

CITY OF
PALMDALE

ENERGY ACTION PLAN



ADOPTED AUGUST 3, 2011

ACKNOWLEDGEMENTS



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CITY OF PALMDALE ENERGY ACTION PLAN

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EXECUTIVE SUMMARY



EXECUTIVE SUMMARY

This Energy Action Plan (Plan) demonstrates the City of Palmdale's (City) commitment to achieve energy efficiency and independence by reducing greenhouse gas (GHG) emissions consistent with state legislation. The City will reduce energy demand and related emissions from City government operations and facilitate reductions in the community through the goals, measures, and actions identified in this Plan. These efforts will sustain the economic, environmental, and physical health of the community and provide the highest quality of life possible. Specifically, this Plan helps to ensure that Palmdale continues to thrive as a place to call home and a place where businesses can grow.

BACKGROUND

The City created this Plan with funds from the United States Department of Energy (DOE) Energy Efficiency and Conservation Block Grant (EECBG) Program. The City received approximately \$1.3 million to implement energy efficiency projects that:

- Reduce fossil fuel emissions;
- Reduce the total energy use of the eligible entities;
- Improve energy efficiency in the transportation, building, and other appropriate sectors; and
- Create and retain jobs.¹

The City hired PMC in August of 2009 to assist with EECBG monitoring and reporting and preparation of a baseline GHG emissions inventory and Energy Action Plan. The purpose of this Plan is to assist the City and all City stakeholders in saving money through energy conservation, identify the City's GHG emissions reduction target, and create a multifaceted strategy to reduce GHG emissions. Reductions will be achieved through energy efficiency actions, energy conservation, and other measures. The Plan

¹ U.S. Department of Energy 2010.





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In 2005, the transportation sector contributed 40% of community emissions. This sector was the largest contributor to community emissions.

demonstrates that all measures to reduce energy consumption and achieve GHG emissions reduction are compatible with the City's economic objectives, the goals of the EECBG program, and the State's strategies to address GHG emissions.

PURPOSE OF THE ENERGY ACTION PLAN

The City developed this Plan to achieve energy independence, energy efficiency and conservation, and land uses that reduce transportation time and costs, to encourage jobs-creation, and to identify strategies to increase investment in the local economy.

The primary purpose of this Plan is to identify how the City will use energy efficiency and independence strategies to achieve its GHG emission reduction target of 15% by the year 2020 consistent with the State's overall target to reduce GHG emissions statewide to 1990 levels by 2020. This Plan provides goals and measures focused on energy use, water use, transportation, land use, and solid waste to reduce GHG emissions wherever possible while enhancing the local economy and reducing reliance on inefficient energy imports.

2005 GREENHOUSE GAS EMISSIONS INVENTORY

In August 2010, the City of Palmdale completed a greenhouse gas (GHG) emissions inventory (Inventory) as part of this Plan. The Inventory calculated GHG emissions produced from government operations and community-wide activities in city limits in 2005.

In 2005, the City emitted approximately 948,258 metric tons of carbon dioxide equivalent (MTCO₂e) within city limits. As shown in **Figure ES-1 and Table ES-1**, the transportation sector was by far the largest contributor to emissions (40% of total emissions), producing approximately 382,013 MTCO₂e in 2005. Emissions from the commercial and industrial sector were the next largest contributor, accounting for 30% of the total emissions, producing approximately 282,624 MTCO₂e. The residential sector accounted for 27% of the total emissions (256,213 MTCO₂e). Emissions from solid waste comprised 3% of the total (27,408



MTCO₂e). The Community-Wide Greenhouse Gas Emissions Inventory Memo is included as **Appendix 1**.

FIGURE ES-1: 2005 GREENHOUSE GAS EMISSIONS (MTCO₂E) FROM COMMUNITY-WIDE SOURCES BY SECTOR

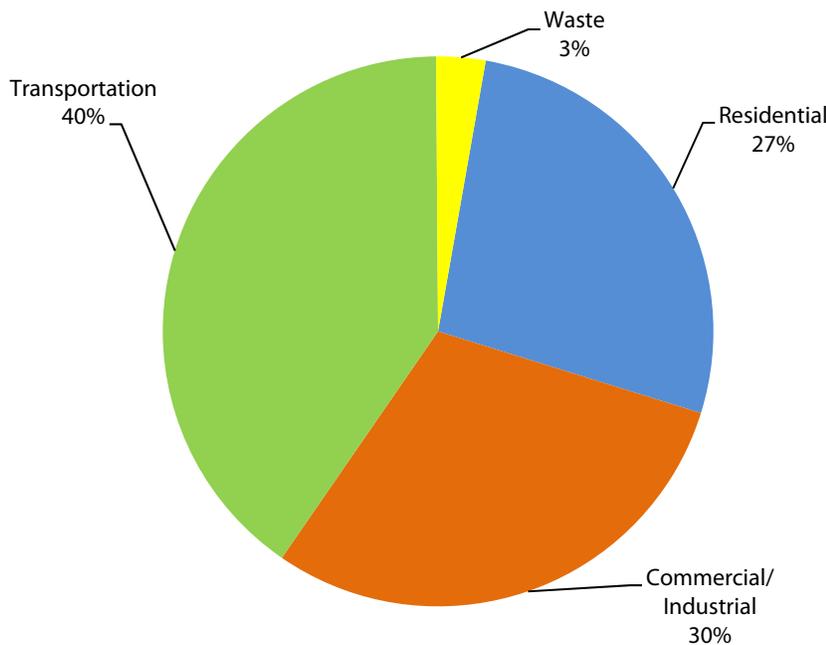


TABLE ES-1: 2005 GREENHOUSE GAS EMISSIONS (MTCO₂E) FROM COMMUNITY-WIDE SOURCES BY SECTOR

Sector	MT CO ₂ e	Percentage of Total
Residential	256,213	27%
Commercial/Industrial	282,624	30%
Transportation	382,013	40%
Waste	27,408	3%
Total	948,258	100%

Due to rounding, totals may not equal 100%.

Emissions from City government operations and facilities produced approximately 5,589 MTCO₂e in 2005 (**Figure ES-2**). Emissions from City government operations result from solid waste, energy consumption by water facilities, buildings, streetlights and traffic signals, and other

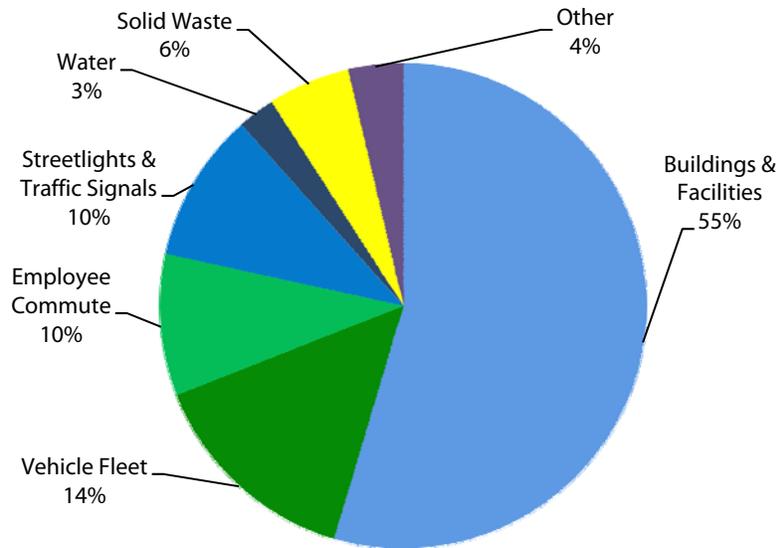


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Business-as-usual emissions in the city will grow by 50% by 2035 to 1.4 million MTCO₂e.

facilities, vehicle fleet fuel consumption, equipment fuel consumption, and employee commutes. Government emissions are a subset of the total community-wide emissions and contributed less than 1% of total emissions in city limits.

FIGURE ES-2: 2005 GREENHOUSE GAS EMISSIONS (MTCO₂E) FROM CITY GOVERNMENT OPERATIONS BY SECTOR



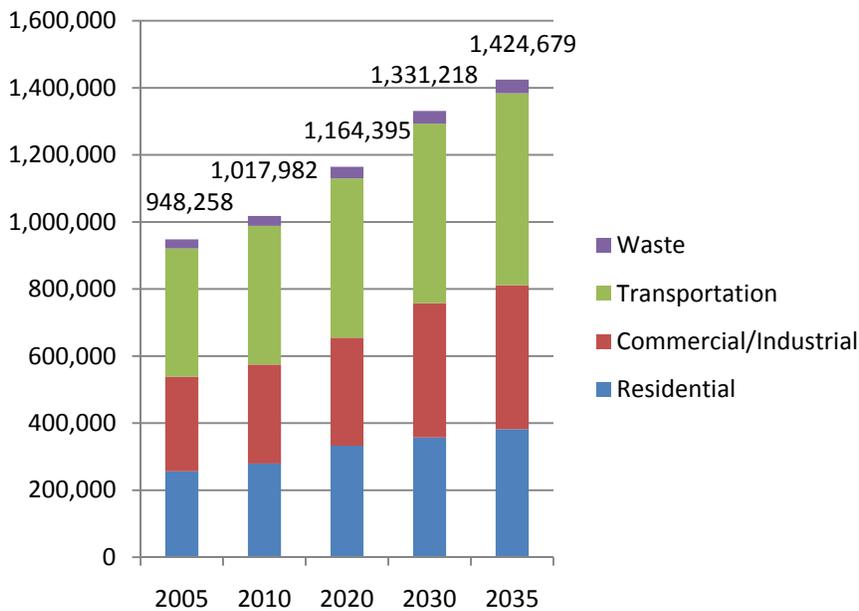
EMISSIONS FORECASTS

Using data from the 2005 baseline inventory, an estimate was projected as to how emissions will grow by 2010, 2020, and 2035 with the city's expected population, jobs, household, and transportation growth. This estimate, also known as a business-as-usual (BAU) emissions forecast or projection, demonstrates how community-wide emissions will continue to grow if regulatory or technical interventions are not put in place to reduce GHG emissions.

Under a BAU scenario, the City of Palmdale's emissions will grow by approximately 23% by the year 2020, from 948,258 to 1,164,395 MTCO₂e. By 2035, the City's BAU emissions are modeled to increase 50% to 1,424,679 MTCO₂e. **Figure ES-3** shows the results of the forecast.



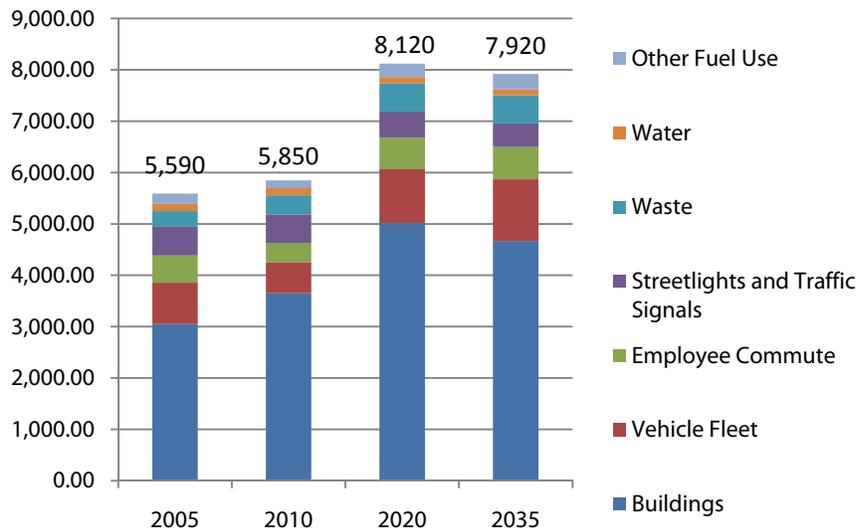
FIGURE ES-3: BUSINESS- AS-USUAL (BAU) COMMUNITY-WIDE EMISSION FORECAST BY SECTOR – 2020 AND 2035 (MTCO₂E)



To illustrate the future growth of emissions from City government operations in 2020 and 2035, existing trends, planned expansions, and levels of service were taken into account to create a City government operations business-as-usual forecast. All improvements the City has completed since 2005 that would reduce emissions are excluded from the business-as-usual forecast. Changes in City government operation emissions trends will ultimately contribute to the achievement of community-wide targets and will be credited as community-wide progress toward reduction goals, yet forecasting emissions over time helps the City to better understand the impact of City government efforts to reduce GHG emissions. All City actions taken since the baseline year of 2005 that would impact emissions will be accounted for in **Chapter 5**.



FIGURE ES-4: CITY GOVERNMENT OPERATIONS EMISSIONS FORECAST BY SECTOR – 2020 AND 2035 (MTCO₂E)



ADJUSTED FORECAST & REDUCTION TARGET

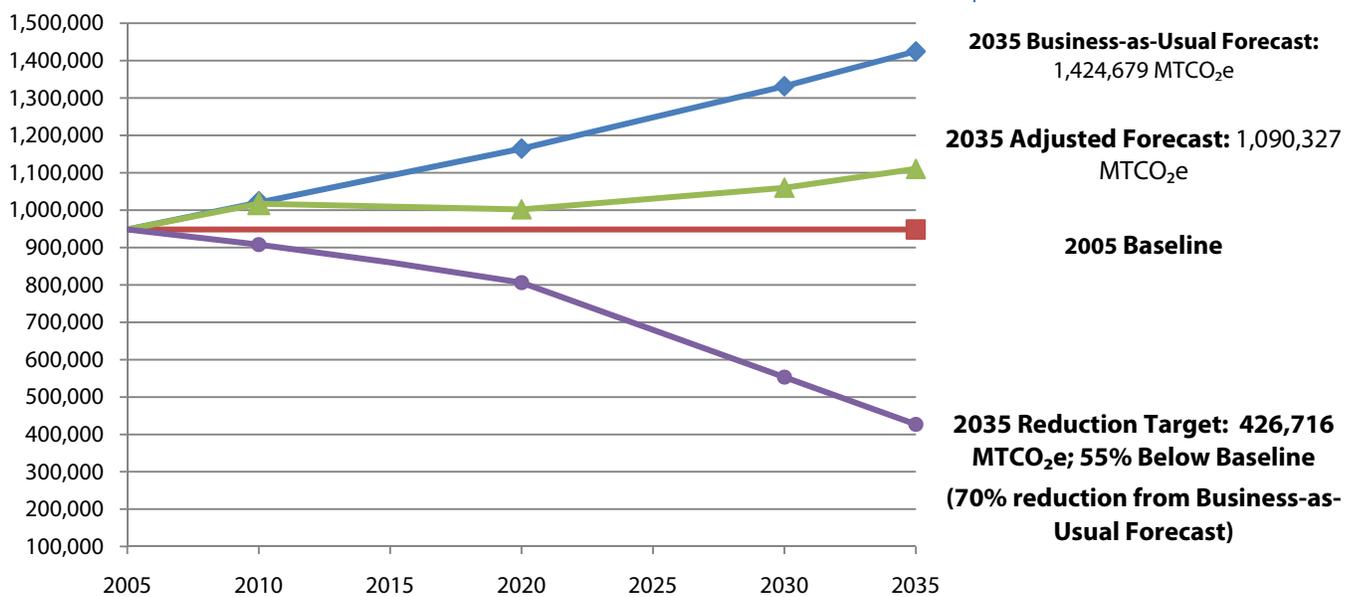
The BAU forecast was adjusted to account for state and federal actions such as mandated fuel efficiency standards, renewable electricity standards, California’s new building code, and federal vehicle efficiency standards. Accounting for these actions provides a more accurate picture of future emissions growth and the responsibility and ability of local governments versus the state to reduce greenhouse gas emissions. The state-adjusted forecast is shown in **Figure ES-5** as a green line. The figure also shows the state-recommended reduction target (purple line) of 15% below 2005 levels by 2020, and reductions continuing through 2035, showing consistency with the Governor’s Executive Order (EO) S-03-05 to reduce emissions by an additional 80% by 2050. The objective of this Plan is to bridge the gap between the city’s growth forecast and the state’s recommended reduction targets.

Emissions will continue to increase along the business-as-usual scenario while reduction efforts are initiated. Achieving the target is therefore more than a 15% decrease; rather, it is an approximate 31% reduction from 2020 business-as-usual emissions levels in Palmdale. By 2035, the gap between



business-as-usual emissions growth and target reduction levels increases to 70%. Once state reductions are accounted for, the reduction necessary at the local level to achieve targets drops to approximately 20% below the adjusted business-as-usual forecast by 2020 and 61% below the adjusted business-as-usual forecast by 2035. **Figure ES-5** demonstrates projected increases and the total emissions reductions that will be necessary to achieve City targets.

FIGURE ES-5: GHG FORECAST IN RELATION TO REDUCTION TARGETS (MTCO₂E)



REDUCTION STRATEGIES

To achieve the reduction target of 15% below 2005 baseline levels by 2020, the City will need to implement a variety of GHG reduction measures. Reduction measure topic areas include energy efficiency and conservation, renewable energy, transportation, land use, solid waste, and buy-local efforts. The GHG emissions reductions from these strategies are summarized in **Table ES-2 and Figure ES-6**. All community-wide and City operation strategies outlined in this Plan allow the City to achieve its reduction target of 15% below baseline 2005 levels by 2020.



EXECUTIVE SUMMARY

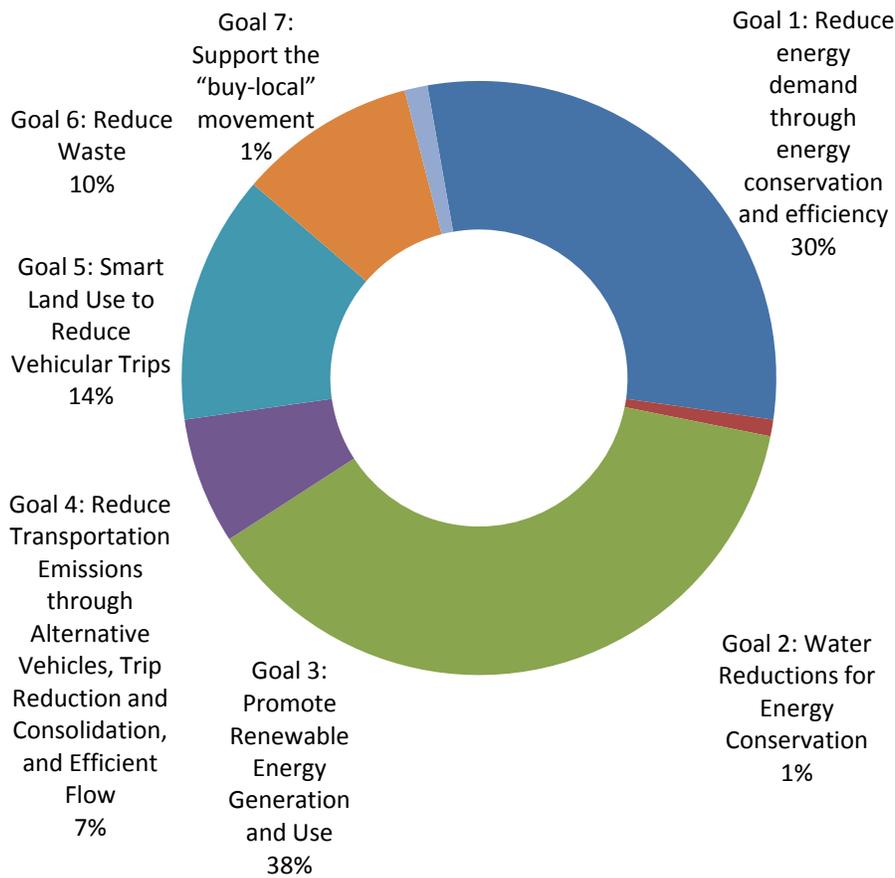
Measures in this Plan achieve a 15% reduction from 2005 baseline levels by 2020.

TABLE ES-2: REDUCTION SUMMARY BY GOAL

Goal	To Date (MTCO ₂ e/yr)	2020 (MTCO ₂ e/yr)	2035 (MTCO ₂ e/yr)
Goal 1: Reduce energy demand through energy conservation and efficiency.	0	-57,696	-127,212
Goal 2: Reduce water consumption for energy conservation.	0	-1,749	-2,446
Goal 3: Promote renewable energy generation and use.	-2,427	-72,515	-113,133
Goal 4: Reduce transportation emissions through alternative vehicles, trip reduction and consolidation, and efficient flow.	-1,541	-13,239	-19,994
Goal 5: Implement smart land use to reduce vehicular trips.	-24,865	-26,011	-36,608
Goal 6: Reduce waste.	-8,279	-18,606	-26,723
Goal 7: Support the “buy-local” movement.	0	-2,397	-3,419
Total – Local Reductions	-37,113	-192,213	-329,535
2005 Emissions	948,258	948,258	948,258
Adjusted Forecast with State Reductions	1,017,246	997,379	1,090,327
Target Emissions Level	907,618	806,019	426,716
Net Emissions with State and Local Reductions	980,133	805,166	760,792
Percentage Change from 2005 Emissions	3%	-15%	-20%



FIGURE ES-6: 2020 REDUCTIONS BY GOAL



In addition to implementing strategies for reducing GHG emissions from community-wide activities, the City will implement strategies to reduce GHG emissions from City government operations to contribute to the City's target of 15% below 2005 baseline levels by 2020. These actions are accounted for above with community-wide actions. Reductions from City government operations contribute 2% of all community-wide reductions in 2020 and represent a 20% reduction from the City government operations business-as-usual emissions forecast in 2020. The GHG emissions reductions from these strategies are summarized in **Table ES-3**.



TABLE ES-3: CITY GOVERNMENT OPERATIONS REDUCTIONS BY GOAL

Goal	To Date (MTCO ₂ e/yr)	2020 (MTCO ₂ e/yr)	2035 (MTCO ₂ e/yr)
Goal 1: Reduce energy demand through energy conservation and efficiency.	0	-799	-739
Goal 2: Reduce water consumption for energy conservation.	0	-8	-8
Goal 3: Promote renewable energy generation and use	0	-2,853	-3,214
Total – Local Reductions	0	-3,660	-3,961
2005 Emissions	5,589	5,589	5,589
Adjusted Forecast with State Reductions	5,846	8,121	7,918
Net Emissions with State and Local Reductions	5,846	4,462	3,957
Percentage Change from 2005 Emissions	5%	-20%	-29%

IMPLEMENTATION

To achieve reductions outlined in this Plan, the Energy Action Plan concludes with an Implementation Program. This is a strategy that outlines actions with specific measures and steps. The Implementation Program identifies responsible departments, potential costs, cost savings, and time frames for action. This tool equips the City to achieve the identified reduction targets in this Plan.

INTRODUCTION



CHAPTER 1



CHAPTER 1: INTRODUCTION

This Palmdale Energy Action Plan (Plan) provides innovative solutions to sustain the economic, environmental, and physical health of the community and provide the highest quality of life possible. Specifically, this Plan demonstrates the City of Palmdale's (City) commitment to achieve energy efficiency and independence by reducing greenhouse gas (GHG) emissions consistent with state legislation. The City will reduce energy demand and related emissions from City government operations and facilitate reductions in the community through the goals, measures, and actions identified in this Plan. These efforts will ensure that Palmdale continues to thrive as a place to call home and a place where businesses can grow.

The United States Department of Energy (DOE) awarded the City of Palmdale approximately \$1.3 million to implement energy efficiency projects through the Energy Efficiency and Conservation Block Grant (EECBG) Program. The EECBG Program supports local governments, states, territories, and Indian tribes in their efforts to develop, promote, implement, and manage energy efficiency and conservation projects and programs. The goals of the EECBG Program include:

- Reduce fossil fuel emissions;
- Reduce the total energy use of the eligible entities;
- Improve energy efficiency in the transportation, building, and other appropriate sectors; and
- Create and retain jobs.¹

In support of EECBG program purposes, the City approved two goals for the City's EECBG program:

- Achieve cost-effective reductions in energy consumption within City government operations, the community, and the region through increased energy efficiency and renewable energy.

¹ U.S. Department of Energy 2010.



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- Reduce greenhouse gas emissions caused by activities within the City of Palmdale through reductions in energy use, vehicle trips, and waste production.

The City hired PMC in August of 2009 to assist with EECBG monitoring and reporting and preparation of a baseline GHG emissions inventory and Energy Action Plan. The purpose of this Plan is to identify the City's GHG emissions reduction target and a multifaceted strategy to reduce GHG emissions through energy efficiency, energy conservation, measures that are compatible with the City's economic objectives, the goals of the EECBG program, and the State's strategies to address GHG emissions.

The City of Palmdale's Vision

Palmdale will be a safe, vibrant, innovative, healthy city, providing the highest overall quality of life possible.

Strategies from the City's mission to fulfill this Vision include:

- Be innovative in seeking solutions, be bold in taking on the challenges of our community, and use the entire range of resources, skills, and technology available throughout the community for the betterment of all.
- Sustain the economic, environmental, and physical health of our community by supporting new medical and health care services, creating a program of sustainable development, and fostering continued job creation.
- Continue to enhance the quality of life for our residents by embracing our small-town spirit, ensuring we maintain strong neighborhoods, valuing and strengthening intergenerational ties among citizens, and providing a range of services that support the whole community.



CHAPTER 1: INTRODUCTION

PRIORITIES IN THE ENERGY ACTION PLAN

This Plan recognizes that the City can only achieve increased energy efficiency and conservation with broad-based public support. All sectors of the community—government, businesses, and residents—will be essential to implement this Plan. The following City priorities provide a framework for this Plan:

- Reliable and efficient energy sources that are cost effective
- Land uses that reduce transportation time and costs
- Household and business investment in the local economy
- Investments in competitive industries that bring jobs and infrastructure to Palmdale

PURPOSE OF THE ENERGY ACTION PLAN

The primary purpose of this Plan is to identify how the City will achieve its GHG emission reduction target of 15% by the year 2020 consistent with the State's overall target to reduce GHG emissions statewide to 1990 levels by 2020. This Plan provides goals and measures focused on energy use, water use, transportation, land use, and solid waste to reduce GHG emissions wherever possible. Specifically, this Plan:

- Introduces the City's background and approach to this Plan (**Chapter 1**).
- Outlines the connections between energy efficiency, economic success, and residential well-being (refer to **Chapter 2**).
- Identifies energy use and sources of greenhouse gas (GHG) emissions within the City of Palmdale's jurisdictional/political boundary (refer to **Chapter 3**; also refer to **Appendix 1** for additional details).
- Forecasts GHG emissions to 2020 and 2035 consistent with the Global Warming Solutions Act (Assembly Bill [AB] 32) (refer to **Chapter 4**).



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- Identifies existing and proposed strategies to achieve energy independence and cost savings in City government operations and facilities (refer to **Chapter 5**).
- Establishes energy use, water use, transportation, land use, solid waste, and local business strategies to achieve energy efficiency and conservation and reduce emissions from community-wide sources (refer to **Chapter 6**).
- Provides methods for reducing Palmdale’s GHG emissions consistent with the State’s goals and Public Resources Code Section 21083.3. [The California Environmental Quality Act (CEQA) Guidelines encourage the adoption of policies or programs as a means of addressing comprehensively the cumulative impacts of projects. See CEQA Guidelines, § 15064, subd. (h)(3), § 15130, subd. (d).]
- Presents an implementation program to assist with monitoring and prioritization of the reduction strategies through 2020 (refer to **Chapter 7**).
- Documents the City’s numeric targets and methods for calculating GHG emissions reductions in **Chapter 5** and **Chapter 6** (refer to **Appendix 2**).

This Plan is a stand-alone strategic policy document that will be implemented by the City, businesses, and residents. This Plan provides the City with flexibility to modify the content as needed to achieve the overall reduction targets. Annual monitoring and reporting will chart the City’s progress and highlight any need to adopt goals and measures.

This Plan encompasses all known current and future efforts to reduce greenhouse gas emissions contained in existing programs, policies, and regulations.

As illustrated in **Figure 1-1**, the Plan serves as an analytical link for the City between local development, state requirements, and regional efforts. It will also be a way for the City to determine consistency with state legislation, such as AB 32 and Senate Bill (SB) 97, which mandate that local

governments address greenhouse gas emissions in local planning and environmental documents.

FIGURE 1-1: CONTEXT OF THE ENERGY ACTION PLAN IN RELATION TO OTHER PLANNING DOCUMENTS AND LEGISLATION



A USERS' GUIDE TO THE ENERGY ACTION PLAN

This Plan covers a broad range of complex issues and strategies related to energy efficiency, energy conservation, energy independence, and the City's economic objectives. The Plan has two primary components: chapters and supporting appendices. Chapters provide the bulk of the Plan's substance. Appendices provide additional technical detail to support the City's overall reduction target and strategies to achieve the target. **Chapters 1 through 4** establish the background for this Plan, including the City's rationale, assessment of existing conditions, and target for future action. **Chapter 5** and **Chapter 6** build on this foundation and provide the "meat" of the Plan: strategies to achieve energy targets. The Plan concludes with **Chapter 7**, which establishes an implementation program to achieve the overall reduction targets of the Plan. The appendices elaborate on the technical analysis that supported the creation of the Plan. **Appendix 1** includes the detailed findings of the City's baseline community-wide and City government operations GHG emissions inventory. **Appendix 2** includes a summary of methodologies, assumptions, and sources that form the basis of this Plan's reduction measures.



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GOALS & MEASURES IN THE PLAN

Chapter 5 and **Chapter 6** depict the City's actions to achieve energy independence and reduction targets. These actions consist of the basic building blocks of actions, measures, and goals:

- **Goal:** An expression of community values and desired outcomes, an ideal future result or condition, based on the City's priorities and vision.
- **Measure:** A specific action derived from a goal that represents the City's strategy to achieve a goal. Measures are assessed and quantified and count toward the City's reduction target.
- **Supportive Measure:** Strategies derived from a goal that are important or essential to goal implementation but not quantified or measured as separate GHG reductions.
- **Action:** Action items that highlight the implementation steps necessary to achieve measures and ultimately the City's reduction target.
- **Reductions:** Each measure includes details on the specific, numeric reductions achieved in energy, transportation, or waste that contribute to the goal and the resulting reduction in GHG emissions. Reductions are presented in the following categories:
 - **GHG Changes (MTCO₂e).** Reductions in GHG emissions show as reductions in metric tons of carbon dioxide equivalent (MTCO₂e), the standard way to present reductions in all six internationally recognized GHG emissions.
 - **Changes in Local Activity.** Measures change local activities to achieve reduction targets, including energy consumption, travel patterns, waste, and more. Each measure shows changes in activity, including:
 - Electricity reductions per year (kWh).
 - Natural gas reductions per year (therms).
 - Water consumption reduced per year (gallons).



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INTRODUCTION

- Vehicle miles traveled (VMT) reductions per year.
- Increased electricity per year (kWh).²
- Waste reductions per year (tons).

The Plan presents seven overarching goals to reduce GHG emissions. A brief introduction to goals and measures in both **Chapter 5** and **Chapter 6** is provided below.

Goal 1: Reduce energy demand through energy conservation and efficiency.	
1.1	Implement energy efficiency improvements (i.e., retrofits) in existing City buildings and facilities.
1.2	Exceed Title 24 energy efficiency standards in new City facilities as feasible.
1.3	Encourage new development to exceed Title 24 energy use requirements by 15%
1.4	Reduce the urban heat island effect to reduce energy consumption and cool the local climate through increased shading on private property, cool surfaces, and high albedo surfaces for sidewalks and parking lots.
1.5	Use City capital improvements and programs to educate the public and promote energy conservation.
1.6	Promote energy efficiency improvements in the city's housing stock.
1.7	Facilitate comprehensive home energy retrofits.
1.8	Promote energy efficiency in commercial and industrial uses through partnerships and programs.
1.9	Establish Palmdale as a model for energy-efficient and innovative industrial, manufacturing, and commercial businesses.
1.10	Continue to participate in regional initiatives to meet energy efficiency targets.

² Chapter 6 provides this metric for Measure 4.5, which aims to reduce fuel consumption by increasing the local electric vehicle population.



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Goal 2: Reduce water consumption for energy conservation.

2.1	Reduce municipal water consumption to reduce energy consumption and conserve water resources.
2.2	Continue to educate the public about water conservation and showcase municipal water conservation projects.
2.3	Facilitate a 20% reduction in water use by 2020 to exceed the 20X2020 initiative to reduce energy consumed for water conveyance and treatment.
2.4	Work with regional partners to stabilize water supplies and conservation capabilities.

Goal 3: Promote renewable energy generation and use.

3.1	Demonstrate City leadership in renewable energy by supplying 100% of City energy needs with renewable sources by 2035.
3.2	Encourage the commercial and industrial sector to meet energy needs through on-site renewable energy sources.
3.3	Encourage the residential sector to meet energy needs through on-site renewable energy sources.
3.4	Facilitate the establishment of large-scale solar facilities to supply regional energy needs.
3.5	Construct and operate the Palmdale Hybrid Power Plant (PHPP) to support the State’s Renewable Energy Portfolio and promote the growth of the local renewable energy industry.

Goal 4: Reduce transportation emissions through alternative vehicles, trip reduction and consolidation, and efficient flow.

4.1	Continue to promote ride sharing and TDM programs to reduce use of traditional motor vehicles for work commutes.
4.2	Employ low emissions vehicles for City government operations where practicable.
4.3	Reduce emissions from mobile sources through efficient vehicle flow.
4.4	Implement a Complete Streets approach to transportation to improve mobility.
4.5	Reduce emissions from on-road vehicle sources.



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INTRODUCTION

Goal 4: Reduce transportation emissions through alternative vehicles, trip reduction and consolidation, and efficient flow.	
4.6	Reduce transportation emissions from the commercial and industrial sectors.
4.7	Support the expansion of transit options within Antelope Valley to reduce vehicle miles traveled.
4.8	Promote upgrades to the regional transit fleet.
Goal 5: Implement smart land use to reduce vehicular trips.	
5.1	Promote accessible housing near transit and services.
5.2	Pursuant to SB 375, support the development and implementation of a regional Sustainable Communities Strategy with the Southern California Association of Governments through local plans and programs.
Goal 6: Reduce waste.	
6.1	Implement the City's Environmentally Preferable Procurement Program.
6.2	Achieve an 80% diversion of landfilled waste by 2020.
6.3	Collaborate with regional partners to achieve local waste diversion targets.
Goal 7: Support the "buy-local" movement.	
7.1	Support efforts that encourage Palmdale residents and businesses to buy goods and services locally.

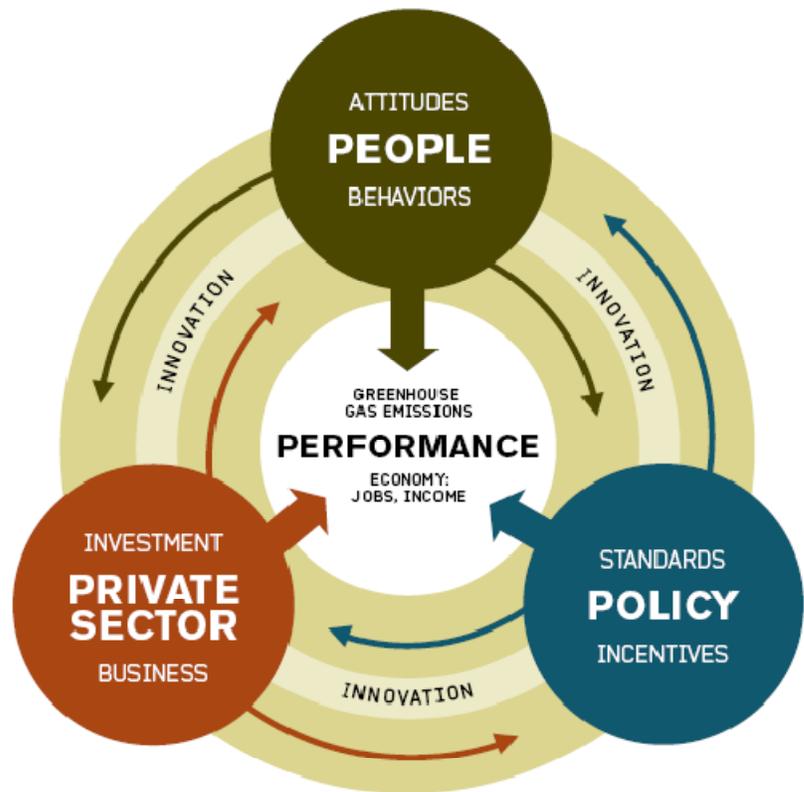
PALMDALE'S PATH FOR SUCCESS

The intent of this Plan is to stimulate and support energy efficiency and conservation while benefiting residents, workers, and businesses in Palmdale. The strategies contained in this Plan recognize that energy reductions and greenhouse gas (GHG) emissions are linked to the patterns of daily life. **Figure 1-2** illustrates that individual lifestyles, economic investment, and governmental actions all work together to impact both economic performance and GHG emissions. Within an innovative context, the City can encourage private and public actions to simultaneously achieve all desired levels of performance, economic and emissions-related alike, while ensuring that Palmdale remains a desirable community that supports optimal lifestyles.



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FIGURE 1-2: THE NEXUS OF ECONOMIC PERFORMANCE AND GREENHOUSE GAS EMISSIONS



Next 10 2010, p. 6

This Plan provides the direction to create the innovative context that fosters economic growth and greenhouse gas emissions reductions.

PALMDALE'S EARLY ACTIONS

The City of Palmdale has initiated ambitious programs to facilitate cost savings and enhance the local quality of life while reducing energy use and GHG emissions. To the greatest extent possible, this Plan includes all programs the City has initiated since 2005 to give the City credit for all GHG emissions reductions that have resulted since the baseline inventory. The Plan depicts all reductions achieved to date as progress toward GHG emissions reduction targets.

Below are examples of initiatives included in this Plan—both public and private. These initiatives provide an important foundation for actions proposed in this Plan. The selected examples demonstrate the City's



CHAPTER 1: INTRODUCTION

rationale that prosperity is synonymous with GHG emissions reductions. **Chapter 4** also integrates all early actions that are introduced below into GHG emissions reduction strategies.

CITY GOVERNMENT OPERATIONS

The City of Palmdale has implemented numerous cost-saving and energy-reducing initiatives since 2005.

- Efficient water management. Since 1995, the City has initiated an ambitious water conservation program, including the installation of a Rain Bird Maxicom Irrigation Control System and staff training in water best management practices, achieving a 20% reduction in municipal water use and \$235,626 in savings from the General Fund.
- Alternative fuel fleet. The City operates five compressed natural gas (CNG) vehicles, including two heavy-duty and two light-duty trucks used by the Public Works Department and one light-duty vehicle used by the Library.
- Municipal projects funded by the Energy Efficiency and Conservation Block Grant (EECBG) Program. Using money allocated by the EECBG Program, the City has initiated several projects, including the installation of an energy-conserving cool roof at the Parks and Recreation Building.

COMMUNITY-WIDE ACTIVITIES

In addition to enhancing the efficiencies of government operations, the City has also worked proactively to implement partnerships and programs to reduce energy consumption and enhance the local quality of life. A selection of these activities follows below.

- Education and outreach. The City of Palmdale has worked as an advocate for residents and businesses on multiple fronts, from energy efficiency to water conservation. The City produces regular installments of *Conserve Palmdale*, available on local channels or on the City's website.



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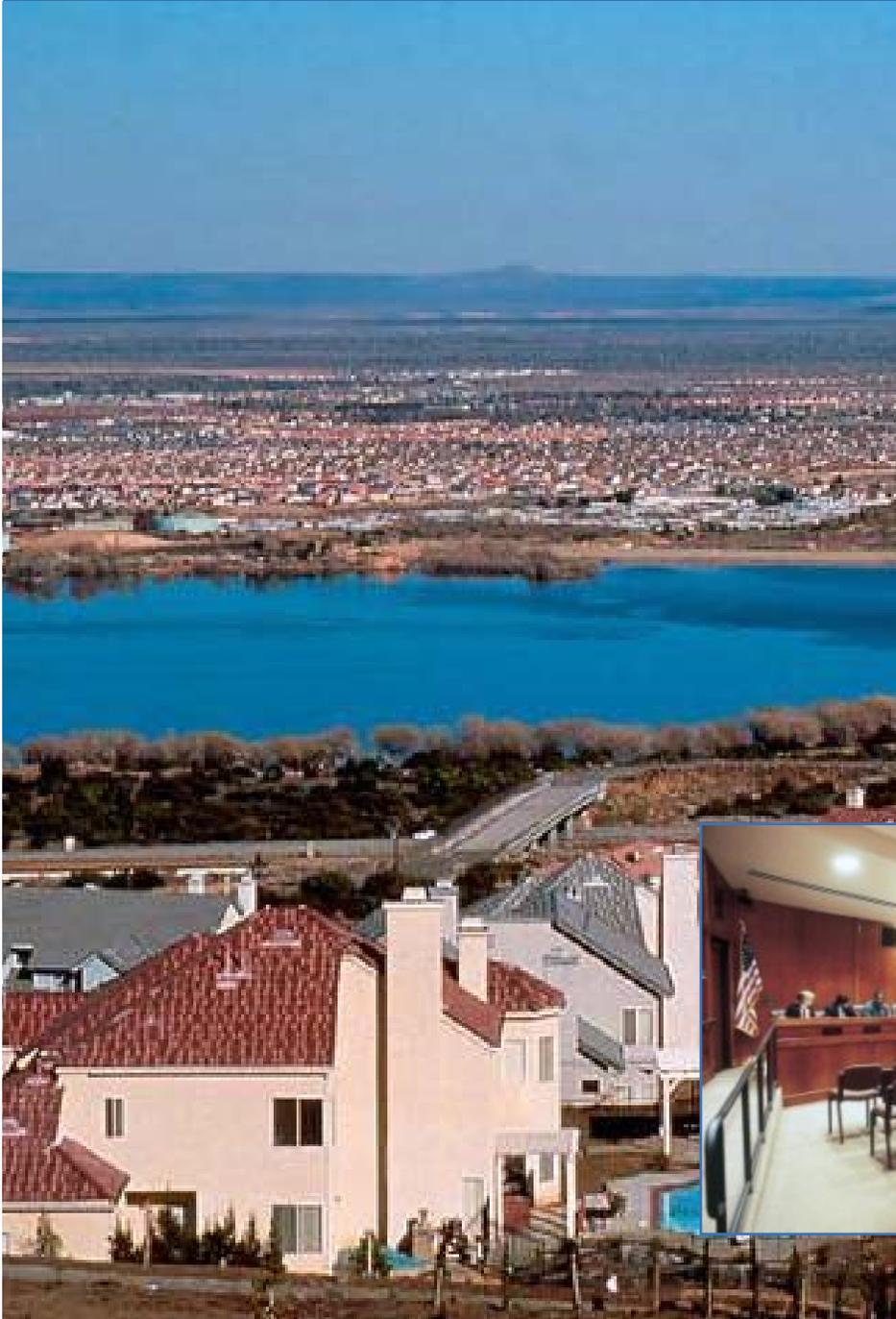
- Water conservation. The City has worked proactively to achieve water conservation throughout the entire community, including and a regional water-wise landscaping CD and website and the adoption of a Water Conservation Ordinance in 2008, which Los Angeles County estimated reduced water use in new development by 50%.
- Support of safe alternative transportation for schoolchildren. The City has a long history of encouraging students to bike and walk safely to school. The Traffic Engineering Department runs a Traffic Safety Program that includes bicycle rodeos and pedestrian safety programs, both geared toward schoolchildren. The City is also using EECBG Program funding for a Safe Routes to School program, which consists of improvements that will provide pedestrian improvements for access to Golden Poppy Elementary and Cimarron Elementary.

This Plan incorporates the City's efforts to date and builds a framework for additional strategies for the City and the community to achieve its targets between now and 2035.

CONCLUSION

The City is already implementing strategies to achieve the reduction targets of this Plan through commitments to reduce energy use and emissions while supporting economic growth and healthier opportunities for daily life. This Plan builds on the City's leadership to date to chart a local path for sustained success. The remaining chapters of this Plan outline in further detail the step-by-step actions the City will take to implement this Plan.

BACKGROUND



CHAPTER 2



CHAPTER 2: BACKGROUND

This chapter outlines how local concerns, economic realities, and regulatory requirements drive the rationale of this Plan. In order to ensure that Palmdale remains a place to call home and a place where business grows, the City must formulate a clear strategy to integrate economic success and residential well-being.

THE COMMUNITY OF PALMDALE

The City of Palmdale is a family-oriented community located in the high desert region of Antelope Valley, one of only two incorporated communities in the valley (**Figure 2-1**). Characterized by affordable housing, a strong business community, and close proximity to the City of Los Angeles, Palmdale has attracted rapid growth since the early 1990s. The City of Palmdale was reputedly one of the fastest growing cities in the nation, growing from just over 20,000 residents in 1986 to more than 150,000 residents by 2010, with over 6,000 licensed businesses.

Energy for Home Cooling

Hot temperatures require more electricity to keep households cool. The warm and dry desert climate is conducive to the use of evaporative coolers in addition to air conditioning. Many residents in Palmdale rely on both evaporative cooling and air conditioning to cool the home.

On average, Palmdale households pay approximately \$1,000 per year in electricity costs.



CHAPTER 2: BACKGROUND



Picture of an evaporative cooler on a Palmdale home



CHAPTER 2: BACKGROUND

Over the last 25 years, the City of Palmdale has consistently been ranked in the top 25 fastest growing cities in the United States. According to the 2010 Census, the City has a population of 152,750, making Palmdale the largest “desert city” in California. From 2000 to 2010, Palmdale was the second fastest growing city in Los Angeles County, increasing by 31%.¹

Palmdale, and the surrounding Antelope Valley, is characteristic of the High Desert location, where the summers are very hot with dry winds, and winters are cold and windy with snowfall. Average annual temperatures range from summer highs in the upper 90 degrees Fahrenheit to winter lows in the 30s. Because of this dramatic weather pattern, proper home weatherization is necessary to maintain healthy and comfortable indoor conditions without excessive energy use. However, with an average household income of \$46,941 in 2000 and about 14% of the population living below the poverty line, the up-front costs of proper weatherization and energy-efficient design are often prohibitive. City experience has demonstrated that there is a gap between the type of home improvements necessary for desirable home conditions and available financial resources, despite the long-term benefits associated with energy efficiency home improvements.

JOBS & HOUSING

People looking for realistic homeownership opportunities or affordable, high-quality rental housing are attracted to Palmdale for its affordable housing stock and relative proximity to the City of Los Angeles and other employment centers. Palmdale’s rapid growth resulted from an affordable housing stock that attracted the county’s moderate-income households. The median-priced home in Palmdale in 2005 (\$116,000) was affordable for the County of Los Angeles’s median income level. As a result, many people live in Palmdale who work outside of the city. The American Communities Survey reports that approximately 60% of all residents in Palmdale worked outside of the city.²



Picture of a neighborhood in Palmdale

¹ California Department of Finance 2011.

² U.S. Census data manipulated by SCAG 2010, for 2006–2008 American Communities Survey. Provided by Richard Kite, October 2010.



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While Palmdale has a strong business sector and affordable housing, existing job supply does not meet the optimal employment needs of all households in the city. In 2010, there were 0.77 jobs per each household, approximately 50% lower than the ideal jobs-to-housing ratio. This mismatch in jobs and housing reflects the fact that many people who live in Palmdale drive out of the city for work (**Figure 2-2**).

