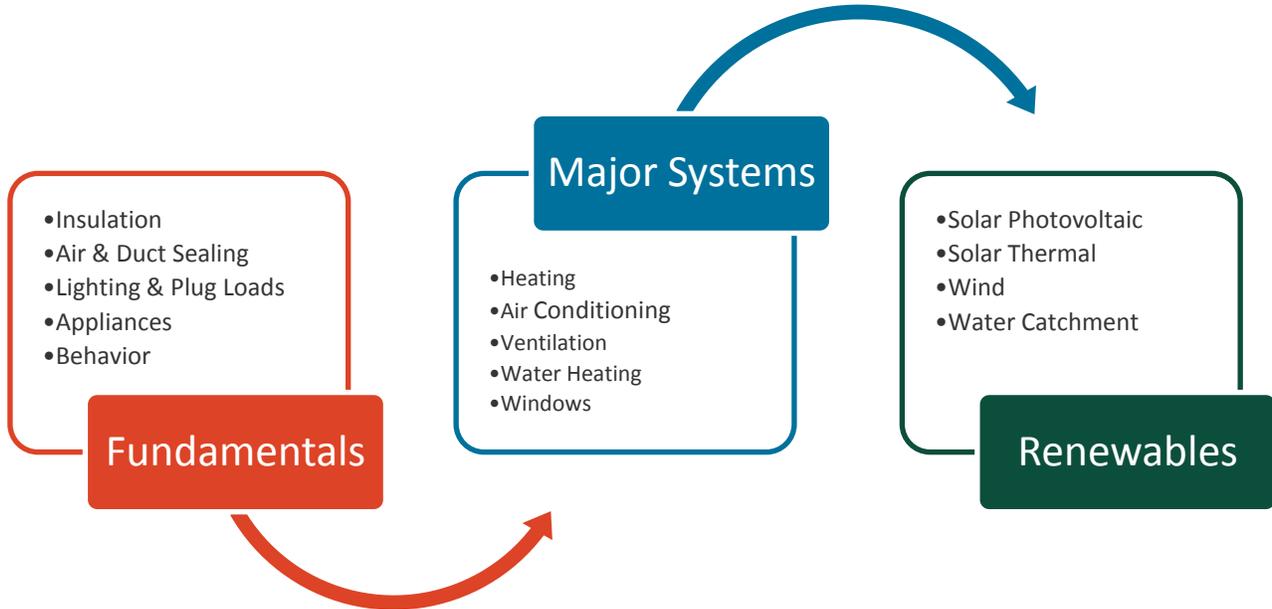
THE ELECTRICITY REDUCTION LOADING ORDER

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 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 11** depicts the recommended loading order for undertaking energy efficiency projects and retrofits.

ELECTRICITY PROFILE

Figure 11: Retrofitting Loading Order



COMMUNITY ELECTRICITY USE

Irwindale’s current energy profile and potential for savings is tied closely to its built environment. Like much of Los Angeles County, Irwindale’s housing stock has remained relatively unchanged over the past decade, with a higher proportion of older homes than the state as a whole. More than 92% of homes in Irwindale are single-family detached homes, rather than multi-family units such as apartments (see **Table 16**). Additionally, the home ownership rate in Irwindale is 69% of homes, higher than most of California. Together, these factors ensure there is high potential for home energy efficiency upgrade programs in the city. The high number of single-family homes owned by the occupants typically results in higher interest and investment in energy efficiency upgrades, since homeowners can more directly see the benefits of lowered utility bills and increased property values through energy efficiency improvements than renters.

Table 16: Irwindale’s Housing Units by Type (2010)

Housing Type	Number of Units	Percentage
1-unit, detached	361	92%
1-unit, attached	10	3%
2 units	4	1%
3 or 4 units	0	0%
5 to 9 units	0	0%
10 to 19 units	11	3%
20 or more units	0	0%
Mobile home	6	1%
Total	392	100%

ELECTRICITY PROFILE

Irwindale is unique in that residential land use is only about 1% of all land area in the city (see **Table 17**). Nonresidential land use is dominated by the Santa Fe Dam Recreational Area (32%) and the mining quarries, including both active and inactive sites (27%). Other notable uses include landfill, utilities, public, and institutional, which collectively make up 10% of the city’s area.

Additional nonresidential space in Irwindale comprises a mix of office, commercial, and industrial space. Opportunities to improve energy efficiency in the retail and office sector will occur through improvements in heating, ventilation, and air conditioning (HVAC), lighting, and appliance or equipment upgrades.

Table 17: Irwindale Existing Land Use Areas

Use	Acres	% of Total	Source
Residential	59.7	1.0%	General Plan
Commercial	77.4	1.3%	General Plan
Office	48.7	<1%	General Plan
Business Park	33.9	<1%	General Plan
Industrial Park, Light Industry, and Heavy Industry	462.4	7.6%	General Plan
Yards	344.9	5.7%	General Plan
Quarries (Active, Inactive, and Plant Sites)	1,631.2	26.8%	General Plan
Landfill, Utilities, Public, and Institutional Uses	626.0	10.3%	General Plan
Santa Fe Dam	1,920.3	31.6%	General Plan
Vacant	327.25	5.4%	General Plan
Other Uses	548.3	9.0%	General Plan
Total	6,080.5	100%	General Plan

Other unique characteristics of Irwindale’s built environment include:

- Large average household size of 3.88 people (higher than the county average of 2.97).
- Mostly single-family detached housing units (92% of units, as opposed to 51% of units in Los Angeles County, and 59% of units in California).
- High rate of homeownership (69% of homes, as opposed to 48% of homes in Los Angeles County).
- Few homes built in the last 20 years, although slightly higher than the countywide average for the percentage of homes built after 1980.

FUTURE DEVELOPMENT

Irwindale is anticipating several significant new planned developments over the next decade that will support the economic transition of the city away from its mining heritage. As the quarries are closed and the land is reclaimed, large areas in the city will be available for development with a focus on industrial and retail, with some small areas designated for residential uses. **Table 18** provides an overview of the key reclaim and development projects planned for Irwindale. Many of these projects are currently on hold, but might occur by 2020 or 2035.

ELECTRICITY PROFILE

Table 18: Irwindale Planned Land Uses

Site Name	Market Demand	Acres	Percentage of Total	Source
17-Acre Site @ Arrow Highway and Live Oak Avenue	Industrial	17.0	10.3%	Economic Strategic Plan
North Kincaid Pit and Denny's @ I-210 and N. Irwindale Avenue	Retail/Industrial	16.6	10.1%	Economic Strategic Plan
Manning Pit @ Vincent Avenue and Arrow Highway	Residential/Industrial/Retail	35.7	21.7%	Economic Strategic Plan
Gore Point/Triangle Pit/JH Pit @ Arrow Highway and Live Oak Avenue West	Retail/Industrial	74.2	45.0%	Economic Strategic Plan
16203 Arrow Highway @ Arrow Highway and Allen Drive	Industrial	6.3	3.8%	Economic Strategic Plan
15768 Arrow Highway @ Arrow Highway and 4th Street	Industrial/Retail	2.5	1.5%	Economic Strategic Plan
La Alderson/Am Vets Property @ Los Angeles Street and Alderson Avenue	Industrial	12.5	7.6%	Economic Strategic Plan
Total		164.8	100%	

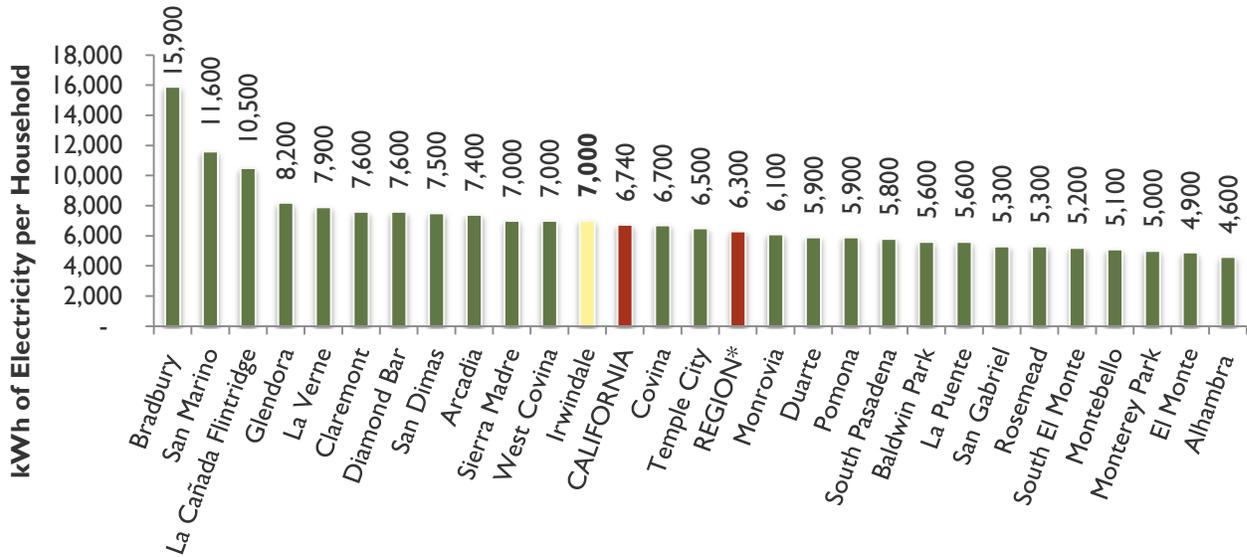
Specific to housing, Irwindale has identified a need to provide a total of 67 new housing units between 2008 and 2014 following the recommendation of the Residential Housing Needs Assessment. At the writing of the 2011 Housing Element Update, 51 of these units had been provided, leaving 16 to be added by 2014. Current plans might seek to provide these units through the second phase of the Las Casitas development (9 units) and the next phase of an infill housing project (7 units).

COMMUNITY COMPARISON TO REGIONAL AND STATEWIDE ELECTRICITY DEMANDS

To compare local use to regional use 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 allowed for a common regional benchmark. It is important to understand how Irwindale's electricity use compares to regional and statewide electricity use. As shown in **Figure 12**, each Irwindale household used an average of 7,000 kilowatt-hours (kWh) in 2010. This is slightly more than the California household average of 6,740 kWh and above the San Gabriel Valley project average of 6,300 kWh.

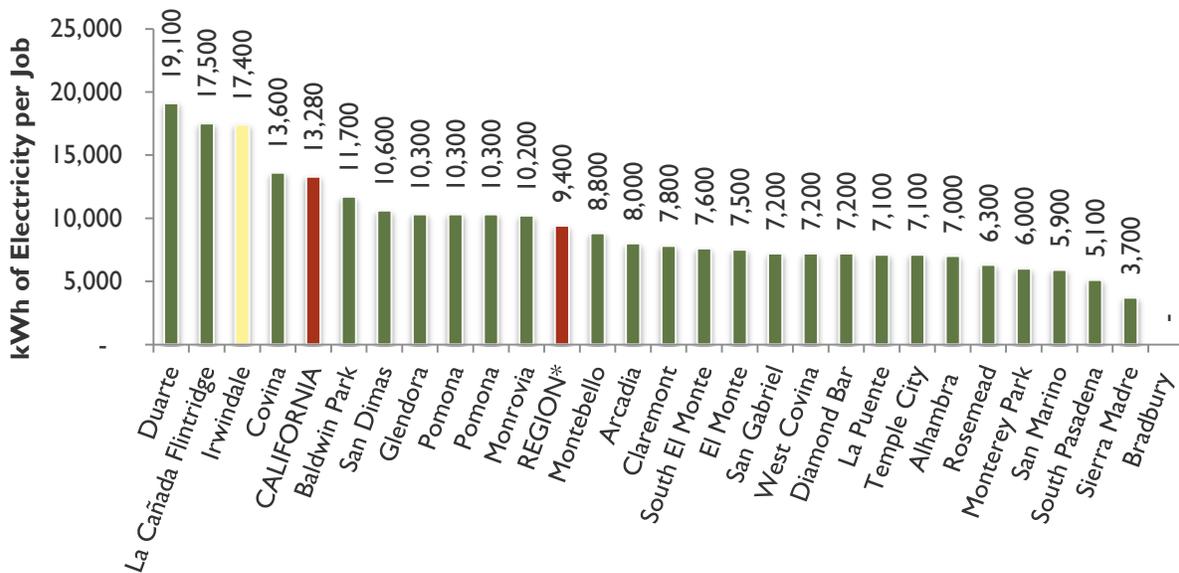
ELECTRICITY PROFILE

Figure 12: Annual Electricity per Household, 2010 (kWh)



In 2010, Irwindale had the fourth highest intensity of nonresidential electricity use of all participating San Gabriel Valley cities, with approximately 17,400 kWh per job. As **Figure 13** illustrates, this is nearly double the energy intensity of other cities in the San Gabriel Valley, which averaged 9,400 kWh per job in 2010. The high electricity intensity per job is probably due to the many industrial activities and quarries, both of which use significant amounts of energy for day-to-day operations.

Figure 13: Annual Electricity Use Per Job, 2010 (kWh)



ELECTRICITY PROFILE

MUNICIPAL ELECTRICITY DEMAND

2008 ELECTRICITY USAGE

In 2008, the City of Irwindale used 2,513,900 kWh from buildings and facilities, and lighting. **Table 19** depicts total municipal electricity use and provides detailed energy totals by rate class for 2008. There are two primary categories in which Irwindale’s municipal energy use is classified: buildings and facilities, and public lighting. Within each category are a series of rate groups.

In the building and facility sector, there are the non-demand rated (GS-1) and demand rated (GS-2) rate groups. Most of the city’s larger facilities and buildings such as City Hall, the senior center, and the teen center fall into the GS-2 category, meaning that the cost of electricity used by these facilities is based on a tiered approach where higher rates of energy use cost more per kWh used. GS-1 electricity accounts include smaller buildings, parks facilities, and irrigation controls with lower levels of electricity use than GS-2 accounts. In 2008, 1,310,050 kWh or 80% of the city’s building and facility-related electricity use fell into the demand rated group, with the non-demand rated accounts totaling 323,460 kWh.

In the public lighting category are three types of rate classes: SCE-owned streetlights (LS-1-ALLNITE), unmetered City-owned streetlights (LS-2), and traffic signals and controllers (TC-1). All of the street lighting and traffic signal lighting in Irwindale used 880,390 kWh in 2008.

Table 19: City of Irwindale Municipal Electricity Use by Rate Class, 2008

Buildings & Facilities	Percentage of Buildings & Facilities	2008 Annual kWh
Non-Demand Rated (GS-1)	20%	323,460
Demand Rated (GS-2)	80%	1,310,050
Total Buildings & Facilities	100%	1,633,510
Lighting	Percentage of Lighting	2008 Annual kWh
SCE-owned Streetlights (LS-1-ALLNITE)	77%	681,580
Unmetered City-owned Streetlights (LS-2)	11%	95,850
Traffic Lights (TC-1)	12%	102,960
Total Lighting	100%	880,390
TOTAL All Municipal Accounts		2,513,900

COMPARISON OF BASELINE YEAR TO 2010

From 2007 to 2010, the City’s total electricity use decreased by 3%, from 2,513,900 kWh in 2008 to 2,446,830 kWh in 2010. The City experienced a 31% decrease in electricity use at buildings and facilities, while experiencing a 49% increase in electricity use for lighting. **Table 20** shows these results.

ELECTRICITY PROFILE

Table 20: Changes in Municipal Electricity Use, 2008–2010

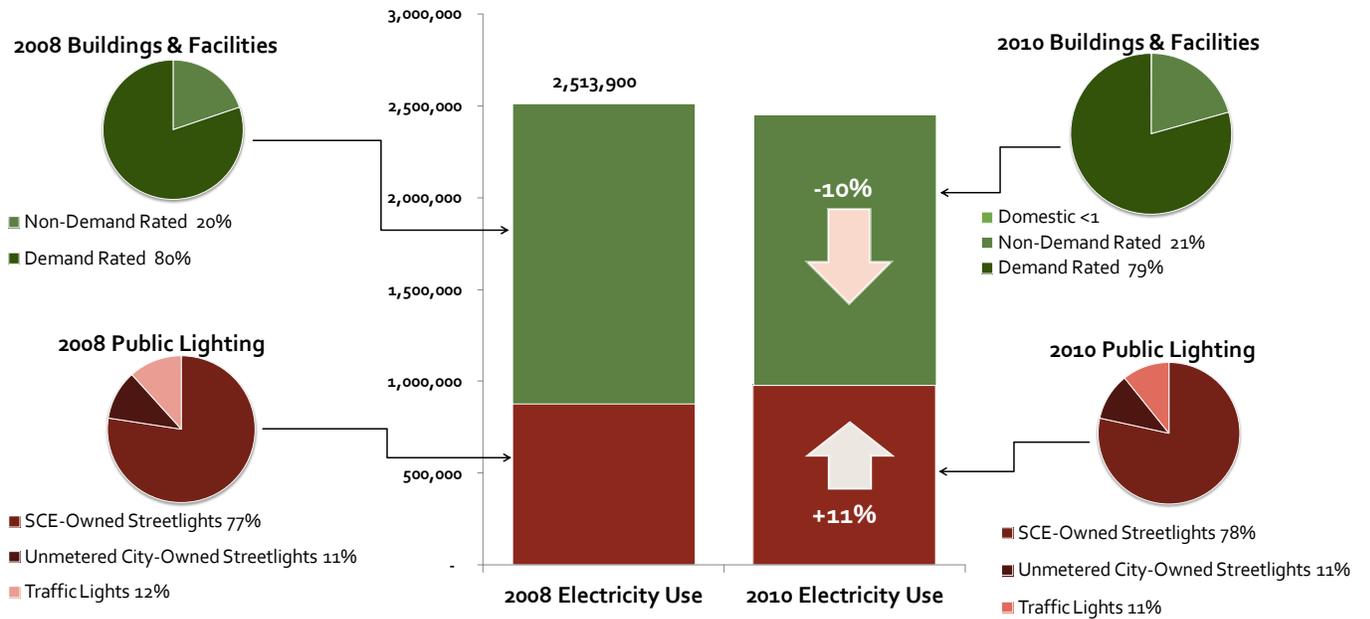
Buildings & Facilities	2008 Annual kWh	2010 Annual kWh	Change 2008–2010 (kWh)	Percentage Change 2008–2010
Non-Demand Rated (GS-1) and Demand Rated (GS-2, GS-2/GS1) ²	1,633,510	1,133,070	-500,400	-31%
Total Buildings & Facilities	1,633,510	1,133,070	-500,400	-31%
Lighting	2008 Annual kWh	2010 Annual kWh	Change 2008–2010 (kWh)	Percentage Change 2008–2010
SCE-owned Streetlights (LS-1-ALLNITE)	681,580	833,250	151,670	22%
Unmetered City Owned Streetlights (LS-2)	95,850	137,430	41,580	43%
Traffic Lights (TC-1)	102,960	343,080	240,120	233%
Total Lighting	880,390	1,313,760	433,370	49%
TOTAL All Municipal Accounts	2,513,900	2,446,830	-67,070	-3%

Table 20 and **Figure 14** show that electricity use for outdoor lighting, particularly the unmetered City-owned streetlights and lighting for traffic signals, as well as outdoor lighting at parks, may offer the largest opportunities for energy efficiency reductions, as these rate groups and electricity uses saw large increases in electricity use between 2008, and likely the highest user in 2010.

