



Rancho Mirage Greenhouse Gas Inventory



September
2012



2012 Community and Municipal
Operations Inventories

Baseline Year 2010



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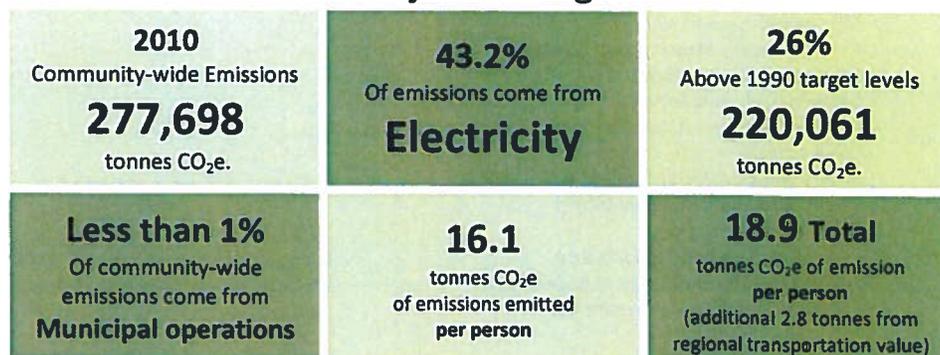
I. Executive Summary

The City of Rancho Mirage is pleased to have completed its first Greenhouse Gas Inventory (GHG Inventory). This GHG Inventory informs the City and its residents and businesses of its ecological footprint in significant detail.

By taking a proactive stance in regard to greenhouse gases (GHG), the City of Rancho Mirage intends to boost its economy through energy efficiency upgrades, plug the flow of dollars leaving the community for imported energy, and create lasting jobs in the “sustainability industry.”

Major Findings

Rancho Mirage Major Findings



1. Community-wide emissions in 2010, using guidelines approved by the California Air Resources Board, total 277,698 tonnes CO₂e.¹
2. This level is 26.2% above 1990 target levels referenced in AB 32²—220,061 tonnes CO₂e.
3. The municipal contribution to the community’s emissions footprint is 0.78%, or 2,145 tonnes CO₂e.
4. Electricity—predominantly used for air conditioning—is responsible for 43.18% of the community’s emissions.
5. At 16.1 tonnes per capita, Rancho Mirage (population 17,218) has high emissions relative to neighboring cities.
6. In addition, the per capita regional transportation emissions value is 2.8 tonnes CO₂e³, putting Rancho Mirage’s total emissions per capita at 18.9 tonnes CO₂e.

¹ Greenhouse gas emissions are measured in metric tons, or “tonnes,” of carbon dioxide. Other gases are converted to their equivalents of CO₂ and tracked as “tonnes CO₂e.”

² The *Global Warming Solutions Act of 2006* (Assembly Bill 32, or AB 32) is the law stating that California must reduce its emissions to 1990 levels by 2020.

³ Rancho Mirage GHG inventory Briefings, Section 5 Regional Mobile Emissions, electronic page 52.

The inventory establishes a 2010 baseline of emissions from which reductions will be measured to be aligned with State of California law. Through analysis of emissions' sources, the inventory points to opportunity, energy efficiency savings, and job creation.

Project Background

Rancho Mirage is an active member of the Desert Cities Energy Partnership (DCEP), a partnership of Southern California Edison (SCE), Southern California Gas Company (SoCalGas), Imperial Irrigation District (IID), the Agua Caliente Band of Cahuilla Indians, and the cities of Blythe, Cathedral City, Coachella, Desert Hot Springs, Indian Wells, Indio, La Quinta, Rancho Mirage, Palm Desert, and Palm Springs, managed by the Coachella Valley Association of Governments (CVAG).



In the fall of 2011 and as part of its DCEP activities, CVAG filed for and was successful in receiving SCE "Flight 5.6" funding for the "Green Government Initiative." Developing GHG inventories for DCEP project cities was one of eight programmatic activities proposed by CVAG. This umbrella of sustainability programs is now known and branded as the Green for Life project.

The International Council for Local Governmental Initiatives (ICLEI) Clean Air and Climate Protection (CACP) software and California Air Resources Board-approved Local Government Operations Protocol (LGOP) have been used for this inventory. ICLEI tools are designed for local governments to manage the inventory process through the efforts of staff, local consultants, or qualified local committee members or institutions. The ICLEI process also considers how the local government will maintain the data moving forward. Care has been taken to provide complete documentation of data sources, assumptions, methodologies used to create this inventory.



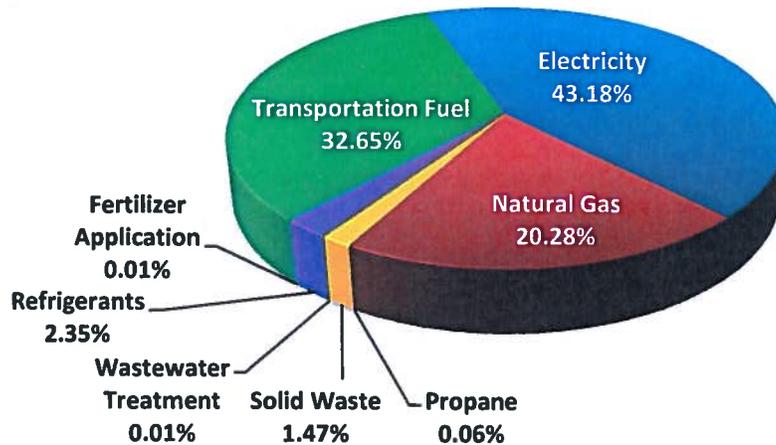
The inventory presents two sets of data. The first covers the entire community and is labeled the "Community Inventory." A second study is made of city government operations and is called the "Municipal Inventory." Municipal emissions are included within the community inventory. This convention of breaking out the municipal inventory provides local governments the tools and opportunity to look directly at the areas they can most readily affect and enables them to lead by example with emissions reduction programs.

Both inventories measure emissions in terms of metric tons of carbon dioxide, or "tonnes." Each inventory also looks at sources of emissions (types of fuel being combusted) as well as at the sectors (activities) that contribute the emissions.

Community Inventory Highlights

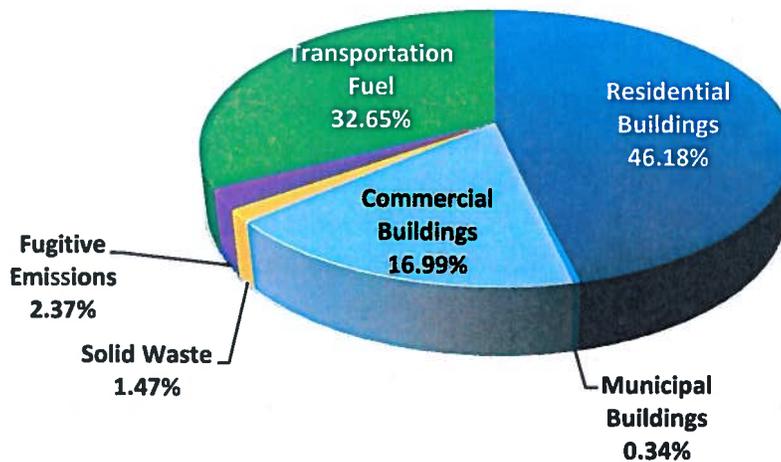
- Rancho Mirage's emissions total for 2010 was 277,698 tonnes CO₂e. The top three sources of emissions for the community, as shown in Figure 1, are electricity (43.18%), transportation fuel (32.65%), and natural gas (20.28%). All other cities in the Green for Life project share the same top three emissions sources, although in different order and proportions. These are also the top emissions sources for the State of California.

Figure 1: Rancho Mirage 2010 Community Emissions by Source



- Rancho Mirage's "footprint" is dominated by the residential building sector when looking at sectors, or activities. As a result of its use of electricity, natural gas and propane, this sector produces 46.18% of all emissions (Figure 2).

Figure 2: Rancho Mirage 2010 Community Emissions by Sector



- Despite the demand for electricity for cooling, Rancho Mirage’s electricity consumption figures are lower than might be expected, reflecting positive awareness and action as well as the following special circumstances related to one of its utilities, SCE:
 - a. SCE’s fuel mix compares favorably to other utilities in Southern California and nationwide. Renewable Portfolio Standard (RPS) requirements cause SCE to further reduce the carbon intensity of its generation and power purchases, resulting in lower GHG values for Rancho Mirage in the future.
 - b. In partnership with SCE and SoCalGas and its neighboring cities and tribe, the City of Rancho Mirage has participated in and sponsored effective, energy-efficiency programs.
- Transportation emissions are the second highest source for the community as a whole. Again, special circumstances can be identified that impact the measurement of transportation emissions for Rancho Mirage:
 - a. Traditional “CVAG traffic counts” are taken in the early spring, when the seasonal population in Rancho Mirage is at its highest. “Scaling” was used to normalize the annual values presented in this inventory.⁴
 - b. Traffic on Highway 111 has a major impact. The larger percentage of Highway 111 to total city street length increases emissions.
 - c. The above-average age of full-time residents in Rancho Mirage shortens the average trip length and thus the overall Vehicle Miles Traveled (VMT).
- In addition to transportation emissions within the community inventory, regional transportation emissions have also been quantified. Per capita emissions for Rancho Mirage, from this regional assessment, total 2.8 tonnes CO₂e⁵.

Municipal Inventory Highlights

The full inventory of emissions from Rancho Mirage municipal operations (based on the Local Government Operations Protocol) counts emissions from nine sectors (Table 1). The total represents about 0.78% of all community emissions.

- Transportation fuel is the largest source of emissions for City operations, as shown in Table 1 **Error! Reference source not found..**

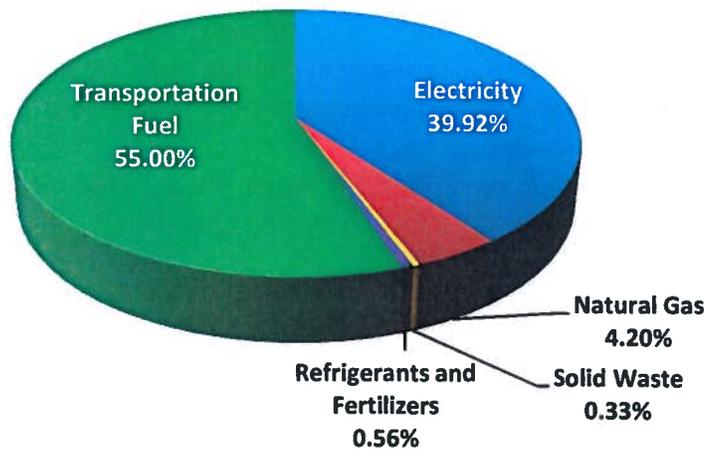
Table 1: Rancho Mirage 2012 Municipal Operations by LGOP Sector

⁴ For the purposes of the GHG inventory, Rancho Mirage vehicle miles traveled, traditionally measured in the high season, have been assigned an annual multiplier of 300 to “scale down” annual vehicle miles traveled.

⁵ Rancho Mirage GHG inventory Briefings, Section 5 Regional Mobile Emissions, electronic page 52.