FIGURE 2-2: JOBS-HOUSING RATIO



A low jobs/housing ratio leads to increased travel from the community to outlying areas for employment

IMPACT OF LOCAL GEOGRAPHY & CLIMATE ON PHYSICAL ACTIVITY

Trends in the Antelope Valley indicate that many of Palmdale’s residents do not engage in the level of physical activity or exercise each week, based on U.S. Department of Health and Human Services Healthy People 2020 Goals.³ In Antelope Valley, only half of adults and less than 40% of children between 6 and 17 years of age obtain the amount of recommended exercise each week. Approximately 40% of adults in Antelope Valley are minimally active or inactive, and 16% of children between 6 and 17 years are minimally active or inactive.⁴ In Palmdale, both sprawling land uses and extreme summers and winters limit opportunities to easily engage in physical activity and exercise.

Sprawling and disconnected land uses lead to longer travel distances and times between home, work, school, and the other activities of daily life. When homes, jobs, and other daily activities are located in close proximity, people are able to choose alternative modes of travel, such as bicycling or walking, that support healthier lifestyles. All people can enjoy the health benefits of accessible, mixed-use communities that encourage walking and biking activity.

³ U.S. Department of Health and Human Services 2010.

⁴ County of Los Angeles Department of Public Health 2009.



CHAPTER 2: BACKGROUND

AIR QUALITY AND HEALTH

Vehicular fuel combustion contributes to deteriorating air quality. Vehicles release numerous air pollutants including gases that lead to ground level ozone, nitrogen, and acid vapor. Vehicles also cause increased levels of particulate matter, consisting of fine particles that people can breathe into their lungs, such as dust. These pollutants are responsible for many negative health impacts, including respiratory illnesses such as asthma, premature heart-related deaths, and premature births.⁵

The California Air Resources Board completed a long-term health study in Southern California and found that chronic air pollution created irreversible damage that harmed children's lungs for life. The study document the following trends in children exposed to air pollution

- Those exposed to higher levels of air pollution had significantly reduced lung growth and were more likely to develop asthma.
- Those exposed to higher concentrations of nitrogen dioxide were less able to move air through their lungs, which may have permanent adverse effects in adulthood.
- Those exposed to higher levels of ozone reported significantly higher school absences due to respiratory illnesses.
- Those exposed to ozone and higher concentrations of particulate matter were much more likely to develop bronchitis.⁶

Air quality in Los Angeles County is notoriously poor due to high amounts of vehicle travel, goods movement, and traffic congestion, exposing residents to numerous air pollutants and health risks. Antelope Valley and Los Angeles County failed to attain several federal or state air quality standards, including the 2010 state standards for ozone and 2010 national 8-hour standards for ozone.⁷

⁵ County of Los Angeles Department of Public Health 2008.

⁶ California Air Resources Board 2004.

⁷ California Air Resources Board. 2010.



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Financial benefits of energy efficiency

In California,
manufacturers spend a
smaller percentage of
total operating costs on
electricity than in the rest
of the United States.

ECONOMIC OPPORTUNITIES FOR PALMDALE'S LONG-TERM PROSPERITY

This Plan is grounded on the City's long-standing commitment to attract and support an excellent economic base. The Plan positions the City to capitalize on emerging opportunities that are driven by the energy economy. The City intends to capitalize on the evidence that economic growth, new approaches to energy use, and reduced emissions are closely related and together facilitate higher quality of life.

EFFICIENCY & ENERGY PRODUCTIVITY: STRATEGIES TO DIRECT WEALTH TO THE LOCAL ECONOMY

The economic climate that has developed since 2008 requires an innovative and forward-thinking strategy to both find and direct scarce economic resources that in turn catalyze economic growth. A primary task of this Plan is to demonstrate opportunities for residents and businesses to reduce unnecessary costs in order to redirect money back into the local economy. The Plan aims to put more money back into the pockets of the people who live and work in Palmdale.

Since the 1970s, California has enacted the nation's leading energy efficiency standards and continually leads the nation in terms of energy efficiency. As a result of lower comparative energy consumption, money that households and businesses would have otherwise paid for energy has been reinvested into the state's economy.⁸ A study prepared for the California Air Resources Board found that the state's energy efficiency measures from 1972 to 2006 have allowed households to redirect approximately \$56 billion in expenditures to a more diverse array of goods and services, creating approximately 1.5 million full-time equivalent jobs with a total payroll of \$45 billion in California.⁹

EFFICIENCY – A GREEN STRATEGY FOR THE MANUFACTURING INDUSTRY

In late 2009, manufacturing employment in the eight-county Southern California region ranked third in size only to California as a whole and Texas,

⁸ Next 10 2010.

⁹ Roland-Host 2008.



CHAPTER 2: BACKGROUND

What Is the “Green “Economy?”

The “green” economy provides the products and services that enable the transformation towards a cleaner, more efficient, and more competitive economy.

Core sectors include:

- Energy generation
- Energy efficiency
- Transportation
- Energy storage
- Recycling and waste
- Water and wastewater
- Business services
- Finance and investment
- Advanced materials
- Green building
- Manufacturing and industrial
- Energy infrastructure

Next 10 2009

providing over 775,000 jobs.¹⁰ The manufacturing industry demonstrates the financial benefits of energy efficiency. In California, manufacturers spend a smaller percentage of total operating costs on electricity than in the rest of the United States. Electricity expenditures as a percentage of total operating expenses are 15% below the rest of the country. From 1992 to 2007, the percentage of operating costs spent on electricity dropped in California by 21%, whereas the rest of the United States only experienced an 18% drop.¹¹ Efficiency and conservation of resources is a strategy not only to save money but also to improve a company’s resilience to external shocks, enhancing a competitive market edge.¹² Manufacturers in California also generate more profit per unit of energy consumed: whereas California’s manufacturing productivity for electricity has grown by 13% since 2002, manufacturing productivity of the rest of the country dropped by 10%. Similarly, in 2007 California’s manufacturing sector generated approximately \$13 more of gross domestic product (GDP) for every dollar spent on electricity than the rest of the United States.¹³

The green economy offers the potential for California to retain its economic strength. The Southern California Association of Governments has identified the green economy as providing top opportunities for enhanced economic growth, specifically indicating the potential of advanced manufacturing. Since 2006, California has attracted \$11.6 billion in cleantech venture capital, 24% of total global investment. California also holds more patent registrations in green technology than any other state.¹⁴ California’s businesses and households have reduced energy consumption and energy import dependence, directing consumption to in-state goods and services that catalyze job creation.¹⁵ For instance, between 2007 and 2008, total jobs in the state dropped 1%, while green jobs grew by 5%.¹⁶

¹⁰ Southern California Association of Governments 2010.

¹¹ Next 10 2010, citing the U.S. Census Bureau, U.S. Department of Commerce, Bureau of Economic Analysis.

¹² Next 10 2010.

¹³ Ibid.

¹⁴ Ibid.

¹⁵ Roland-Host 2008.

¹⁶ Next 10 2010.



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Most sectors within the green economy are not “new” but represent the creative adaptations of existing industries into more profitable markets. New jobs in this economy result from both the repositioning of existing sectors and the development of new sectors. Many sectors of the green economy are already established and thriving in Southern California, including the existing traditional manufacturing base.

OPPORTUNITIES FOR SOUTHERN CALIFORNIA

While the green economy provides unparalleled economic potential for the region and the state, new opportunities do not guarantee an equitable distribution of benefits. Market forces, legislation, and local initiatives will continue to cause growth in the green economy. These developments are not location-dependent. As reported to the U.S. Council of Mayors, “future green jobs will be located in cities and metropolitan areas that are currently the most attractive for investment, or in areas that actively increase their attractiveness relative to competing areas.”¹⁷ The ability of both Southern California and Palmdale to benefit from potentials in the green economy will be realized through active planning and foresight, including implementing the strategies established in this Plan.

The Los Angeles county region provides the highest proportion of the state’s green manufacturing employment in energy storage (49%). The Los Angeles area is the state’s traditional manufacturing base, with 32% of total manufacturing jobs in the state in 2008 (both traditional and green manufacturing). However, in green manufacturing employment, the Los Angeles area and the Bay Area together lead the state, each providing approximately 10,000 jobs.¹⁸

The green economy provides opportunity for Palmdale to capitalize on new job opportunities and emerging industries that can benefit Palmdale’s current and future workforce. A more viable economic base will catalyze greater opportunities for the city’s existing employment pool, including residents who drive out of town for work and the youth of the city who will be entering the labor force.

¹⁷Global Insight 2008.

¹⁸Next 10 2010.



CHAPTER 2:
BACKGROUND

Palmdale Hybrid Power Plant: Energy Independence for Jobs by 2013

- Potential to supply electricity for up to 590,000 homes
- 36 new full-time jobs
- Over \$63 million in annual benefits to the community through enhanced tax revenue, operations, and demand for supplies

California Energy Commission 2009

TABLE 2-1: 2008 MEDIAN ANNUAL EARNING FOR GREEN JOBS

Job Title	Wage	Education & Training
Sales Rep. Wholesale and Manuf. Technical and Scientific Products	\$77,060	Moderate-Term On-the-Job Training
Surveying and Mapping Technicians	\$55,900	Moderate-Term On-the-Job Training
Industrial Engineering Technicians	\$50,200	Associate Degree
Civil Engineers	\$84,620	Bachelor's Degree
Aerospace Engineers	\$104,550	Bachelor's Degree
Engineering Managers	\$130,520	Work Experience, Plus a Bachelor's or Higher

Source: Next 10 2009.



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PALMDALE'S PATH IN PERSPECTIVE: HOW TO ACHIEVE THE CITY'S AMBITIONS IN A REGULATORY CONTEXT

The City of Palmdale's strategies to achieve energy independence fall within a broader regulatory framework. This Plan recognizes the City's flexibility to chart its own course in the context of state and federal actions. The City is able to exercise its discretion as it creates a locally-appropriate strategy for energy efficiency and conservation that also satisfies minimum regulatory standards. A summary of the regulatory context follows below.

STATE AND FEDERAL CONTEXT

FEDERAL DIRECTION

The federal government has yet to enact legislative targets for GHG emissions reductions. However, numerous proposals are under way at the federal level to limit GHG emissions from power plants, impose pricing on carbon emissions, and provide federal energy legislation. The federal government adopted efficiency standards in 2010, creating a nationwide standard through 2016.

In addition, the federal government has primarily addressed GHG emissions through the approval of the American Reinvestment and Recovery Act (ARRA), also referred to as the federal stimulus package. Through the Energy Efficiency and Conservation Block Grant (EECBG) Program, a division of ARRA, the U.S. Department of Energy (DOE) is providing a total of \$3.2 billion to cities and counties to reduce fossil fuel emissions; reduce total energy use; improve energy efficiency in the transportation, building, and other appropriate sectors; and create and retain jobs.¹⁹ Using this money, jurisdictions across the United States are allocating funds to achieve reductions in GHG emissions.

¹⁹ U.S. Department of Energy 2010.

CALIFORNIA'S LEGISLATIVE DIRECTION

The State of California is the 15th largest emitter in the world of GHG emissions, ultimately accounting for 2% of global emissions.²⁰ However, the State has been working proactively to reduce emissions. California has a long history of proven leadership in addressing these issues that spans the last 20 years. In 1988, Assembly Bill (AB) 4420 (Sher, Chapter 1506, Statutes of 1988) designated the California Energy Commission (CEC) as the lead agency for climate change issues in California.²¹ Since that time, there has been a flurry of initiatives in California to address climate change, with the majority of legislation passed between 2000 and now. These initiatives have strengthened the ability of entities in California to engage in accurate data collection and have created ambitious targets and regulations that will directly lead to reductions in GHG emissions. Not only have California's efforts earned it a role as the leader in the United States for climate planning strategies, but the state has received world attention and accolades for its efforts. A summary of state efforts by topic is provided below in **Figure 2-3**.

Green Business is a Prudent Investment

- Since 2006 California has attracted 24% of total global investment in cleantech industries
- California has more patent registrations in green technology than any other state
- Between 2007 and 2008, total jobs dropped one percent, while green jobs grew by five percent.
- Most of California's green employment is in manufacturing (21%)

Next 10 2010

²⁰ California Air Resources Board, CCAR, and ICLEI 2008.

²¹ California Energy Commission 2009.



CHAPTER 2: BACKGROUND

How Are Greenhouse Gases Measured?

Metric tons of carbon dioxide equivalent (MTCO₂e) is a way to equalize the different potencies of the six internationally recognized greenhouse gases (carbon dioxide, methane, nitrous oxides, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride). For example, methane (CH₄) has 21 times the potency of carbon dioxide (CO₂); therefore, 1 ton of CH₄ is reported as 21 MTCO₂e.



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FIGURE 2-3: SUMMARY OF STATE EFFORTS RELATED TO CLIMATE CHANGE, BY TOPIC

Climate Change

**E.O.
S-3-05**

2005 - Established the California Environmental Protection Agency (CalEPA) as the agency responsible for coordinating the State's effort to achieve the progressive greenhouse gas emissions reduction targets outlined in the executive order for the state.

**AB
32**

2006 - The landmark legislation required the California Air Resources Board (CARB) to develop regulatory and market mechanisms that will reduce greenhouse gas emissions to 1990 levels by 2020.

**SB
97**

2008 - Required lead agencies to analyze GHG emissions and climate change impacts under the California Environmental Quality Act (CEQA).

Transportation and Vehicles

**AB
1493**

2002 - Commonly referred to as the Pavley standards, AB 1493 directed CARB to create regulations that would lead to reductions in greenhouse gas emissions from passenger vehicles, light-duty trucks, and noncommercial vehicles sold in California.

**E.O.
S-1-07**

2007 - Known as the Low Carbon Fuel Standard, Executive Order S-1-07 established a goal to reduce the carbon intensity of California's transportation fuels by 10% by 2020.

**SB
375**

2008 - Required the California Air Resources Board to establish GHG reduction targets for each Metropolitan Planning Organization (MPO) in California and directs each MPO to develop a Sustainable Communities Strategy.



CHAPTER 2: BACKGROUND

Energy

Title 24

Title 24 Standards were first adopted in 1978 and established minimum energy efficiency performance standards for residential and nonresidential buildings. Since then, the standards have been continually updated to reduce California's energy consumption.

SB 1078

2002 - Established Renewable Portfolio Standards for each of the state's investor-owned utilities (IOUs) to acquire 20% of their electricity from renewable resources by 2010 and 33% by 2020.

SB 1368

2006 - Established emissions performance standards for new and existing power plants that produce energy that is sold to publicly owned and investor-owned utilities.

AB 811

2008 - Authorized all cities and counties in California to designate areas within which willing property owners could finance the installation of distributed renewable generation, as well as energy efficiency improvements through low-interest loans.

Water

SB 1881

2006 - Required cities and counties to adopt a water-efficient landscape ordinance, limiting the amount of water used for landscaping purposes.

SB 7

2009 - Required the State to achieve a 20% reduction in per capita water use by 2020. Noncompliance by local water providers will make them ineligible for state grant or loan funding from the State.

SB 407

2010 - Required inefficient plumbing fixtures be replaced with more efficient models at the time of property sale or improvement.



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Waste

**AB
939**

1989 - Established the goal of achieving a statewide diversion rate of 50% and requires cities and counties to divert a minimum of 50% of their waste stream for reuse or recycling.

**SB
1016**

2008 - Established per capita disposal rate requirements and goals for local agencies in California. Requirements are expressed in a pounds per person per day measurement.

STATE RATIONALE TO ADDRESS GREENHOUSE GAS EMISSIONS

The State has premised its collective actions dealing with GHG emissions on a large body of scientific and economic findings. Primarily, laws that address GHG emissions aim to mitigate California's contribution to climate change by addressing GHG emissions. The State has recognized that human-induced GHG emissions are influencing the natural greenhouse effect and increasing the retention of heat in the earth's atmosphere.

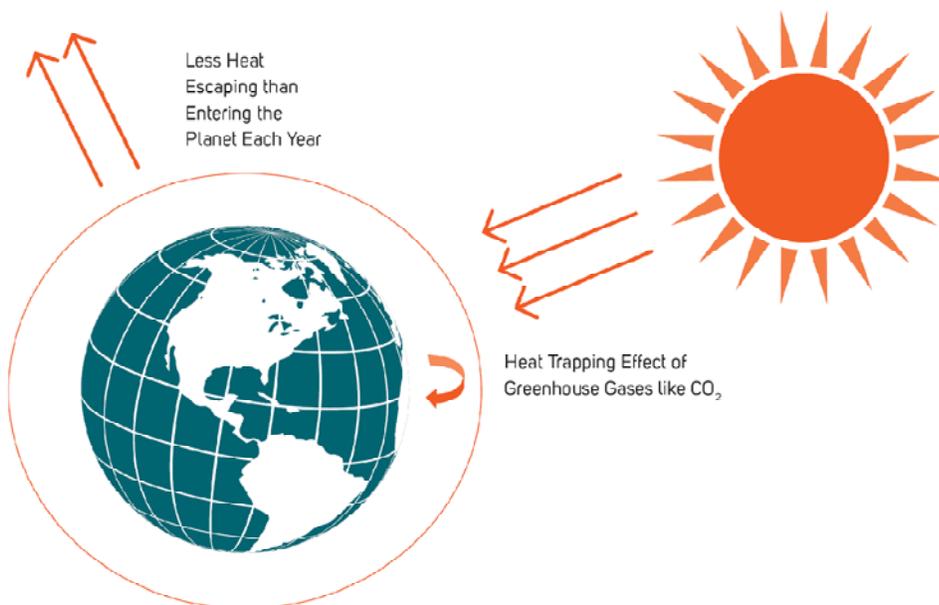
The greenhouse effect is a natural process that results when the atmosphere captures heat that radiates away from the earth toward space. By retaining heat and warming the planet's surface, life on earth is possible. Several gases in the atmosphere function as barriers and trap heat within the planet's atmosphere, including water vapor, carbon dioxide, methane, nitrous oxides, and chlorofluorocarbons. These gases function similarly to glass on a greenhouse; the glass panes of a greenhouse allow sunlight to pass into the building but trap heat within it, preventing heat from escaping.²² (Refer to **Figure 2-4.**) While the greenhouse effect is a natural process, human activities have accelerated the generation of GHG emissions beyond natural levels. Laws adopted and implemented by the State of California are premised on the understanding that an overabundance of greenhouse gases has led to an unexpected warming of the earth that has the potential to severely impact the earth's climate system.

²² NASA 2009.



CHAPTER 2: BACKGROUND

FIGURE 2-4: THE GREENHOUSE EFFECT



Source: DARA 2010.

The State's intent by addressing GHG emissions and the impacts of climate change is to protect residents, businesses, resources, and infrastructure from the threats of climate change while positioning the state for sustained economic success. To refrain from action is costly and risky; the California Climate Adaptation Strategy estimates that refraining from action to address the potential impacts of climate change will lead to sector-wide losses of "'tens of billions of dollars per year in direct costs' and 'expose trillions of dollars of assets to collateral risk.'"²³ Both state laws and the premises of this Energy Action Plan are in agreement: there is more potential benefit in working proactively to reduce GHG emissions than there is in refraining from action.

LOCAL CONTEXT

This Plan will function as an easy-to-use tool for the implementation of the City's overarching policies, achievement of the City's vision, and achievement of GHG emissions reductions. The Plan establishes goals for GHG emissions reductions and creates steps to achieve these targets. Unlike other components of City policies, this Plan translates goals and

²³ California Natural Resources Agency 2009.



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actions into numeric thresholds and targets for GHG emissions. The Plan builds on the goals and vision of the General Plan, but translates these goals into quantifiable impacts on GHG emissions.

INTEGRATION WITH THE CITY'S ENERGY EFFICIENCY AND CONSERVATION STRATEGY

In April 2010, the U.S. Department of Energy (DOE) awarded the City of Palmdale approximately \$1.3 million through the Energy Efficiency and Conservation Block Grant (EECBG) Program. The City is required to use the award to reduce energy use and GHG emissions and create jobs through eligible activities established by the DOE. The City allocated EECBG funds to the implementation of several projects that will achieve GHG emissions reductions through improved energy efficiency, reduced energy use, and improved transportation efficiencies. The City's Energy Efficiency and Conservation Strategy (EECS) outlines the parameters of these projects. This Energy Action Plan is one of several projects the City is funding through the EECBG Program. EECBG projects are included within the Energy Action Plan as GHG emissions reduction strategies. This approach allows the City to take full credit for all its endeavors and to use these projects to inform and support other strategies contained in the Energy Action Plan.

RELATIONSHIP TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

The City of Palmdale completed an Initial Study (IS) and Mitigated Negative Declaration to analyze the PEAP pursuant to the requirements of the California Environmental Quality Act (CEQA). The IS shows that any potential significant effects the PEAP could have on the environment are self-mitigated by measures contained in the PEAP. The PEAP also serves as a programmatic tiering document for the purposes of CEQA, consistent with the CEQA Guidelines (§ 15064, subd. (h)(3), § 15130, subd. (d)). A tiering document front-loads the GHG analysis needed for subsequent projects in order to decrease the time and money that would be needed for individual analyses on a project-by-project basis. If a future development or improvement in Palmdale can prove that it is consistent with the PEAP, then it is consistent with state legislation and the California Environmental Quality Act for purposes of GHG emissions.



GREENHOUSE GAS EMISSIONS INVENTORY

CHAPTER 3



CHAPTER 3: 2005 GREENHOUSE GAS EMISSIONS INVENTORY BACKGROUND

An inventory of GHG emissions is an important first step in the planning for GHG emissions reductions. It identifies major sources of GHG emissions and provides a baseline against which progress can be measured.

OVERVIEW

In August 2010, the City of Palmdale completed a GHG emissions inventory (Inventory) as part of the Energy Action Plan. The Inventory calculated GHG emissions produced from government operations and community-wide activities in city limits in 2005.

The City chose a baseline year of 2005 because of the availability of reliable data and to maintain consistency with California's Assembly Bill (AB) 32. A 2005 baseline year also enables the City to take credit for proactive programs implemented since 2005 and to measure their impact, allowing the City's actions to form the foundation for the strategies outlined in the Energy Action Plan. The Inventory is an important first step for the City to create a baseline against which it can measure future progress. The largest GHG emitters and opportunities for reduction are revealed through the Inventory, making it an integral component of the City's efforts to address GHG emissions and demonstrate progress in achieving reductions.

INVENTORY STRUCTURE

The Inventory is separated into two sections: community-wide and City operations. The community-wide section provides an assessment of activities throughout the community. The City operations section provides a more detailed analysis of the City government's contribution to GHG emissions, including those from streetlights, building energy use, fleet vehicles, water conveyance, and more. It is important to note that the City operations (municipal) inventory is a subset of the community inventory, meaning that all City operations are included in the commercial/industrial,



CHAPTER 3: GREENHOUSE GAS EMISSIONS INVENTORY



CITY OF PALMDALE

transportation, waste, or “other” categories of the community-wide inventory (see **Figure 3-1**). The City’s government operations inventory should not be added to the community analysis; rather, it should be looked at as a slice of the complete picture of local emissions trends.

FIGURE 3-1: RELATIONSHIP BETWEEN THE COMMUNITY-WIDE AND CITY OPERATIONS GHG INVENTORY



Although City operations are a small contributor to the community’s overall emissions levels, an inventory allows the City to track its individual facilities and vehicles and to evaluate the effectiveness of its emissions reduction efforts at a more detailed level and to test strategies available to the community at large. Specifying municipal emissions and establishing programs for municipal emissions reductions also demonstrates the City’s leadership in achieving this Energy Action Plan’s targets.

2005 GREENHOUSE GAS EMISSIONS INVENTORY

COMMUNITY-WIDE EMISSIONS

In 2005, the City emitted approximately 948,258 MTCO₂e within city limits. As shown in **Table 3-1** and **Figure 3-2**, the transportation sector was by far the largest contributor to emissions (40% of total emissions), producing approximately 382,010 MTCO₂e in 2005. Emissions from the commercial



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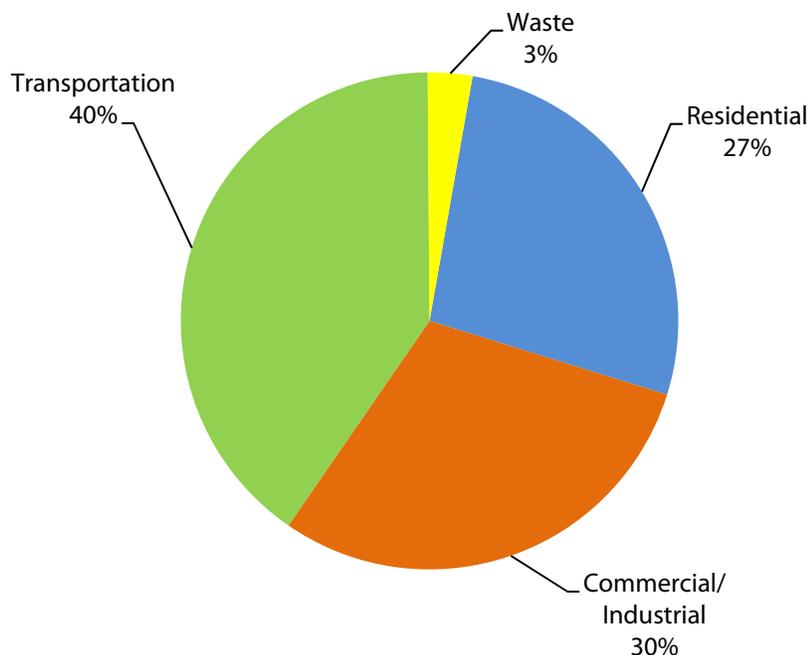
and industrial sector were the next largest contributor, accounting for 30% of the total emissions, producing approximately 282,620 MTCO₂e. The residential sector accounted for 27% of the total emissions (256,210 MTCO₂e). Emissions from solid waste comprised 3% of the total (27,410 MTCO₂e). The Community-Wide Greenhouse Gas Emissions Inventory Memo is included as **Appendix 1**.

TABLE 3-1: 2005 GREENHOUSE GAS EMISSIONS (MTCO₂E) FROM COMMUNITY-WIDE SOURCES BY SECTOR

Sector	MTCO ₂ e	Percentage of Total
Residential	256,210	27%
Commercial/Industrial	282,620	30%
Transportation	382,010	40%
Waste	27,410	3%
Total	948,250	100%

Due to rounding, totals may not equal 100%.

FIGURE 3-2: 2005 GREENHOUSE GAS EMISSIONS (MTCO₂E) FROM COMMUNITY-WIDE SOURCES BY SECTOR



In 2005, the transportation sector contributed 40% of community emissions. This sector was the largest contributor to community emissions.



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CITY OPERATIONS EMISSIONS

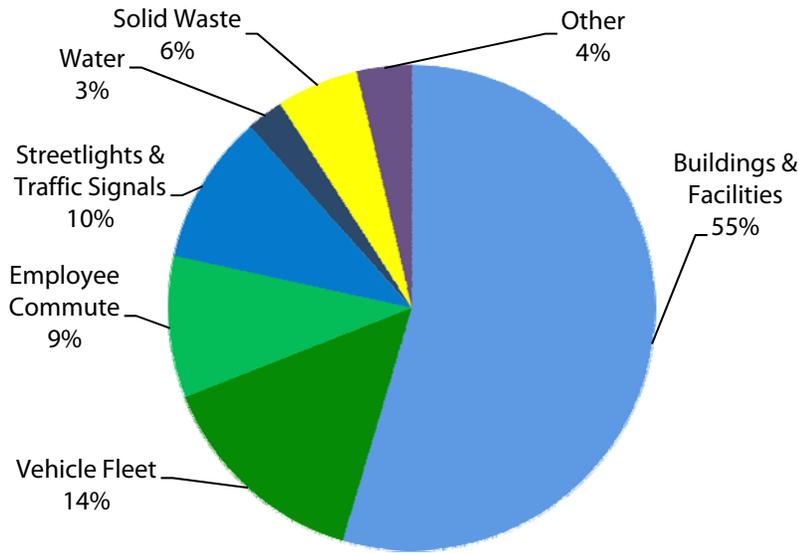
Emissions from City operations and facilities produced approximately 5,590 MTCO₂e of GHG emissions in 2005 (**Table 3-2** and **Figure 3-3**). City government emissions result from solid waste, energy consumption by water facilities, buildings, streetlights and traffic signals, other facilities, vehicle fleet fuel consumption, equipment fuel consumption for landscaping maintenance, and employee commutes. The City's buildings and facilities were the largest contributor to the City's emissions (55%), producing 3,050 MTCO₂e. The second and third largest contributors were fuel consumption from the vehicle fleet (14%) and streetlights and traffic signals (10%). Every other sector contributed individually less than 10% to City emissions, including (in order of contribution) fuel consumption from employee commutes (9%), solid waste (6%), fuel consumption from equipment (4%), and water-related energy consumption (3%). The City operations Greenhouse Gas Emissions Inventory is provided as **Appendix 2**. The Inventory does not include emissions that the City has no operational control over, including contracted police and fire services from Los Angeles County.

TABLE 3-2: 2005 GREENHOUSE GAS EMISSIONS FROM CITY OPERATIONS BY SECTOR

Sector	MTCO ₂ e	Percentage of Total
Buildings and Facilities	3,050	55%
Vehicle Fleet	800	14%
Employee Commute	530	9%
Streetlights and Traffic Signals	560	10%
Water	140	3%
Solid Waste	310	6%
Other	200	4%
Total	5,590	100%

Due to rounding, totals may not equal 100%.

FIGURE 3-3: 2005 GREENHOUSE GAS EMISSIONS (MTCO₂E) FROM CITY OPERATIONS BY SECTOR



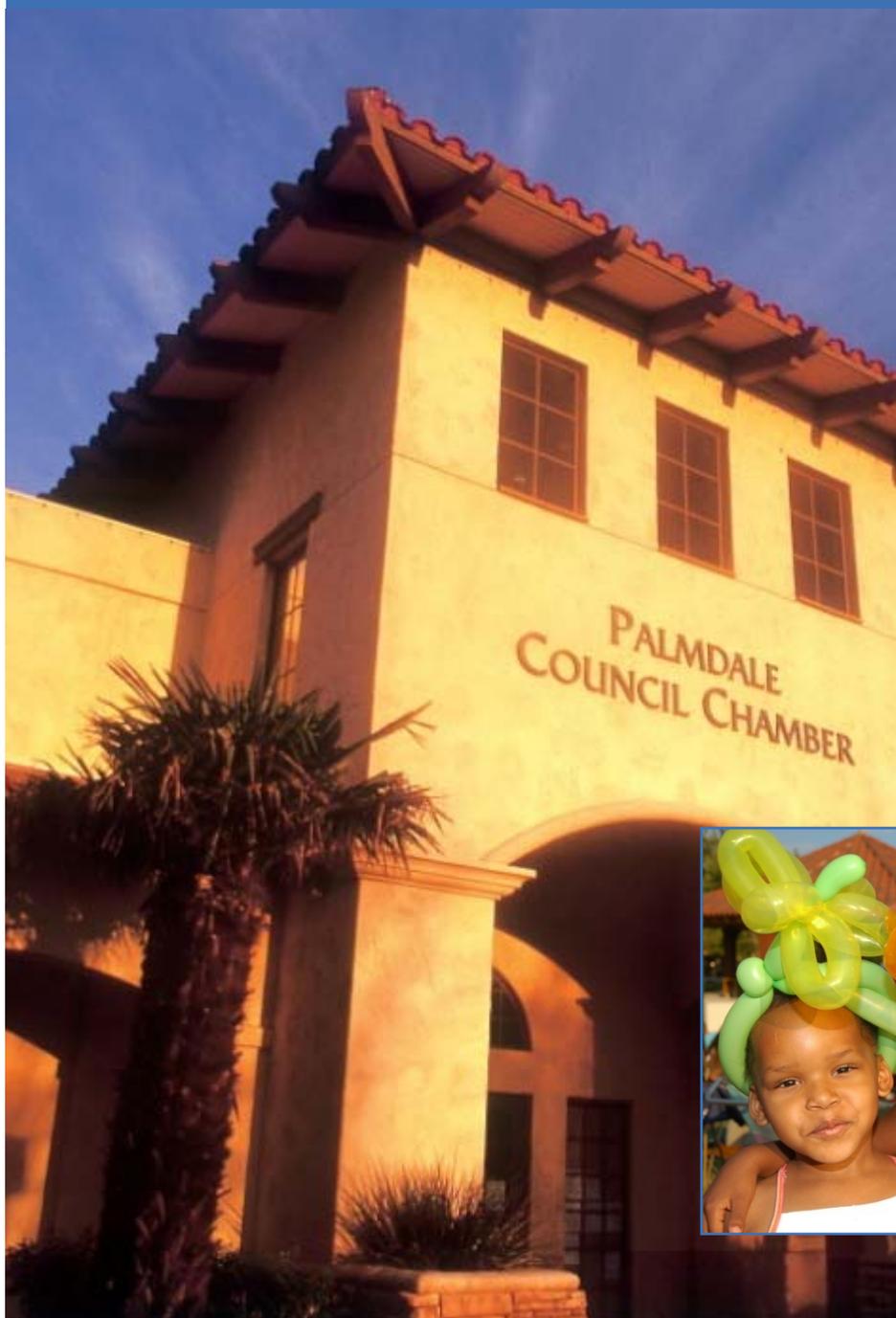
Government emissions are a subset of the total community-wide emissions. The methodology for estimating emissions from local government operations is consistent with the Local Government Operations Protocol developed by the California Air Resources Board (ARB), ICLEI, The Climate Registry, and the California Climate Action Registry (CCAR). Government operations contributed less than 1.0% of total emissions in city limits.



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The lighting and heating of public buildings and facilities contributed 55% of emissions from City operations.

GHG EMISSIONS FORECASTS AND GHG REDUCTION TARGET



CHAPTER 4

CHAPTER 4: GREENHOUSE GAS EMISSIONS FORECASTS AND REDUCTION TARGETS

Emission forecasts depict what will happen if existing trends continue unchecked by the actions established in this Energy Action Plan.

2020 AND 2035 GREENHOUSE GAS EMISSIONS FORECAST

The City modeled future emissions growth based on projected trends in energy use, driving habits, job growth, and population growth in 2020 and 2035. Forecasts allow the City to assess the effectiveness of various reduction strategies. Forecasts also provide a snapshot of how annual emissions levels will likely change under various scenarios. Forecasting is completed by adjusting baseline levels of emissions so they are consistent with future household, population, and transportation growth.

The basis for all growth scenarios is a business-as-usual (BAU) projection. A BAU projection predicts how GHG emissions will increase if consumption behavior and efficiencies do not change from baseline levels, yet population, households, and vehicle miles traveled continue to increase at a rate consistent with regional forecasts completed by the Southern California Association of Governments (SCAG). Under a BAU scenario, the City of Palmdale's emissions will grow by approximately 23% by the year 2020, from 948,258 to 1,164,395 MTCO₂e. By 2035, the City's BAU emissions are modeled to increase 50% to 1,424,679 MTCO₂e. **Table 4-1** and **Figure 4-1** show the results of the forecast.



CHAPTER 4: GREENHOUSE GAS EMISSIONS FORECASTS AND REDUCTION TARGETS

**Business-as-usual
emissions in the
city will grow by
50% by 2035 to 1.4
million MTCO₂e.**

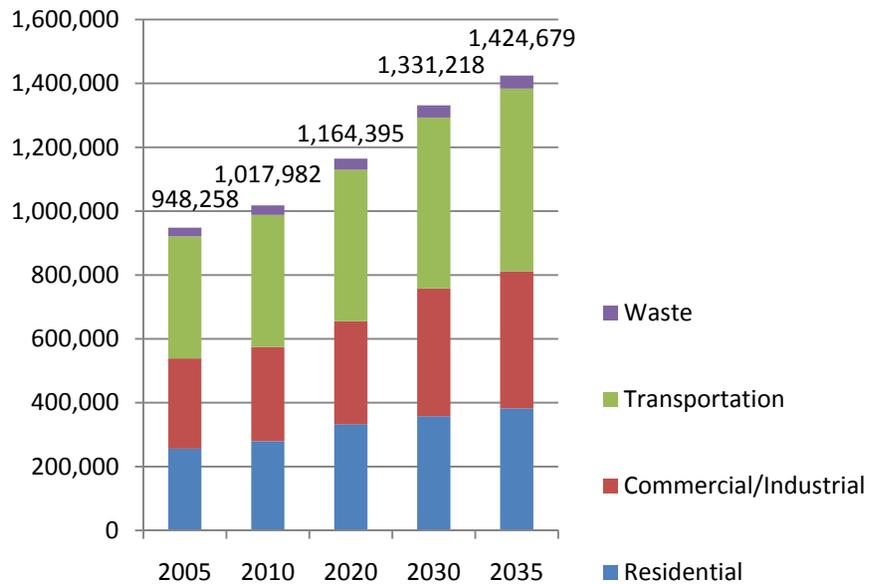


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TABLE 4-1: BUSINESS-AS-USUAL (BAU) GREENHOUSE GAS EMISSIONS FORECAST BY SECTOR – 2020 AND 2035

Sector		MTCO ₂ e	MTCO ₂ e	MTCO ₂ e
		2005	2020	2035
Residential	Electricity	141,015	183,207	210,400
	Natural Gas	115,198	149,666	171,880
Commercial/ Industrial	Electricity	204,976	233,685	311,392
	Natural Gas	77,648	88,524	117,960
Transportation	VMT	382,013	474,527	572,006
Waste	Landfilled Tons	27,408	34,786	41,039
Total		948,258	1,164,395	1,424,679
Percentage Increase from 2005		--	23%	50%

FIGURE 4-1: BUSINESS- AS-USUAL (BAU) COMMUNITY-WIDE EMISSION FORECAST BY SECTOR – 2020 AND 2035 (MTCO₂E)



The business-as-usual forecast depicted above in **Figure 4-1** excludes anticipated reductions that will occur at the statewide level, which are discussed below.

INCORPORATION OF STATE REDUCTIONS FOR ADJUSTED COMMUNITY-WIDE FORECASTS

Recognizing that local governments do not have full authority to reduce emissions in their communities, the City adjusted the business-as-usual forecast to include State-led or State-induced GHG reduction strategies included in the Assembly Bill (AB) 32 Scoping Plan. The adjusted forecast includes all State actions that are approved, programmed, and/or adopted and that do not require additional local action.

Reliance on the adjusted forecast is consistent with standard practice. The adjusted forecast provides a more accurate picture of future emissions growth and focuses the City's GHG reduction strategies toward a more accurate reduction. State-led actions that the City used to create the adjusted forecast include Assembly Bill 1493, the Low Carbon Fuel Standard, the Renewable Portfolio Standard, and Title 24.

The adjusted forecast more clearly represents the responsibility of local governments to reduce GHG emissions once state measures have been implemented. A brief description of each of these items is provided below. The impact of these actions on the BAU forecast is shown in **Table 4-2**. The methodology for quantification of business-as-usual and adjusted forecasts is provided in **Appendix 1**.



CHAPTER 4: GREENHOUSE GAS EMISSIONS FORECASTS AND REDUCTION TARGETS

With state reductions, emissions in the city limits will grow by 15% to 1,090,327 MTCO₂e by 2035.



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TABLE 4-2: TABLE COMPARISON OF BUSINESS-AS-USUAL GROWTH IN COMMUNITY-WIDE EMISSIONS WITH STATE ACTIONS (MTCO₂E)

	2005	2010	2020	2035
Growth Projection (MTCO ₂ e) (BAU Forecast)	948,258	1,017,982	1,164,395	1,424,679
Pavley I Reductions (MTCO ₂ e)	n/a	n/a	-76,156	-156,531
LCFS (MTCO ₂ e)	n/a	n/a	-39,837	-41,548
RPS Reductions (MTCO ₂ e)	n/a	-736	-36,687	-92,879
CALGreen 2008 Title 24 Reductions (MTCO ₂ e)	n/a	n/a	-14,336	-43,394
Total State Reductions (MTCO ₂ e)	n/a	-736	-167,016	-334,352
Adjusted Growth Projection (MTCO ₂ e)	n/a	1,017,246	997,379	1,090,327
Percentage Change with Adjusted Forecast from 2005	n/a	7%	5%	15%

Several state actions are accounted for in the City of Palmdale’s adjusted forecast, as described below. These State-led efforts are anticipated to decrease the BAU forecast by approximately 12% or by 167,016 MTCO₂e by 2020. By 2035, State-led efforts are expected to decrease BAU emissions by 10% or 334,352 MTCO₂e. Since these reductions will occur with or without local action, they are accounted for in the adjusted GHG forecast rather than in the GHG reductions summary. State initiatives such as funding mechanisms and loan programs are not included in state reductions. Rather, they are included within the local reductions as appropriate because of the need for or requirement for local government implementation or contribution to the effort.



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Assembly Bill 1493 (Pavley). Signed into law in 2002, AB 1493 required carmakers to reduce GHG emissions from new passenger cars and light trucks beginning in 2011. Regulations were adopted by the California Air Resources Board (ARB). It is expected that new vehicles sold in California will result in an average of 16% less GHG emissions than current models. These standards were recently adopted by the U.S. Environmental Protection Agency (EPA) and will become national standards through 2016.

Low Carbon Fuel Standard. The State is proposing to reduce the carbon intensity of transportation fuels consumed in California through a Low Carbon Fuel Standard (LCFS) being developed by ARB. Standards would reduce the carbon intensity of California's transportation fuels by at least 10% by 2020 and 20% by 2035 as called for by Governor Schwarzenegger in Executive Order S-01-07.

California Building Code, Title 24 .

Title 24 of the California Code of Regulations (CCR) mandates how each new home and business is built in California. It includes requirements for the structural, plumbing, electrical and mechanical systems of buildings, and for fire and life safety, energy conservation, green design and accessibility in and about buildings. The 2010 triennial edition Title 24 applies 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 Plan focuses on two sections of Title 24: Part 6, the California Energy Code; and Part 11, the California Green Building Standards Code or CALGreen 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.

PART 6, 2008 BUILDING ENERGY EFFICIENCY STANDARDS

The most recent update to Title 24 Part 6, the California Energy Code, went into effect on January 1, 2010 for both residential and nonresidential new construction. Part 6 also includes requirements for lighting and insulation upgrades to nonresidential buildings undergoing a major retrofit.



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PART 11, 2010 CALIFORNIA GREEN BUILDING CODE

The California Green Building Standards Code, or CALGreen, became a mandatory code beginning January 1, 2011. The Code includes minimum green building requirements requirements in the areas of planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. All local governments must adopt the minimum requirements of the CALGreen code and may elect to adopt one of the two additional tiers. Mandatory CALGreen standards do not require explicit reductions in energy consumption beyond the minimum Title 24 Part 6 standards.

The GHG forecast in this Plan incorporates the net energy and water 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 on-going triennial updates to Title 24 that will yield regular increases in the 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.

Renewable Portfolio Standard (RPS). California's Renewable Portfolio Standard (RPS) is one of the most ambitious renewable energy standards in the country, mandating that 33% of electricity delivered in California is generated by renewable sources like solar, wind and geothermal by 2020. The California RPS was first codified in 2002 by Senate Bill 1078 (requiring 20% renewable electricity mix by 2010) and further strengthened in April 2011 with the adoption of Senate Bill X 1-2 (requiring 33% renewable electricity mix by 2020).¹ The RPS intended to boost the economy and establish California as a center for the development and use of renewable energy. Only Hawaii's electricity standard of 40% renewable by 2030 trumps California renewable energy standards.



CHAPTER 4: GREENHOUSE GAS EMISSIONS FORECASTS AND REDUCTION TARGETS

Despite the 2020 goal of California's RPS, technological and political challenges may prevent some investor-owned utilities from meeting the 33% target by 2020. In 2010, the California Public Utilities Commission, the agency responsible for regulating and tracking the progress of RPS, reported that 18% of California's electricity came from renewable sources in 2010, missing the 20% goal by 2%. California utilities have more than enough renewable electricity under consideration to meet the 33% target by 2020. However, due to contract and transmission limitations, not all of this new electricity will be available in time.¹ Taking these issues into account, this document assumes a more conservative forecast of a 28% renewable mix by 2020.

MUNICIPAL FORECASTS

Numerous factors informed municipal forecasts. The City of Palmdale's 2009 10-Year Capital Improvement Plan yielded the basis for the expansion of facilities. In general, the size of municipal facilities was correlated with energy consumption and waste generation to determine rates of change. City services were expected to expand proportional to population growth, which was translated into increased emissions from the City fleet and employee commute. Emissions from the vehicle fleet account for planned fleet expansion and anticipated improvements in vehicle fuel efficiency. Emissions from water delivery and equipment are not expected to change significantly, as existing facilities and equipment are sized to meet future needs.

To illustrate municipal emissions growth for the forecast years 2020 and 2035, existing trends, planned expansions, and levels of service were taken into account to create a municipal business-as-usual forecast. Municipal forecasts and reductions are captured within the umbrella of community-wide reductions. All changes in municipal emission trends will ultimately feed into achievement of community-wide targets and will therefore be credited as community-wide progress toward reduction goals. Forecasting City emissions over time simply helps the City to better understand the impact of municipal efforts to reduce emissions.

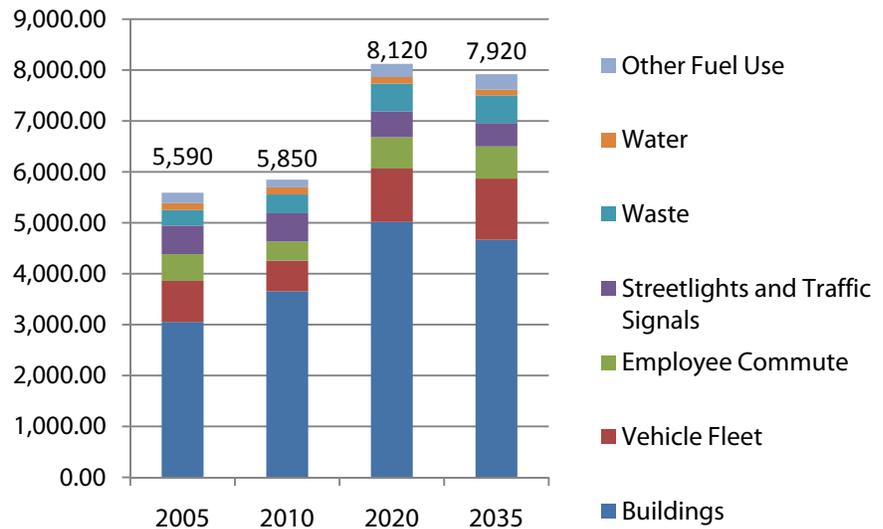
¹ California Public Utilities Commission. 2011.



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As shown in **Figure 4-2**, forecasts show emissions percentage by 2035. The majority of forecast increases in emissions result from business-as-usual growth from City buildings and facilities. The business-as-usual municipal forecast assumes the impact of reduced emissions coefficients for electricity and mobile fuel combustion for consistency with the adjusted community-wide forecast that accounts for statewide actions.

FIGURE 4-2: CITY GOVERNMENT OPERATIONS EMISSIONS FORECAST BY SECTOR – 2020 AND 2035 (MTCO₂E)



GREENHOUSE GAS EMISSIONS REDUCTION TARGET

AB 32 establishes a statewide emissions target to reduce emissions to 1990 levels by 2020. The AB 32 Scoping Plan defines the local equivalent of 1990 emissions as a 15% reduction from baseline by 2020. Executive Order S-3-05 calls for a target reduction of 80% below 1990 levels by 2050.