² Electricity usage in the GS-1 and GS-2 rate classes was not provided separately for 2010; thus, these rate classes are grouped together in Table 18.

ELECTRICITY PROFILE

Figure 14: Municipal Electricity Comparison, 2008–2010



The top ten municipal electricity users by account are provided in **Table 21** below. Between 2008 and 2010, a number of the ten facilities had a decrease in electricity use, including a 19% energy reduction at the City pool. However, energy use increased significantly for a number of the City’s largest street and area lighting accounts over those years, perhaps due to an increased number of outdoor events at those locations. The lighting at the corner of Arrow Highway and Maine Avenue saw the largest increases.

ELECTRICITY PROFILE

City of Irwindale Top Electricity Uses by Account, 2008–2010

User Account	Rank in 2008	Facility	Address	2008 kWh	2010 kWh	Net change	2008 Cost	2010 Cost
10222899, 2447369, 2447372, 1470334, 24114472	1	Irwindale City Hall Complex 5050 Irwindale Ave	5050 Irwindale Avenue	544,751	502,008	-8%	\$85,945	\$87,659.1
22447368	2	Police Department	5050 Irwindale Avenue	263,420	246,380	-6%	\$30,143	\$30,176.3
1470332	3	Irwindale City Hall – City Pool	5050 Irwindale Avenue	228,652	169,748	-26%	\$27,089	\$22,045.4
LS-1-ALLNITE	4	SCE Streetlights (LS-1) ¹	Citywide	681,580	769,510	13%	\$163,734	\$163,734.2
1470310	5	LS-1 Account ²	Arrow/Maine Street	390,996	88,381	-77%	\$68,725	\$88,380.5
–	6	Traffic Lights (TC-1) ³	Citywide	102,960	105,570	3%	\$102,960	\$105,570.0
–	7	City-Owned Streetlights ⁴	Citywide	95,850	106,010	11%	\$95,850	\$106,010.0
1470306	8	City-Owned Streetlight Account ⁵	Arrow Highway Buena Rio	54,175	54,175	0%	\$5,526	\$5,445.1
1470331, 1470330	9	Irwindale Senior Citizens Center – 16116 Arrow Highway	16116 Arrow Highway	317,220	244,200	-23%	\$44,222	\$42,535.6
900217	10	Baseball Field – 16034 Calle Del Norte	16034 Calle Del Norte	55,200	44,240	-20%	\$19,064	\$15,352.0

1. All accounts in the SCE-owned rate group, including account 1470310.

2. This account is the single largest LS-1 account and fifth largest overall. It represents greater than half of the City’s total LS1 electricity use. Presented separately for reference purposes.

3. All accounts in the traffic light (TC-1) rate group.

4. All accounts in the City-owned streetlights (LS-2) rate group, including account 1470306.

5. This account is the single largest LS-2 account, representing greater than half of the City’s total LS-2 electricity use. Presented for reference purposes.

CHAPTER 4

ENERGY EFFICIENCY STRATEGY

The energy efficiency strategy in this Energy Action Plan (EAP) presents reduction targets for electricity use and greenhouse gas (GHG) emissions. These targets focus on community-wide activities and municipal operations. The strategies include 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.

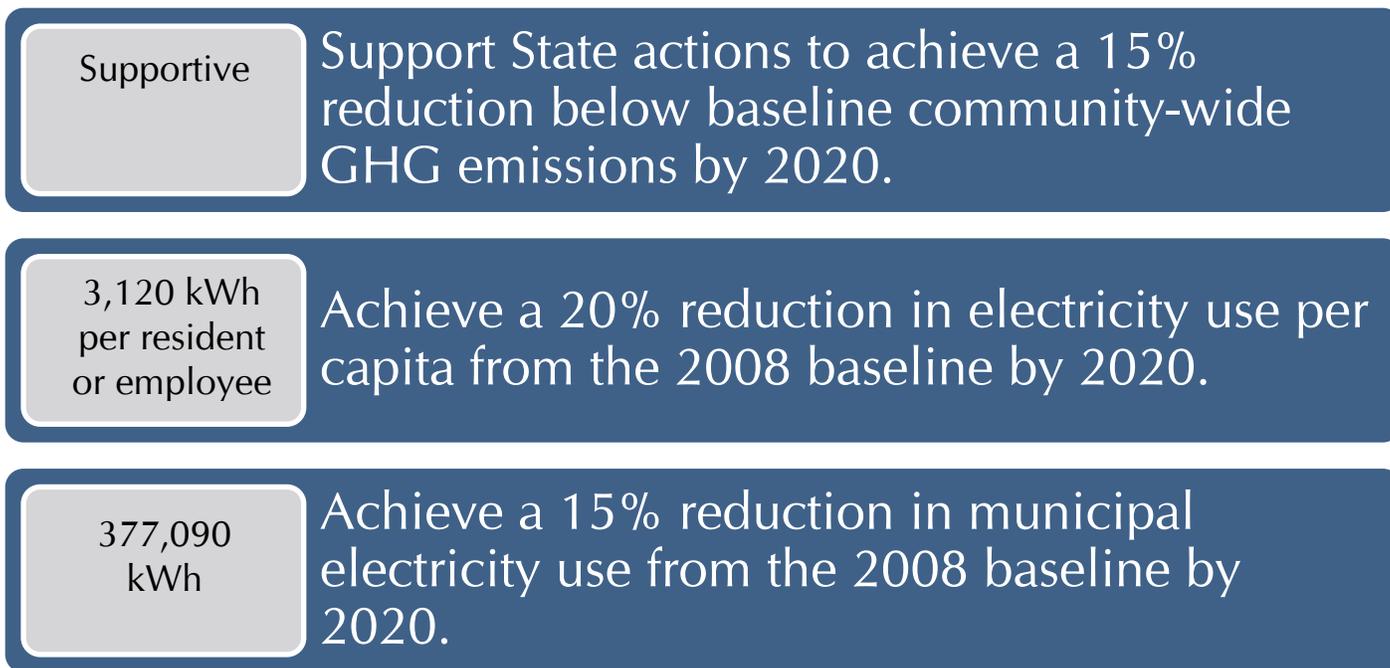
REDUCTION TARGETS

The City of Irwindale 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 Public Utility Commission's (CPUC) Long Term Energy Efficiency Strategic Plan (CEESP) (refer to **Chapter 1, Figure 1**) the focus of this plan is on electricity efficiency. Electricity efficiency also provides the added benefit of reducing greenhouse gas (GHG) emissions. Although the City is projected to achieve the State-recommended GHG reduction target of 15% below baseline emissions levels by 2020, this EAP identifies additional targets that will strengthen the business sector while supporting the state's electricity reduction goals. This approach equips the City to act as a leader and enhance the competitiveness of the local economic sector.

ENERGY EFFICIENCY STRATEGY

Three reduction targets are presented below in **Figure 15**. The City’s GHG emissions reduction goal reflects the State’s goal established by the AB-32 Scoping Plan. The City’s electricity reduction goals have been set at practical and achievable levels in order to demonstrate the City’s commitment to local reductions and support consistency with state energy efficiency goals. The per capita electricity reduction target in **Figure 15** will also provide additional benefits to the community while strengthening the competitiveness of the business sector. Through actions and policies to bring about per capita energy use reductions, the City can help ensure that homeowners save money and that local businesses are identifying effective ways to reduce energy costs and remain cost-competitive to their neighbors. The municipal electricity reduction target shown in **Figure 15** provides a path for the City to achieve energy and cost savings. By identifying and executing energy efficiency measures in its own operations, the City will also act as a leader for the community. Each reduction target is supported by a series of goals, policies, and actions.

Figure 15: City of Irwindale’s Energy Efficiency Targets



STRATEGY STRUCTURE

In order to achieve the target electricity reductions by 2020, the City of Irwindale will need 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 16** below.

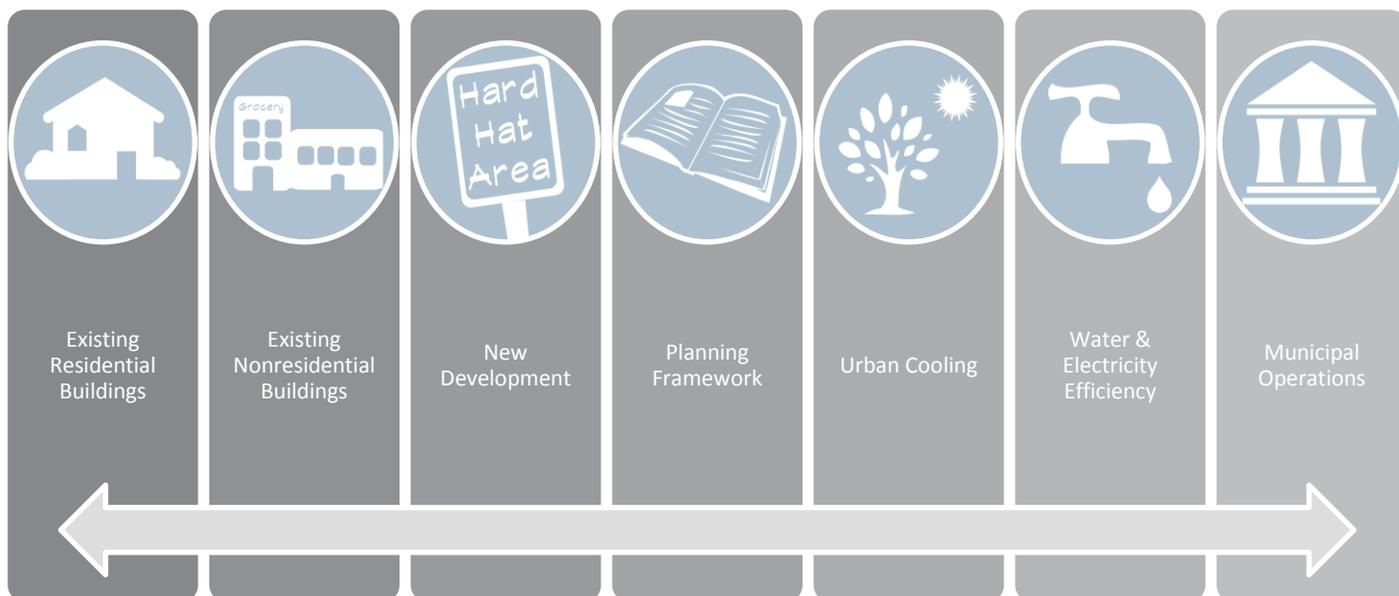
Each topic area includes corresponding goals, policies, and supporting actions that are necessary for successful implementation. Together, the goals, policies, and actions provide the City’s “strategy” to achieve the electricity

ENERGY EFFICIENCY STRATEGY

efficiency targets of this EAP. Each piece 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 topic areas identified.
- **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.

Figure 16: Energy Efficiency Strategy Topic Areas



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, and additional benefits, or co-benefits, resulting from the implementation of each policy. (Refer to **Chapter 5, Table 1** for a policy summary and associated implementation details. See **Appendix C** for detailed methods and sources of quantified policies.) This assessment recognizes the broad value of electricity efficiency for the community and the City of Irwindale. Not only will electricity efficiency actions reduce utility bills, but also they provide an opportunity to improve the quality of homes and businesses, increase property values, improve the indoor comfort of buildings, and reduce ongoing maintenance costs. Actions in City government facilities also fulfill the City's requirements for participation in the ELP model, helping to qualify the City for additional financial incentives from Southern California Edison (SCE).

ENERGY EFFICIENCY STRATEGY

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.

Each policy in this chapter is presented with the following information:

- GHG reduction estimates, presented in ranges, for the year 2020.
- Kilowatt-hours (kWh) reduction estimates, presented in ranges, for the year 2020.
- Co-benefits that will probably 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, kWh of electricity, is combined with the performance targets and indicators identified in this EAP to calculate the range of potential reduction benefit for each policy. This approach ensures that the City’s electricity reductions are tied to the baseline and anticipated demand that will occur in Irwindale. Details on the assumptions, methods and citations used in the electricity reduction quantifications can be found in **Appendix C**.

COMMUNITY-WIDE ELECTRICITY EFFICIENCY STRATEGIES

The following goals, policies, and actions are aimed at reducing electricity use within the community.

GOAL 1: IMPROVE ENERGY EFFICIENCY IN EXISTING RESIDENTIAL DEVELOPMENT AND REDUCE RESIDENTIAL ENERGY COSTS.

POLICY 1.1: PROMOTE THE USE OF ENERGY-EFFICIENT APPLIANCES AND EQUIPMENT IN HOMES.

Actions

- Market up to three incentives/rebate programs that will help save money, such as rebates on Energy Star refrigerators, electric water heater rebates, portable room air conditioner units, or professional air conditioning maintenance and repair.
- Provide educational information on the use of smart-grid-integrated appliances through the City’s website and distribution of San Gabriel Valley Energy Wise Partnership materials, and encourage participation in in-home monitoring programs provided by Southern California Edison.
- Promote the use of Energy Star appliances on the City’s website and the newsletter sent by the City to city residents.
- Promote information on plug-load management devices, such as motion-activated power strips.

Policy 1.1
2020 kWh Reduction:
8,000–32,010
2020 MTCO_{2e} Reduction:
< 10
Co-Benefits:
Provides Permanent Energy Reduction,
Reduces Peak Energy Demand,
Supports Community Education,
Reduces Monthly Utility Costs

POLICY 1.2: ENCOURAGE ENERGY AUDITS SO THAT 30% TO 40% OF EXISTING HOUSEHOLDS PARTICIPATE IN AUDITS BY 2020 AND IMPLEMENT RETROFITS BASED ON AUDIT FINDINGS.

Actions

- Apply for funds to assist residents with energy conservation audits and retrofits, including the cost of weatherization resources. (ref. Housing Element section 3.3.7.4)
- Partner with Southern California Edison, Southern California Gas Company, and local organizations to promote free energy audits for low-income owners and renters, rebate programs for installing energy-efficient features/appliances, and public education about ideas to conserve energy. (ref. Housing Element section 3.3.7.4).
- Provide information on energy audit programs such as Energy Upgrade California to homeowners through various channels, including the City’s website, neighborhood associations, and other community groups.

Policy 1.2
2020 kWh Reduction:
108,780–290,090
2020 MTCO_{2e} Reduction:
30–80
Co-Benefits:
Provides Permanent Energy Reduction,
Reduces Peak Energy Demand,
Supports Community Education,
Reduces Monthly Utility Costs

POLICY 1.3: DEVELOP A VOLUNTARY ENERGY EFFICIENCY CHECKLIST AT TIME OF RESIDENTIAL BUILDING SALE.

Actions

- Partner with the Energy Leader Partnership to customize existing templates for use in Irwindale.
- Include a prioritized and targeted set of high-value energy efficiency improvements on the checklist.
- Educate homebuyers on options for financing energy efficiency at the time of sale, such as mortgages that include financing for energy efficiency improvements.

Policy 1.3
2020 kWh Reduction:
24,980–99,920
2020 MTCO_{2e} Reduction:
10–30
Co-Benefits:
Provides Permanent Energy
Reductions, Reduces Peak Energy
Demand, Supports Community
Education, Reduces Monthly Utility
Costs

ENERGY EFFICIENCY STRATEGY

GOAL 2: IMPROVE ENERGY EFFICIENCY IN EXISTING NONRESIDENTIAL DEVELOPMENT AND REDUCE RESIDENTIAL ENERGY COSTS.

POLICY 2.1: PROMOTE THE USE OF ENERGY-EFFICIENT APPLIANCES AND EQUIPMENT IN BUSINESSES.

Actions:

- Help promote up to three incentives/rebate programs that will help save money, with a focus on the warehousing, retail, and industrial sectors. Examples include the HVAC Optimization Program and the Continuous Energy Improvement Program.
- Educate business owners about time-of-use rates and demand management as methods to reduce energy bills, especially during peak demand times, in conjunction with Southern California Edison.
- Promote information on plug-load management devices and strategies, such as motion-activated power strips, vending machine misers, and server optimization.

