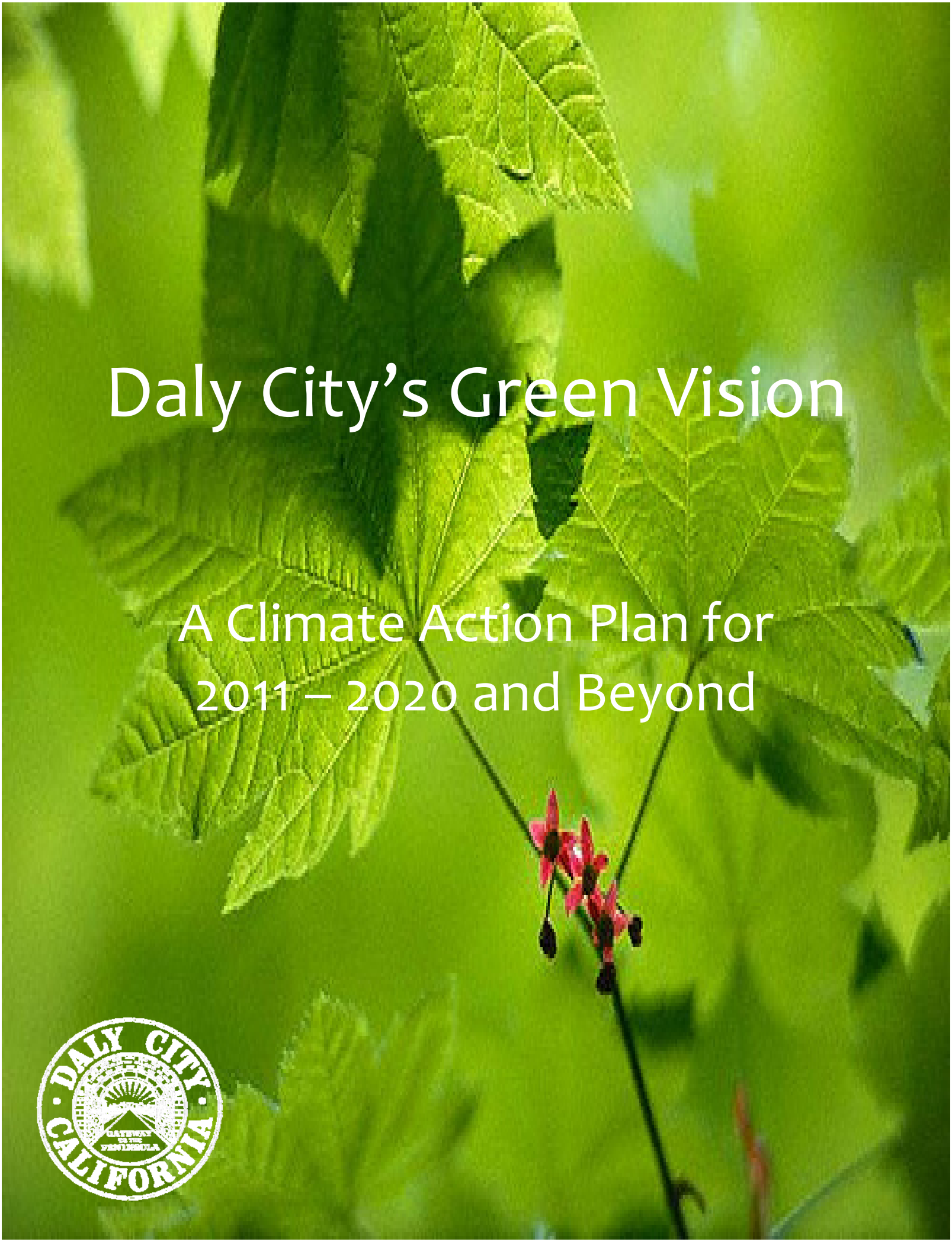


Daly City's Green Vision

A Climate Action Plan for 2011 – 2020 and Beyond

Table of Contents

Chapter 1: Introduction

While the science suggests the planet's climate cools and warms due to naturally occurring environmental factors, the science is clear about the human effect on the planet's environment and ecosystem. Humankind is changing the global climate in ways which exceed naturally occurring changes and at a pace neither the climate nor the planet's creatures can adapt. Climate change, whether warming or cooling, is a real and significant threat to all living creatures.

The threat is real. Climate change impacts nearly every facet of our lives. Due to rising temperatures, the Sierra Nevada mountain snowpack, the source which supplies much of the State's drinking and agricultural water, could decrease dramatically. Some estimate by as much as 80%. Climate change could render currently rich farmland arid and non-producing. As weather patterns change due to global warming and cooling, usual rainfall could either increase or decrease. This change in weather patterns could lead to a reduction in hydropower and farmable land or result in catastrophic flooding.

Over the past few years, local, regional and state governments have sought to understand climate change and implement strategies and programs to address the challenges it presents. Many agencies have adopted scientifically complex and expensive strategies and plans, while other agencies have developed community based, relatively inexpensive and action oriented approaches. Daly City's Green Vision – TEN for TWENTY seeks to provide both scientifically and public policy relevant information in a way both members of our community and climate action experts would find useful.

The Daly City climate action plan entitled "The Daly City Green Vision – TEN for TWENTY," focuses on actions the City organization has already taken and can take over the next ten years to reduce its carbon footprint. While this plan focuses only on City operations, one key goal is to engage the community in the creation of a community based strategy for reducing our community's adverse impact on the ecology of our planet. We have already begun this effort in partnership with the local business community, Sierra Club and homeowner associations and will continue the preparation of the community-based strategy and plan through ongoing community outreach.

The Daly City Green Vision – TEN for TWENTY sets goals rather than specific, technical emissions reduction targets. We envision the plan to be a living document. As part of each biennial budget development, review and adoption cycle, the plan will be reviewed by City staff and the City Council and updated as conditions dictate. By ensuring this is a living document and incorporating its review into the regular budget development process, the City ensures the implementation of the vision through the appropriation of the necessary fiscal resources and performance measurements to achieve its goals.

