Cathedral City Greenhouse Gas Inventory

May
2013

2010 Community and Municipal Operations Inventories

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I. Executive Summary

The City of Cathedral City is pleased to have completed its first Greenhouse Gas Inventory and the accompanying Methodology Briefings. This 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), Cathedral City 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

1. Communitywide emissions in 2010, using guidelines approved by the California Air Resources Board, total 236,863 tonnes CO_2e.[1]
2. This level is 29.1% above 1990 target levels referenced in AB 32[2]—183,424 tonnes CO_2e.
3. The municipal contribution to the community's emissions footprint is 1.3%, or 3,104 tonnes CO_2e.
4. Electricity—predominantly used for air conditioning—is responsible for 39.9% of the community's emissions.
5. At 4.6 tonnes per capita, Cathedral City has low emissions relative to its neighboring cities.
6. Cathedral City's transportation emissions are high relative to neighboring cities due to a larger segment of Highway 111.
7. The per capita regional transportation emissions value of 2.8 tonnes CO_2, when added to City emissions, puts Cathedral City's total emissions per capita at 7.4 tonnes CO_2e.

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

Cathedral City is an active member of the Desert Cities Energy Partnership (DCEP), a partnership of Southern California Edison (SCE), Southern California Gas Company (SCG), 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 Southern California Edison "Flight 5.6" funding for the Strategic Plan Strategic Program. Developing greenhouse gas inventories for DCEP project cities was one of eight

[1] Greenhouse gas emissions are measured in metric tons, or "tonnes," of carbon dioxide. Other gases are converted to their equivalents of CO_2 and tracked as "tonnes CO_2e."

[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.

programmatic activities proposed by CVAG and funded by SCE. 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, and methodologies used to create this inventory. These details are found in the Methodology Briefings.

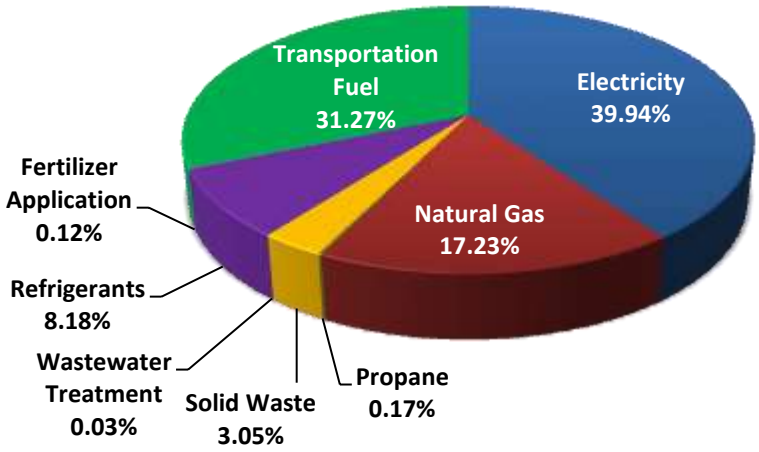
The inventory presents two sets of data. The first covers the entire community and is labeled the "Community Inventory." A second study is made of City government operations and is called the "Municipal Inventory." Municipal emissions are included within the community inventory. This convention of breaking 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

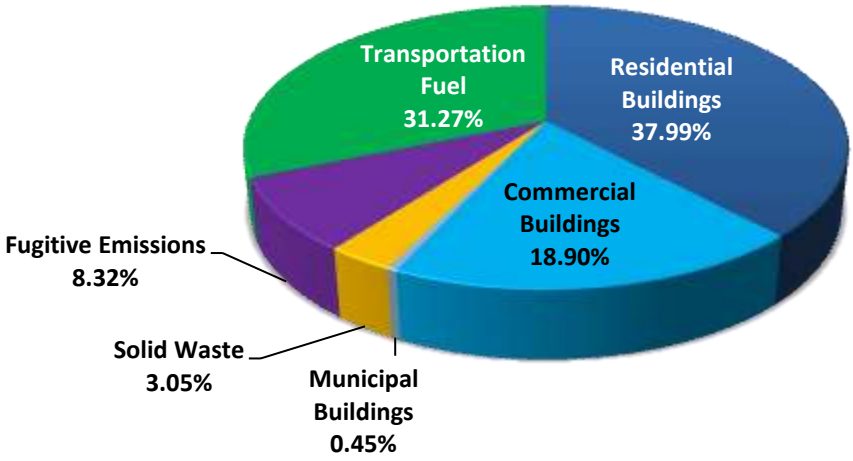
- Cathedral City's emissions total for 2010 was 236,863 tonnes CO_2e. The top three sources of emissions for the community, as shown in Figure 1 below, are electricity (39.94%), transportation fuel (31.27%), and natural gas (17.23%). All other cities in the Green for Life project share the same top three emissions sources, although in different order and proportions. These are also the top emissions sources for the State of California.

Figure 1: Cathedral City 2010 Community Emissions by Source



- When looking at sectors or activities, Cathedral City's "footprint" is dominated by the residential buildings sector (Figure 2). As a result of its use of electricity, natural gas and propane, this sector produces 37.99% of all emissions.

Figure 2: Cathedral City 2010 Community Emissions by Sector



- Despite the demand for electricity for cooling, Cathedral City's electricity consumption figures are quite low, reflecting positive awareness and progressive City energy management steps as well as the following special circumstances related to its utility, Southern California Edison (SCE):

    a. In partnership with Southern California Edison and Southern California Gas and its neighboring cities and tribe, Cathedral City has participated in and sponsored effective, energy-efficiency programs.

    b. Southern California Edison's fuel mix compares favorably to the fuel mix of other utilities in 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 greenhouse gas (GHG) values for Cathedral City in the future.

- 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 Cathedral City:

    a. Traditional "CVAG traffic counts" are taken in early Spring when the seasonal population is at its highest. "Scaling"[3] was used to normalize the annual values presented in this inventory.

[3] For the purposes of the GHG inventory, Cathedral City vehicle miles traveled, traditionally measured in the high season, have been assigned an annual multiplier of 300 to "scale down" annual vehicle miles traveled.

b. Traffic on Highway 111 has a major impact increasing emission in this sector.

c. On the other hand, the average age of full-time residents in Cathedral City shortens the average trip length in the City.

- In addition to transportation emissions within the community inventory, regional transportation emissions have also been quantified. Per capita emissions for Cathedral City, from this regional assessment, total 2.8 tonnes CO_2.