Policy 2.1

2020 kWh Reduction:

356,450–1,425,800

2020 MTCO_{2e} Reduction:

100–390

Co-Benefits:

Provides Permanent Energy Reduction, Reduces Peak Energy Demand, Conserves Water, Supports Community Education, Reduces Monthly Utility Costs, Supports Local Economy & Job Creation

POLICY 2.2: ENCOURAGE NONRESIDENTIAL BUILDING OWNERS TO ACHIEVE A 30% TO 40% PARTICIPATION RATE IN AUDITS BY 2020 AND IMPLEMENT RETROFITS BASED ON AUDIT FINDINGS.

Actions

- Partner with Southern California Edison (SCE) to promote appropriate energy efficiency training events at the local SCE Energy Training Center located in Irwindale.
- Partner with the City's Chamber of Commerce and other business organizations to provide information on existing energy audit opportunities to business owners.
- Work with Los Angeles County and other regional public or private organizations to create a revolving loan fund to support nonresidential retrofits that are not covered by utility rebates or other existing incentives.
- Provide education and outreach to commercial property owners on the benefits of complying with state requirements regarding energy disclosure at the time of sale or lease of nonresidential property.
- Working with the Irwindale Chamber of Commerce Environmental Committee, sponsor a business-oriented energy competition to encourage businesses to reduce energy usage. Continue to provide recognition to businesses that achieve energy reductions and other sustainability goals through support

Policy 2.2

2020 kWh Reduction:

13,709,630–36,559,000

2020 MTCO_{2e} Reduction:

3,740–9,960

Co-Benefits:

Provides Permanent Energy Reductions, Reduces Peak Energy Demand, Supports Community Education, Reduces Monthly Utility Costs, Supports Local Economy & Job Creation

ENERGY EFFICIENCY STRATEGY

of the Chamber’s annual Environmental Awards and other venues to demonstrate the business benefits of energy efficiency.

POLICY 2.3: DEVELOP EDUCATIONAL MATERIALS AND A VOLUNTARY ENERGY EFFICIENCY CHECKLIST AT TIME OF NONRESIDENTIAL BUILDING SALE.

Actions

- Partner with the Energy Leader Partnership to customize existing outreach material templates for use in Irwindale.
- Include a prioritized and targeted set of high-value energy efficiency improvements on the checklist.
- Educate building buyers about options for financing energy efficiency at the time of sale, such as mortgages that include financing for energy efficiency upgrades, or the Los Angeles County Commercial Property Assessed Clean Energy program.

Policy 2.3

2020 kWh Reduction:

479,840–1,599,460

2020 MTCO_{2e} Reduction:

130–440

Co-Benefits:

Provides Permanent Energy Reduction, Reduces Peak Energy Demand, Supports Community Education, Reduces Monthly Utility Costs

POLICY 2.4: MAXIMIZE ENERGY EFFICIENCY IN LARGE NONRESIDENTIAL FACILITIES GREATER THAN 25,000 SQUARE FEET.

Actions

- Encourage participation in Southern California Edison energy-saving programs, such as the Retrocommissioning Program, available only to commercial buildings with at least 25,000 square feet.
- Work with key partners in the business community, such as the MillerCoors Brewery, to publicize energy-efficient practices and case studies.

Policy 2.4

2020 kWh Reduction:

4,264,220–8,528,450

2020 MTCO_{2e} Reduction:

1,160–2,320

Co-Benefits:

Provides Permanent Energy Reduction, Reduces Peak Energy Demand, Conserves Water, Reduces Monthly Utility Costs, Supports Community Education, Supports Local Economy & Job Creation

GOAL 3: REDUCE THE AVERAGE ELECTRICITY INTENSITY OF NEW CONSTRUCTION AND MOVE TOWARD NET ZERO CONSTRUCTION BY 2020.

POLICY 3.1: INCREASE ENERGY EFFICIENCY OF ALL NEW CONSTRUCTION.

Actions

- Working with existing programs such as the San Gabriel Valley Energy Wise Partnership, develop realistic, simple energy efficiency checklists, or tailor the sample checklist provided by the San Gabriel Valley Council of Governments that could be provided to developers during the permitting process. Compliance with the checklist will be voluntary. Provide separate checklists for residences and for each major type of commercial and industrial building being constructed in the city, i.e., industrial, retail, warehouse, etc.
- Provide training to all City planning/permit staff so they consider energy efficiency during the permit process for new construction. Work collaboratively with project applicants to identify energy-saving features for projects.
- Encourage participation in the Southern California Edison Savings by Design and Sustainable Communities Programs, as applicable.
- Collaborate with local green building organizations to provide training and workshops.
- Provide contractor and architect training on green building and energy efficiency design and construction practices.
- Target local funds, including redevelopment resources (if available) and the Community Development Block Grant, to assist affordable housing developers to incorporate energy efficient designs and features. (Housing Element section 3.3.7.4).
- Require all City-sponsored housing developments to exceed Title 24 energy requirements by 15% and promote such developments on the City's website and other media outlets to educate other members of the community. (Housing Element section 3.3.7.4).

Policy 3.1

2020 kWh Reduction:

758,490–1,516,980

2020 MTCO_{2e} Reduction:

210–400

Co-Benefits:

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

POLICY 3.2: ENCOURAGE THE USE OF SMART-GRID TECHNOLOGY, ENERGY MANAGEMENT SYSTEMS, AND ENERGY-EFFICIENT APPLIANCES AND EQUIPMENT IN NEW BUILDINGS.

Actions

- Promote existing energy efficiency rebate offerings for appliances, HVAC equipment, and lighting fixtures.
- Provide educational information regarding the use of smart grid and energy management tools in new construction through the City’s website and the distribution of San Gabriel Valley Energy Wise Partnership materials.

Policy 3.2
2020 kWh Reduction:
736,470–1,472,940
2020 MTCO_{2e} Reduction:
200–400
Co-Benefits:
Provides Permanent Energy Reduction, Reduces Peak Demand, Conserves Water, Supports Community Education, Reduces Monthly Utility Costs

POLICY 3.3: CONTINUE TO CONDUCT OUTREACH AND EDUCATION TO THE COMMUNITY.

Actions

- Highlight stories in which residents and businesses have successfully installed energy-efficient equipment on their properties.
- Promote broad public outreach relating to energy efficiency, including educational programs and the marketing of energy-saving incentives. (Housing Element, section 3.3.7.4).
- Provide an energy kiosk, available through the San Gabriel Valley Energy Wise Partnership, at City Hall showing energy-saving opportunities.

Policy 3.3
2020 kWh Reduction:
Supportive Policy
2020 MTCO_{2e} Reduction:
Supportive Policy
Co-Benefits:
Provides Permanent Energy Reduction, Reduces Peak Demand, Conserves Water, Supports Community Education, 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

- Provide a two-tiered expedited permitting process:
 - Expedite and streamline the permitting process for new construction projects that use the voluntary energy efficiency checklist described in Policy 3.1.
 - Provide additional incentives, such as expedited plan review, to projects that achieve 15% or higher energy efficiency above Title 24 standards. (Housing Element, Section 3.3.7.4).
- Update the City's discretionary review guidance to identify zero net energy as a preferred GHG emissions mitigation policy for new development.
- By 2015, evaluate compliance with the voluntary energy efficiency checklist and the expedited permitting process and consider adoption of regionally consistent mandatory standards.
- Work with the San Gabriel Valley Energy Wise Partnership 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 should include information regarding residential financing programs such as Energy Upgrade California, energy efficiency loans, and Property Assessed Clean Energy financing for nonresidential properties.

Policy 4.1

2020 kWh Reduction:

Supportive Policy

2020 MTCO_{2e} Reduction:

Supportive Policy

Co-Benefits:

Provides Permanent Energy Reduction, Reduces Peak Demand, Conserves Water, Supports Community Education, Reduces Monthly Utility Costs

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

- Promote creative options to achieve building shading, including deciduous tree plantings on the west and south and other shading techniques, such as awnings. (Housing Element, section 3.3.7.4).
- Provide suggestions on use of trees to provide shade for parking lots and other spaces when landscaping plans are submitted to the City for review.

Policy 5.1

2020 kWh Reduction:

620–11,220

2020 MTCO_{2e} Reduction:

< 10

Co-Benefits:

Provides Permanent Energy Reduction, Reduces Peak Energy Demand, Supports Community Education, Conserves Water, Reduces Monthly Utility Costs

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

Actions

- Encourage installation of cool roofs and the use of light- reflective paving surfaces.
- Endorse standards that promote passive solar heating, such as overhangs on south facing windows. (Housing Element, section 3.3.7.4).

Policy 5.2

2020 kWh Reduction:

6,550–19,640

2020 MTCO_{2e} Reduction:

10–20

Co-Benefits:

Provides Permanent Energy Reduction, Reduces Peak Energy Demand, Supports Community Education, Conserves Water, Reduces Monthly Utility Costs

GOAL 6: EXPAND KNOWLEDGE AND EDUCATION RELATED TO WATER CONSERVATION AND IMPROVE WATER EFFICIENCY IN NEW AND EXISTING DEVELOPMENT.

POLICY 6.1: CONTINUE TO LEVERAGE CITY RESOURCES AND PROGRAMS TO ENCOURAGE WATER CONSERVATION.

Actions

- Provide a water conservation webpage on the City’s website and conduct other outreach activities. Promote current programs offered by the various water agencies such as rebates for high efficiency toilets and clothes washers.
- Consider adoption of a new code requiring all new development to install low-flow or no-flow fixtures.

Policy 6.1

2020 kWh Reduction:

65,150–108,590

2020 MTCO_{2e} Reduction:

20–30

Co-Benefits:

Provides Permanent Energy Reduction, Reduces Peak Energy Demand, Conserves Water, Supports Community Education, Reduces Monthly Utility Costs

ENERGY EFFICIENCY STRATEGY

POLICY 6.2: ENCOURAGE THE USE OF WATER-CONSERVING LANDSCAPING PRACTICES THAT REDUCE ELECTRICITY USED FOR WATER PUMPING.

- Consider adoption of a new code requiring all new development to install dual plumbing in anticipation of more widespread distribution of recycled water for landscape irrigation.
- Provide suggested lists of drought-tolerant plants for landscaping on the City’s website and via other channels.
- Install educational information in parks regarding water-wise practices in place.
- Promote existing rebates for water-conserving landscaping equipment and materials.

Policy 6.2

2020 kWh Reduction:
69,750–116,250

2020 MTCO_{2e} Reduction:
20–30

Co-Benefits:
Provides Permanent Energy Reduction, Reduces Peak Energy Demand, Conserves Water, Reduces Maintenance Costs, Supports Community Education, Reduces Monthly Utility Costs

MUNICIPAL ELECTRICITY EFFICIENCY PROJECTS AND POLICIES

NEAR-TERM 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. Priority near-term municipal projects are presented in **Table 22** below. The City will seek to implement these projects as funding becomes available.

Table 21: Near-Term Municipal Projects¹

Location	Project	Annual Electricity Reduction (kWh/year)	Annual Cost Savings	Estimated SCE Incentive	Funding Opportunities
Meeting Room at 16116 Arrow Highway	Upgrade T-12 fluorescent lamps to energy-efficient models	To Be Confirmed			On-Bill Financing, SCREC, CEC Loans
Water pump with meter near the intersection of Los Angeles Street and Hornbook Avenue	Install a VSD pump and consider pump optimization	To Be Confirmed			On-Bill Financing, SCREC, CEC Loans
Park at City Hall	Retrofit park, walkway, and sport court lighting with energy-efficient models	To Be Confirmed			On-Bill Financing, SCREC, CEC Loans

ENERGY EFFICIENCY STRATEGY

Location	Project	Annual Electricity Reduction (kWh/year)	Annual Cost Savings	Estimated SCE Incentive	Funding Opportunities
City-wide	Replace the 96 HPS and 2 metal halide City-owned safety streetlights with LED or induction lamps	To Be Confirmed			On-Bill Financing, SCREC, CEC Loans
Total		To Be Confirmed			

1. At the time of report preparation, information regarding projected energy savings, cost savings, and estimated SCE incentives was unavailable.

To further evaluate energy efficiency projects, the City will need to complete audits at City-owned facilities such as the swimming pool located at 5050 North Irwindale Avenue, to help identify near-term projects to be implemented. Once audit results are known, the City may commit to prioritizing the implementation of projects with a payback period of four years or less.

LONG-TERM MUNICIPAL POLICIES

In addition to the near-term projects that will be identified, the City has identified additional policies and programs to be implemented in the next eight years to increase energy efficiency and achieve the goal of 15% below baseline municipal electricity consumption by 2020.

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 Irwindale is committed to integrating the Energy Action Plan into the next update of the General Plan.

GOAL 7: IMPROVE ENERGY EFFICIENCY IN EXISTING MUNICIPAL BUILDINGS AND REDUCE MUNICIPAL ENERGY COSTS.

POLICY 7.1: IMPLEMENT AN ENERGY-EFFICIENT PROCUREMENT POLICY REQUIRING THE PURCHASE OF EFFICIENT EQUIPMENT.

Actions

- Work with the San Gabriel Valley Council of Governments and regional partners to reduce the costs of energy-efficient appliances and equipment through bulk purchases.
- Consider lifecycle costs in all equipment and building components that impact energy usage.
- Consider including energy efficiency in budget planning, particularly when major building repairs or equipment replacements are planned in the City’s Capital Improvement Plan.

POLICY 7.2: IDENTIFY ADDITIONAL OPPORTUNITIES TO IMPROVE THE ENERGY EFFICIENCY OF CITY FACILITIES AND INFRASTRUCTURE.

Actions

- Complete audits at all City facilities and audit all infrastructure, such as the pool pump and lift stations.
- Identify cost-effective projects with a payback period of less than four years to reduce electricity use at City facilities.
- 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.
- Install software that automatically shuts off plug-in equipment, such as computers and copiers, at night.
- Consider a virtual server or consolidating servers to reduce energy usage.

POLICY 7.3: WORK WITH THE SAN GABRIEL VALLEY COUNCIL OF GOVERNMENTS 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 IMPLEMENT ENERGY EFFICIENCY PROJECTS.

Actions

- Continue to support City staff participation in regional planning efforts and trainings related to energy efficiency.
- Conduct energy benchmarking on a regular basis.

GOAL 8: REDUCE THE AVERAGE ELECTRICITY INTENSITY OF NEW CONSTRUCTION AND MOVE TOWARD NET ZERO CONSTRUCTION BY 2020.

POLICY 8.1: DEVELOP AND REQUIRE ENERGY EFFICIENCY GOALS AND DESIGN STANDARDS FOR NEW CITY BUILDINGS.

Actions

- Require all new buildings to achieve 15% energy savings over Title 24 requirements. Analyze new municipal facilities to determine zero net energy feasibility. Utilize Southern California Edison Sustainable Communities Program and Savings by Design Program when program criteria can be met.

GOAL 9: INCREASE FINANCING OPPORTUNITIES FOR ENERGY EFFICIENCY IN ORDER TO DRIVE COMPLETION OF NEW PROJECTS.

POLICY 9.1: DEVELOP AT LEAST ONE NEW FINANCING STRATEGY FOR ENERGY EFFICIENCY PROJECTS.

Actions

ENERGY EFFICIENCY STRATEGY

- Consider creation of a revolving loan fund, in which energy savings from completed projects are used to fund the upfront cost of new projects.
- Review and implement appropriate financing options such as loans from the California Energy Commission and on-bill financing from Southern California Edison.
- Review and participate in appropriate financing options provided by the Southern California Regional Energy Center.

GOAL 10: EXPAND EXISTING WATER CONSERVATION EFFORTS.

POLICY 10.1: REDUCE WATER USED FOR LANDSCAPING AND OTHER OUTDOOR USES.

Actions

- Continue to install irrigation controls and time irrigation operations for off-peak use.
- Expand drought-tolerant plantings in parks and other public locations.
- Create zero water medians that do not require irrigation.
- Once available, use recycled water to irrigate parks and landscaping at City facilities.

POLICY 10.2: REDUCE WATER USED WITHIN EXISTING MUNICIPAL BUILDINGS.

Action

- Consider retrofits of water fixtures within City buildings, such as faucet aerators, showerheads, and toilets and urinals, to low-flow or no-flow fixtures as appropriate.

SUMMARY

This EAP identifies a clear path for the City to achieve the community-wide electricity reduction target of 15% below 2008 residential electricity levels and 15% below 2008 nonresidential levels by 2020. **Figures 17** and **18** identify the low and high estimates of kWh reductions and GHG reductions to be achieved by 2020 by goal.