The cornerstone of Daly City's Green Vision is "TEN for TWENTY." This vision identifies ten goals and seeks to achieve these goals through cost-effective strategies, by the year 2020. TEN for TWENTY is intended to be a practical approach for addressing the complex issues surrounding climate change and emissions reductions. Great consideration was given to these ten goals. They were developed in collaboration with the City's Green Team and representatives from each City department. In this time of great economic uncertainty, it is essential the goals be ones the Daly City organization can afford to implement, while still aggressively seeking to be a leader in the environmental arena. Provided below are ten realistic strategies for positively affecting climate change:

TEN for TWENTY

1. Adopt a General Plan with measurable policies for sustainable development
2. Decrease landfill bound waste from 2.8 to 2.6 pounds per person per day
3. Recycle and beneficially reuse 25 percent of City wastewater
4. Evaluate all fleet replacements to ensure the smallest carbon footprint while still meeting operational needs
5. Preserve the urban forest by replanting at least one tree for each tree removed by the City due to disease and adopt a tree preservation and maintenance ordinance
6. Create a master pedestrian and bicycle plan and seek grant funding to expand the existing system
7. Beneficially reuse 100 percent of Wastewater Treatment Plant produced biosolids
8. Develop a sustainability awareness campaign in partnership with the community
9. Construct all new City facilities at a Leadership in Energy and Environmental Design Gold standard
10. Seek to reduce local government greenhouse gas emissions by 15 percent in accordance with the goal of Assembly Bill 32, the Global Warming Solutions Act of 2006

Each of these goals will be further explored later in this plan. It will include a general description of each goal and the environmental benefits to be achieved. After the City Council's adoption of the Daly City Green Vision – TEN for TWENTY, an action plan will be developed for its implementation. Each City department will have a role in its implementation and will establish performance measurements to ensure its achievement.

Chapter 2: Meaningful Action Already Underway

While this plan focuses on achievements yet to be made and goals yet to be realized, the City of Daly City has already taken bold steps to tackle climate change. These actions mark the first important steps in Daly City's commitment to environmental stewardship. One important first step was the completion of the International Council on Local Environmental Initiatives, City of Daly City 2005 Government Operations Greenhouse Gas Emissions Inventory. Funded through a grant from the City/County Association of Governments, the greenhouse gas emissions inventory represents the completion of the important first step in the City's climate protection initiative.

Statewide Initiatives

Beginning in 2005, the State of California responded to growing concern over the effects of climate change by adopting a comprehensive approach for addressing public and private sector emissions. This approach was officially initiated with the passage of Assembly Bill 32 - the Global Warming Solutions Act of 2006 (AB 32). This law requires the State to reduce its greenhouse gas emissions to 1990 levels by 2020. It also requires the California Air Resources Board to regularly inventory State emissions and to create a plan for reducing these emissions. In addition, AB 32 authorized the Air Resources Board (ARB) to adopt and enforce regulations targeted at greenhouse gas emissions reductions in both the public and private sectors.

The resulting AB 32 Scoping Plan was adopted by the Air Resources Board in December 2008. It requires the State take the following actions to meet the greenhouse gas emissions reduction targets:

- Develop a California cap-and-trade program
- Expand energy efficiency programs
- Establish and seek to achieve reduction targets for transportation-related Greenhouse Gas emissions
- Support implementation of a high-speed rail system
- Expand the use of green building practices
- Increase waste diversion, composting and commercial recycling toward zero-waste
- Continue water efficiency programs and use cleaner energy sources to move and treat water
- Implement the Million Solar Roofs Programs
- Achieve a Statewide renewable energy mix of 33 percent
- Develop and adopt the low-carbon fuel standard
- Implement vehicle efficiency measures for light-, medium-, and heavy-duty vehicles
- Adopt measures to reduce high global warming potential gases
- Reduce methane emissions at landfills

- Preserve forest sequestration and encourage the use of forest biomass for sustainable energy generation
- Capture of methane through use of manure digester systems at dairies

Other measures undertaken by the State include mandating stronger vehicle emissions standards per Assembly Bill 1493, the Clean Air Act of 2002, establishing a low-carbon fuel standard (EO # S-01-07, 2007), mandating a climate adaptation plan for the State (S-EO # 13-08, 2008), establishing a Green Collar Job Council and establishing a renewable energy portfolio standard for power generation or purchase in the State. The State is also mandating, through a number of laws and initiatives, the following local government action:

Senate Bill 97 (2007) – Required the State Office of Planning and Research to create greenhouse gas planning guidelines for the California Environmental Quality Act. In addition, the ARB is tasked with creating energy-use and transportation thresholds in California Environmental Quality Act reviews. This may require local governments to account for greenhouse gas emissions when reviewing project applications.

Assembly Bill 811 (2007) – Authorized all local governments in California to establish special districts to finance home and business solar or other renewable energy improvements.

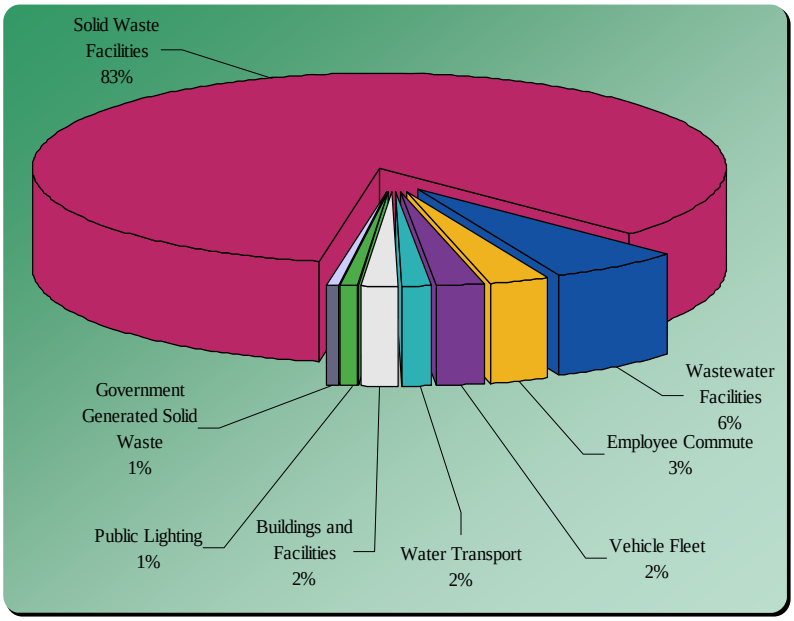
Senate Bill 732 (2008) – Established a Strategic Growth Council charged with coordinating policies across State agencies to support a unified vision for land use development in California. This vision is intended to serve as a reference point for local land use policies.

Senate Bill 375 (2008) – Mandated the creation of regional sustainable community strategies (SCS) by regional planning agencies. The SCS links regional housing and transportation planning processes in an attempt to meet regional greenhouse gas emissions targets.