Municipal Inventory Highlights

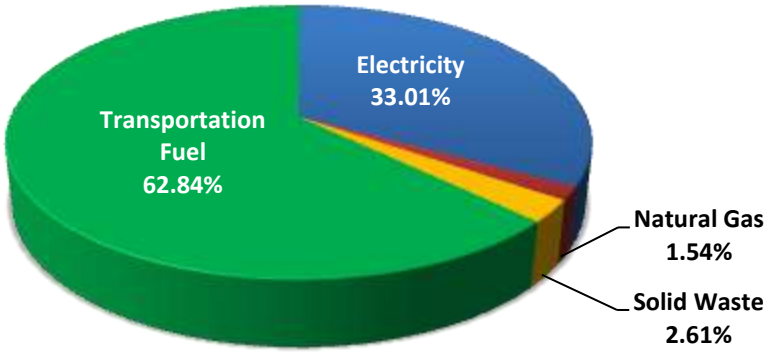
The full inventory of emissions from Cathedral City municipal operations (based on the Local Government Operations Protocol) counts emissions from seven sectors (Table 1). The total represents about 1.3% of all community emissions.

Table 1: Cathedral City 2010 Municipal Operations by Sector

Category	Scope	2010 Emissions (Tonnes CO_2e)
Buildings and Other Facilities	1, 2	747
Streetlights and Traffic Signals	2	317
Water Delivery	2	8
Vehicle Fleet	1	739
Employee Commute	3	731
Transit Fleet	3	480
Solid Waste	3	81
Total Municipal Emissions		**3,104**

- Transportation fuel is the largest source of emissions for City operations, as shown in Figure 3 below.

Figure 3: Cathedral City 2010 Municipal Emissions by Source



Summary

The Cathedral City 2013 Greenhouse Gas Inventory, the Cathedral City 2013 Energy Action Plan, and the Cathedral City 2013 Climate Action 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 Cathedral City 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.

Working together 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 environmental fabric of the Coachella Valley.

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

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II. Introduction

Impetus

Climate protection regulations can either threaten a local economy or serve to stimulate a set of opportunities. The City of Cathedral City has taken a proactive approach to leverage job creation and economic development while meeting regulatory mandates. Energy management work in Cathedral City municipal buildings—including a large and highly visible solar system—demonstrate leadership.

This inventory provides a solid foundation for climate action planning and for Cathedral City to strategically position to cut costs, boost jobs, while maintaining a high quality of life.

Cathedral City has been an active member of the Desert Cities Energy Partnership (DCEP), a partnership of Southern California Edison (SCE), Southern California Gas Company (SCG), 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 Southern California Edison "Flight 5.6" funding for the Strategic Plan Strategies Program. 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.[4]

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 CO_2 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.

[4] Green Government Initiative, Task 4.C. (Strategic Plan Task 4.C.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.[5]

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.[6]

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.[7]

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 were examined for insights and regional-specific suggestions, which were incorporated in this document where appropriate.

Local Coachella Valley Inventories

Seven greenhouse gas inventory studies have been produced for desert communities in the Coachella Valley in addition to the seven inventories prepared as part of Green for Life. In addition, a "Briefing on Climate Action Planning for Elected Officials in the CVAG Region" has been published to provide summary and comparative data, and to suggest regional climate action planning priorities.

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 be fluid as cities follow their own paths and individual timelines.

[5] Local Government Operations Protocol Version 1.1 May 2010.

[6] 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.

[7] 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 following inventories were referenced, reviewed, and used as resources for this effort.

- 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 2011 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 2012 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 completed in 2012 by the City of Indio and EcoMotion. This inventory is based on ICLEI methodologies following the LGOP.

Cathedral City has already examined its emissions as part of the larger CVAG-sponsored AQMD inventory, completed in 2011 as mentioned above. This inventory included specific data on direct emissions from major source categories.[8]

Major points of the CVAG/AQMD inventory:

- Cathedral City produced City-wide emissions of 310,000 tonnes CO_2e out of the regional tally of 4,130,000 tonnes CO_2e.
- The CVAG/AQMD inventory has a major focus on transportation. In this inventory fully 68% percent of emissions were attributed to mobile emissions from cars, trucks, and other vehicles for the Coachella Valley as a whole.
- The 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 Cathedral City 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.

The Policy Context of the GHG Inventory

In the absence of a national energy policy, California has moved ahead with significant and far-reaching greenhouse gas 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

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

carbon impact, a second 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 (AB 32) 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.[9]

In 2012, 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 Cathedral City 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.

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

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

for Southern California Association of Governments (SCAG)—of which Cathedral City is a member—is an 8% per capita reduction by 2020 relative to 2005 emissions, and a conditional target of 13% by 2035.[10] This 8% decrease will come from appropriate local planning to reduce vehicle miles traveled (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.

Greenhouse gas inventories are accounting exercises that need not be reviewed for environmental impact. Nevertheless, the City of Cathedral City Greenhouse Gas Inventory will play an important role in CEQA, notably for the 2013 Climate Action 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 Cathedral City:

1. An agency must calculate or estimate a future project's greenhouse gas 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.[11]

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

[10] "What SB 375 means to SCAG" http://www.scag.ca.gov/factsheets/pdf/2010/SB375processUpdate.pdf

[11] 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

GHG Accounting

Gas Basics and Warming Potentials

The main focus of this inventory is to determine the sources of greenhouse gas emissions within Cathedral City.

A number of chemical compounds make up the emissions known as greenhouse gases, which trap the radiation from the sun's energy and heat the earth's atmosphere. Some of the gases are natural; additional gases are produced by human activity. Carbon dioxide (CO_2) is the most common greenhouse gas. In addition to CO_2, the other GHG gases measured by the inventory are methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6).

Each greenhouse gas 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 GHGs are measured in terms of their carbon dioxide equivalent (CO_2e). 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 CO_2e.

Sources of greenhouse gases, and their global warming potentials:[12]

- Carbon Dioxide (CO_2): 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 CO_2 is 1.

- Methane (CH_4): Methane is the next most important GHG. Each molecule of methane has 21 times the global warming potential of CO_2. Methane comes from landfills (from anaerobic digestion of organic materials), from fermentation of materials, and from feedlots.

- Nitrous Oxide (N_2O): 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.

[12] "Climate Change 2007: Synthesis Report," Intergovernmental Panel on Climate Change, 2007.

- Sulfur Hexafluoride (SF_6): Sulfur hexafluoride is a little known GHG, with a huge global warming potential of 23,900. SF_6 results from electricity transmission and distribution, as well as magnesium production. SF_6 emissions are not included in this inventory as they are typically accounted for in utility programs.

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.

- 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

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 EcoMotion collaborated to provide face-to-face introductions to city staff, elected officials and various commissions.
- **EcoMotion** interviewed key staff and stakeholders in the city and solicited referrals to other people who could assist with data collection.
- **EcoMotion 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.