ENERGY EFFICIENCY STRATEGY

Figure 17: Estimated 2020 kWh Savings by Goal

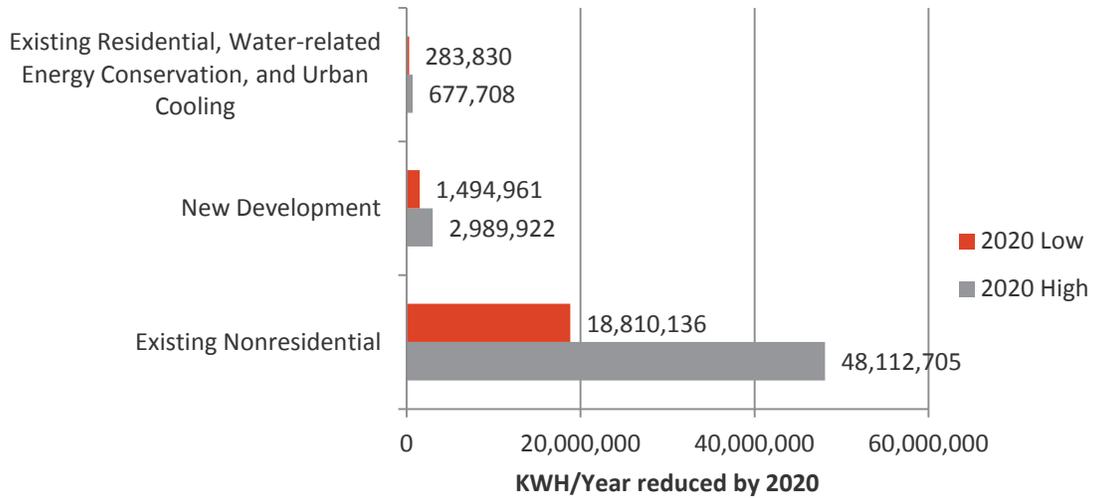
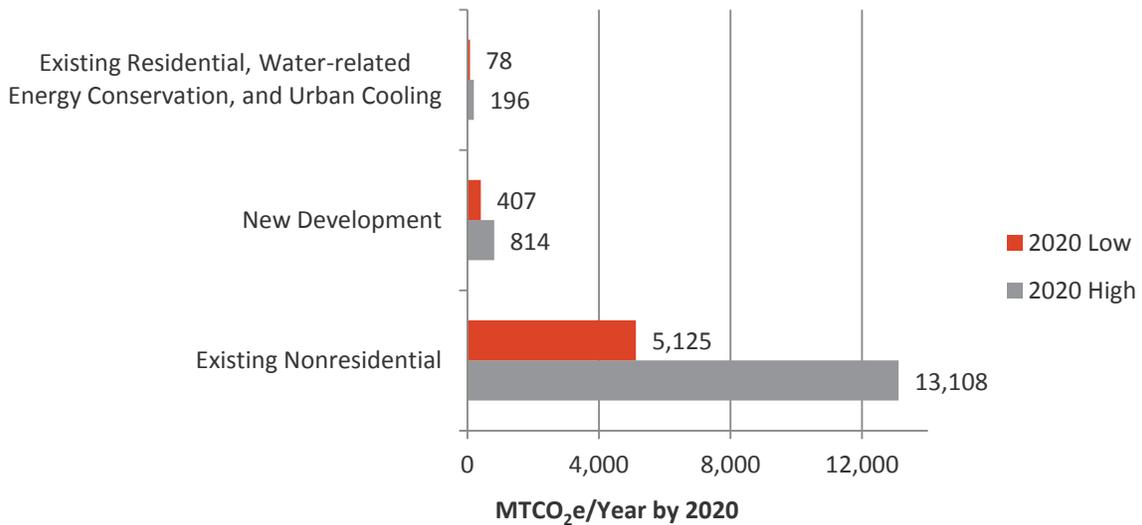


Figure 18: Estimated 2020 MTCO₂e Savings by Goal



Additionally, the City will be able to reduce overall GHG emissions up to 21% below baseline by 2020, which exceeds the AB 32 recommended target of 15% below baseline levels by 2020. In total, state programs and policies in this EAP will reduce GHG emissions by 19,790 MTCO₂e, and local reductions will reduce emissions by 9,860 MTCO₂e.

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.

The EAP implementation will require City leadership to execute strategies and report on the progress of implementation. This Plan identifies the responsible department for each policy and offers time frames and plan-level cost estimates for implementing each strategy. Last, successful implementation requires regular monitoring and reporting. City staff should monitor the progress on implementing the EAP on an annual basis and report to the City Council about the EAP progress each year.

Irwindale will work with the San Gabriel Valley Council of Governments (SGVCOG), the San Gabriel Valley Energy Wise Partnership (SGVEWP), and other partners as appropriate, such as Los Angeles County, the Los Angeles Regional Collaborative, and the Southern California Regional Energy Alliance, 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. The City staff lead will participate in the identification of regional resources available to support and streamline the implementation process.

IMPLEMENTATION

All program activity managers will be required to submit regular project updates to the City's designated EAP implementation coordinator and/or energy manager, including written reports of activities and project outcomes. The energy manager will 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.

City finance staff will maintain records of all project costs, funds, and expenditures. City staff will work closely with the energy manager to submit necessary reports to all funding agencies, including required financial reports and documentation of project outcomes. City staff or a third-party inspector will be responsible for all pre- and post- inspections of new or retrofitted work to confirm that the projects are installed, operational, and consistent with project objectives. The energy manager will be responsible for tracking all related project files and providing appropriate information to the SGVCOG and the SGVEWP.

Crucial to the implementation of this Plan will be the City's implementation program. The implementation program identifies the anticipated electricity savings, greenhouse gas (GHG) emissions reduction, agency, or department responsible for implementation, starting timeframe, and co-benefits.

MONITORING AND UPDATING THE EAP

The City will use the implementation program 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 that the anticipated electricity and GHG reductions are occurring. In the event that GHG reductions do not occur as expected, the City will be able to modify and add additional policies to the EAP to ensure the City meets its reduction target

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.
- Utilize the monitoring and reporting tool to assist with annual reports.
- Identify key 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 three to five years.
- 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.

IMPLEMENTATION

- When City resources are available, integrate the EAP into a comprehensive climate action plan or GHG 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 participation as an active member of the SGVEWP and the Energy, Environment, and Natural Resources Committee.
- 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 action 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 POLICY 5: FULFILL SCE'S ENERGY LEADER PARTNERSHIP PROGRAM REQUIREMENTS TO IMPLEMENT THIS ENERGY ACTION PLAN.

- Confirm review and acceptance/adoption of this EAP by the City Council.
- Identify the plan's implementation time frame to begin within 6 months of approval.
- Integrate EAP implementation projects into the City's operating budget.
- Integrate EAP initiatives into the City's General Plan and other appropriate policy documents.
- Implement the identified policies, actions, and projects identified in this EAP.
- Demonstrate to SCE that the energy efficiency actions identified in this EAP have been implemented and the criteria identified as part of the Energy Leader Partnership Requirements Checklist have been met.

IMPLEMENTATION AND MONITORING TOOLS

MONITORING 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

IMPLEMENTATION

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 incorporated into the report template 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.

ENTERPRISE ENERGY MANAGEMENT INFORMATION SYSTEM

The SGVCOG is collaborating with the City and Los Angeles County to implement the 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 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.

EEMIS includes the following components and features:

- Web-based application using browser-based technology.
- Collects data from all connected facilities and stores data in a standard format.
- Generates usage and demand profiles for the purpose of energy procurement and efficiency project identification.
- Provides utility bill data for the different department subtenants within a building based on prevailing rates or customized for modified rate schedule.
- Utilizes energy cost analysis and notifications based on user-defined parameters to control costs by gaining experience from similar usage facilities (based on area of facility, number of occupants, size of equipment, season, historical usage over user-defined periods, etc).

IMPLEMENTATION PROGRAM

The information in this implementation program provides an overall, planning-level framework for achieving the reductions in this Plan. **Table 23** presents indicators for the implementation of each policy. These indicators represent the level of participation and energy reductions that would achieve the average range 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 average reduction potential. Metrics for supportive policies are shown as "Supportive." **Appendix C** also presents the approach to quantification, including the analytical process for identifying appropriate regional reductions, costs, and financial benefits.

IMPLEMENTATION

Table 22: Implementation Program Table

	Policy	2020 Electricity Reductions (kWh) ³	2020 Performance Targets	Participant Type	Average Reduction per Participant	Beginning Time Frame	Implementing Department
1.1	Promote the use of energy-efficient appliances and equipment in homes.	-20,010	30 households achieve 10% to 20% electricity reductions	Household	650 kWh /household	Mid-Term (2015 to 2020)	Community Development
1.2	Encourage energy audits so that 30% to 40% of existing households participate in audits by 2020 and implement retrofits based on audit findings.	-199,440	90 households achieve 20% to 40% electricity reductions	Household	2,110 kWh /household	Mid-Term (2015 to 2020)	Community Development
1.3	Develop a voluntary energy efficiency checklist at time of residential building sale.	-62,450	30 households achieve 20% to 40% electricity reductions	Household	2,100 kWh /household	Mid-Term (2015 to 2020)	Community Development
2.1	Promote the use of energy-efficient appliances and equipment in business.	-891,130	40 businesses achieve 20% to 40% electricity reductions	Business	20,520 kWh /business	Mid-Term (2015 to 2020)	Community Development
2.2	Encourage nonresidential building owners to achieve a 30% to 40% participation rate in audits by 2020 and implement retrofits based on audit findings.	-7,032,770	310 businesses achieve 20% to 40% electricity reductions	Business	78,930 kWh /business	Near-Term (2013 to 2020)	Community Development

³ Identifies the midpoint between the low and high range of potential electricity reductions.

IMPLEMENTATION

	Policy	2020 Electricity Reductions (kWh) ³	2020 Performance Targets	Participant Type	Average Reduction per Participant	Beginning Time Frame	Implementing Department
2.3	Develop educational materials and a voluntary energy efficiency checklist at time of nonresidential building sale.	-1,039,650	13 businesses achieve 20% to 40% electricity reductions	Business	78,930 kWh /business	Mid-Term (2015 to 2020)	Community Development
2.4	Maximize energy efficiency in large nonresidential facilities greater than 25,000 square feet.	-6,396,340	15% reduction in commercial and industrial electricity use from the 2008 baseline by 2020.	Business	Not Applicable	Mid-Term (2015 to 2020)	Community Development
3.1	Increase energy efficiency of all new construction.	-1,132,740	15% reduction in residential and commercial electricity use from the 2008 baseline by 2020.	Household and Business	Not Applicable	Near-Term (2013 to 2020)	Community Development
3.2	Encourage the use of smart-grid technology, energy management systems, and energy-efficient appliances and equipment in new buildings.	-1,104,710	15% reduction in residential and commercial electricity use from the 2008 baseline by 2020	Household and Business	Not Applicable	Near-Term (2013 to 2020)	Community Development
3.3	Continue to conduct outreach and education to the community.	Supportive	15% reduction in residential and commercial electricity use from the 2008 baseline by 2020	Household and Business	Not Applicable	Near-Term (2013 to 2020)	Community Development

IMPLEMENTATION

	Policy	2020 Electricity Reductions (kWh) ³	2020 Performance Targets	Participant Type	Average Reduction per Participant	Beginning Time Frame	Implementing Department
4.1	Integrate energy efficiency into the city's discretionary permit review framework.	Supportive	15% reduction in residential and commercial electricity use from the 2008 baseline by 2020	Household and Business	Not Applicable	Near-Term (2013 to 2020)	Community Development & Permitting
5.1	Maximize the cooling of buildings through tree planting and shading to reduce building electricity demands.	-5,920	30 households, and 65 businesses	Household and Business	170 kWh per household	Near-Term (2013 to 2020)	Public Works Department
5.2	Reduce building electricity demands through voluntary standards and outreach to promote cool roofs and surfaces.	-13,100	40 households, and 85 businesses	Household and Business	350 kWh per household	Near-Term (2013 to 2020)	Public Works Department
6.1	Continue to leverage city resources and programs to encourage water conservation.	-86,870	15% reduction in residential and commercial electricity use from the 2008 baseline by 2020	Household and Business	Not Applicable	Near-Term (2013 to 2020)	Community Development
6.2	Encourage the use of water-conserving landscaping practices.	-93,000	15% reduction in residential and commercial electricity use from the 2008 baseline by 2020	Household and Business	Not Applicable	Near-Term (2013 to 2020)	Community Development

IMPLEMENTATION

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 will continue to participate in SGVCOG discussions and events related to energy efficiency such as the SGVEWP, the Energy, Environment, and Natural Resources Committee, and other SGVCOG-sponsored events to help meet the goals described in this EAP.

CHAPTER 6

CONCLUSION

This Energy Action Plan (EAP) is an opportunity for the City to create and achieve a long-term vision for energy efficiency. The City of Irwindale has developed this EAP as part of a regional framework that allows for close coordination and consistency between communities in the San Gabriel Valley, while responding to local community characteristics, values, and planning frameworks.

The policies and actions in this plan are meant to serve as a roadmap for reducing electricity use in the community and municipal facilities. While the primary focus of this Plan is on reducing electricity and related greenhouse gas emissions, the policies and actions in this Plan also provide the ancillary benefits of improving the quality of the local built environment, reducing household electricity costs, and stimulating the local economy through investments in energy efficiency.

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 measurable 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 incandescent bulbs.

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 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.

GLOSSARY

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 use 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.

GLOSSARY

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.

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 roadmap 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 (CO₂e)

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 MTCO₂e.

GLOSSARY

City Energy Action Team (CEAT)

A team assembled to provide input on Energy Action Plan (EAP) preparation and participate in EAP implementation. The team is composed of the City's key staff and department representatives, including those necessary to implement EAP projects, such as building maintenance staff. CEAT members support data, collection, share information on existing efforts and projects, and advise the development of EAP strategies.

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 online: <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, 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

GLOSSARY

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 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 factors. 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 Resources 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 ELP, 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

GLOSSARY

valued partner and to advance to the next incentive tier, each participating city must achieve the pre-determined energy savings and requirements community-wide and for 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: Pacific Gas and Electric Company

Enterprise Energy Management Information Systems

The San Gabriel Valley Council of Governments (SGVCOG) 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 lifecycle 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

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.

GLOSSARY

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 (CO₂):** 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 (CH₄):** 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 (N₂O):** 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 (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), 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.

Heating, Ventilation, and Air Conditioning (HVAC)

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

GLOSSARY

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.

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.

Lifecycle Cost

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

Methods

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 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, and West Covina).

Source: Southern California Edison

GLOSSARY

Performance Indicators

Specific, measurable, 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 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.

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. The PSC convened approximately once a month from June 2011 to September 2012. During PSC meetings, representatives from San Gabriel Valley Council of Governments staff and 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 funds which make up the Implementer Budget and which are collected from electric utility ratepayers pursuant to Section 381 of the California Public Utilities Code for public purposes programs, including energy efficiency programs approved by the California Public Utilities Commission.

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.

San Gabriel Valley Energy Wise Partnership

An alliance between the San Gabriel Valley Council of Governments and Southern California Edison to bring energy savings to the San Gabriel Valley through innovative public education and energy efficiency projects. The program seeks to reduce energy usage in the region by approximately 5 million kilowatt-hours by 2012.

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, owner's incentives, design team incentives, and energy design resources. Services begin in the project design phase and continue through construction completion.

Source: Southern California Edison

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.

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.

GLOSSARY

SCE Incentive (financial incentive)

Provisions issued by Southern California Edison 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.

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 U.S. 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, methods, 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.

GLOSSARY

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.

Title 24

See California Building Code.

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 onsite through renewable resources such as solar, wind, or geothermal power.

Source: California Long Term Energy Efficiency Strategic Plan

REFERENCES

Burr Consulting. 2004. West San Gabriel Valley Draft Municipal Service Review.

http://www.burrconsulting.com/upload/LA%20LAFCO/WSG%20Draft%20Final%20MSR%20Nov%2030%20_clean_.pdf.

———. 2004. East San Gabriel Valley Draft Municipal Service Review. Burr Consulting.

http://www.lalafco.org/MSR%20SOI%20Updates/ESG%20Final%20MSR%20_clean_.pdf.

CARB (California Air Resources Board). 2009. California's 1990–2004 Greenhouse Gas Emissions Inventory and 1990 Emissions Level, GHG Inventory Technical Support Document. Sacramento.

http://www.arb.ca.gov/cc/inventory/doc/methods_v1/ghg_inventory_technical_support_document.pdf.

———. 2010. California Waste-to-Energy Emissions Calculations.

<http://arb.ca.gov/cc/capandtrade/capandtrade.htm>.

———. 2010. Local Government Operations Protocol, version 1.1. Sacramento.

http://www.arb.ca.gov/cc/protocols/localgov/pubs/lgo_protocol_v1_1_2010-05-03.pdf.

———. 2010. Off-Road Emissions Inventory. Sacramento.

<http://www.arb.ca.gov/msei/offroad/offroad.htm>.

———. 2010. Pavley I and Low Carbon Fuel Standard Postprocessor Version 1.0.

<http://www.arb.ca.gov/cc/sb375/tools/postprocessor.htm>.

———. 2011. ARB Landfill Emissions Tool, version 1.3.

<http://www.arb.ca.gov/cc/protocols/localgov/localgov.htm>.

———. 2011. Emissions Factor Software (EMFAC 2011). Sacramento.

http://www.arb.ca.gov/jpub/webapp/EMFAC2011WebApp/rateSelectionPage_1.jsp.