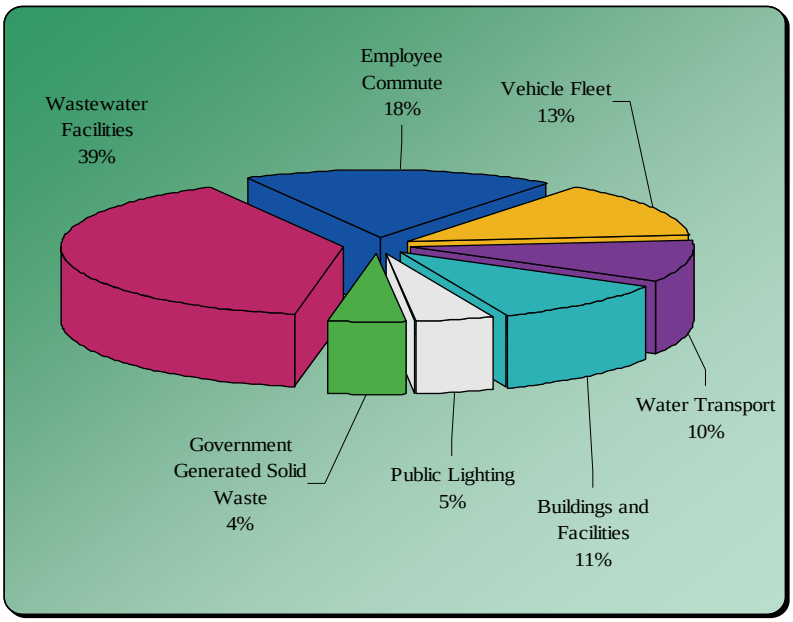
Local Initiatives

Prior to these State mandates, a growing local government moment was leading the way in advocating for a more sustainable future. Similarly, community-based movements have also contributed to the urgent desires now found among local agencies and private enterprises to examine the precarious outcomes of unabated climate change. These efforts have culminated in broad-based understanding for immediate action. Daly City has long recognized the cost of inaction and the following policies and programs highlight the many ways in which the City has addressed climate change to reducing greenhouse gas emissions:

Emissions Inventory – With grant funding through the City/Council Association of Governments, the City, working in partnership with the International Council on Local Environmental Initiatives, commenced the "City of Daly City 2005 Government Operations Greenhouse Gas Emissions Inventory."



This inventory measured, using 2005 as the base year, Daly City's direct emissions, emissions from electricity consumption and select indirect sources totaled 80,530 metric tons of carbon dioxide equivalents (CO_2e). Of the total emissions accounted for in this inventory, emissions from solid waste facilities (the Mussel Rock landfill) were overwhelmingly the largest source of estimated emissions (83 percent as shown in the chart to the right). Emissions from wastewater facilities comprised the second highest source of emissions from the City's operations (six percent). Emissions from employees commuting to and from work, from City buildings and facilities, the City vehicle fleet and water pumps and irrigation devices also comprised major sources of emissions. Since solid waste facilities make up the majority of the emissions, to get a better understanding of the other sectors, the chart below depicts emissions estimates excluding solid waste facilities. It presents an additional picture of the most appropriate areas for the City to explore potential reductions of greenhouse gas emissions.



Cumulatively, the City spent approximately $2.64 million on energy (electricity, natural gas, diesel and gasoline) for government operations in 2005. Of this total, 79 percent of these energy expenses ($2.08 million) were due to electricity consumption and five percent ($142,294) from purchased natural gas purchases. Fuel purchases (gasoline and diesel) for the vehicle fleet and mobile equipment totaled $421,862, or 16 percent of total costs

included in this inventory. Beyond reducing greenhouse gases, any future reductions in municipal energy consumption will result in budget cost savings thereby enabling the City to reallocate limited funds for other municipal services or leverage costs savings to support future climate protection activities.

Energy Watch Program – In October 2007, Daly City participated in the Association of Bay Area Governments' Energy Watch Program. The program identified City owned facilities where significant reductions in energy consumption could be made—all of which were included in the City Energy Assessment Report. The strategies and actions highlighted in the report, in addition to the activities mentioned below, represent many aspects of Daly City's vision for a more sustainable future.

The Green Team – In January 2008, the Daly City Leadership Academy's Green Team presented to the City Council a host of recommendations aimed at significantly reducing City greenhouse gas emissions. These recommendations, know as the Green Policy, build on environmental policies and goals already active in City departments as well as policies and goals slated for implementation in the near future. These recommendations highlighted areas where significant reductions in greenhouse gas emissions could be made and the steps necessary to commence and successfully complete their implementation.

Climate Action Team – In June 2009, the City's Climate Action Team, comprised of members from each City department, presented to the City Council a mission statement, guiding principles and research highlighting appropriate measures and goals to be included in a Daly City climate action plan.

U.S. Mayors Climate Protection Agreement – In June 2009, the City Council adopted the U.S. Mayors Climate Protection Agreement paving the way for further climate protection initiatives.

Storm Water Management – In 2009, the City constructed an aesthetically attractive and environmentally responsible bio-swale stormwater treatment facility fronting Serramonte Library. This stormwater garden is regularly used by area schools, non-profits and government agencies as a demonstration project to highlight ways to reduce and/or control stormwater run-off and to improve stormwater quality and aquatic health.

Diversion of Construction and Demolition Debris – The City adopted a construction debris recycling ordinance designed to ensure construction debris is taken to approved sites capable of disposing the waste properly and diverting materials able to be recycled to appropriate facilities.

Green Building Ordinance – The City adopted a Green Building Ordinance designed to encourage energy efficient construction practices for all new residential construction.

Fleet Management – The City's fleet management program is now designed to identify vehicles in the City fleet which could be replaced by hybrid, electric or other alternative fuel vehicles.

Energy Audits – As a multi-year program, the City identified City-owned facilities where relatively minor and highly cost effective improvements could be made to significantly reduce energy consumption. This was achieved by retrofitting or replacing outdated heating, ventilation and air condition equipment, through the replacement of lighting with energy efficient alternatives and with other internal and external modifications. Fueled in large part by the American Recovery and Reinvestment Act, the City is currently pursuing multiple retrofit and replacement projects totaling over $1,000,000.

Water and Wastewater – The City provides recycled tertiary water to large irrigators such as golf courses, parks and street medians. The recycled water, which otherwise would be discharged into the ocean, replaces drinking water historically used for irrigation.

The culmination of this work, ongoing City initiatives and the foresight to begin preparing for eventual compliance with State and Federal mandates places Daly City in the respected company of other Bay Area communities committed to a sustainable energy future. The Daly City Green Vision – TEN for TWENTY expands on these prior achievements and defines the City's future goals for reducing energy consumption and greenhouse gas emissions. The following pages present a roadmap for the future.