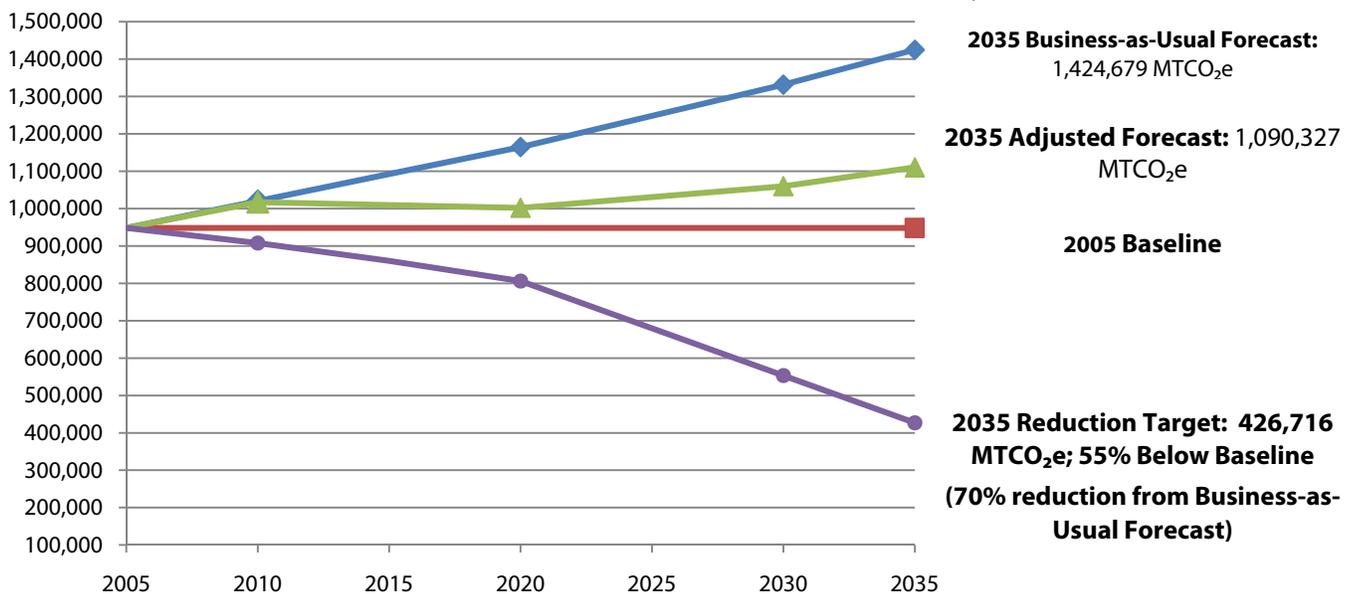
Figure 4-3 provides a comparison of the business-as-usual forecasts for 2020 and 2035 to the 2005 baseline year and reduction targets. The chart also depicts the challenge that Palmdale will face meeting its reduction target. Emissions will continue to increase along the business-as-usual scenario while reduction efforts are initiated. Achieving the target is therefore more than a 15% decrease; rather, it is an approximate 31% reduction from 2020 business-as-usual emissions levels in Palmdale. By



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2035, the gap between business-as-usual emissions growth and target reduction levels increases to 70%. Once state reductions are accounted for, the reduction necessary at the local level to achieve targets drops to approximately 20% below the adjusted business-as-usual forecast by 2020 and 61% below the adjusted business-as-usual forecast by 2035. **Figure 4-3** demonstrates projected increases and the total emissions reductions that will be necessary to achieve City targets. Reduction targets and the changes in emission levels required to achieve them are detailed further in **Table 4-3**.

FIGURE 4-3: GHG FORECAST IN RELATION TO REDUCTION TARGETS (MTCO₂E)





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TABLE 4-3: COMPARISON OF 2020 AND 2030 FORECASTS TO BASELINE AND REDUCTION TARGETS

	2020	2035
Target reduction	15%	55%
Local level needed to achieve target	806,019	426,716
Local percentage reduction from BAU forecast to achieve target	-31%	-71%
Local reduction needed from BAU forecast (MTCO ₂ e)	-358,376	-997,962
Local reduction needed from adjusted forecast (MTCO ₂ e)	-191,360	-663,611
Local percentage reduction needed from adjusted BAU	-19%	-61%
Percentage contribution of state actions to targets	-12%	-9%



CITY OPERATIONS REDUCTION GOALS AND MEASURES

CHAPTER 5



CHAPTER 5: CITY GOVERNMENT OPERATIONS REDUCTION GOALS AND MEASURES

This chapter summarizes the City’s measures to reduce GHG emissions from City operations, facilities, and activities.

SUMMARY OF MEASURES

City government (City or municipal) actions have the potential to reduce GHG emissions from City sources by 3,660 MTCO₂e by 2020. Nearly all of these planned emissions reductions will result from programs that are already funded, implemented, or otherwise initiated. The City’s municipal reductions are aggregated with community-wide measures in total reductions for credit to the City’s reduction targets in **Chapter 6**, where each goal summary reviews the relative contribution of both City government and community-wide reduction measures in achieving reduction targets. All City actions contribute toward the City’s reduction target. Municipal actions presented here include all energy-conserving programs and Energy Efficiency and Conservation Block Grant (EECBG) programs.

The City’s achievement of reduction targets is dependent on successful implementation of both City and community-wide measures. The City’s City measures contribute significant momentum toward the reduction target, but alone are not sufficient to achieve the target. This chapter presents City measures as case studies to highlight the significant opportunity for simultaneous emissions reductions, cost savings, and enhanced operational performance. All City measures are closely related to community-wide measures presented in **Chapter 6** and in some cases have provided a basis to justify community-wide measures.

Table 5-1 presents the potential City GHG emissions reductions (MTCO₂e) for 2020 and 2035 by goal and then by sector (also see **Figure 5-1** and **Figure 5-2**). **Chapter 6** provides a full summary of all goals and reductions,



CHAPTER 5: MUNICIPAL REDUCTION GOALS AND MEASURES

**The City of
Palmdale will
reduce emissions
from City
operations 20% by
2020.**



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including City reductions outlined in this Chapter. The reductions identify the importance of Palmdale’s progress to date in achieving these goals since the baseline year of 2005. Methodologies for the quantification of all reduction measures are presented in **Appendix 2**.

TABLE 5-1: CITY GOVERNMENT REDUCTIONS BY GOAL

Goal	To Date (MTCO ₂ e/yr)	2020 (MTCO ₂ e/yr)	2035 (MTCO ₂ e/yr)
Goal 1: Reduce energy demand through energy conservation and efficiency	0	-799	-739
Goal 2: Reduce water consumption for energy conservation	0	-8	-8
Goal 3: Promote renewable energy generation and use	0	-2,853	-3,214
Goal 4: Reduce transportation emissions through alternative vehicles, trip reduction and consolidation, and efficient flow*	-	-	-
Goal 5: Implement smart land use to reduce vehicular trips*	-	-	-
Goal 6: Reduce waste*	-	-	-
Goal 7: Support the “buy-local” movement*	-	-	-
Total – City Government Reductions	0	-3,660	-3,961
2005 Emissions	5,589	5,589	5,589
Adjusted Forecast with State Reductions	5,846	8,121	7,918
Net Emissions with State and Local Reductions	5,846	4,462	3,957
Percentage Change from 2005 Emissions	5%	-20%	-29%

*Reductions captured with community-wide actions in **Chapter 6**.



CHAPTER 5:
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FIGURE 5-1: 2020 CITY GOVERNMENT REDUCTIONS BY GOAL

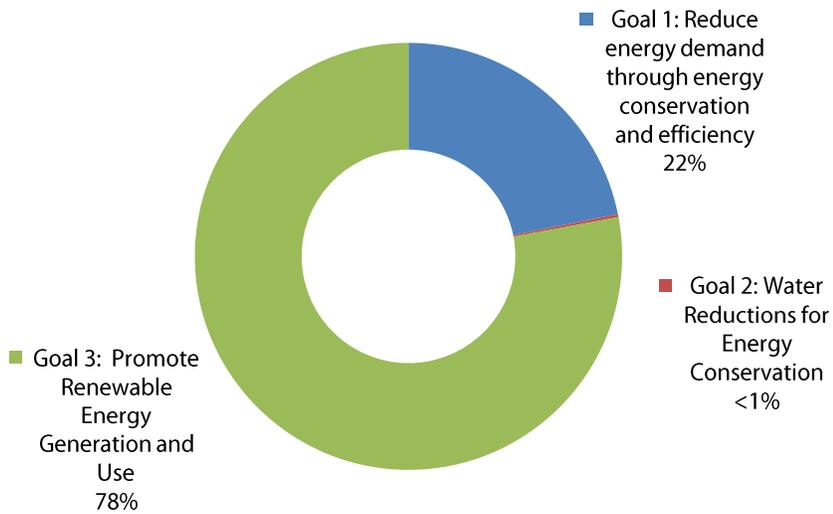
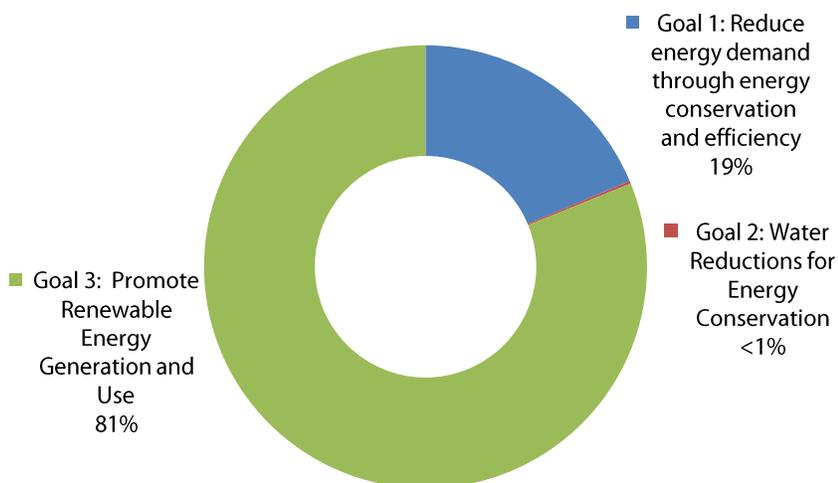


FIGURE 5-2: 2035 CITY GOVERNMENT REDUCTIONS BY GOAL





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**Measure 1.1:
Municipal Energy
Efficiency Retrofits**

**GHG Changes per Year
(MTCO₂e)**

To Date:	0
2020:	- 799
2035:	- 739

**Electricity Changes Per
Year (kWh)**

To Date:	0
2020:	- 1,508,132
2035:	- 1,508,132

**Natural Gas Changes Per
Year (Therms)**

To Date:	0
2020:	-37,112
2035:	-37,112

Why Upgrade Government Facilities?

Facilities upgrades equal cost savings. That is why the City of Palmdale investigated energy efficiency opportunities and identified possible cost savings. The City’s audit allows staff to direct resources to reduce annual energy costs and act as a fiscal steward of City resources.

Johnson Controls estimates that the City of Palmdale pays approximately \$1.172 million in annual electricity, natural gas, and water expenses. With facilities upgrades, the City is able to realize a long-term reduction in these annual utility costs.

**GOAL 1: REDUCE ENERGY DEMAND
THROUGH ENERGY CONSERVATION
AND EFFICIENCY**

MEASURE 1.1: MUNICIPAL ENERGY EFFICIENCY RETROFITS

Implement energy efficiency improvements (i.e., retrofits) in existing City buildings and facilities.

ACTIONS FOR MEASURE 1.1:

1.1.1 Implement HVAC upgrades at City Hall, Council Chambers, Library, SAVES Building, City Maintenance Yard, and Human Resources Building.

1.1.2 Complete lighting and controls upgrades to City facilities. Programmed upgrades include the Lighting Demonstration Program at the Transportation Center, Developmental Services, City Center Park, City Hall, Library, Chimbole Cultural Center, SAVES Building, City Maintenance Yard, Public Safety Building, Human Resources Building, Apollo Storage Building, Parks and Recreation Building, Palmdale Playhouse Building, Courson Park, Marie Kerr Park, Desert Sands Park, and Adams Park.

1.1.3 Install the energy-efficient roof at the Parks and Recreation Building.



CHAPTER 5: MUNICIPAL REDUCTION GOALS AND MEASURES

1.1.4 Continue and expand the City Facility Environmental Retrofit Program to assess, monitor, and prepare for additional retrofits as they become warranted.

The City of Palmdale has recognized the long-term financial benefits of energy efficiency actions. The City implements the City Facility Environmental Retrofit Program on an ongoing basis to fund improvements to existing facilities to reduce water and energy consumption, repair or replace outdated equipment, and more. In 2010, the City completed an audit of all City facilities to better understand opportunities to reduce electricity, natural gas, and water consumption and achieve cost savings. Combined, all energy-efficient actions offer the City the opportunity to reduce annual utility bills by \$312,931 and achieve an additional \$20,596 in annual operational savings.

The City of Palmdale has voluntarily initiated proactive energy-saving measures in government facilities to reduce energy costs.

- Programmable thermostats set at 55 degrees in the winter and 80 degrees in the summer
- Investing Energy Efficiency and Conservation Block Grant funds into lighting, roofing, and heating and air conditioning retrofits for reduced electricity consumption and long-term cost savings



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Measure 1.2:

Voluntary Energy Reductions in Municipal New Buildings

Supportive Measure

MEASURE 1.2 VOLUNTARY ENERGY REDUCTIONS IN NEW BUILDINGS

Exceed Title 24 energy efficiency standards in new City facilities as feasible.

ACTIONS FOR MEASURE 1.2:

1.2.1 Create guidelines to encourage new facilities to exceed Title 24 energy efficiency standards.

The City anticipates that achieving cost-saving energy efficiency in new facilities will become more feasible in coming years. City staff will continue to investigate and identify all options for cost-effective energy efficiency that contribute to reduce project construction costs and to ongoing operational cost savings. To encourage the investigation of cost-saving opportunities in new facilities, City staff will consolidate a checklist of considerations and resources. This checklist will guide future decision-making and model a flexible approach for investigating energy efficiency opportunities that can be replicated in the private sector.

GOAL 2: REDUCE WATER CONSUMPTION FOR ENERGY CONSERVATION

MEASURE 2.1: MUNICIPAL WATER CONSERVATION

Reduce municipal water consumption.

ACTIONS FOR MEASURE 2.1:

- 2.1.1** Implement turf removal plans for municipal facilities and City Landscape Maintenance Districts.
- 2.1.2** Expand installation of low-flow urinals at City facilities as funds become available.
- 2.1.3** Implement plans to use recycled water at public parks.
- 2.1.4** Expand the use of recycled water at municipal facilities.

Water reductions reduce City utility costs. The City is implementing an ambitious water reduction program that demonstrates the financial benefits of water conservation.

The City of Palmdale is a certified Water Sense Partner with the U.S. Environmental Protection Agency (EPA). The City is a proactive water-conservation leader and has been recognized and rewarded for its numerous incentives. Through an Antelope Valley partnership, the City and its partners jointly received \$713,833 to fund water efficiency projects and implement community-wide water educational programs. A selection of the City’s achievements includes the following:

- Installation of 15 high-efficiency urinals at all City administrative buildings, public libraries, City Theater, and Parks and Recreation Building.
- Turf removal around the administrative complex and from most of the 1.3 million square feet of nonessential turf in City Landscape Maintenance Districts.



CHAPTER 5: MUNICIPAL REDUCTION GOALS AND MEASURES

Measure 2.1:

Municipal Water Conservation

GHG Changes per Year (MTCO₂e)

To Date:	0*
2020:	-8
2035:	-8

Water Changes Per Year (Gallons)

To Date:	0*
2020:	-3,843,032
2035:	-3,843,032

Electricity Changes Per Year (kWh)

To Date:	0
2020:	-42,273
2035:	-42,273

**Although the City has significantly reduced municipal water consumption, most reductions are accounted for in business-as-usual practices. A lack of data for reductions since the baseline year of 2005 prevents accounting for reductions beyond business-as-usual forecasts.*



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- Installation of water-efficient irrigation systems, including Rain Bird Maxicom Central Irrigation Control for Landscape Maintenance Districts, City Capital Improvement Projects, and existing parks.
- Engineering standards now require ET-based controllers for all new irrigation systems, specify point source irrigation systems for City projects whenever possible to prevent overspray, and include drip and subterranean irrigation systems for front yards and commercial and industrial development.
- All City Certified Water Auditors are also professional EPA Water Sense Partners. All Maintenance Department employees who repair irrigation systems have participated in the Rain Bird Irrigation Training Camp and now utilize best management practices.
- Palmdale is a Weather Reach signal provider for the Rain Bird ET Manager at no cost to citizens or commercial users. This service initiated March 15, 2008, and was opened for public access on August 26, 2008.



*ET Irrigation Weather Station
at a City Park*

In 2008, the City found that water-conserving actions resulted in a 20% drop in municipal water consumption and \$235,626 in savings for the City's General Fund.

A City audit identified an opportunity to reduce \$26,408 in annual water utility costs by implementing additional turf removal and plumbing fixture projects.

GOAL 3: PROMOTE RENEWABLE ENERGY GENERATION AND USE

MEASURE 3.1: RENEWABLE ENERGY FOR MUNICIPAL FACILITIES

Demonstrate City leadership in renewable energy by supplying 100% of City energy needs with renewable sources by 2035.

ACTIONS FOR MEASURE 3.1:

3.1.1 Implement plans to procure renewable energy for City operations through on-site solar infrastructure or a Power Purchase Agreement.

The City is moving forward with plans to meet 100% of City government energy needs with renewable sources by 2035, achieving 80% by 2020.. The City will achieve this either with on-site solar systems or through a Power Purchase Agreement (PPA) that will allow the City to retain green energy credits from a solar energy provider.

The geographic setting and weather patterns in Palmdale provide ample opportunity for solar energy. The City will lead by example through pilot projects and cost-saving lessons that can be replicated in the community. These projects will save the City costs on energy bills and demonstrate feasible and profitable renewable energy technologies to the community. Through this measure, the City intends to spur the local solar industry and strengthen Palmdale’s position as a regional renewable energy leader.

Staff will continue to investigate cost-effective options to generate renewable energy at City facilities and disseminate lessons learned in support of private endeavors throughout the community.



CHAPTER 5: MUNICIPAL REDUCTION GOALS AND MEASURES

Measure 3.1: Renewable Energy for Municipal Facilities

GHG Changes per Year (MTCO₂e)

To Date:	0
2020:	-2,853
2035:	-3,214

Electricity Changes Per Year (kWh)

To Date:	0
2020:	-7,164,310
2035:	-8,955,387



The City of Palmdale is committed to meeting City government energy needs with solar and other renewable sources.



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Measure 4.1:
Reductions
inMunicipal
Commute VMT
Supportive Measure

The City of Palmdale
Public Works
Department is the
recipient of multiple
awards from the
Antelope Valley Air
Quality
Management for its
fleet, including
Achievement in
Reducing Emissions
(AIRE) Awards and
the Use of
Alternative Fuel
Vehicles Award.

GOAL 4: REDUCE TRANSPORTATION EMISSIONS THROUGH ALTERNATIVE VEHICLES, TRIP REDUCTION AND CONSOLIDATION, AND EFFICIENT FLOW

MEASURE 4.1: REDUCTIONS IN MUNICIPAL COMMUTE VMT

Continue to promote ride sharing and transportation demand management (TDM) programs to reduce use of traditional motor vehicles for work commutes.

ACTIONS FOR MEASURE 4.1:

- 4.1.1** Encourage City staff to participate in alternative commute programs.
- 4.1.2** Continue to implement a 4/10 work schedule.
- 4.1.3** Provide bicycle parking facilities at all City facilities.
- 4.1.4** Provide bicycle support facilities (e.g., changing rooms, showers, lockers) at new City facilities.
- 4.1.5** Offer the City's Development Services Building Conference Room as a teleconferencing facility for City and public use.

The City will leverage existing commuting programs and facilities to support and expand alternative modes of commuting. For instance, the City's 4/10 work schedule reduces work commutes. All City staff complete a full-time workweek in four 10-hour workdays, and in comparison to a traditional work schedule, each employee has one less day of commuting to work per week.

The City has also partnered with SCAG to provide a regional teleconferencing center at the City Development Services Building that will support reduced work commuting in the region. This facility will allow staff and community members at large to participate remotely in regional meetings while reducing travel costs. The impact of the City's efforts to reduce employee commutes is captured with related community-wide efforts in **Chapter 6**.



CHAPTER 5:
MUNICIPAL
REDUCTION GOALS
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Measure 4.2:

**Low Emissions
Fleet**

Supportive Measure

MEASURE 4.2: LOW EMISSIONS FLEET

Employ low emissions vehicles for City operations where practicable.

ACTIONS FOR MEASURE 4.2:

4.2.1 Install electric vehicle charging stations in new municipal facilities, as feasible.

4.2.2 Maintain the existing CNG fleet.

4.2.3 Continue to investigate options for expanding the CNG vehicular fleet through lease or purchase options.

The City's fleet includes three alternative fuel vehicles that are powered by compressed natural gas (CNG): one light-duty Library truck and two heavy-duty Public Works trucks. CNG is a cleaner-burning fuel than traditional gasoline or diesel. While CNG fuel consumption represented 4% of all fleet fuel use, CNG fuel only contributed 0.5% of total fleet emissions. The impact of the City's CNG vehicles is captured in the City's business-as-usual forecast. The City will continue to explore options to expand the CNG fleet as feasible options become available. The City will also leverage partnerships with Southern California Edison to support the deployment of an electric vehicle infrastructure. A supply of dispersed charging facilities dispersed throughout the City will expand the City's options to purchase electric or hybrid vehicles. Reductions in GHG emissions resulting from clean vehicles are captured with community-wide actions in **Chapter 6**.

The City's CNG Fleet = Cost Savings

\$2.14/ gallon for CNG vs. \$2.607/gallon for diesel and
\$2.725/gallon for gasoline (2009 average costs in California)

LNG and CNG fuels are primarily produced domestically in North
America, and emit less GHGs than traditional fuels

Clean Energy Fuels Corp. 2009; U.S. Energy Information Administration 2010



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GOAL 5: IMPLEMENT SMART LAND USE TO REDUCE VEHICULAR TRIPS

The City is working to establish land use patterns throughout the community that encourage walking, bicycling, and the use of alternative transportation to reduce transportation emissions. These actions are strategies that the City is implementing in the community at large through policies, development standards, and programs that are discussed in **Chapter 6**. These are actions that will affect the lifestyles and patterns of the City of Palmdale's employees, but the impact of these actions is quantified with general community-wide benefits in measures provided for Goal 5 in **Chapter 6**.



*In **Chapter 6** this Plan presents strategies to promote accessible mixed-uses that reduce the need to drive.*

GOAL 6: REDUCE WASTE

MEASURE 6.1: MUNICIPAL ENVIRONMENTALLY PREFERABLE PROCUREMENT PROGRAM

Implement the City's Environmentally Preferable Procurement Program.

ACTIONS FOR MEASURE 6.1:

6.1.1 Encourage resource conservation and waste reduction through the City's Environmentally Preferable Procurement Program.

6.1.2 Establish an Environmental Coordinator to lead the Environmental Purchasing Task Force.

The City of Palmdale is working to achieve reductions in municipal solid waste. In 2009, the City adopted an Environmentally Preferable Procurement (EPP) Program to establish a framework for conserving resources and maximizing recyclability. The EPP program encourages the adoption of guidelines and procedures to encourage the continued implementation of these goals, including procurement of products that widely recognized authorities have certified, including Energy Star, Green Seal, and the EPA Eco Purchasing Guidelines, when practicable. The EPP program also establishes goals of replacing disposable products with reusable or recyclable items, accounting for life cycle costs and benefits, and evaluating the environmental performance of vendors in providing products and services. The EPP program also covers municipal practices addressed elsewhere in this chapter, including energy- and water-saving equipment, waste minimization, and landscaping practices.

Implementation of this measure includes establishment of an EPP Task Force, as established by Section 6.0 of the EPP program. The task force will be composed of representatives from each department that will meet at least six times a year to discuss lessons, prioritize goals and objectives, recommend practices, and create annual reports that facilitate effective implementation of the EPP program while ensuring the highest level of performance for City staff.



CHAPTER 5: MUNICIPAL REDUCTION GOALS AND MEASURES

Measure 6.1: Municipal EPP Program

Supportive Measure

With other Antelope Valley partners, the City received the 2005 Best Environmental Project award for the Antelope Valley Environmental Collection Center.



Tire-derived mulch at the Marie Kerr Park Walking Trail

COMMUNITY-WIDE GOALS AND REDUCTION MEASURES



CHAPTER 6



CHAPTER 6: COMMUNITY-WIDE GOALS AND REDUCTION MEASURES

This chapter summarizes the Energy Action Plan’s measures to reduce GHG emissions from community-wide sources within city boundaries.

SUMMARY OF MEASURES

ATTAINMENT OF REDUCTION TARGETS

The community-wide measures have the potential to reduce GHG emissions by 192,213 MTCO₂e by 2020. These reductions are equivalent to a 15% change from 2005 baseline levels (refer to **Figures 6-1** and **6-2**). By 2035, the City of Palmdale will achieve a reduction of 329,535 MTCO₂e, or a 23% reduction from 2005 levels.

Local implementation of all proposed measures and State-mandated efforts will allow the City to achieve its reduction target of 15% below baseline levels by 2020. The City’s 2020 target is consistent with the State’s Global Warming Solutions Act (AB 32). Therefore, implementation of the goals and measures in the Palmdale Energy Action Plan (Plan) will place the City on a trajectory to be consistent with the State’s recommended goal for local governments.

The City’s 2035 reduction achievement of 20% from 2005 levels follows a trajectory toward the State’s 2050 reduction target of 80% below 1990 levels by 2020. However, it is likely that the City’s actual 2035 reduction achievement will be much greater due to the evolution of technical innovation, regulatory change, and the impacts of climate change through the next decade. For example, the State is expected to increase the standards of the Renewable Portfolio Standard (RPS), Assembly Bill (AB) 1493, and Low Carbon Fuel Standard (LCFS) after 2020.



CHAPTER 6: COMMUNITY-WIDE REDUCTION GOALS AND MEASURES

Measures in the Energy Action Plan achieve a 15% reduction from 2005 baseline emissions levels and achieve the City’s reduction target and consistency with the State’s Global Warming Solutions Act (AB 32).



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**Measures in this Plan
achieve a 15%
reduction from 2005
baseline levels by
2020.**

TABLE 6-1: COMMUNITY REDUCTIONS BY GOAL

Goal	To Date (MTCO ₂ e/yr)	2020 (MTCO ₂ e/yr)	2035 (MTCO ₂ e/yr)
Goal 1: Reduce energy demand through energy conservation and efficiency.	0	-57,696	-127,212
Goal 2: Reduce water consumption for energy conservation.	0	-1,749	-2,446
Goal 3: Promote renewable energy generation and use.	-2,427	-72,515	-113,133
Goal 4: Reduce transportation emissions through alternative vehicles, trip reduction and consolidation, and efficient flow.	-1,541	-13,239	-19,994
Goal 5: Implement smart land use to reduce vehicular trips.	-24,865	-26,011	-36,608
Goal 6: Reduce waste.	-8,279	-18,606	-26,723
Goal 7: Support the “buy-local” movement.	0	-2,397	-3,419
Total – Local Reductions	-37,113	-192,213	-329,535
2005 Emissions	948,258	948,258	948,258
Adjusted Forecast with State Reductions	1,017,246	997,379	1,090,327
Target Emissions Level	907,618	806,019	426,716
Net Emissions with State and Local Reductions	980,133	805,166	760,792
Percentage Change from 2005 Emissions	3%	-15%	-20%

Due to rounding, subtotals and totals may not equal the sum of component parts shown in this table.



CHAPTER 6:
COMMUNITY-WIDE
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Figures 6-1 and 6-2 present the potential GHG emissions reductions (MTCO₂e) for 2020 and 2035 by goal. Figures 6-3 and 6-4 and Table 6-2 display the proportion of 2020 and 2035 GHG reductions from each sector. The tables and figures also identify Palmdale’s progress in achieving these goals since the baseline year of 2005. Goal topics and measures are summarized in detail later in this chapter. Methodologies for the quantification of all reduction measures are presented in Appendix 3.

FIGURE 6-1: 2020 REDUCTIONS BY GOAL

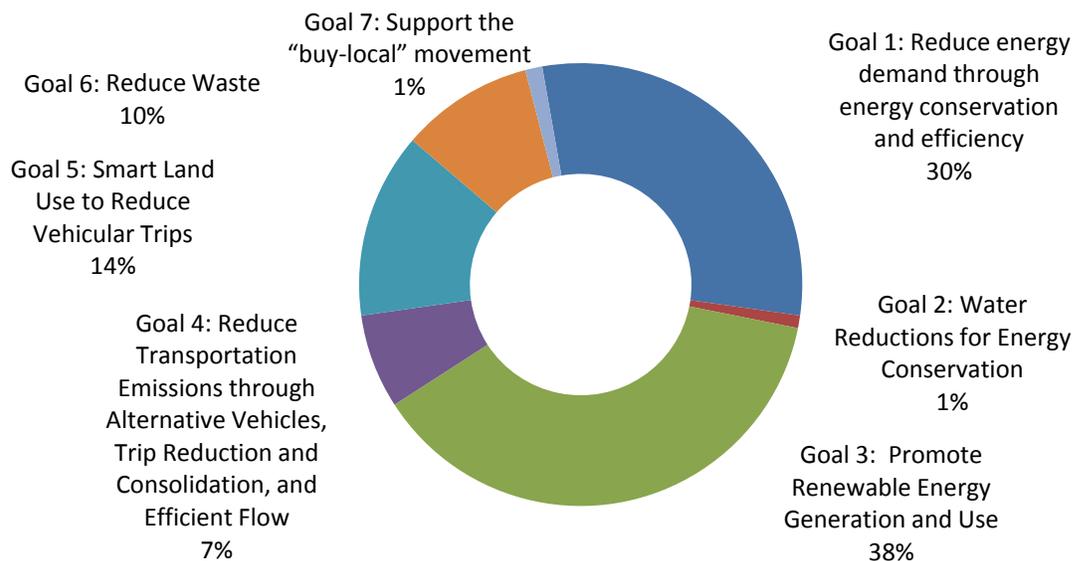
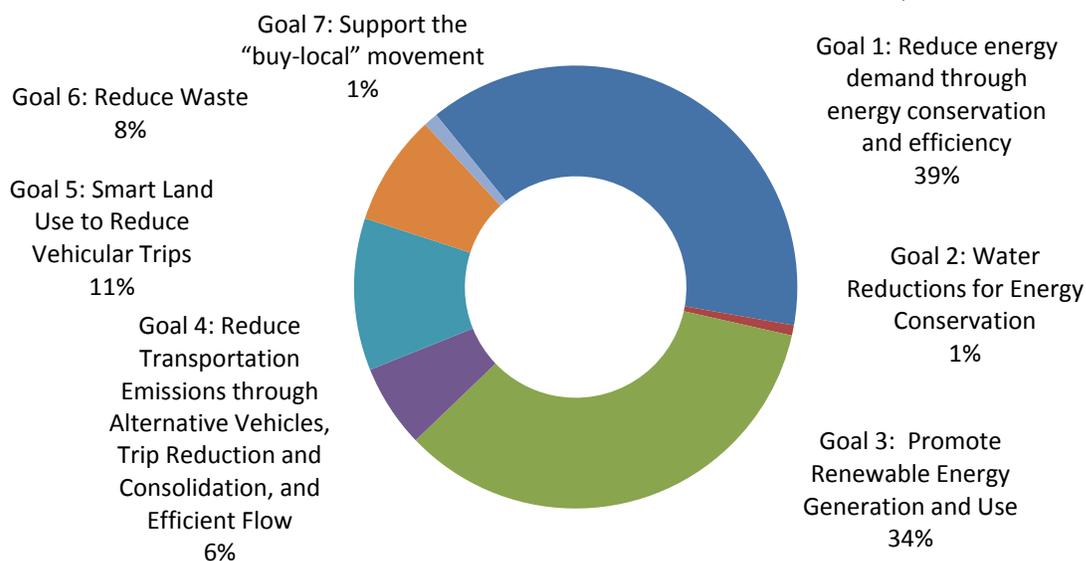


FIGURE 6-2: 2035 REDUCTIONS BY GOAL





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TABLE 6-2: COMMUNITY REDUCTIONS BY SECTOR

Sector	2010 GHG Reductions (MTCO ₂ e/yr)	2020 GHG Reductions (MTCO ₂ e/yr)	2035 GHG Reductions (MTCO ₂ e/yr)
Residential	-317	-49,296	-100,528
Commercial	-2,110	-80,915	-139,817
Transportation	-26,407	-41,647	-60,020
Waste	-8,279	-18,606	-26,723
Water	0	-1,749	-2,446
Total Reductions	-37,113	-192,213	-329,535

Due to rounding, subtotals and totals may not equal the sum of component parts shown in this table.

FIGURE 6-3: 2020 REDUCTIONS BY SECTOR

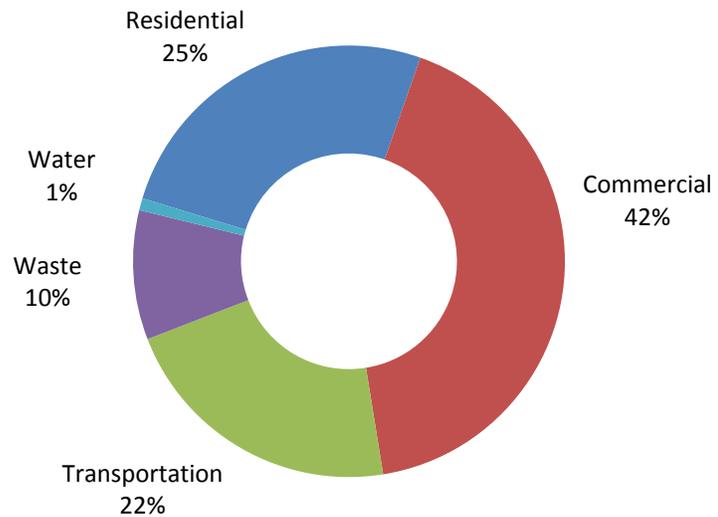
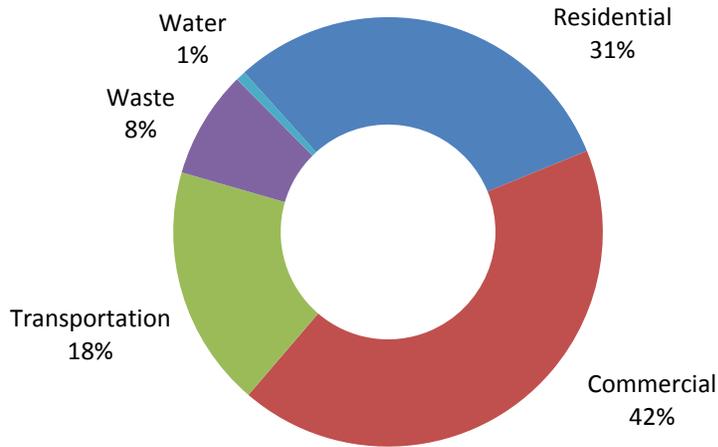


FIGURE 6-4: 2035 REDUCTIONS BY SECTOR



CHAPTER 6:
COMMUNITY-WIDE
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What is the difference between a goal and a sector?

Goals are aggregate groups of Palmdale’s measures that correspond to policy intent and the type of activity affected. Goals are simply a way to present and communicate emissions reduction measures clearly.

Sectors refer to the source or activity that creates GHG emissions, regardless of the policy topic it falls under. These correspond to the sectors of the City’s GHG Inventory. Sectors are more universal and demonstrate the types of emissions-generating activities that are being affected through this Plan. For instance, commercial, residential, waste, and transportation are common sectors.



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GOAL 1: REDUCE ENERGY DEMAND THROUGH ENERGY CONSERVATION AND EFFICIENCY

Electricity and natural gas consumption supports businesses, industrial facilities, and homes. Residents use natural gas to heat water and fuel natural gas cooking ranges. Industrial and commercial enterprises use natural gas for water heating in addition to on-site fuel combustion that supports manufacturing and industrial processes. Electricity powers appliances that are the cornerstones of daily life, from personal appliances to citywide infrastructure such as traffic signals. Greater efficiencies in existing levels of energy consumption can be realized while still supporting the needs of existing and future communities. This outcome will reduce both GHG emissions and the cost of energy bills for Palmdale's residents and businesses.

The following measures target efficiencies in electricity and natural gas use in homes and nonresidential uses to reduce emissions. Total reductions include City government measures discussed in **Chapter 5**, which are credited to the City's reduction target.



CHAPTER 6:
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FIGURE 6-5: 2020 GOAL 1 REDUCTIONS BY MEASURE

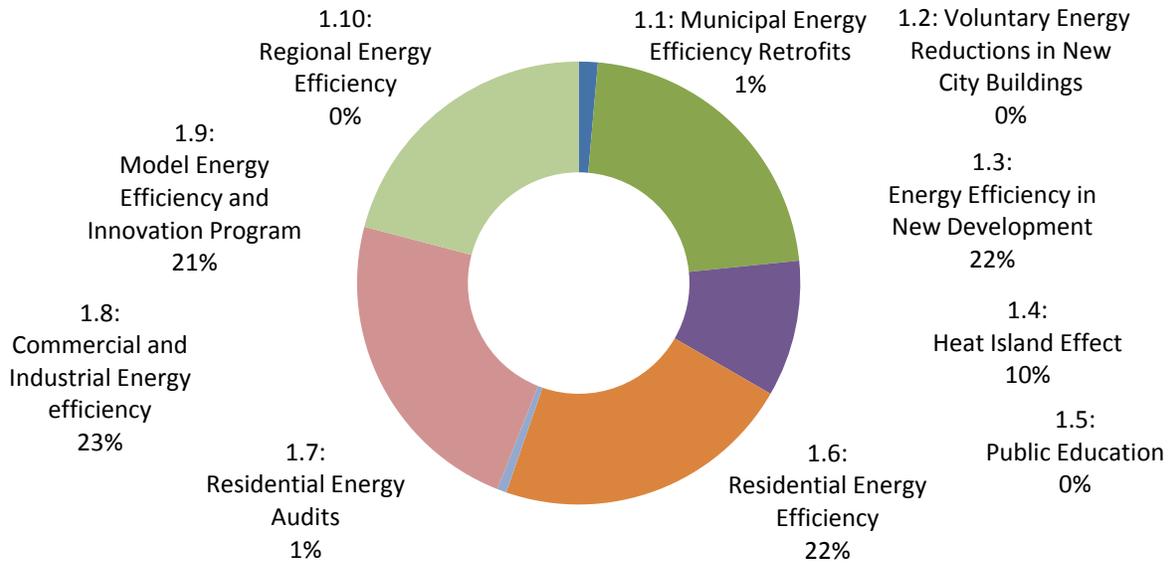
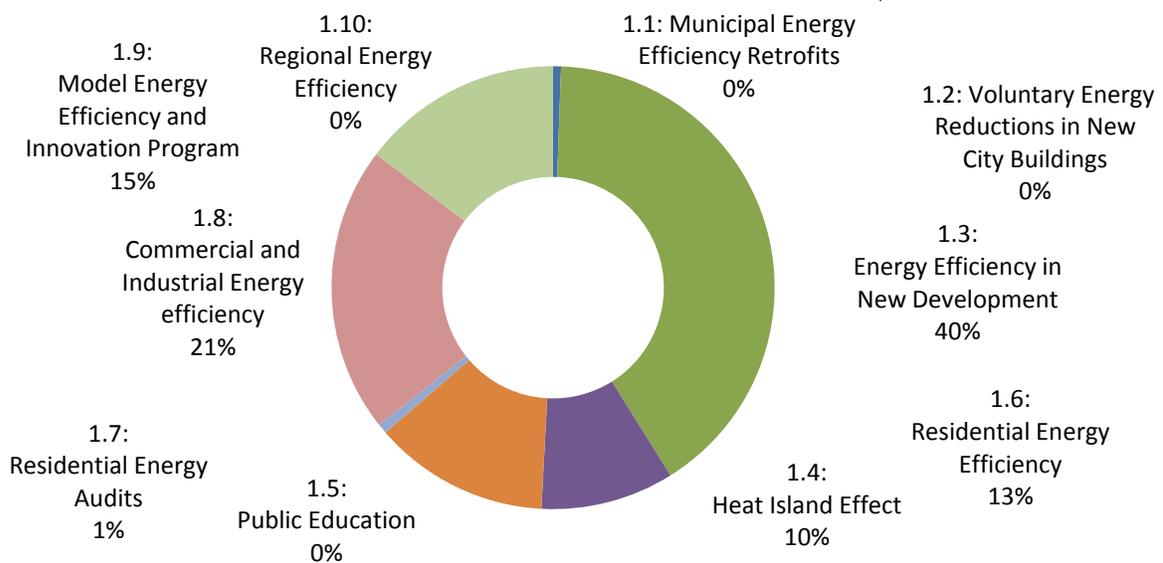


FIGURE 6-6: 2035 GOAL 1 REDUCTIONS BY MEASURE





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Measure 1.3: Energy Efficiency in New Development

GHG Changes per Year (MTCO₂e)

To Date:	0
2020:	-12,694
2035:	-51,553

Electricity Changes per Year (kWh)

To Date:	0
2020:	-3,030,300
2035:	-5,200,300

Natural Gas Changes per Year (Therms)

To Date:	0
2020:	-56,600
2035:	-109,400

MEASURE 1.3: ENERGY EFFICIENCY IN NEW DEVELOPMENT

Encourage new development to exceed Title 24 energy use requirements by 15%.

ACTIONS FOR MEASURE 1.3:

1.3.1 Implement the minimum Title 24 standards for energy efficiency. (Quantified in forecast)

1.3.2 Encourage new construction, remodels over 50%, and tenant improvements to exceed Title 24 energy use requirements by 15%.

1.3.3 Support Southern California Edison as it installs the smart grid.

This measure supports voluntary energy reductions in new development, encouraging new development to exceed Title 24 energy use requirements by 15%. Energy efficiency creates operational savings that offset initial premiums in building costs. This measure is also supported by the statewide “smart grid” deployment in the city. Southern California Edison (Edison) is implementing smart grid initiatives through SmartConnect, a \$1.6 billion upgrade program. The program consists of the installation of new smart meters for all Edison accounts. These upgrades are part of a statewide shift to update and enhance the statewide infrastructure necessary to support efficient and renewable energy consumption and maintain target service levels. At an individual scale, users will be able to use smart meters to monitor electricity consumption in real time and to better understand the relationship between electricity usage and costs. Smart meters will also allow Southern California Edison and the City to more effectively manage and target electricity trends for peak and off-peak demand scenarios.

Edison will complete installation smart meters in the City of Palmdale by September 2011. The costs of installation will be recovered by Edison through an estimated 2% increase in customer rates during the installation time frame, which will be incorporated in the overall electricity rate. Edison anticipates that customers can offset this cost by actively participating in new smart meter programs and services designed to help save energy and money once the new technology is installed.



CHAPTER 6:
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MEASURE 1.4: HEAT ISLAND EFFECT

Reduce the urban heat island effect to cool the local climate and reduce energy consumption by increased shading on private property, high albedo surfaces in sidewalks and parking lots, and cool surfaces.

ACTIONS FOR MEASURE 1.4:

1.4.1 Implement passive orientation and design standards from the Community Design Element.

1.4.2 Update the City’s design guidelines for single family residential uses (Section 41.09.H of the Zoning Ordinance) to ensure effective shading of the east and south sides of structures, where permissible.

1.4.3 Require the use of high “albedo” material for new outdoor parking lots, medians, and sidewalks.

This measure relies on a multifaceted approach to reduce the urban heat island effect through increased tree plantings appropriate to the high desert climate, building orientation, and the use of cooler surfaces. The energy and greenhouse gas benefits of this measure result from increased shading on buildings and pavements. Increased shading causes lower urban temperatures, thus reducing the urban heat island effect. Co-benefits of this measure include carbon sequestration, extended life of paved surfaces, improved water quality from trapping runoff, increased traffic safety, aesthetic improvements, increased real estate values, and increased sociological benefits

The urban environment is characterized by an abundance of paved material that is often dark-colored and absorbs heat, increasing temperatures and fostering the urban heat island effect. Pavements and roofs typically constitute over 60% of urban surfaces. Increasing the reflectivity of these surfaces, the albedo, can reduce summertime temperatures, resulting in better air quality and savings from reduced air-conditioning costs. To maximize albedo, lighter-colored aggregate can be used in the pavement mix. Alternatively, asphalt pavements can be covered with high-albedo sealcoats, small rocks set in binder, or a thin layer of concrete.

**Measure 1.4:
Heat Island Effect**

**GHG Changes per Year
(MTCO₂e)**

To Date:	0
2020:	-5,742
2035:	-12,376

**Electricity Changes per
Year (kWh)**

To Date:	0
2020:	-14,323,400
2035:	-33,481,600



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Measure 1.5:
Public Education
Supportive Measure

MEASURE 1.5: PUBLIC EDUCATION

Use City capital improvements and programs to educate the public and promote energy conservation.

ACTIONS FOR MEASURE 1.5:

1.5.1 Continue to educate the public about energy efficiency programs and opportunities through such initiatives as the City-created Conserve Palmdale public TV program on Channel 27.

1.5.2 Use interns to track progress and refine strategies.

1.5.3 Utilize the Palmdale Hybrid Power Plant as a case study to promote innovative closed-loop industrial energy processes. (Quantified in Renewable Portfolio Standard forecast)

1.5.4 Promote changes in household energy behavior through the City's website and other social networks.

This supportive measure captures the City's active community outreach and educational programs. The City models energy efficiency practices while involving the public at large through ambitious educational outreach. The City will continue to demonstrate energy efficient technologies and opportunities through creative outreach that involves all kinds of residents and workers in Palmdale.

The City already has developed a wide following through its website and public television episodes. The City achieved a large website following by inviting residents to submit photos of Palmdale for display on the City's website. Conserve Palmdale is the City-created public TV program that airs on Channel 27. Staff from multiple departments participated in the creation of multiple episodes that educate residents on a range of topics from oil recycling to local options for commute programs. Staff will use this resource to promote the energy efficiency actions outlined in this Plan. The City will expand its outreach to include regular interactive messaging through such social mediums as the City's website and Facebook.

The City has an annual summer intern program for local high school students. The City will use these and other interns to continue to track and

modify energy efficiency measures outlined in this Plan and to refine education strategies and facilitate achievement of the energy efficiency reductions outlined in this Plan.

This measure also calls for the City to expand its outreach efforts and use municipal projects to promote the benefits of energy efficiency. The City will integrate lessons learned into its social media-based outreach and education initiatives to further promote energy reductions.



Conserve Palmdale show logo



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Measure 1.6: Residential Energy Efficiency

GHG Changes per Year (MTCO₂e)

To Date:	0
2020:	-12,668
2035:	-16,306

Electricity Changes per Year (kWh)

To Date:	0
2020:	-17,536,000
2035:	-26,802,000

Natural Gas Changes per Year (Therms)

To Date:	0
2020:	-1,023,000
2035:	-1,093,000

Households Participating in Energy Efficiency Retrofits

To Date:	0
2020:	14,000
2035:	20,000

MEASURE 1.6: RESIDENTIAL ENERGY EFFICIENCY

Promote energy efficiency improvements in the city's housing stock.

ACTIONS FOR MEASURE 1.6:

1.6.1 Support implementation of Energy Upgrade California in Los Angeles County to achieve energy efficiency in the residential housing stock.

1.6.2 Leverage AB 811 funds from the Energy Efficiency and Conservation Block Grant Program to promote Energy Upgrade California in Los Angeles County.