REFERENCES

REFERENCES

- California Department of Finance. 2010. E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2010, with 2000 Benchmark. Sacramento.
- California Department of Resources Recycling and Recovery. 2011. Disposal Reporting System (DRS). <http://www.calrecycle.ca.gov/LGcentral/Reports/DRS/default.aspx>.
- California Department of Water Resources. 2004. California's Groundwater Bulletin 118 – San Gabriel Valley Groundwater Basin. http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/4-13.pdf.
- California Energy Commission. 2006. Refining Estimates of Water-Related Energy Use in California. PIER Final Project Report. Prepared by Navigant Consulting, Inc. CEC-500-2006-118.
- . 2007. Impact Analysis: 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings.
- . 2010. 2009 California Residential Appliance Saturation Study. Sacramento. <http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-ES.PDF>.
- California Energy Commission and California Public Utilities Commission. 2010. "About the California Solar Initiative." <http://www.gosolarcalifornia.org/about/csi.php>.
- . 2011. California Solar Initiative: California Solar Statistics - Geographical Statistics. http://www.californiasolarstatistics.ca.gov/reports/locale_stats.
- California Public Utilities Commission. 2008. California Long Term Energy Efficiency Strategic Plan. Sacramento. <http://www.cpuc.ca.gov/NR/rdonlyres/D4321448-208C-48F9-9F62-1BBB14A8D717/0/EEStrategicPlan.pdf>.
- . 2009. 33% Renewable Portfolios Standard Implementation Analysis Report. <http://www.cpuc.ca.gov/NR/rdonlyres/1865C207-FEB5-43CF-99EB-A212B78467F6/0/33PercentRPSImplementationAnalysisInterimReport.pdf>.
- . 2011. California Renewables Portfolio Standard. Sacramento. <http://www.cpuc.ca.gov/PUC/energy/Renewables/index.htm>.
- The Climate Registry. 2009. Utility Specific Electricity Emissions Factors. http://www.climateregistry.org/resources/docs/PUP_Metrics-June-2009.xls.
- County of Los Angeles. 2012. Solid Waste Information Management System. <http://dpw.lacounty.gov/epd/swims/>.
- Fehr & Peers. 2012. SCAG Travel Model Data for Irwindale Memorandum. Riverside, CA.
- . 2012. Adjustment Process for SCAG Model Data Related to Socio-Economic Data Memorandum. Riverside, CA.
- Heaney, J.P. et al. "Nature of Residential Water Use and Effectiveness of Conservation Programs." <http://bcn.boulder.co.us/basin/local/heaney.html>.
- Los Angeles County Sanitation District. n.d. Website – Wastewater Facilities. http://www.lacsd.org/about/wastewater_facilities/default.asp.
- Metropolitan Water District of Southern California. 2007. Groundwater Assessment Study - Report Number 1308. <http://www.mwdh2o.com/mwdh2o/pages/yourwater/supply/groundwater/gwas.html>.
- . 2010. The Regional Urban Water Management Plan. http://www.mwdh2o.com/mwdh2o/pages/yourwater/RUWMP/RUWMP_2010.pdf.

GLOSSARY

- SCAG (Southern California Association of Governments). 2008. Year 2003 Regional Travel Demand Model. Los Angeles, CA.
- . 2010. City of Irwindale Racial and Ethnic Profile.
- . 2012. Regional Transportation Plan.
- SCE (Southern California Edison). 2011. City of Irwindale Municipal Accounts – Year 2006.
- . 2011. City of Irwindale Municipal Accounts – Year 2010.
- . 2011. Electricity Report for the City of Irwindale – Year 2006.
- . 2011. Electricity Report for the City of Irwindale – Year 2010.
- . 2012. Energy Efficiency Partnerships. Rosemead, CA. <http://www.sce.com/business/energy-solutions/energy-efficiency-partnerships.htm>.
- US Census Bureau. 2012. American FactFinder, Covina Quick Facts. Washington, D.C.
- . 2012. Longitudinal Employer-Household Dynamics. Washington, D.C. <http://lehd.did.census.gov/led/>.
- US Department of Energy. 2009. PV Watts Calculator. http://rredc.nrel.gov/solar/calculators/PVWATTS/version1/US/California/Los_Angeles.html.
- US Department of Housing and Urban Development. 2011. State of the Cities Data Systems, Building Permits Database. <http://www.huduser.org/portal/datasets/socds.html>.
- US Environmental Protection Agency. 2005. "Emissions Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle." <http://www.epa.gov/otaq/climate/420f05004.pdf>.

APPENDIX A: SAMPLE OUTREACH 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 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

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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
 - 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)

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- 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
 - 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 measures 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.sgvenergywise.org/energyplan

APPENDIX B: GREENHOUSE GAS INVENTORY AND FORECAST

INVENTORY AND FORECAST PURPOSE

This greenhouse gas (GHG) emissions inventory and forecast (Inventory) provides a detailed summary of community-wide and municipal GHG emissions. This information is used to create reduction strategies in the City of Irwindale'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 GHG Inventory:

- Presents GHG emissions from community-wide and municipal activities in calendar year 2008.
- 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 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 this EAP and to establish GHG emissions reduction and energy efficiency targets.

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RELEVANT EMISSIONS

The Inventory includes the major sources of GHGs caused by activities in Irwindale per best practice and consistent with the methods outlined in the Best Practices Memo and in 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 2008.
- **Direct Access Electricity** – Electricity purchased by commercial customers from utilities other than Southern California Edison (SCE).
- **Street and Traffic Lighting** – Electricity used by street and traffic lights within the city but not owned by the City of Irwindale.
- **On-Road Transportation** – Vehicle miles traveled (VMT) in, to, and from the city in 2008.
- **Waste** – Methane emissions from solid waste (municipal solid waste), and green waste (alternative daily cover) sent to landfills and regional incinerators (also known as transformation facilities) from the city in 2008.
- **Water and Wastewater** – The electricity used to extract, filter, deliver, and treat water used and wastewater disposed by the community in city limits.
- **Off-Road Equipment** – Emissions from construction and lawn & garden equipment/vehicles operated within the city.

MUNICIPAL

- **Buildings** – Electricity and natural gas consumed by City buildings and facilities in 2008.
- **Fleet** – Gasoline, diesel and compressed natural gas (CNG) used by all City-owned vehicles.
- **Lighting** – Electricity, paid for by the City, used by street, traffic and/or outdoor lighting 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 solid waste disposed 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:

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- **Baseline year** – Emissions are quantified for the baseline year of 2008 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 (CO₂e)** – Represents the three main GHGs—carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O)—in comparable terms, since all three gases trap heat in the atmosphere differently. Greenhouse gases are reported in metric tons of CO₂e (MTCO₂e).
- **Sectors** – Emissions are grouped by the type of activity that generated the emissions, such as on-road transportation, residential energy use, or commercial energy use.

COMMUNITY-WIDE INVENTORY

INVENTORY SUMMARY

The community of Irwindale emitted approximately 221,540 MTCO₂e in the baseline year 2008. As shown in **Figure 1** and **Table 1**, the largest source of emissions was energy use from commercial and industrial land uses, which were responsible for 124,980 MTCO₂e or 56% of total community emissions. This is consistent with Irwindale’s status as a largely industrial community. On-road transportation was the other major source of emissions, emitting 74,750 MTCO₂e (34%). All other sources, including residential energy use, community-generated solid waste, off-road equipment, direct access electricity, water, and wastewater, amounted for a combined 21,810 MTCO₂e, or about 10% of community emissions.

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Figure 1 – Community-Wide GHG Emissions by Sector, 2008

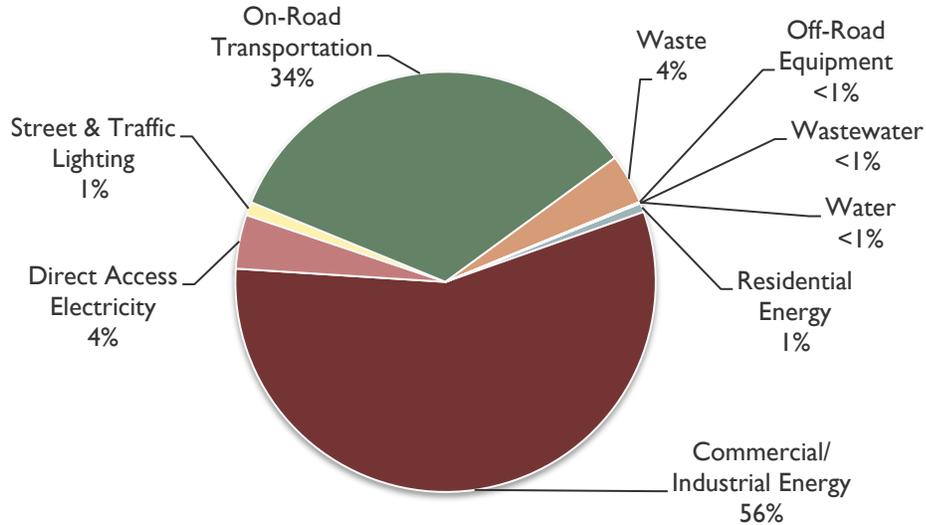


Table 1 – Community-Wide GHG Emissions by Sector, 2008

Sector	MTCO ₂ e	Percentage of Total
Residential Energy	1,560	1%
Commercial/Industrial Energy	124,980	56%
Direct Access Electricity	9,210	4%
Street & Traffic Lighting	2,280	1%
On-Road Transportation	74,750	34%
Solid Waste	8,520	4%
Off-Road Equipment	10	< 1%
Water	190	< 1%
Wastewater	40	< 1%
Total*	221,540	100%

* 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 subsectors that contribute to the total emissions. **Table 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 1**. For example, the residential energy category in **Table 1** consists of emissions from residential electricity and residential natural gas.

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Table 2 – Detailed Activity Data and GHG Emissions

Subsector	Activity Data	Unit	MTCO _{2e}
Residential Electricity	2,623,820	kWh	760
Residential Natural Gas	150,510	Therms	800
Commercial/Industrial Electricity	206,501,680	kWh	59,440
Commercial/Industrial Natural Gas	12,320,140	Therms	65,540
Direct Access Electricity	21,992,070	kWh	9,210
Street & Traffic Lighting	7,926,640	kWh	2,280
On-Road Transportation	142,589,120	Annual VMT	74,750
Waste – Solid Waste	44,890	Tons of Waste	8,350
Waste – Green Waste	380	Tons of ADC	60
Waste – Transformed	380	Tons Transformed	110
Off-Road Equipment – Lawn and Garden	410	Households	< 10
Off-Road Equipment – Construction	< 10	Permits Issued	10
Water	657,520	kWh	190
Wastewater	143,690	kWh	40
Total*			221,540

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

INFORMATIONAL ITEMS

There are two landfills within the Irwindale city limits, as listed in **Table 3**. These landfills are closed; however, the biogenic waste deposited there is still decomposing, emitting GHGs in the process. As this waste continues to decompose, emissions will decrease and eventually cease. In 2008, emissions from these two landfills were a combined 12,350 MTCO_{2e}, declining to 11,870 MTCO_{2e} in 2010. Emissions from these landfills are included in the Inventory as an informational item because there are no actions the City of Irwindale could take to address the emissions.

Table 3 – Informational Landfill GHG Emissions

Landfill	Open Date	Close Date	Tons of Waste Disposed per Year	2008 Emissions (MTCO _{2e})	2010 Emissions (MTCO _{2e})
San Marino Dump	1961	1990	15,577	5,710	5,490
Longden Avenue Disposal Site	1929	1979	15,856	6,640	6,380

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MUNICIPAL INVENTORY

INVENTORY SUMMARY

Operations and activities by the City of Irwindale in 2008 resulted in approximately 1,360 MTCO_{2e}. **Figure 2** and **Table 4** depict the contribution of each activity to the total GHG emissions. Building energy use was the single largest source, responsible for 520 MTCO_{2e}, or 38% of total municipal emissions. Emissions from the City fleet were the second-largest sector, totaling about 460 MTCO_{2e}, or 34%. Outdoor and street & traffic lighting contributed 260 MTCO_{2e} (19%) and emissions from employee commute were 120 MTCO_{2e}, or 9% of all municipal emissions.

Figure 2 – Municipal GHG Emissions by Sector, 2008

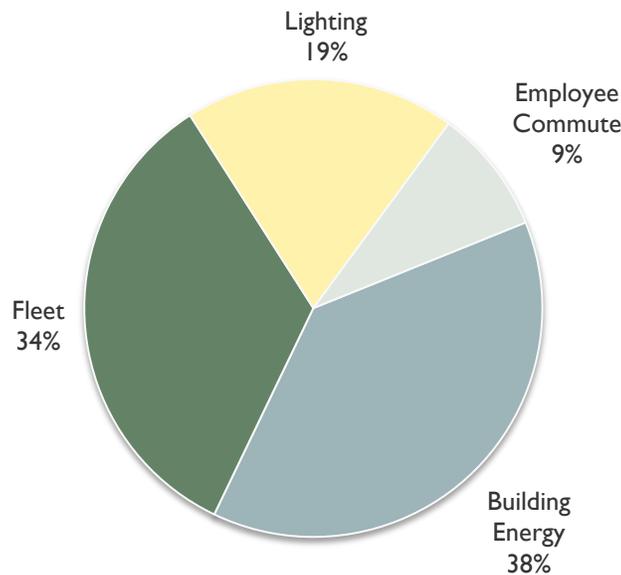


Table 4 – Municipal GHG Emissions by Sector, 2008

Sector	MTCO _{2e}	Percentage of Total
Building Energy	520	38%
Fleet	460	34%
Lighting	260	19%
Employee Commute	120	9%
Total*	1,360	100%

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

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DETAILED ANALYSIS BY SECTOR

Much like the community inventory, the municipal inventory has multiple subsectors that are included in each sector reported in **Table 4**. Detailed activity data for each municipal subsector and their individual contribution to GHG emissions are shown in **Table 5**.

Table 5 – Detailed Municipal Activity Data and GHG Emissions

Subsector	Activity Data	Unit	MTCO _{2e}
Buildings – Electricity	1,633,510	kWh	470
Buildings – Natural Gas	9,520	Therms	50
Buildings – Diesel**	-	Gallons	-
Fleet – Gasoline	52,630	Gallons	460
Fleet – Diesel	160	Gallons	< 10
Lighting – Streetlights	95,850	kWh	30
Lighting – Traffic Lights	102,960	kWh	30
Lighting – SCE-Owned Streetlights	681,580	kWh	200
Lighting – Other Public Lighting			
Employee Commute	290,040	VMT	120
Total*			1,360

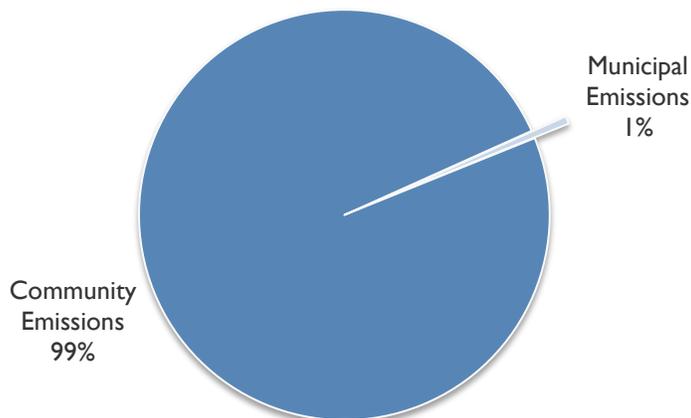
* Due to rounding, the total may not equal the sum of component parts.

**Activity data was not available during preparation of this report.

RELATION TO COMMUNITY-WIDE INVENTORY

Municipal emissions account for approximately 1% of community-wide emissions, as shown in **Figure 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 Irwindale. This means that all municipal operations are included in the commercial, industrial, transportation, solid 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 3** is intended more for informational purposes and to show the relative scale of municipal and community-wide emissions.

Figure 3 – Comparison of Municipal and Community GHG Emissions, 2008



2010 EMISSIONS ASSESSMENT

Activity data for 2010 was available for a number of community sectors and municipal sectors. This information has been translated into GHG emissions for Irwindale and all other participating cities. This common inventory year will serve as a shared platform that will allow activities from all participating cities in the San Gabriel Valley to be compared accurately. This 2010 interim inventory will also help cities track the GHG and energy reductions from programs implemented since the baseline year.

Table 6 below summarizes community activity data and emissions for both 2008 and 2010. Data was available for all sectors and subsectors in the community inventory. Of the fourteen subsectors, seven saw a decrease in emissions, including residential natural gas, transportation, solid and transformed waste, and water use. 2010 data was unavailable for electricity use; therefore this sector has been omitted from the table. There were a number of significant changes between 2008 and 2010 that merit further discussion. Although the number of new building permits for Irwindale doubled from 2008 to 2010, resulting in a doubling of emissions from construction, the number of permits issued remained below 10 for both years. There was also a decline in emissions from wastewater that matches the decline in activity data, but this decrease does not show up in the table below due to rounding.

The largest change in community activity data was the amount of solid waste produced, which declined dramatically from 2008 to 2010. Although many communities in Los Angeles County saw a significant decline in municipal solid waste during the latter half of the 2000s, in Irwindale this drop occurred as brief, rapid changes, rather than the more gradual decrease seen elsewhere. While there is a greater change in this activity data from baseline to 2010 than is seen in other communities, Irwindale’s longer-scale change is about average for cities in Los Angeles County. The California Department of Resources Recycling and Recovery notes that an ordinance addressing recycling was implemented in 2009, which could explain the timing of this decrease. Direct access electricity also saw a significant change in activity data and emissions with a 53% growth in both areas. This growth cannot be completely explained but was likely to do with changes in the number of customers using direct

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access electricity and the increase in percent of total electricity being sold as direct access electricity (9.2% in 2008 and 15.7% in 2010).

Table 6 – Baseline and 2010 Community Activity Data and Emissions

Sector	2008 Activity Data	2010 Activity Data	Percent Change 2008–2010	Unit	2008 MTCO ₂ e	2010 MTCO ₂ e	Percent Change 2008–2010
Residential Electricity	2,623,820	2,430,570	-7%	kWh	760	700	-8%
Residential Natural Gas	150,510	143,150	-5%	Therms	800	760	-5%
Commercial/Industrial Electricity	206,501,680	170,144,390	-18%	kWh	59,440	48,980	-18%
Commercial/Industrial Natural Gas	12,320,140	12,837,600	4%	Therms	65,540	68,290	4%
Direct Access Electricity	21,992,070	33,645,520	53%	kWh	9,210	14,090	53%
Street & Traffic Lighting	7,926,640	8,082,220	2%	kWh	2,280	2,330	2%
On-Road Transportation	142,589,120	143,303,990	1%	VMT	74,750	74,190	-1%
Waste – Solid Waste	44,890	34,010	-24%	Tons of Waste	8,350	6,260	-25%
Waste – Green Waste	380	460	21%	Tons of ADC	60	70	17%
Waste – Transformed	380	330	-13%	Tons Transformed	110	100	-9%
Off-Road Equipment – Lawn and Garden	410	370	-10%	Households	<10	<10	0%
Off-Road Equipment – Construction	<10	<10	0%	Permits Issued	10	20	100%
Water	657,520	546,480	-17%	kWh	190	160	-16%
Wastewater	143,690	129,320	-10%	kWh	40	40	0%
Total*					221,540	215,990	-3%

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

Municipal 2010 data is currently available for natural gas use and employee commute. Natural gas use rose significantly, primarily due to an increase in natural gas use at the City's public swimming pool. Employee commute numbers remained constant, as employee numbers did not change. Since 2010 data was not available for buildings electricity, fleet, or lighting, these sectors have been omitted from the table and total emissions for 2008 and 2010 have not been compared.