Category	Scope ⁶	2010 Emissions (Tonnes CO ₂ e)
Buildings and Other Facilities	1, 2	780
Streetlights and Traffic Signals	2	166
Vehicle Fleet	1	170
Solid Waste Disposal	3	7
Employee Commute	3	394
Business Travel	3	8
Contracted Police and Fire Fleet	3	118
Transit Fleet	3	501
Fertilizer Use on Municipal Parks	3	1
Total Municipal Emissions		2,145

Figure 3: Rancho Mirage 2012 Municipal Emissions by Source



Summary

The Rancho Mirage 2012 Greenhouse Gas Inventory, the 2012 Energy Action Plan, and 2012 Sustainability Plan provides the City with a sustainability strategy that offers clear direction and provides a win-win for job creation and compliance.

With this GHG inventory, the City of Rancho Mirage can assess its GHG emissions and can strategically implement policies that specifically target GHG emissions by sectors or source. Thus creating the most mitigating impact while phasing in programs and initiatives that need time to develop and implement. These actions will position the City as a leader in energy efficiency, charting cost-effective pathways for cutting municipal and community energy costs.

⁶ The “scope” of emissions refers to the type of emissions generated. Scope 1 emissions are “direct” emissions; Scope 2 emissions are “indirect” emissions; and Scope 3 emissions are “all other” emissions.

Working with other Green for Life cities can improve each other's GHG reduction results by sharing best practices and lessons learned. Collaborating as a region will assist in strengthening the economic and environmental fabric of the Coachella Valley.

Rancho Mirage recognizes the opportunity to stimulate the economy through energy efficiency while also reducing emissions to comply with state mandates. This inventory along with the Sustainability Plan and Energy Action Plan will increase the City's eligibility for grants. It demonstrates that Rancho Mirage has a Plan to efficiently and effectively reduce GHGs.

II. Introduction

Impetus

Climate protection regulations can either threaten a local economy or serve to stimulate a set of opportunities. The City of Rancho Mirage has taken a proactive approach to leverage job creation and economic development while aligning with regulatory mandates. This inventory provides a solid foundation for sustainability planning and for the City of Rancho Mirage to strategically position to cut costs, boost jobs, while maintaining a high quality of life.

Rancho Mirage has been an active member of the Desert Cities Energy Partnership (DCEP), a partnership of Southern California Edison (SCE), Southern California Gas Company, Imperial Irrigation District, the Agua Caliente Band of Cahuilla Indians, and the cities of Blythe, Cathedral City, Coachella, Desert Hot Springs, Indian Wells, Indio, La Quinta, Rancho Mirage, Palm Desert, and Palm Springs, managed by the Coachella Valley Association of Governments (CVAG).



In the fall of 2011 and as part of its DCEP activities, CVAG filed for and was successful in receiving Southern California Edison “Flight 5.6” funding for the “green government initiative.” Developing greenhouse gas (GHG) inventories for DCEP project cities was one of eight programmatic activities funded. This umbrella of sustainability programs is now known and branded as the Green for Life project.

Resources

The Flight 5.6 Scope of Work required ICLEI’s greenhouse gas inventory software program be used for the inventory.⁷

ICLEI (originally the International Council for Local Environmental Initiatives, and now called “ICLEI – Local Governments for Sustainability USA”) has been at the forefront of measuring greenhouse gases for over two decades. In 1990, its pioneering Urban CO₂ Reduction Project developed the first inventories of European and North American cities. Today, ICLEI has over 600 members in the United States and 1,200 members worldwide.



Using the ICLEI protocol for the inventories offered a number of advantages, some of which will be enjoyed in the future as the inventories are updated. Those advantages include collaboration and training made available to the project by the local ICLEI organization, plus:

⁷ Green Government Initiative, Task 4.C. (Strategic Plan Task 4.1.4): “Conduct a Greenhouse Gas Inventory for each member jurisdiction” [pursuant to] Southern California Edison’s “Statement of Work” page 31: “The Implementer will collaborate on this effort with ICLEI, and use ICLEI’s greenhouse gas inventory software program.”

Local Government Operations Protocol

The Local Government Operations Protocol (LGOP) is designed to provide a standardized set of guidelines to assist local governments in quantifying and reporting GHG emissions associated with the government operations. It was developed in partnership by the California Air Resources Board (CARB), California Climate Action Registry (CCAR), and ICLEI. The protocol provides principles, approach, methodology and procedures to support complete, transparent and accurate reporting of a local government's emissions.⁸

Global Protocol for Community-Scale GHG Emissions

The Global Protocol for Community-Scale GHG Emissions (GPC) is a protocol for developing internationally recognized and accepted community-scale greenhouse gas accounting and reporting standards.⁹

SEEC Tools

In 2010, ICLEI joined with two other nonprofit organizations and California's four investor-owned utilities to create the Statewide Energy Efficiency Collaborative (SEEC). Together, the partners developed a number of tools to be used specifically for the Flight 5.6 program. These tools have provided additional guidance in the preparation of the GHG inventories.¹⁰

Existing California Inventories

ICLEI reports over 160 members in California. The California Governor's Office of Planning and Research lists 140 jurisdictions that have developed greenhouse gas inventories and set baselines. Many of these earlier inventories have been examined for insights and regional-specific suggestions and they have been incorporated in this document where appropriate.

Local Coachella Valley Inventories

Eight GHG inventory studies have been produced in the Valley and at least one more, for the City of Coachella, is in progress and nearly ready for a public draft to be released. The goal of the Green for Life project is to embrace all previous inventories and offer a comprehensive methodology and report template. These tools will allow inventories to be compared and contrasted, added together to feed a regional assessment, and to be fluid as cities follow their own paths and individual timelines.

The following inventories were referenced, reviewed, and used as resources for this effort.

⁸ Local Government Operations Protocol Version 1.1 May 2010

⁹ Global Protocol for Community-Scale GHG Emissions, Version 0.9 – 20 March 2012, Prepared by: C40 Cities Climate Leadership Group and ICLEI Local Governments for Sustainability in collaboration with: World Bank, UNEP, UN-HABITAT, World Resources Institute.

¹⁰ SEEC Community Inventory Tool, Quick Start Guide for Conducting a Greenhouse Gas Emissions Inventory, SEEC Community Inventory Master Data Workbook, Community GHG Inventory Instructions Parts 1, 2 and 3. Available at <http://californiaseec.org/tools-guidance/ghg-inventories-for-community-wide-emissions>

- The Coachella Valley 2005 Inventory completed in 2011 by CVAG and AQMD. This inventory is consistent with the Air Quality Management Plan inventory method.
- The Palm Springs 2008 inventory completed in 2010 by the Palm Springs Office of Sustainability and Michael Brandman Associates. This is an ICLEI-based inventory using the LGOP.
- The Palm Desert 2008 inventory completed in 2009 by the Palm Desert Office of Energy Management and EcoMotion. This inventory is also based on ICLEI methodologies following the LGOP.
- The Unincorporated Riverside County 2008 inventory completed in 2010 by the Riverside County Planning Office and Atkins Engineering and Design. This inventory follows the methodologies of the California Climate Action Registry and the LGOP.
- The La Quinta 2005 inventory completed in 2011 by the City of La Quinta and Terra Nova Consulting. This inventory is based on the ICLEI methodologies and the LGOP.
- The Indio 2010 inventory was just completed in 2012 by the City of Indio and EcoMotion, Inc. This inventory is based on ICLEI methodologies following LGOP.

Rancho Mirage has already examined its emissions as part of the larger CVAG-sponsored AQMD inventory, completed in 2011 as mentioned above. This in-depth inventory included specific data on direct emissions from major source categories.¹¹

Major points of the CVAG/AQMD inventory:

- Rancho Mirage produced city-wide emissions of 130,000 tonnes CO₂e out of the regional tally of 4,130,000 tonnes CO₂e.
- The CVAG/AQMD inventory has a major focus on transportation. In this inventory 68% percent of emissions were attributed to mobile emissions from cars, trucks, and other vehicles for the Coachella Valley as a whole.
- This inventory uses the EMFAC 2007, CARB OFFROAD calculator to calculate these mobile emissions, scaled from a regional data source to the City's population.
- Emissions from locomotives and air travel are studied regionally based on a percentage of statewide emissions, as a placeholder for future methodologies and studies. Locomotive and aircraft emissions are not attributed to Rancho Mirage in the CVAG/AQMD inventory.
- The CVAG/AQMD inventory focused on counting direct emissions (Scope 1). Electricity emissions (Scope 2) and waste disposal emissions (Scope 3) were not included.

CVAG/AQMD
2005 GHG Inventory
68% of CO₂e
Came from mobile emissions

¹¹ Greenhouse Gas (GHG) Inventories for the Coachella Valley, South Coast Air Quality Management District, June 2011.

Policy Context of the GHG Inventory



In the absence of a national energy policy, California has moved ahead with significant and far-reaching legislation. While a GHG inventory may be considered a valuable tool for the City, providing understanding of its carbon footprint and initial direction for reducing its carbon impact, an equally important reason for emissions measurement and control is impending regulation.

The two major laws associated with emissions control and reduction are California Assembly Bill 32 (AB 32)—the Global Warming Solutions Act of 2006—and California Senate Bill 375 (SB 375), the Sustainable Communities and Climate Protection Act of 2008, also known as the “anti-sprawl bill.” Another recent law, Senate Bill 97 (SB 97) was passed in 2007 and its subsequent guidelines were codified in 2010. It amended the California Environmental Quality Act (CEQA) to incorporate emissions analysis and mitigation in all development plans including a city’s General Plan.

AB 32

California Assembly Bill 32 (AB32) set forth a comprehensive program of regulatory and market mechanisms designed to achieve real, quantifiable, cost-effective reductions of greenhouse gas emissions in California. The law requires the State to reduce carbon emissions to 1990 levels by 2020. The Southern California Leadership Council Future Issues Committee estimated in 2008 that to bring the State’s total GHG emissions to 1990 levels by 2020 would require that emissions be cut by 3.9 metric tons per capita from the per capita average of 13.6 metric tons.¹²

In 2012, the date of this report, while the exact emissions figures may have changed slightly from earlier projections, the statewide goal still represents a reduction of 25–30% per person over the next eight years.

The California Air Resource Board (CARB), a part of the California Environmental Protection Agency (Cal/EPA), has the primary responsibility for reducing GHG emissions. It has been tasked with developing a comprehensive series of actions, including regulations and market mechanisms, to achieve these goals. After four years of groundwork, the initial plan components are now being rolled out. For example, phase one of the Cap-and-Trade Program became active starting January, 2012; phase two (applying to 85% of all emitters) is scheduled to start in 2015.

While Rancho Mirage does not now fall into the category of regulated emitter, it is anticipated that local governments will be required to address those issues within their control, such as building standards, land use and local mass transit. The greenhouse gas inventory is an essential preparatory step for future regulatory compliance.