Chapter 3: TEN for TWENTY

The climate action plans of local government are diverse and varied. Daly City has elected to set goals rather than specific, technical emission reductions targets. In doing so, the City will be more flexible and able to respond to the diversity of technology and information to emerge in the coming years. We envision this climate action plan to be a living document; our Plan will be reviewed every two years, amended if necessary, and adopted with every bi-annual budget. A sustainable energy future is a critical component of Daly City's future. The following climate action plan is a tool designed to help Daly City protect the natural environment while continuing to foster economic growth, social diversity and a livable community. Daly City's Green Vision – TEN for TWENTY is a ten year road map, identifying meaningful changes the City can make in the way it manages government operations to expand its environmental stewardship.

Goal 1 – Adopt a General Plan with Measurable Policies for Sustainable Development

Daly City recognizes the challenges inherent when attempting to alter the urban environment and is poised to address and tackle this challenge. The City's built environment consists mainly of commercial and highly dense residential neighborhoods with limited industry. Efforts are currently underway to reduce greenhouse gas emissions through policies and objectives which will be incorporated into and ultimately adopted through in the General Plan Update. Simultaneously with this update effort, the City continues to encouraging environmentally friendly land use planning.

Goal 1 is aimed at reducing emissions resulting from new construction and redevelopment. The City will explore transportation options, the addition of bicycle lanes and pedestrian walkways and policies to set minimum densities around transportation corridors. Any combination of the above efforts, when adopted, will help Daly City reduce greenhouse gas emissions and create a healthier and more economically sustainable urban environment. Further, when adopted, the General Plan will implement policies seeking to reduce wasteful energy practices and encouraging energy efficient housing and commercial development.

Proposed policies in the Draft General Plan include revised land use policies to meet or exceed the greenhouse gas reduction goals outlined in Assembly Bill 32. If adopted as part of the General Plan Update, the City will encourage and promote the use of alternative sources of energy in all homes by reducing permit fees involving energy efficient installations, incentivize or require all new major construction to pre-plumb or pre-wire for solar energy systems and continue to encourage high-density mixed-use development near existing transportation hubs.

Goal 2 – Decrease Landfill Bound Waste

In 1995, the State adopted Assembly Bill 939, the Integrated Waste Management Act, mandating landfill waste reduction targets. Since then, Daly City has implemented a wide array of strategies for reducing landfill waste. Currently, each person in Daly City generates 2.8 pounds of landfill waste per day. Goal 2 seeks to reduce this volume to 2.6 pounds per person per day. By comparison, the average volume of landfill waste generated by a Californian is 4.5 pounds per day.

In 2005, waste generated by Daly City residents produced approximately 14,237 metric tons of the landfill gas, methane. The majority of this waste consisted of paper products, food waste and wood and textile debris. It is therefore the aim of Goal 2 to reduce emissions resulting from the decomposition of solid waste in landfills by diverting more solid waste to a beneficial reuse through recycling.

Through its franchise waste hauler Allied Waste, the City provides curbside recycling services to all residential customers. Additionally, an aggressive recycling program encompassing all City-owned facilities currently diverts tons of solid waste to recycling facilities. In order to reach our goal of diverting more solid waste from landfills to environmentally friendly reprocessing centers, the City will continue, in conjunction with Allied Waste to explore and implement additional recycling initiatives. As stated, that target is set at 2.6 pounds per person per day. In the event the community reaches this target prior to 2020, new targets will be created aimed at diverting an even higher volume of solid waste to reprocessing facilities. By generating less waste, we lessen the environmental impact of landfills and create fewer greenhouse gas emissions.

Goal 3 – Recycle and Beneficially Reuse Wastewater

Despite the perception of abundance, water is a precious and finite resource. Daly City is committed to using its water in the most efficient manner possible. By reducing the amount of drinking water used for irrigation by supplying golf courses and large irrigation systems with recycled wastewater, Daly City significantly reduces the amount of drinking water it pumps from the aquifer or purchases from the San Francisco Public Utilities Commission. By recycling and reusing wastewater, which would otherwise be discharged into the ocean, Daly City is able to preserve a precious resource, drinking water, and minimize the environmental impact of producing and delivering this valuable resource.

Goal 3 aims to supply 2.77 million gallons of recycled wastewater per day for irrigation. Currently, the City is delivering, on average, 2.6 million gallons of recycled wastewater per day to irrigation systems at the Lake Merced Golf Club, Olympic Golf Club and San Francisco

Golf Club. In time, the San Francisco Harding Park Golf Course will also receive recycled wastewater from the Daly City system. The delivery of 2.77 million gallons per day would deliver the full average daily capacity of the system. Additional infrastructure improvements would be necessary for the City's wastewater treatment plant to increase its daily production.

The City will continue to explore the use of recycled wastewater to irrigate medians along John Daly Boulevard and Junipero Serra Boulevard as well as Marchbank Park. Additionally, Daly City will continue to evaluate the feasibility of providing recycled wastewater to the cemeteries in the neighboring town of Colma and will research more efficient water transport and collection technologies to reduce energy consumption without reducing service capabilities.

Goal 4 – Evaluate All Fleet Replacements to Ensure the Smallest Carbon Footprint while Still Meeting Operational Needs

In 2005, the City's vehicle fleet emitted 1,641 metric tons of CO_2e. This represents 13% of the total greenhouse gases produced by City operations in 2005. Other than the Mussel Rock landfill, only wastewater facilities and the employee commutes produced more greenhouse gas emissions. Vehicles and other mobile equipment emit greenhouse gases by burning fuel. One meaningful way to reduce the City's carbon footprint is to reduce fuel consumption and the emissions produced by the City's vehicle and equipment fleet. In order to do so, the City will implement a fleet replacement program to ensure older, outdated models are replaced by the most environmentally friendly alternative possible while still meeting operational demands. Goal 4 has the potential to transform the City's municipal fleet into one of the greenest on the Peninsula. Reducing the impact of vehicle miles traveled is one way the City will work to reduce harmful emissions.

Currently, the City is examining its fleet to determine which vehicles are best suited for green vehicle replacements. An examination of all vehicle usage will provide the City with the information necessary to make replacements or reductions, if necessary. Additionally, the City is currently examining its heavy-duty diesel fleet in order to determine which engines qualify to have particulate matter and nitrous oxide filters installed, thereby producing highly scrubbed discharged air.