EcoMotion's approach was to break down requests into specific pieces that could be easily delegated and readily completed. EcoMotion also attempted to make the process 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 4):

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.

Figure 4: Inventory Subsets

Community Inventory

Figure 5: The GHG "Emissions Bubble"

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 Coachella Valley airports.

The visual of an emissions "bubble" offers a simplistic way to grasp how emissions are captured. Imagine putting a bubble over Cathedral City's city

limits (Figure 5). 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 2013 Cathedral City municipal inventory with a 2010 baseline uses the LGOP's guidelines. The Local Government Operations Protocol specifies the importance of municipal organizational boundaries. Specifically, a greenhouse gas inventory should tabulate emissions based on either operational control or financial control.

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. That said, the inventory includes quasi-governmental agencies (such as the solid waste disposal fleet). While Cathedral City 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.

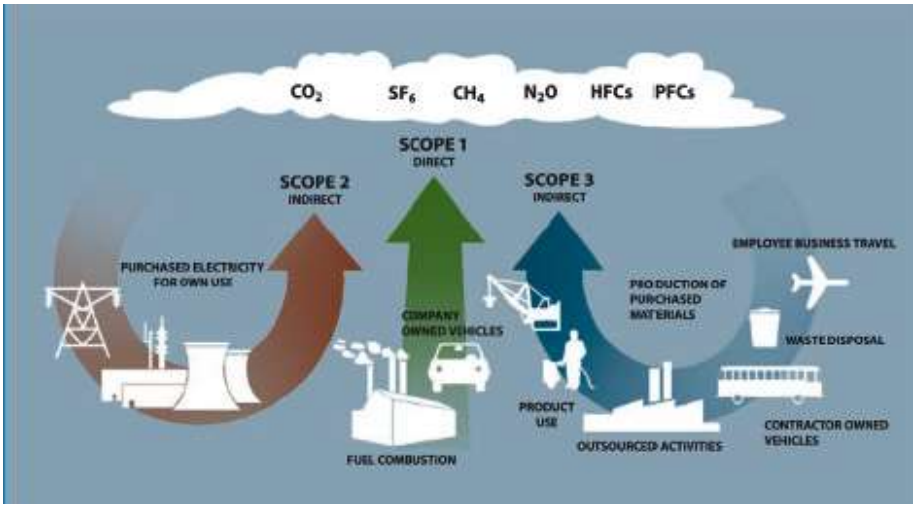
Scopes and Sectors

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 6).

Figure 6: Greenhouse Gases Sources and Scopes



Scope 1: All direct emissions sources from activities taking place within 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 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 solid waste, wastewater treatment, landfill, and where applicable, information about agriculture and/or special industries.

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

Community Snapshot

About Cathedral City

Figure 7: Cathedral City Location Map

Cathedral City is located in a cluster of cities in the Coachella Valley. The Valley is an area with approximately 420,000 residents located 100 miles southeast of Los Angeles. The Valley added approximately 100,000 new residents between 2000 and 2010.[13]

One of the unique features of the Coachella Valley is the presence of the Aqua 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 Cathedral City, they are incorporated into the Cathedral City inventory because, at this time, available data from utilities, transportation statistics, and public agencies do not differentiate between the geographical borders of Cathedral City and Reservation land.

[13] Wheeler's Desert Letter, June 15, 2011.

Cathedral City is located at the base of the Santa Rosa Mountains, stretching between State Highway 111 and Interstate 10. A city of 21.76 square miles, its population grew at the rate of 20% between 2000 and 2010, reaching 51,200.[14] During the winter season the population of the City swells substantially, adding as many as 16,000 people.[15]

Cathedral City is a center for business in the Valley, strategically located, with borders on both sides of Interstate 10. The City ranks in the top three cities in the Coachella Valley in population, retail sales and total taxable sales.[16]

Climate Mitigation Measures to Date

Cathedral City has already demonstrated civic leadership on issues related to environmental sustainability. Its performance-based energy-efficiency contract with Honeywell is exemplary and resulting in major energy savings. 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 Coachella Valley Association of Governments, Cathedral City provides input and participates in developing solutions to Valley-wide issues including transportation.

The City has sponsored or supported a number of sustainability initiatives–recognized by dozens of awards–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 sometimes 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 important for Cathedral City to get full credit for the emissions reductions that is realizing.

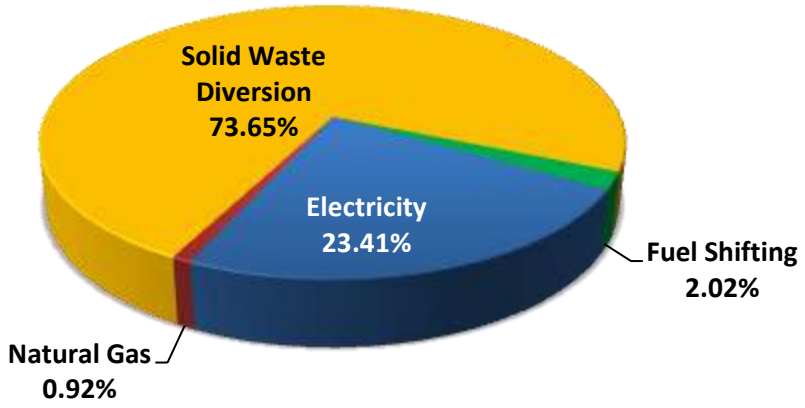
For this report an effort has been made to capture the results of these programs and initiatives for 2010. In 2010, sustainability programs produced substantial savings, estimated at 11,207 tonnes CO_2e (Table 2 and Figure 8). This suggests that Cathedral City's overall footprint would have been 4.5% larger than the current totals had initiatives not been in place (see Methodology Briefing 13).

Table 2: Savings from Prior Sustainability Initiatives

Focus Area			Tonnes CO_2e Saved
Electricity	9,113,655	kWh	2,624
Natural Gas	19,367	therms	103
Solid Waste	47,006	tons	8,254
Water Savings	-	gallons	0
Fuel Shifting	68,933	gge	226
Total Tonnes CO_2e			**11,207**

[14] Population figures from scag.ca.gov/resources/pdfs/2011/Riverside/CathedralCity.pdf
[15] Wheeler's Demographic Profiles of the Coachella Valley, 2008/2009 edition
[16] Cathedral City website: http://www.cathedralcity.gov/index.aspx?page=1

Figure 8: Source of 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.
- Aggressive, targeted, business recycling
- Commitment of City to a contract with Honeywell that produced savings and community pride
- 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 greenhouse gas inventory figures. Every effort has been made to tabulate comprehensive results. Note that data for several initiatives was not available.