1.6.3 Support Southern California Edison as it installs the smart grid in existing development.

1.6.4 Promote energy-efficient alternative house cooling.

Existing, older buildings are often a major contributor to a city's greenhouse gas emissions, especially for buildings built before California's Building Code became more stringent in the early 1990s. As houses age, their appliances, water heaters, HVAC units, windows, and insulation often become outdated or decrease in efficiency.

Numerous programs are offered by local utility providers, regional partnerships, and the City of Palmdale. The County of Los Angeles is developing the Los Angeles County Energy Program, as part of the statewide Energy Upgrade California Whole House Program, that aims to consolidate overlapping energy efficiency efforts to provide a single, one-stop resource for energy efficiency information, opportunities, and financing. The program will leverage grant funds the State of California received from the American Recovery and Reinvestment Act (ARRA) to provide additional incentives and benefits for program participants. The City of Palmdale is working with Los Angeles County to develop the regional program structure. The program is designed to enable local governments to develop a localized approach to energy efficiency while benefitting from the economies of scale that result from regional management of the program. Local governments will also benefit from the efficiencies of coordinated program outreach, incentives, and a simplified contractor and participant qualification process in conjunction with federal, state, and utility providers.

This measure also looks at the energy-saving benefits that will be realized through Edison’s implementation of the SmartConnect project, which includes the installation of smart meters at all existing properties by 2011. Through smart meters, customers will be able to participate in new services designed to help save energy and money. The program also allows Southern California Edison and the City to more effectively manage and target electricity trends.



CHAPTER 6: COMMUNITY-WIDE REDUCTION GOALS AND MEASURES



City promotes the Energy Upgrade California Program on a trash truck



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Measure 1.7: Residential Energy Audits

GHG Changes per Year (MTCO₂e)

To Date:	0
2020:	-397
2035:	-916

Electricity Changes per Year (kWh)

To Date:	0
2020:	-996,600
2035:	-2,491,400

Natural Gas Changes per Year (Therms)

To Date:	0
2020:	0
2035:	0

MEASURE 1.7: RESIDENTIAL ENERGY AUDITS

Facilitate comprehensive home energy retrofits.

ACTIONS FOR MEASURE 1.7:

1.7.1 Promote voluntary appliance upgrade programs and publicize resources as they become available (e.g., Cash for Appliances, etc.).

1.7.2 As funding permits, continue Housing Department programs to retrofit housing.

1.7.3 Integrate the use of best practices into all homeowner assistance programs.

1.7.4 Continue to pursue funding for creative whole-house residential energy improvements and upgrades.

This measure establishes the framework needed to implement a comprehensive home energy audit program that funds a range of weatherization efforts and home improvements. This measure is related to the retrofits outlined under other residential energy-efficiency measures, but more specifically targets audits and upgrades that the City will fund through grant programs to households that would otherwise be constrained to undertake such programs without special assistance.

Proper home weatherization is necessary in high desert climates to maintain healthy and comfortable indoor conditions without excessive energy use, yet the cost of such weatherization is often prohibitive. The City will continue to bridge the gap between resources available to low-income families and the extreme energy inefficiencies of older homes in the high desert climate, building on the City’s existing framework. Active home assistance programs include the Emergency Grant Program, the Mobilehome Rehabilitation Program, the Single Family Rehabilitation Loan Program, and the Neighborhood Improvement Program (NIP). These programs provide funding to low- and moderate-income households to correct unsafe, unhealthy, or undesirable conditions and to help revitalize older neighborhoods. By using this existing framework, the City can maximize the benefits available to residents while minimizing institutional barriers.

MEASURE 1.8: COMMERCIAL AND INDUSTRIAL ENERGY EFFICIENCY

Promote energy efficiency in commercial and industrial uses through partnerships and programs.

ACTIONS FOR MEASURE 1.8:

1.8.1 Partner with Southern California Edison to encourage participation in their Energy Management Solutions Program.

1.8.2 Support implementation of Energy Upgrade California in Los Angeles County to achieve energy efficiency in the nonresidential building stock.

1.8.3 Leverage AB 811 funds from the Energy Efficiency and Conservation Block Grant Program to implement Energy Upgrade California in Los Angeles County.

1.8.4 Support implementation of AB 1103 and promote voluntary energy benchmarking using tools such as the free EnergyStar Portfolio Manager.

1.8.5 Encourage businesses located in the appropriate industrial zones to work with the City to identify alternative operating hours.

1.8.6 Integrate energy efficiency retrofit program promotions into the City's business resources.

1.8.7 Support Southern California Edison as it installs the smart grid in existing development.

There is often a decision gap between energy uses and efficiency options. Feedback is critical to improved decision making by connecting decisions with outcomes. According to the American Council for an Energy Efficient Economy,¹ achieving energy efficiency targets requires self-motivated action. This measure works to promote voluntary energy efficiency opportunities to close the decision gap between energy consumption and available opportunities for energy efficiency. This approach will help to identify and incentivize energy efficiency programs.

¹ 2010.



CHAPTER 6: COMMUNITY-WIDE REDUCTION GOALS AND MEASURES

Measure 1.8: Commercial and Industrial Energy Efficiency

GHG Changes per Year (MTCO₂e)

To Date:	0
2020:	-13,331
2035:	-26,626

Electricity Changes per Year (kWh)

To Date:	0
2020:	-23,210,000
2035:	-44,032,000

Natural Gas Changes per Year (Therms)

To Date:	0
2020:	-737,000
2035:	-1,870,000



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This measure also quantifies the impact of the Edison smart grid. Edison is installing smart meters that will allow users to monitor electricity consumption in real time and to better understand the relationship between electricity usage and costs.

California Assembly Bill 1103 also requires that all owner-occupied nonresidential buildings report energy consumption in a manner that is compatible with the Energy Star Portfolio Manager and that owners or operators disclose benchmarking data and ratings to prospective buyers. Initial compliance with AB 1103 is scheduled to begin January 1, 2012.



Local retailer utilizes wind turbines to offset their energy usage

MEASURE 1.9: MODEL ENERGY EFFICIENCY AND INNOVATION PROGRAM

Establish Palmdale as a model for energy-efficient and innovative industrial, manufacturing, and commercial businesses.

ACTIONS FOR MEASURE 1.9:

1.9.1 Leverage existing public-private partnerships to recognize, promote, and acknowledge energy efficient businesses.

1.9.2 Continue to use public-private partnerships with the WorkSource Center to educate businesses about opportunities for strategic cost-saving energy improvements.

1.9.3 Recognize the leadership role of local industries that voluntarily monitor, track, and report energy consumption trends.

Through this measure, the City will promote voluntary programs to equip local businesses to realize significant cost and operational savings through energy conservation and efficiency improvements. By enabling local businesses to increase their efficiencies and enhance profitability, the City is working to retain and improve its position as a regional economic leader that continues to attract new and beneficial businesses.

The City will work with the WorkSource Center and local chambers of commerce in the Antelope Valley to identify opportunities and recognize business leaders. The City will seek to promote success stories to encourage replication throughout the private sector. This may take place through a new forum or partnership with the local chambers of commerce to implement as a forum for businesses to share energy efficiency lessons and cost savings opportunities. The City will support and encourage Antelope Valley chambers of commerce to develop a curriculum for participants and help them to develop and implement a business action plan to enhance competitiveness through energy efficiency.



CHAPTER 6: COMMUNITY-WIDE REDUCTION GOALS AND MEASURES

Measure 1.9: Model Energy Efficiency and Innovation Program

GHG Changes per Year (MTCO₂e)

To Date:	0
2020:	-12,066
2035:	-18,696

Electricity Changes per Year (kWh)

To Date:	0
2020:	-21,410,000
2035:	-35,662,000

Natural Gas Changes per Year (Therms)

To Date:	0
2020:	-666,800
2035:	-1,104,000



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Measure 1.10: Regional Energy Efficiency

Supportive Measure

MEASURE 1.10: REGIONAL ENERGY EFFICIENCY

Continue to participate in regional initiatives to meet energy efficiency targets.

ACTIONS FOR MEASURE 1.10:

1.10.1 Collaborate with other jurisdictions in the Antelope Valley on a coordinated approach to promoting energy conservation and efficiency.

1.10.2 Support implementation of the Los Angeles County Energy Program to achieve energy efficiency in the existing residential housing stock.

This is a supportive measure that outlines regional partnership as a fundamental component of achieving the energy efficiency measures outlined above. The City recognizes that economies of scale can be realized in program implementation and will continue to use regional partnerships as they are beneficial to achieving the energy targets established in preceding energy efficiency measures. Primary regional partners include other jurisdictions in the Antelope Valley and Los Angeles County. Other opportunities that provide additional supportive benefit include the Statewide Energy Efficiency Collaborative, with an alliance of partners dedicated to help local governments reduce emissions and save energy.

The City of Palmdale's history demonstrates the City's commitment to partnership and an ability to use regional initiatives to benefit Palmdale's residents and businesses. Such examples are discussed throughout other measures in this chapter. While not all regional initiatives to date target energy efficiency, they illustrate the City's ability to effectively collaborate and achieve new resources for Palmdale.

GOAL 2: REDUCE WATER CONSUMPTION FOR ENERGY CONSERVATION

Rapid population growth and rates of development have created competition for scarce water resources throughout the Antelope Valley. The stability of the region's water supply is uncertain, and there are insufficient resources to supply water demands throughout the Valley. Water demands in 2010 were anticipated to exceed water supply by 73,600 acre-feet. Overdrafted groundwater aquifers supply most of Antelope Valley's water. In addition, numerous sensitive plant and animal species are also dependent on this restricted water supply for survival.²

Water is our most precious resource and the pumping, treatment, and delivery of clean drinking water is a very energy intensive process. Therefore, water conservation in homes, businesses, and industry correlates directly to energy efficiency and cost savings for the community and end user as well as a more sustainable future for the City of Palmdale.

The following water conservation measures outline steps to implement public education on simple water conservation projects, regional partnerships, and water-efficient landscaping showcase projects. Total reductions include City government measures discussed in **Chapter 5**, which are credited to the City's reduction target.

²Antelope Valley Regional Water Management Group 2007.



CHAPTER 6: COMMUNITY-WIDE REDUCTION GOALS AND MEASURES



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**Measure 2.2:
Public Water
Conservation
Education**

Supportive Measure

**The City has
reduced total
municipal water
consumption 20%,
yielding
approximately
\$235,600 in water
cost savings.**

MEASURE 2.2: PUBLIC WATER CONSERVATION EDUCATION

Continue to educate the public about water conservation and showcase municipal water conservation projects.

ACTIONS FOR MEASURE 2.2:

2.2.1 Continue to publicize the City's demonstration garden to promote low-water landscaping.

2.2.2 Continue to act as a Weather Reach signal provider free of charge to the community for Rain Bird ET Manager Systems.

2.2.3 Continue to educate the public about landscaping standards by providing information such as the water-wise landscaping CD, book, and directory.

This measure supports other water reductions outlined in this Plan. The City will continue numerous broad-based public education efforts for water conservation. Educational efforts include videos, publications, and regular events. For instance, the City supports the annual Palmdale Water District Conservation Fair and hosts EPA WaterSense events. These events provide educational materials, free prizes, and how-to demonstrations.

The City will continue proactive initiatives to support water reduction education. The City partnered with other Antelope Valley jurisdictions to create the Water Wise Gardening for the High Desert resources, a regional landscape and irrigation CD and interactive website. The California Department of Water Resources funded this effort through grant funds to promote drought-tolerant landscaping. The grant also funded the purchase of approximately 6,000 CDs to be distributed to homeowners.

MEASURE 2.3: REDUCE WATER USE 20%

Facilitate a 20% reduction in water use by 2020 to exceed the 20X2020 initiative.

ACTIONS FOR MEASURE 2.3:

2.3.1 Continue to implement the City's Water Conservation Ordinance.

2.3.2 Implement the substandard landscaping program, as feasible.

2.3.3 Implement residential turf removal programs, as feasible, and continue distribution of turf removal vouchers as available from participating water purveyors.

2.3.4 Continue to promote the City's role as an EPA WaterSense Partner for community education and outreach.

Energy used to transmit water is embedded in the City's GHG inventory. This measure quantifies the reduction in energy use that results from reduced water conveyance activity. It assumes the reduction in water use established by the State of California's 20x2020 Water Conservation Plan, which directed state agencies to develop a plan to reduce statewide per capita urban water use by 20% by the year 2020. The City's water reduction targets are supported by the mandatory CalGreen standards that went into effect on January 1, 2011. The CalGreen code requires mandatory reductions in new residential and nonresidential development water use and also establishes water meters and water-efficient plumbing fixtures as mandatory standards.

The City has a robust framework to address water conservation. Existing standards include a water-efficient landscape ordinance and a substandard landscaping program. Also, through City negotiations with the community waste provider, each single-family home is eligible for two free turf disposal vouchers per year, each good for up to one ton of materials.

The Desert Landscaping CD-ROM is made available on public counters to encourage water conservation



CHAPTER 6: COMMUNITY-WIDE REDUCTION GOALS AND MEASURES

Measure 2.3: Reduce Water Use 20%

GHG Changes per Year (MTCO₂e)

To Date:	0
2020:	-1,740
2035:	-2,438

Electricity Changes per Year (kWh)

To Date:	0
2020:	-13,597,500
2035:	-21,882,600

Gallons of Water Saved per Year:

To Date:	0
2020:	-13,597,500
2035:	-21,882,600



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**Measure 2.4:
Regional Water
Partnerships**
Supportive Measure

MEASURE 2.4: REGIONAL WATER PARTNERSHIPS

Work with regional partners to stabilize water supplies and conservation capabilities.

ACTIONS FOR MEASURE 2.4:

2.4.1 Pursue groundwater basin recharge programs.

2.4.2 Continue efforts to facilitate the use of recycled water.

The City will continue to work with regional partners to implement the infrastructure and programs that will protect Antelope Valley water resources. These are supportive actions that impact energy consumption, but due to jurisdictional boundaries, these actions cannot be credited to the City as actions that reduce energy consumption.

The City is actively supporting expansion of recycled water infrastructure. The City is implementing the Recycled Water Project that will consist of the installation of 8,300 feet of 24-inch recycled waterline and will provide recycled water for irrigating McAdam Park. This project is part of the City's first phase to provide recycled water to all City facilities on the eastside of Palmdale. The City is exploring opportunities to provide other water users in the city with recycled water, including local school districts. The Palmdale Water District's Recycled Water Master Plan³ identifies a new system to deliver recycled water to the district's municipal customers and industrial customers. This system will be operational by 2012.

The City of Palmdale is also pursuing groundwater recharge projects with a regional benefit and completed a certified environmental impact report for a water recharge project. Recharge efforts will replenish the groundwater basin and support regional reductions in energy for groundwater pumping. The project will capture excess rainwater to recharge approximately 25,000 acre-feet a year, in addition to capturing 400 acre-feet of stormwater cache per year.

³ 2009.

GOAL 3: PROMOTE RENEWABLE ENERGY GENERATION AND USE

Energy conservation and efficiency improvements are the first step to try to reduce energy consumption trends. Yet only so much energy consumption can be eliminated. A minimum level of energy is necessary to support a functioning built environment. The intent of this goal is to shift a portion of energy consumption away from traditional electricity and natural gas (i.e., fossil fuels) to renewable energy sources.

The City's Greenhouse Gas Inventory captured GHG emissions that result from residential and nonresidential natural gas and electricity use. These GHG emissions result in two ways:

- Combustion of natural gas within the City of Palmdale through on-site activities such as water heating or natural gas cooking ranges.
- Combustion of a variety of fuels to produce electricity that is consumed in the City of Palmdale, regardless of its origin.

Both natural gas and electricity can be offset with renewable sources of energy that are profitable, yield cost savings to users, and spur local energy independence. Through this goal, the City will reduce GHG emissions from traditional electricity production and natural gas by promoting the production of local, on-site renewable energy for both residential and nonresidential uses. Through these measures, the City will continue to lead the region by example through its innovative use of alternative and renewable energy sources that save money.

These reductions include City government actions in **Chapter 5**, which also contribute to the community-wide reduction target. Additional descriptions of community measures follow.



CHAPTER 6: COMMUNITY-WIDE REDUCTION GOALS AND MEASURES



A City contractor works on the installation of the City's reclaimed water infrastructure



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FIGURE 6-7: 2020 GOAL 3 REDUCTIONS BY MEASURE

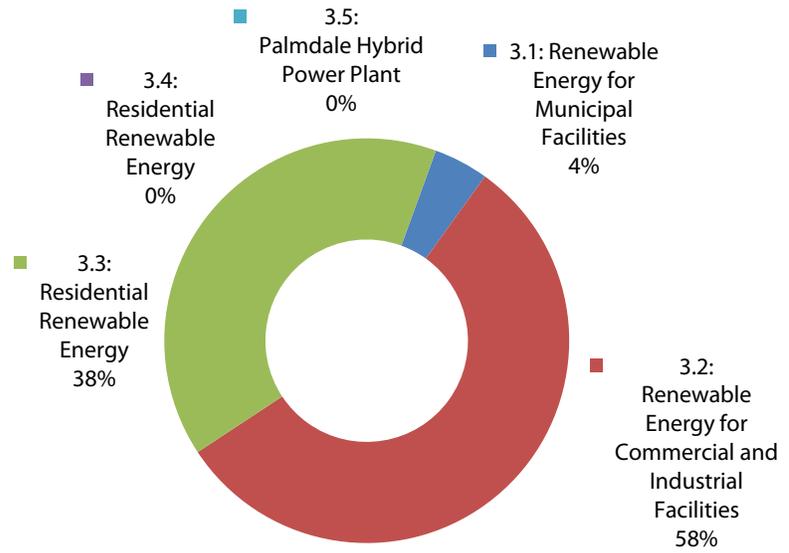
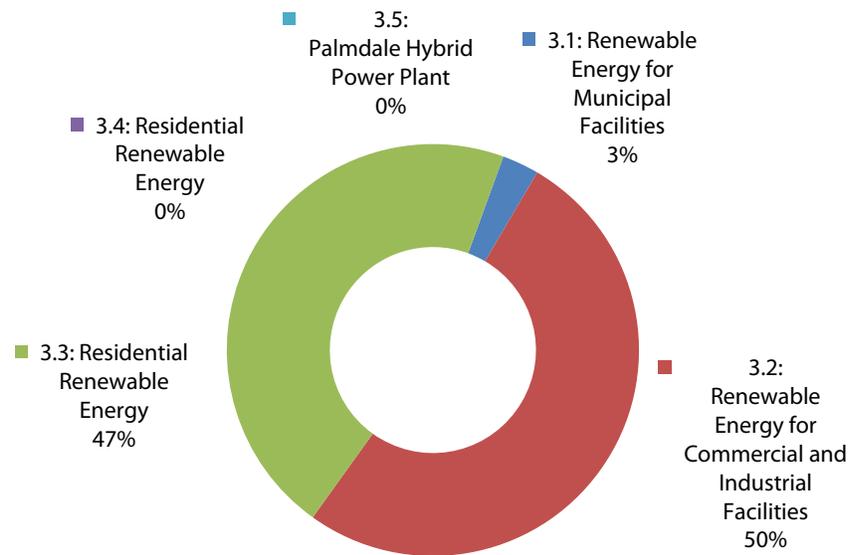


FIGURE 6-8: 2035 GOAL 3 REDUCTIONS BY MEASURE



MEASURE 3.2: RENEWABLE ENERGY FOR COMMERCIAL AND INDUSTRIAL FACILITIES

Encourage the commercial and industrial sectors to meet energy needs through on-site renewable energy sources.

ACTIONS FOR MEASURE 3.2:

3.2.1 Update the Zoning Ordinance to include a renewable energy strategy that removes barriers to small-scale solar energy systems.

3.2.2 Incentivize development of on-site renewable energy systems through streamlined permit procedures.

3.2.3 Promote the production of renewable energy through Energy Upgrade California in Los Angeles County,

3.2.4 Continue to participate in the second phase of the statewide AB 811 program, the California PACE Program.

3.2.5 Identify and promote early leaders in the community that have harnessed on-site renewable energy.

3.2.6 Encourage private development of a community solar group buy program.

Commercial and industrial energy consumption comprised nearly a third of all emissions in the baseline year. The intent of this measure is to reduce GHG emissions related to commercial energy use by facilitating the development of small-scale distributed renewable energy production, assuming that 30% of baseline energy use will be replaced with renewable energy produced on-site by 2035. Renewable energy installations are expected to increase dramatically throughout the next few decades due to innovative financing strategies and lower costs of renewable energy equipment. Furthermore, the city is well suited for on-site solar installations with its climate. While this measure focuses on the expansion of renewable solar facilities due to available resources and funding mechanisms, the City also anticipates that wind power can supply local energy needs. The City removed hindrances to co-located small wind energy systems on commercial and industrial land through updates to the



CHAPTER 6: COMMUNITY-WIDE REDUCTION GOALS AND MEASURES

Measure 3.2: Renewable Energy for Commercial and Industrial Facilities

GHG Changes per Year (MTCO_{2e})

To Date:	-2,110
2020:	-36,444
2035:	-57,011

Electricity Changes per Year (kWh)

To Date:	-4,842,700
2020:	-91,530,300
2035:	-158,860,900



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City's Zoning Ordinance. Recent updates to Zoning Ordinance Article 99 allow for co-located small wind energy systems as an accessory use for commercial and industrial land uses. Sam's Club took advantage of these updates and in 2009 installed 17 small wind-turbines in the store parking lot, which are expected to generate 76,000 annual kWhs of energy.

Group solar programs are another strategy to reduce initial investment costs required to purchase renewable power or to install renewable energy facilities. By aggregating consumer demand through a representative organization or local credit union, participants can achieve enhanced economies of scale and access to more financing models than would be available to a single consumer. This strategy would require coordination with an entity that could assume the responsibility of managing such an endeavor; the cost of administration could be offset through a small fee distributed to all program participants. Potential partners to implement this measure include local credit unions and local chambers of commerce. A new regional Antelope Valley partnership could possibly be developed.



A local school has solar shade structures installed in its parking lot



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MEASURE 3.3: RESIDENTIAL RENEWABLE ENERGY

Encourage the residential sector to meet energy needs through on-site renewable energy sources.

ACTIONS FOR MEASURE 3.3:

3.3.1 Identify barriers to widespread use of on-site renewable energy for residential uses.

3.3.2 Promote the production of renewable energy through Energy Upgrade California in Los Angeles County,

3.3.3 Educate the community about the benefits of on-site renewable energy production and use through the countywide AB 811 program.

3.3.4 Update the Zoning Ordinance to define a renewable energy strategy that removes barriers to small-scale solar energy systems.

3.3.5 Support implementation of the Homebuyer Solar Option for all subdivision projects and require developers of new medium and multiple residential projects larger than four units to supply 20% of projected electricity use of each building from renewable resources.

3.3.6 Identify a nonprofit partner to implement a residential community solar program for housing stock that serves the city's special needs population, including senior housing projects, mobile home parks, and affordable housing projects.

This measure reduces energy use in the residential sector through the development of small-scale distributed renewable energy production for homes. Residential solar programs throughout the state demonstrate that it is feasible for homes to meet all electricity needs through renewable energy produced on-site. This strategy yields long-term savings for residents by eliminating the need to pay for electricity from utility companies and induces the job creation to supply renewable energy services and goods.

New regulations established by the Homebuyer Solar Option support reductions under this measure by requiring all new developers of

Measure 3.3: Residential Renewable Energy

GHG Changes per Year (MTCO₂e)

To Date:	-317
2020:	-27,466
2035:	-52,908

Electricity Changes per Year (kWh)

To Date:	-727,600
2020:	-68,980,600
2035:	-143,943,000

From 2007 to 2010, Palmdale residents installed 72 home solar systems at an average size of 5.54 kW per installation.

California Solar Initiative 2011.



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subdivisions to offer solar systems to customers or to pay into an offset system that the California Energy Commission will establish. The City will also require developers of new multi-family projects to offer solar systems, consistent with the provisions of the Homebuyer Solar Option.



The City will promote solar energy systems to supply residential energy needs



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Measure 3.4:
Large-Scale Solar
Facilities
Supportive Measure

MEASURE 3.4: LARGE-SCALE SOLAR FACILITIES

Facilitate the establishment of large-scale solar facilities to supply regional energy needs.

ACTIONS FOR MEASURE 3.4:

3.4.1 Remove barriers in the Zoning Ordinance to facilitate the development of large-scale solar facilities.

3.4.2 Monitor success of solar projects as they come online and refine development standards to optimize future projects.

3.4.3 Collaborate with Southern California Edison to monitor and encourage the expansion of the solar industry in Palmdale.

This measure is supportive of other renewable energy measures outlined in the Energy Action Plan, but recognizes that regional endeavors to promote renewable energy is an integral component of achieving renewable energy in the city. The City of Palmdale has an optimal location for solar renewable facilities and offers a regulatory climate that is supportive of development projects. The City is pursuing the development of large-scale solar projects that provide regional renewable energy sources. Actions outlined in this measure will be accounted for by Southern California Edison as progress toward the Renewable Portfolio Standard targets and are quantified in the City's adjusted emissions forecast. Nonetheless, this measure recognizes the importance of the City's forward-thinking action in catalyzing a local renewable energy hub.

As of early 2011, the City approved three solar farm projects approximately 20 acres in size each. The City is currently investigating updates to the General Plan to allow for creation of solar farms that range from 150 to 160 acres in size. The City will adopt such standards and continue to partner with local businesses. The City recognizes that by promoting renewable energy production, the City can capitalize on job-generating industries that serve the residents of Palmdale.



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Measure 3.5: Palmdale Hybrid Power Plant

Supportive Measure

MEASURE 3.5: PALMDALE HYBRID POWER PLANT

Construct and operate the Palmdale Hybrid Power Plant (PHPP) to support the State's Renewable Energy Portfolio and promote the growth of the local renewable energy industry.

ACTIONS FOR MEASURE 3.5:

3.5.1 Develop educational materials to promote awareness and support of alternative energy sources.

3.5.2 Use the PHPP to encourage similar innovations in the industrial and manufacturing sector through its demonstration of profitable green business, cost-saving technologies, and other lessons learned.

3.5.3 Explore opportunities to partner with other renewable energy producers and providers to give priority to local customers.

The City recognizes the potential of the renewable energy industry for jobs and revenue generation. Thus, the City is constructing the Palmdale Hybrid Power Plant (PHPP) to efficiently serve regional electricity demand through traditional and renewable sources. Solar technology at the PHPP will contribute to Southern California Edison's renewable energy credits for compliance with the Renewable Portfolio Standard; although the PHPP will emit GHG emissions, the relative efficiency of the PHPP will result in a net cumulative reduction of GHG emissions. This supportive measure is captured in the City's adjusted forecast.

The PHPP's primary equipment includes natural-gas-fired combustion turbine-generators, two heat recovery steam generators (HRSGs), one steam turbine-generator (STG) rated at 267 MW, and 250 acres of parabolic solar-thermal collectors with associated heat transfer equipment. With all technologies combined, the proposed PHPP will have a nominal electrical output of 570 MW, with up to 50 MW of solar-generated electricity.⁴ The California Energy Commission completed its final assessment of the project in December 2010;⁵ if the project is approved, the PHPP will be operational by 2013.

⁴ California Energy Commission 2010.

⁵ California Energy Commission 2010.

The City anticipates that the PHPP would generate 36 full-time employees; most are expected to commute to the site from communities in Los Angeles, San Bernardino, and Kern counties. The City will work to ensure that these renewable energy jobs can be served by a highly trained, local population through jobs training and technical certification programs.

The City will use the additional opportunities for public education that the PHPP provides to encourage other ambitious energy projects in the private sector.



Artist rendering of the proposed Hybrid Power Plant



CHAPTER 6: COMMUNITY-WIDE REDUCTION GOALS AND MEASURES



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GOAL 4: REDUCE TRANSPORTATION EMISSIONS THROUGH ALTERNATIVE VEHICLES, TRIP REDUCTION AND CONSOLIDATION, AND EFFICIENT FLOW

Transportation is often the largest contributor of GHGs within a community and one of the most complex sectors to address. Economic considerations, political will, and other factors complicate actions to optimize land use and transportation options. In 2005, the transportation sector contributed approximately 40% of the City of Palmdale's emissions. Goal 4 measures address both the City's transportation challenges and assets to establish a strategy that enhances daily lifestyle transportation options while reducing the impact of transportation on GHG emissions.

The distribution of land uses throughout a community shape transportation choices; in order to take part in the tasks of daily living, each day people must make choices about transportation that have direct impacts on GHG emissions. Likewise, transportation options and accessibility in turn shape daily lifestyle choices. The City of Palmdale is a large family community of approximately 150,000 residents with a suburban development style. Affordable housing has attracted people from throughout the greater Los Angeles region that commute throughout the region for work.



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FIGURE 6-9: 2020 GOAL 4 REDUCTIONS BY MEASURE

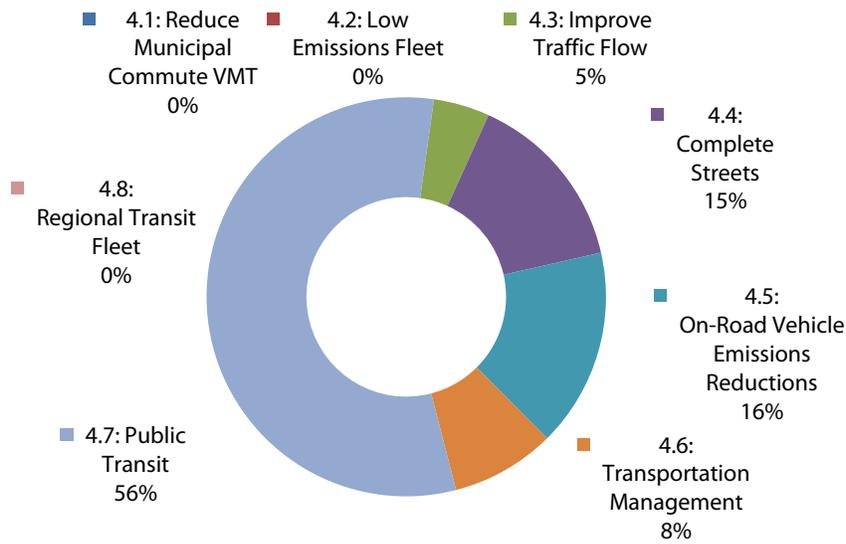
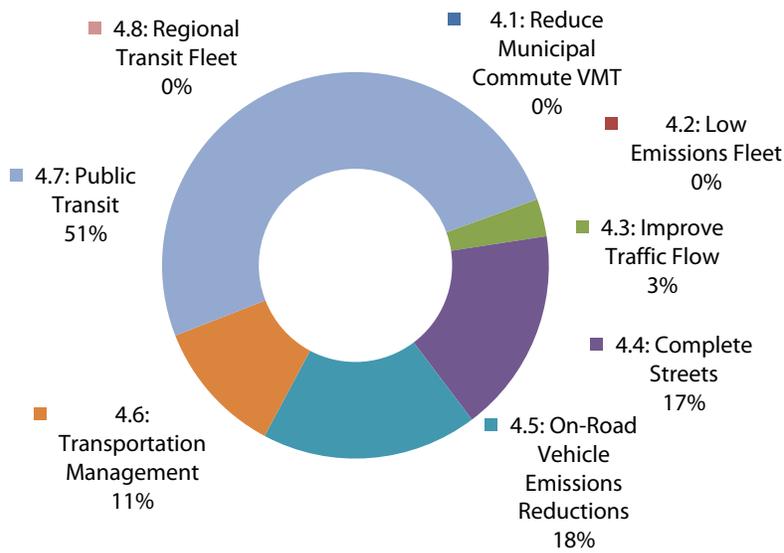


FIGURE 6-10: 2035 GOAL 4 REDUCTIONS BY MEASURE





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Measure 4.3: Improve Traffic Flow

GHG Changes per Year (MTCO₂e)

To Date:	0
2020:	-602
2035	-628

Vehicle Miles Traveled (VMT) Changes per Year:

To Date:	0
2020:	-4,598,900
2035:	-5,543,600

MEASURE 4.3: IMPROVE TRAFFIC FLOW

Reduce emissions from mobile sources through efficient vehicle flow.

ACTIONS FOR MEASURE 4.3:

4.3.1 Implement the Traffic Signal Synchronization program.

4.3.2 Continue to install street design features such as landscaped medians and roundabouts in order to reduce vehicle speeds, volumes, and idling.

4.3.3 Continue to include an anti-idling provision in Conditional Use Permits.

The City will promote enhanced efficiencies through intelligent transportation system management. The City has dedicated approximately \$340,000 of its Energy Efficiency and Conservation Block Grant (EECBG) award to implement a Traffic Signal Synchronization (TSS) program along 11 miles of roadway throughout the city, including the synchronization of 49 traffic signals along sections of Rancho Vista Boulevard, 10th Street West, Avenue R, and Avenue S. The synchronization of traffic signals allows increased traffic mobility and relieves existing traffic congestion by reducing delays in travel times. The synchronization of these traffic signals will help reduce fuel consumption and improve air quality, increase traffic mobility, and relieve existing traffic congestion by reducing delays and travel times. In addition to the 11 miles of roadway that the City will synchronize with EECBG funds, the City will work to synchronize an additional 9 miles of roadway by 2035.



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MEASURE 4.4: COMPLETE STREETS

Implement a Complete Streets approach to transportation to improve mobility.

ACTIONS FOR MEASURE 4.4:

- 4.4.1** Continue to implement a Complete Streets approach in the General Plan.
- 4.4.2** Implement the Bicycle and Pedestrian Master Plan as funding is available.
- 4.4.3** Revise development standards to require the provision of bicycle support facilities throughout the city for multi-family and commercial uses.
- 4.4.4** Continue to support and implement the Safe Routes to School programs.
- 4.4.5** Continue implementation of the Sidewalk Improvement Program.
- 4.4.6** Investigate benefits of becoming a designated Bicycle Friendly Community through the League of American Bicyclists.

This measure supports alternative transportation through the adoption of a Complete Streets approach to transportation. Complete Streets refers to an integrated, multimodal transportation system that equally supports all types of transportation, including pedestrian, bicycle, and vehicular traffic. According to the Governor’s Office of Planning and Research, the California Complete Streets Act adopted with Assembly Bill 1358 requires local jurisdictions to plan for multimodal transportation through the general plan. Commencing January 1, 2011, any substantial revision of the circulation element of a general plan must plan for a “balanced, multimodal transportation network that meets the needs of all users of the streets, roads, and highways for safe and convenient travel in a manner that is suitable to the rural, suburban, or urban context of the general plan.”⁶ Through a Complete Streets approach to transportation, the City will elevate the dominance of non-motorized transportation throughout the city’s transportation network. Strategies include traffic calming features, multimodal lanes, landscaping, planter strips with trees, raised

⁶ Governor’s Office of Planning and Research

Measure 4.4: Complete Streets

GHG Changes per Year (MTCO₂e)

To Date:	0
2020:	-1,942
2035:	-3,424

Vehicle Miles Traveled (VMT) Changes per Year:

To Date:	0
2020:	-4,983,300
2035:	-10,151,000



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crosswalks, median islands, and other features. Additional strategies the City may consider are car-free zones and bicycle boulevards.

The City is supporting the development of a Complete Streets network with wayfinding projects that serve to enhance the usability of the city's transit, pedestrian, and bicycle facilities. The City will work to increase bicycle use throughout the community by implementing the Bicycle and Pedestrian Master Plan and adopting new standards for the provision of bicycle support facilities, including showers, lockers, and bicycle racks. 21 miles of bicycle lanes currently exist throughout the community. The City will install an additional 123 miles of bicycle lanes to achieve 144 miles of bicycle lanes by 2035.

Safe Routes to School programs are another Complete Streets strategy. The City is implementing a highly leveraged Safe Routes to School project to promote pedestrian travel, reduce vehicle miles traveled, and improve pedestrian safety along key access routes to Golden Poppy Elementary and Cimarron Elementary. The proposed infrastructure improvements include perpendicular curb ramps, ladder-style striped crosswalks, stop signs supplemented with flashing beacons, new traffic signals, pedestrian countdown signals, and sidewalk improvements. The City received a grant from Caltrans for \$900,000 toward the design and construction of this project, which the City is leveraging with Energy Efficiency and Conservation Block Grant funds. This program is supported by the City's ongoing Bike Rodeo educational programs. The Public Safety Department hosts these events at local schools to promote bicycle safety and use for children in elementary schools.



Local officers demonstrate bicycle safety with the use of their motorcycles at a Bicycle Rodeo

MEASURE 4.5: ON-ROAD VEHICLE EMISSIONS REDUCTIONS

Reduce emissions from on-road vehicle sources.

ACTIONS FOR MEASURE 4.5:

4.5.1 Require designated parking in all new development for low emissions vehicles.

4.5.2 Require electric vehicle charging facilities at new large developments.

4.5.3 Continue partnership with Southern California Edison to promote and provide guidance for installation of plug-in hybrid electric and electric vehicles at homes and businesses.

4.5.4 Support the development of a private, local car-share program.

To promote an efficient vehicle population throughout Palmdale, the City recognizes the importance of establishing a transportation infrastructure that supports the competitive vehicle class of the future. This measure seeks to expand the clean vehicle population through new regulatory standards, incentives, a car-share program, and proactive outreach. The City will continue to work with Southern California Edison to support the installation of infrastructure at homes and businesses through education and other promotional efforts. New development standards will both defer to the statewide requirements for electric vehicle charging established by the California Building Code and create additional incentives with parking reductions that can be achieved through the provision of charging stations beyond the minimum requisite amount.

The City recognizes the value of these strategies in empowering residents to achieve cost savings and more effective vehicle use. Car-share programs throughout the country provide a viable alternative for an income-restricted population to benefit from the option of traditional vehicular use without the burden of traditional vehicular ownership costs.



CHAPTER 6: COMMUNITY-WIDE REDUCTION GOALS AND MEASURES

Measure 4.5: On-Road Vehicle Emissions Reductions

GHG Changes per Year (MTCO₂e)

To Date:	0
2020:	-2,131
2035:	-3,613

Vehicle Miles Traveled (VMT) Changes per Year:

To Date:	0
2020:	-2,095,500
2035:	-2,359,400

Gallons of Fuel Consumption Changes per Year:

To Date:	0
2020:	-117,600
2035:	-294,000

Electricity Changes (kWh) per Year:

To Date:	0
2020:	1,305,400
2035:	3,263,400



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Measure 4.6: Transportation Management

GHG Changes per Year (MTCO₂e)

To Date:	0
2020:	-1,119
2035:	-2,258

Vehicle Miles Traveled (VMT) Changes per Year:

To Date:	0
2020:	-2,871,000
2035:	-6,695,100

MEASURE 4.6: TRANSPORTATION MANAGEMENT

Reduce transportation emissions from the commercial and industrial sectors.

ACTIONS FOR MEASURE 4.6:

4.6.1 Continue to require transit amenities for all transit destination-related new developments.

4.6.2 Review and update the City’s Transportation Demand Management Ordinance.

4.6.3 Encourage participation in commute programs.

The City will continue to connect local employers and residents with transportation management resources. As of 2006, of the 63% of residents in Palmdale that work outside of the city, 74% drive alone to work.⁷ The City will work to increase commute participation to shift approximately 20% of all single-occupant commute trips to carpool or vanpool programs by 2020.

Residents and employees in the city can benefit from Metro carpool and vanpool programs that serve the entire Los Angeles and Antelope Valley region. Metro programs include an online carpool database and a vanpool system available to people traveling more than 15 miles one way for work. Metro offers vanpools to rent, with a subsidized rental credit of \$400 a month to offset operating costs. Companies often rent a vanpool on behalf of employees. Vanpool and carpool programs save Los Angeles participants approximately 60–70% of the cost of commuting in a single-occupant vehicle.⁸ The City offers three park-and-ride lots that support the use of regional commuting services such as Metro.

⁷ U.S. Census data manipulated by SCAG 2010, for 2006–2008 American Communities Survey. Provided by Richard Kite, October 13, 2010.

⁸ Valerie Rader 2010.

MEASURE 4.7: PUBLIC TRANSIT

Support the expansion of transit options within the Antelope Valley.

ACTIONS FOR MEASURE 4.7:

4.7.1 Collaborate with the Antelope Valley Transit Authority to identify gaps in local existing transit service and facilitate solutions.

4.7.2 Maintain park-and-ride lots to support regional vanpool and carpool programs.

4.7.3 Actively support implementation of the Palmdale Station of California’s High-Speed Rail line.

4.7.4 Continue to support regional transit programs, including Metro’s vanpool and carpool programs and the Metrolink commuter rail line.

4.7.5 Continue to promote regional transit options to the public.

4.7.6 Collaborate with other jurisdictions to implement portions of the Southern California Association of Government’s (SCAG) Regional Comprehensive Plan and Regional Transportation Plan.

The City will work to increase the use of public transportation in the community. Local public transit is dependent on an effective regional framework, but is also supported through local action. Primary transit programs that serve the local population include the Metrolink rail line and the Antelope Valley Transit Authority.

The City will continue to provide facilities that encourage the use of public transit. The state-of-the-art Palmdale Transportation Center (PTC) is the city’s primary public transit hub. It offers a location for all primary regional transit routes and is connected to the city’s bicycle and multi-use trail infrastructure. The City also supports public transit through the Transit Amenities Program, which provides benches, signage, and shelters along each transit route in the city. Through the program, the City installed 78 new transit stops served by the Antelope Valley Transit Authority (AVTA) by 2008.



CHAPTER 6: COMMUNITY-WIDE REDUCTION GOALS AND MEASURES

Measure 4.7: Public Transit

GHG Changes per Year (MTCO_{2e})

To Date:	-1,541
2020:	-7,445
2035:	-10,071

Vehicle Miles Traveled (VMT) Changes per Year:

To Date:	-2,987,900
2020:	-9,009,800
2035:	-16,812,100



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This measure also forecasts the impact of the high-speed rail segment that is planned to route through Palmdale as part of the statewide high-speed rail line by 2020. The Palmdale segment of the line consists of three stations that provide service to northern Los Angeles County, including one station in the City of Palmdale. This route will provide an important high-speed transit route connecting Palmdale to the greater Los Angeles region and other networks throughout the state. This project is managed by the California High-Speed Rail Authority, which forecasts that operations for the rail line will be self-financing. By 2035, daily boardings at the Palmdale stop for intra-regional travel are forecast at 7,700, while inter-regional boardings (going outside of LA region) are projected at 5,500.⁹



The City proposes the Transportation Center as the High Speed Rail stop for the City of Palmdale

⁹ California High-Speed Rail Authority 2009



CHAPTER 6:
COMMUNITY-WIDE
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Measure 4.8:
Regional Transit
Fleet
Supportive Measure

MEASURE 4.8: REGIONAL TRANSIT FLEET

Promote upgrades to the regional transit fleet.

ACTIONS FOR MEASURE 4.8:

4.8.1 Support the Antelope Valley Transit Authority in vehicle upgrades as opportunities arise.

4.8.2 Work with the County of Los Angeles to support and promote the use of cleaner vehicles for contracted County services.

Contracted services represent a transportation emissions source that the City cannot fully control. As established in this supportive measure, the City of Palmdale will support the County of Los Angeles and the Antelope Valley Transit Authority (AVTA) in initiatives to rely on cleaner service fleets. For instance, Palmdale contracts with the County of Los Angeles for police and fire services, and the City does not maintain operational control over vehicle or fuel types. While the AVTA is a Joint Powers Authority between the City of Palmdale, City of Lancaster, and unincorporated areas of Los Angeles County, the City does not maintain operational control over the AVTA's fleet or operations. The City will continue to support both the AVTA and Los Angeles County in upgrading the regional fleet and achieving reduced vehicular emissions in the City of Palmdale. As opportunities arise, the City will share lessons learned and encourage these entities to benefit from cost-saving opportunities that cleaner fuel vehicles provide.

The AVTA has completed an impressive retrofit of the region's transit fleet and AVTA facilities. The AVTA has purchased 15 hybrid buses that will save several million dollars in fuel costs over the life of the vehicles. The AVTA also replaced older minivans with seven Ford Fusions. The American Recovery and Reinvestment Act (ARRA) provided approximately \$11 million that funded these projects.



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Local high school students perform a survey for the Palmdale Energy Action Plan as part of the City's high school internship program

GOAL 5: IMPLEMENT SMART LAND USE TO REDUCE VEHICULAR TRIPS

The creation of integrated land use patterns that promote walking, bicycling, and the use of alternative transportation is another approach to reducing transportation emissions. These strategies support other goals contained in this Energy Action Plan that specifically target transportation actions. All reductions under Goal 5 are achieved by Measure 5.1 (Accessible Housing), discussed in more detail below.

From a survey the City interns administered to 106 people at Dry Town Water Park and the Palmdale Transportation Center in July 2010, 71% of survey respondents reported that their primary method of transportation to and from local shops and services was driving alone by car. These trends reflect that locally residents and employees rely on the car because of a lack of other convenient transportation options. The same survey respondents reported that it would take over 15 minutes to safely walk from home to purchase most of their daily goods and services. These survey results paint a picture of the limited transportation options in the City and their impact on daily lifestyle choices, choices that these measures attempt to address.



Artist rendering of Transit Village



CHAPTER 6:
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MEASURE 5.1: ACCESSIBLE HOUSING

Promote accessible housing near transit and services.

ACTIONS FOR MEASURE 5.1:

5.1.1 Implement high-density mixed uses and housing near public transit routes and employment centers with the Palmdale Transit Village Specific Plan.

5.1.2 Support infill development throughout the city.

5.1.3 Continue to provide housing that targets the local workforce.

5.1.4 Identify strategies to ensure accessibility of transit options to affordable housing to reduce the impacts of the jobs-housing imbalance.

5.1.5 Explore increasing allowed densities in transit-oriented areas to those allowed by the Palmdale Transit Village Specific Plan to expand the city's stock of transit-oriented development.

5.1.6 Improve the jobs-housing balance within the city.

The City will reduce transportation emissions by promoting mixed-use housing that is integrated with the city's alternative transportation infrastructure and supports easily daily services. The City will achieve this reduction with an improved jobs-housing mix and a minimum of 2,660 units that are planned for development as part of the City's transit-oriented development Transit Village Specific Plan.

The City will also investigate appropriate areas throughout the community to increase the allowed housing densities and mix of uses. The Transit Village Specific Plan allows for a residential density of up to 58 dwelling units per acre depending on the land use category, while City zoning standards outside of the Specific Plan area allow for a density of up to 16 dwelling units per acre in the Multiple-Residential Zone. The City will continue to focus key areas that hold the potential of successful, high-density and mixed-use developments that support the desired quality of life in Palmdale. The City anticipates that lessons learned from the

Measure 5.1: Accessible Housing

GHG Changes per Year (MTCO₂e)

To Date:	-24,865
2020:	-26,011
2035:	-36,608

Vehicle Miles Traveled (VMT) Changes per Year:

To Date:	-48,195,800
2020:	-66,727,600
2035:	-108,544,900



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development of the Transit Village will inform and guide subsequent high-density strategies throughout the city.

The implementation of this measure will position the City for implementation of SB 375 through the alignment of housing and transportation options that reduce the need to drive, and in turn, reduce emissions from the transportation sector. The City will be acting as an early leader and position itself to serve as a regional example of the types of strategies that will be feasible and effective to implement through SB 375. Full implementation of this measure is dependent upon implementation of the General Plan with the full range of high-density housing options. The City will also undertake a review of existing development standards to allow for mixed uses by right. Currently, mixed uses are only available through application for an overlay zone. The City will identify appropriate strategies to address concerns with mixed use while also removing obstacles to achieving the mixed uses that are envisioned by this measure.