¹² The AB 32 Challenge – Prepared for the Southern California Leadership Council Future Issues Committee by Gregory Freeman, Nancy Sidhu, PhD., and Myasnik Poghosyan, 2008: http://www.laedc.org/sclc/documents/Global_AB32Challenge.pdf

SB 375

California Senate Bill 375 (SB 375), passed in 2008, mandates that California's 18 Metropolitan Planning Organizations (MPOs) develop regional plans that reduce vehicle miles traveled by integrating land use (housing needs) and transportation planning (options for alternative transportation methods including walking, biking, rail, etc.). GHG targets were adopted by the California ARB in 2010 for each region; the approved regional GHG emissions reduction target for Southern California Association of Governments (SCAG)—of which Rancho Mirage is a member—is an 8% per capita reduction by 2020 relative to 2005 emissions, and a conditional target of 13% by 2035.¹³ This 8% decrease will come from appropriate city planning to reduce VMT; SCAG has taken the lead on implementation.

CEQA

The California Environmental Quality Act (CEQA) requires that public agencies (e.g., local governments) consider the environmental effects of "projects." CEQA addresses a broad range of environmental issues, including water quality, noise, land use, natural resources, transportation, energy, human health, and air quality.

Climate action plans and sustainability plans are considered "projects" that must be reported to the Statewide Clearinghouse and that must engage in an environmental review. Some projects are "exempt," others seek "negative declaration" status, some are "mitigated negative declarations," and other projects need full environmental reviews and comprehensive environmental impact reports.

GHG inventories are accounting exercises that need not be reviewed for environmental impact. Nevertheless, the City of Rancho Mirage Greenhouse Gas Inventory will play an important role in CEQA, notably for the 2012 Sustainability Plan. The Institute for Local Government (ILG) illustrates the role of the greenhouse gas inventory in the CEQA process for future projects within a city such as Rancho Mirage:

1. An agency must calculate or estimate a future project's GHG emissions.
2. Once emissions have been estimated, an agency must consider at least three factors in determining whether the emissions are significant. These include:
 - Whether the project will cause a net increase in emissions;
 - Whether the project's emissions will comply with any applicable threshold of significance; and
 - Whether the project will be consistent or inconsistent with plans, policies or rules regulating greenhouse gas emissions."¹⁴

¹³ "What SB 375 means to SCAG" <http://www.scag.ca.gov/factsheets/pdf/2010/SB375processUpdate.pdf>

¹⁴ Institute for Local Government. (September 2011). Evaluating Greenhouse Gas Emissions as Part of California's Environmental Review Process: A Local Official's Guide. <http://www.ca-ilg.org/post/evaluating-greenhouse-emissions-part-californias-environmental-review-process-local-officials>

This GHG Inventory provides the City of Rancho Mirage with a baseline of emissions from which future developments within the City will be measured. The accompanying Energy Action Plan and Sustainability Plan identify energy efficiency and savings measures that will serve staff and project developers alike.

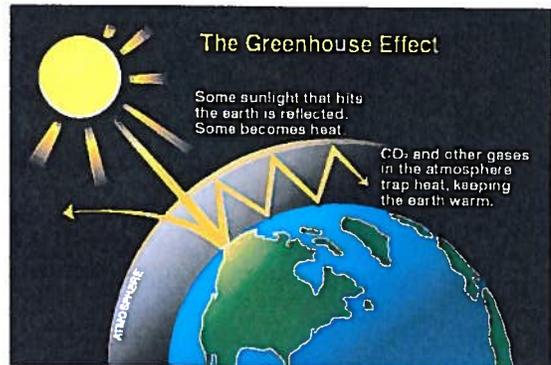
GHG Accounting

Gas Basics and Warming Potentials

The main focus of this inventory is to determine the sources of GHG emissions within Rancho Mirage.

A number of chemical compounds make up the GHG emissions, which trap the radiation from the sun's energy and heat the earth's atmosphere (Figure 4). Some of the gases are natural; additional gases are produced by human activity. Carbon dioxide (CO₂) is the most common GHG. In addition to CO₂, the other GHG gases measured by the inventory are methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF₆).

Figure 4: Greenhouse Effect Illustration



Each GHG has a different impact on the earth's atmosphere, called its global warming potential (GWP). Methane, for example, has a global warming potential of 21, while nitrous oxide has a GWP of 310. In order to create a standard unit of measurement for the inventory, the GHG are referred to in terms of their carbon dioxide equivalent (CO₂e). By multiplying the amount in metric tons of each gas by its GWP, all the gases can be reported in the common unit of metric tons (or tonnes) of CO₂e.

Sources of GHG, and their global warming potentials:¹⁵

- Carbon Dioxide (CO₂): Carbon dioxide results from the combustion of carbon-based fuels—fossil fuels from coal, oil, gas, as well as wood wastes and trees—and some industrial manufacturing. The global warming potential of CO₂ is 1.
- Methane (CH₄): Methane is the next most important GHG. Each molecule of methane has 21 times the global warming potential of CO₂. Methane comes from landfills (from anaerobic digestion of organic materials), from fermentation of materials, and from feedlots.

¹⁵ "Climate Change 2007: Synthesis Report." Intergovernmental Panel on Climate Change. (2007).

- Nitrous Oxide (N₂O): Nitrous oxide results from ammonia production, fertilizer manufacturing and other agricultural practices and from the burning of transportation fuels. It has a global warming potential of 310.
- Hydrofluorocarbons (HFCs): Refrigerants, which were created as a substitute for earlier ozone-depleting substances such as chlorofluorocarbons (CFCs), have a global warming potential of 140–11,700.
- Perfluorocarbons: (PFCs): PFCs result from semiconductor manufacturing and have a global warming potential of 6,500–9,200.
- Sulfur Hexafluoride (SF₆): Sulfur hexafluoride is a little-known GHG, with a huge global warming potential of 23,900. SF₆ results from electricity transmission and distribution, as well as magnesium production. SF₆ emissions are accounted for in utility inventories.

Units of Measurement: Tonnes

For this analysis, emissions are measured in metric tons (MT), or tonnes (and will be referred to as such), following the procedure of the Intergovernmental Panel on Climate Change (IPCC) convention.

Metric Tons (or Tonnes)	Unit of weight equal to 1,000 kilograms, or 2,204.6 pounds
Long Tons (UK)	A British measurement equivalent to 2,240 pounds, not to be confused with the US “short ton”
Short Tons (US)	US measurement also known as a short ton, equals 2,000 pounds

Inventory Protocols and Tools

ICLEI’s Cities for Climate Protection (CCP) campaign, begun in 1993, provides an ever-developing but consistent framework for local communities to identify and reduce greenhouse gas emissions.

The ICLEI CCP Climate Action process for cities includes five milestones (Figure 5).

Figure 5: ICLEI 5 Milestone Process

- Milestone One: Conduct a baseline emissions inventory and forecast.
- Milestone Two: Establish a greenhouse gas emissions reduction target.
- Milestone Three: Develop a local action plan for achieving the target.
- Milestone Four: Implement the plan.
- Milestone Five: Monitor progress and report results.



In California, in conjunction with the California Air Resource Board (CARB), ICLEI has developed and continues

to refine special software and training materials for greenhouse gas accounting. The Clean Air and Climate Protection (CACP) software divides the inventory into two parts: municipal government emissions and community-wide emissions. The software determines emissions using specific factors and coefficients according to the type of fuel used. Coefficients for this inventory have been customized to southern California and to Southern California Edison's fuel mix.

Data Collection

California The task of collecting data on municipal and community emissions requires participation from a host of parties:

- **CVAG** first introduced the project to city leaders through its Liaisons with the Desert Cities Energy Partnership. Subsequently, CVAG staff and consultant team collaborated to provide face-to-face introductions to city staff, elected officials and various commissions.
- **Interviews** were held with key staff and stakeholders in the City and solicited referrals to other people who could assist with data collection.
- **Green for Life Interns** assisted in capturing information via on-the-ground activities: traffic counting, visits to city facilities, and face-to-face meetings with the public and with staff.
- **Southern California Edison and Southern California Gas** provided data for both municipal and community energy usage.

The Green for Life consultant team's approach was to break down requests into specific pieces that could be easily delegated and readily completed. The process was made easier by welcoming data in any form, whether as a spreadsheet, copies of statements, or hand-written "fill-in-the-blank" pages.

GHG Inventory Boundary

The inventory consists of two parts as required by ICLEI and the SEEC (Figure 6):

1. The community inventory, which examines emissions for the entire city including municipal emissions.
2. The municipal inventory, which accounts for city-owned and city-managed operations.

Community Inventory

This inventory accounts for all residential, commercial, and municipal activity in the City. In addition, it includes references to emissions generated by traffic on Interstate 10, the Union Pacific and Amtrak rail lines, and the various Coachella Valley airports.

Figure 6: Inventory Subsets



Figure 7: Emissions Bubble



The visual of an emissions “bubble” offers a simplistic way to grasp how emissions are captured. Imagine putting a bubble over Rancho Mirage’s city limits (Figure). All emissions that are within the bubble will be taken into account for the inventory. The Bubble concept provides only a start for the full understanding of the community’s emissions. As previously stated, standards continue to evolve.

The newly published Global Protocol for Community Scale Emissions (GPC) re-defines community emissions categories, reflecting varying levels of control by the community over these emissions. Through its 2012 Standard, GPC seeks to help cities standardize their GHG accounting to allow for networking, sharing of best practices, and setting and measuring targets in a consistent fashion.

Municipal Inventory

The Rancho Mirage 2012 municipal inventory uses the LGOP’s guidelines. The LGOP specifies the importance of municipal organizational boundaries in a logical way. A greenhouse gas inventory should tabulate emissions based on either operational control (where a local government has the full authority to implement policies within a facility/organization) or financial control (where a local government has financial control over an operation).

A local government has operational control over an operation if the local government has the full authority to introduce and implement its operating policies at that operation. This approach

is required under AB 32's mandatory reporting program and is consistent with the requirements of many other types of environmental and air quality reporting.

This inventory generally tabulates emissions based on the operational control boundary. The inventory includes a significant number of quasi-governmental agencies (like transit fleets and water districts). While Rancho Mirage does not have "full authority" to control these emissions, the GPC recommends incorporating as many emissions sources as possible, especially in cases where those emissions are not accounted for elsewhere.

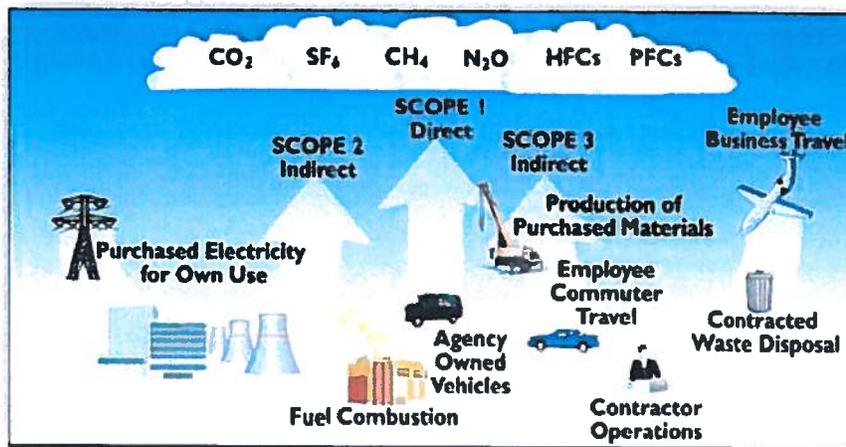
Scopes and Sectors

Emissions are tracked in a number of ways for the GHG inventory. These different "filters" permit a better understanding of the sources of the emissions, the City's control over them, and the relative costs associated with managing or reducing them.