The hope and goal of any greenhouse gas 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 Sustainability Initiatives

Measure Name	Measure Type	Annual Savings	Units	Emissions Reductions (tonnes CO_2e)
Electricity				
Honeywell Project	Municipal Building lighting	65,737	kWh	19
Honeywell Project	Traffic Signals	383,880	kWh	111
Honeywell Project	Window Film City Hall	8,068	kWh	2
Honeywell Project	Solar Parking Garage	416,143	kWh	120
SCE Programs	Rebates for appliance and HVAC EE upgrades, Lighting, HVAC, Refrigeration, Pumping, Manufacturing Process, Ag.	7,710,734	kWh	2,220
SCE Municipal Programs		105,436	kWh	30
California Solar Initiative	Photovoltaics	423,657	kWh	122
Total Electricity		**9,113,655**	**kWh**	**2,624 Tonnes CO_2e**
Natural Gas				
Gas Company Programs	Clothes Washers, Dishwashers, Showerheads, Furnaces, Boilers, Hot Water Heaters, Food Service, Government, Healthcare, Hotels/Lodging, Ind/Manu, Large Comm, Schools and Univ, Small Business	19,367	Therms	103
Total Natural Gas		**19,367**	**Therms**	**103 Tonnes CO_2e**
Solid Waste				
Municipal Recycling	1990	34	Tons	
Government Source Reduction program	1990 - Reduce printing waste and other gov. function waste			
School Source Reduction Program	1997 - Education and assistance			
Grasscycling and Xeriscaping	1999 - Waste diversion	324	Tons	
Curbside Recycling	1993 - Waste diversion	3,651	Tons	
Business Waste Recycling	2010 -Co-mingled recycling		Tons	
Business Greenwaste	1990	311	Tons	
Special recycling events	1989 - e-waste etc	27	Tons	
Curbside Greenwaste	1990 - Waste diversion	4,985	Tons	
Drop off recycling	1990 - Waste diversion			

Residential Buy-back	1990 - Waste diversion	2,160	Tons	
Commercial Pick Up	1990 - Waste diversion	1,082	Tons	
Commercial Self Haul	1990 - Waste diversion			
Commercial Self Haul Greenwaste	1995 - Waste diversion	16,153	Tons	
Material Waste	1990 - Thrift shop diversion			
Special recycling	1990 - Christmas trees and fruit collection	3	Tons	
Tire Recycling	1990	7	Tons	
Other recycling	1999	79	Tons	
Scrap Metal	1990	418	Tons	
Wood Waste	1990			
Concrete Waste	1990	17,772	Tons	
Total Solid Waste		**47,006**	**Tons**	**8,254 Tonnes CO_2e**

Water Savings

CVWD: Waterwise	Lawn Conversion Program			
CVWD: Waterwise	Smart Irrigation Controllers			
CVWD: Waterwise	Spray Nozzle Conversion			
CVWD: Waterwise	High Efficiency Toilets			
CVWD: Ordinance	2010 - Landscape Ordinance #1302.1			
Desert Water Agency	Lawn Conversion Program			
Desert Water Agency	Smart Irrigation Controllers			
Total Water		**-**	**Gallons**	**0 Tonnes CO_2e**

Fuel Shifting

Municipal Fleet	Fuel Shift to CNG	10,973	gge	33
Solid Waste Vehicle Fleet	Fuel Shift to CNG	57,960	gge	193
Total Fuel Shifting		**68,933**	**gge**	**226 Tonnes CO_2e**

Total Emissions Savings

11,207 Tonnes CO2e

Role of Alternative Energy

The statewide California Solar Initiative (CSI) has had a positive impact on emissions in Cathedral City and in the Coachella Valley as a whole. Whenever community members generate electricity using solar, they reduce imported electricity and the emissions associated with it.

One of Cathedral City's most dramatic features is the solar canopy on top of the City Hall parking lot. The 226 kW system generates over 400,000 kWh of electricity every year.

Data from the CSI website shows 442 kW of solar capacity has been installed in Cathedral City. Solar is responsible for 122 tonnes of the 11,207 tonnes CO_2e avoided in Cathedral City in 2010. SCE reported that, in 2010, approximately 328,671,890 kWh were billed community-wide; therefore, solar systems generated approximately 0.25% of total community electricity use.

(Table 4 assumes 1,900 kWh generated per kW of solar at optimal azimuth and tilt—180 degree azimuth and 17 degree tilt.)

Table 4: Solar Energy in Cathedral City

Utility	kW of Solar	kWh Generated Annually	Tonnes CO_2e Saved
SCE	442	839,800	122

A Living Document

This inventory is a significant step on the road to meeting the goals for emissions reduction for Cathedral City, 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 their energy usage and the amount of their energy bills private.

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.

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.

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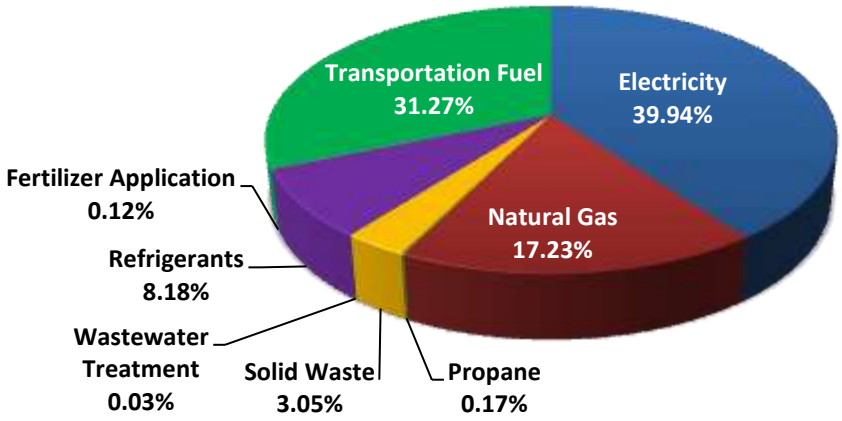
III. Emissions Summary

Cathedral City's 2013 greenhouse gas emissions inventory establishes a 2010 baseline of 236,863 tonnes CO_2e. These emissions come from the following sources (Figure 9).

Figure 9: Cathedral City 2010 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 Cathedral City, this number is affected by two factors:

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

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

With these caveats, the per capita emissions of Cathedral City, with a population of 51,200, are estimated at 4.6 tonnes CO_2e.

Backcasting and Forecasting

One benefit of a greenhouse gas 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 greenhouse gas inventories because AB 32 requires jurisdictions to establish 1990 levels of emissions in order to measure emissions reduction progress.

Cathedral City 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 Cathedral City (see Methodology Briefing 14).