The City adopted the Transit Village Specific Plan to create a mixed-use, transit-oriented community around the Transit Center.

MEASURE 5.2: SUSTAINABLE COMMUNITIES STRATEGY

Pursuant to SB 375, support the development and implementation of a regional Sustainable Communities Strategy with the Southern California Association of Governments through local plans and programs.

Senate Bill 375 establishes a regional framework to integrate transportation decisions and support the reduction of emissions from transportation. Through this bill, the City will be responsible for achieving reductions in greenhouse gas emissions generated by transportation. These target reductions are established for the regional level by the state's Regional Targets Advisory Committee and then delegated to the regional Metropolitan Planning Organizations for distribution between local governments. The Southern California Association of Governments is responsible for initiating the assignment of regional targets to the City of Palmdale. The City will achieve these targets by aligning housing and transportation through strategies outlined in this Energy Action Plan and further developed in the General Plan.



CHAPTER 6: COMMUNITY-WIDE REDUCTION GOALS AND MEASURES

Measure 5.2: Sustainable Communities Strategy

Supportive Measure



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GOAL 6: REDUCE WASTE

Both the consumption and disposal of resources requires energy and emits greenhouse gases. For instance, emissions are generated by the energy used to create products and finished goods within the city, while emissions also result from the decomposition of resources that have been converted into waste by residents and businesses within the city. In 2005, the decomposition of all waste generated within the City of Palmdale generated approximately 27,408 MTCO₂e, or 3% of all emissions.

By reversing disposal trends within the community, the City is able to reduce its impact on GHG emissions. Further, the City has recognized that by treating even waste as a resource, there is a large potential to expand the city's economic base. All reductions in this goal result from Measure 6.2 (Solid Waste Diversion), which is discussed in additional detail below.

MEASURE 6.2: SOLID WASTE DIVERSION

Achieve an 80% diversion of landfilled waste by 2020.

ACTIONS FOR MEASURE 6.2:

6.2.1 Implement and expand waste reduction programs, including expansion of commercial recycling service initiated in 2010.

6.2.2 Continue to provide curbside green waste opportunities for residents and businesses.

6.2.3 Expand the types of material accepted for curbside recycling.

6.2.4 Require the use of recycled concrete in base material in City and private road construction.

6.2.5 Expand the current construction and demolition ordinance to require over 50% waste diversion.

6.2.6 Explore offering curbside composting for residential and commercial uses.

The City of Palmdale will work to reduce emissions from solid waste by reducing landfilled waste through the enhancement of green waste and recycling programs. In 2005, the City had a diversion rate of 57%. As established by this measure, the City will achieve an 80% waste diversion rate by 2020 and an 85% diversion rate by 2035. Since 2005, the City has expanded its waste diversion programs to achieve a diversion rate of 69%. Through waste agreements, the City has eliminated all commercial recycling fees and established a sharps mail-back program for residents with diabetes or other diseases to safely and legally dispose of sharps. Recycling and green waste containers are now 94 gallons rather than 64 gallons. The City's waste management provider also agreed to expand waste education and outreach programs.

The City will continue to model waste reduction leadership through implementation of the Environmentally Preferable Procurement (EPP) Program. The EPP creates a strategy to conserve resources and maximize recyclability in City operations. Refer to **Measure 6-1** in **Chapter 5** for more information.



CHAPTER 6: COMMUNITY-WIDE REDUCTION GOALS AND MEASURES

Measure 6.2: Solid Waste Diversion

GHG Changes per Year (MTCO₂e)

To Date:	-8,279
2020:	-18,606
2035:	-26,723

Waste Changes per Year (Tons)

To Date:	-45,386
2020:	-102,000
2035:	-146,497



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Measure 6.3:
Regional
Partnerships
Supportive Measure

MEASURE 6.3: REGIONAL PARTNERSHIPS

Collaborate with regional partners to achieve local waste diversion targets.

ACTIONS FOR MEASURE 6.3:

6.3.1 Continue to operate the Antelope Valley Environmental Collection Center in collaboration with the City of Lancaster and the County of Los Angeles.

6.3.2 Collaborate with the County of Los Angeles to explore options to use new waste conversion technologies through the Southern California Conversion Technology Demonstration Project.

This measure will enhance and build regional partnerships aimed at reducing solid waste. Partnerships already exist between the City of Palmdale, the County of Los Angeles, and the City of Lancaster through the joint operation of the Antelope Valley Environmental Collection Center. The City of Palmdale is also exploring possibilities to support the development of the Southern California Conversion Technology Demonstration Project. Operated by the County of Los Angeles, the Demonstration Project's goal is to support the development of technologies and programs that can reduce waste put into landfills by diverting landfilled waste to energy.

The Los Angeles County Department of Public Works' efforts have been under way since 2004. Waste conversion projects offer the potential to reduce landfilled waste and provide a new source of renewable energy and fuels. The County is investigating appropriate technologies that would only convert landfilled waste that could not otherwise be recycled.

Currently, there are only three permitted waste-to-energy facilities in California. These facilities act as revenue generators and provide a potential waste diversion credit available to jurisdictions. Several waste-to-energy technologies exist, ranging from the conversion of traditional waste to green waste into fuel. Through the conversion of waste into fuel, these facilities provide the potential to reduce GHG emissions that would otherwise take place through waste decomposition, while attracting regional waste as a revenue-generating product for conversion.

GOAL 7: SUPPORT THE “BUY-LOCAL” MOVEMENT

"Buy-local" campaigns encourage the community to make shopping trips within the community instead of going outside of the community for shopping and necessities. Local trips help to reduce the distance traveled for shopping purposes while supporting the local tax base. The 2011 Independent Business Survey found that independent business owners located in a community with a buy-local campaign increased revenues by an average of 6% compared to 2010.¹⁰

This goal seeks to support efforts that encourage people who live, work, or have businesses in Palmdale to buy local goods, food supplies, and services in manners that are less reliant on cars.



The City participates in a ribbon cutting ceremony

¹⁰ Institute for Local Self-Reliance 2011.



CHAPTER 6: COMMUNITY-WIDE REDUCTION GOALS AND MEASURES



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7.1: Local First

GHG Changes per Year (MTCO₂e)

To Date:	0
2020:	-2,397
2035:	-3,419

Vehicle Miles Traveled Changes per Year (VMT)

To Date:	0
2020:	-6,149,300
2035:	-9,883,300

MEASURE 7.1: LOCAL FIRST

Support efforts that encourage Palmdale residents and businesses to buy goods and services locally.

ACTIONS FOR MEASURE 7.1:

7.1.1 Support strategies to increase business-to-business commerce in Palmdale, specifically within the city's special economic zones.

7.1.2 Use initiatives such as the Conserve Palmdale and Backdrop Palmdale programs to recognize employers that contribute to the quality of life in the community.

7.1.3 Actively promote business revitalization along major commercial thoroughfares.

7.1.4 Assist in the formation of mutual benefit organizations such as merchants associations and business improvement districts.

7.1.5 Continue to implement local preference purchasing policy as feasible.

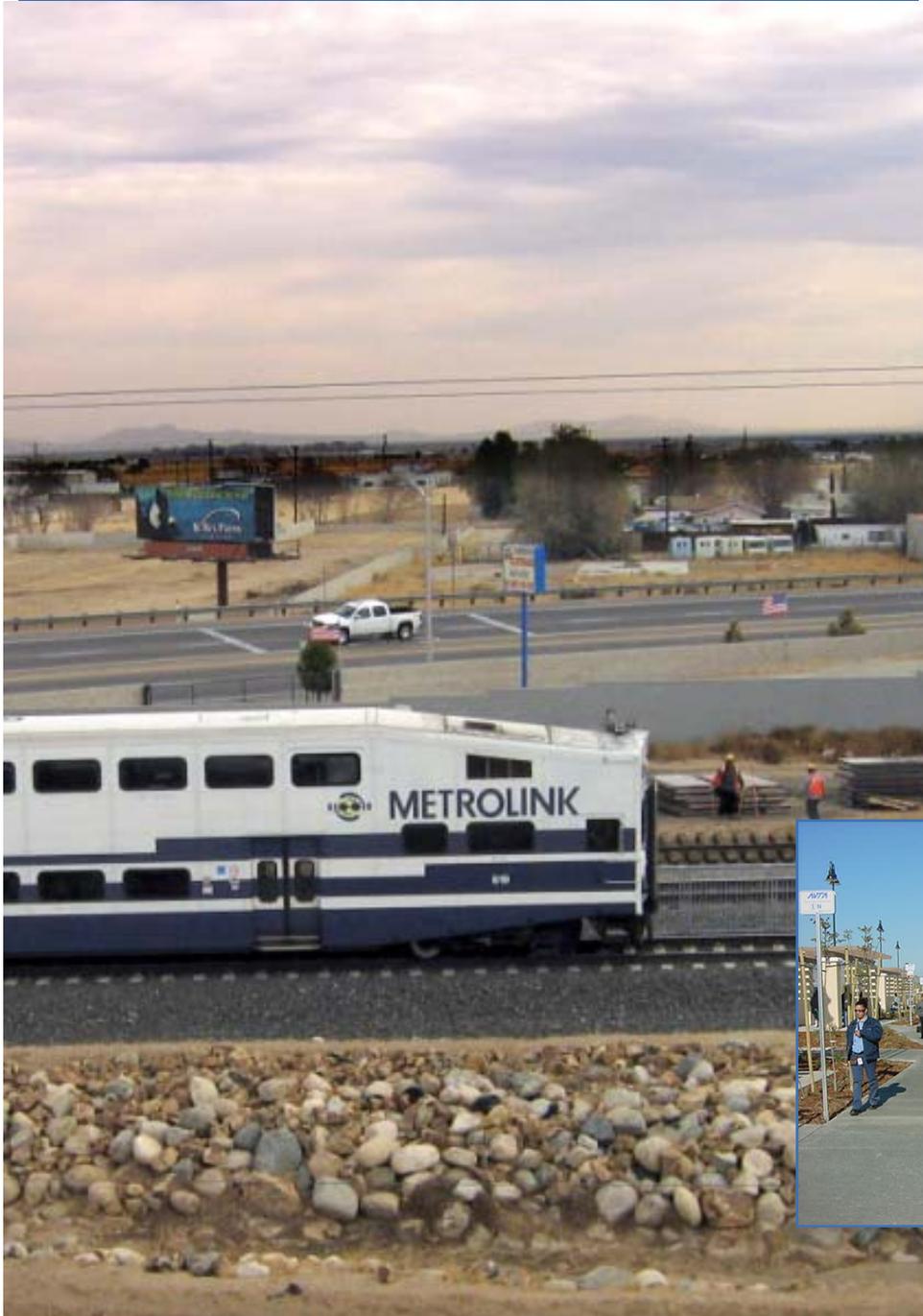
Increasing commerce between residents and local businesses reduces the amount of travel required to meet the lifestyle needs of residents and supports modes of travel that are less auto-dependent. Shopping locally also increases local tax revenue and supports businesses owned by neighbors. The City will seek to implement elements of the Transit Village Specific Plan and policies for Downtown that encourage the promotion of economic revitalization to create local options for commerce. The City will also partner with local chambers of commerce to enact new or participate in existing award programs that recognize successful examples of local employers and businesses that provide goods in accessible locations which reduce greenhouse gas emissions.

The City will also continue to implement the local preference purchasing policy as feasible to directly support and spur local business growth.

IMPLEMENTATION PROGRAM



CHAPTER 7



CHAPTER 7: IMPLEMENTATION PROGRAM

The City of Palmdale recognizes that a clear and practical implementation program is necessary to achieve our 2020 and 2035 goals and reduction targets. Overcoming climate change will require everyone—government agencies, nonprofit organizations, businesses, residents, and staff—to work together to implement this Plan collaboratively with regional, state, and national activities.

This Implementation Program provides a strategy for action with specific measures and steps to achieve the identified reduction targets. The program identifies responsible departments, potential costs, cost savings, and time frames for action. The Implementation Program is provided separately for municipal and community-wide measures below in **Table 7-3** and **Table 7-4**, respectively. Community-wide measures note consistency with General Plan policies. This chapter concludes with Goal 8 (Implement the Energy Action Plan), which includes measures and actions to achieve Energy Action Plan reduction targets (see **Section 7.2 (Goal 8: Implement the Energy Action Plan)**), which starts on page 7-17).

These matrices allow staff, the City Council, and interested parties to track measures of interest and to monitor progress. Each reduction measure is prepared with the best intentions; however, implementation requires oversight and political, organizational, and financial commitment. City costs, City cost savings/payback, and community-wide savings/payback are presented as metrics for simplicity.

IMPLEMENTATION PROGRAM METRICS

The Implementation Program provides several details metrics to facilitate measure implementation. Details on these metrics are listed below.

Actions: Abbreviated actions for each reduction measure.

Action Steps: Primary indicators of progress for achieving measure reductions, including quantitative targets for tasks to be completed (e.g.,



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number of streetlights retrofitted) and qualitative steps that are necessary to achieve quantitative targets and supportive measures (e.g., necessary Zoning Ordinance updates).

Responsible City Department(s): City department responsible for implementation.

Cost to City: Estimated overall cost to the City for implementation of the measure. Costs represent the full anticipated City costs for measure implementation through 2035 and in current (2010) dollars (see **Table 7-1**).

TABLE 7-1: CITY COSTS METRICS FOR IMPLEMENTATION PROGRAM

City Cost Metric	Equivalent Cost	Impact on Staff Time
Negligible	0	Requires no investment or generates a profit
Low	\$1–\$25,000	Uses existing staff
Low-Mid	\$25,000 –\$100,000	Existing staff can implement but will require reprioritization of workload
Medium	\$100,000–\$200,000	Requires new staff or contracts to implement
Medium-High	\$200,000–\$500,000	Requires new staff or contract(s) to implement
High	Over \$500,000	Requires new staff or contract(s) to implement

Savings/Payback: Due to the nature of variation in costs between municipal programs and community-wide programs, for purposes of simplicity, City costs for community-wide programs are presented on a separate scale from municipal costs (see **Table 7-2**).



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TABLE 7-2: SAVINGS/PAYBACK METRICS FOR IMPLEMENTATION PROGRAM

Savings/Payback	Equivalent Cost
Minimal	\$1–\$25,000
Low	\$25,000–\$500,000
Low-Mid	\$500,000–\$1 million
Medium	\$1 million –\$10 million
Medium-High	\$10 million–\$30 million
High	Over \$30 million

ABBREVIATIONS AND REFERENCES IN THE IMPLEMENTATION PROGRAM

Implementation Program metrics rely on the following abbreviations and references:

- **Sectors.** All sectors are designated as follows: C = Commercial, I = Industrial, R = Residential, RG = Regional
- **Consistency with the General Plan, SCAG Policies, and the Local Planning Framework.** Unless otherwise cited as SCAG Regional Comprehensive policies or the 2009 Ten-Year Capital Improvement Program, all references are to the City’s General Plan.
 - Measures within this Plan implement the General Plan policies. General Plan policies establish the framework for the city’s development. References to General Plan policies refer to policies as set forth in the City’s nine adopted General Plan elements:
 - Land Use (L, adopted 1993)
 - Circulation (C, adopted 1993)
 - Environmental Resources (ER, adopted 1993)



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- Public Services (PS, adopted 1993)
 - Safety (S, adopted 1993)
 - Noise (N, adopted 1993)
 - Housing (HE, adopted 2001)
 - Parks, Recreation, and Trails (PRT, adopted 2003)
 - Community Design (CD, adopted 1994)
- References to the Southern California Association of Governments (SCAG) Regional Comprehensive Plan (RCP) note consistency with policies from the RCP. SCAG prepared the RCP as an advisory plan that addresses regional issues including housing, transportation, water, and air quality. The RCP is an advisory document that supports regional coordination and equips local agencies in Southern California to address local issues that hold regional significance with best practices. The policies are available on SCAG’s website: <http://www.scag.ca.gov/rcp/index.htm>.



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TABLE 7-3: IMPLEMENTATION PROGRAM: MUNICIPAL MEASURES

Measure		2020 Reductions	Action Steps	Responsible City Department	City Costs	Savings/Payback	Time Frame
1.1	Implement energy efficiency improvements (i.e., retrofits) in existing City buildings and facilities.	-799	<ul style="list-style-type: none"> HVAC and lighting controls upgrades. Ongoing implementation of projects outlined in the City Facility Environmental Retrofit Program. Install the Energy Efficient Roof at the Parks and Recreation Building (completed) 	Public Works	Low	Low	Near-Term
1.2	Exceed Title 24 energy efficiency standards in new City facilities as feasible.*	-	<ul style="list-style-type: none"> Create an energy conservation checklist for new facilities to inform options in new facilities. 	Building & Safety	Low-Mid	Low	Immediate

*Reductions captured with community-wide actions in **Chapter 6**.



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Measure		2020 Reductions	Action Steps	Responsible City Department	City Costs	Savings/Payback	Time Frame
2.1	Reduce municipal water consumption.	-8	<ul style="list-style-type: none"> Reduce approximately 2 million gallons of municipal water consumption by 2020 through low-flow urinals, use of recycled water, and the on-going impact of completed turf removal projects. 	Public Works	Medium	Medium	Near-Term
3.1	Demonstrate City leadership in renewable energy by supplying 100% of City energy needs with renewable sources by 2035.	-2,853	<ul style="list-style-type: none"> 80% of municipal energy needs supplied with on-site renewable sources or through a Power Purchase Agreement by 2020, and 100% by 2035. 	Public Works	Medium	Low-Mid	Near-Term
4.1	Continue to promote ride sharing and TDM programs to reduce use of traditional motor vehicles for work commutes. *	-	<ul style="list-style-type: none"> Ongoing support of commute programs. Operate the completed teleconferencing center from the City Development Services Building. 	Public Works	Low	Low-Mid	Near-Term

*Reductions captured with community-wide actions in **Chapter 6**.



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Measure		2020 Reductions	Action Steps	Responsible City Department	City Costs	Savings/ Payback	Time Frame
4.2	Employ low emissions vehicles for City operations where practicable.*	-	<ul style="list-style-type: none"> Ongoing monitoring of cost-effective opportunities to invest in low emissions vehicles. Maintain the existing CNG fleet. 	Public Works	Low-Mid	Low	Long-Term
6.1	Implement the City's Environmentally Preferable Procurement Program.*	-	<ul style="list-style-type: none"> Identify an Environmental Coordinator to lead the Environmental Purchasing Task Force. Ongoing support of resource conservation and waste reduction. 	Finance	Low	Low	Near-Term

*Reductions captured with community-wide actions in **Chapter 6**.



TABLE 7-4: IMPLEMENTATION PROGRAM: COMMUNITY-WIDE MEASURES

Measure		2020 Reductions	Sector(s)	Action Steps	Responsible City Department	City Costs	Savings/Payback	Consistency with the General Plan, SCAG Policies, and the Local Planning Framework	Time Frame
1.3	Encourage new development to exceed Title 24 energy use requirements by 15%.	-12,694	C&R	<ul style="list-style-type: none"> Implement the minimum Title 24 standards for energy efficiency Smart grids to be installed in all new development, with 95% monitoring program participation by 2020 	Building & Safety	Low	Medium	H6.1.2 (Public Outreach for Energy and Water Conservation)	Long-Term
1.4	Reduce the urban heat island effect to cool the local climate and reduce energy consumption by increased shading on private property, high albedo surfaces in sidewalks and parking lots, and cool surfaces.	-5,742	C&R	<ul style="list-style-type: none"> New standards to require the use of high “albedo” material for new and renovated parking lot and sidewalk surfaces adopted by 2020 50% of City pavement covered in high albedo material by 2035 New standards to require tree plantings shade residential buildings, with approximately 2,000 new trees shading homes by 2020 	Planning and Public Works	Medium	Medium High	CD 2.2.4 (Desert Sensitive Design) CD 2.2.4 (Building Design for Passive Solar Heating and Cooling) CD4.2.16 (Subdivision Design to Maximize Opportunities for Passive Solar Heating and Cooling) CD 8.2.6 (Landscaping to Minimize Heat Gain) CD8.3.2 (Pavement Materials to Minimize Reflected Heat) L.3.5.5 (Building Orientation for Desert Design) L.4.2.14, CD 6.4.3 (Parking Lot Shading for Vehicle Shading) CD 8.3.1 (Minimize Unshaded Pavement)	Long-Term
1.5	Use City capital improvements and programs to educate the public and promote energy conservation.	0	C&R	<ul style="list-style-type: none"> Promote simple maintenance activities and energy-efficient behaviors through mass media messaging 	Communications	Low	Minimal		Mid-Term



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Measure		2020 Reductions	Sector(s)	Action Steps	Responsible City Department	City Costs	Savings/Payback	Consistency with the General Plan, SCAG Policies, and the Local Planning Framework	Time Frame
1.6	Promote energy efficiency improvements in the city's housing stock.	-35,641	R	<ul style="list-style-type: none"> 100% of existing homes with smart meters by 2020, with 80% monitoring program participation and 8% of households with integrated appliances by 2035 14,000 homes to participate in energy efficiency financing programs by 2020, including improvements to home cooling systems, to achieve average annual energy savings of 30% 	Building & Safety	Low-Mid	Medium High	H6.1.2 (Public Outreach for Energy and Water Conservation)	Near-Term
1.7	Facilitate comprehensive home energy retrofits.	-397	R	<ul style="list-style-type: none"> City to continue pursuing grant funding for whole-house retrofits 600 households participating in creative whole-house retrofits by 2020 	Building & Safety and Public Works	Medium-High	Low	H6.1.2 (Public Outreach for Energy and Water Conservation)	Mid-Term



Measure		2020 Reductions	Sector(s)	Action Steps	Responsible City Department	City Costs	Savings/Payback	Consistency with the General Plan, SCAG Policies, and the Local Planning Framework	Time Frame
1.8	Promote energy efficiency in commercial and industrial uses through partnerships and programs.	-21,785	C	<ul style="list-style-type: none"> 100% of businesses with smart meters by 2020, with 80% monitoring program participation and 4% of customers with integrated appliances by 2035 Approximately four industrial or manufacturing firms participating as Certified Partners in the ANSI/ANAB-accredited Superior Energy Performance program or similar program by 2020, to demonstrate energy performance improvement of 15% by 2020 1,000 businesses to undergo voluntary energy efficiency retrofits by 2020, achieving an average of 30% in energy savings 	Building & Safety	Medium-High	Medium High	H6.1.2 (Public Outreach for Energy and Water Conservation)	Near-Term
1.9	Establish Palmdale as a model for energy-efficient and innovative industrial, manufacturing, and commercial businesses.	-9,049	C	<ul style="list-style-type: none"> Outreach and energy efficiency education to result in 1,400 businesses, with average energy reductions of 20% per business 	Public Works	Low-Mid	Medium	H6.1.2 (Public Outreach for Energy and Water Conservation)	Mid-Term
1.10	Continue to participate in regional initiatives to meet energy efficiency targets.	0	RG	<ul style="list-style-type: none"> Ongoing participation in regional partnerships and programs 	Planning and Public Works	Low-Mid	Low-Mid		Near-Term



Measure		2020 Reductions	Sector(s)	Action Steps	Responsible City Department	City Costs	Savings/Payback	Consistency with the General Plan, SCAG Policies, and the Local Planning Framework	Time Frame
WR 2.2	Continue to educate the public about water conservation and showcase municipal water conservation projects.	0	C&R	<ul style="list-style-type: none"> Continue to promote water conservation Release new water educational resources as funds become available 	Public Works	Low	Minimal	H6.1.2 (Public Outreach for Energy and Water Conservation)	Near-Term
2.3	Facilitate a 20% reduction in water use by 2020 to exceed the 20X2020 initiative.	-1,740	C&R	<ul style="list-style-type: none"> Reduce 1,700 million gallons of forecast water consumption by 2020, or 20% of forecast water use 	Public Works	Low-Mid	Low	H6.1.2 (Public Outreach for Energy and Water Conservation) Ordinance No. 952 (Native Desert Vegetation Ordinance) Ordinance No. 1362 (Water Conservation Ordinance) Ordinance No. 1176 (Landscape Ordinance) Approved Plant List CD 2.2.1 (Drought Tolerant Landscaping and Water Conserving Irrigation) H6.1.1 (Energy and Water Conservation Checklist) ER 8.2 (Agricultural Uses for Aquifer Recharge)	Long-Term
2.4	Work with regional partners to stabilize water supplies and conservation capabilities.	0	RG	<ul style="list-style-type: none"> Ongoing participation for regional water conservation 	Public Works	Medium	Low	ER 4.3.1 (Investigate Reclaimed Water for City-wide Landscaping and Consider an Ordinance for Secondary Water Delivery Systems to Service Landscaped Areas)	Long-Term



Measure		2020 Reductions	Sector(s)	Action Steps	Responsible City Department	City Costs	Savings/Payback	Consistency with the General Plan, SCAG Policies, and the Local Planning Framework	Time Frame
3.2	Encourage the commercial and industrial sectors to meet energy needs through on-site renewable energy sources.	-36,444	C	<ul style="list-style-type: none"> Adopt new Zoning Ordinance provisions to streamline renewable energy facilities Partner with local chambers of commerce to promote renewable energy leaders in the community Approximately 86.7 kWhs of business electricity use supplied through on-site renewable sources by 2020 	Planning	Low-Mid	Medium High	SCAG Regional Comprehensive Plan EN-12 (Encourage Solar and Renewable Energy) Zoning Article 99 (Renewable Energy) ER 5.5.3 (Maximum Solar Access in New Construction)	Near-Term
3.3	Encourage the residential sector to meet energy needs through on-site renewable energy sources.	-26,020	R	<ul style="list-style-type: none"> Approximately 13,000 homes to meet all electricity needs on-site renewable energy by 2020 	Planning and Public Works	Low-Mid	Medium High	SCAG Regional Comprehensive Plan EN-12 (Encourage Solar and Renewable Energy) Zoning Article 99 (Renewable Energy) ER 5.5.3 (Maximum Solar Access in New Construction)	Near-Term
3.4	Facilitate the establishment of large-scale solar facilities to supply regional energy needs.	0	RG	<ul style="list-style-type: none"> Identify prime locations for large-scale solar facilities and remove barriers to project implementation 	Planning	Low-Mid	Low	SCAG Regional Comprehensive Plan EN-12 (Encourage Solar and Renewable Energy) Zoning Article 99 (Renewable Energy) ER 5.5.3 (Maximum Solar Access in New Construction)	Long-Term
3.5	Construct and operate the Palmdale Hybrid Power Plant (PHPP) to support the State's Renewable Energy Portfolio and promote the growth of the local renewable energy industry. (Quantified in Renewable Portfolio Standard forecast)	0	RG	<ul style="list-style-type: none"> Construct and operate the Palmdale Hybrid Power Plant 	Public Works	High	High	Ten-Year Capital Improvement Program projects	Mid-Term



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Measure		2020 Reductions	Sector(s)	Action Steps	Responsible City Department	City Costs	Savings/Payback	Consistency with the General Plan, SCAG Policies, and the Local Planning Framework	Time Frame
4.3	Reduce emissions from mobile sources through efficient vehicle flow.	-602	C&R	<ul style="list-style-type: none"> Implement a Traffic Signal Synchronization program along 11 miles of major roadways through the city by 2020 and 20 miles by 2035 	Public Works	Medium-High	Low-Mid		Near-Term
4.4	Implement a Complete Streets approach to transportation to improve mobility.	-1,942	C&R	<ul style="list-style-type: none"> Complete Streets standards for all new development New nonresidential projects to provide short- and long-term bicycle parking at a ratio of 1 bicycle parking space per 20 vehicle parking spaces New medium and multiple residential projects to provide bike parking to equal 10% of required vehicle parking spaces Implement Safe Routes to School programs Complete 87 miles of new bike lanes by 2020 and 123 miles of new bike lanes by 2035, for a total of 144 miles of bicycle lanes by 2035, including existing mileage 	Public Works	High	Medium High	C 2.2.3 (Encourage Integration of Bicycle Facilities with Public Transit) C 3.1 (Reduce Service-Oriented Trips through Land Use and Design) PRT 5.1.1 (Bikeway Master Plan) PRT 5.1.3 (Bikeways in New Construction through Development Review) C 3.1.4 (Pedestrian and Bike Access in Subdivisions) Zoning 87.21 (Bicycle Parking Standards for Non Residential Uses) CD 9.1.8 (Pedestrian Comfort and Safety) CD 2.2.6 (Regional Transportation Center) C 2.1.1 (Transportation Demand Management Plans) Zoning Ordinance 87.06 (Shared Parking)	Long-Term
4.5	Reduce emissions from on-road vehicle sources.	-2,131	C&R	<ul style="list-style-type: none"> 500 new electric vehicle charging stations by 2020 Car share program by 2020, with approximately 1,100 participants 	Planning and Public Works	Medium	Medium		Mid-Term



Measure		2020 Reductions	Sector(s)	Action Steps	Responsible City Department	City Costs	Savings/Payback	Consistency with the General Plan, SCAG Policies, and the Local Planning Framework	Time Frame
4.6	Reduce transportation emissions from the commercial and industrial sectors.	-1,119	C	<ul style="list-style-type: none"> Update the Transportation Demand Ordinance to support higher participation in commuting programs Achieve a 20% increase in commuting program participation by 2020, or approximately 5,200 single-occupant trips shifted to commute programs 	Public Works & Communications	Low	Low-Mid	ER 5.1.1 (Alternative Modes for Trip Reduction) CD 10.7.7 (Support for Alternative Transit Modes for Alternative Uses) Zoning Article 101 (Transportation Demand Management)	Near-Term
4.7	Support the expansion of transit options within the Antelope Valley.	-7,445	RG	<ul style="list-style-type: none"> California High-Speed rail station in operation by 2019 Increase local transit ridership by 111% by 2020 	Planning	Low-Mid	Medium	ER 5.1.2 (Reduce Non-Work Trips with Merchant Transportation Incentives) ER 5.1.6 (Expand Dial-a-Ride for Retirees) C 2.1.2 (Promote Ridesharing) C 2.2.2 (Promote Public Transit) C 2.2.4 (Encourage Regional Transit) C 4.2.1 (Support High Speed Rail for Airport Connections) ER 5.6.4 (Promote Metrolink) C 2.2.1 (Promote Public Transit)	Long-Term
4.8	Promote upgrades to the regional transit fleet.	0	RG	<ul style="list-style-type: none"> 0.00 	Planning	Negligible	Minimal		Long-Term



Measure		2020 Reductions	Sector(s)	Action Steps	Responsible City Department	City Costs	Savings/Payback	Consistency with the General Plan, SCAG Policies, and the Local Planning Framework	Time Frame
5.1	Promote accessible housing near transit and services.	-26,011	C&R	<ul style="list-style-type: none"> 10.8% of local housing stock to be affordable by 2020 Implement the Transit Village Specific Plan Achieve forecast jobs-housing ratio Investigate increasing allowed housing densities throughout the city 	Planning & Building	Medium	Medium High	ER 5.6.1 (Reduce VMT in New Development) L 3.2.2 (Transit Accessible Housing for Senior and Multi-Family Housing Near Mixed Uses) L 1.1.2 (Incentives for Infill Development) L 3.2.1 (Range of Dispersed Residential Densities) SCAG Regional Comprehensive Plan LU 4.1 (Affordable and Transit Accessible Housing Near Services) H 1.1.3 (Mixed Use Housing Near Transportation Corridors) L 2.1.2 (Comprehensive Plans to Expedite Review) L 2.1.6 (Consider Jobs/Housing Balance in New Development) L 2.2.3 (Assistance to Support Nonresidential Infrastructure for New Uses) L 2.2.4 (Expedite Permit Processing) L 2.3.1 (Special Development Area in Core for Economic Development)	Long-Term
5.2	Pursuant to SB 375, support the development and implementation of a regional Sustainable Communities Strategy with the Southern California Association of Governments through local plans and programs.	0	RG	<ul style="list-style-type: none"> Ongoing regional coordination and achievement of VMT reduction target 	Planning and Public Works	Negligible	Minimal		Long-Term



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Measure		2020 Reductions	Sector(s)	Action Steps	Responsible City Department	City Costs	Savings/Payback	Consistency with the General Plan, SCAG Policies, and the Local Planning Framework	Time Frame
6.2	Achieve an 80% diversion of landfilled waste by 2020.	-6,472	C&R	<ul style="list-style-type: none"> Achieve a diversion rate of 70% for the city by 2020, equivalent to a reduction of approximately 102,000 tons from forecast trends 	Public Works	Medium	Minimal	SCAG Regional Comprehensive Plan SW-14 (Waste Prevention and Recycling) ER 5.5.2 (Mandatory Recycling)	Long-Term
6.3	Collaborate with regional partners to achieve local waste diversion targets.	0	RG	<ul style="list-style-type: none"> Ongoing participation in regional partnerships Explore waste conversion opportunities through the Southern California Conversion Technology Demonstration Project 	Public Works	Low	Minimal		Mid-Term
7.1	Support efforts that encourage Palmdale residents and businesses to buy goods and services locally.	-2,397	R&C	<ul style="list-style-type: none"> 6% increase in walk-local, car-free, buy-local shopping trips by 2020 	Communications	Low	Low-Mid	L 4.2.7 (Commercial Needs to Serve East Side Residents) L 4.2.1 (Encourage Commercial Uses Accessible from Major Streets and Intersections) PS 1.3.2 (Infill Growth Supported by Existing Infrastructure)	Mid-Term

GOAL 8: IMPLEMENT THE ENERGY ACTION PLAN

This Plan will be implemented to reduce Palmdale’s greenhouse gas emissions by a minimum of 15% from the 2005 baseline by 2020.

The following implementation measures are intended to accompany the reduction measures presented in Chapters 5 and 6.

MEASURE 8.1:

Annually monitor and report on the City’s progress toward the reduction target.

MEASURE 8.2:

Update the baseline greenhouse gas emissions inventory every five years.

MEASURE 8.3:

Continue and expand partnerships that support implementation of the Plan.

MEASURE 8.4:

Maintain funding to implement the Plan.

MEASURE 8.5:

Integrate energy action planning with other activities and programs in the city.

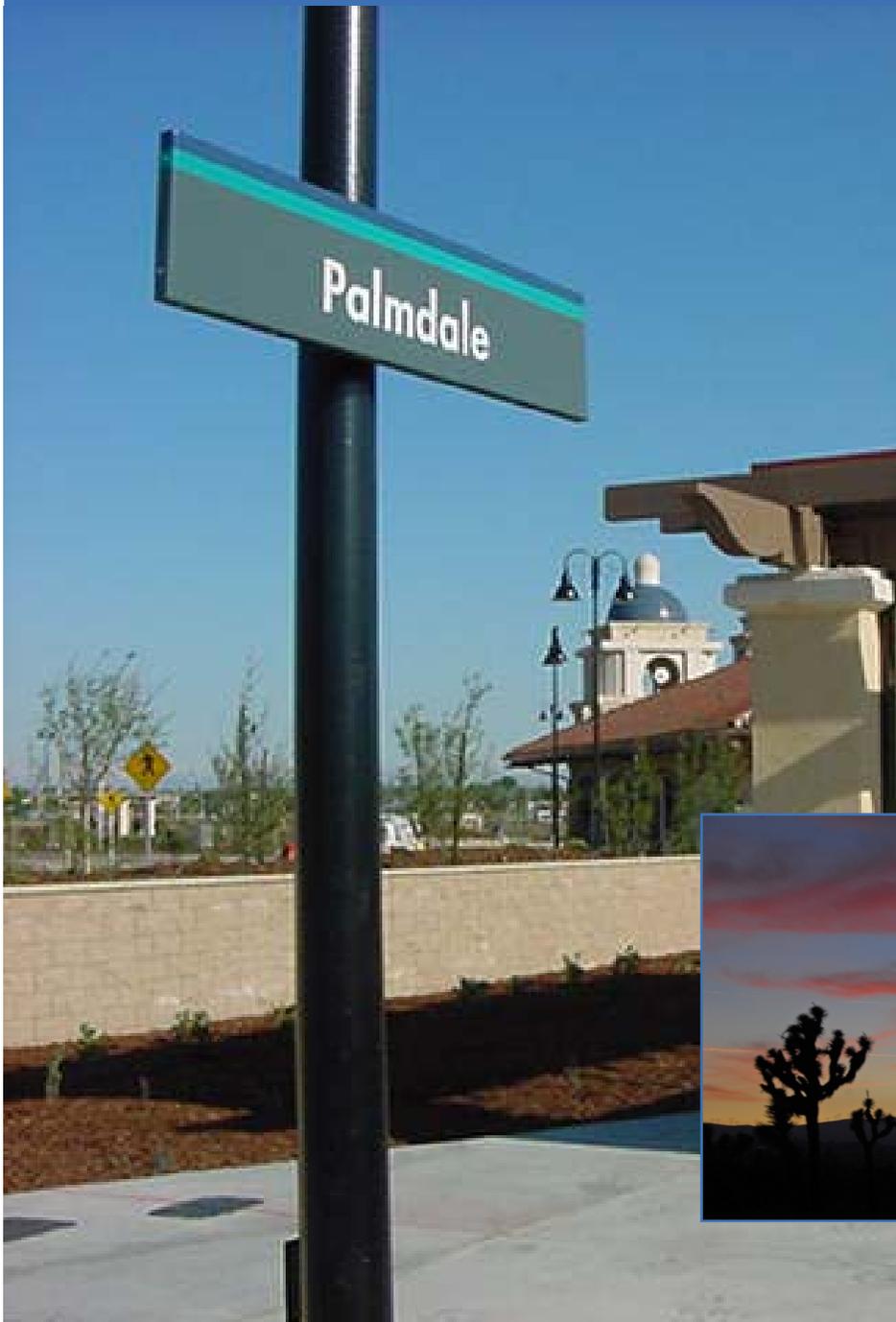
MEASURE 8.6:

Review and update the Plan regularly, at a minimum of every five years.



CHAPTER 7: IMPLEMENTATION PROGRAM

WORKS CITED



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COMMUNITY-WIDE
AND CITY
GOVERNMENT
OPERATIONS
GREENHOUSE GAS
EMISSIONS INVENTORY



APPENDIX 1



MEMO

To: Benjamin Lucha
City of Palmdale

From: Tammy Seale

Date: August 25, 2010

Re: Community-Wide and City Government Operations Greenhouse Gas Emissions Inventory
for the City of Palmdale

I. INTRODUCTION

PURPOSE

The purpose of this greenhouse gas (GHG) emissions inventory memo (Inventory) is to present the major sources and quantities of GHG emissions within the city from community-wide and government operations. This inventory will provide a baseline against which future progress can be measured¹ and will provide the foundation for the City's Climate Action Plan (CAP).

Specifically, this Inventory does the following:

- Calculates GHGs from community-wide activities, including City government operations, within the City's jurisdictional boundary in calendar year 2005;²
- Details the impact of City government operations to overall community-wide emissions in order to identify inefficiencies and create an example for other organizations to study their operational emissions;
- Forecasts how emissions will increase in the community if no behavioral changes are made, accounting for all reasonably foreseeable state reductions to clearly identify emissions reduction targets within the City government's control; and
- Provides City decision-makers with adequate information to direct development of the Climate Action Plan and establish an appropriate emissions reduction target.

¹ In this report, the term "city" refers to the area inside the jurisdictional boundary of the City of Palmdale, whereas "City government" or "City" refers to those activities which are under the operational control of City agencies.

² "Community-wide" or "community" refers to all activities within the city (as defined above), including those from businesses, industrial processes, residents, vehicles, and City government operations.

Appendix I: Community-Wide and City Government Operations Greenhouse Gas Emissions Inventory

This Community-Wide and City Government Operations Baseline GHG Emissions Inventory captures the major sources of GHGs caused by activities within the city per best practice and consistent with the protocols adopted by the California Air Resources Board and ICLEI-Local Governments for Sustainability (ICLEI). It is estimated that the sources not included in the Inventory due to privacy laws, lack of data, or a lack of reasonable methodology for calculating emissions comprise less than 5.0% of total emissions in the city. As GHG inventories become more common, it is likely that methodology and accessibility to data will improve. The sources that could not be included due to privacy laws, lack of data availability, and/or a reasonable methodology include the following:

- Refrigerants from City government operations, facilities, and vehicles;
- Propane, wind, or solar energy consumed by the community at large; and
- Recreational off-road equipment and vehicles

The emissions identified in this report are primarily GHGs that the community has directly caused and has the ability to reduce through implementation of conservation actions, a Climate Action Plan, or corresponding efforts.

The Inventory is supplemented with four appendices: 1) **Appendix 1** provides detailed summaries of community-wide baseline emissions by sector, 2) **Appendix 2** includes summaries of government operation emissions by sector, 3) **Appendix 3** provides the detailed the Clean Air and Climate Protection (CACP) report for community-wide emissions, and 4) **Appendix 4** includes the detailed CACP report for government operation emissions.

KEY TERMS AND TIMELINES

The following terms are used throughout the Inventory. These are concepts fundamental to understanding the contents of the Inventory.

Baseline year: Emissions are quantified for the baseline year of 2005, due to the availability of reliable data. This baseline year allows the City to track and observe the impact of its actions taken to date on GHG emissions and better inform future strategies.

Carbon dioxide equivalent (CO₂e): The universal unit for comparing emissions of different GHGs expressed in terms of the global warming potential of one unit of carbon dioxide.

Clean Air and Climate Protection 2009 (CACP) software package: The City government operations and community-wide inventories use the Clean Air and Climate Protection 2009 (CACP) software package developed by ICLEI in partnership with the National Association of Clean Air Agencies (NACAA) and Torrie Smith Associates. This software calculates emissions resulting from energy consumption, vehicle miles traveled (VMT), and waste generation. The CACP software calculates emissions using specific factors (or coefficients) and aggregates and reports the three main GHG emissions [carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O)] and converts them to equivalent carbon dioxide units, or CO₂e. The emissions coefficients and quantification method employed by the CACP software are consistent with national and international inventory standards established by the Intergovernmental Panel on Climate Change (1996 Revised IPCC Guidelines for the Preparation of National Inventories) and the U.S. Voluntary Greenhouse Gas Reporting Guidelines (EIA form 1605).

Appendix I: Community-Wide and City Government Operations Greenhouse Gas Emissions Inventory

Greenhouse gas (GHG) emissions: Gases that trap heat in the earth's atmosphere are called greenhouse gases, or GHGs. GHGs include carbon dioxide, methane, nitrous oxide, and fluorinated gases. While many of these gases occur naturally in the atmosphere, modern human activity has led to a steep increase in the amount of GHGs released into the atmosphere over the last 100 years. Collectively, these gases intensify the natural greenhouse effect, thus causing global average surface temperatures to rise, which in turn affects global climate patterns. GHGs are often quantified in terms of CO₂ equivalent, or CO₂e, a unit of measurement that equalizes the potency of GHGs.³

Scope: Emissions sources are also categorized by scope to help identify where emissions originate from and what entity retains regulatory control and the ability to implement efficiency measures. Scopes are discussed in further detail below.

Scope 1. Direct emissions sources located within the community, primarily from the combustion of fuels. Examples of Scope 1 sources include use of fuels such as gasoline and natural gas.

Scope 2. Indirect emissions that result because of activities within the community, limited to electricity, district heating, steam, and cooling consumption. An example of a Scope 2 source is purchased electricity used within the community. These emissions should be included in the community-wide analysis, as they are the result of the community's electricity consumption.

Scope 3. All other indirect emissions that occur as a result of activity within the community. Examples of Scope 3 emissions include methane emissions from solid waste generated within the community that decomposes at landfills either inside or outside of the community.

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

II. COMMUNITY-WIDE INVENTORY

This Inventory includes Scope 1, Scope 2, and Scope 3 sources from the following sectors, consistent with the California Air Resources Board protocol: residential, commercial/industrial, transportation, and waste.

The City of Palmdale emitted approximately 948,258 metric tons of carbon dioxide equivalent (CO₂e) in the baseline year 2005. As shown in **Table I** and **Figure I**, the transportation sector was by far the largest contributor to emissions (40.3%), producing approximately 382,013 metric tons of CO₂e in 2005. Emissions from the commercial and industrial sectors were the next largest contributor, accounting for a combined 29.8% of the total emissions, producing approximately 282,624 metric tons of CO₂e. The residential sector accounted for 27.0% of the total emissions (256,213 metric tons of CO₂e) and emissions from solid waste comprised 2.9% of the total (27,408 metric tons of CO₂e).

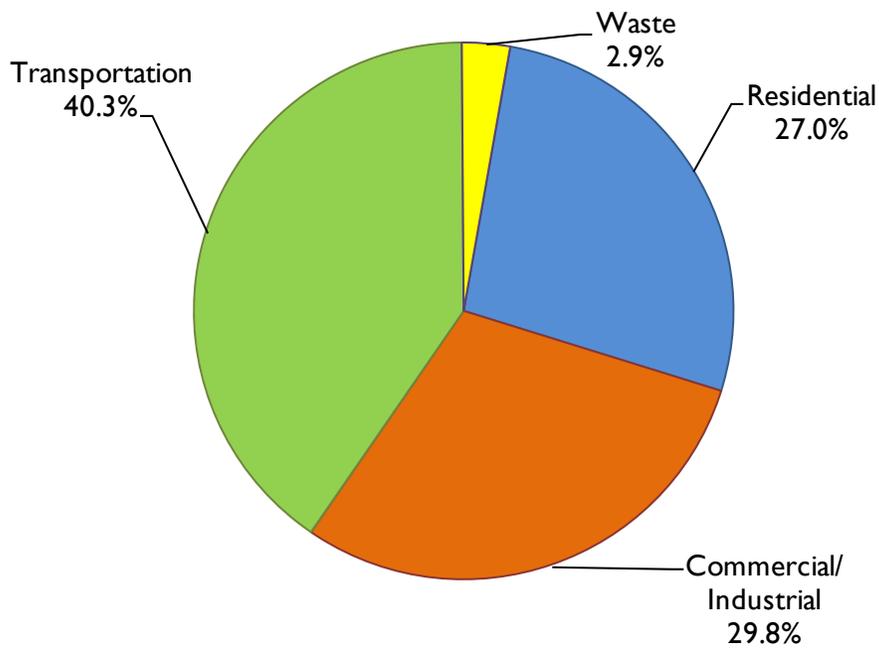
³ Refer to the IPCC for more information: <http://www.ipcc.ch/>.