Scopes

The CACP software defines three types of emissions, or "scopes," for the analysis. The scopes define what is included in the analysis and what is excluded.

Figure 4: LGOP Emissions Sources and Scopes



Scope 1: All direct emissions sources from activities taking place within the city boundaries, such as natural gas and gasoline combustion, refrigerant leakage, or other fugitive emissions.

Scope 2: Energy-related indirect emissions that result as a consequence of consumption of grid-supplied electricity, heating and/or cooling within the city boundaries.

Scope 3: All other indirect emissions that can be tracked but do not fall within Scope 1 or Scope 2.

Information Items are items that present emissions information transparently, but do not count towards a community's GHG emissions. Common information items include refrigerants phased out by the Montreal Protocol (i.e. R-22).

Sectors

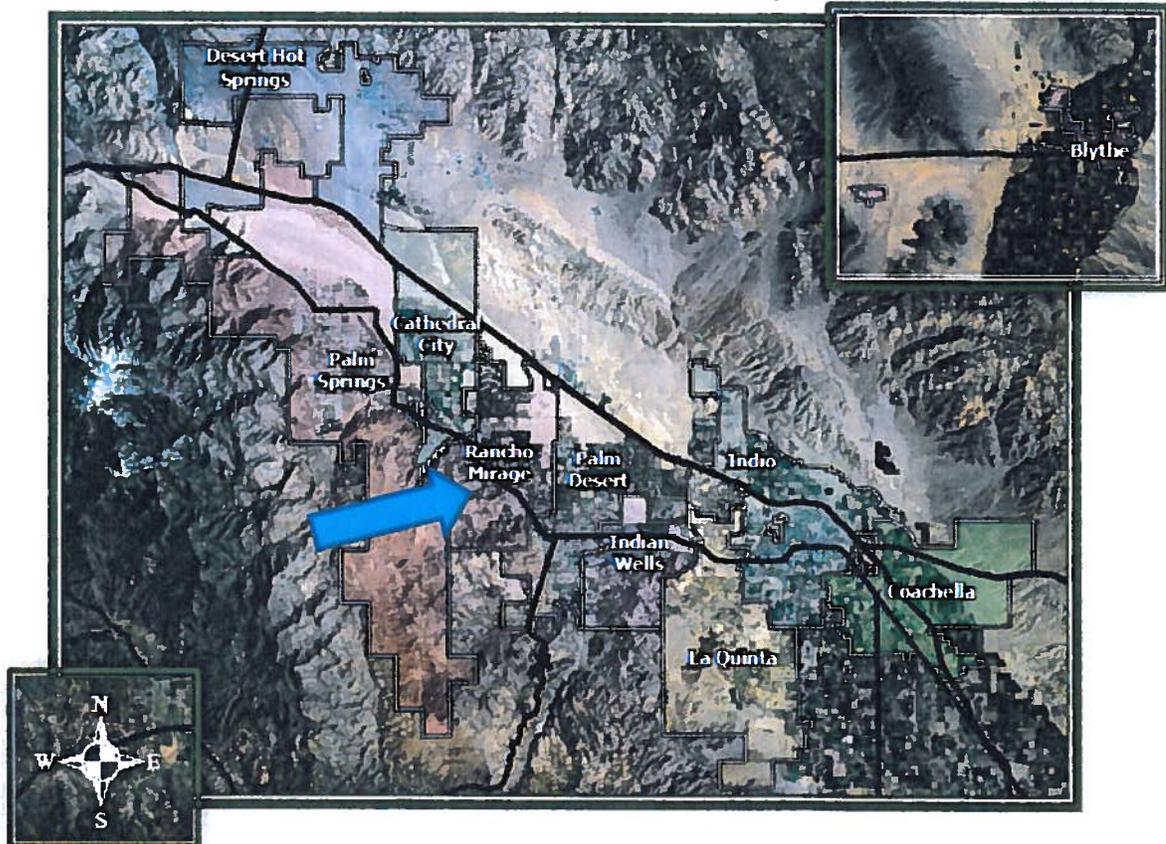
Community emissions are also sourced as to sector. Community inventory sectors include the municipal items, plus activities from within the entire community: residential, commercial and industrial buildings, transportation, community-generated waste, wastewater treatment, landfill, and where applicable, information about agriculture and/or special industries.

Municipal operations sectors are designed to help the city gather, store and organize its own data. These sectors include: facilities, vehicle and transit fleet, refrigerants and fire suppressants, employee commute, government disposed waste, wastewater treatment facilities, solid waste landfills, power generation facilities, and sectors unique to the city.

Community Snapshot

About Rancho Mirage

Figure 5: Coachella Valley Location Map



Rancho Mirage is located in the center of a cluster of cities in the Coachella Valley¹⁶. The Valley is an area with approximately 420,000 residents located 100 miles southeast of Los Angeles. As a whole, the Valley continues to grow, having added approximately 100,000 new residents between 2000 and 2010¹⁷.

One of the unique features of the Coachella Valley is the presence of the Agua Caliente Indian Reservation, which covers nearly 29 square miles in a checkerboard pattern throughout Palm Springs, Cathedral City, Rancho Mirage and unincorporated areas of Riverside County.

To the extent that tribal emissions arise within the borders of Rancho Mirage, they are incorporated into the Rancho Mirage inventory because, at this time, available data from utilities, transportation statistics, and public agencies do not differentiate between the geographical borders of Rancho Mirage and Reservation land.

¹⁶ Figure 5Error! Reference source not found. is for relative position only. It is not to scale and does not accurately reflect city boundaries.

¹⁷ Wheeler's Desert Letter, June 15, 2011.

Rancho Mirage is located at the base of the Santa Rosa Mountains, stretching between State Highway 111 and Interstate 10. A city of 24.84 square miles, its population grew at the rate of 30% between 2000 and 2010, reaching 17,218.¹⁸ During the winter season the population of the City swells substantially, to the extent of even doubling.¹⁹

Rancho Mirage features residential communities, a dozen country clubs/golf courses, a restaurant row, and several world-class destination resorts including the Agua Caliente Casino, Resort, and Spa. Its Eisenhower Medical Center and Betty Ford Center attract patients from around the world.

Climate Mitigation Measures to Date

The City of Rancho Mirage has already demonstrated civic leadership on issues related to environmental sustainability. As part of the Desert Cities Energy Partnership, the City receives ongoing encouragement and support in identifying and addressing energy efficiency and demand response opportunities, for both municipal facilities and the broader community. As a member of the CVAG, Rancho Mirage provides input and participates in developing solutions to Valley-wide issues including transportation.

The City has sponsored or supported a number of sustainability initiatives, whose results are embedded in the inventory baseline as part of this GHG inventory. Attributing exact savings results to these initiatives has been difficult, since documentation is sparse or non-existent. Now that a baseline has been established, tracking results from energy-related programs will perhaps be easier. It will certainly be more important for Rancho Mirage to get full credit for the emissions reductions it is realizing.

For this report an effort has been made to capture the results of these programs and initiatives for 2010. In 2010, sustainability programs produced substantial savings, estimated at 14,199 tonnes CO₂e. This suggests that Rancho Mirage's overall footprint would have been 4.9% larger than the current totals had initiatives not been in place (Figure 6 and **Error! Reference source not found.**).

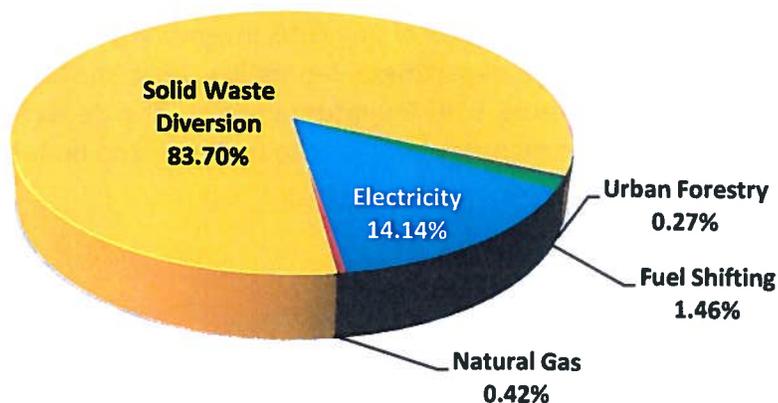
Table 2: Sustainability Initiatives Emissions Savings

Focus Area		Tonnes CO ₂ e Saved
Electricity	6,974,573 kWh	2,008
Natural Gas	11,275 Therms	60
Solid Waste	68,527 Tons	11,885
Urban Forestry		38
Water	- Gallons	-
Fuel Shifting	67,007 gge	208
Total Tonnes CO₂e		14,199

¹⁸ Population figures from <http://www.scag.ca.gov/resources/pdfs/2011LP/Riverside/RanchoMirage.pdf>

¹⁹ Wheeler's Demographic Profiles of the Coachella Valley, 2008/2009 edition.

Figure 6: Emissions Reductions from Sustainability Initiatives



Highlights of these efforts:

- City-wide recycling programs via roadside pick-up, hazardous waste collection, etc. These programs have been successful due to their longevity and community support.
- Commercial recycling programs such as the “111 Corridor” restaurant food waste effort
- Aggressive, targeted, business recycling
- Commitment of City staff time and the use of recycling specialists to spur field efforts
- The City’s urban forestry program
- Uptake of the California Solar Initiative to capture solar electric incentives and generate electricity locally

SCE and SCG residential and commercial efficiency programs providing energy efficiency upgrades for lighting, pumps, and HVAC

Table 3 lists climate mitigation measures undertaken by the City and embedded in the GHG inventory figures. The hope and goal of any GHG inventory is to spur future data collection in a new way. For example, a City department can realize what information is already tracked that might be applicable to a future GHG inventory process. The department can thus be prepared to keep and transmit these records every year to populate and update a report such as this.