The City will continue to examine its fleet and compile and master fleet replacement schedule. This schedule will identify vehicles in need of replacement and offer suggestions for the most environmentally friendly replacement. Similarly, the heavy-duty diesel fleet as well as the off-road diesel fleet will continue to be examined and a master replacement schedule compiled. This will enable the City to add cost-effective filtration devices to

vehicles when necessary and identify vehicles whose replacement or disposal would be more cost-effective. Environmental as well as economic factors will continuously be weighed to ensure the community continues to receive the highest level of service possible.

Goal 5 – Preserve the Urban Forest by Replant at Least One Tree for Each Diseased Tree Removed by the City

Goal 5, when realized, would result in the planting of new tress and the creation of a plan to care for the City's existing urban forest. In 2005, leisure and business activities and operations in Daly City resulted in approximately 555,027 metric tons of CO_2e emitted into the atmosphere. This includes emissions from the combustion of fuels in the residential, commercial/industrial and transportation sectors within the City's boundaries. Planting trees will both increase the aesthetic quality of Daly City and will help to clean the air. Trees play an important ecological role in our environment. Through the process of photosynthesis, trees act as filters, capturing pollutants from the air and converting these toxic gases into oxygen. By exploring ways to ensure new trees are planted and cared for, the City is ensuring the preservation of the urban forest and utilizing one of nature's resources to clean the air and support a healthy environment.

Due to the destructive and devastating impact of the pitch cancer disease on both pine and cypress tress, for safety reasons, the City must remove these diseased trees. Removing these trees and planting new ones is an expensive process. During these challenging economic times, Daly City is able to continue the removal process of diseased trees through funding from a $100,000 Re-Leaf grant awarded to the City in 2010 as part of the Federal economic stimulus program. It is estimated these grant funds will be sufficient to continue the removal of diseased trees, repair damage to sidewalks and streets caused by trees and plant 100 new trees throughout the City.

Ongoing efforts to secure funding through grants and donations will be essential if the City is to realize Goal 5. The City will continue to encourage the replanting of trees to offset the removed hazardous and diseased trees. Similarly, the City will encourage the strategic planting of trees to assist with stormwater filtration and erosion control.

An additional method for preserving and maintaining the City's urban forest would be through the City Council's adoption of a tree ordinance. This tree preservation and maintenance ordinance would clarify how existing trees would be maintained and protected.

Goal 6 – Develop a Master Pedestrian and Bicycle Plan

There are certainly many challenges and obstacles inherent in reducing vehicle miles traveled. Local government continues to lead the way in advocating and planning for transit-oriented development and more robust public transportation systems. However, financial resource and societal attitudes continue to frustrate this pursuit. In an attempt to encourage commuters to access alternative modes of transportation, the network of pedestrian and bicycle friendly routes and corridors continues to expand throughout the Bay Area. This network provides a cost-effective, safe and efficient transportation alternative.

Daly City is committed to creating a master pedestrian and bicycle plan to encourage the development of safe pedestrian walk-ways and bicycle lanes and routes. Reducing vehicle miles traveled within our community is one way to reduce harmful exhaust emissions. Goal 6 demonstrates Daly City's commitment to cleaner and healthy modes of transportation. Not only will these efforts contribute to cleaner air and a healthier environment, but they will also contribute to a healthier, more active life style. Our community will benefit from both burning less fossil fuel and more calories.

Beginning in late 2003, the Planning Commission and Bicycle/Pedestrian Advisory Committee presented the City Council with a Bicycle Master Plan. The Plan paved the way for the vast network of bicycle lanes currently being used by residents and visitors. There are currently 5.9 miles of existing bike lanes throughout the City. In addition, there are also several miles of bike paths along John Daly Boulevard as well as shared vehicle bike routes along Mission Street and Junipero Serra Boulevard.

There are currently 1.3 miles of bike lanes scheduled for construction along Gellert Boulevard and an additional 3.2 miles proposed for future construction throughout the City. Daly City will continue to encourage the design and completion of a master plan to encompass both future bike lane development and future pedestrian walk-ways. This plan will highlight areas throughout the community where additional bike lanes and walk-ways would be appropriate, further expanding the already existing network. This will allow for travel to public transportation hubs and commercial centers with greater ease, safety and efficiency. In addition to the completion of this master plan, the City will also pursue additional grant funding to expedite new construction.

Goal 7 – Beneficially Reuse Wastewater Biosolids

Biosolids are a product of wastewater treatment. Currently, Federal, State and local regulations define where biosolids can be used and what they can be used for. At the Federal level, the use of biosolids is regulated under the Clean Water Act and by the Environmental Protection Agency - Region 9, who oversees many aspects of biosolid use in California. Further, various orders and regulations at the State level serve to limit the uses of biosolids and to ensure biosolids are used in a manner which protects both health and safety.

Goal 7 aims to arrive at a viable, safe and environmentally sustainable use of biosolids. Daly City will continue to explore options for the beneficial reuse of biosolids. Currently, the City is a member of the Bay Area Biosolids to Energy Coalition, a body comprised of 16 wastewater agencies throughout the Bay Area committed to designing and implementing a beneficial biosolids reuse program. Due to tightening restrictions aimed at limiting the reuse of biosolids for land applications, the Bay Area Biosolids to Energy Coalition is diligently researching cost-effective solutions aimed at beneficially reusing biosolids as an alternative fuel source.

According to the Coalition, over 80% of the Bay Area biosolids produced are beneficially reused in some manner. Due to its rich organic composition, currently, biosolids derived from the treatment of wastewater in Daly City are used as soil enhancers for non-foodstuff crops. Similarly, biosolids are used in mine reclamation, to restore land marred by fire and in various other ways to restore forests.

The City will continue to explore the potential economic and environmental benefits of biosolid reuse. To that end and through its partnership in the Coalition, Daly City will continue to pursue a centrally located beneficial biosolid reuse facility in the Bay Area. The City hopes the benefits of biosolid reuse, as outlined in Goal 7, can be realized by 2020.

Goal 8 – Develop a Sustainability Awareness Campaign in Partnership with the Community

Daly City has already begun developing partnerships throughout the community to create a climate action movement. Goal 8 seeks to further this effort by developing an ongoing outreach effort where, in cooperation with local residents, business leaders and regional and local agencies, the City can further its goal of achieving meaningful reductions in greenhouse gas emissions. The City is committed to collaborating with residents and businesses in the creation, development, implementation and evaluation of strategies and programs aimed at reducing our carbon footprint and creating safe and a healthy environment.