Forecasting starts with emissions at a point in time, typically 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 emissions 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 (see Methodology Briefing 15):

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 graph on the next page summarizes the position of Cathedral City based on available data from 1990, 2005, and 2010 (Figure 10). The blue line shows the trajectory the City would follow given full implementation of federal and State emissions reduction programs with "business-as-usual" practices. The dotted line shows the required trajectory for the City to reach AB 32 targets.

Note that, starting in 2005, Cathedral City's emissions have declined. The reduction can be attributed to a number of factors:

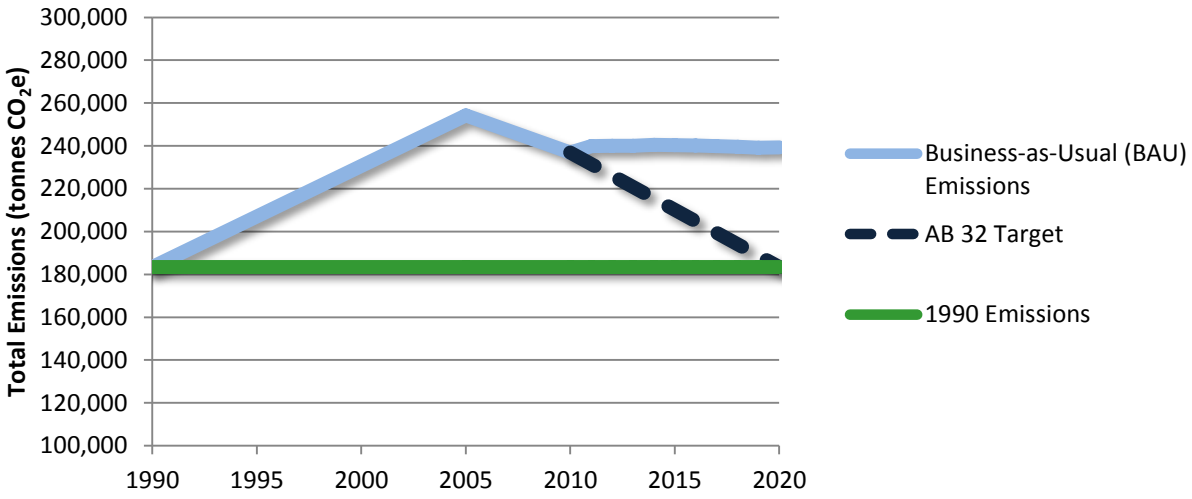
- Community education
- Energy efficiency programs
- General economic slowdown

The emissions projection to 2020 is based on current and historical inventory data. Table 5 shows that Cathedral City'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, Cathedral City would need to reduce emissions by 55,909 tonnes CO_2e to reach the 1990 emission level.

Table 5: Emissions Targets for Cathedral City

Scenario	Total Emissions (Tonnes CO_2e)	Tonnes over 1990	% Reduction Needed
1990 Emissions Level	183,424	-	-
2010 Baseline	236,863	53,439	22.6%
2020 Business-as-Usual	239,333	55,909	23.4%

Figure 10: Cathedral City Forecasted Emissions 2020



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 Desert Cities Energy Partnership and the Green for Life program are creating a regional assessment for the CVAG territory to be able to aggregate individual city emissions inventories as they become available or are updated.

To get a complete picture of the Valley emissions from the 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 at three of the 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 Climate Action Planning. While many cities might geographically have little contact with an emissions source they may have some direct or indirect benefits—for example, power generation going back into SCE's power mix, tourism from the airport, etc.

Regional transportation emissions have been quantified based on population figures for the Coachella Valley as 2.8 tonnes CO_2 per capita. These emissions are not included in the inventory totals, but are detailed in the Regional Transportation Methodology Briefing (see Methodology Briefing 5).

IV. Community Inventory

The community inventory presents the total quantity of greenhouse gas emissions produced by Cathedral City as largely defined by its geographic borders during 2010. Following ICLEI convention, emissions from local government operations are embedded in the community inventory.

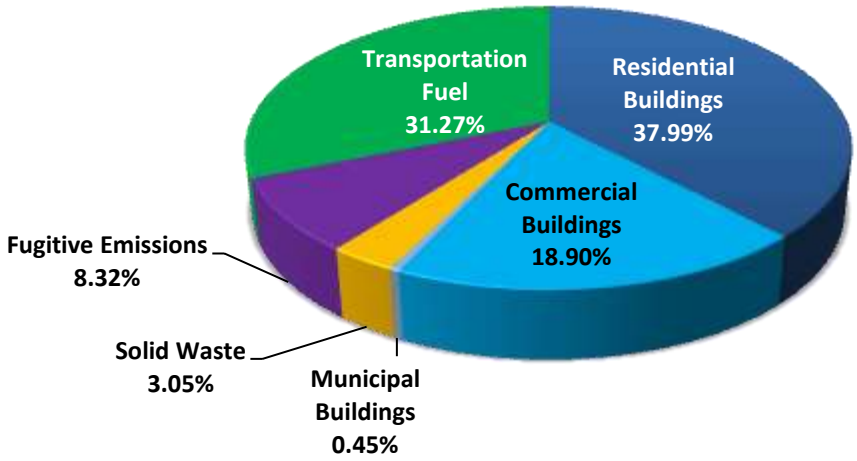
The community inventory covers six major sectors: residential, commercial, municipal, transportation, solid waste and fugitive emissions (Table 6).

GHG Community Inventory Details for Cathedral City

Table 6: Cathedral City 2010 Detailed Community Emissions

Category	Source			2010 Emissions (Tonnes CO_2e)
Residential Buildings	Electricity	192,756,064	kWh	55,485
	Natural Gas	6,414,659	therms	34,098
	Propane	72,522	gallons	409
Commercial Buildings	Golf Courses and Country Clubs - Electricity	1,207,435	kWh	348
	Golf Courses and Country Clubs - Natural Gas	14,579	therms	77
	Hotels, Motels, and Hospitality - Electricity	27,094,436	kWh	7,799
	Hotels, Motels, and Hospitality - Natural Gas	327,148	therms	1,739
	Motion Picture Theaters - Electricity	282,665	kWh	81
	Motion Picture Theaters - Natural Gas	3,413	therms	18
	New Car Dealerships - Electricity	1,384,918	kWh	399
	New Car Dealerships - Natural Gas	16,722	therms	89
	Other Commercial - Electricity	73,984,372	kWh	21,296
	Other Commercial - Natural Gas	893,314	therms	4,748
	Domestic Water Supply - Electricity (CVWD)	9,484,747	kWh	2,730
	Water Pumping/Sewage - Electricity	16,727,218	kWh	4,815
	Street Lights - Electricity	2,179,330	kWh	627
	Traffic Control - Electricity	12,173	kWh	4
Municipal Buildings	Buildings and Other Facilities - Electricity	2,427,846	kwh	699
	Buildings and Other Facilities - Natural Gas	8,983	therms	48
	City Services - Electricity	1,130,686	kWh	325
Transportation	On-Road Vehicles			73,792
	Off-Road Vehicles			286
Solid Waste	Paper Products			3,502
	Food Waste			1,779
	Plant Debris			464
	Wood or Textiles			1,488
Fugitive Emissions	Wastewater Treatment Facilities (CVWD)			63
	Ozone-Depleting Substance Substitutes			19,376
	Golf Course Fertilizer Application			276
Total Community Emissions				**236,863**