Table 3: List of Mitigation Measures and Savings

Measure Name	Measure Type	Annual Savings	Units	Emissions Reductions (tonnes CO ₂ e)
Electricity				
Southern California Edison	In store rebate programs: lighting			
Southern California Edison	In store rebate programs: appliances			
Southern California Edison	Pool pump program			
Southern California Edison	Direct install residential: mobile home			
Southern California Edison	Special residential lighting: such as LED Christmas Lights			
Southern California Edison	Commercial programs: lighting			
Southern California Edison	Commercial programs: HVAC			
Southern California Edison	Commercial programs: restaurant/process industry			
Southern California Edison	Rebates for appliance and HVAC EE upgrades			
Southern California Edison	Ag and large pump programs			
<i>Total SCE Program Savings from 2004 - 2011</i>		3,213,160	kWh	925
Real Time Monitoring of Municipal Building's HVAC			Not quantified	
Landscape Lighting	Relamp and reduction of lighting		kWh	
LED Traffic Signals	Relamping	125,935	kWh	36
SCE Commercial Municipal Programs for 2004 - 2011		15,978	kWh	5
California Solar Initiative 2010	Photovoltaics 1905 watts capacity	3,619,500	kWh	1,042
Total Electricity		6,974,573	kWh	2,008 Tonnes CO₂e
Natural Gas				
Gas Company Programs for 2010	In store rebate programs: appliances			
Gas Company Programs	Home Energy Efficiency program			
Gas Company Programs	EE kits: Direct install or distribution: showerheads and low flow aerators			
Gas Company Programs	Incentive programs: furnaces, boilers, hot water heaters			
Gas Company Programs	Commercial: food service special programs			
Gas Company Programs	Commercial: healthcare special programs			
Gas Company Programs	Commercial: hospitality special programs			
Gas Company Programs	Commercial: industry/manufacturing			
Gas Company Programs	Commercial: school/university			
<i>Total Gas Company Programs Savings</i>		11,275	Therms	60
Total Natural Gas		11,275	Therms	60 Tonnes CO₂e

Table 4 (cont): List of Mitigation Measures and Savings

Solid Waste				
Restaurant Food Waste "111 Program"	Diversion to compost			
Educational Programs in Schools	Recycling			
Residential Consulting on Recycling	Recycling			
Business Consulting on Recycling	Recycling			
Curbside Pick-up	Recycling			
Business Pick-up	Recycling			
Construction Recycling	Recycling			
Hazardous Waste Programs				
Total Solid Waste		68,527	Tons	11,885 Tonnes CO_{2e}
Urban Forestry				
Urban Forest for 2010	Carbon Sequestration	21,031	lbs	19
Urban Forest	Reduced Electricity	31,727	kWh	9
Urban Forest	Reduced Natural Gas	277	Therms	10
Total Urban Forestry				38 Tonnes CO_{2e}
Water				
CVWD: Waterwise	Lawn Conversion, Smart Irrigation, Spray Nozzle Conversion, High Efficiency Toilets, additional initiatives			Not quantified
CVWD: Ordinance	2010 Landscape Ordinance 1302.1			Not quantified
Total Water			- Gallons	- Tonnes CO_{2e}
Fuel Shifting				
Municipal Fleet	Fuel Shift to CNG and Electric for 2010	2,807	gge	16
Burtec Solid Waste Fleet	Fuel Shift to CNG for 2010	64,200	gge	192
Total Fuel Shifting		67,007	gge	208 Tonnes CO_{2e}
Total Emissions Savings				14,199 Tonnes CO_{2e}

Role of Alternative Energy

The statewide California Solar Initiative (CSI) has had a positive impact on emissions in Rancho Mirage and in the Coachella Valley as a whole. When a community generates its own electricity using solar, it reduces imported electricity and the emissions associated with it.



Residential solar installation

Data from the CSI website shows that nearly 2 megawatts (MW) of solar capacity has been installed in Rancho Mirage. This has resulted in emissions reductions of 1,042 tonnes of the 14,429 tonnes CO₂e avoided by the City in 2010. SCE and IID report that, in 2010, approximately 396,222,634 kWh were sold in Rancho Mirage; therefore, solar systems saved approximately 0.91% of total community electricity use.

(Table 5 assumes 1,900 kWh generated per kW of solar at optimal azimuth and tilt—180 degree azimuth and 17 degree tilt.)

Table 5: Solar Contribution to Electricity Generation

Utility	kW of Solar	kWh Generated Annually	Tonnes CO ₂ e Saved
SCE	1,837	3,490,300	1,005
Imperial Irrigation District	68	129,200	37
Total	1,905	3,619,500	1,042

A Living Document

This inventory is a significant step on the road to meeting the goals for emissions reduction for Rancho Mirage, the Coachella Valley, and California. It has been prepared using the best data available, and the most current methodologies. Quality control measures have been applied both internally and externally with the assistance of consultants.

Calculating emissions is both an art and a science, requiring numerous assumptions. Over time, technologies and methodologies may change. While this inventory provides a solid foundation for future decisions, its findings are highly qualified approximations.

Note Regarding Data Confidentiality

Inventory professionals always seek the most detailed and complete information available. When it comes to analysis of a specific building or company, this requires analysis of monthly or even daily usage. Understandably, some utility customers may wish to keep private their energy usage and the amount of their energy bills.

To respect their customers' privacy, utilities do not share such details. The release of aggregated data is subject to the so-called "15/15" rule, which requires that data be aggregated to a higher level if there are fewer than 15 customers in a category or if one customer represents 15% or more of the total usage within the category.

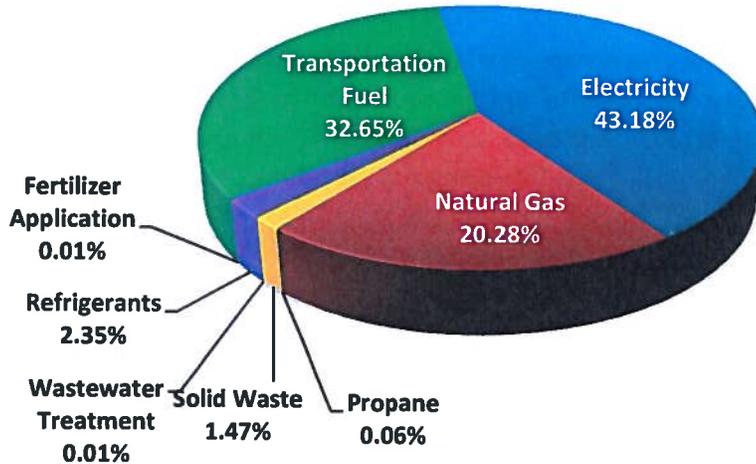
Generally, utility data is delivered sorted by rate class or by industry category. In cases where a specific business could be identified by looking at this breakout—for example, where only one business within the city would fall into a specific rate class—then categories are combined to deliberately obscure identification.

From the standpoint of the GHG Inventory, the very best source of data comes directly from the customer. In the absence of individual-customer provided data, the inventory uses aggregated figures and breaks them down following established protocols or simply best judgment. The Methodology Briefings (describe how each set of data is treated.

III. Emissions Summary

Rancho Mirage's 2010 greenhouse gas emissions inventory establishes a baseline of 277,698 tonnes CO₂e. These emissions come from the following sources (Figure 7).

Figure 7: Rancho Mirage 2012 Community Emissions by Source



Per Capita Emissions

While not an exact science, per capita emissions have been viewed as a way of comparing emissions between cities, and are often expected as part of the GHG inventory analysis. In Rancho Mirage, this number is affected by two factors:

- High vehicle miles traveled due to a long stretch of Highway 111 within city limits
- Large seasonal population not included in full-time resident data

Rancho Mirage

16.1 tonnes CO₂e

Emissions emitted
per person

These factors may artificially distort per capita emissions. In addition, per capita emissions for Rancho Mirage may not compare with other cities throughout the country because of differences in methodology.

With these caveats, the per capita emissions of Rancho Mirage, with a population of 17,218, are estimated at 16.1 tonnes CO₂e.

Backcasting and Forecasting

One benefit of a GHG inventory is to give the City an understanding of where it has come from, and where it is headed with regards to its emissions.

Backcasting is a term used to describe the process of looking backwards to a given date from data and emissions levels measured at a current point in time. Backcasting has become important to GHG inventories because AB 32 requires the State to establish 1990 levels of emissions in order to measure emissions reduction progress.

Rancho Mirage has a number of options as to how to “backcast” to the past emissions levels:

- Conduct a GHG inventory using 1990 data;
- Estimate a 15% reduction in emissions from “current” levels (as suggested in the AB 32 Scoping Plan); or
- Perform calculations to achieve a 1990 baseline estimate based on population and available historical data.

ICLEI neither offers nor condones recommendations on the backcasting process. Because most Coachella Valley cities are unique in that population growth and development have changed substantially since 1990, estimating 1990 emissions on population appears to be most accurate and relevant for the City of Rancho Mirage (Methodology Briefing 14, electronic page 132).

Forecasting starts with emissions at a point in time, typically now (a baseline year or update year), and looks forward.

Forecasting allows a city to estimate its future emissions assuming Business-as-Usual (BAU) practices—that is, generating emissions at the same rate without an adjustment in behavioral or operational activity. Having a BAU estimate allows a city to set emissions reduction goals and show its successes once the City recalculates its GHG emissions at that time.

Forecasting typically takes into consideration:

- Emissions increases that result from growth of population;
- Data from past inventories and updates;
- Economic and major source emission changes ;
- Federal and state standards; and
- Sustainability programs that are developed and implemented.

AB 32 requires the State of California to forecast emissions to 2020. Two forecasted scenarios to 2020 were developed (Methodology Briefing 15, electronic page 187):

- 1) BAU incorporating renewable portfolio standards and increased fuel standards using the Statewide Energy Efficiency Collaborative (SEEC)’s Greenhouse Gas Forecasting Assistant.
- 2) AB 32 targets.

The Figure 10 and Table 5 summarizes the position of Rancho Mirage based on available data from 1990, 2005 and 2010. The blue line shows the trajectory the City would follow given full implementation of state and federal emissions reduction programs. The dotted line shows the required trajectory for the City to reach AB 32 targets.

Note that, starting in 2005, Rancho Mirage’s emissions have declined. The reduction can be attributed to a number of factors:

- Community education

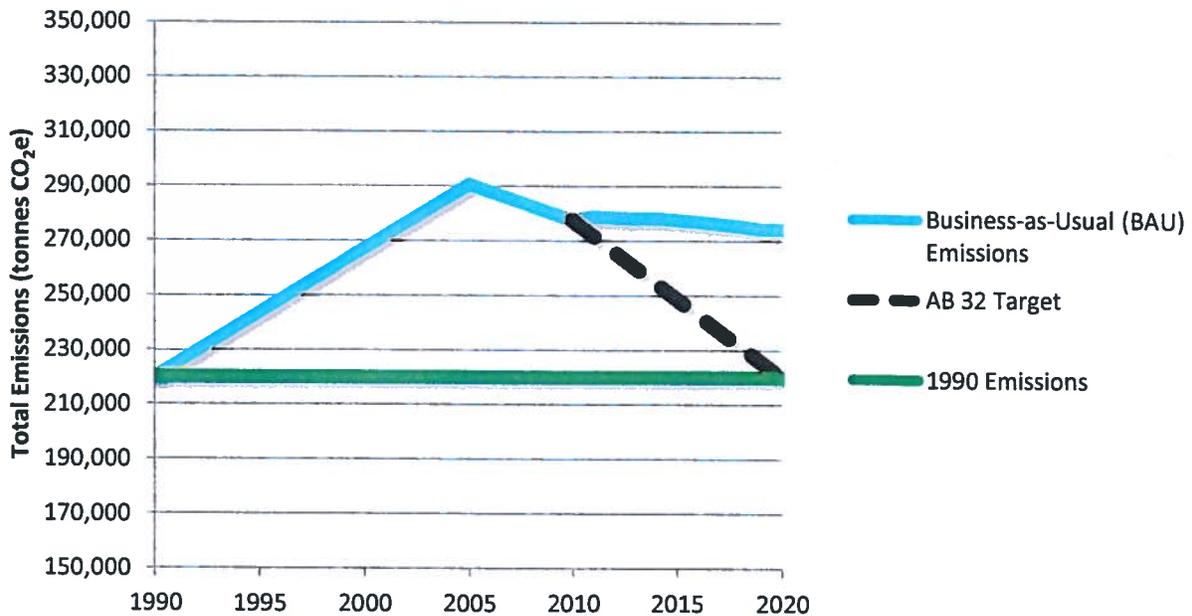
- Energy efficiency programs
- General economic slowdown

The emissions projection to 2020 is based on current and historical inventory data. The Figure 10 shows that Rancho Mirage’s BAU community emissions, even with the impact of federal and state efficiency programs, will not reach AB 32 goals. In order to do so, Rancho Mirage will need to reduce community emissions by 54,272 tonnes CO₂e by 2020.