Eventually, it is possible State and Federal mandates will require large reductions in

greenhouse gas emissions and it will ultimately be up to each of us individually to reduce our energy consumption, resulting emissions and carbon footprint. The City recognizes it will be the totality of individual actions which will ultimately help the community realize its emissions reduction goals. Therefore, it will be the aim of Goal 8 to see productive, cost-effective steps are undertaken throughout the community to reduce the overall Daly City carbon footprint.

The City will continue to cultivate relationships with its environmental stakeholders, including the schools, Sierra Club and homeowners associations, to encourage environmental awareness and sustainability. Only through the collaborative and productive partnerships will the community environmental goals be realized - combating climate change will be a team effort throughout the Daly City community.

Goal 9 – Design and Construct New City Facilities to the Leadership in Energy and Environmental Design Gold Standard

Over the past several years, the technology incorporated into new construction to mitigate and manage the building's carbon footprint has greatly improved. The current standard for determining the overall efficiency of a building is a framework developed by the U.S. Green Building Council (USGBC). Developed by the USGBC, the Leadership in Energy and Environmental Design (LEED) program provides building owners and operators a concise framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions.

LEED is an internationally recognized green building certification system, with third-party verification that a building or community was designed and built using strategies aimed at improving performance across all metrics: energy savings, water efficiency, carbon emissions reduction, improved indoor environmental quality and stewardship of resources and sensitivity to their impacts. LEED is flexible enough to apply to all building types – commercial as well as residential. It works throughout the building lifecycle – design and construction, operations and maintenance, tenant improvements and significant retrofit.

In its early years of implementation, it was perceived LEED resulted in greater construction and maintenance costs. However, since its inception a decade ago, time has proven these LEED facilities are actually less expensive to operate and healthier for people to live in and work. Although no new City facility construction is currently planned, Goal 9 would ensure the design and construction of any new facility, or large retrofits of an existing building, be in accordance with the LEED Gold standard.

Goal 10 – Seek to Achieve the Emissions Reduction Target of Assembly Bill 32 - the California Global Warming Solutions Act

For the past decade, all levels of government have embraced the essential nature of its leadership and stewardship on climate change. While relatively few legal mandates are currently in place compelling local government action, Daly City understands the urgency to act. Accordingly, the City voluntarily elected, through its adoption of the U.S. Conference of Mayors Climate Protection Agreement, to attempt to reduce overall greenhouse gas emissions per the Kyoto Protocol targets. Realizing this goal will not only help satisfy possible future Federal and/or State regulations, but also ensures residents, visitors and businesses have a cleaner environment in which to live, relax and conduct business. Daly City embraces its role in ensuring future generations look back on today's climate change threat with a sense of achievement and recognition, that through their actions, climate change no longer present a threat to humankind.

Chapter 4: Implementation, Monitoring & Reporting

From advisory committees to staff involvement, energy audits to securing grant funds, Daly City, as is evident from its achievements to date, has already taken many steps to begin systematically reducing greenhouse gas emissions. However, the challenge remains real and the solutions evermore urgent.

Daly City's plan for the future as expressed in the Daly City Green Vision – TEN for TWENT ensures each of the ten goals of this climate action plan can be achieved. This roadmap includes:

1. Developing specific timelines to achieve each of the ten goals
2. Establishing, monitoring and evaluating incremental progress to determine how and when each goal will be attained
3. Continuing to identify and pursue funding opportunities and develop sustained revenue streams to support ongoing and future climate change protection initiatives
4. Establish and strengthen existing community partnerships to facility the efficient distribution of information and to engage the community in the formation and implementation of sustainable climate protection solutions

Additionally, this vision will be evaluated as part of the biennial budget development, review and adoption process and adjusted as necessary. Finally, as part of the biennial budget, departments will incorporate specific performance measurements to ensure each goal is attained.

The overarching vision of the Daly City climate action plan is to rise to the immense challenges presented by climate change and to systematically develop and implement solutions. Through the local actions of both the City and the community, Daly City will use its local ingenuity and creative talent to change the course of climate change.

Appendix A

Daly City's Leadership Team Citywide Green Policy and Marketing Campaign

A Green Policy for the City of Daly City: Statement in Support of Environmentally Responsible Practices

Living in a world with finite resources require us to act in a way that is sustainable, in a way that allows us to meet our current needs without compromising the ability of future generations to meet their own needs. Municipal governments provide a wide variety services, define public benefit and have the ability to communicate with a very local, but diverse community. This unique position creates a great opportunity to effect real change at the local level in a broad spectrum of ways.

The City of Daly City recognizes that the work of the City may have a direct or indirect effect on local, regional, and global environment. The City is committed to reducing any harmful effects on the environment and promoting the understanding of sustainability in its broadest context to its employees and the residents it serves.

The City shall consider incorporating environmentally preferable practices in all of its activities in the following categories:

Diversion (Recycle, Reduce, Reuse)

- Purchasing of City Supplies
- Citywide Recycling Programs
- Operations
- Development and Maintenance of City Projects

Energy Consumption

- Purchasing of City Supplies
- Operations

Water Conservation and Water Quality

- Water Conservation Measures
- Stormwater Pollution Prevention

Pollution and Toxin Reduction

- Purchasing of City Supplies
- Operations

Carbon Emission Reduction

- Purchasing of City Vehicles

In addition, the City shall develop a multi-phase marketing campaign and an educational outreach program that emphasizes specific environmentally responsible practices such as increasing recycling efforts and reducing litter. The City will also coordinate with outside agencies such as the County of San Mateo and the local school districts in their efforts of promoting environmentally responsible practices and programs.

Green Guidelines: A City of Daly City Employees' Reference to Environmentally Responsible Practices

Introduction

The City of Daly City recognizes that the work of the City may have a direct or indirect effect on local, regional, and global environment. The City is committed to reducing any harmful effects on the environment and promoting the understanding of sustainability in its broadest context to its employees and the residents it serves.

These Green Guidelines have been developed to guide staff towards making decisions in various aspects of its activities that range from purchasing to operations, from community outreach to ordinance development.

Diversion (Recycle, Reduce, Reuse)

Diversion refers to the process of diverting waste from the landfill and can occur through the recycling of materials, reducing the amount of materials used for a given function, or reusing materials. To this end, the City will continue implementing and improving upon the following practices:

Purchasing of City Supplies

- The City purchases recycled paper and Energy Star certified products
- The City continues to make smart printer purchases such as duplex printers.
- The City purchases 20% biofuel/low sulfur diesel in bulk to avoid multiple plastic containers for recycling.