Figure 11: Cathedral City 2010 Community Emissions by Sector



Residential Buildings

The residential sector of the City contributed 89,992 tonnes CO_2e, or 37.99%, as a result of its use of electricity, natural gas and propane. (Methodology Briefings 1, 2 and 3)

- 192,756,064 kWh of electricity, or 55,485 tonnes CO_2e
- 6,414,659 therms of natural gas, or 34,098 tonnes CO_2e
- 72,522 gallons of propane, or 409 tonnes CO_2e

Commercial Buildings

Commercial activities in the City contributed 44,771 tonnes CO_2e, or 18.90%, to the emissions count. (Methodology Briefings 1, 2, and 7)

- 132,357,294 kWh of electricity, or 38,099 tonnes CO_2e
- 1,255,176 therms of natural gas, or 6,672 tonnes CO_2e

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. City-wide, municipal buildings contributed 1,072 tonnes CO_2e, or 0.45%, to the emissions count. (Methodology Briefings 16 and 17)

- 3,558,532 kWh of electricity, or 1,024 tonnes CO_2e
- 8,983 therms of natural gas, or 48 tonnes CO_2e

Transportation

Community-wide transportation contributed 74,078 tonnes CO_2e, or 31.27%, to the emissions count. (Methodology Briefings 4 and 6)

- 73,792 tonnes CO_2e for on-road vehicles

- 286 tonnes CO_2e for off-road vehicles (recreational vehicles, construction vehicles, landscaping equipment, etc.)

Solid Waste

Cathedral City diverted over 53.3% of its waste through diversion or recycling in 2010. Remaining solid waste was sent to local landfills and will contribute emissions in the future as it decomposes. Solid waste sent to landfills contributed 7,233 tonnes CO_2e, or 3.05%, to the emissions count. (Methodology Briefings 9 and 10)

- 3,502 tonnes CO_2e of paper products
- 1,779 tonnes CO_2e of food waste
- 464 tonnes CO_2e of plant debris
- 1,488 tonnes CO_2e of wood or textiles

Fugitive Emissions

Fugitive emissions are miscellaneous sources of CO_2e. They include refrigerants used within the City (ozone-depleting substance substitutes), methane from wastewater treatment plants, and fertilizers used on golf courses. Note that, while no wastewater treatment facilities falls within the jurisdiction of Cathedral City, the City still 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—is included in the Methodology Briefings (see Methodology Briefings 8, 11, and 12). Fugitive emissions contributed 19,715 tonnes CO_2e or 8.32% to the emissions count.

- 0.9 tonnes nitrous oxide from golf course fertilizer application, or 276 tonnes CO_2e
- 0.02 tonnes nitrous oxide from wastewater treatment facilities, or 63 tonnes CO_2e
- 19,376 tonnes CO_2e from refrigerants

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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 face specific challenges because of their 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 Cathedral City, electricity is provided by Southern California Edison (SCE), and as such the CACP software reflects appropriate SCE emissions factors.

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.

Electricity Efficiency Programs

Southern California Edison, as one of the major investor-owned-utilities, offers many programs to provide incentives for energy 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). Many 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; for example, SCE's allocation for basic services in Region 15 is four times the allocation for Region 8 (Orange County).[17] The need for air conditioning—and its cost—requires constant attention, and drives programs for technology upgrades.

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 energy is used to pump water.

[17] http://www.sce.com/CustomerService/billing/tiered-rates/baseline-chart-map.htm

Methodology

SCE has provided city-wide (aggregated) and municipal account data for 2010 and 2005 and 1990 (limited). Municipal account data were connected with specific buildings in each city, with quality control provided by city staff. (These reports can be found in the Methodology Briefings 1 and 16.)

Transportation

Transportation emissions for all the cities within the Desert Cities Energy Partnership were calculated with the goal to be the most relevant to their unique and local community. The inventory is based on local verification and counts and information directly obtained from CVAG, to get a more accurate picture than could be provided with countywide or statewide modeling. Efforts were made to address 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 Cathedral City was included in the analysis.

A full explanation of this process with references and spreadsheets is available in the Methodology Briefing 4. 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 arterial roads and calculated to supply a daily VMT (vehicle miles traveled) on arterial roads. Figure 12 shows the arterial roadways ("Major Roads") in Cathedral City.

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.

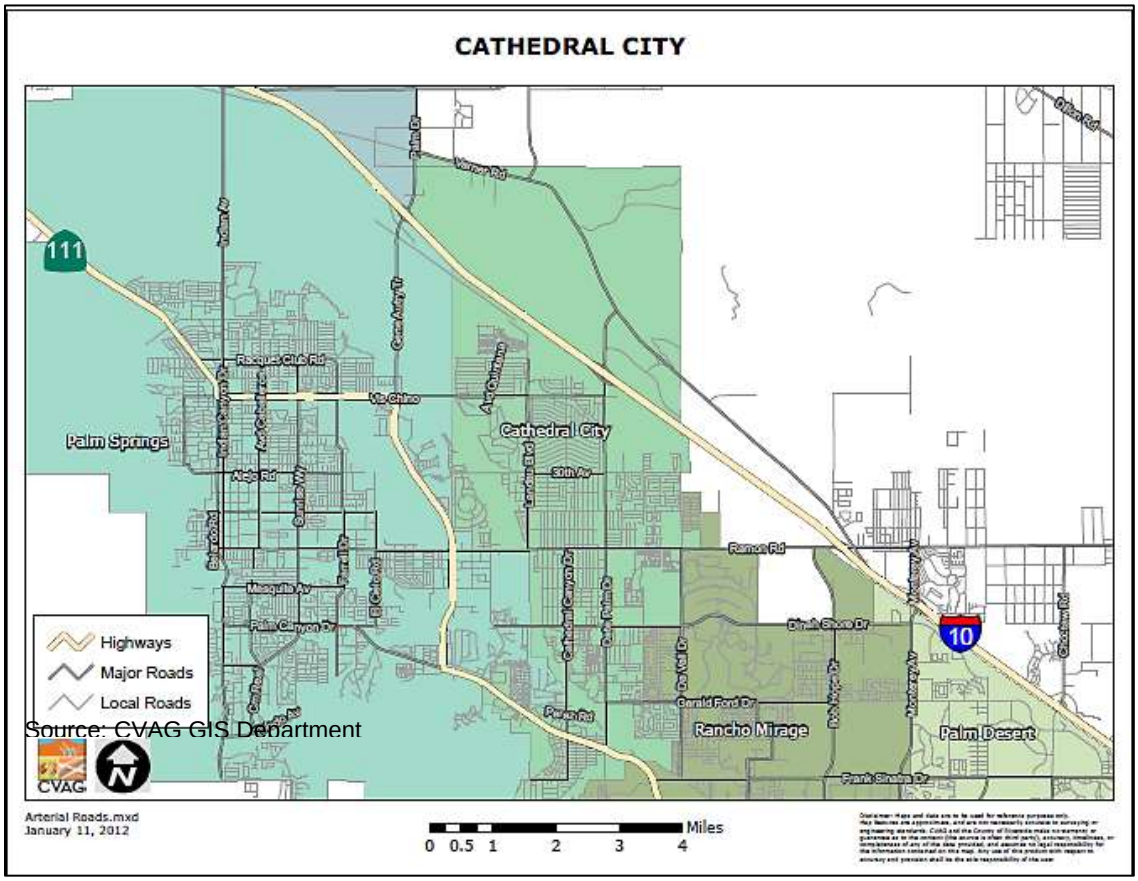
3. An annual VMT was calculated by using a 300 day "scaler" (versus 365 days) to take into account seasonal population fluctuations. This adjustment is required because traffic counts in this area are done in the high season (late January/early February).