Appendix I: Community-Wide and City Government Operations Greenhouse Gas Emissions Inventory

Table I: Summary of Community Emissions by Sector (Metric Tons of CO₂e)

2005 Baseline Greenhouse Gas Emissions	Metric Tons CO₂e	Percentage of Total
Residential	256,213	27.0%
Commercial/Industrial	282,624	29.8%
Transportation	382,013	40.3%
Waste	27,408	2.9%
Total	948,258	100.0%

Figure I: Community Emissions by Sector



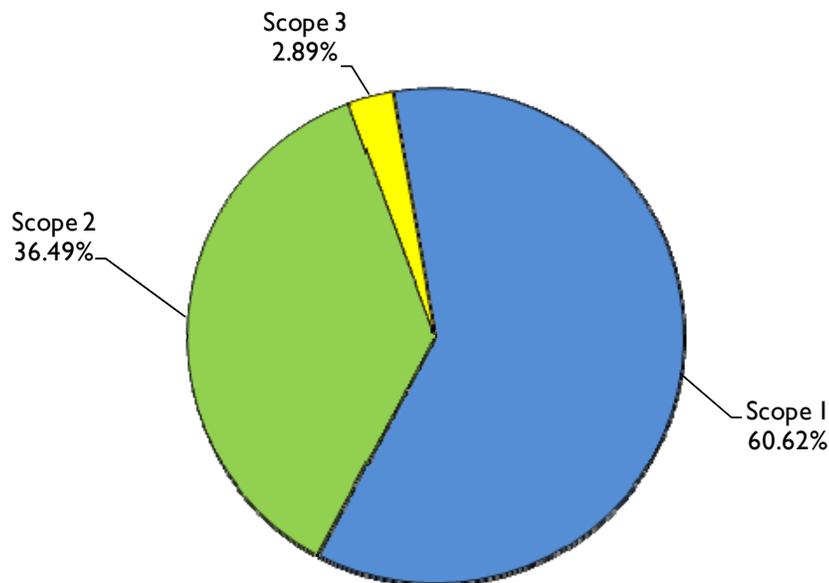
Appendix I: Community-Wide and City Government Operations Greenhouse Gas Emissions Inventory

The largest portion of Scope 1 emissions came from the transportation sector (refer to **Figure 2** and **Table 2**). These emissions are considered Scope 1 because they involve the direct combustion of fuel within the jurisdictional boundary of the city. The second largest source of Scope 1 emissions was residential natural gas use. Commercial/industrial uses generated the largest percentage of Scope 2 emissions. Emissions from waste operations account for all Scope 3 emissions.

Table 2: Community Emissions per Sector and Scope (Metric Tons of CO₂e)

Sector	Scope 1 Emissions (MTCO ₂ e)	Scope 2 Emissions (MTCO ₂ e)	Scope 3 Emissions (MTCO ₂ e)	Total Emissions (MTCO ₂ e)
Residential	115,198	141,015	0	256,213
Commercial/Industrial	77,648	204,976	0	282,624
Transportation	382,013	0	0	382,013
Waste	0	0	27,408	27,408
Other	0	0	0	0
Total	574,859	345,991	27,408	948,258
Percentage of Total	60.62%	36.49%	2.89%	100.00%

Figure 2: Community Emissions by Scope (Metric Tons of CO₂e)



Appendix I: Community-Wide and City Government Operations Greenhouse Gas Emissions Inventory

Additional details on the activities represented in the Inventory are provided in **Table 3** below. The table summarizes activity data units, data sources, and emissions scopes for each sector. Refer to **Appendix 3** for additional descriptions of detailed CACP outputs, emissions coefficients, assumptions, and data sources that were used to calculate community-wide emissions.

Table 3: Community-Wide Data Sources and Scopes

Sector	Information	Unit of Measurement	Emissions Scope	Activity Data Source	Emissions Coefficients Source
Residential	Electricity consumption	kWh	Scope 2	Southern California Edison	ARB & CEC
	Natural gas consumption	Therms	Scope 1	SoCal Gas Co.	CEC & SoCal Gas Co.
Commercial/ Industrial	Electricity consumption	kWh	Scope 2	Southern California Edison	ARB & CEC
	Natural gas consumption	Therms	Scope 1	SoCal Gas Co.	CEC & SoCal Gas Co.
Transportation	Local road VMT	Annual average VMT	Scope 1	Southern California Association of Governments	Emfac 2007
	Highway and interstate VMT	Annual average VMT	Scope 1	Southern California Association of Governments	Emfac 2007
Solid Waste	Solid waste tonnage sent to landfill from activities in City of Palmdale	Short tons	Scope 3	Los Angeles County Department of Public Works and CalRecycle (formerly the California Integrated Waste Management Board, or CIWMB)	Local Government Operations Protocol

TRANSPORTATION

As with the majority of California municipalities, travel by on-road motorized vehicles constitutes the greatest percentage of GHG emissions in the city (40.3%). This Inventory does not include trains or off-road recreational vehicles, as there is no feasible methodology for calculating emissions from these

Appendix I: Community-Wide and City Government Operations Greenhouse Gas Emissions Inventory

sources as part of a community-wide inventory. The majority of the emissions in the transportation sector came from travel on local roads (79.6%), while approximately 20.4% of the GHG emissions in the transportation sector resulted from travel on highways (refer to **Table AI-2** in **Appendix I** for more details).

Vehicle miles traveled on local roads and highways was determined by the Southern California Association of Governments (SCAG) using regional models. Due to data limitations, 2005 data was interpolated from 2003 and 2008 models. Transportation emissions accounted for in the Inventory include pass-through trips on highways that do not begin or end in the city. Inclusion of pass-through traffic is consistent with regional data and standard inventory practice.⁴ Emissions coefficients for gasoline and diesel vehicles in Los Angeles County were calculated by Tom Scheffelin of the California Air Resources Board (ARB) using ARB's vehicle emissions model, EMFAC2007.⁵

THE BUILT ENVIRONMENT (RESIDENTIAL, COMMERCIAL, INDUSTRIAL)

With all scopes and sectors aggregated, 56.8% of total community-wide emissions in the year 2005 came from the "built environment." The built environment comprises residential, commercial, and industrial natural gas and electricity consumption (see **Tables AI-3** and **AI-1** and **Figure AI-1** in **Appendix I**). This analysis does not include emissions from other types of energy such as propane, solar, and wind due to lack of reliable sales, construction, or consumption data. The commercial and industrial sectors are combined in this Inventory due to the California Public Utility Commission (CPUC) 15/15 rule which requires data be aggregated to protect customer confidentiality.

Southern California Edison (SCE) and Southern California Gas Company (SoCal Gas Co.) provided residential and nonresidential energy consumption data.⁶ Natural gas coefficients are provided by SoCal Gas Co. and the California Energy Commission (CEC). SCE could not provide a confirmed coefficient factor; therefore the confirmed ARB and CEC Grid Average emissions coefficient was used.

WASTE

Solid waste disposed of at managed landfills was responsible for 2.9% of total emissions for the community. While the city's waste was sent to ten landfills, most waste was received by the Antelope Valley Public Landfill in the City of Palmdale (see **Table AI-4** in **Appendix I**). This category includes only those emissions that result from waste generated within the city and does not include the total emissions released from the Antelope Valley Public Landfill from waste generated in other jurisdictions; waste generated by other jurisdictions and landfilled at the Antelope Valley Public Landfill will be accounted for in the baseline inventories of the communities responsible for the waste. Waste emissions are considered Scope 3 emissions because they are not generated in the base year, but will result from the decomposition of waste generated in 2005 over the full 100-year cycle of its decomposition.

Data relative to the tons of waste generated within the city was provided by Los Angeles County Department of Public Works. Waste characterization stream profiles are provided by CalRecycle for residential, commercial, and self-haul waste in the 2004 Statewide Waste Characterization Study. Default methane capture rates of 75% are provided by the Local Government Operations Protocol.

⁴ Calculations conducted by Mana Sangkapichai of SCAG (sangkapi@scag.ca.gov).

⁵ Tom Scheffelin, ARB (tscheffe@arb.ca.gov).

⁶ Respectively: Chris Coronel, 10 August 2010, and Colby Morrow, 24 November 2009.

III. CITY GOVERNMENT OPERATIONS GHG INVENTORY RESULTS

GHG emissions from government operations are a subset of the community-wide inventory, meaning that all City government operations are included in the commercial/industrial, transportation, waste, or “other” categories of the community-wide inventory. However, similar to the way in which businesses and factories perform their own facility-scale GHG inventories, this Inventory analyzes City emissions in more detail in order to identify cost-saving and emissions-reducing strategies in the future. This approach also better positions the jurisdiction to demonstrate leadership in action to address GHG emissions. The methodology for estimating emissions from local government operations is guided specifically by the Local Government Greenhouse Gas Inventory Protocol developed by the California Air Resources Board, ICLEI, and the California Climate Registry.

City government operations and facilities produced approximately 7,045 metric tons of GHG emissions in 2005. As displayed in **Figure 3**, this amount represents approximately 0.59% of total community-wide emissions in the city. City government emissions result from waste, energy consumption from water facilities, buildings, streetlights and other facilities, and fuel consumption by the vehicle fleet, employee commutes, and contracted landscaping services.

Figure 3: City Government Portion of Community-Wide GHG Emissions

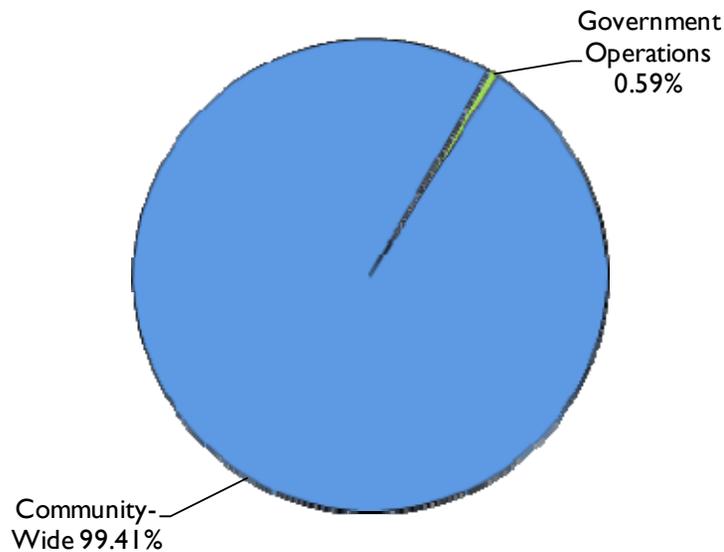
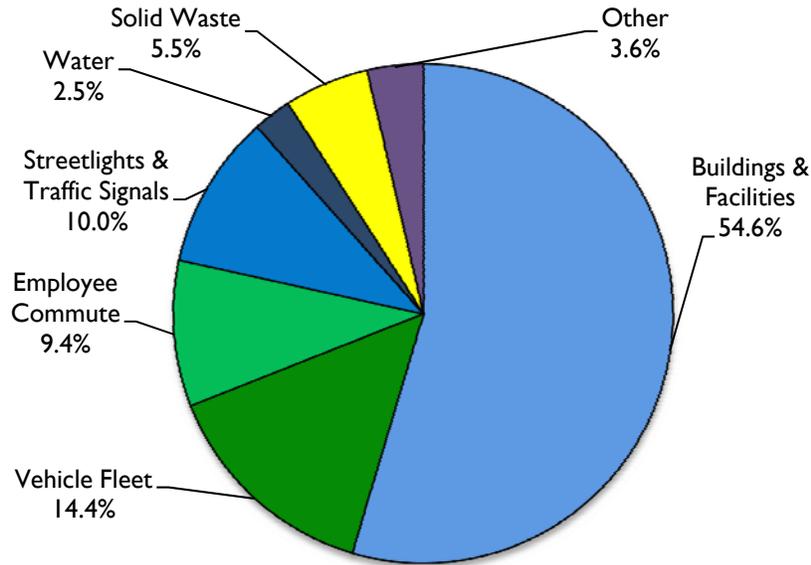


Figure 4: City Government Operations Emissions by Sector



As shown in **Figure 4 and Table 4**, energy consumption in City buildings and facilities was the largest contributor to the City’s emissions (54.6%), producing 3,051 metric tons of carbon dioxide equivalent. The second largest contributor was fuel consumption from the vehicle fleet (14.4%). Every other sector contributed individually 10.0% or less to City emissions, including (in order of contribution) streetlights and traffic signals (10.0%), fuel consumption from employee commutes (9.4%), solid waste (5.5%), other fuel consumption from miscellaneous and contracted landscaping services (3.6%), and water-related energy consumption (2.5%).

Table 4: City Government Emissions by Sector

2006 Municipal Emissions by Sector	Buildings & Facilities	Vehicle Fleet	Employee Commute	Streetlights & Traffic Signals	Water	Solid Waste	Other	Total
CO ₂ e (metric tons)	3,051	806	528	558	139	306	201	5,589
Percentage of Total CO ₂ e	54.6%	14.4%	9.4%	10.0%	2.5%	5.5%	3.6%	54.6%
Energy Use (MMBtu)	32,757	13,010	7,662	4,360	1,089	n/a	n/a	58,878

It can also be helpful to view overall City government emissions by source. As shown in **Table 5**, the majority of emissions are from electricity consumption in City-owned buildings, streetlights, and water facilities (52.4%) and natural gas (14.6%) consumed in City-owned facilities. Gasoline, compressed

Appendix I: Community-Wide and City Government Operations Greenhouse Gas Emissions Inventory

natural gas, diesel, and solid waste decomposition contributed in decreasing amounts to the remaining 47.5% of the overall City GHG emissions.

Table 5: City Government Emissions by Source

Source	CO ₂ e (metric tons)	CO ₂ e (percentage of total)
Electricity	2,930	52.4%
Natural Gas	818	14.6%
Gasoline	1,058	18.9%
Diesel	473	8.5%
Compressed Natural Gas	4	0.1%
Propane	0	0.0%
Solid Waste	306	5.5%
TOTAL	5,589	100.0%

*Note: totals may not yield 100% due to rounding.

Table 6 provides information on activity data and data sources and for all sources of City emissions. A summary of the methodology used to obtain and calculate emissions for each sector follows. Refer to **Appendix 4** for additional descriptions of detailed CACP outputs, emissions coefficients, assumptions, and data sources that were used to calculate emissions from City government operations.

Table 6: City Government Operations Data Sources

Sector	Information	Unit of Measurement	Activity Data Source	Emissions Coefficients Source
Buildings & Facilities	Electricity consumption	kWh	Southern California Edison	ARB & CEC
	Natural gas consumption	Therms	SoCal Gas Co.	CEC & SoCal Gas Co.
Vehicle Fleet	Diesel consumption & diesel vehicle fleet	Gallons	City of Palmdale	Emfac 2007
	Gasoline consumption & gasoline vehicle fleet	Gallons	City of Palmdale	Emfac 2007
	Compressed natural gas consumption & corresponding vehicle fleet	Gallons	City of Palmdale	Local Government Operations Protocol
Employee Commute	Sample of employee commuting patterns	Annual VMT	Commuter survey (November 2009)	Local Government Operations Protocol
Streetlights & Traffic Signals	Electricity consumption	kWh	Southern California Edison	ARB & CEC

Appendix I: Community-Wide and City Government Operations Greenhouse Gas Emissions Inventory

Sector	Information	Unit of Measurement	Activity Data Source	Emissions Coefficients Source
Water Delivery	Electricity consumption	kWh	Southern California Edison	ARB & CEC
Waste	Rates of waste generation, pick-up, number, and size of waste bins at all City facilities	Short tons	Waste Management of Antelope Valley for proxy data in 2009 & City of Palmdale	Local Government Operations Protocol
Other	Miscellaneous fuel consumption & equipment types for City equipment	Gallons	City of Palmdale	Local Government Operations Protocol
	Fuel consumption & equipment types for contracted landscaping services	Gallons	Rich Meier's Landscaping	Local Government Operations Protocol

BUILDING SECTOR

The building sector includes GHG emissions from energy consumption in facilities owned and operated by the City. The facilities included in this analysis include City Hall, the Public Works Maintenance Center, the Transportation Center, Hammack Activity Center, parks, and numerous other facilities (see **Table A2-2** and **Figure A2-1** in **Appendix 2**). Streetlights and traffic signals, and facilities associated with the treatment and conveyance of water, are analyzed separately.

Similar to community-wide energy data, Southern California Edison (SCE) and Southern California Gas Company (SoCal Gas Co.) provided data for all City facilities that consume energy.⁷ Natural gas coefficients are provided by the SoCal Gas Co. and the California Energy Commission (CEC).⁸ SCE did not provide a confirmed coefficient factor; therefore the confirmed ARB and CEC Grid Average emissions coefficient was used.

VEHICLE FLEET

This sector includes gasoline, diesel, and compressed natural gas consumption from all departments in the City operating vehicles, including Administration, Heritage Airpark, Parks and Recreation, Public Safety, Public Works, the library, and SAVES (refer to **Tables A2-3** and **A2-4** and **Figures A2-2** and **A2-3** in **Appendix 2**).

⁷ Respectively: Chris Coronel, 10 August 2010; and Colby Morrow, 24 November 2009.

⁸ California Air Resources Board 2008.

Appendix I: Community-Wide and City Government Operations Greenhouse Gas Emissions Inventory

Fuel consumption by vehicle type for each department was provided by the City. Emissions coefficients for gasoline and diesel vehicles in Los Angeles County was calculated by Tom Scheffelin of the California Air Resources Board (ARB) using ARB's vehicle emissions model, EMFAC2007 (ARB 2009).⁹ Emissions coefficients for compressed natural gas vehicles were provided by the Local Government Operations Protocol v1.0.¹⁰

EMPLOYEE COMMUTE

This sector includes GHG emissions from City employees traveling to and from work in 2005. The estimate is based on a November 2009 online survey conducted by the City (a blank version is included as **Figure A2-4** in **Appendix 2**). Approximately 136 employees responded to the survey with usable information, meaning that all essential questions were answered, for an approximate 55% response rate, the results of which were applied to the City employment total for 2005.

The online survey found that most City employees travel to and from work alone by car. Employees were asked how many days of the week they travel by each commute mode, including driving alone (which includes motorcycles), carpooling, vanpooling, public transit, bicycling, walking, telecommuting, and other. These figures for commute mode were combined with each respondent's travel distance to work, car model (if any), and fuel type (if any). The results yield vehicle miles traveled (VMT) annually per vehicle type and fuel type (see **Tables A2-5** and **A2-6** in **Appendix 2**). These VMT numbers were then adjusted for the total employee population in 2005 and entered into the CACP software to obtain CO₂e.

STREETLIGHTS AND TRAFFIC SIGNALS

Information regarding the electricity consumed by City streetlights and traffic signals in calendar year 2005 was provided by SCE. Consistent with energy consumption data for buildings and facilities and community-wide electricity consumption, the ARB and CEC Grid Average emissions coefficient was used. The City has over 12,000 streetlights and traffic signals. This Inventory accounts for all traffic signals and streetlights included in the 118 service accounts for which SCE provided records.

WATER

This category includes energy use for the City's miscellaneous pumps and irrigation facilities that are necessary to convey water to serve all city residents and maintain City facilities. This data was provided by SCE. The ARB and CEC Grid Average emissions coefficient was used.

WASTE

Waste generated by City operations was calculated using proxy data from the year 2009 provided by Sandra Pursley of Waste Management of Antelope Valley.¹¹ Data for waste generated in 2005 was not available; therefore it was calculated using the proxy data from 2009 and information from the City and Sandra Pursley about changes in the frequency of waste service, the size of waste bins, changes in City facilities, and changes in employee count. This sector only includes emissions from waste generated by

⁹ Tom Scheffelin, ARB (tscheffe@arb.ca.gov).

¹⁰ California Air Resources Board 2008.

¹¹ Sandra Pursley, Waste Management of Antelope Valley (SPursley@wm.com).

Appendix I: Community-Wide and City Government Operations Greenhouse Gas Emissions Inventory

City operations at City facilities and does not include the total emissions from the Antelope Valley Public Landfill. A default methane capture rate of 75% provided by the Local Government Operations Protocol was used. The CACP software calculates the methane expected to be released from this landfilled waste over the course of its lifetime.

Unlike other sectors analyzed, the emissions from waste disposed of in 2005 will occur over multiple years as the waste breaks down over time. This category includes only those emissions generated by waste produced at City operations and does not include the total emissions released from the Antelope Valley Public Landfill; waste generated in other jurisdictions will be accounted for in the baseline inventories of the communities responsible for the waste.

OTHER – MISCELLANEOUS EQUIPMENT

The “other” category encompasses emissions from miscellaneous equipment such as general service equipment and contracted landscaping services. Fuel consumption by equipment and fuel type was provided by the City and Rich Meier’s Landscaping.¹² Emissions from miscellaneous City equipment were analyzed outside of the CACP software using the California Air Resources Board protocol for inventorying local GHGs. Emissions were then put into the CACP software in the “other” category, which allows for direct inputs when CACP automation is not feasible.

IV. INVENTORY FORECAST

COMMUNITY-WIDE BUSINESS-AS-USUAL FORECAST

To illustrate the potential GHG emissions growth in the community based on projected trends in energy use, driving habits, job growth, and population growth from the baseline year going forward, the Inventory provides a GHG emissions forecast for the year 2020 and year 2035. The year 2020 is consistent with the State of California GHG Inventory forecast year and Assembly Bill (AB) 32 target.¹³ The year 2035 is consistent with SCAG’s regional projections. Forecasts also allow for the assessment of the effectiveness of various reduction strategies in the CAP. Forecasting is completed by adjusting baseline levels of emissions consistent with household, population, and transportation growth.

The basis for all growth scenarios is a “business-as-usual” projection. A business-as-usual (BAU) projection identifies how GHG emissions will increase if behaviors and efficiencies do not change from baseline levels, yet population, households, and vehicle miles traveled continue to increase. Under a business-as-usual scenario, the City of Palmdale’s emissions will grow by approximately 22.8% by the year 2020 to 1,164,395 metric tons CO₂e. By 2035, emissions will grow by approximately 50.2% to 1,424,679 metric tons CO₂e. The results of the forecast are shown in **Table 7** and **Figure 5** below. This forecast assumes growth projections created by the City for jobs, housing, and population.¹⁴

¹² Bonnie Hernandez, Rich Meier’s Landscaping (rmlandscape@verizon.net).

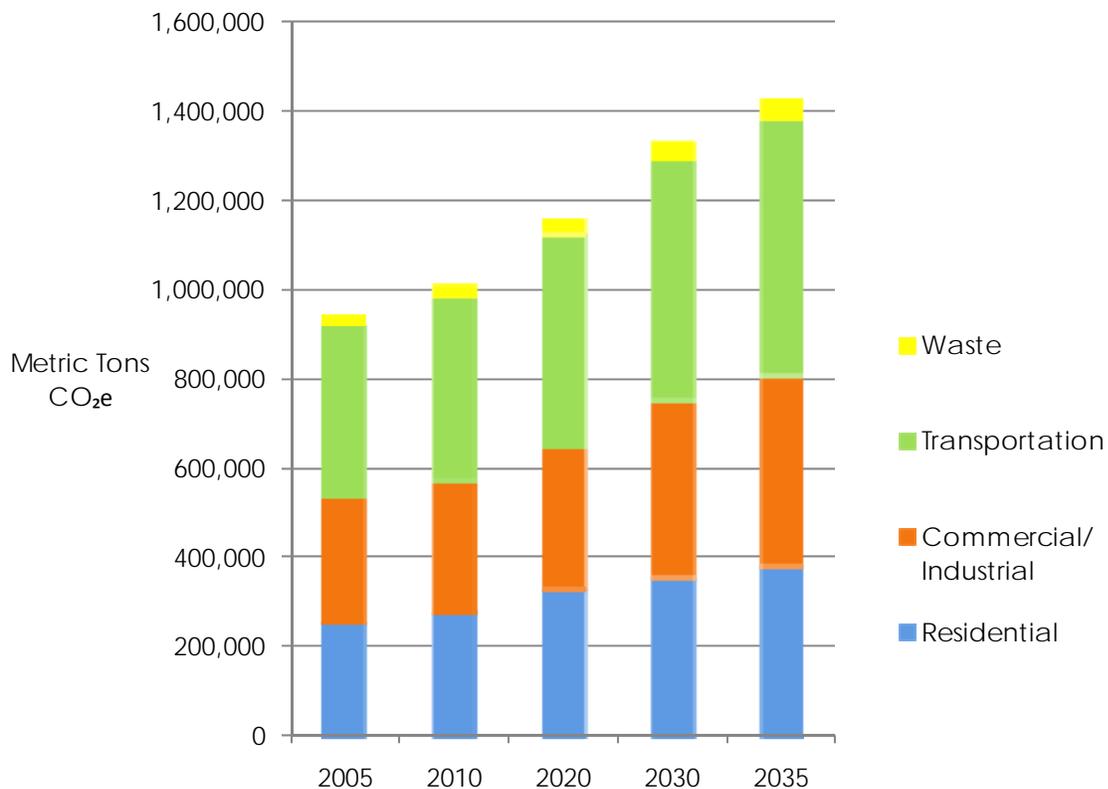
¹³ California Greenhouse Gas Inventory, <http://www.arb.ca.gov/cc/inventory/inventory.htm>.

¹⁴ City projections are for 2020 and 2030, based on the latest City traffic model update that was completed in January 2007 using EAVTAM 3 model. Updated figures provided by Marc Zuber, GIS Analyst, in an email to Ben Lucha dated November 5, 2009. Projections for 2020 and 2030 were completed by the City assuming linear growth from 2005 to achieve buildout. PMC completed forecasts for 2035 assuming the Compound Average Growth Rate (CAGR) for the City’s 2020 and 2030 projections.

Table 7: Business-As-Usual Projected Growth in Community-Wide Emissions, 2005–2035 (Metric Tons CO₂e)

Sector		2005	2010	2020	2035
Residential	Electricity	141,015	153,872	183,207	210,400
	Natural Gas	115,198	125,701	149,666	171,880
Commercial/Industrial	Electricity	204,976	214,132	233,685	311,392
	Natural Gas	77,648	81,117	88,524	117,960
Transportation	VMT	382,013	413,493	474,527	572,006
Waste	Landfilled Tons	27,408	29,667	34,786	41,039
TOTAL		948,258	1,017,982	1,164,395	1,424,679
% Change from 2005		0.0%	7.4%	22.8%	50.2%

Figure 5: Business-As-Usual Projected Growth in Community-Wide Emissions, 2005–2035



ADJUSTED COMMUNITY-WIDE FORECAST WITH STATE ACTIONS

State-led or state-induced reduction strategies included in the AB 32 Scoping Plan are accounted for in the adjusted business-as-usual forecast. This includes all State of California actions that are approved, programmed, and/or adopted. These programs require no additional local action. Incorporating them

Appendix I: Community-Wide and City Government Operations Greenhouse Gas Emissions Inventory

into the forecast and reduction assessment provides a more accurate picture of future emissions growth and the responsibility of local governments once state measures to reduce GHG emissions have been implemented. A brief description of each of these items is provided below. The impact of these actions on the BAU forecast is shown in **Table 8**. Additional detail is shown in **Table AI-5** and **AI – 7** in **Appendix I**

Table 8: Comparison of Business-as-Usual Growth in Community-Wide Emissions with State Actions

	2005	2010	2020	2035
Growth Projection (MTCO ₂ e)	948,258	1,017,982	1,164,395	1,424,679
BAU Percentage Change from 2005	n/a	7.4%	22.8%	50.2%
Pavley I Reductions (MTCO ₂ e)	n/a	n/a	-76,156	-156,531
LCFS (MTCO ₂ e)	n/a	n/a	-39,837	-41,548
RPS Reductions (MTCO ₂ e)	n/a	-736	-36,687	-92,879
CalGreen 2008 Title 24 Reductions (MTCO ₂ e)	n/a	n/a	-14,336	-43,394
Total State Reductions (MTCO ₂ e)	n/a	-736	-167,016	-334,352
Adjusted Growth Projection (MTCO ₂ e)	948,258	1,017,246	997,379	1,090,327
Percentage Change from 2005 with Adjusted Forecast	n/a	7.28%	5.18%	14.98%

Assembly Bill 1493 (Pavley), signed into law in 2002, will require carmakers to reduce GHG emissions from new passenger cars and light trucks beginning in 2011. Regulations were adopted by the California Air Resources Board (ARB). It is expected that new vehicles sold in California will create an average of 16% fewer GHG emissions than current models.

Low Carbon Fuel Standard. The State is proposing to reduce the carbon intensity of transportation fuels consumed in California through a Low Carbon Fuel Standard (LCFS) being developed by ARB. Standards would reduce the carbon intensity of California's transportation fuels by at least 10% by 2020 and 20% by 2035 as called for by Governor Schwarzenegger in Executive Order S-01-07.

Renewable Portfolio Standard. Established in 2002 in Senate Bill 1078, the Renewable 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 26% renewable sources by 2020, 33% by 2030, and 35% by 2035.¹⁵

Title 24 (CalGreen) – 2008 Standards. The 2008 Title 24 update went into effect on January 1, 2010. The energy reductions quantified in the forecast are the mandatory improvements over the 2005

¹⁵ California Public Utilities Commission 2009.

Appendix I: Community-Wide and City Government Operations Greenhouse Gas Emissions Inventory

Title 24 code that were established by the 2010 update. These are statewide standards applied at the local level by city agencies through project review. The revamped CalGreen standards that go into effect January 1, 2011, do not provide additional mandatory reductions in energy consumption that can be quantified as an anticipated alteration to business-as-usual trends; rather, CalGreen establishes optional tiers for enhanced energy efficiency and conservation that can be implemented at the discretion of local governments.

AB 32 establishes an emissions reduction target of 15% below 2005 levels by 2020, which is consistent with the State’s direction to local governments in the AB 32 Scoping Plan. Executive Order S-3-05 calls for a target reduction of 80% below 1990 levels by 2050. The chart below (**Figure 6**) provides a comparison of the business-as-usual forecasts for 2020 and 2035 to the 2005 baseline year and reduction targets. The chart also depicts the challenge that Palmdale will face meeting its reduction target. Emissions will continue to increase along the business-as-usual scenario while reduction efforts are initiated. Achieving the target is therefore more than a 15% decrease; rather, it is an 30.8% reduction from 2020 emissions levels, or business as usual, in Palmdale. By 2035, the gap between future growth and target reduction levels increases to 70.1%. Once state reductions are accounted for, the reduction necessary at the local level to achieve targets drops to 19.2% below the adjusted business-as-usual forecast by 2020 and 60.9% below the adjusted business-as-usual forecast by 2035. **Figure 6** demonstrates projected increases and the total emissions reductions that will be necessary to achieve City targets. Reduction targets and the changes in emission levels required to achieve them are detailed further in **Table 9**.

Figure 6: GHG Forecast in Relation to Reduction Targets

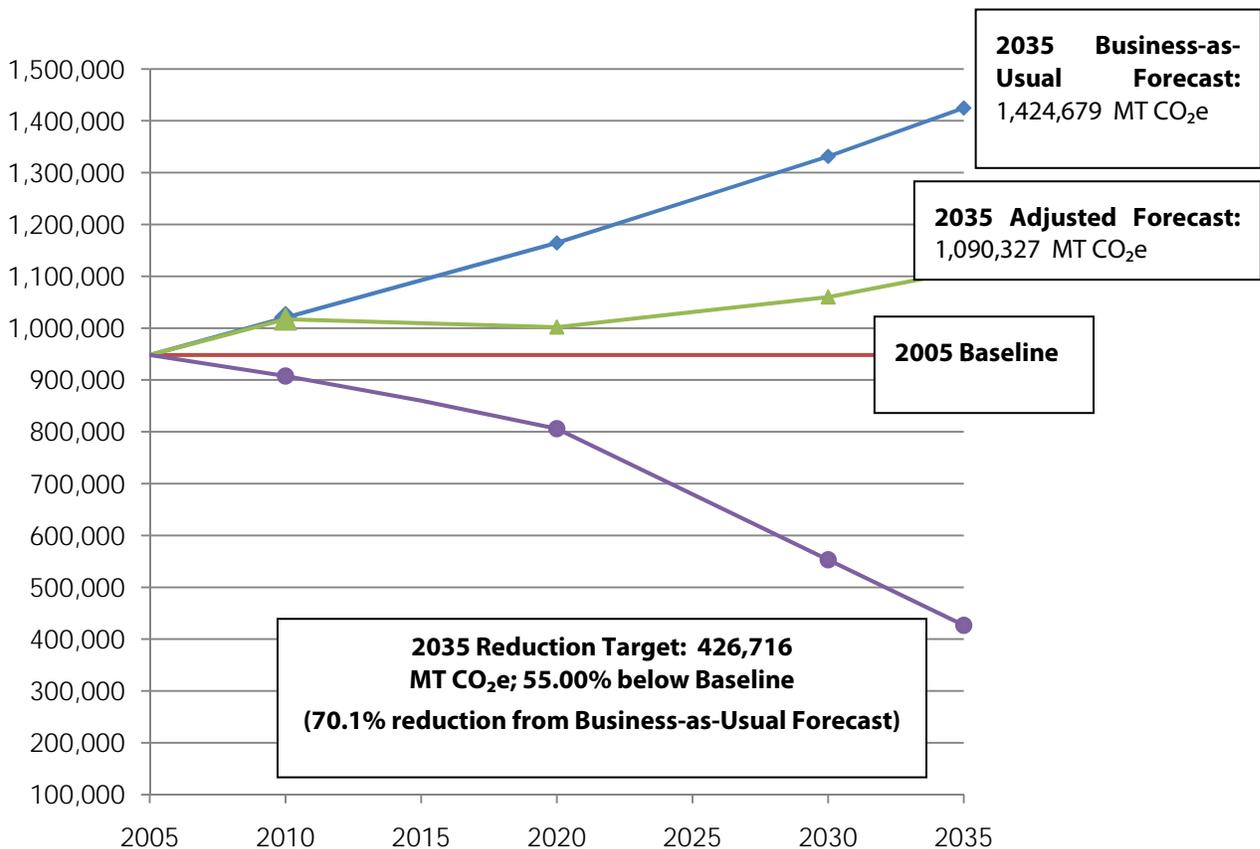


Table 9: Comparison of Business-As-Usual and Adjusted Forecasts to Reduction Targets

	2020	2035
Percentage reduction goal from baseline – target	15.00%	55.0%
Equivalent target in MTCO ₂ e	806,019	426,716
Local % reduction from BAU forecast to achieve target	-30.8%	-70.1%
Local reduction needed from BAU forecast (MTCO ₂ e) to achieve target	-358,376	-997,962
Local reduction needed from adjusted forecast (MTCO ₂ e) to achieve target	-191,360	-663,611
Local % reduction needed from adjusted BAU to achieve target	-19.2%	-60.9%
% contribution of state actions to targets	-11.6%	-9.2%

MUNICIPAL FORECAST

To depict municipal GHG emissions growth for the forecast years 2020 and 2035, existing trends, planned expansions, and levels of service were taken into account to create a municipal business-as-usual forecast. Municipal forecasts and reductions will be captured within the umbrella of community-wide reductions. All changes in municipal emission trends will ultimately feed into achievement of community-wide targets and will be credited as community-wide progress toward reduction goals, yet forecasting City emissions over time helps the City to better understand the impact of municipal efforts to reduce GHG emissions.

Numerous factors informed municipal forecasts. The 2009 10-Year Capital Improvement Plan yielded the basis for the expansion of facilities. In general, the size of municipal facilities was correlated with energy consumption and waste generation to determine rates of change. City services were expected to expand proportional to population growth, which was translated into increased emissions from the City fleet and employee commute. Emissions from the vehicle fleet account for planned fleet expansion and anticipated improvements in vehicle fuel efficiency. Emissions from water delivery and equipment are not expected to change significantly, as existing facilities and equipment are sized to meet future needs. As shown in **Table 10**, forecasts show emissions from City government operations increasing by approximately 42% by 2035.

Figure 7: City Government Operations Emissions Forecast

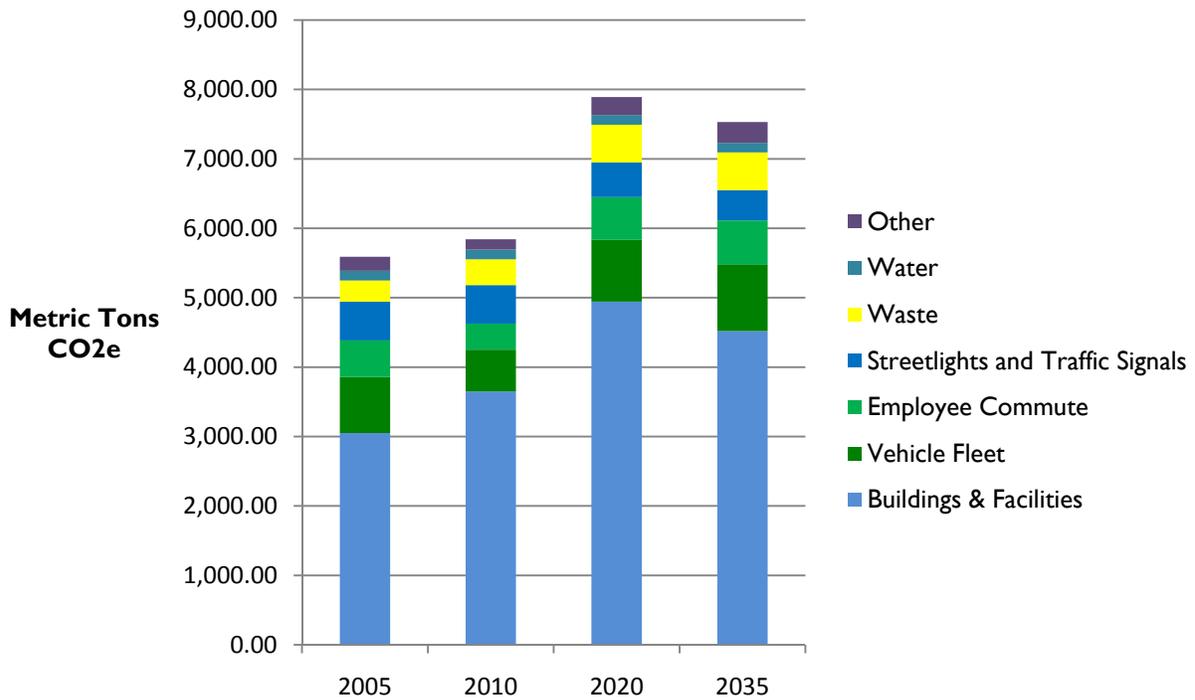


Table 10: City Government Operations Emissions by Sector, Metric Tons CO₂e

Sector	2005	2010	2020	2035	% Change from 2005
Buildings & Facilities	3,051	3,652	5,018	4,666	52.9%
Vehicle Fleet	806	603	1,046	1,203	49.2%
Employee Commute	528	375	617	630	19.4%
Streetlights and Traffic Signals	558	557	509	458	-17.8%
Waste	306	371	543	543	77.5%
Water	139	139	127	117	-15.5%
Other	201	150	261	300	49.2%
Total	5,589	5,846	8,121	7,918	41.7%
Percentage Change from Baseline	0	4.6%	45.3%	41.7%	

V. CONCLUSION AND NEXT STEPS

The Inventory is an important milestone for the City in assessing and mitigating its impact on climate change from both government operations and activities within the community at large. The Inventory yields data that will shape the development of the Climate Action Plan. Data calculated in the Inventory forms the foundation of the Climate Action Plan and provides a justifiable basis for the City's analysis of its impact on climate change.

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APPENDIX I: DETAILED EMISSIONS BY SECTOR FROM COMMUNITY-WIDE ACTIVITIES

CITY OF PALMDALE GHG INVENTORY SUMMARY MEMO

COMMUNITY-WIDE BASELINE EMISSIONS

Table AI-1: Summary of Community-Wide Emissions by Sector

2005 Baseline Greenhouse Gas Emissions	Metric Tons CO ₂ e	Percentage of Total
Residential	256,213	27.0%
Commercial/Industrial	282,624	29.8%
Transportation	382,013	40.3%
Waste	27,408	2.9%
Total	948,258	100.0%

Table AI-2: Transportation Emissions by Road Type

Sector	Emissions Source	Input Data	Emissions Output (MTCO ₂ e/year)
Highway	Vehicle Miles Traveled (Annual VMT)	151,119,125	83,953
Local Road	Vehicle Miles Traveled (Annual VMT)	589,334,110	298,060
Total		740,453,235	382,013

Table AI-3: Energy Use and the Built Environment: Consumption and Emissions by Sector and Source

Sector	Emissions Source	Input Data	Emissions Output (MTCO ₂ e/year)	% of Total Energy Emissions	% of Total Energy Emissions by Sector
Residential	Electricity	322,994,683	141,015	26.2%	47.5%
	Natural Gas	21,534,879	115,198	21.4%	
Commercial/Industrial	Electricity	469,497,353	204,976	38.0%	52.5%
	Natural Gas	14,562,268	77,648	14.4%	
Total			538,837	100.0%	100.0%

Figure AI-1: Energy Use and the Built Environment: Consumption and Emissions by Sector and Source

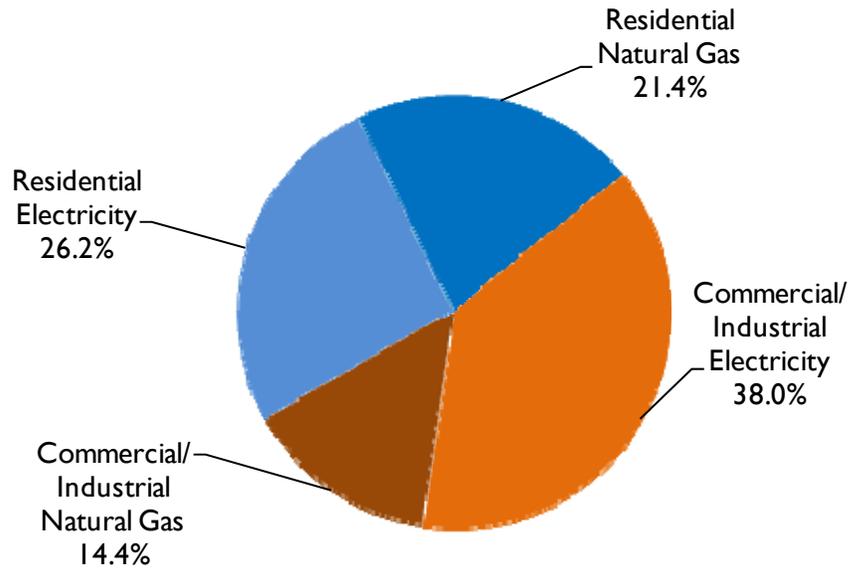


Table AI-4: Waste by Landfill

Emissions Source (Landfill)	Input Data (Tons Landfilled)	Emissions Output (MTCO ₂ e/year)	% of Total Waste Emissions
Antelope Valley	145,379	26,520	96.76%
Azusa Land Reclamation	478	87	0.32%
Bradley Landfill	7	1	0.00%
Chiquita Canyon	23	4	0.02%
Lancaster Landfill	4,193	765	2.79%
Nu-Way Arrow	24	4	0.02%
Nu-Way Live Oak	126	23	0.08%
Puente Hills	19	3	0.01%
Sunshine Canyon	3	0	0.00%
Total	150,251	27,408	100.00%

*Note: totals may not yield 100% due to rounding.

Table AI-5: Forecast Transportation Reductions

GHG Emissions Summary			Pavley I Emissions Reduction		
Year	Annual VMT	Total MTCO ₂ e	Year	Emissions Reduction (MTCO ₂ e)	
2005	740,453,235	382,013	2020	-76,156	
2020	919,773,127	474,527	2035	-156,531	
2035	1,108,715,809	1,108,715,809			
LCFS Emissions Reduction					
Year	Emissions Reduction (MTCO ₂ e)				
2020	-39,837				
2035	-41,548				
Transportation GHG Emissions Summary with Pavley I & LCFS					
Year	Total MT CO ₂ e				
2005	n/a				
2020	358,541				
2035	373,928				

Notes: Calculates the percentage change from state actions from EMFAC Post-Processor Tool and apply to City's emissions for passenger cars and light-duty trucks. Low Carbon Fuel Standard reductions were applied to City's emissions after Pavley I was applied.

Table AI-6: State Reduction Summary

	2005	2010	2020	2035
Growth Projection (MTCO ₂ e)	948,258	1,017,982	1,164,395	1,424,679
BAU Percentage Change from 2005	n/a	7.4%	22.8%	50.2%
Pavley I Reductions (MTCO ₂ e)	n/a	n/a	-76,156	-156,531
LCFS (MTCO ₂ e)	n/a	n/a	-39,837	-41,548
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Adjusted Growth Projection (MTCO ₂ e)	948,258	1,017,246	997,379	1,090,327
Percentage Change from 2005 with Adjusted Forecast	n/a	7.28%	5.18%	14.98%

Notes:

Senate Bill 1078, the Renewable Portfolio Standard (RPS), requires electricity providers to increase the portion of energy that comes from renewable sources to 20% by 2010 and to 33% by 2020.

- 16.1% of Southern California Edison's energy mix qualified under the Renewable Portfolio Standard in 2006 (California Public Utilities Commission 2008).
- 17.4% of Southern California Edison's energy mix qualified under the Renewable Portfolio Standard by the end of 2009 (California Public Utilities Commission 2010).
- According to a report by the California Public Utilities Commission in June 2009, it is clear that the state will not reach 33% by 2020. A more realistic estimate of renewable energy in 2020, according to the report, is 26% by 2020. Assumes 33% by 2030 and 35% by 2035, according to the report's projections.

Title 24 forecasts:

- All energy increases between base and forecast years is due to new building construction. Residential energy increases are separated by single-family and multi-family based on the percentage of single-family households in the jurisdiction and a factor for the lower energy consumption in multi-family homes. According to the CEC 2009 California Residential Appliance Saturation Study, multi-family homes use 51.6% of the electricity and 67.2% of the natural gas of single-family homes (California Energy Commission 2010).
- The AB 32 Scoping Plan calls for a triennial update to Title 24. To be conservative, we estimate that updated Title 24 Standards will become effective every four years in 2010 (current version), 2014, 2018, and 2022. This analysis does not take into consideration any updates past 2022 due to lack of certainty.
- Past updates to Title 24 have shown equal if not higher increases in efficiency as a result of the update. To be conservative, calculation estimates that each update to the Title 24 Standards will have 70% of the effectiveness of the 2008 vs. 2005 standards.
- The energy impact of 2008 Title 24 Standards for nonresidential alterations is modeled. Future updates to nonresidential alteration standards are not taken into consideration for lack of data and certainty.
- Per the California Energy Commission Impact Analysis (2007), nonresidential facilities are anticipated to be renovated once every 20 years.