- The City shall specify and purchase recycled content transportation products whenever possible, including signs, cones, parking stops, delineators, and barricades.

- All pre-printed recycled content papers intended for distribution that are purchased or produced shall contain a statement that the paper has recycled content. Whenever feasible, the statement should indicate the percentage of postconsumer recycled content it contains.

- Copiers and printers purchased shall be compatible with the use of recycled content and remanufactured products.

- To the extent practicable, all printing and copy paper products shall meet U.S. EPA guidelines for post–consumer recycled fiber content.

- To the extent practicable, all janitorial paper products shall meet U.S. EPA guidelines for post–consumer content.

- All re–refined oil must be American Petroleum Institutes certified. The Public Works Department will conduct a pilot program for a designated portion of the motor vehicle fleet using motor oil containing a minimum 25% re–refined base stock. The City shall expand the pilot to all fleets, if successful.

- Any other products with recycled content used by the County which are not identified in this policy shall meet the U.S. EPA recommendations and specification guidelines for recycled content.

- If the State of California adopts recommendations and specification guidelines for recycled content products that are more stringent than the U.S. EPA guidelines, the City will follow the State guidelines.

- The City shall not procure products that originate from rainforest hardwood or tropical wood. To the extent practicable, the City will use products from certified forests.

- Carpets purchased by the City shall consist of recycled material and shall contain the lowest volatile organic compound (voc) content available in its installation system.

- Where practicable, all photocopiers and printers acquired by the City following adoption of this policy are required to be capable of double–sided copying.

- Preference shall be given to products that are reusable or refillable rather than disposable, long–lasting, durable, and which are able to be recycled or composted at the end of their life. A pre–purchase review shall be done before purchasing disposable or single–use items to determine their necessity and to compare these items to long lasting, reusable or refillable alternatives.

- Preference shall be given to the lightest, smallest, most durable product that will complete the task (e.g. photocopiers, microwaves, etc.).

- For large purchases, life–cycle cost analysis shall be taken into consideration for cost comparisons of alternative products. Life–cycle cost analysis includes an assessment of a product's maintenance, energy and water use, and disposal costs.

- To the extent practicable, the City shall require packaging to be reusable, recyclable or compostable. Items purchased shall be bulk–packed if possible and carded items shall be avoided.
- Vendors shall be encouraged to take back and reuse pallets and packaging materials.
- Purchasing will work with vendors to ensure the most effective packaging of products.

Citywide Recycling Program

- Continue to collect batteries and ink cartridges at City Hall.
- The City recycles waste materials (oil, tires, batteries…)
- The City has recycle bins (paper, plastic, aluminum cans) at all City facilities and offices.
- The City provides a program for residents to drop off recyclables at a City site, once or twice a year.
- Continue to provide in-office recycling and throughout all facilities
- Comply with the Construction and Debris Recycling Ordinance
- With cooperation from Allied Waste, the City shall continue single-stream recycling for commercial customers
- The City shall implement an integrated waste management program consistent with the waste management hierarchy set forth in state law (AB 939); that is, waste prevention and reuse (source reduction) first, followed by recycling and composting, with only the residual being disposed of as trash or garbage. Recycling programs are currently available at the City for paper, telephone books, laser–jet cartridges, wood pallets, scrap metal, batteries, glass and plastic bottles, and aluminum cans. The City will evaluate and implement, where practicable, expansions of and additions to the current programs in order to increase waste diversion.
- The City, with cooperation from Allied Waste, shall extend single-stream recycling services to all of its customers, specifically residential users.

Operations

- All documents shall be printed and copied on both sides to reduce the use and purchase of paper, whenever practical.
- The City is working on going paperless with a “work flow” project, Agenda plus, and electronic timesheets.
- Provide a comprehensive training program on composting to community volunteers to extend composting information to the public through volunteers.
- Where practicable, all motor vehicles operated shall use recycled propylene glycol antifreeze.

- Occasional use items shall be shared to the extent practicable.

Development and Maintenance of City Projects

- Recycle plastic lumber used in park benches, trash cans, picnic tables
- Use of chips produced by tree removals or trimming as mulch versus purchasing
- When specifying asphalt concrete, aggregate base or portland cement concrete for road construction projects, the City shall use recycled, reusable or reground materials when practicable.
- All playground equipment, including rubberized cover surfacing, shall consist of recycled content materials consistent with U.S. EPA guidelines, where practicable.

Energy Consumption

Because of the limited amount of nonrenewable energy sources in the world, it is important to conserve the current supply or to use renewable sources so that these natural resources will be available for future generations. Energy conservation is also important because consumption of nonrenewable sources impacts the environment.

Energy conservation can occur in a wide variety of ways and the City is committed to this effort by continuing and improving upon the following practices:

Purchasing

- Where applicable, energy-efficient equipment shall be purchased with the most up-to-date energy efficiency functions. This includes, but is not limited to, high efficiency space heating systems and high efficiency space cooling equipment.
- When practicable, the City shall replace inefficient street lighting and traffic signal lights with energy-efficient equipment.
- All products purchased by the City and for which the U. S. EPA Energy Star certification is available shall meet Energy Star certification, when practicable. When Energy Star labels are not available, choose energy-efficient products that are in the upper 25% of energy efficiency as designated by the Federal Energy Management Program.
- When practicable, the City shall replace inefficient interior lighting with energy-efficient equipment.
- The City shall continue to replace monitors with LCD, as compared to the old CRT.
- Where practicable, purchased or leased electronic equipment including photocopiers, computers, printers, lighting systems, HVAC, kitchen and laundering appliances, and energy management systems must meet U.S. Environmental Protection Agency (EPA) or U.S. Department of Energy

Operations

- Use of skylights to reduce need for lights during the day
- The City changed the light fixtures in city hall to sensor lights and use fluorescent lighting in other city facilities to make them energy-efficient.
- The City continues to implement retrofits of all public buildings with and require in new public buildings more fixtures such as low-flow toilets and sensor lights and installs better windows and heating/cooling systems to improve insulation and reduce energy consumption.
- The City programs sleep mode on all computers.
- The City is working towards converting multiple servers onto one main server.

Water Conservation and Water Quality

Sustainable water consumption requires that no more freshwater be used than can be replenished naturally. As population increases the demand for water would likely increase without the benefit of an increase in fresh water supply. For these reasons, it is imperative that water conservation measures be implemented to ensure the availability of water to future generations.