Table 5: Rancho Mirage Emission Targets

Scenario	Total Emissions (Tonnes CO ₂ e)	Tonnes over 1990	% Reduction Needed
1990 Emission Level	220,061	-	-
2010 Baseline	277,698	57,637	20.8%
2020 Business-as-Usual	274,333	54,272	19.8%

Figure 8: Rancho Mirage Emissions Projections



Putting Emissions into the Regional Perspective

As a region the Coachella Valley has leadership through local government (CVAG) and geographic interest that represents its entire area (or bubble). The DCEP and the Green for Life program are creating a regional template and assessment for the CVAG territory to be able to incorporate the individual city emissions inventories as they become available or are updated.

To get a complete picture of the Valley emissions from the template and the resulting regional assessment, some emissions must be considered that have not been accounted for in the city-wide inventories. Chief among these are emissions from:

- Through and Valley travel on the I-10 and Route 86;
- Air travel originating in the four Valley airports; and
- Union Pacific and Amtrak rail locomotive traffic.

All Valley cities, by virtue of their location and membership in CVAG, have some “ownership” and control of these emissions in future sustainability planning. While many cities might geographically have little contact with an emissions source they may have some direct or indirect benefits—for example, tourism from the airport, etc.

Regional transportation emissions have been quantified based on population figures for all CVAG members as 2.8 tonnes CO₂ per capita. These emissions are not included in the inventory totals, but are detailed in Methodology Briefing 5.

Rancho Mirage

2.8 tonnes CO₂e
Added per capita
Regional Transportation Emissions

IV. Community Inventory

The community inventory presents the total quantity of GHG emissions produced by Rancho Mirage as largely defined by its geographic borders during 2010. Following ICLEI convention, it includes local government operations emissions.

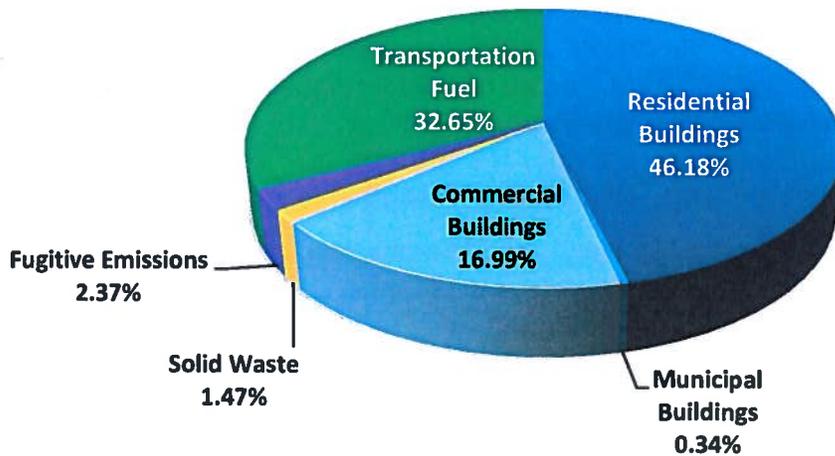
The community inventory covers six major sectors: residential, commercial, municipal, transportation, waste and fugitive emissions. For specific details regarding emissions from each category, please refer to the Methodology Briefings.

GHG Community Inventory Details for Rancho Mirage

Table 6: 2010 Rancho Mirage Detailed Community Emissions

Category	Source	2010 Emissions (Tonnes CO ₂ e)
Residential Buildings	Electricity (SCE)	78,947
	Electricity (IID)	4,490
	Natural Gas	44,643
	Propane	157
Commercial Buildings	Golf Courses and Country Clubs - Electricity (SCE)	1,433
	Golf Courses and Country Clubs - Natural Gas	810
	Hotels, Motels, and Hospitality - Electricity (SCE)	6,699
	Hotels, Motels, and Hospitality - Natural Gas	3,788
	Medical Facilities - Electricity (SCE)	2,858
	Medical Facilities - Natural Gas	1,616
	Other Commercial - Electricity (SCE)	9,483
	Other Commercial - Natural Gas	5,362
	Small Commercial - Electricity (IID)	1,735
	Large Commercial - Electricity (IID)	5,334
	Domestic Water Supply - Electricity (CVWD)	918
	Water Pumping/Sewage - Electricity (SCE)	6,659
	Street Lights - Electricity (SCE)	480
Traffic Control (SCE)	6	
Municipal Buildings	Municipal Buildings and Other Facilities - Electricity (SCE)	539
	Municipal Buildings and Other Facilities - Natural Gas	90
	City Services - Electricity (SCE)	258
	Public Authority - Electricity (IID)	60
Transportation	On-Road Vehicles	90,578
	Off-Road Vehicles	96
Solid Waste	Paper Products	1,977
	Food Waste	1,004
	Plant Debris	262
	Wood or Textiles	840
Fugitive Emissions	Wastewater Treatment Facilities (CVWD)	21
	Ozone-Depleting Substance Substitutes	6,516
	Golf Course Fertilizer Application	38
	Municipal Parks Fertilizer Application	1
Total Community Emissions		277,698

Figure 9: Rancho Mirage 2010 Community Emissions by Sector



Residential Buildings

The residential sector of the City contributed 128,237 tonnes CO₂e, or 46.18%, as a result of its use of electricity, natural gas, and propane (see Methodology Briefings 1, 2 and 3, which can be found on electronic page 1, 31 and 44 respectively).

- 282,016,904 kWh of purchased electricity, or 83,437 tonnes CO₂e
- 8,398,556 therms of natural gas, or 44,643 tonnes CO₂e
- 27,846 gallons of propane, or 157 tonnes CO₂e

Commercial Buildings

Commercial activities in the City contributed 47,181 tonnes CO₂e, or 16.99%, to the emissions count (see Methodology Briefings 1, 2, and 7, which can be found on electronic page 1, 31 and 90 respectively).

- 111,335,264 kWh of purchased electricity, or 35,604 tonnes CO₂e
- 2,177,900 therms of natural gas, or 11,577 tonnes CO₂e

Municipal Buildings, Facilities and Services

Emissions from municipal buildings in this community inventory only include emissions from electricity and natural gas. More information can be found in the municipal inventory (VI). City-wide, municipal buildings contributed 947 tonnes CO₂e to the emissions count, or 0.34% (see Methodology Briefings 16 and 17, which can be found on electronic page 190 and 199).

- 2,870,466 kWh of purchased electricity, or 857 tonnes CO₂e
- 16,852 therms of natural gas, or 90 tonnes CO₂e

Transportation

Community-wide transportation contributed 90,674 tonnes CO₂e, or 32.65%, to the emissions count (see Methodology Briefings 4 and 6, , which can be found on electronic page 45 and 88).

- 90,578 tonnes CO₂e for on-road vehicles
- 96 tonnes CO₂e for off-road vehicles (recreational vehicles, construction vehicles, landscaping equipment, etc.)

Solid Waste

Rancho Mirage diverted over 74.4 % of its waste through diversion and recycling in 2010. Nevertheless, solid waste was sent to local landfills and will contribute emissions in the future as it decomposes. Solid waste sent to landfills contributed 4,083 tonnes CO₂e, or 1.47%, to the emissions count (see Methodology Briefings 9 and 10, which can be found electronic page 93 and 103).

- 1,977 tonnes CO₂e from paper products
- 1,004 tonnes CO₂e from food waste
- 262 tonnes CO₂e from plant debris
- 840 tonnes CO₂e from woods and textiles

Fugitive Emissions

Fugitive emissions are miscellaneous sources of CO₂e. They include refrigerants used within the City (ozone-depleting substance substitutes), methane from wastewater treatment plants, and fertilizers used on golf courses and parks. Note that, while no wastewater treatment facilities falls within the jurisdiction of Rancho Mirage, the City maintains a contract with CVWD for wastewater treatment services. Information on each of these sources, and how it was collected—along with clear data collection limitations can be found in Methodology Briefings 8, 11, and 12(Methodology Briefings electronic page 91, 118 and 120, respectively). Fugitive emissions contributed 6,576 tonnes CO₂e, or 2.4%, to the emissions count.

- 1.8 tonnes nitrous oxide from fertilizer application, or 39 tonnes CO₂e
- 0.07 tonnes nitrous oxide from wastewater treatment facilities, or 21 tonnes CO₂e
- 6,516.3 tonnes CO₂e from refrigerants

V. Major Emissions Sources

Three areas of the inventory deserve more detail because of the overall impact of their content: electricity, transportation, and natural gas.

Electricity

California is the nation's leader in energy efficiency and Green for Life cities reflect the same statewide accomplishments. That said, Green for Life cities also face specific challenges because of the desert climate.

The following special circumstances are reflected in the inventory.

Utility Providers

Emissions from electricity provided by a given utility vary because each utility has a different fuel mix (% from coal, natural gas, nuclear, renewables). In the CVAG region, electricity is provided by Southern California Edison (SCE) and by Imperial Irrigation District (IID). The CACP software uses different emission factors for each utility.

Renewable Portfolio Standard

California requires its utilities to increase the percentage of renewable energy contained in their "portfolio" of energy sources. The RPS program requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 33% of total procurement by 2020. Each utility's portfolio contains a different level of renewables.

Electricity Efficiency Programs

SCE, as one of the major investor-owned-utilities in California, offers many programs to incent efficiency. All the cities of the Desert Cities Energy Partnership participate in at least some of these programs. Some of the Green for Life cities have developed their own local programs to further incent their residents to save electricity and water (with its embedded electricity for pumping). Most of these programs are quantified within the Sustainability Measures section.

Impact of Air Conditioning in the Coachella Valley

Residents in Climate Region 15 use considerably more electricity for air conditioning than residents in other zones. Edison's allocation for basic services in Region 15 is four times the allocation for Region 8 (Orange County).²⁰ The need for air conditioning—and its cost—requires constant attention and drives programs for technology upgrades.

²⁰ <http://www.sce.com/CustomerService/billing/tiered-rates/baseline-chart-map.htm>

Embedded Energy in Water

Water pumping is the largest single use of electricity in the State of California. Water pumping rates provided by SCE reveal that a significant amount of electricity is used to pump water

Methodology

SCE and IID have provided city-wide (aggregated) and municipal account data for 2010 and 2005 and 1990 (limited). Municipal account data has been connected with specific buildings in each city, with quality control provided by city staff. These reports can be found in Methodology Briefing 1 (Methodology Briefing electronic page 1).