APPENDIX 2: DETAILED EMISSIONS BY SECTOR FROM GOVERNMENT OPERATIONS

CITY OF PALMDALE GHG INVENTORY SUMMARY MEMO

Table A2-1: Municipal Emissions by Sector

2006 Municipal Emissions by Sector	Buildings & Facilities	Vehicle Fleet	Employee Commute	Street-lights & Traffic Signals	Water	Solid Waste	Other	Total
CO ₂ e (metric tons)	3,051	806	528	558	139	306	201	5,589
Percentage of Total CO ₂ e	43.3%	14.4%	7.5%	7.9%	2.0%	4.3%	2.9%	100.0%
Energy Use (MMBtu)	32,757	13,010	7,662	4,360	1,089	n/a	n/a	58,878

Table A2-2: Buildings & Facilities Electricity & Natural Gas Emissions

2005 Municipal Emissions by Sector	Electricity	Natural Gas	Total
CO ₂ e (metric tons)	2,233	818	3,051
Percentage of Total MT CO ₂ e	73.2%	26.8%	100.0%
Energy Use (kWh or therms)	5,044,254 kWh	153,110 therms	32,757

Figure A2-1: Buildings & Facilities Electricity & Natural Gas Emissions

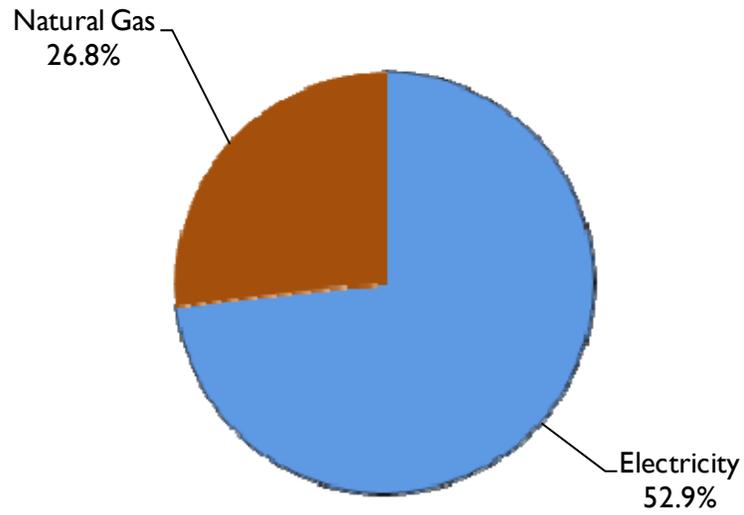


Table A2-3: Vehicle Fleet Fuel Consumption

Emissions by Fuel Type	Gallons	% of Total Gallons	CO₂e (metric tons)	% of Total CO₂e (metric tons)
Gasoline	57,468	59.64%	546	67.74%
Diesel	35,496	36.84%	256	31.76%
CNG	3,400	3.53%	4	0.50%
Total	96,364	100.00%	2,262	100.00%

Figure A2-2: Vehicle Fleet Fuel Combustion by Fuel Type (Gallons)

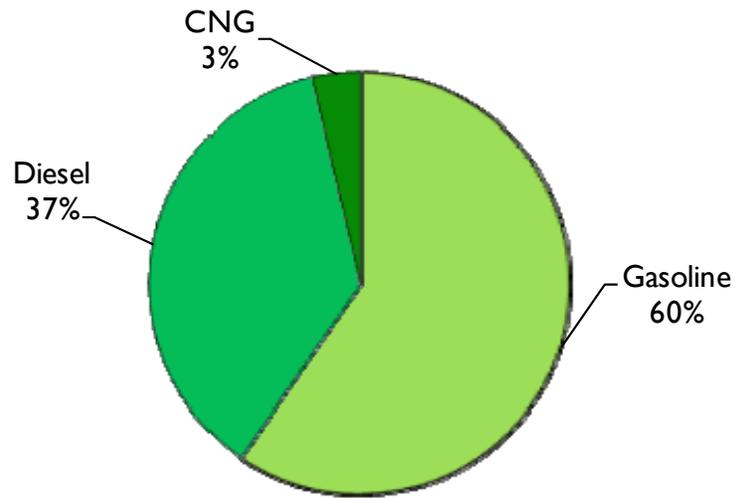


Figure A2-3: Vehicle Fleet Fuel Emissions by Fuel Type (MT CO₂e)

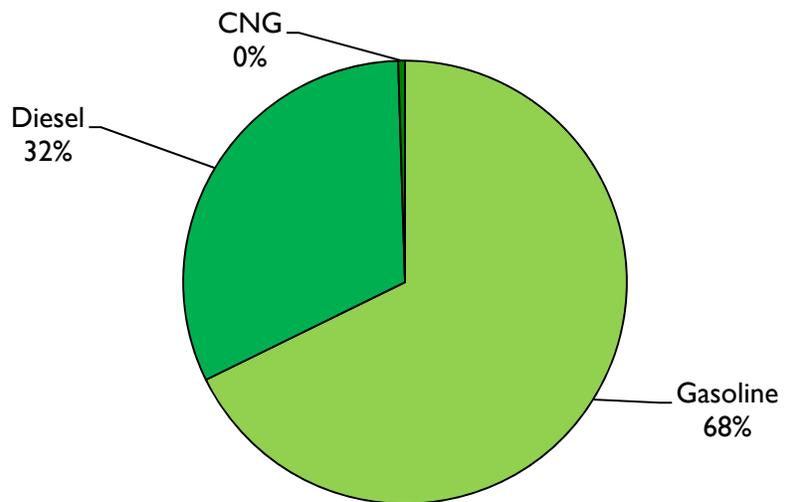


Table A2-4: Fuel Combustion for Vehicle Fleet, Employee Commute, and Miscellaneous & Contracted Equipment

Fuel Type	Fuel (gallons)	CO ₂ e metric tons/year	% of Total CO ₂ e metric tons
Gas	3,061	1,058	68.93%
Diesel	16,140	473	30.81%
Propane	21	1,460	0.26%
Total	19,222	1,535	100.00%

Figure A2-3: Fuel Combustion for Vehicle Fleet, Employee Commute, and Miscellaneous & Contracted Equipment

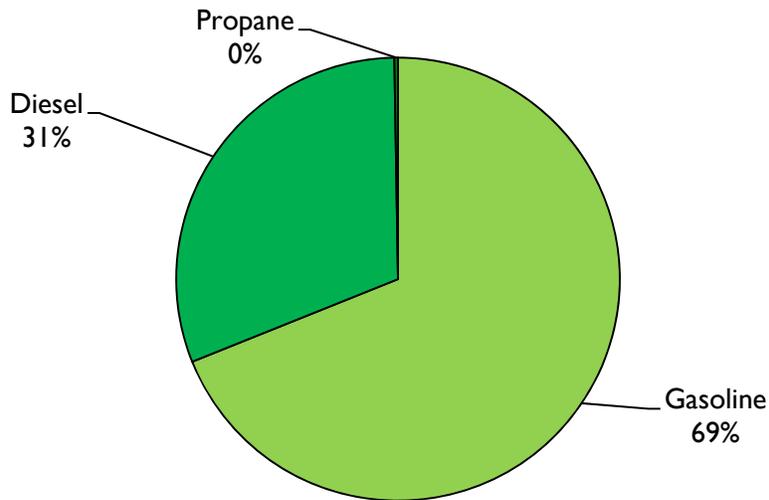


Table A2-5: Commute Survey Responses

	Days Traveled by Commute Mode	% of Total
Drive Alone	29,012	95.2%
Carpool	939	3.1%
Vanpool	470	1.5%
Public Transit	0	0.0%
Bicycle	0	0.0%
Walk	52	0.2%
Telecommute	0	0.0%
Other	0	0.0%
Total	30,473	100.0%

Table A2-6: Adjusted VMT from Employee Commute Survey Responses

Vehicle Group	Fuel Type	2009 Sample Annual VMT	Adjusted 2006 Annual VMT for Employee Population
Passenger Car/Light-Duty Truck	Gasoline	466,689.34	624,150.32
	Diesel	10,761.60	14,392.56
	Hybrid	1,793.60	2,398.76
Mid-Size Truck/SUV	Gasoline	143,102.38	191,385.12
	Hybrid	0.00	0.00
	Diesel	0.00	0.00
Large Truck/SUV	Gasoline	52,193.76	69,803.93
	Diesel	44,391.60	59,369.33
Total		718,932.28	961,500.02

Figure A2-4: Employee Commute Survey Questions

1. What is your approximate one-way distance to work (in miles)? Please indicate the most direct distance to work, discounting midway destinations that would be taken whether or not you drove to work each day (i.e., dropping off children at school).

2. Please indicate the type of transportation you take to work each day in your average work week. Please note that there are two types of carpooling.

	Day 1	Day 2	Day 3	Day 4	Day 5
Drive alone	_____	_____	_____	_____	_____
Carpool with fellow City employees	_____	_____	_____	_____	_____
Carpool with other drivers not employed by the City	_____	_____	_____	_____	_____
Vanpool	_____	_____	_____	_____	_____
Public transit	_____	_____	_____	_____	_____
Bicycle	_____	_____	_____	_____	_____
Walk	_____	_____	_____	_____	_____
Telecommute	_____	_____	_____	_____	_____
I do not work this day	_____	_____	_____	_____	_____
Other	_____	_____	_____	_____	_____

3. What type of vehicle do you drive?
 - Passenger Car, Small Truck/SUV/Pickup or Motorcycle (such as RAV4, Chev S10, Pickup (4 cylinder), PT Cruiser or similar)
 - Medium Size Truck/SUV/Pickup (Minivan, Sonoma Pickup Truck, Durango, Ford F150 or similar)
 - Large Truck/SUV/Pickup (Suburban, Expedition, Navigator, Ford E250/350/450 or similar)
 - I don't drive alone or drive a carpool

4. What type of fuel does your vehicle from Question 3 use?

- Gasoline
- Diesel
- Biodiesel
- Hybrid
- Electric
- I don't drive to work or drive a carpool
- Other

If you selected other, please specify

5. If you carpool or vanpool with fellow City employees, how many City employees ride with you? If you carpool with a different number each day, please indicate the average. If 'not applicable' please enter 0.

Community Greenhouse Gas Emissions in 2005**Detailed Report**

CO	N O	CH	Equiv CO	Energy		
2	2	4	2			
(tonnes)	(kg)	(kg)	(tonnes)	(%)(MMBtu)		

Residential**Palmdale, California***1 SoCal Gas Company - Residential*

Natural Gas	114,264	2,153	12,706	115,198	12.1	2,153,488
<i>Subtotal 1 SoCal Gas Company - Residential</i>	114,264	2,153	12,706	115,198	12.1	2,153,488

Source:

1. Natural gas consumption for 2005 provided by Colby L. Morrow, Air Quality Manager, Customer Programs Environmental Affairs, Southern California Gas Company and San Diego Gas and Electric Company.

Notes:

1. CEC Emissions Factor for Natural Gas - RCI Average Set. Default Fuel CO2 Set.

2 Southern California Edison - Residential

Electricity	140,426	1,612	4,249	141,015	14.9	1,102,371
<i>Subtotal 2 Southern California Edison - Residential</i>	140,426	1,612	4,249	141,015	14.9	1,102,371

Source:

1. Electricity consumption for 2005 provided by Southern California Edison on August 3, 2010, in a report entitled "Electricity Use Report for City of Palmdale Year 2005; Version 5.0".

Note:

1. The Residential category includes the DOMESTIC Rate Group, which is defined by Southern California Edison as including all residential service including lighting, heating, cooking, and power or combination thereof in a single-family accommodation; also to domestic farm service when supplied through the farm operator's domestic meter.
2. CARB average CO2e Factor for Electricity - CARB CEC California Grid Average. Default Set.

Subtotal Residential	254,690	3,765	16,954	256,213	27.0	3,255,859
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Commercial**Palmdale, California***1 SoCal Gas Company - Commercial*

Natural Gas	20,977	395	2,332	21,148	2.2	395,337
<i>Subtotal 1 SoCal Gas Company - Commercial</i>	20,977	395	2,332	21,148	2.2	395,337

Source:

1. Natural gas consumption for 2005 provided by Colby L. Morrow, Air Quality Manager, Customer Programs Environmental Affairs, Southern California Gas Company and San Diego Gas and Electric Company (CLMorrow@semprautilities.com).

Notes:

1. CEC Emissions Factor for Natural Gas - RCI Average Set. Default Fuel CO2 Set.

This report has been generated for Palmdale, California using ICLEI's Clean Air and Climate Protection 2009 Software.

Community Greenhouse Gas Emissions in 2005**Detailed Report**

CO	N O	CH	Equiv CO	Energy		
2	2	4	2			
(tonnes)	(kg)	(kg)	(tonnes)	(%)(MMBtu)		
<i>2 Southern California Edison - Com/Ind</i>						
Electricity	204,120	2,343	6,176	204,976	21.6	1,602,380
<i>Subtotal 2 Southern California Edison - Com/Ind</i>	<i>204,120</i>	<i>2,343</i>	<i>6,176</i>	<i>204,976</i>	<i>21.6</i>	<i>1,602,380</i>

Source:

1. Electricity consumption for 2005 provided by Southern California Edison on August 3, 2010, in a report entitled "Electricity Use Report for City of Palmdale Year 2005; Version 5.0".

Notes:

1. The Commercial/Industrial category includes the following Rate Groups identified by Southern California Edison:
 AG Tou (Time-of-Use Agricultural and Pumping - Demand Measured): Includes accounts where SCE determines that: 70% or more of the customer's electrical usage is for water pumping used for agricultural purposes, except where the customer's monthly Maximum Demand, is expected to exceed 500 kW or has exceeded 500 kW for any three months during the preceding 12 months. These accounts are time of use agricultural and pumping accounts that do not qualify for the TOU-PA-5 tariff.

GS-1 (General Service Non-Demand): Includes single- and three-phase general service including lighting and power, except that the customer whose monthly maximum demand, in the opinion of SCE, is expected to exceed 20 kW or has exceeded 20 kW in any three months during the preceding 12 months.

GS-2 (General Service - Demand): As of August 2006, includes single- and three-phase general service including lighting and power customers whose monthly maximum demand registers, or in the opinion of SCE is expected to register, above 20 kW and below 200 kW. In 2005, this rate group included customers with monthly maximum demands above 20 kW through 500 kW.

PA-1 (Power-Agricultural and Pumping Connected Load Basis): Includes accounts where SCE determines that 70% or more of the customer's electrical usage is for general agricultural purposes or for general water or sewerage pumping and none of any remaining electrical usage is for purposes for which a domestic schedule is applicable.

Street Lighting (Lighting - Street and Highway Company-Owned System): Includes service for the lighting of streets, highways, and publicly-owned and publicly-operated automobile parking lots which are open to the general public where SCE owns and maintains the street lighting equipment and associated facilities included under this schedule.

Tou-8 (Time of Use General Services - Large): Includes general service, lighting and power, except agricultural water pumping accounts. This Schedule is mandatory for all customers whose monthly maximum demand, in the opinion of SCE, is expected to exceed 500 kW or has exceeded 500 kW in any three months during the preceding 12 months.

2. CARB average CO₂e Factor for Electricity - CARB CEC California Grid Average. Default Set.

This report has been generated for Palmdale, California using ICLEI's Clean Air and Climate Protection 2009 Software.

Community Greenhouse Gas Emissions in 2005**Detailed Report**

CO	NO	CH	Equiv CO	Energy		
2	2	4	2			
(tonnes)	(kg)	(kg)	(tonnes)	(%)(MMBtu)		
Subtotal Commercial	225,097	2,738	8,508	226,124	23.8	1,997,717

Industrial**Palmdale, California***1 SoCal Gas Company - Industrial*

Natural Gas	56,291	481	2,839	56,500	6.0	1,060,890
<i>Subtotal 1 SoCal Gas Company - Industrial</i>	56,291	481	2,839	56,500	6.0	1,060,890

Source:

1. Natural gas consumption for 2005 provided by Colby L. Morrow, Air Quality Manager, Customer Programs Environmental Affairs, Southern California Gas Company and San Diego Gas and Electric Company.

Notes:

1. CEC Emissions Factor for Natural Gas - RCI Average Set. Default Fuel CO2 Set.

Subtotal Industrial	56,291	481	2,839	56,500	6.0	1,060,890
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Transportation**Palmdale, California***1 Community On-Road VMT*

Diesel 22,485	133	9,269	22,721	2.4438,431		
Gasoline	267,993	21,340	34,809	275,340	29.0	3,854,567
<i>Subtotal 1 Community On-Road VMT</i>	290,478	21,473	44,078	298,060	31.4	4,292,998

Sources:

1. Community on-road VMT within the City limits provided by the Southern California Association of Governments via email correspondence on 7/26/2010; Mana Sangkapichai [sangkapi@scag.ca.gov]

2. Vehicle composition provided by EMFAC v2/3, run by Tom Scheffelin, California Air Resources Board Planning and Technical Support Division [Tscheffe@arb.ca.gov] on 12/17/2009 and confirmed via email correspondence on 12/23/2009.

Notes:

1. Emissions factors for gas and diesel per vehicle class provided by EMFAC 2007 v2.3 run by Tom Scheffelin, California Air Resources Board Planning and Technical Support Division.

2. Contribution of each vehicle type to total VMT derived from EMFAC calculations completed by Tom Scheffelin, California Air Resources Board (tscheffe@arb.ca.gov). The contribution of each vehicle type to VMT was as follows:

- Gasoline: heavy duty vehicles alt. method 2.97%, light trucks alt. method 10.27%, passenger vehicles alt. method 81.70%.
- Diesel: heavy duty vehicles alt. method 4.61%, light trucks alt. method 0.04%, passenger vehicles alt. method 0.42%.

This report has been generated for Palmdale, California using ICLEI's Clean Air and Climate Protection 2009 Software.

Community Greenhouse Gas Emissions in 2005**Detailed Report**

CO	NO	CH	Equiv CO	Energy		
2	2	4	2			
(tonnes)	(kg)	(kg)	(tonnes)	(%)(MMBtu)		
<i>1 Community State Highway VMT</i>						
Diesel 7,136	43	2,782	7,208	0.81	39,156	
Gasoline	74,843	5,542	8,767	76,745	8.1	1,076,477
<i>Subtotal 1 Community State Highway VMT</i>	81,980	5,584	11,549	83,953	8.9	1,215,632

Sources:

1. Community State Highway VMT was provided by the Southern California Association of Governments via email correspondence on 7/26/2010; Mana Sangkapichai.
2. Vehicle composition provided by EMFAC v2/3, run by Tom Scheffelin, California Air Resources Board Planning and Technical Support Division via email correspondence.

Notes:

1. Emissions factors for gas and diesel per vehicle class provided by EMFAC 2007 v2.3 run by Tom Scheffelin, California Air Resources Board Planning and Technical Support Division.
2. Contribution of each vehicle type to total VMT derived from EMFAC calculations completed by Tom Scheffelin, California Air Resources Board (tscheffe@arb.ca.gov). The contribution of each vehicle type to VMT was as follows:
 - a. Gasoline: heavy duty vehicles alt. method 2.97%, light trucks alt. method 10.27%, passenger vehicles alt. method 81.70%.
 - b. Diesel: heavy duty vehicles alt. method 4.61%, light trucks alt. method 0.04%, passenger vehicles alt. method 0.42%.

Subtotal Transportation	372,458	27,057	55,627	382,013	40.3	5,508,630
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Waste**Palmdale, California**

<i>3 Antelope Valley Public Landfill</i>	<i>Disposal Method - Managed Landfill</i>					
Paper Products	0	0	705,015	14,805	1.6	
Food Waste	0	0	276,495	5,806	0.6	
Plant Debris	0	0	74,194	1,558	0.2	
Wood or Textiles	0	0	207,134	4,350	0.5	
<i>Subtotal 3 Antelope Valley Public Landfill</i>	0	0	1,262,839	26,520	2.8	

Sources:

1. Total waste tonnage for the City in 2005 provided by Los Angeles County Department of Public Works (<http://dpw.lacounty.gov/swims/reports/predefined_master.asp?Action=RELOAD&rpt=23>).

Notes:

1. Waste type data not collected by landfill. Percentages of waste share by type for landfill tonnage provided by CalRecycle (formerly CIWMB) 2004 Statewide Waste Characterization Study for residential, commercial, and self haul waste (<http://www.calrecycle.ca.gov/WasteChar/WasteStudies.htm>).
2. Default methane capture rate from the Local Government Operations Protocol was utilized for all landfills (75%).

This report has been generated for Palmdale, California using ICLEI's Clean Air and Climate Protection 2009 Software.

Community Greenhouse Gas Emissions in 2005**Detailed Report**

CO	NO	CH	Equiv CO	Energy	
2	2	4	2		
(tonnes)	(kg)	(kg)	(tonnes)	(%)(MMBtu)	
<i>3 Azusa Land Reclamation. Disposal Method - Managed Landfill</i>					
Paper Products	0	0	2,316	49	0.0
Food Waste	0	0	908	19	0.0
Plant Debris	0	0	244	5	0.0
Wood or Textiles	0	0	680	14	0.0
<i>Subtotal 3 Azusa Land Reclamation</i>	<i>0</i>	<i>0</i>	<i>4,149</i>	<i>87</i>	<i>0.0</i>

Sources

1. Total waste tonnage for the City in 2005 provided by Los Angeles County Department of Public Works (http://dpw.lacounty.gov/swims/reports/predefined_master.asp?Action=RELOAD&rpt=23).

Notes:

1. Waste type data not collected by landfill. Percentages of waste share by type for landfill tonnage provided by CIWMB 2004 Statewide Waste Characterization Study for residential, commercial, and self haul waste (<http://www.ciwmb.ca.gov/Publications/default.asp?pubid=1097>).
2. Default methane capture rate from the Local Government Operations Protocol was utilized for all landfills (75%).

3 Bradley Landfill & Recycling Center. Disposal Method - Managed Landfill

Paper Products	0	0	33	1	0.0
Food Waste	0	0	13	0	0.0
Plant Debris	0	0	4	0	0.0
Wood or Textiles	0	0	10	0	0.0
<i>Subtotal 3 Bradley Landfill & Recycling Center</i>	<i>0</i>	<i>0</i>	<i>60</i>	<i>1</i>	<i>0.0</i>

Sources:

1. Total waste tonnage for the City in 2005 provided by Los Angeles County Department of Public Works (http://dpw.lacounty.gov/swims/reports/predefined_master.asp?Action=RELOAD&rpt=23).

Notes:

1. Waste type data not collected by landfill. Percentages of waste share by type for landfill tonnage provided by CIWMB 2004 Statewide Waste Characterization Study for residential, commercial, and self haul waste (<http://www.ciwmb.ca.gov/Publications/default.asp?pubid=1097>).
2. Default methane capture rate from the Local Government Operations Protocol was utilized for all landfills (75%).

3 Chiquita Canyon Landfill. Disposal Method - Managed Landfill

Paper Products	0	0	112	2	0.0
Food Waste	0	0	44	1	0.0
Plant Debris	0	0	12	0	0.0
Wood or Textiles	0	0	33	1	0.0
<i>Subtotal 3 Chiquita Canyon Landfill</i>	<i>0</i>	<i>0</i>	<i>201</i>	<i>4</i>	<i>0.0</i>

Sources:

1. Total waste tonnage for the City in 2005 provided by Los Angeles County Department of Public Works (<http://dpw.lacounty.gov/swims/reports/predefined_master.asp?Action=RELOAD&rpt=23>).

Notes:

1. Waste type data not collected by landfill. Percentages of waste share by type for landfill tonnage provided by CIWMB 2004 Statewide Waste

Characterization Study for residential, commercial, and self haul waste (<http://www.ciwmb.ca.gov/Publications/default.asp?pubid=1097>).

2. Default methane capture rate from the Local Government Operations Protocol was utilized for all landfills (75%).

This report has been generated for Palmdale, California using ICLEI's Clean Air and Climate Protection 2009 Software.

Community Greenhouse Gas Emissions in 2005**Detailed Report**

CO	NO	CH	Equiv CO	Energy	
2	2	4	2		
(tonnes)	(kg)	(kg)	(tonnes)	(%)(MMBtu)	
<i>3 Lancaster Landfill. Disposal Method - Managed Landfill</i>					
Paper Products	0	0	20,334	427	0.0
Food Waste	0	0	7,975	167	0.0
Plant Debris	0	0	2,140	45	0.0
Wood or Textiles	0	0	5,974	125	0.0
<i>Subtotal 3 Lancaster Landfill</i>	<i>0</i>	<i>0</i>	<i>36,423</i>	<i>765</i>	<i>0.1</i>

Sources:

1. Total waste tonnage for the City in 2005 provided by Los Angeles County Department of Public Works (<http://dpw.lacounty.gov/swims/reports/predefined_master.asp?Action=RELOAD&rpt=23>).

Notes:

1. Waste type data not collected by landfill. Percentages of waste share by type for landfill tonnage provided by CIWMB 2004 Statewide Waste Characterization Study for residential, commercial, and self haul waste (<http://www.ciwmb.ca.gov/Publications/default.asp?pubid=1097>).
2. Default methane capture rate from the Local Government Operations Protocol was utilized for all landfills (75%).

3 Nu-Way Arrow Reclamation, Inc. 1270 Arrow Highway. Disposal Method - Managed Landfill

Paper Products	0	0	116	2	0.0
Food Waste	0	0	46	1	0.0
Plant Debris	0	0	12	0	0.0
Wood or Textiles	0	0	34	1	0.0
<i>Subtotal 3 Nu-Way Arrow Reclamation, Inc. 1270 Arrow Highway</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>208</i>	<i>4 0.0</i>

Sources:

1. Total waste tonnage for the City in 2005 provided by Los Angeles County Department of Public Works (<http://dpw.lacounty.gov/swims/reports/predefined_master.asp?Action=RELOAD&rpt=23>).

Notes:

1. Waste type data not collected by landfill. Percentages of waste share by type for landfill tonnage provided by CIWMB 2004 Statewide Waste Characterization Study for residential, commercial, and self haul waste (<http://www.ciwmb.ca.gov/Publications/default.asp?pubid=1097>).
2. Default methane capture rate from the Local Government Operations Protocol was utilized for all landfills (75%).

This report has been generated for Palmdale, California using ICLEI's Clean Air and Climate Protection 2009 Software.

Community Greenhouse Gas Emissions in 2005**Detailed Report**

CO	NO	CH	Equiv CO	Energy	
2	2	4	2		
(tonnes)	(kg)	(kg)	(tonnes)	(%)(MMBtu)	
<i>3 Nu-Way Live Oak Reclamation, Inc. 13620 Live Oak Lane. Disposal Method - Managed Landfill</i>					
Paper Products	0	0	611	13	0.0
Food Waste	0	0	240	5	0.0
Plant Debris	0	0	64	1	0.0
Wood or Textiles	0	0	180	4	0.0
<i>Subtotal 3 Nu-Way Live Oak Reclamation, Inc. 13620 Live Oak Lane</i>	0	0	0	1,095	23 0.0

Sources:

1. Total waste tonnage for the City in 2005 provided by Los Angeles County Department of Public Works (<http://dpw.lacounty.gov/swims/reports/predefined_master.asp?Action=RELOAD&rpt=23>).

Notes:

1. Waste type data not collected by landfill. Percentages of waste share by type for landfill tonnage provided by CIWMB 2004 Statewide Waste Characterization Study for residential, commercial, and self haul waste (<http://www.ciwmb.ca.gov/Publications/default.asp?pubid=1097>).
2. Default methane capture rate from the Local Government Operations Protocol was utilized for all landfills (75%).

3 Puente Hills Landfill. Disposal Method - Managed Landfill

Paper Products	0	0	91	2	0.0
Food Waste	0	0	36	1	0.0
Plant Debris	0	0	10	0	0.0
Wood or Textiles	0	0	27	1	0.0
<i>Subtotal 3 Puente Hills Landfill</i>	0	0	163	3	0.0

Sources:

1. Total waste tonnage for the City in 2005 provided by Los Angeles County Department of Public Works (<http://dpw.lacounty.gov/swims/reports/predefined_master.asp?Action=RELOAD&rpt=23>).

Notes:

1. Waste type data not collected by landfill. Percentages of waste share by type for landfill tonnage provided by CIWMB 2004 Statewide Waste Characterization Study for residential, commercial, and self haul waste (<http://www.ciwmb.ca.gov/Publications/default.asp?pubid=1097>).
2. Default methane capture rate from the Local Government Operations Protocol was utilized for all landfills (75%).

3 Sunshine Canyon County Landfill. Disposal Method - Managed Landfill

Paper Products	0	0	13	0	0.0
Food Waste	0	0	5	0	0.0
Plant Debris	0	0	1	0	0.0
Wood or Textiles	0	0	4	0	0.0
<i>Subtotal 3 Sunshine Canyon County Landfill</i>	0	0	23	0	0.0

Sources:

1. Total waste tonnage for the City in 2005 provided by Los Angeles County Department of Public Works (<http://dpw.lacounty.gov/swims/reports/predefined_master.asp?Action=RELOAD&rpt=23>).

Notes:

1. Waste type data not collected by landfill. Percentages of waste share by type for landfill tonnage provided by CIWMB 2004 Statewide Waste

Characterization Study for residential, commercial, and self haul waste (<http://www.ciwmb.ca.gov/Publications/default.asp?pubid=1097>).

2. Default methane capture rate from the Local Government Operations Protocol was utilized for all landfills (75%).

This report has been generated for Palmdale, California using ICLEI's Clean Air and Climate Protection 2009 Software.

Community Greenhouse Gas Emissions in 2005**Detailed Report**

CO	NO	CH	Equiv CO	Energy	
2	2	4	2		
(tonnes)	(kg)	(kg)	(tonnes)	(%)(MMBtu)	
Subtotal Waste	0	0	1,305,160	27,408	2.9
Total	908,536	34,041	1,389,089	948,258	100.0
11,823,096					

This report has been generated for Palmdale, California using ICLEI's Clean Air and Climate Protection 2009 Software.

3/16/2011

Government Greenhouse Gas Emissions in 2005

Detailed Report

CO	N O	CH	Equiv CO	Energy	Cost
2	2	4	2		
(tonnes)	(kg)	(kg)	(tonnes)	(%)(MMBtu)	(\$)
Buildings and Facilities					
Palmdale, California					
<i>1 & 2 Chimbole Cultural Center</i>					
Electricity 34,178	110	1	3	110 2.0	862
Natural Gas 4,946	12	0	1	12 0.2	233
<i>Subtotal 1 & 2 Chimbole Cultural Center</i> 39,124	122	1	5	123 2.2	1,095
<i>1 & 2 City Facility at 39101 3rd Street E</i>					
Electricity 23,685	74	1	2	74 1.3	578
Natural Gas 2,653	11	0	1	11 0.2	205
<i>Subtotal 1 & 2 City Facility at 39101 3rd Street E</i> 26,338	84	1	3	85 1.5	783
<i>1 & 2 City Hall, Administration</i>					
Electricity 24,330	205	2	6	205 3.7	1,606
Natural Gas 1,651	7	0	1	7 0.1	133
<i>Subtotal 1 & 2 City Hall, Administration</i> 25,980	212	2	7	213 3.8	1,739
<i>1 & 2 Courson Park Buildings & Palmdale Playhouse</i>					
Electricity 39,884	100	1	3	101 1.8	789
Natural Gas 2,523	12	0	1	12 0.2	231
<i>Subtotal 1 & 2 Courson Park Buildings & Palmdale Playhouse</i> 113 1	4	113	2.0	1,020	42,408
<i>1 & 2 Courson Park Maintenance Building</i>					
Electricity 1,332	8	0	0	8 0.1	64
Natural Gas 224	0	0	0	0 0.0	9
<i>Subtotal 1 & 2 Courson Park Maintenance Building</i> 9 0	0	9	0.2	73	1,555
<i>1 & 2 Courthouse (Palmdale Institute of Technology)</i>					
Electricity 20,697	59	1	2	59 1.1	464
Natural Gas 3,841	19	0	2	19 0.3	360

Subtotal 1 & 2 Courthouse (Palmdale Institute of Technology)

78 1	4	79	1.4	824	24,538
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1 & 2 Dry Town Water Park

Electricity 13,354	35	0	1	35	0.6 275
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Natural Gas 1,580	6	0	1	6	0.1 120
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<i>Subtotal 1 & 2 Dry Town Water Park</i> 14,934	41	1	2	42	0.7 395
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1 & 2 Hammack Activity Center

Electricity 41,404	139	2	4	140	2.5 1,092
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Natural Gas 1,886	9	0	1	9	0.2 163
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<i>Subtotal 1 & 2 Hammack Activity Center</i> 43,291	148	2	5	148	2.7 1,255
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1 & 2 Main Library

Electricity 32,714	105	1	3	106	1.9 825
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Natural Gas 1,745	7	0	1	7	0.1 137
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<i>Subtotal 1 & 2 Main Library</i> 34,460	112	1	4	113	2.0 962
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Detailed Report

CO	NO	CH	Equiv CO	Energy	Cost
2	2	4	2		
(tonnes)	(kg)	(kg)	(tonnes)	(%)(MMBtu)	(\$)
<i>1 & 2 McAdam Park</i>					
Electricity 49,550	136	2	4	137 2.4	1,068
Natural Gas 10,597	62	1	7	63 1.1	1,170
<i>Subtotal 1 & 2 McAdam Park</i> 60,146	198	3	11	199 3.6	2,238
<i>1 & 2 Palmdale Oasis Park Recreation Center</i>					
Electricity 52,703	173	2	5	174 3.1	1,360
Natural Gas 2,206	9	0	1	9 0.2	174
<i>Subtotal 1 & 2 Palmdale Oasis Park Recreation Center</i> 182 2	6	183	3.3	1,534 54,909	
<i>1 & 2 Palmdale Senior Center</i>					
Electricity 18,067	49	1	1	49 0.9	385
Natural Gas 1,605	7	0	1	7 0.1	126
<i>Subtotal 1 & 2 Palmdale Senior Center</i> 19,672	56	1	2	56 1.0	511
<i>1 & 2 Palmdale Transportation Center</i>					
Electricity 27,918	94	1	3	95 1.7	741
Natural Gas 2,060	9	0	1	9 0.2	166
<i>Subtotal 1 & 2 Palmdale Transportation Center</i> 29,978	103	1	4	104 1.9	907
<i>1 & 2 Parks and Recreation</i>					
Electricity 16,708	48	1	1	48 0.9	376
Natural Gas 861	4	0	0	4 0.1	69
<i>Subtotal 1 & 2 Parks and Recreation</i> 17,569	52	1	2	52 0.9	445
<i>1 & 2 Personnel / Public Safety / Families in Action</i>					
Electricity 5,890	36	0	1	36 0.7	285
Natural Gas 1,598	7	0	1	7 0.1	130
<i>Subtotal 1 & 2 Personnel / Public Safety / Families in Action</i> 414 7,488		43	1	2 43	0.8
<i>1 & 2 Public Works Maintenance Center</i>					

Electricity 22,443	74	1	2	75	1.3	583
Natural Gas 124	0	0	0	0	0.0	0
<i>Subtotal 1 & 2 Public Works Maintenance Center</i> 22,568	74	1	2	75	1.3	583
<i>1 & 2 South Antelope Valley Emergency Services (S.A.V.E.S.) Suite I</i>						
Electricity 1,161	7	0	0	7	0.1	57
Natural Gas 621	2	0	0	2	0.0	45
<i>Subtotal 1 & 2 South Antelope Valley Emergency Services (S.A.V.E.S.) Suite I</i>						
10 0	0	10	0.2	102	1,782	
<i>1 & 2 Youth Library</i>						
Electricity 23,711	79	1	2	79	1.4	618
Natural Gas 1,466	6	0	1	6	0.1	117
<i>Subtotal 1 & 2 Youth Library</i> 25,176	85	1	3	85	1.5	735

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CO	N O	CH	Equiv CO	Energy	Cost
2	2	4	2		
(tonnes)	(kg)	(kg)	(tonnes)	(%)(MMBtu)	(\$)
<i>1 Boulders at the Lake</i>					
Natural Gas 87,037	590	11	66	595 10.6	11,123
<i>Subtotal 1 Boulders at the Lake</i> 87,037	590	11	66	595 10.6	11,123
<i>1 City Hall, Council Chambers, City Clerk/Attorney, Finance & Information</i>					
Natural Gas 6,301	30	1	3	31 0.5	571
<i>Subtotal 1 City Hall, Council Chambers, City Clerk/Attorney, Finance & Information</i>					
30 1	3	31	0.5	571 6,301	
<i>1 Heritage Airpark</i>					
Natural Gas 463	2	0	0	2 0.0	30
<i>Subtotal 1 Heritage Airpark</i> 463	2	0	0	2 0.0	30
<i>2 1817 E Ave Q Suite A10</i>					
Electricity 306	1	0	0	1 0.0	8
<i>Subtotal 2 1817 E Ave Q Suite A10</i> 306	1	0	0	1 0.0	8
<i>2 1817 E Ave Q Suite A11</i>					
Electricity 329	1	0	0	1 0.0	8
<i>Subtotal 2 1817 E Ave Q Suite A11</i> 329	1	0	0	1 0.0	8
<i>2 19123 E Spanish Broom</i>					
Electricity 401	2	0	0	2 0.0	14
<i>Subtotal 2 19123 E Spanish Broom</i> 401	2	0	0	2 0.0	14
<i>2 2001 E Avenue P</i>					
Electricity 4,830	8	0	0	8 0.1	62
<i>Subtotal 2 2001 E Avenue P</i> 4,830	8	0	0	8 0.1	62
<i>2 346 W Technology</i>					
Electricity 410	2	0	0	2 0.0	13
<i>Subtotal 2 346 W Technology</i> 410	2	0	0	2 0.0	13
<i>2 38237 Sierra Highway</i>					
Electricity 2,036	6	0	0	6 0.1	47

<i>Subtotal 2 38237 Sierra Highway</i> 2,036	6	0	0	6	0.1	47
<i>2 38315 9th St E</i>						
Electricity 8,241	24	0	1	24	0.4	186
<i>Subtotal 2 38315 9th St E</i> 8,241	24	0	1	24	0.4	186
<i>2 38602 3rd St E</i>						
Electricity 221	1	0	0	1	0.0	6
<i>Subtotal 2 38602 3rd St E</i> 221	1	0	0	1	0.0	6
<i>2 38613 N Sierra Highway</i>						
Electricity 2,554	8	0	0	8	0.1	61
<i>Subtotal 2 38613 N Sierra Highway</i> 2,554	8	0	0	8	0.1	61
<i>2 4044 E Ave S</i>						
Electricity 310	1	0	0	1	0.0	5
<i>Subtotal 2 4044 E Ave S</i> 310	1	0	0	1	0.0	5

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CO	N O	CH	Equiv CO	Energy	Cost
2	2	4	2		
(tonnes)	(kg)	(kg)	(tonnes)	(%)(MMBtu)	(\$)
<i>2 41041 50th St W</i>					
Electricity 286	1	0	0	1 0.0	8
<i>Subtotal 2 41041 50th St W</i> 286	1	0	0	1 0.0	8
<i>2 808 E Palmdale Blvd</i>					
Electricity 225	0	0	0	0 0.0	4
<i>Subtotal 2 808 E Palmdale Blvd</i> 225	0	0	0	0 0.0	4
<i>2 949 E Avenue Q-10</i>					
Electricity 217	1	0	0	1 0.0	6
<i>Subtotal 2 949 E Avenue Q-10</i> 217	1	0	0	1 0.0	6
<i>2 Boulders at the Ranch MHP</i>					
Electricity 1,646	5	0	0	5 0.1	38
<i>Subtotal 2 Boulders at the Ranch MHP</i> 1,646	5	0	0	5 0.1	38
<i>2 Boulders at the Ranch MHP - Space 359</i>					
Electricity 13,739	48	1	1	48 0.9	374
<i>Subtotal 2 Boulders at the Ranch MHP - Space 359</i> 13,739	48	1	1	48 0.9	374
<i>2 Chamber of Commerce</i>					
Electricity 242	1	0	0	1 0.0	6
<i>Subtotal 2 Chamber of Commerce</i> 242	1	0	0	1 0.0	6
<i>2 Courson Park</i>					
Electricity 231	0	0	0	0 0.0	2
<i>Subtotal 2 Courson Park</i> 231	0	0	0	0 0.0	2
<i>2 Development Services</i>					
Electricity 56,143	186	2	6	186 3.3	1,458
<i>Subtotal 2 Development Services</i> 56,143	186	2	6	186 3.3	1,458
<i>2 Domenic Massari Park</i>					
Electricity 33,954	108	1	3	108 1.9	845

<i>Subtotal 2 Domenic Massari Park</i> 33,954	108	1	3	108	1.9	845
<i>2 Joshua Hills Park Fieldhouse</i>						
Electricity 255	1	0	0	1	0.0	5
<i>Subtotal 2 Joshua Hills Park Fieldhouse</i> 255	1	0	0	1	0.0	5
<i>2. Manzanita Heights Parkfield House</i>						
Electricity 1,016	6	0	0	6	0.1	47
<i>Subtotal 2 Manzanita Heights Parkfield House</i> 1,016	6	0	0	6	0.1	47
<i>2 Marie Kerr Park - 02</i>						
Electricity 9,495	32	0	1	32	0.6	247
<i>Subtotal 2 Marie Kerr Park - 02</i> 9,495	32	0	1	32	0.6	247

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Government Greenhouse Gas Emissions in 2005**Detailed Report**

CO	NO	CH	Equiv CO	Energy	Cost
2	2	4	2		
(tonnes)	(kg)	(kg)	(tonnes)	(%)(MMBtu)	(\$)
<i>2 Marie Kerr Park - 03</i>					
Electricity 4,611	9	0	0	9 0.2	72
<i>Subtotal 2 Marie Kerr Park - 03</i> 4,611	9	0	0	9 0.2	72
<i>2 Marie Kerr Park - 04</i>					
Electricity 11,413	36	0	1	36 0.6	280
<i>Subtotal 2 Marie Kerr Park - 04</i> 11,413	36	0	1	36 0.6	280
<i>2 Marie Kerr Park - 05</i>					
Electricity 10,420	28	0	1	28 0.5	221
<i>Subtotal 2 Marie Kerr Park - 05</i> 10,420	28	0	1	28 0.5	221
<i>2 Marie Kerr Park 39700 30th St W</i>					
Electricity 35,789	97	1	3	98 1.7	762
<i>Subtotal 2 Marie Kerr Park 39700 30th St W</i> 35,789	97	1	3	98 1.7	762
<i>2 Palmdale Records Center</i>					
Electricity 4,211	13	0	0	13 0.2	102
<i>Subtotal 2 Palmdale Records Center</i> 4,211	13	0	0	13 0.2	102
<i>2 Public Works Maintenance Center</i>					
Electricity 16,333	51	1	2	51 0.9	400
<i>Subtotal 2 Public Works Maintenance Center</i> 16,333	51	1	2	51 0.9	400
<i>2 Public Works Storage Facility</i>					
Electricity 848	5	0	0	5 0.1	37
<i>Subtotal 2 Public Works Storage Facility</i> 848	5	0	0	5 0.1	37
<i>2 SAVES Suite H</i>					
Electricity 2,239	11	0	0	11 0.2	87
<i>Subtotal 2 SAVES Suite H</i> 2,239	11	0	0	11 0.2	87
<i>2 Worksource</i>					
Electricity 257	1	0	0	1 0.0	6

<i>Subtotal 2 Worksource</i> 257	1	0	0	1	0.0	6
Subtotal Buildings and Facilities 808,921	3,035	41	158	3,051	54.6	32,755

Sources:

1. Southern California Gas Co. data for CY 2005 provided by Colby L. Morrow, Air Quality Manager, Customer Programs Environmental Affairs, Southern California Gas Company and San Diego Gas and Electric Company.
2. Southern California Edison data for 12 calendar months falling in 2005 provided by Denise C. Russo, Program-Project Analyst, Southern California Edison.
3. Identification of City facilities and square footage provided by Michael Gass [mgass@cityofpalmdale.org], Department of Public Works - City of Palmdale, and Benjamin Lucha, Department of Public Works - City of Palmdale.

Notes:

1. CEC Emissions Factor for Natural Gas - RCI Average Set. Default Fuel CO2 Set.
2. CARB average CO2e Factor for Electricity - CARB CEC California Grid Average. Default Set.
3. Assumed that all charges to 38300 Sierra Highway Suite D included charges to 38300 Sierra Highway Suite B, C, and D; whereas it was assumed that all charges to 38300 Sierra Highway Suite A included only charges to Suite A; based on a correlation between total energy usage and square footage of each Suite.

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Government Greenhouse Gas Emissions in 2005

Detailed Report

CO	N O	CH	Equiv CO	Energy	Cost
2	2	4	2		
(tonnes)	(kg)	(kg)	(tonnes)	(%)(MMBtu)	(\$)
Streetlights & Traffic Signals					
Palmdale, California					
<i>2 Palmdale Streetlights</i>					
Electricity 64,616	392	4	12	394 7.0	3,077
<i>Subtotal 2 Palmdale Streetlights</i> 64,616	392	4	12	394 7.0	3,077
<i>2 Palmdale Traffic Controls</i>					
Electricity 31,839	163	2	5	164 2.9	1,283
<i>Subtotal 2 Palmdale Traffic Controls</i> 31,839	163	2	5	164 2.9	1,283
4,360	Subtotal Streetlights & Traffic Signals 96,455	555	6	17 558	10.0

Sources:

1. Southern California Edison data for 12 calendar months falling in 2005 provided by Denise C. Russo, Program-Project Analyst, Southern California Edison.

2. Parking lot facilities, where lighting was the primary electricity use, were identified on the city's website: http://www.cityofpalmdale.org/community/park_ride.html

Notes:

1. CARB average CO2e Factor for Electricity - CARB CEC California Grid Average. Default Set.

Water Delivery Facilities

Palmdale, California

2 37008 Fallon PI Pump

Electricity
180

0	0	0	0	0 0.0	0
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Subtotal 2 37008 Fallon PI Pump
180

0	0	0	0	0 0.0	0
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2 38226 10th St E

Electricity
9,473

99	1	3	99	1.8	777
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Subtotal 2 38226 10th St E
9,473

99	1	3	99	1.8	777
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2 5602 E Ave R Pump

Electricity
4,519

15	0	0	16	0.3	122
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Subtotal 2 5602 E Ave R Pump
4,519

15	0	0	16	0.3	122
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2 Marie Kerr Park Irrigation

Electricity
518

0	0	0	0	0.0	0
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Subtotal 2 Marie Kerr Park Irrigation
518

0	0	0	0	0.0	0
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2 Miscellaneous Water District Charges

Electricity 50,061	1	0	0	1	0.0	9
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<i>Subtotal 2 Miscellaneous Water District Charges</i> 50,061	1	0	0	1	0.0	9
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2 Pelona Vista Park Irrigation

Electricity 8,156	21	0	1	21	0.4	167
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<i>Subtotal 2 Pelona Vista Park Irrigation</i> 8,156	21	0	1	21	0.4	167
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Government Greenhouse Gas Emissions in 2005

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CO	NO	CH	Equiv CO	Energy	Cost
2	2	4	2		
(tonnes)	(kg)	(kg)	(tonnes)	(%)(MMBtu)	(\$)
<i>2 Poncitlan Square</i>					
Electricity 398	2	0	0	2 0.0	14
<i>Subtotal 2 Poncitlan Square</i> 398	2	0	0	2 0.0	14
<i>2 Pump Sierra/RR</i>					
Electricity 202	0	0	0	0 0.0	0
<i>Subtotal 2 Pump Sierra/RR</i> 202	0	0	0	0 0.0	0
Subtotal Water Delivery Facilities 73,507	139	2	4	140 2.5	1,091

Sources:

1. Southern California Edison data for 12 calendar months falling in 2005 provided by Denise C. Russo, Program-Project Analyst, Southern California Edison

Notes:

1. CARB average CO2e Factor for Electricity - CARB CEC California Grid Average. Default Set.
2. Accounts that were unidentifiable by facility were listed by address

Solid Waste Facilities

Palmdale, California

3 Municipal Solid Waste

Carbon Dioxide 0	306	0	0	306 5.5	0
<i>Subtotal 3 Municipal Solid Waste</i> 0	306	0	0	306 5.5	0
Subtotal Solid Waste Facilities 0	306	0	0	306 5.5	0

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CO	NO	CH	Equiv CO	Energy	Cost
2	2	4	2		
(tonnes)	(kg)	(kg)	(tonnes)	(%)(MMBtu)	(\$)

Sources:

1. Municipal waste data provided by Benjamin Lucha Department of Public Works - City of Palmdale, and Sandra Pursley, Waste Management of Antelope Valley. Employee figures for 2009 and 2005 provided by Benjamin Lucha.
2. Conversion factors based on guidance from National Recycling Coalition Measurement Standards and Reporting Guidelines; EPA; FEEO and CalRecycle (formerly CIWMB) 2006, as provided by as provided by CalRecycle 2010 (<http://www.calrecycle.ca.gov/Search/default.asp?q=solid+waste+conversion+factors&cx=017557373779849962485%3Aerv3s56gka0&cof=FORID%3A10&ie=UTF-8#961>).
3. Percentages of waste share by type for landfill tonnage provided by CalRecycle (formerly CIWMB) 2004 Statewide Characterization Study (<http://www.calrecycle.ca.gov/WasteChar/WasteStudies.htm>).
4. Default methane capture rate of 75% provided by Local Government Operations Protocol v. 1.0.