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 CO_2e emissions using standard coefficients.

Figure 12: Cathedral City Major Arterial Roadways



Natural Gas

Natural gas also plays an important role in the overall energy equation in the Valley. Of the "Big Three" in Cathedral City, natural gas emissions account for 17.23%, compared to electricity and transportation at 39.94% and 31.27%, respectively. Southern California Gas (SCG) participates in the Desert Cities Energy Partnership with SCE and the 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 is provided by account (see Methodology Briefings 2 and 17).

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 dramatically over the last 10 years.

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.

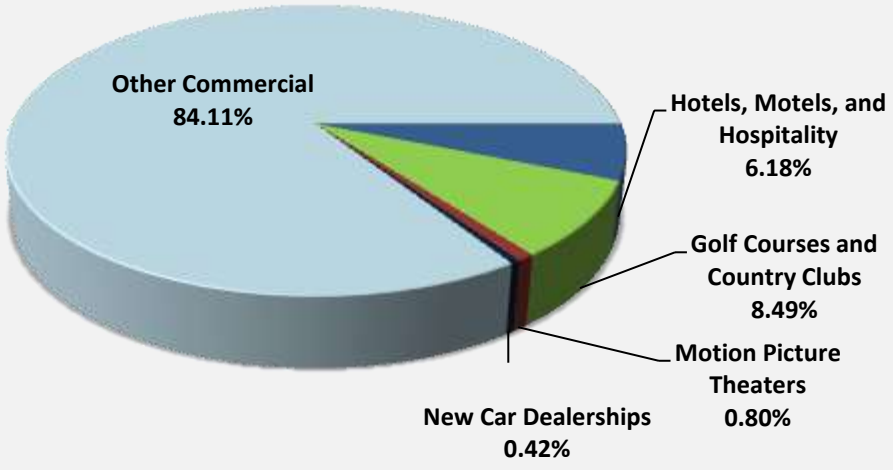
Compressed Natural Gas (CNG)

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, two fleets operating in Cathedral City, including the municipal fleet and Burrtec Waste Industries have converted a portion of their vehicles to CNG, resulting in an annual reduction of 226 tonnes CO_2e (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 Cathedral City the inventory has identified key classifications below (Figure 13). Note that these figures are approximations, as detailed information is not available on a per-business basis. While hospitality, theaters, and car dealerships make Cathedral City characteristically unique, they do not result in a substantial amount of emissions. The very large "Other Commercial" section (composed of natural gas from restaurants, grocery, and other general goods and services) suggests the need for further analysis in order to identify savings strategies for those categories not highlighted here.

Figure 13: Electricity and Natural Gas Emissions from Commercial Buildings



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 Cathedral City

Item	Data
Jurisdiction name	City of Cathedral City
Street Address (for City Hall)	68-700 Avenida Lalo Guerrero
City, State, Zip	Cathedral City, CA 92234
County	Riverside
Website	http://www.cathedralcity.gov
Area	21.8 sq mi
Population (full time)[18]	51,200 (2010)
Population (seasonal)[19]	16,200 (2008/2009)
Median age of population[20]	32.4
Housing Units	20,995
Persons per occupied unit	3.1
Median household income	$52,708
Growth rate 2000-2010	20.1%
Annual budget (per website)	$67,163,837
Climate zone[21]	15
Annual heating degree days[22]	793
Annual cooling degree days[22]	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,

[18] 2010 Census Data.
[19] Wheeler's Demographic Profiles, 2008/2009 edition.
[20] Population figures from scag.ca.gov/resources/pdfs/2011/Riverside/PalmSprings.pdf
[21] http://www.energy.ca.gov/maps/renewable/Climate_Zones_by_City.pdf
[22] 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.

the City is uniquely positioned to set the tone and demonstrate leadership in energy management and energy efficiency.

In Cathedral City, municipal emissions for 2010 total 3,104 tonnes. They account for 1.3% of City-wide emissions. Figure 14 shows the breakdown of emissions by source.