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Table 7 –Municipal Activity Data and Emissions Comparison, 2008 and 2010*

Sector	2008 Activity Data	2010 Activity Data	Percent Change 2008–2010	Unit	2008 MTCO ₂ e	2010 MTCO ₂ e	Percent Change 2008–2010
Buildings – Electricity	1,633,510	1,471,590	-10%	kWh	470	430	-9%
Buildings – Natural Gas	9,520	13,710	44%	Therms	50	70	40%
Lighting – Streetlights	95,850	106,010	11%	kWh	30	30	0%
Lighting – Traffic Lights	102,960	105,570	3%	kWh	30	30	0%
Lighting – SCE-Owned Streetlights	681,580	769,510	13%	kWh	200	220	10%
Employee Commute	290,040	290,040	0%	VMT	120	120	0%

*2010 fleet activity data was not available at the time of this report. As a result, this sector has been omitted from this table and total emissions for 2008 and 2010 have not been compared.

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 2008 energy consumption, solid 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 8 below lists the various growth indicators and sources used in the forecasting of Irwindale’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 emissions are assumed to grow with the number of jobs. Growth in solid waste emissions is based on the total service population of Irwindale 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 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. Using the 2003 RTP travel model, Fehr & Peers calculated VMT for 2003 and 2035, and estimated VMT for 2010 and 2020. In order to calculate data for the City’s baseline year of 2008, annual VMT was interpolated using the compound annual growth rate (CAGR) from 2003 to 2035. For consistency with the 2008 calculation, VMT for 2010 and 2020 was re-calculated using the CAGR.

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Note that Irwindale is expected to lose jobs between 2010 and 2020, with partial recovery by 2035. This is consistent with the City's planning documents that anticipate the eventual closure of the mining and quarry operations that support much of Irwindale's economy and a transition to commercial jobs. For example, the Irwindale General Plan calls for quarries to be rezoned to reflect the likely land use after the quarry is reclaimed.

Table 8 – BAU Growth Indicators and Affected Sectors

Growth Indicator	Emissions Sector	2008	2010	2020	2035	Sources
Jobs	Commercial/ Industrial Energy	13,400	13,100	11,500	12,300	2010 Census, SCAG 2012 RTP
Service Population (Residents + Jobs)	Solid Waste, Water, Wastewater	14,800	14,520	13,100	14,300	2010 Census, SCAG 2012 RTP
Households	Residential Energy, Off-Road Equipment	400	370	400	500	2010 Census, SCAG 2012 RTP
Annual VMT	On-Road Transportation	142,589,120	143,303,990	146,933,550	152,554,730	Fehr & Peers, SCAG 2003 RTP

Community Business-as-Usual Forecast

Table 9 and **Figure 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 decrease 8% below baseline to 203,870 MTCO_{2e} in 2020 and to 3% below baseline to 215,970 MTCO_{2e} in 2035. This is likely the result of a decrease in jobs in Irwindale, causing decreases to commercial/industrial and direct access energy use.

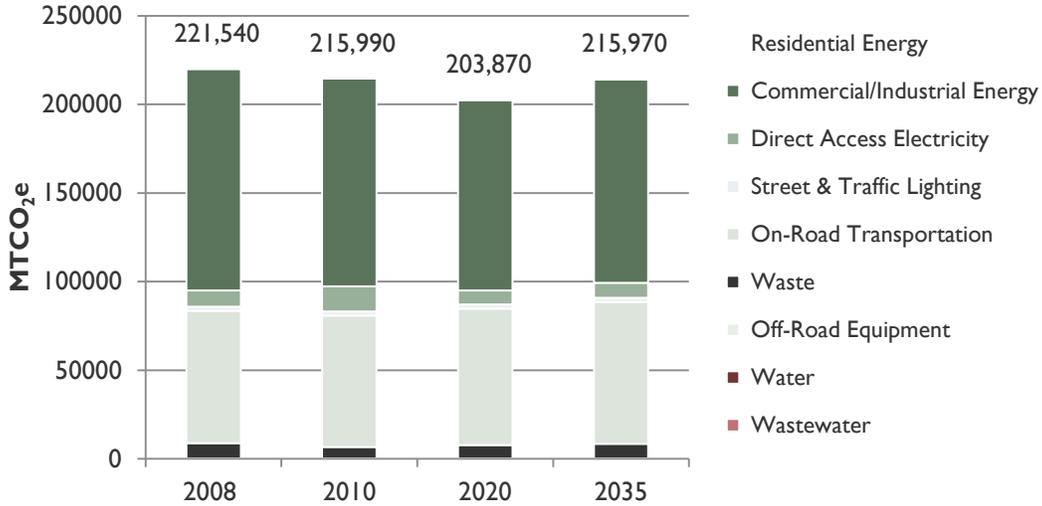
Table 9 – Comparison of Community BAU Emissions by Sector

Sector	2008 MTCO _{2e}	2010 MTCO _{2e}	2020 MTCO _{2e}	2035 MTCO _{2e}
Residential Energy	1,560	1,460	1,560	1,950
Commercial/Industrial Energy	124,980	117,270	107,260	114,720
Direct Access Electricity	9,210	14,090	7,900	8,450
Street & Traffic Lighting	2,280	2,330	2,330	2,330
On-Road Transportation	74,750	74,190	77,030	79,970
Community-Generated Waste	8,520	6,430	7,540	8,240
Off-Road Equipment	10	20	40	90
Water	190	160	170	180
Wastewater	40	40	40	40
Total*	221,540	215,990	203,870	215,970
Percent Change from 2008	-	-3%	-8%	-3%

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

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Figure 4 – Comparison of Community BAU Emissions by Sector



MUNICIPAL BUSINESS-AS-USUAL FORECAST

The municipal BAU forecast assumes no changes to City facility or operations. Irwindale does not anticipate any new construction to City facilities at this time. The number of City employees remained constant from 2008 to 2010, and although the number has declined since, this forecast assumes 2010 employment numbers in order to be consistent with other participating communities. As Irwindale is not a water provider, changes to the service population do not affect municipal emissions. Due to these factors, annual emissions are expected to remain constant at 2010 levels.

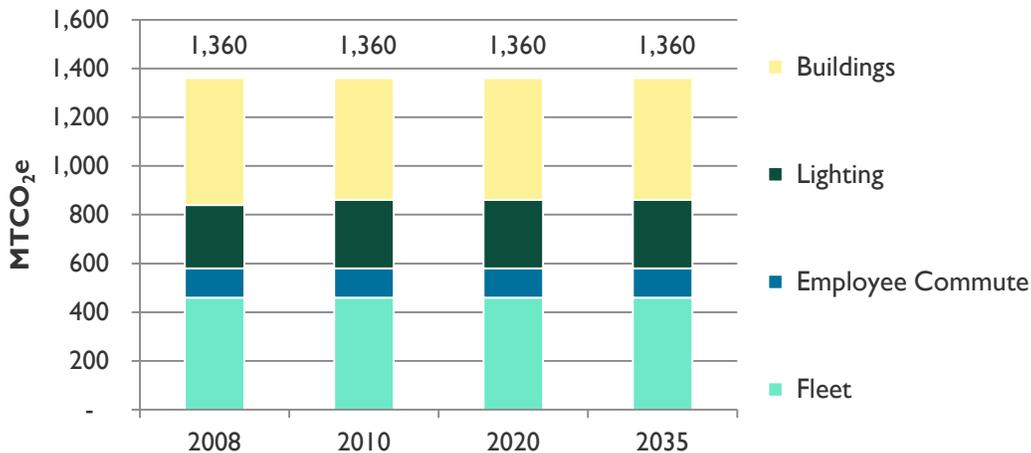
Table 10 – Comparison of Municipal BAU Emissions by Sector

Sector	2008 MTCO _{2e}	2010 MTCO _{2e}	2020 MTCO _{2e}	2035 MTCO _{2e}
Building Energy	520	500	500	500
Fleet	260	280	280	280
Lighting	120	120	120	120
Employee Commute	460	460	460	460
Total*	1,360	1,360	1,360	1,360
Percent Change from 2008	0%	0%	0%	0%

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

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Figure 5 – Comparison of 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.

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 US 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.⁴ 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 2020.⁵

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

⁴ California Air Resources Board 2010.

⁵ California Public Utilities Commission 2009.

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systems of buildings and for fire and life safety, energy conservation, green design, and accessibility in and around 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. 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, the LCFS will not be considered in the adjusted business-as-usual (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).

Community ABAU Forecast

All of the state programs highlighted above are included in the community-wide ABAU forecast. As shown in **Table 11** and **Table 12**, these state reduction efforts are anticipated to reduce emissions 19,810 MTCO_{2e} in 2020 and 31,730 MTCO_{2e} in 2035. The majority of these reductions are from the Pavley standards and the RPS. In comparison to the BAU scenario, **Table 12** shows 2020 emissions with state reduction measures are 17% below baseline 2008 levels rather than 8% below. Similarly, 2035 emissions go from 3% below baseline levels to 17% below after state efforts are taken into account.

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Table 11 – Impact of State Policies on Community GHG Emissions

State Reductions Summary	2020 MTCO _{2e}	2035 MTCO _{2e}
Pavley Reductions	-11,890	-18,500
RPS Reductions	-7,790	-12,970
CA Building Code Reductions	0	-140
CSI Reductions	-130	-120
Total State Reductions*	-19,810	-31,730

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

Table 12 – Comparison of Community BAU and ABAU Forecast

State Reductions Summary	2008 MTCO _{2e}	2010 MTCO _{2e}	2020 MTCO _{2e}	2035 MTCO _{2e}
Growth Projection	221,540	215,990	203,870	215,970
Total State Reductions			(19,810)	(31,740)
Adjusted BAU Forecast (2020, 2035)*	221,540	215,990	184,060	184,230
Percent Change from 2008	-	-3%	-17%	-17%

**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_{2e}.

Municipal ABAU Forecast

Only certain state reduction programs affect the municipal BAU forecast. These include the RPS and the Pavley standards. Updates to the California Building Code Standards such as Title 24, since no new buildings are planned to be built, and the CSI are not applicable to Irwindale and are therefore not quantified. **Table 13** shows the effect of the included state reduction efforts and **Table 14** shows how this changes the BAU emissions. Emissions in 2020 are reduced by 170 MTCO_{2e} in 2020 and by 280 MTCO_{2e} in 2035. These reductions are from the RPS and the Pavley standards. With state reduction measures, 2020 emissions are 13% below baseline 2008 levels compared to 0% in the BAU scenario. Similarly, 2035 emissions go from 0% above baseline to 21% below after state efforts are taken into account.

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Table 13 – Impact of State Policies on Municipal GHG Emissions

State Reductions Summary	2020 MTCO _{2e}	2035 MTCO _{2e}
Pavley Reductions	-90	-140
RPS Reductions	-80	-140
CA Building Code Reductions	0	0
CSI Reductions	0	0
Total State Reductions*	-170	-280

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

Table 14 – Comparison of Municipal BAU and ABAU Forecast

State Reductions Summary	2008 MTCO _{2e}	2010 MTCO _{2e}	2020 MTCO _{2e}	2035 MTCO _{2e}
Growth Projection	1,360	1,360	1,360	1,360
Total State Reductions			-170	-280
Adjusted BAU Forecast (2020, 2035)*	1,360	1,380	1,190	1,080
Percent Change from 2008		0%	-13%	-21%

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

REDUCTION TARGETS

The next step is for the City 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 (2005 to 2008) 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 15**, the City would not need to facilitate any additional reduction in community-wide emissions to meet the AB 32 Scoping Plan GHG reduction goal for 2020, as it is forecasted to be 4,250 MTCO_{2e} below this goal as a result of state reductions. Due to some uncertainties regarding the ABAU forecast, it would still be very beneficial for the City of Irwindale to take local action prior to 2020. This would allow Irwindale to still meet the Scoping Plan goal in the event that reductions from state actions are less than forecasted. To be on a trajectory

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toward the Executive Order S-3-05 target for 2050, the City would need to reduce community-wide emissions 84,540 MTCO_{2e} by 2035.

Table 15 – Community GHG Emissions and State-Recommended Reduction Targets

	2020	2035
State-Recommended Reduction Targets (percent below baseline)	15%	55%
State-Recommended Emissions Goal (MTCO _{2e})	188,310	99,690
ABAU Forecast with State Reductions (MTCO _{2e})	184,060	184,230
Local Reduction Needed from Adjusted BAU (MTCO_{2e})	-4,250	84,540

The State-recommended reduction targets for community-wide GHG emissions can also be applied to municipal operations. **Table 16** 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 Irwindale are forecasted to reach 40 MTCO_{2e} above the State-recommended reduction targets for 2020, requiring local action by city facility and fleet managers. Irwindale will also need to facilitate a local reduction of 480 MTCO_{2e} to reach the 2035 goal.

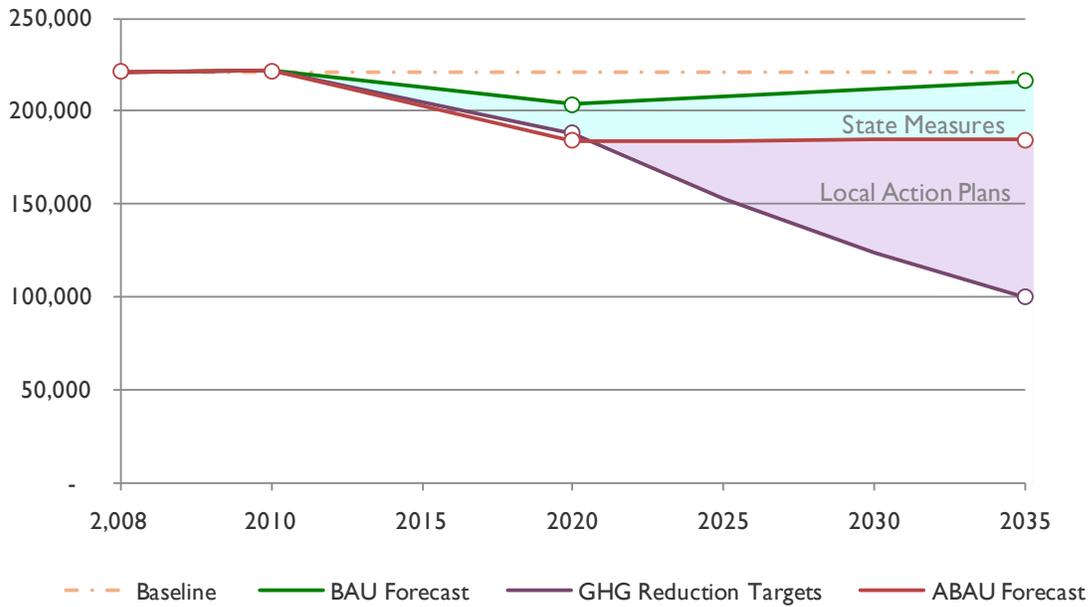
Table 16 – Municipal GHG Emissions and State-Recommended Reduction Targets

	2020	2035
State-Recommended Reduction Targets (percent below baseline)	15%	55%
State-Recommended Emissions Goal (MTCO _{2e})	1,160	610
ABAU Forecast with State Reductions (MTCO _{2e})	1,190	1,080
Local Reduction Needed from Adjusted BAU (MTCO_{2e})	30	470

Figure 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 Irwindale 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.

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Figure 6 – GHG Forecast and State-Recommended Reduction Target Summary



CONCLUSION AND NEXT STEPS

The community and municipal inventories are important milestones for assessing and mitigating the City of Irwindale's impact on climate change from the activities of the people and businesses. 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 Energy Action Plan.

APPENDIX C: GHG METHODS AND ASSUMPTIONS REPORT

This technical appendix provides a summary of the data sources, assumptions, and performance metrics utilized in this Energy Action Plan to quantify the estimated kilowatt-hour (kWh) savings, greenhouse gas (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 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.

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Whenever possible, emissions reduction estimates are based on tools and reports provided by government agencies such as the US Environmental Protection Agency, California Environmental Protection Agency, California Energy Commission, California Air Resources Board, California Air Pollution Control Officers Association, 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.