Notes:

1. Municipal waste data was only available for 2009. The following adjustments were made to back-cast for 2005:
 - a. Eliminated waste generated at Dry Town Water Park at one of the accounts at 3850 S Avenue S. It opened in 2006 (per Benjamin Lucha).
 - b. In addition to Dry Town Water Park, one facility was opened and one closed - therefore, no adjustments for these changes, as changes were assumed to balance out (per Benjamin Lucha).
 - c. Yard bins were converted into tons, assuming 225 lbs of waste per yard bins (CalRecycle 2010), and the frequency of pick-up for each bin (provided by Sandra Pursley of Waste Management of Antelope Valley). Accounts for bins being partially full.
 - d. Aggregate waste in 2009 was converted into a ratio per employee per year (17.92 tons), using figures provided by Benjamin Lucha. Employee count includes full and part time employees, the composition of which remained relatively stable from 2005 to 2009: in 2005, 59% of employees were part time; in 2009 57% of employees were part time. In 2009, the City employed 582 employees (249 full time and 333 part time); in 2005, the City employed 831 employees (333 full time and 498 part time).
 - e. Waste ratio in 2009 was applied to total employees in 2005 to determine total waste in 2005. This accounts for the increased amount of employees in 2005. Applying the 2009 waste per employee ratio assumes that the ratio of waste generated by employee remains constant.
 - f. All municipal waste is collected in 19 bins at City facilities. Includes bins at Palmdale City Hall, Chimbole Cultural Center, Manzanita Park, Joshua Park, Palmdale Oasis Park Recreation Center, Engineering Department, Hammock Center, Senior Center, Metrolink, Maintenance Yard, Desert Sands, McAdam Park, Pony League, Palmdale Playhouse, and Courson Park.
2. All recent changes to the frequency of waste pick up or the amount of bins noted by Sandra Pursley (of Waste Management of Antelope Valley) for the service year of 2009 were assumed to take place after the baseline year, 2005.
3. Palmdale's waste was received by 11 landfills; therefore, the default methane capture rate was utilized.
4. Average weight of one yard bin was assumed to be 225 lbs, accounting for the average fullness (CalRecycle 2010).
5. Waste Type data not collected by landfill. State average waste characterization data is used for residential, commercial and self haul waste. Percentages of waste share by type for landfill tonnage provided by CalRecycle (formerly CIWMB) 2004 Statewide Waste Characterization Study (<http://www.calrecycle.ca.gov/WasteChar/WasteStudies.htm>).

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2	2	4	2		
(tonnes)	(kg)	(kg)	(tonnes)	(%)(MMBtu)	(\$)

Vehicle Fleet

Unless otherwise noted, all vehicle sources are provided with the sector summary.

Palmdale, California

1 Administration

Gasoline 0	1	0	0	1	0.0	12
<i>Subtotal 1 Administration</i> 0	1	0	0	1	0.0	12

1 Contracted Landscaping Truck

Gasoline 0	3	0	0	3	0.1	44
<i>Subtotal 1 Contracted Landscaping Truck</i> 0	3	0	0	3	0.1	44

1 Employee Travel

Gasoline 0	31	3	3	32	0.6	452
<i>Subtotal 1 Employee Travel</i> 0	31	3	3	32	0.6	452

Sources:

1. Auto mileage provided by Benjamin Lucha [blucha@cityofpalmdale.org], Department of Public Works - City of Palmdale.

Note(s):

1. Auto mileage includes employee travel that took place for the 2006/2007 fiscal year. Due to unavailability of accurate travel data for the 2005 calendar year, accurate data from the 2006/2007 fiscal year was used as a proxy. There were no major changes to the travel policy during the 2006/2007 fiscal year in comparison to 2005, nor were there major changes in staff size.
2. Auto mileage includes travel by City van and shuttle. Travel by City van constituted approximately 5% of all auto mileage (1,514 miles), and travel by shuttle constituted approximately 1% of all auto mileage (294 miles). Due to lack of sufficient data about the number of carpoolers and type of vehicle for van and shuttle trips, trips were assumed to be general auto trips.
3. Auto mileage assumed to have occurred in gasoline passenger cars (alt. method).
4. Emissions coefficients for Los Angeles County provided by EMFAC calculations completed by Tom Scheffelin, California Air Resources Board (tscheffe@arb.ca.gov).
-Air mileage was not included, due to insufficient data on jet types, total passengers, or other appropriate assumptions for each trip to accurately attribute jet emissions to Palmdale employees.

1 Heritage Airpark

Diesel 1	0	0	1	0.0	11	0
Gasoline 0	0	0	0	0	0.0	6
<i>Subtotal 1 Heritage Airpark</i> 0	1	0	0	1	0.0	17

1 Library

Diesel 7	0	3	7	0.1	141	0
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<i>Subtotal 1 Library</i>	7	0	3	7	0.1	141
0						
<i>1 Parks and Recreation</i>						
Gasoline	7	1	1	7	0.1	95
0						
<i>Subtotal 1 Parks and Recreation</i>	7	1	1	7	0.1	95
0						
<i>1 Public Safety</i>						
Diesel 1	0	0	1	0.0	11	0
Gasoline	19	1	1	19	0.3	266
0						
<i>Subtotal 1 Public Safety</i>	19	1	1	19	0.3	277
0						

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Government Greenhouse Gas Emissions in 2005

Detailed Report

CO	N O	CH	Equiv CO	Energy	Cost
2	2	4	2		
(tonnes)	(kg)	(kg)	(tonnes)	(%)(MMBtu)	(\$)
<i>1 Public Works</i>					
Diesel 244	1	104	247	4.4 4,759	0
Gasoline 0	466	45	29	480 8.6	6,697
<i>Subtotal 1 Public Works</i> 0	710	47	132	727 13.0	11,456
<i>1 South Antelope Valley Emergency Services (S.A.V.E.S.)</i>					
Gasoline 0	4	1	0	4 0.1	62
<i>Subtotal 1 South Antelope Valley Emergency Services (S.A.V.E.S.)</i> 4 1	0	4	0.1	62	0
<i>1 Public Works Compressed Natural Gas Vehicles</i>					
Carbon Dioxide	4	0	0	4 0.1	
<i>Subtotal 1 Public Works Compressed Natural Gas Vehicles</i>		4	0	0 4	0.1
<i>1 Library Compressed Natural Gas Vehicle</i>					
Carbon Dioxide	0	0	0	0 0.0	
<i>Subtotal 1 Library Compressed Natural Gas Vehicle</i> 0	0	0	0	0 0.0	
Subtotal Vehicle Fleet 0	787	52	141	806 14.4	12,557

Source:

1. David Reader (dreader@cityofpalmdale.org), Fleet Maintenance Supervisor - City of Palmdale - Public Works Maintenance. Provided in an email communication dated 1/222010 to Jennifer Venema, Michael Gass, and Benjamin Lucha.

Notes:

1. Gasoline and diesel emissions calculated using model year emissions factors in CACP.

2. Emissions calculated using Local Government Operations v1.1 protocols for alternative vehicles based on vehicle mileage and cubic feet of natural gas consumed, and total CO2e emissions outputs by department entered into CACP. Calculation of CNG emissions outside of CACP allows for more accurate quantification of CO2, CH4, and N2O using both mileage and fuel consumption (as opposed to only mileage or fuel consumption within CACP). Consistent with Protocol guidance, this approach facilitates the calculation of CO2 emissions based on cubic foot of natural gas consumed and CH4 and N2O based on mileage traveled.

For light trucks, assumes Light Duty Emissions factors from the Protocol, Tables G.11 and G.13 (.0054 kg CO2/standard cubic foot, 0.737 g CH4/mile, and .005 g N2O/mile). For heavy trucks, assumes Heavy Truck Emissions factors from the Protocol, Tables G.11 and G.13 (.0054 kg CO2/standard cubic foot, 1.966 g CH4/mile, and 0.175 g N2O/mile).

Employee Commute

Palmdale, California

3 Employee Commute

Diesel	51	0	20	52	0.9	999	0
Gasoline		463	38	61	476	8.5	6,663
0							
<i>Subtotal 3 Employee Commute</i>		514	39	81	528	9.4	7,661
0							

Source:

1. Employee commute survey was conducted in Fall 2009 and adjusted for 2005 employee figures. Survey data was manipulated by Jennifer Venema, PMC [jvenema@pmcworld.com].
2. 2005 and 2009 City employment figures provided by Benjamin Lucha [blucha@cityofpalmdale.org], Department of Public Works - City of Palmdale.
3. Hybrid fuel economy of 2005 Toyota Prius found at www.fueleconomy.gov.

Notes:

1. 136 City employees successfully responded to the online survey or completed hard survey copies that were entered into the online survey software, meaning that all essential entries were given. This is approximately a 55% response rate.
2. Survey responses were adjusted for 2005 employee population, assuming constant distribution of gasoline/diesel consumption by vehicle type.
3. The population of hybrid cars was decreased by two-thirds, based on California sales records for 2005 found at www.hybridcars.com <<http://www.hybridcars.com>>.
4. For more detailed information on methodology used in this sector, please see the appendices.

This report has been generated for Palmdale, California using ICLEI's Clean Air and Climate Protection 2009 Software.

Government Greenhouse Gas Emissions in 2005**Detailed Report**

CO	NO	CH	Equiv CO	Energy	Cost
2	2	4	2		
(tonnes)	(kg)	(kg)	(tonnes)	(%)(MMBtu)	(\$)
Subtotal Employee Commute	514	39	81	528 9.4	7,661
0					

Other Process Fugitive**Palmdale, California***1 Contracted Landscaping Equipment*

Carbon Dioxide	9	0	0	9	0.2
<i>Subtotal 1 Contracted Landscaping Equipment</i>	9	0	0	9	0.2

Contracted Landscaping Equipment includes the follow equipment as provided by Rich Meier's Landscaping Inc (rmlandscape@verizon.net):

- 1 - Astron gas leaf blower
- 3 - John Deere 62" gas mowers
- 2 - 2 cycle Astron weed eaters
- 1 - Power gas edger

A total 1,024 gallons of gasoline was consumed during the 4 months Rich Meier's Landscaping Inc maintained 4 City parks (September - December

'05). Local Government Operations Protocol (2008) Table G.9 was used to calculate CO2.

1 Diesel Equipment

Carbon Dioxide	164	0	0	164	2.9
Methane	0	0	9	0	0.0
Nitrous Oxide	0	4	0	1	0.0
<i>Subtotal 1 Diesel Equipment</i>	164	4	9	165	3.0

Source:

1. David Reader, City of Palmdale Fleet Maintenance Supervisor. Provided in an email communication dated 12/2/2009 to Jennifer Venema, Michael Gass, and Benjamin Lucha.

Notes:

1. Diesel equipment emissions are those resulting from fuel use of all diesel equipment (total fuel consumption of 16,140.40 gallons). Diesel equipment includes:
 - a. 7 pieces/instances of 1) miscellaneous power equipment, and 2) miscellaneous instances of fuel use for non-City vehicles (e.g., for rental vehicles and equipment).
 - b. 11 pieces of Public Works equipment, including an air compressor, heavy motor grader, 2 medium backhoes, medium paver, medium roller, medium wheel loader, small pump, small stump grinder, and 2 small tractors.
2. Calculates emissions based on gallon of fuel use, using factors from the Local Government Operations Protocol, Table G.9 and G.12: Other large utility (diesel) = 10.15 kg CO2, 0.26 g N2O and 0.58 g CH4 per gallon

1 Gasoline Equipment

Carbon Dioxide	27	0	0	27	0.5
Methane	0	0	2	0	0.0
Nitrous Oxide	0	1	0	0	0.0
<i>Subtotal 1 Gasoline Equipment</i>	27	1	2	27	0.5

Source:

1. David Reade], City of Palmdale Fleet Maintenance Supervisor. Provided in an email communication dated 12/2/2009 to Jennifer Venema, Michael Gass, and Benjamin Lucha.

Notes:

1. Gasoline equipment emissions are those resulting from fuel use of all gasoline equipment (total fuel consumption of 3,061 gallons). Gasoline equipment includes:

a. 7 instances/pieces of miscellaneous power equipment, including gasoline used in small equipment, 2 manlifts, and 1 small pressure washer.

b. 10 pieces of Public Works equipment, including a medium forklift, 3 small chippers, leaf vacuum, small roller, small stump grinder, 2 small tractors, and 1 small trencher.

2. Calculates emissions based on gallon of fuel use, using factors from the Local Government Operations Protocol, Table G.9 and G.12: Small/large utility (unleaded gasoline) = 8.81 kg CO₂, 0.22 g N₂O and 0.50 g CH₄ per gallon

This report has been generated for Palmdale, California using ICLEI's Clean Air and Climate Protection 2009 Software.

3/16/2011

Government Greenhouse Gas Emissions in 2005

Detailed Report

CO	NO	CH	Equip CO	Energy	Cost
2	2	4	2		
(tonnes)	(kg)	(kg)	(tonnes)	(%)(MMBtu)	(\$)
<i>1 Propane Equipment</i>					
Carbon Dioxide	0	0	0	0	0.0
Methane	0	0	0	0	0.0
Nitrous Oxide	0	0	0	0	0.0
<i>Subtotal 1 Propane Equipment</i>	0	0	0	0	0.0
Process Fugitive	204	5	11	201	3.6
Total	5,536	144	412	5,589	100.0
978,883					58,424

Source:

1. David Reader, City of Palmdale Fleet Maintenance Supervisor. Provided in an email communication dated 12/2/2009 to Jennifer Venema, Michael Gass, and Benjamin Lucha.

2. Environmental Protection Agency (July 2008). External Combustion Sources: Liquefied Petroleum Gas Combustion. Retrieved

<<http://www.epa.gov/ttnchie1/ap42/ch01/final/c01s05.pdf>>.

Notes:

1. Propane equipment includes 1 Public Works medium forklift, which used 21 gallons of propane.

2. Calculates emissions based on gallon of fuel use, using factors from the Local Government Operations Protocol, Table G.9 and G.12. and the Environmental Protection Agency (July 2008):

Propane = 5.74 kg CO₂, .40824 g N₂O, and .09072 g CH₄ per gallon

3. Emissions of N₂O and CH₄ derived from Environmental Protection Agency (July 2008). Assumes that fuel combustion occurs with a heat input capacity between 0.3 and 10 million Btu/hour. Emissions factors provided in lb/10³ gallons. Converted as follows:

N₂O: .9 lb/10³ gallon X 453.6 grams/ 1 lb = .40824 grams/gallon

CH₄: .2 lb/ 10³ gallon X 453.6 grams/ 1 lb = .09072 grams/gallon

This report has been generated for Palmdale, California using ICLEI's Clean Air and Climate Protection 2009 Software.

QUANTIFICATION OF REDUCTION MEASURES



APPENDIX 2

APPENDIX 2:
QUANTIFICATION OF REDUCTION MEASURES

GOAL 1: REDUCE ENERGY DEMAND THROUGH ENERGY CONSERVATION AND EFFICIENCY.

1.1: IMPLEMENT ENERGY EFFICIENCY IMPROVEMENTS (I.E., RETROFITS) IN EXISTING CITY BUILDINGS AND FACILITIES.

Target Year	MT CO ₂ e/year	Indicator
2010 Reductions (MT CO ₂ e):	0	Construct energy-efficient roof on the Parks & Recreation Building
2020 Reductions (MT CO ₂ e):	-799	Implement planned HVAC and lighting control upgrades Ongoing implementation of projects outlined in the City Facility Environmental Retrofit Program
2035 Reductions (MT CO ₂ e):	-739	Ongoing implementation of projects outlined in the City Facility Environmental Retrofit Program

ASSUMPTIONS:

The City will implement retrofits and anticipates that energy reduction potential will be similar to the energy reduction potentials outlined in the Johnson Controls scope. Captures the impact of EECBG projects, including the roof rehabilitation project. To determine other energy reductions, assumes the utility-specific blended averages for Southern California Edison and Southern California Gas.

SOURCES:

Johnson Controls. 2010. Financial Analysis. Fifteen Year Financing Term. City of Palmdale.

1.3: ENCOURAGE NEW DEVELOPMENT TO EXCEED TITLE 24 ENERGY USE REQUIREMENTS BY 15%.

Target Year	MT CO ₂ e/year	Indicator
2010 Reductions (MT CO ₂ e):	0	n/a
2020 Reductions (MT CO ₂ e):	-12,694	95% of nonresidential customers and 95% of households monitoring program participation
2035 Reductions (MT CO ₂ e):	-51,553	95% of nonresidential customers and 95% of households monitoring program participation

ASSUMPTIONS:

Southern California Edison will complete smart meter installation by 2011 and will continue to install smart meters for all new accounts. At an individual scale, users will use smart meters to monitor electricity consumption in real time and better understand the relationship between electricity usage and costs. Studies document that this new technology will result in behavioral changes that decrease electricity and

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QUANTIFICATION OF REDUCTION MEASURES

natural gas consumption.

SOURCES:

California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures.

California Building Standards Commission. 2010. California 2010 Green Building Standards Code. CalGreen. California Code of Regulations Title 24. Part 11.

California Energy Commission. 2008. Impact Analysis: 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings, November 2007.

City of Los Angeles. 2009. RFP: Green Building Compliance Audit. <http://cityplanning.lacity.org/PressRelease/RFP/GreenBuilding/RFP%20-%20Green%20Building%20Program%20Compliance%20Audit.pdf>.

Ehrhardt-Martinez, K., K. Donnelly, and J. Laitner. 2010. Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Saving Opportunities. American Council for an Energy-Efficient Economy. Report Number E105. <http://www.aceee.org/sites/default/files/publications/researchreports/e105.pdf>.

Energy Star. 2008. Clothes Washer Product Snapshot. http://www.energystar.gov/ia/partners/reps/pt_reps_res_retail/files/CW_ProductSnapshot_May08.pdf.

———. n.d. Residential New Construction: An Overview of Energy Use and Energy Efficiency Opportunities. http://www.energystar.gov/ia/business/challenge/learn_more/ResidentialNewConstruction.pdf.

Global Sustainability Initiative. 2008. 2020: Enabling the low carbon economy in the information age. United States report addendum. http://www.smart2020.org/_assets/files/Smart2020UnitedStatesReportAddendum.pdf.

Kats, G. et al. October 2003. The Costs and Financial Benefits of Green Buildings: A Report to California's Sustainable Building Task Force. Funded by the California Integrated Waste Management Board (CIWMB), Department of Finance (DOF), Department of General Services (DGS), Department of Transportation (Caltrans), Department of Water Resources (DWR), and Division of the State Architect (DSA). <http://www.ciwmb.ca.gov/GreenBuilding/Design/CostBenefit/Report.pdf>.

Pikes Research. 2010. Smart Appliance Sales. <http://www.smartgridnews.com/artman/publish/Smart-Grid-Press-Releases/Smart-appliance-sales-to-start-off-slow-but-118-million-units-will-be-sold-worldwide-by-2019-forecasts-Pike-Research-3290.html> and <http://www.pikeresearch.com/>.

Southern California Edison. Smart Grid Strategy and Roadmap. Advanced Technology Transmission & Distribution Business Unit. <http://www.sce.com/NR/rdonlyres/B4A56998-97E6-4380-9993->

APPENDIX 2:
QUANTIFICATION OF REDUCTION MEASURES

B3A54D9B2A0B/0/100712_SCE_SmartGridStrategyandRoadmap.pdf.

1.4: REDUCE THE URBAN HEAT ISLAND EFFECT TO COOL THE LOCAL CLIMATE AND REDUCE ENERGY CONSUMPTION BY INCREASED SHADING ON PRIVATE PROPERTY, HIGH ALBEDO SURFACES IN SIDEWALKS AND PARKING LOTS, AND COOL SURFACES.

Target Year	MT CO ₂ e/year	Indicator
2010 Reductions (MT CO ₂ e):	0	n/a
2020 Reductions (MT CO ₂ e):	-5,742	2,000 new trees to shade residential structures 50% of sidewalks and parking lots with high albedo materials
2035 Reductions (MT CO ₂ e):	-12,375	3,500 new trees to shade residential structures 80% of sidewalks and parking lots with high albedo materials

ASSUMPTIONS:

This measure quantifies the impact of updating requirements for tree plantings and requiring high albedo materials in the city for new development and project maintenance. A variety of materials, including asphalt, can achieve high albedo. Emissions reductions from new tree plantings include annual sequestration during a 40-year tree life cycle, avoided emissions from the reduction in electricity consumption as a result of direct shading, and overall climate cooling.

SOURCES:

Gilbert, H., M. Pomerantz, M. and P. Salisbury. 2010. Cool Pavements for Cool Communities. Presented at the California Air Resources Board by representatives from the California Nevada Cement Association and Lawrence Berkeley National Laboratory. At Byron Sher Auditorium, 2nd Floor, Cal/EPA Building, 1001 I Street, Sacramento CA.

McHale, Melissa R., E. Gregory McPherson, and Ingrid C. Burke. 2007. The potential of urban tree plantings to be cost effective in carbon credit markets. Fort Collins, CO: Elsevier.

1.6: PROMOTE ENERGY EFFICIENCY IMPROVEMENTS IN THE CITY'S HOUSING STOCK.

Target Year	MT CO ₂ e/year	Indicator
2010 Reductions (MT CO ₂ e):	0	n/a
2020 Reductions (MT CO ₂ e):	-12.668	50% household monitoring program participation and 2% households with integrated appliances 14,000 households to complete energy efficiency retrofits for an average of 30% energy savings

APPENDIX 2:
QUANTIFICATION OF REDUCTION MEASURES

2035 Reductions (MT CO ₂ e):	-16,306	80% household monitoring program participation and 8% households with integrated appliances 20,000 households to complete energy efficiency retrofits for an average of 30% energy savings
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ASSUMPTIONS

State and local agencies will continue to utilize available rebates to reduce energy use in existing development. Programs include financing through Energy Upgrade California in Los Angeles County and smart meter monitoring programs. Southern California Edison will complete smart meter installation for all existing residential accounts in 2011.

SOURCES:

California Energy Commission (CEC). 2007. 2008 California Building Energy Efficiency Standards Residential Evaporative Cooling. Proposer: Southern California Gas. Measure Information Template.

———. 2007. Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings.

City of Palmdale. 2010. Economic Roundtable Report. Final Energy Efficiency and Conservation Strategy: AB 811 outreach.

Council of Neighborhood Associations. 2011. "Tallahassee - Leon County Energy Challenge." Council of Neighborhood Associations. http://www.econa.org/econa/page.html?page_id=34.

Ehrhardt-Martinez, K. K. Donnelly, and J. Laitner. 2010. Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Saving Opportunities. American Council for an Energy-Efficient Economy. Report Number E105. <http://www.aceee.org/sites/default/files/publications/researchreports/e105.pdf>

Energy Upgrade CA. 2011. Energy Upgrade in Los Angeles County. Rebates and Incentives. <http://www.lacountyenergyprogram.org/Content/10022/RebatesandIncentives.html>.

Global Sustainability Initiative. 2008. 2020: Enabling the low carbon economy in the information age. United States report addendum. http://www.smart2020.org/_assets/files/Smart2020UnitedStatesReportAddendum.pdf.

Southern California Edison. Smart Grid Strategy and Roadmap. Advanced Technology Transmission & Distribution Business Unit. http://www.sce.com/NR/rdonlyres/B4A56998-97E6-4380-9993-B3A54D9B2A0B/0/100712_SCE_SmartGridStrategyandRoadmap.pdf

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QUANTIFICATION OF REDUCTION MEASURES

1.7: FACILITATE COMPREHENSIVE HOME ENERGY RETROFITS.

Target Year	MT CO ₂ e/year	Indicator
2010 Reductions (MT CO ₂ e):	0	n/a
2020 Reductions (MT CO ₂ e):	-397	600 households
2035 Reductions (MT CO ₂ e):	-916	1,500 households

ASSUMPTIONS:

The City will pursue funding for a creative whole house program to reduce energy consumption by 20% for qualifying special needs households.

SOURCES:

City of Palmdale. 2010. U.S. EPA Grant Application. Non-Construction Market-Based Approaches to Reducing Greenhouse Gas Emissions Through Energy Efficiency in Homes and Buildings Grant Application.

1.8: PROMOTE ENERGY EFFICIENCY IN COMMERCIAL AND INDUSTRIAL USES THROUGH PARTNERSHIPS AND PROGRAMS.

Target Year	MT CO ₂ e/year	Indicator
2010 Reductions (MT CO ₂ e):	0	n/a
2020 Reductions (MT CO ₂ e):	-13,332	50% monitoring program participation and 1% of accounts with integrated appliances 4 industrial firms to reduce energy by 15% 1,000 businesses complete energy efficiency retrofits to reduce energy use by 30%
2035 Reductions (MT CO ₂ e):	-26,626	80% monitoring program participation and 4% of accounts with integrated appliances 9 industrial firms to reduce energy by 15% 2,700 businesses complete energy efficiency retrofits to reduce energy use by 30%

ASSUMPTIONS:

State and local agencies will continue to promote energy efficiency opportunities for nonresidential sector. The Energy Performance Ordinance will help businesses to identify cost-effective opportunities. The City will also promote industrial specific and manufacturing programs such the ISO 50001 standard as a foundational tool for energy management.

SOURCES:

Energy Upgrade CA. 2011. Energy Upgrade in Los Angeles County. Rebates and Incentives.

APPENDIX 2:
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<http://www.lacountyenergyprogram.org/Content/10022/RebatesandIncentives.html>.

Global Sustainability Initiative. 2008. 2020: Enabling the low carbon economy in the information age. United States report addendum. http://www.smart2020.org/_assets/files/Smart2020UnitedStatesReportAddendum.pdf.

Southern California Edison. Smart Grid Strategy and Roadmap. Advanced Technology Transmission & Distribution Business Unit. http://www.sce.com/NR/rdonlyres/B4A56998-97E6-4380-9993-B3A54D9B2A0B/0/100712_SCE_SmartGridStrategyandRoadmap.pdf.

Wong, T., D. Kazama, and J. Wang. 2008. California Energy Commissions. Energy Efficiency Opportunities in California Food Processing Facilities. Proceedings from the Thirtieth Industrial Energy Technology Conference, New Orleans, LA, May 6–9, 2008. <http://repository.tamu.edu/bitstream/handle/1969.1/87972/ESL-IE-08-05-04.pdf?sequence=1>

1.9: ESTABLISH PALMDALE AS A MODEL FOR ENERGY-EFFICIENT AND INNOVATIVE INDUSTRIAL, MANUFACTURING, AND COMMERCIAL BUSINESSES.

Target Year	MT CO ₂ e/year	Indicator
2010 Reductions (MT CO ₂ e):	0	n/a
2020 Reductions (MT CO ₂ e):	-12,066	1,400 businesses to reduce energy by 20%
2035 Reductions (MT CO ₂ e):	-18,696	2,300 businesses to reduce energy by 20%

ASSUMPTIONS:

The City will work to promote early leaders and facilitate the exchange of energy-efficiency best practices in Palmdale's business sector. Recognition of private leadership and achievements in greenhouse gas emission reductions will have an educational effect on other businesses throughout the city.

SOURCES:

California Energy Commission (CEC). 2003. Impact Analysis 2005 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings.

———. 2007. Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings.

California Public Utilities Commission (CPUC). 2008. California Long Term Energy Efficiency Strategic Plan. <http://www.californiaenergyefficiency.com/docs/EEStrategicPlan.pdf>.

Sacramento Metropolitan Air Quality Management District (SMAQMD). 2009. Spare the Air Control Measure Program; Revision to State Implementation Plan Staff Report. <http://www.airquality.org/notices/CAPUpdate/STA-revisiontoSIP-StaffRpt23April2009.pdf>.

GOAL 2: WATER REDUCTIONS FOR ENERGY CONSERVATION

2.1: REDUCE MUNICIPAL WATER CONSUMPTION.

Target Year	MT CO ₂ e/year	Indicator
2010 Reductions (MT CO ₂ e):	0	
2020 Reductions (MT CO ₂ e):	-8	Reduce approximately 2 million gallons of municipal water consumption
2035 Reductions (MT CO ₂ e):	-8	Ongoing implementation of turf removal and fixture upgrade plans

ASSUMPTIONS:

The City will continue to implement plans for turf removal and installation of low-flow urinals. Reductions in energy result from reduced water conveyance and are based on past municipal upgrades and an audit of City facilities.

SOURCES:

California Energy Commission. 2005. California's Water-Energy Relationship. <http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF> (accessed September 2, 2010).

Johnson Controls. 2010. Financial Analysis. Fifteen Year Financing Term. City of Palmdale.

2.3: FACILITATE A 20% REDUCTION IN WATER USE BY 2020 TO EXCEED THE 20X2020 INITIATIVE.

Target Year	MT CO ₂ e/year	Indicator
2010 Reductions (MT CO ₂ e):	0	n/a
2020 Reductions (MT CO ₂ e):	-1,740	20% water savings in all new buildings 20% decrease in water consumption in existing development
2035 Reductions (MT CO ₂ e):	-2,438	20% water savings in all new buildings 28% decrease in water consumption in existing development

ASSUMPTIONS:

The City will reduce water through continued water education and infrastructure and enforce minimum building code standards that require efficient water use in new development. This measure only accounts for reduced energy for water conveyance within city limits.

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QUANTIFICATION OF REDUCTION MEASURES

SOURCES:

California Energy Commission. 2005. California's Water-Energy Relationship. <http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF> (accessed September 2, 2010).

Palmdale Water District. 2005. Final Recycled Water Master Plan. <http://www.palmdalewater.org/>.

U.S. Geological Society. 2010. <http://water.usgs.gov/watuse/data/2005/index.html>.

GOAL 3: PROMOTE RENEWABLE ENERGY GENERATION AND USE

3.1: DEMONSTRATE CITY LEADERSHIP IN RENEWABLE ENERGY BY SUPPLYING 100% OF CITY ENERGY NEEDS WITH RENEWABLE SOURCES BY 2035.

Target Year	MT CO ₂ e/year	Indicator
2010 Reductions (MT CO ₂ e):	0	
2020 Reductions (MT CO ₂ e):	-2,853	Solar to supply 80% of municipal energy needs
2035 Reductions (MT CO ₂ e):	-3,214	Solar to supply 100% of municipal energy needs

ASSUMPTIONS:

The City is committed to providing a majority of municipal energy needs with renewable solar energy through on-site infrastructure or the purchase of credits through a Power Purchase Agreement.

SOURCES:

3.2: ENCOURAGE THE COMMERCIAL AND INDUSTRIAL SECTORS TO MEET ENERGY NEEDS THROUGH ON-SITE RENEWABLE ENERGY SOURCES.

Target Year	MT CO ₂ e/year	Indicator
2010 Reductions (MT CO ₂ e):	-2,110	n/a
2020 Reductions (MT CO ₂ e):	-36,444	30% business participation
2035 Reductions (MT CO ₂ e):	-57,011	40% business participation

ASSUMPTIONS:

This measure assumes that average installation sizes will be consistent with baseline trends for small and large commercial systems installed through the California Solar Initiative for the City (528 kW on average for large businesses, and 8 kW for small systems). The City will continue to facilitate the installation of on-site

APPENDIX 2:
QUANTIFICATION OF REDUCTION MEASURES

renewable energy systems that reduce operating costs.

SOURCES:

California Solar Initiative. 2010. <http://www.californiasolarstatistics.ca.gov/>.

3.3: ENCOURAGE THE RESIDENTIAL SECTOR TO MEET ENERGY NEEDS THROUGH ON-SITE RENEWABLE ENERGY SOURCES.

Target Year	MT CO ₂ e/year	Indicator
2010 Reductions (MT CO ₂ e):	-317	n/a
2020 Reductions (MT CO ₂ e):	-26,020	12,800 households
2035 Reductions (MT CO ₂ e):	-50,587	25,500 households

ASSUMPTIONS:

The City will promote programs that help residents meet all electricity needs with on-site renewable energy and ensure that programs meet the needs of affordable housing. Participation rates are premised on existing financing programs and the Homebuyer Solar Option. The City will require that all multi-family projects comply with California Homebuyer Solar standards, with the option to pay into an in-lieu fee.

SOURCES:

California Solar Initiative. 2010. <http://www.californiasolarstatistics.ca.gov/>.

City of Berkeley. n.d. Berkeley FIRST Initial Evaluation. [http://www.cityofberkeley.info/uploadedFiles/Planning_and_Development/Level_3_-_Energy_and_Sustainable_Development/Berkeley%20FIRST%20Initial%20%20Evaluation%20%20final%20\(2\).pdf](http://www.cityofberkeley.info/uploadedFiles/Planning_and_Development/Level_3_-_Energy_and_Sustainable_Development/Berkeley%20FIRST%20Initial%20%20Evaluation%20%20final%20(2).pdf).

Neidich, Sherrill, and Anthony Ng. 2010. Solar Offset Program Express Terms15-Day Language.

California Energy Commission, Energy Efficiency and Renewable Energy Office.

Publication number: CEC-300-2010-009-15DAY.

3.5: CONSTRUCT AND OPERATE THE PALMDALE HYBRID POWER PLANT (PHPP) TO SUPPORT THE STATE'S RENEWABLE ENERGY PORTFOLIO AND PROMOTE THE GROWTH OF THE LOCAL RENEWABLE ENERGY INDUSTRY. (QUANTIFIED IN RENEWABLE PORTFOLIO STANDARD FORECAST)

Target Year	MT CO ₂ e/year	Indicator
2010 Reductions (MT CO ₂ e):	0	n/a
2020 Reductions (MT CO ₂ e):	0	PHPP operational by 2013
2035 Reductions (MT CO ₂ e):	0	PHPP operational by 2013

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QUANTIFICATION OF REDUCTION MEASURES

ASSUMPTIONS

The Palmdale Hybrid Power Plant is a high efficiency power plant. While it will consume substantial amounts of energy (natural gas), it will do so in the most efficient manner practicable and will produce up to 50 MW of electricity using renewable solar energy. Costs include \$2 million in design and permits for FY 2009–10 (City of Palmdale), between \$615 and \$715 million in capital costs, and \$106 million in construction costs. Cost benefits include average annual property tax revenue and operational state and local sales taxes, annual construction and operations, and maintenance supplies.

SOURCES:

California Energy Commission (CEC). 2009. Preliminary Staff Assessment Volume 1. Palmdale Hybrid Power Project. Application for Certification (08AFC-9). CEC-700-2009-018-PSA. <http://www.energy.ca.gov/sitingcases/palmdale/index.html>.

City of Palmdale, Department of Public Works Program Management Division. 2009. Ten-Year Capital Improvement Program.

GOAL 4: REDUCE TRANSPORTATION EMISSIONS THROUGH ALTERNATIVE VEHICLES, TRIP REDUCTION AND CONSOLIDATION, AND EFFICIENT FLOW

4.1: CONTINUE TO PROMOTE RIDE SHARING AND TDM PROGRAMS TO REDUCE USE OF TRADITIONAL MOTOR VEHICLES FOR WORK COMMUTES.

Target Year	MT CO ₂ e/year	Indicator
2010 Reductions (MT CO ₂ e):	0	n/a
2020 Reductions (MT CO ₂ e):	0	Ongoing commute program support Operate the teleconferencing center at the City Development Services Building
2035 Reductions (MT CO ₂ e):	0	Ongoing commute program support Ongoing operation of the teleconferencing center at City Hall

ASSUMPTIONS

The City will continue to support commute programs to reduce employee commutes. The City will also operate the teleconferencing center at the City Development Services Building, a project primarily financed by SCAG to reduce regional work-related trips.

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SOURCES:

Cambridge Systematic. 2009. Moving Cooler: An Analysis of Transportation Strategies

for Reducing Greenhouse Gas Emissions. Technical Appendices. Prepared for the

Urban Land Institute. (p. B-54). http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendix%20B_Effectiveness_102209.pdf

Victoria Transport Policy Institute. 2011. <http://www.vtpi.org/tdm/tdm8.htm>.

4.3: REDUCE EMISSIONS FROM MOBILE SOURCES THROUGH EFFICIENT VEHICLE FLOW.

Target Year	MT CO ₂ e/year	Indicator
2010 Reductions (MT CO ₂ e):	0	n/a
2020 Reductions (MT CO ₂ e):	-602	11 miles of synchronized major routes
2035 Reductions (MT CO ₂ e):	-628	20 miles of synchronized major routes

ASSUMPTIONS:

11 miles of roadway will be synchronized through the City's EECBG Traffic Signal Synchronization project. The City will expand the program to synchronize an additional 9 miles by 2035. Calculation provides fuel savings from increased driving efficiencies, which are translated into equivalent VMT reduction.

SOURCES:

Halkias, J., and M. Schauer. 2004. Public Roads Journal, U.S. DOT. Red Light, Green Light. <http://www.itsbenefits.its.dot.gov/its/benecost.nsf/ID/8D5E4B72F890856C8525733A006D547C?OpenDocument&Query=BApp>.

4.4: IMPLEMENT A COMPLETE STREETS APPROACH TO TRANSPORTATION TO IMPROVE MOBILITY.

Target Year	MT CO ₂ e/year	Indicator
2010 Reductions (MT CO ₂ e):	0	n/a
2020 Reductions (MT CO ₂ e):	-1,942	Complete streets in all new development 87 miles of new bike lanes, for a total of 108 miles of bike lanes
2035 Reductions (MT CO ₂ e):	-3,424	Complete streets in all new development 123 miles of new bike lanes for a total of 144 miles of bike lanes

ASSUMPTIONS:

The City will continue to require complete streets in new development and work to enhance mobility in

APPENDIX 2: QUANTIFICATION OF REDUCTION MEASURES

existing development through pedestrian access and Safe Routes to School Programs. New standards will require the provision of bicycle support facilities at all new multi-family and nonresidential development.

SOURCES:

California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures.

California Department of Finance. 2009. <http://www.dof.ca.gov/>.

Cambridge Systematics. 2009. Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions. (p. B-25).http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendices_Complete_102209.pdf.

CCAP Transportation Emission Guidebook; TIAX Results of 2005 Literature Search Conducted by Tax on behalf of SMAQMD, as cited in CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act, January 2008. California Air Pollution Control Officers Association. (Appendix B).

Center for Clean Air Policy (CCAP) Transportation Emission Guidebook. http://www.ccap.org/safe/guidebook/guide_complete.html; Based on results of 2005 literature search conducted by TIAX on behalf of SMAQMD.

Dierkers, G., E. Silsbe, S. Stott, S. Winkelman, and M. Wubben. 2007. CCAP Transportation Emissions Guidebook. Center for Clean Air Policy. Washington, D.C. <http://www.ccap.org/safe/guidebook.php>. as cited in California Air Pollution Control Officers Association (CAPCOA). 2008. CEQA and Climate Change.

Dill, Jennifer, and Theresa Carr. 2003. "Bicycle Commuting and Facilities in Major U.S. Cities: If You Build Them, Commuters Will Use Them – Another Look." TRB 2003 Annual Meeting CD-ROM.

National Center for Safe Routes to School. 2010. Safe Routes to School Travel Data: A Look at the Baseline Results from Parent Surveys and Student Travel Tallies, January 2010. http://www.saferoutesinfo.org/resources/collateral/srts_talkingpoints.doc.

Sacramento Metropolitan Air Quality Management District (SMAQMD). Recommended Guidance for Land Use Emission Reductions. (p.13). <http://www.airquality.org/ceqa/GuidanceLUEmissionReductions.pdf>.

San Joaquin Valley Air Pollution Control District. 2009. Climate Change Action Plan: Addressing Greenhouse Gas Emissions Under the California Environmental Quality Act; Draft Staff Report.

U.S. Census Bureau.2010. <http://factfinder.census.gov>

Victoria Transportation Planning Institute (VTPI). 2010. <http://www.vtpi.org/tdm/tdm93.htm>.

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4.5: REDUCE EMISSIONS FROM ON-ROAD VEHICLE SOURCES.

Target Year	MT CO ₂ e/year	Indicator
2010 Reductions (MT CO ₂ e):	0	n/a
2020 Reductions (MT CO ₂ e):	-2,131	500 new electric vehicle charging stations 1,100 participants in a local car share program
2035 Reductions (MT CO ₂ e):	-3,613	1,250 new electric vehicle charging stations 1,300 participants in a local car share program

ASSUMPTIONS:

The City will adopt new standards to require nonresidential development to provide charging stations in order to support the deployment of clean vehicles in the community. The City will also support the development of a private car-share program for the benefit of Palmdale's residents, assuming that the program will facilitate the efficient use of single-occupant vehicles while creating cost savings for participants.

SOURCES:

California Building Standards Commission. June 2010. California 2010 Green Building Standards Code. CalGreen. California Code of Regulations Title 24. Part 11.

Cambridge Systematics. 2009. Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions. Technical Appendices. Prepared for the Urban Land Institute. http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendices_Complete_102209.pdf.

Idaho National Laboratory. 2006. Full Size Electric Vehicles. Advanced Vehicle Testing Reports at avt.inel.gov.

Millard-Ball, Adam. 2005. Car-Sharing: Where and How it Succeeds. Transit Cooperative Research Program (108). P 4-22.

4.6: REDUCE TRANSPORTATION EMISSIONS FROM THE COMMERCIAL AND INDUSTRIAL SECTORS.

Target Year	MT CO ₂ e/year	Indicator
2010 Reductions (MT CO ₂ e):	0	n/a
2020 Reductions (MT CO ₂ e):	-1,119	20% employee participation in commuter programs
2035 Reductions (MT CO ₂ e):	-2,258	20% employee participation in commuter programs

ASSUMPTIONS:

Regional and local agencies will continue to promote expanded commuting programs to target commuters

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who drive alone to work. Best practices will be incorporated into an updated Transportation Demand Ordinance to ensure maximum commute program participation. Assumes baseline percentage of single-occupant vehicle commuters based on the US Census ACS Survey, as manipulated by the Southern California Association of Governments for the City of Palmdale.

SOURCES:

American Communities Survey 2006–2008, as manipulated by Southern California Association of Governments (SCAG). Provided by Javier Minjares (SCAG), 2010.

California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures.

Cambridge Systematics. 2009. Moving Cooler: An Analysis of Transportation Strategies

for Reducing Greenhouse Gas Emissions. Technical Appendices. Prepared for

the Urban Land Institute. (Table 5.13). http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendix%20B_Effectiveness_102209.pdf.

Victoria Transport Policy Institute (VTPI). 2010. Transportation Management Programs. <http://www.vtpi.org/tdm/tdm42.htm>.

4.7: SUPPORT THE EXPANSION OF TRANSIT OPTIONS WITHIN THE ANTELOPE VALLEY.

Target Year	MT CO ₂ e/year	Indicator
2010 Reductions (MT CO ₂ e):	-1,541	n/a
2020 Reductions (MT CO ₂ e):	-7,445	111.40% increase in local transit ridership for an average of 12.8 bus trips/person/year 8.6 million annual round-trip high-speed rail trips
2035 Reductions (MT CO ₂ e):	-10,071	122.77% increase in local transit ridership for an average of 16.34 bus trips/person/year 9.2 million annual round-trip high-speed rail trips

ASSUMPTIONS:

Local, regional, and statewide transit providers will continue to expand transit service and support reduced automobile use. The City will work with the Antelope Valley Transit Authority to support increased ridership on local bus routes through land use planning and other programs. By 2019, Palmdale commuters will also shift auto trips to the California high-speed rail line via the Palmdale Station.

SOURCES:

California High-Speed Rail Authority. 2009. Report to the Legislature: December 2009.

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<http://www.cahighspeedrail.ca.gov/>.

Cambridge Systematics. 2009. Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions. Technical Appendices. Prepared for the Urban Land Institute. http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendices_Complete_102209.pdf

Rudolph, Candice. 2010. Customer Service Supervisor, Antelope Valley Transit Authority. Personal Communication. October 13.

GOAL 5: SMART LAND USE TO REDUCE VEHICULAR TRIPS

5.1: PROMOTE ACCESSIBLE HOUSING NEAR TRANSIT AND SERVICES.

Target Year	MT CO ₂ e/year	Indicator
2010 Reductions (MT CO ₂ e):	-24,865	n/a
2020 Reductions (MT CO ₂ e):	-26,011	30% increase in citywide jobs and housing density 10.8% of total housing units to qualify as affordable
2035 Reductions (MT CO ₂ e):	-36,608	49% increase in citywide jobs and housing density 12.6% of total housing units to qualify as affordable

ASSUMPTIONS:

This measure captures the elasticity of increased density and reduced travel associated with the increased mixture of uses, including housing and jobs. Mixed uses with accessible housing and employment opportunities support reduced vehicle miles traveled. Reduced vehicle miles traveled will also result from increased convenience of shopping and services that the City will achieve with forecast increases in housing and jobs.

SOURCES:

California Air Pollution Control Officers Association (CAPCOA). 2007. CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act. (Appendix B). Recommended Guidance for Land Use Emission Reductions, Version 2.4.

California Department of Finance. 2009. <http://www.dof.ca.gov/>.

Nelson/Nygaard. 2005. Creating Low-Traffic Developments: Adjusting Site-Level Vehicle Trip Generation Using URBEMIS.

ONL. 2004. Transportation Energy Book, Oak Ridge National Lab, Dept. of Energy <http://cta.ornl.gov/data/index.shtml>.

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TIAX Results of 2005 Literature Search Conducted by Tax on behalf of SMAQMD, as cited in Sacramento Metropolitan Air Quality Management District.

Urbemis 2007. Version 9.2.4. Rimpo and Associates.

GOAL 6: REDUCE WASTE

6.2: ACHIEVE AN 80% DIVERSION OF LANDFILLED WASTE BY 2020.

Target Year	MT CO ₂ e/year	Indicator
2010 Reductions (MT CO ₂ e):	-8,279	69% diversion rate 45,400 tons diverted waste
2020 Reductions (MT CO ₂ e):	-18,606	80% landfill diversion rate 102,000 tons diverted waste
2035 Reductions (MT CO ₂ e):	-26,723	85% landfill diversion rate 146,500 tons diverted waste

ASSUMPTIONS:

This measure assumes a reduction in forecast waste through expanded recycling, composting, and pursuit of alternative programs to divert construction and demolition waste, such as on-site pickup.

SOURCES:

Los Angeles County Department of Public Works. 2010. http://dpw.lacounty.gov/swims/reports/predefined_master.asp?Action=RELOAD&rpt=23.

GOAL 7: SUPPORT THE “BUY-LOCAL” MOVEMENT.

7.1: SUPPORT EFFORTS THAT ENCOURAGE PALMDALE RESIDENTS AND BUSINESSES TO BUY GOODS AND SERVICES LOCALLY.

Target Year	MT CO ₂ e/year	Indicator
2010 Reductions (MT CO ₂ e):	0	n/a
2020 Reductions (MT CO ₂ e):	-2,397	6% increase in non-car shopping trips through buy-local campaign
2035 Reductions (MT CO ₂ e):	-3,419	8% increase in non-car shopping trips through buy-local campaign

ASSUMPTIONS:

The City will support a "buy-local" campaign to increase local revenue and divert shopping trips to local

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accessible shopping opportunities. This measure targets a 6% increase in local shopping activity by 2020 that consists of trips made by alternative travel (walking, biking, and bus) instead of car trips at the average local trip length. Buy-local campaigns encourage the Palmdale community to make shopping trips within the community instead of driving long distances for shopping and necessities.

SOURCES:

Institute for Local Self-Reliance. 2011. Buy Local First Survey. <http://www.ilsr.org/>.

U.S. Department of Transportation; Oak Ridge National Laboratory. 2004. Summary of Travel Trends: 2001 National Household Travel Survey. <http://nhts.ornl.gov/2001/pub/STT.pdf>.

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