Transportation

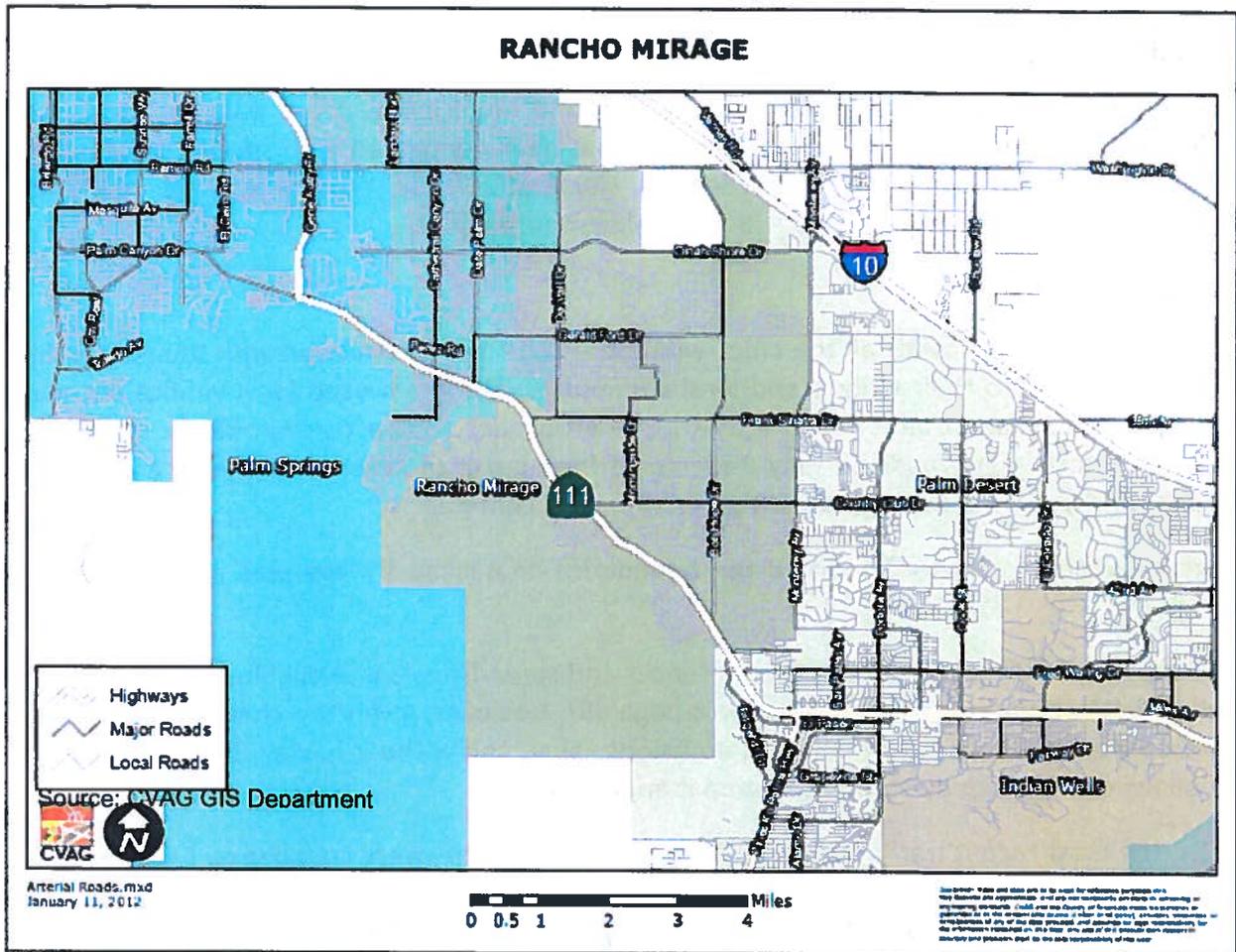
Transportation emissions for all the cities within the DCEP were calculated with the goal to be the most relevant to their unique and local community. The team used local verification and counts and information directly from CVAG, preferring not to use countywide or statewide modeling. Efforts were made to fully understand the impact of seasonal issues, the effect of through traffic, and the demographics that exist in each community.

For this inventory only traffic within the boundaries of Rancho Mirage was included in the analysis.

A full explanation of this process with references and spreadsheets is available in Methodology Briefing 4 (Methodology Briefing electronic page 45). However, given the challenge and great interest associated with determining an emissions value, and without having fuel sales figures, the following brief step-by-step description is appropriate.

1. The most recent traffic counts and road distance lengths were supplied by CVAG for city arterial roads and calculated to supply a daily VMT (vehicle miles traveled) on arterial roads. Figure 10 shows the arterial roadways ("Major Roads") in Rancho Mirage.
2. This arterial road figure was then multiplied by a factor (based on Department of Transportation data and other local traffic studies analysis) that accounts for travel on collector and local roads. This results in a city-wide daily VMT for the day of the traffic count.
3. An annual VMT was calculated by using a 300 day "scaler" (verses 365 days) to take into account seasonal population fluctuations. This adjustment is required because traffic counts in this area are done in the high season (late January/early February).
4. Annual VMT from the city was then apportioned to a vehicle type based on local traffic and classification counts done for the project.
5. Once apportioned by vehicle type, each vehicle was assigned the appropriate fuel and fuel efficiency rating by class. Local fuel quantities were then tallied and determined for all the vehicular traffic in the city.
6. The fuel types and quantities were then converted to CO₂e emissions using standard coefficients.

Figure 10: Rancho Mirage Major Arterials



Natural Gas

Natural Gas also plays an important role in the overall energy equation in the Valley. Of the “Big Three” emissions from natural gas account for 20.28%, compared to electricity and transportation at 43.18% and 32.65%, respectively. Southern California Gas (SCG) participates in the Desert Cities Energy Partnership with SCE and 10 jurisdictions.

Methodology

For this inventory at the community level, SCG has provided detailed grouped by North American Industry Classification System (NAICS) code. At the municipal level, data was provided by account.

Residential Efficiency Cost-Effectiveness

In the CVAG region, most homes are heated and have hot water provided by natural gas. SCG offers incentive programs for residential efficiency upgrades for hot air furnaces, hot water

heaters, and pool heaters. In these areas, system efficiencies have been improving over the last 10 years. However, due to the desert climate and the interrupted usage due to the seasonal population, cost-effectiveness can be a challenge.

Commercial Efficiency Opportunities

In the commercial sector, programs for large users are effective. SCG has been aggressive in targeting multifamily homes, hotels and food service for efficiency upgrades with special programs.

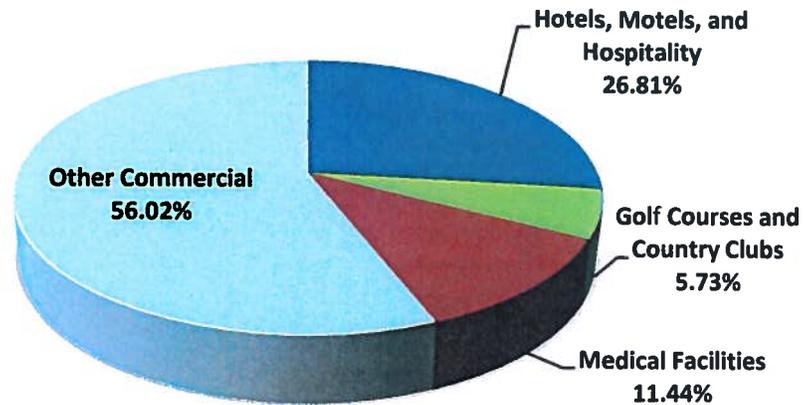
Compressed Natural Gas (CNG)

In the CVAG region the use of CNG has shown a dramatic rise, backed by community support for better air quality and a growing infrastructure of CNG fueling stations. As seen in the sustainability sections of this document, four fleets operating in Rancho Mirage, including the municipal fleet and Burrtec have converted a portion of their vehicles to CNG, resulting in an annual reduction of 208 tonnes CO₂e (see Methodology Briefing 13).

Special Section: Energy Use in the Commercial Sector

Each city has its own make-up of commercial activity that impacts community emissions. For the purposes of better illustrating how this sector impacts emissions in Rancho Mirage the inventory has identified key classifications below (**Error! Reference source not found.**). Note that these figures are approximations, as detailed information is not available on a per-business basis. Golf and hospitality make up more than 32.54% of all commercial emissions. Medical facilities also contribute a significant amount of emissions, 11.44%. The "Other Commercial" emissions predominate and include emissions from food establishments, supermarkets, leased spaces, and other general services.

Figure 11: Electricity and Natural Gas from Commercial Building



VI. Municipal Inventory

The municipal inventory is more detailed than the community inventory, largely because the municipality has more control over its emissions and a greater incentive to measure them. The municipal inventory includes data on local government operations.

City Profile Information, 2010

Table 7: City Profile for Rancho Mirage

Item	Data
Jurisdiction name	City of Rancho Mirage
Street Address (for City Hall)	69-825 Highway 111
City, State, Zip	Rancho Mirage, CA 92270
County	Riverside
Website	http://www.rancho Mirage ca.gov/index.php
Area	24.836 sq mi
Population (full time) ²¹	17,218 (2010)
Population (seasonal) ²²	13,500 (2008/2009)
Median age of population ²³	60
Housing Units	14,243
Persons per occupied unit	2
Median household income	\$74,709
Growth rate 2000-2010	30%
Annual budget	\$21,863,463
Climate zone ²⁴	15
Annual heating degree days ²⁵	793
Annual cooling degree days ²⁵	4,343

Municipal GHG Inventory Details

Emissions for municipal operations reflect the commitment of the city to providing a full range of services to its citizens. At the same time, the municipal government has the ability to make changes in how it operates and to set policies and be sure they are followed. Even though city operations are typically responsible for a small percentage of the emissions of a community, the city is uniquely positioned to set the tone and show the way when it comes to efficiency.

²¹ 2010 Census Data

²² Wheeler's Demographic Profiles, 2008/2009 edition.

²³ Population figures from scag.ca.gov/resources/pdfs/2011/Riverside/RanchoMirage.pdf

²⁴ http://www.energy.ca.gov/maps/renewable/Climate_Zones_by_City.pdf

²⁵ National Climatic data Center. ggweather.com. A Degree Day is a unit of measurement equal to a difference of one degree between the mean outdoor temperature and a reference temperature (65°F). Degree Days are used in estimating the energy needs for heating or cooling a building. For an example of a heating degree day: if a day's temperature is 60°F and the low is 40°F, the average temperature is 50°F. 65°F - 50°F = 15 heating degree days. For a cooling degree day: if a day's temperature is 90°F and the low is 70°F, the average temperature is 80°F. 80°F - 65°F = 15 cooling degree days.

In Rancho Mirage, municipal emissions for 2010 total 2,703 tonnes, less than 1% of city-wide emissions. Error! Reference source not found. Figure 12 presents the breakdown of emissions by source.