Policy	Policy 1.1: Promote the use of energy-efficient appliances and equipment in homes.
Actions:	<ul style="list-style-type: none"> • Market up to three incentives/rebate programs that will help save money, such as rebates on Energy Star refrigerators, electric water heater rebates, portable room air conditioner units, or professional air conditioning maintenance and repair. • Provide educational information on the use of smart-grid integrated appliances through the City’s website and distribution of San Gabriel Valley Energy Wise Partnership materials, and encourage participation in in-home monitoring programs provided by Southern California Edison. • Promote the use of Energy Star appliances on the City’s website and the newsletter sent by the City to city residents. • Promote information on plug-load management devices, such as motion-activated power strips.
Applicable Reduction Target:	Achieve 15% reduction in residential electricity use from the 2008 baseline by 2020.
kWh Reduction (2020):	8,000 to 32,010
MTCO _{2e} Reduction (2020):	< 10
Assumed Reduction per Participant:	430 to 860 kWh per household
Performance Target(s) (2020):	20 to 40 households achieve 10% to 20% electricity reductions
Implementation Time Frame:	Mid-Term
Implementation Department(s):	To be determined

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Policy	Policy 1.1: Promote the use of energy-efficient appliances and equipment in homes.
Reduction Method:	Used Census data and data on residential electricity use to determine annual electricity use per household. Based on Residential Appliance Saturation Survey results, assumed that 61% of residential household energy is consumed by appliances. Calculated average household electricity use due to appliances and applied the assumed 5% to 10% participation rate, as well as the assumed 10% to 20% electricity reduction rate to determine electricity reductions.
Reduction Sources:	KEMA, Inc. 2010. 2009 Residential Appliance Saturation Survey; US Census 2010.
Policy	Policy 1.2: Encourage energy audits so that 30–40% of existing households participate in audits by 2020 and implement retrofits based on audit findings.
Actions:	<ul style="list-style-type: none"> Apply for funds to assist residents with energy conservation audits and retrofits, including the cost of weatherization resources. (ref. Housing Element section 3.3.7.4) Partner with Southern California Edison, Southern California Gas Company, and local organizations to promote free energy audits for low-income owners and renters, rebate programs for installing energy-efficient features/appliances, and public education about ideas to conserve energy. (ref. Housing Element section 3.3.7.4). Provide information on energy audit programs such as Energy Upgrade California to homeowners through various channels, including the City’s website, neighborhood associations, and other community groups.
Applicable Reduction Target:	Achieve 15% reduction in residential electricity use from the 2008 baseline by 2020.
kWh Reduction (2020):	108,780 to 290,090
MTCO _{2e} Reduction (2020):	30 to 80
Assumed Reduction per Participant:	1,400 to 2,810 kWh per household
Performance Target(s) (2020):	80 to 100 households achieve 20% to 40% electricity reductions

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Policy	Policy 1.2: Encourage energy audits so that 30–40% of existing households participate in audits by 2020 and implement retrofits based on audit findings.
Implementation Time Frame:	Mid-Term
Implementation Department(s):	Planning
Reduction Method:	Used Census data and data on residential electricity use to determine annual electricity use per household. Assumed 30% to 40% of existing owner-occupied units will be audited, achieving 20% to 40% reductions of household electricity use from subsequent retrofits.
Reduction Sources:	US Census 2010.

Policy	Policy 1.3: Develop a voluntary energy efficiency checklist at time of residential building sale.
Actions:	<ul style="list-style-type: none"> • Partner with the Energy Leader Partnership to customize existing templates for use in Irwindale. • Include a prioritized and targeted set of high-value energy efficiency improvements on the checklist. • Educate homebuyers on options for financing energy efficiency at the time of sale, such as mortgages that include financing for energy efficiency improvements.
Applicable Reduction Target:	Achieve 15% reduction in residential electricity use from the 2008 baseline by 2020.
kWh Reduction (2020):	24,980 to 99,920
MTCO _{2e} Reduction (2020):	10 to 30
Assumed Reduction per Participant:	1,400 to 2,800 kWh per household
Performance Target(s) (2020):	20 to 40 households achieve 20% to 40% electricity reductions
Implementation Time Frame:	Mid-Term
Implementation Department(s):	Planning
Reduction Method:	Used Census data and data on residential electricity use to determine annual electricity use per household. Assumes 3% of residential properties are sold annually, with 20% to 40% of households participating and

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Policy	Policy 1.3: Develop a voluntary energy efficiency checklist at time of residential building sale.
	achieving 20% to 40% reductions in household electricity use.
Reduction Sources:	US Census 2010.
Policy	Policy 2.1: Promote the use of energy-efficient appliances and equipment in businesses.
Actions:	<ul style="list-style-type: none"> Help promote up to three incentives/rebate programs that will help save money, with a focus on the warehousing, retail, and industrial sectors. Examples include the HVAC Optimization Program and the Continuous Energy Improvement Program. Educate business owners about time-of-use rates and demand management as methods to reduce energy bills, especially during peak demand times, in conjunction with Southern California Edison. Promote information on plug-load management devices and strategies, such as motion-activated power strips, vending machine misers, and server optimization.
Applicable Reduction Target:	Achieve 15% reduction in commercial and industrial electricity use from the 2008 baseline by 2020.
kWh Reduction (2020):	356,450 to 1,425,800
MTCO ₂ e Reduction (2020):	100 to 390
Assumed Reduction per Participant:	13,680 to 27,360 kWh per business
Performance Target(s) (2020):	30 to 50 businesses achieve 20% to 40% electricity reductions
Implementation Time Frame:	Mid-Term
Implementation Department(s):	Community Development
Reduction Method:	Used Census data and data on nonresidential electricity use to determine annual electricity use per business. Based on the California End Use Survey results, assumed that 26% of nonresidential energy is consumed by appliances. Calculated average business electricity use due to appliances and applied the assumed 3% to 6% participation rate, as well as the assumed 20% to 40% electricity reduction rate to determine electricity reductions.

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Policy	Policy 2.1: Promote the use of energy-efficient appliances and equipment in businesses.
Reduction Sources:	Itron, Inc. 2007. California End Use Survey–Results Page; US Census 2010.

Policy	Policy 2.2: Encourage nonresidential building owners to achieve a 30% to 40% participation rate in audits by 2020 and implement retrofits based on audit findings.
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Actions:	<ul style="list-style-type: none"> Partner with Southern California Edison (SCE) to promote appropriate energy efficiency training events at the local SCE Energy Training Center located in Irwindale. Partner with the City’s Chamber of Commerce and other business organizations to provide information on existing energy audit opportunities to business owners. Work with Los Angeles County and other regional public or private organizations to create a revolving loan fund to support nonresidential retrofits that are not covered by utility rebates or other existing incentives. Provide education and outreach to commercial property owners on the benefits of complying with state requirements regarding energy disclosure at the time of sale or lease of nonresidential property. Working with the Irwindale Chamber of Commerce Environmental Committee, sponsor a business-oriented energy competition to encourage businesses to reduce energy usage. Provide recognition to all competition participants and businesses that achieve the highest energy reductions.
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Applicable Reduction Target:	Achieve 15% reduction in commercial and industrial electricity use from the 2008 baseline by 2020.
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kWh Reduction (2020):	13,709,630 to 36,559,000
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MTCO _{2e} Reduction (2020):	3,740 to 9,960
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Assumed Reduction per Participant:	52,620 to 105,230 kWh per business
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Performance Target(s) (2020):	260 to 350 businesses achieve 20% to 40% electricity reductions
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Implementation Time Frame:	Near-Term
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Implementation Department(s):	Community Development
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Policy	Policy 2.2: Encourage nonresidential building owners to achieve a 30% to 40% participation rate in audits by 2020 and implement retrofits based on audit findings.
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Reduction Method:	Used Census data and data on nonresidential electricity use to determine annual electricity use per business. Assumed 30% to 40% of businesses will be audited, achieving 20% to 40% reductions of business electricity use from subsequent retrofits.
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Reduction Sources:	US Census 2010.
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Policy	Policy 2.3: Develop educational materials and a voluntary energy efficiency checklist at time of nonresidential building sale.
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Actions:	<ul style="list-style-type: none"> • Partner with the Energy Leader Partnership to customize existing outreach material templates for use in Irwindale. • Include a prioritized and targeted set of high-value energy efficiency improvements on the checklist. • Educate building buyers about options for financing energy efficiency at the time of sale, such as mortgages that include financing for energy efficiency upgrades, or the Los Angeles County Commercial Property Assessed Clean Energy program.
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Applicable Reduction Target:	Achieve 15% reduction in commercial and industrial electricity use from the 2008 baseline by 2020.
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kWh Reduction (2020):	479,840 to 1,599,460
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MTCO _{2e} Reduction (2020):	130 to 440
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Assumed Reduction per Participant:	52,620 to 105,230 kWh per business
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Performance Target(s) (2020):	10 to 15 businesses achieve 20% to 40% electricity reductions
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Implementation Time Frame:	Mid-Term
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Implementation Department(s):	Community Development
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Reduction Method:	Used Census data and data on nonresidential electricity use to determine annual electricity use per household. Assumes 1% of commercial properties are sold annually, with 15% to 25% of businesses participating and achieving 20% to 40% reductions in household electricity use.
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Policy	Policy 2.3: Develop educational materials and a voluntary energy efficiency checklist at time of nonresidential building sale.
Reduction Sources:	US Census 2010
Policy	Policy 2.4: Maximize energy efficiency in large nonresidential facilities greater than 25,000 square feet.
Actions:	<ul style="list-style-type: none"> • Encourage participation in Southern California Edison energy-saving programs, such as the Retrocommissioning Program, available only to commercial buildings with at least 25,000 square feet. • Work with key partners in the business community, such as the MillerCoors Brewery, to publicize energy-efficient practices and case studies.
Applicable Reduction Target:	Achieve 15% reduction in commercial and industrial electricity use from the 2008 baseline by 2020.
kWh Reduction (2020):	4,264,220 to 8,528,450
MTCO _{2e} Reduction (2020):	1,160 to 2,320
Assumed Reduction per Participant:	Not Applicable – Calculated in aggregate and not per participant
Performance Target(s) (2020):	Not Applicable – Calculated in aggregate and not per participant
Implementation Time Frame:	Mid-Term
Implementation Department(s):	Planning
Reduction Method:	Used Census data and forecasted electricity use to estimate total electricity use in applicable buildings. Assumed 10% of commercial/industrial electricity use and all direct access electricity use forecasted in 2020 is consumed in applicable buildings (over 25,000 square feet in area). Assumed 10% to 20% reduction in energy savings through programs at large industrial facilities.
Reduction Sources:	US Census 2010.

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Policy	Policy 3.1: Increase energy efficiency of all new construction.
<p>Actions:</p>	<ul style="list-style-type: none"> • Working with existing programs such as the San Gabriel Valley Energy Wise Partnership, develop realistic, simple energy efficiency checklists or tailor the sample checklist provided by the San Gabriel Valley Council of Governments that could be provided to developers during the permitting process. Compliance with the checklist will be voluntary. Provide separate checklists for residences and for each major type of commercial and industrial building being constructed in the city, i.e., industrial, retail, warehouse, etc. • Provide training to all City planning/permit staff so they consider energy efficiency during the permit process for new construction. Work collaboratively with project applicants to identify energy-saving features for projects. • Encourage participation in the Southern California Edison Savings by Design and Sustainable Communities Programs, as applicable. • Collaborate with local green building organizations to provide training and workshops. • Provide contractor and architect training on green building and energy efficiency design and construction practices. • Target local funds, including redevelopment resources (if available) and the Community Development Block Grant, to assist affordable housing developers to incorporate energy efficient designs and features. (Housing Element section 3.3.7.4). • Require all City-sponsored housing developments to exceed Title 24 energy requirements by 15% and promote such developments on the City’s website and other media outlets to educate other members of the community. (Housing Element section 3.3.7.4).
<p>Applicable Reduction Targets:</p>	<ul style="list-style-type: none"> • Achieve 15% reduction in residential electricity use from the 2008 baseline by 2020. • Achieve 15% reduction in commercial and industrial electricity use from the 2008 baseline by 2020.
<p>kWh Reduction (2020):</p>	<p>748,490 to 1,516,980</p>

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Policy	Policy 3.1: Increase energy efficiency of all new construction.
MTCO ₂ e Reduction (2020):	210 to 410
Assumed Reduction per Participant:	Not Applicable – Calculated in aggregate and not per participant
Performance Target(s) (2020):	Not Applicable – Calculated in aggregate and not per participant
Implementation Time Frame:	Near-Term
Implementation Department(s):	Planning
Reduction Method:	Using Irwindale’s projections for residential and nonresidential electricity use in 2020, estimated the expected electricity use from new development. For each 1% above Title 24, assumed a 0.09% reduction in residential energy use and 0.28% reduction in nonresidential energy use. Model assumed achievement of 15% to 30% over Title 24, which equals 1.4% to 2.8% total reduction in residential electricity use, and 4.2% to 8.4% percent reduction in nonresidential electricity use. Assumed all buildings are in Climate Zone 9.
Reduction Sources:	<p>Irwindale Housing Elements of General Plan. Irwindale Economic Strategy Plan, Oct. 2011. CAPCOA. 2010. Quantifying Greenhouse Gas Mitigation Measures. Measure BE-1, pages 92-98.</p> <p>CAPCOA. 2010. Quantifying Greenhouse Gas Mitigation Measures. Table BE-1.1, page 96.</p> <p>2009 Residential Appliance Saturation Survey, published 2010.</p> <p>US Census 2010.</p> <p>www.zillow.com.</p>

Policy	Policy 3.2: Encourage the use of smart-grid technology, energy management systems, and energy-efficient appliances and equipment in new buildings.
Actions:	<ul style="list-style-type: none"> • Promote existing energy efficiency rebate offerings for appliances, HVAC equipment, and lighting fixtures. • Provide educational information regarding the use of smart grid and energy management tools in new construction through the

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Policy	Policy 3.2: Encourage the use of smart-grid technology, energy management systems, and energy-efficient appliances and equipment in new buildings.
	<p>City’s website and the distribution of San Gabriel Valley Energy Wise Partnership materials.</p>
Applicable Reduction Targets:	<ul style="list-style-type: none"> • Achieve 15% reduction in residential electricity use from the 2008 baseline by 2020. • Achieve 15% reduction in commercial and industrial electricity use from the 2008 baseline by 2020.
kWh Reduction (2020):	736,470 to 1,472,940
MTCO _{2e} Reduction (2020):	200 to 400
Assumed Reduction per Participant:	Not Applicable – Calculated in aggregate and not per participant
Performance Target(s) (2020):	Not Applicable – Calculated in aggregate and not per participant
Implementation Time Frame:	Near-Term
Implementation Department(s):	Planning
Reduction Method:	<p>Using Irwindale’s projections for residential and nonresidential electricity use in 2020, estimated the expected electricity use from new development. Assumed 61% of electricity use for new residential construction and 20% of electricity use for new nonresidential construction is used for appliances and plug-in equipment, and that smart grid energy management systems can achieve 20% to 40% reductions by 2020.</p>
Reduction Sources:	<p>Irwindale Housing Elements of General Plan. Irwindale Economic Strategy Plan, Oct. 2011. KEMA, Inc. 2010. 2009 Residential Appliance Saturation Survey (RASS). Itron, Inc. 2007. California End Use Survey – Results Page.</p>
Policy	Policy 3.3 Continue to conduct outreach and education to the community.
Actions:	<ul style="list-style-type: none"> • Highlight stories in which residents and businesses have successfully installed energy-efficient equipment on their

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Policy	Policy 3.3 Continue to conduct outreach and education to the community.
Applicable Reduction Targets:	<p>properties.</p> <ul style="list-style-type: none"> • Promote broad public outreach relating to energy efficiency, including educational programs and the marketing of energy-saving incentives. (Housing Element, section 3.3.7.4). • Provide an energy kiosk, available through the San Gabriel Valley Energy Wise Partnership, at City Hall showing energy-saving opportunities.
kWh Reduction (2020):	Supportive Policy
MTCO _{2e} Reduction (2020):	Supportive Policy
Assumed Reduction per Participant:	Not Applicable
Performance Target(s) (2020):	Not Applicable
Implementation Time Frame:	Near-Term
Implementation Department(s):	Planning
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable

Policy	Policy 4.1: Integrate energy efficiency into the city's discretionary permit review framework.
Actions:	<ul style="list-style-type: none"> • Provide a two-tiered expedited permitting process: <ul style="list-style-type: none"> ○ Expedite and streamline the permitting process for new construction projects that use the voluntary energy efficiency checklist described in Policy 3.1. ○ Provide additional incentives, such as expedited plan review, to projects that achieve 15% or higher energy

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Policy	Policy 4.1: Integrate energy efficiency into the city's discretionary permit review framework.
	<p>efficiency above Title 24 standards. (Housing Element, Section 3.3.7.4).</p> <ul style="list-style-type: none"> • Update the City's discretionary review guidance to identify zero net energy as a preferred GHG emissions mitigation policy for new development. • By 2015, evaluate compliance with the voluntary energy efficiency checklist and the expedited permitting process and consider adoption of regionally consistent mandatory standards. • Work with the San Gabriel Valley Energy Wise Partnership 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 should include information regarding residential financing programs such as Energy Upgrade California, energy efficiency loans, and Property Assessed Clean Energy financing for nonresidential properties.
Applicable Reduction Targets:	<ul style="list-style-type: none"> • Achieve 15% reduction in residential electricity use from the 2008 baseline by 2020. • Achieve 15% reduction in commercial and industrial electricity use from the 2008 baseline by 2020.
kWh Reduction (2020):	Supportive Policy
MTCO _{2e} Reduction (2020):	Supportive Policy
Assumed Reduction per Participant:	Not Applicable
Performance Target(s) (2020):	Not Applicable
Implementation Time Frame:	Near-Term (2013 to 2020)
Implementation Department(s):	Planning & Permitting
Reduction Method:	Not Applicable
Reduction Sources:	Not Applicable

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Policy	Policy 5.1: Maximize the cooling of buildings through tree planting and shading to reduce building electricity and demands.
Actions:	<ul style="list-style-type: none"> Promote creative options to achieve building shading, including deciduous tree plantings on the west and south and other shading techniques, such as awnings. (Housing Element, section 3.3.7.4). Provide suggestions on use of trees to provide shade for parking lots and other spaces when landscaping plans are submitted to the City for review.
Applicable Reduction Targets:	<ul style="list-style-type: none"> Achieve 15% reduction in residential electricity use from the 2008 baseline by 2020. Achieve 15% reduction in commercial and industrial electricity use from the 2008 baseline by 2020.
kWh Reduction (2020):	620 to 11,220
MTCO _{2e} Reduction (2020):	< 10
Assumed Reduction per Participant:	33 to 300 kWh per household or business
Performance Target(s) (2020):	20 to 40 households, and 40 to 90 businesses
Implementation Time Frame:	Near-Term (2013 to 2020)
Implementation Department(s):	Public Works Department
Reduction Method:	Assumed 5% to 10% of buildings are cooled by a new shade tree. The model assumed that shade trees can reduce electricity by 33 to 300 kWh per tree.
Reduction Sources:	<p>Hashem Akbari. Energy Savings Potentials and Air Quality Benefits of Urban Heat Island Mitigation. http://heatland.lbl.gov/</p> <p>US Environmental Protection Agency. 2005. Reducing Urban Heat Island Compendium of Strategies.</p> <p>Cool Pavements; ICLEI's CAPP and The San Diego Urban Forestry Council.</p>