Figure 14: Cathedral City 2010 Municipal Emissions by Source

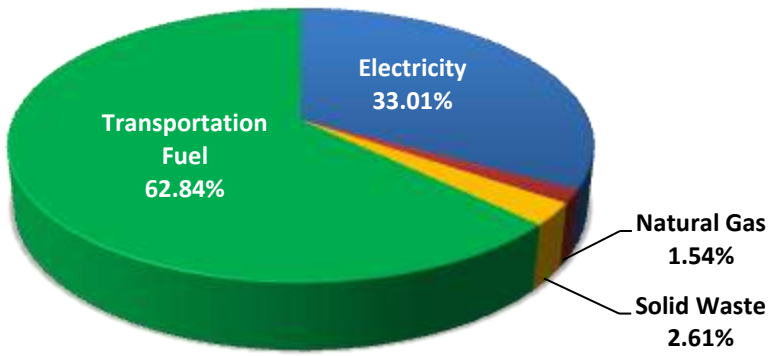
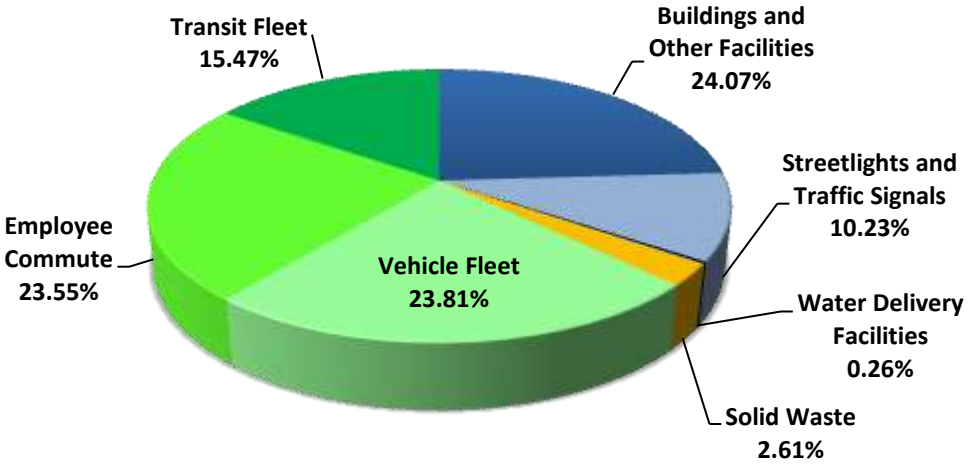


Table 8 and Figure 15 show City operations emissions by sector as identified in the LGOP. Whereas the community inventory tracks six sectors, the municipal inventory presents seven.

Table 8: Cathedral City 2010 Detailed Municipal Emissions

Category	Scope	2010 Emissions (Tonnes CO_2e)
Buildings and Other Facilities	1, 2	747
Streetlights and Traffic Signals	2	317
Water Delivery	2	8
Vehicle Fleet	1	739
Employee Commute	3	731
Transit Fleet	3	480
Solid Waste	3	81
Total Municipal Emissions		**3,104**

Figure 15: Cathedral City 2010 Municipal Emissions by Sector



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

Municipal Buildings

City buildings contributed 747 tonnes CO_2e, representing 24.07% 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. (Methodology Briefing 16)

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. (Methodology Briefing 17)

- 2,427,846 kWh of electricity, or 699 tonnes CO_2e
- 8,983 therms of natural gas, or 48 tonnes CO_2e

Streetlights and Traffic Signals

Streetlights and traffic signals contributed 317 tonnes CO_2e, representing 10.23% of municipal greenhouse gas emissions. (Methodology Briefing 16)

- 1,102,591 kWh of electricity, or 317 tonnes CO_2e

Water Delivery

Municipal accounts labeled as water and water pumping provide the emissions figures for water delivery. Emissions from electricity for water pumping totaled 8 tonnes CO_2e, or 0.26%. (Methodology Briefing 16)

- 26,352 kWh of electricity, or 8 tonnes CO_2e

Vehicle Fleet

The Cathedral City municipal fleet is made up of vehicles from all City departments. A detailed inventory of City-operated vehicles appears in Methodology Briefings, with further breakdown by fuel type and miles per gallon or gallon gas equivalents (see Methodology Briefings 18 and 19). These calculations also include off-road and portable sources of emissions, such as generators. In all, the fleet contributed 739 tonnes CO_2e, or 23.81%, as follows:

- 10,973 gge of compressed natural gas, or 78 tonnes CO_2e
- 11,207 gallons of diesel, or 117 tonnes CO_2e
- 56,082 gallons of gasoline, or 496 tonnes CO_2e
- 1,802 gallons of liquid propane gas (LPG), or 11 tonnes CO_2e
- 3.666 gallons of off-road diesel, or 37 tonnes CO_2e

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 731 tonnes CO_2e, or 23.55%. (Methodology Briefing 21)

- 3,026 miles traveled in diesel-fueled vehicles, or 1 tonne CO_2e
- 1,352,678 miles traveled in gasoline-fueled vehicles, or 730 tonnes CO_2e

Transit Fleet

Cathedral City contracts with Burrtec Waste Industries for City disposal services. Burrtec provided detailed statistics regarding its activities within the City borders. It should be noted that Burrtec has completed partial fuel shifts from gasoline and/or diesel to compressed natural gas (CNG). (Methodology Briefings 20)

Total emissions from the transit fleet are 480 tonnes CO_2e, or 15.47%.

- 57,960 gasoline gallons equivalent (gge) of compressed natural gas, or 419 tonnes CO_2e
- 6,000 gallons of diesel, or 61 tonnes CO_2e

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 22 as Scope 3 emissions. Emissions totaled 81 tonnes CO_2e, or 2.61%.

- 39 tonnes CO_2e from paper products
- 20 tonnes CO_2e from food waste
- 5 tonnes CO_2e from plant debris
- 17 tonnes CO_2e from wood or textiles

VII. Next Steps

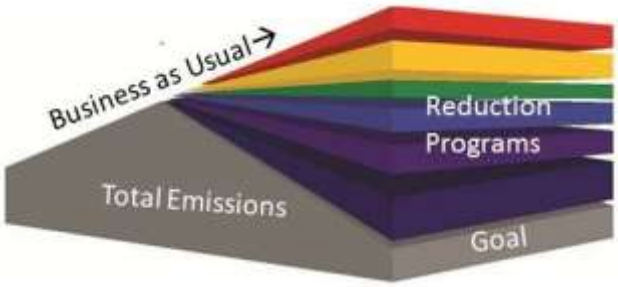
This inventory provides Cathedral City with a baseline figure upon which to base future decisions and actions.

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 are presented in the Climate Action Plan.

Policies and Programs

Figure 16: Emissions Reduction Wedges



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

This "emissions wedges" graphic (Figure 16) provides a visual representation of how a portfolio of programs can reduce emissions from business-as-usual to reach emissions reduction goals.

Climate Action Plan

Recommendations for each of the "wedges," or focus areas, are included in the Cathedral City Climate Action Plan. These documents 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 pre-requisite.

Updates

Success with policies and programs to cut emissions, economic conditions, and other factors will cause Cathedral City's emissions to change over time. The Climate Action Plan presents an update plan, 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 appendices are purposefully detailed, to facilitate updates.

Leadership

Cathedral City is pleased to have completed its first greenhouse gas inventory, an important step in climate action 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. Cathedral City is committed to continuing this collaboration to improve results and strengthen the fabric and livelihood of the Coachella Valley.

Cathedral City 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.

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For further information regarding the Cathedral City inventory, please contact Deanna Pressgrove, Environmental Conservation Manager, at DPressgrove@cathedralcity.gov.