Figure 12: Rancho Mirage 2010 Municipal Emissions by Source

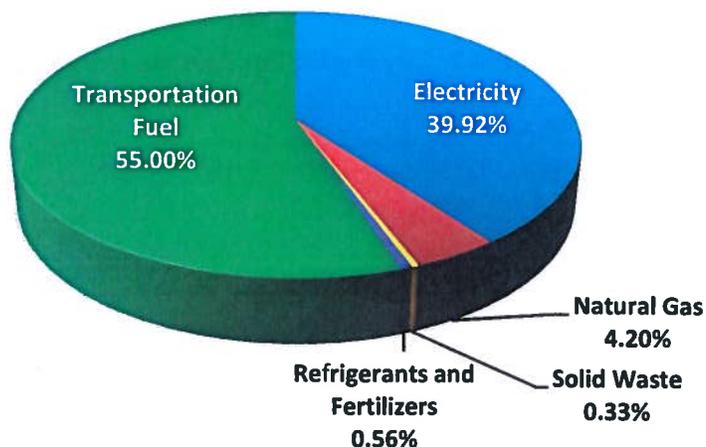
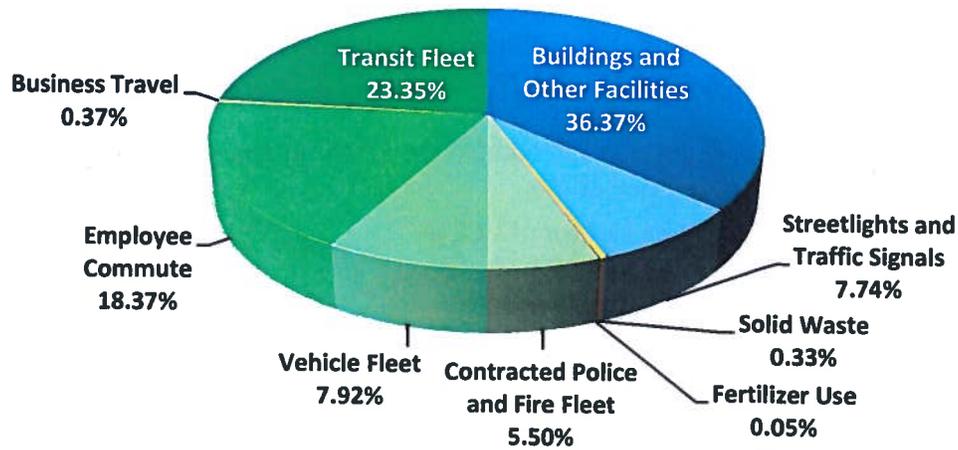


Table 8 and Figure 13 Error! Reference source not found. show City operations emissions by sector as identified in the LGOP. Whereas the community inventory tracks six sectors, the municipal inventory monitors nine.

Table 8: 2010 Rancho Mirage Detailed Municipal Emissions

Category	Scope	2010 Emissions (Tonnes CO ₂ e)
Buildings and Other Facilities	1, 2	780
Streetlights and Traffic Signals	2	166
Vehicle Fleet	1	171
Employee Commute	3	394
Business Travel	3	8
Contracted Police and Fire Fleet	3	118
Transit Fleet	3	501
Solid Waste Disposal	3	6
Fertilizer Use on Municipal Parks	3	1
Total Municipal Emissions		2,145

Figure 13: Rancho Mirage 2010 Municipal Emissions by Sector



As with the community inventory, reports and detailed data analysis can be found in the Methodology Briefings.

Municipal Buildings and Facilities

City buildings contributed 780 tonnes CO₂e, representing 28.9% of municipal greenhouse gas emissions. Southern California Edison provided the Electricity Municipal Accounts Report for 2010. The Report gives kWh usage, meter read date, rate family, bill amount, tariff and service address. Imperial Irrigation District provided a lump sum kWh usage for 4 accounts. Data was cross-referenced with SCE data to break apart emissions for signal lights, traffic signal shop, landscaping, and the City Yard (see Methodology Briefing 1 and 16, can be found on electronic page 1 and 190).

The Natural Gas Municipal Accounts Report for 2010 was provided by Southern California Gas Company. It provides annual therms used, North American Industry Classification System (NAICS) code classification, rate group and customer address (see Methodology Briefing 17, can be found on electronic page 199).

- 1,974,096 kWh of purchased electricity, or 691 tonnes CO₂e
- 16,852 therms of natural gas, or 90 tonnes CO₂e

Streetlights and Traffic Signals

Streetlights and traffic signals contributed 166 tonnes CO₂e, representing 6.1% of municipal greenhouse gas emissions (see Methodology Briefing 1 and 16, can be found on electronic page 1 and 190)).

- 575,791 kWh of purchased electricity, or 166 tonnes CO₂e

Vehicle Fleet

The Rancho Mirage municipal fleet data was provided by Rancho Mirage Public Works for all departments. A detailed inventory of City-operated vehicles appears in Methodology Briefings 18, 21, and 28 (Methodology Briefing electronic pages 200, 204, and 226), with further breakdown by fuel type and miles per gallon gas equivalents, as well as the amount of refrigerants used. In all, the fleet contributed 171 tonnes CO₂e, or 6.3%, as follows:

- 2,807 gallons-gas equivalent (gge) of compressed natural gas, or 20 tonnes CO₂e
- 404 gallons of diesel, or 4 tonnes CO₂e
- 12,768 gallons of gasoline, or 114 tonnes CO₂e
- 623 gallons of off-road diesel, or 27 tonnes CO₂e
- 10 pounds HFC-134A, or 6 tonnes CO₂e

Solid Waste

Disposal of waste from City buildings, City parks, and roadside cleanup was reported by City staff. Composition of solid waste and total diversion figures are included in Methodology Briefing 27. Solid waste contributed 6 tonnes CO₂e, or 0.33% of municipal emissions.

- 3 tonnes CO₂e from paper products
- 2 tonnes CO₂e from food waste
- Negligible amounts from plant debris
- 1 tonne CO₂e from wood or textiles

Employee Commute

Employee commute information was provided by City staff. While commute figures are considered Scope 3 emissions, the study of the employee commute is encouraged by the LGOP because it typically reveals large efficiency opportunities. Employee commute emissions totaled 394 tonnes CO₂e, or 18.37% of municipal emissions (see Methodology Briefing 25).

- 410,341 miles driven in gasoline-fueled passenger cars, or 189 tonnes CO₂e
- 318,326 miles driven in gasoline-fueled light trucks, or 204 tonnes CO₂e
- 1,380 miles driven in diesel-fueled passenger cars, or <1 tonne CO₂e
- 250 miles driven in diesel-fueled light trucks, or <1 tonne CO₂e

Business Travel

Business travel information was provided by City staff. Emissions totaled 8 tonnes CO₂e, or 0.37% (see Methodology Briefing 26, electronic page 222).

- 16,699 miles driven in gasoline-fueled passenger cars, or 8 tonnes CO₂e
- Negligible amounts from jet fuel

Contracted Sheriff and Fire Fleet

Rancho Mirage contracts the services of Riverside County Sheriff's Department and Riverside County Fire. They provided vehicle inventory information by department, fuel type, vehicle type, and model year and miles driven for entry into the CACP software. Emissions for this category totaled 118 tonnes CO₂e, or 4.4% (see Methodology Briefings 19, 20, 29, and 30).

- 4,435 gallons of diesel, or 45 tonnes CO₂e
- 7,637 gallons of gasoline, or 67 tonnes CO₂e
- 9 lb. HFC-134A, or 5 tonnes CO₂e

Transit Fleet

The City of Rancho Mirage works with SunLine Transit, Burrtec Waste Industries, Palm Springs Unified School District and the Desert Sands Unified School District for City transit and/or disposal services (Palm Springs Unified School District did not provide data regarding fleet fuel consumption.). Each of these provided detailed statistics regarding their activities within the City borders. These entities have completed fuel shifts from gasoline and/or diesel to Compressed Natural Gas (CNG). Rancho Mirage's share of emissions from each entity is included below, totaling 1,059 tonnes CO₂e, or 39.2% (see Methodology Briefings 22–24).

- 64,200 gge of compressed natural gas, or 464 tonnes CO₂e
- 3,600 gallons of diesel, or 37 tonnes CO₂e

Nitrous Oxide from Fertilizer Use on Municipal Parks

Rancho Mirage staff apply fertilizer to at least four parks within the City. Total fertilizer application was estimated to generate approximately 1 tonne CO₂e (or 0.05%) (see Methodology Briefing 31).

- 0.004 tonnes nitrous oxide or approximately 1 tonne CO₂e.

VII. Next Steps

This inventory provides the City of Rancho Mirage with a baseline figure upon which to base future decisions and actions.

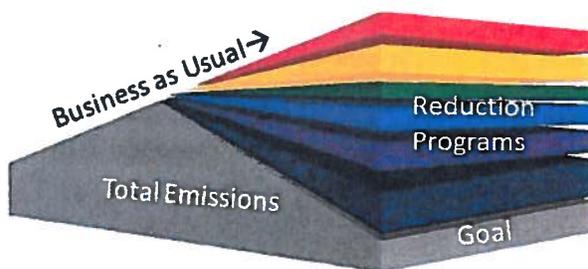
Goals for Emissions Reductions

The greenhouse gas inventory findings lead the City to look to the future, and to the changes in policy or processes that will need to be made to meet local or statewide goals. California's AB 32-mandated target is to reduce emissions to 1990 levels by 2020. More specific goals will be presented in the Sustainability Plan.

Policies and Programs

Business-as-usual is likely to produce an ever-rising total of emissions. To meet its goals, Rancho Mirage will develop and/or expand energy efficiency and cost savings programs in a number of areas.

Figure 14: Emissions Reduction Wedges



This “wedges” graphic (Figure 14) provides a visual representation of how a portfolio of programs can reduce emissions from business-as-usual to reach emissions reduction goals.

Sustainability Plan

Recommendations for each of the “wedges,” or focus areas, are included in the Rancho Mirage Sustainability Plan. These documents will give the City tools and options for managing energy and efficiency policies and programs. The inventory and plan will also open doors for funding where having such documents is a prerequisite.

Updates

Success with policies and programs to cut emissions, economic conditions, and other factors will cause Rancho Mirage's emissions to change over time. The sustainability plan presents an update policy, potentially drawing upon local academic institutions that provide training and workforce development services in the climate action arena.

Data collection methods from this inventory have been described, and the Methodology Briefings in the Exhibits are purposefully detailed, to facilitate updates.

Leadership

The City of Rancho Mirage is pleased to have completed its first greenhouse gas inventory, an important step in sustainability planning and regulatory compliance. It is also an important step in finding win-win opportunities between economy and environment.

Green for Life cities continue to work in concert. Rancho Mirage is committed to continuing this collaboration to improve results and strengthen the fabric and livelihood of the Coachella Valley.

The City of Rancho Mirage intends to promote means of taking action on reducing its emissions, to meet if not exceed mandates and goals, while maintaining and building on the exceptional quality of life that its residents, businesses, and visitors enjoy.

For further information about this inventory, please contact Bud Kopp, Interim Director of Community Development, at budk@ranchomirageca.gov.