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Policy	Policy 5.2: Reduce building electricity demands through voluntary standards and outreach to promote cool roofs and surfaces.
Actions:	<ul style="list-style-type: none"> • Encourage installation of cool roofs and the use of light-reflective paving surfaces. • Endorse standards that promote passive solar heating, such as overhangs on south facing windows. (Housing Element, section 3.3.7.4).
Applicable Reduction Targets:	<ul style="list-style-type: none"> • Achieve 15% reduction in residential electricity use from the 2008 baseline by 2020. • Achieve 15% reduction in commercial and industrial electricity use from the 2008 baseline by 2020.
kWh Reduction (2020):	6,550 to 19,640
MTCO _{2e} Reduction (2020):	10 to 20
Assumed Reduction per Participant:	350 kWh per household or business
Performance Target(s) (2020):	20 to 60 households, and 40 to 130 businesses
Implementation Time Frame:	Near-Term
Implementation Department(s):	Public Works Department
Reduction Method:	Assumed 5% to 15% of buildings install cool roofs. The model assumed an average roof size of 1,750 square feet and assumed that 0.2 kWh is saved for each square foot of cool roof installed.
Reduction Sources:	<p>Hashem Akbari. Energy Savings Potentials and Air Quality Benefits of Urban Heat Island Mitigation. http://heatland.lbl.gov/</p> <p>US Environmental Protection Agency. 2005. Reducing Urban Heat Island Compendium of Strategies. Source for average roof size: http://www.everybodyandnobody.org/general/water/domestic.htm</p>

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Policy	Policy 6.1: Continue to leverage city resources and programs to encourage water conservation.
Actions:	<ul style="list-style-type: none"> • Provide a water conservation webpage on the City’s website and conduct other outreach activities. Promote current programs offered by the various water agencies such as rebates for high efficiency toilets and clothes washers. • Consider adoption of a new code requiring all new development to install low-flow or no-flow fixtures.
Applicable Reduction Targets:	<ul style="list-style-type: none"> • Achieve 15% reduction in residential electricity use from the 2008 baseline by 2020. • Achieve 15% reduction in commercial and industrial electricity use from the 2008 baseline by 2020.
kWh Reduction (2020):	65,150 to 108,590
MTCO _{2e} Reduction (2020):	20 to 30
Assumed Reduction per Participant:	Not Applicable – Calculated in aggregate and not per participant
Performance Target(s) (2020):	Not Applicable – Calculated in aggregate and not per participant
Implementation Time Frame:	Near-Term (2013 to 2020)
Implementation Department(s):	Planning
Reduction Method:	Calculated the total water used per year. Assumed 40% of water is used for indoor plumbing and that 15% to 25% water reductions can be achieved by 2020. Estimated the kWh used per gallon of water consumed, and applied this factor to estimated water savings to determine electricity reductions.
Reduction Sources:	<p>US Census 2010.</p> <p>SCAG Growth Forecast.</p> <p>Sources for kWh used per gallon of water for: water supply, pumping, treatment, and wastewater treatment.</p> <p>SA Associates, Consulting Engineers. 2011. 2010 Azusa Light & Water Urban Water Management Plan.</p> <p>California Energy Commission. 2006. Refining Estimates of Water-Related Energy Use in California. PIER Final Project Report. Prepared by Navigant</p>

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Policy	Policy 6.1: Continue to leverage city resources and programs to encourage water conservation.
	Consulting, Inc. CEC-500-2006-118.
Policy	Policy 6.2: Encourage the use of water-conserving landscaping practices.
Actions:	<ul style="list-style-type: none"> Consider adoption of a new code requiring all new development to install dual plumbing in anticipation of more widespread distribution of recycled water for landscape irrigation. Provide suggested lists of drought-tolerant plants for landscaping on the City’s website and via other channels. Install educational information in parks regarding water-wise practices in place. Promote existing rebates for water-conserving landscaping equipment and materials.
Applicable Reduction Targets:	<ul style="list-style-type: none"> Achieve 15% reduction in residential electricity use from the 2008 baseline by 2020. Achieve 15% reduction in commercial and industrial electricity use from the 2008 baseline by 2020.
kWh Reduction (2020):	69,750 to 116,250
MTCO _{2e} Reduction (2020):	20 to 30
Assumed Reduction per Participant:	Not Applicable – Calculated in aggregate and not per participant
Performance Target(s) (2020):	Not Applicable – Calculated in aggregate and not per participant
Implementation Time Frame:	Near-Term
Implementation Department(s):	Planning
Reduction Method:	Calculated the total water used per year. Assumed 60% of water is used in the outdoors and that 15% to 25% water reductions can be achieved by 2020. Estimated the kWh used per gallon of water consumed, and applied this factor to estimated water savings to determine electricity reductions.
Reduction Sources:	US Census 2010.

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Policy	Policy 6.2: Encourage the use of water-conserving landscaping practices.
	<p>SCAG Growth Forecast.</p> <p>Sources for kWh used per gallon of water for: water supply, pumping, treatment, and wastewater treatment.</p> <p>SA Associates, Consulting Engineers. 2011.</p> <p>2010 Azusa Light & Water Urban Water Management Plan.</p> <p>California Energy Commission. 2006. Refining Estimates of Water-Related Energy Use in California. PIER Final Project Report. Prepared by Navigant Consulting, Inc. CEC-500-2006-118.</p>

Table C-1: Sources for Community 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
Landfill	Los Angeles County SWIMS Database

Table C-2: Sources for Municipal Activity Data

Subsector	Source
Buildings – Electricity	Southern California Edison
Buildings – Natural Gas	Southern California Gas Company

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Subsector	Source
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
Refrigerant Leakage	City records

Table C-3: Emissions Coefficients (2010)

Subsector	Original Emissions factor		Source	Final Emissions factor	
SCE Electricity*	630.89	lbs CO ₂ /MWh	LGOP v1.1, Table G.6	0.00029	MTCO ₂ e/kWh
	0.029	lbs CH ₄ /MWh	LGOP v1.1, Table G.7		
	0.01	lbs N ₂ O/MWh	LGOP v1.1, Table G.7		
Direct Access Electricity*	919.64	lbs CO ₂ /MWh	LGOP v1.1, Table G.7	0.00042	MTCO ₂ e/kWh
	0.029	lbs CH ₄ /MWh	LGOP v1.1, Table G.7		
	0.01	lbs N ₂ O/MWh	LGOP v1.1, Table G.7		
SoCal Gas – Natural Gas	53.06	kg CO ₂ /MMBtu	LGOP v1.1, Table G.1	0.00532	MTCO ₂ e/Therm
	0.005	kg CH ₄ /MMBtu	LGOP v1.1, Table G.3		
	0.0001	kg N ₂ O/MMBtu	LGOP v1.1, Table G.3		
Stationary Diesel	10.21	lbs CO ₂ /Gallon	LGOP v1.1, Table G.1	0.01027	MTCO ₂ e/Gallon
	0.0015	lbs CH ₄ /Gallon	LGOP v1.1, Table G.4		

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Subsector	Original Emissions factor		Source	Final Emissions factor	
Fleet Gasoline	0.0001	lbs N ₂ O/Gallon	LGOP v1.1, Table G.4		
	8.78	kg CO ₂ /Gallon	LGOP v1.1, Table G.11	0.00878	MTCO ₂ /Gallon
	.0107 - .4090	g CH ₄ /mile**	LGOP v1.1, Table G.12	.0107 - .4090	g CH ₄ /mile**
	.0038 - .1726	g N ₂ O/mile**	LGOP v1.1, Table G.12	.0038 - .1726	g N ₂ O/mile**
Fleet Diesel	10.21	kg CO ₂ /Gallon	LGOP v1.1, Table G.11	0.01021	MTCO ₂ /Gallon
	.0005 - .0051	g CH ₄ /mile**	LGOP v1.1, Table G.12	.0005 - .0051	g CH ₄ /mile**
	.0012 - .0048	g N ₂ O/mile**	LGOP v1.1, Table G.12	.0012 - .0048	g N ₂ O/mile**
Fleet CNG	0.054	kg CO ₂ /scf	LGOP v1.1, Table G.11	0.000054	MTCO ₂ /scf
	0.737	g CH ₄ /mile	LGOP v1.1, Table G.13	0.000031	MTCO ₂ e/mile
	0.05	g N ₂ O/mile	LGOP v1.1, Table G.13		
Fleet LPG	5.59	kg CO ₂ /Gallon	LGOP v1.1, Table G.11	0.00559	MTCO ₂ /Gallon
	0.037	g CH ₄ /mile	LGOP v1.1, Table G.13	0.000022	MTCO ₂ e/mile
	0.067	g N ₂ O/mile	LGOP v1.1, Table G.13		
On-Road Transportation	491.8	g CO ₂ /mile	EMFAC 2011	0.00052	MTCO ₂ e/mile
	1.05	CO ₂ e/CO ₂	Fehr & Peers Transportation Consultants		
Off-Road Construction	879	tons CO ₂ /day in LA County	OFFROAD2007	291,660	MTCO ₂ e/year in LA County
	0.0853	tons CH ₄ /day in LA County	OFFROAD2007		
	0.0007	tons N ₂ O/day in LA County	OFFROAD2007		
Off-Road Lawn and Garden	8.97	tons CO ₂ /day in LA County	OFFROAD2007	3,690	MTCO ₂ e/year in LA County

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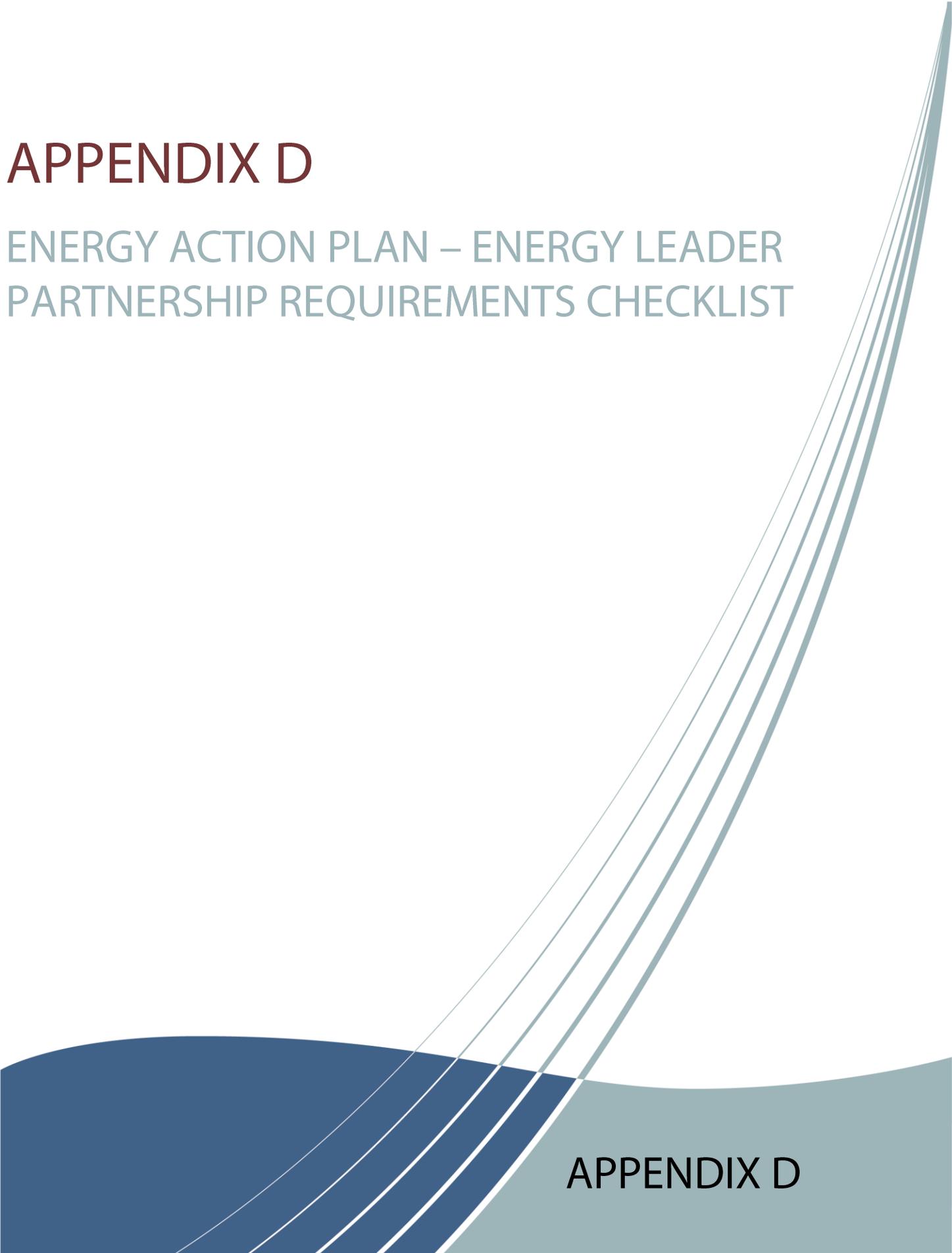
Subsector	Original Emissions factor	Source	Final Emissions factor
	0.0144	tons CH ₄ /day in LA County	OFFROAD2007
	0.0061	tons N ₂ O/day in LA County	OFFROAD2007

* 2010 factors not available. 2007 factors used as a proxy.

** Dependent on vehicle's model year and size.

APPENDIX D

ENERGY ACTION PLAN – ENERGY LEADER PARTNERSHIP REQUIREMENTS CHECKLIST

A decorative graphic on the right side of the page. It features several thin, curved lines in shades of blue and grey that sweep upwards from the bottom right towards the top right. At the bottom, there are two overlapping shapes: a dark blue shape on the left and a light grey-blue shape on the right.

APPENDIX D

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Silver Level – Initiate EAP

The Partner City demonstrates initiation of an EAP to qualify for the Silver level. This can include any of the following options:

- A. Partner selected and was approved for Strategic Plan menu item 3.2.1
- B. A draft of an EAP is submitted by the Partner City
- C. RFP issued or consultant hired to complete EAP

Gold Level – Complete EAP

The Partner City must submit a completed plan to SCE, which includes (at least) the following components:

- A. Establishes long-term vision and plan for energy efficiency in the city
- B. Clearly states the aim and objectives of the plan
- C. Records the baseline municipal energy usage (kWh)
- D. Displays the highest users (facilities) that the city should target
- E. Identifies the city reduction goals and milestones
- F. Provides the plan of municipal facility projects that the city can complete to assist in achieving their reduction
 - i. Identifies priority of projects
 - ii. Identifies expected funding mechanisms to complete municipal facility energy efficiency projects
- G. Identifies any policies or procedures the city can implement to assist in reducing energy
- H. Adds statement/paragraph identifying all actions including (but not limited to) municipal retrofit projects and policies that will constitute meeting the “Implementation” requirement in the ELP Platinum level
- I. Includes language stating the EAP will be integrated in the next general plan update or other policy documents

Platinum Level – Implement EAP

- A. EAP approved by city council with the plan’s implementation time frame beginning within 6 months of approval
- B. Implementation actions must include the following
 - a. Evidence of inclusion (as a line item) of EAP implementation in city operating budget
 - Example: Establishment of energy revolving fund or reference to energy efficiency in the annual maintenance budget demonstrating long-term implementation of EAP
 - b. Evidence of integration of EAP initiatives in city general plan or other policy documents
 - c. As referenced in Gold Level H, the completion of the identified actions that were delineated in the EAP
 - d. Substantial evidence showing implementation of energy efficiency actions as identified in the EAP (such as invoices for municipal projects)

APPENDIX D

Please use the following table to help identify areas of the EAP that satisfy the requirements.

EAP Requirements for Gold Level	Section and Page Number Where Found
A. Establishes long-term vision and plan for energy efficiency in the city	Chapter 1, "Role of the EAP" section, page 4
B. Clearly states the aim and objectives of the plan	Chapter 1, "Role of the EAP" section, page 4
C. Records the baseline municipal energy usage (kWh)	Chapter 3, "Municipal Electricity Demand" section, page 29
D. Displays the highest users (facilities) that the city should target	Chapter 3, "Municipal Electricity Demand" section, page 32
E. Identifies the city reduction goals and milestones	Chapter 4, "Reduction Targets" section, page 34
F. Provides the plan of municipal facility projects that the city can complete to assist in achieving their reduction <ul style="list-style-type: none"> i. Identifies priority of projects ii. Identifies expected funding mechanisms to complete municipal facility energy efficiency projects 	Chapter 4, "Municipal Electricity Projects and Policies" section, Table 21, page 44
G. Identifies any policies or procedures the city can implement to assist in reducing energy	Chapter 4, Policy 1.1–10.2, page 36-page 47
H. Add statement/paragraph identifying all actions including (but not limited to) municipal retrofit projects and policies that will constitute meeting the "Implementation" requirement in the ELP Platinum level	Chapter 5, "Monitoring and Updating the EAP" section, page 51
I. Includes language stating the EAP will be integrated in the next general plan update or other policy documents	Chapter 5, "Monitoring and Updating the EAP" section, page 51