A variety of toxic pollutants are washed from streets and parking lots into storm drains and creeks. The storm drains prevent flooding, by sending this run-off to the Bay or the Ocean. But this water is not treated. Therefore, these pollutants ultimately reach the Bay or Ocean. Recent studies indicate that 80% of the pollution entering the San Francisco Bay comes from our polluted stormwater runoff. Through the success of the city and county stormwater programs in the Bay area, the water quality of the Bay will improve. With improved water quality, the marine ecosystem will become healthier. A healthier marine ecosystem will enhance the quality of life for all residents around the Bay and on the Ocean.

Water Conservation

- All landscape renovations, construction and maintenance performed by the City, including workers and contractors providing landscaping services for the City, shall employ Bay-Friendly Landscaping or sustainable landscape, management techniques for design, construction and maintenance whenever possible, including, but not limited to, integrated pest management, grasscycling, drip irrigation, composting, and procurement and use of mulch and compost that give preference to those produced from regionally generated plant debris and/or food waste programs.
- Continue to recycle water
- Drip irrigation systems where applicable

- Install drought tolerant plants where practical

- Advanced irrigation system to monitor use, reduce waste of water and assist in scheduling; including rain gauges and wind monitors.

- Use of “hardier” turf grasses that reduce water demand

- The City shall purchase water-saving products whenever practicable

- The City shall require the use of recycled water for dust control during construction of public works projects when practicable.

- The City continues to implement retrofits of all public buildings with and require in new public buildings low-flow toilets and sensor sinks.

Stormwater Pollution Prevention

- Manage Integrated Pest Management (IPM) program to include all potential pest control strategies and focus on non-pesticide controls whenever possible.

- The County shall implement an integrated pest management program for pest control. Any chemicals used to eliminate or deter insect pests and undesirable vegetation shall be the most readily and completely biodegradable product available for the given application, and shall be applied in a manner that is least likely to come into contact with humans and any other animals for which treatment is not intended.

- The surface soils within the City limits generally consist of expansive clays. Wherever practicable considering this soil condition, the City shall limit the amount of impervious surfaces in the landscape. Permeable substitutes, such as permeable asphalt or pavers, are encouraged for walkways, patios and driveways. Hardscapes and landscape structures constructed of recycled content materials are encouraged.

- Use of decomposed crushed granite as pathways/trails, as appropriate, instead of asphalt.

- All stormdrains shall be labeled “No Dumping! Flows to Bay/Ocean” or other similar phrase.

<u>Pollution and Toxin Reduction</u>

Chemicals can enter the environment through their production, use or disposal, and can be found in all parts of the environment--air, water, soil and living organisms. Many kinds and levels of chemical substances released to our air, water and soil are easily absorbed and do not pose a threat. However, some chemical substances can be very dangerous if they accumulate to unhealthy levels. The City will minimize the use of products containing known toxins to the maximum extent practicable.

- All cleaning and disinfecting products (i.e. for janitorial or industrial use) shall at a minimum meet Green Seal standards for environmentally preferability and performance.

- To the extent practicable, no cleaning or disinfecting products (i.e. for janitorial or automotive use) shall contain ingredients that are identified by the United States Environmental Protection Agency or the National Institute for Occupational Safety and Health as carcinogens, mutagens, or teratogens.

- The use of chlorofluorocarbon containing refrigerants, solvents and other products shall be phased out to accommodate the Montreal Protocol on Substances that Deplete the Ozone Layer, and national requirements. Each new purchase will comply with the protocol.

- All surfactants shall meet U.S. EPA standards as "readily biodegradable." Where practicable, no detergents shall contain phosphates.

- All paint used in the City shall contain the minimum amount necessary of volatile organic compounds, and/or shall contain maximum recycled content where practicable.

- The City shall reduce or eliminate its use of products that contribute to the formation of dioxin and furan compounds. To the extent practicable processed chlorine–free or less bleached paper shall be purchased for photo–copy–grade and janitorial paper products. The 10% price preference applies to the purchase of chlorine–free paper. Additionally, the County shall eliminate the use of Polyvinyl Chloride (PVC) plastics to the extent practicable.

Carbon Emissions

The use of fossil fuels contributes to air and water pollution. When carbon dioxide is produced by the use of fuels such as coal, oil, and gasoline, it contributes to global warming. The trend of global warming could ultimately result in rising sea levels that could damage coastal areas, changes in vegetation growth patterns, and the loss of various plant and animal species.

- The City shall consider purchasing vehicles that have reduced carbon emissions either from the use of alternative fuels or hybrid engines.

- The City shall consider energy conservation measures previously identified as a means of lowering its carbon emissions

Community Outreach and Education

The City shall develop a multi-phase marketing campaign to emphasize specific environmentally responsible practices. The first phase shall include an anti-littering campaign to prevent pollutants entering the stormdrain system and develop a strategy to encourage residents to recycle, reduce or reuse as an effort to improve the City's landfill diversion rate.

In addition to the marketing campaigns, the City shall continue to participate in countywide efforts and work with the schools to instill a culture of environmental responsibility in its residents, property owners, and business owners.

Implementation and Monitoring

Policies are only as successful at meeting intended goals as the measures that are taken to actualize those policies and the ongoing monitoring used to determine their effectiveness. For these reasons, an implementation and monitoring policy is crucial in developing a green policy that meets its own intent.

The City shall develop a Green Advisory Committee to assist in the coordination and implementation of the City's Green Policy. This committee will be responsible for the following:

- Provide information to their respective agencies, departments, and divisions about the City's Green Policy. They will work in collaboration with the City Manager's Office to inform their agencies, departments, and divisions of their responsibilities under this policy, at a minimum, providing them with information about recycled content products and environmental procurement opportunities.

- The Green Advisory Committee will develop and implement an ongoing promotional program to educate and inspire the City of Daly City staff on this policy. Information concerning this policy will be added to the new employee orientation process.

- Work in collaboration with Central Services to develop and maintain information about environmentally preferable products and recycled content products containing the maximum practicable amount of recycled materials to be purchased by agencies, departments and divisions.

- The Green Advisory Committee with collaboration with Central Services will develop and implement a monitoring and tracking system as a tool to confirm compliance with this policy. This system shall track the purchase of environmentally preferable products compared to the total amount of products purchased.

The Green Advisory Committee should meet at regular intervals, perhaps quarterly, to evaluate the success of the implementation of the City's Green Policy. The committee should report annually to the City Council. When possible, reports should include an evaluation of performance, safety, cost, and environmental benefits achieved through the use of the environmentally preferable products purchased and the implementation of other environmentally responsible practices. Reports should also include notations of any barriers encountered in the implementation of the green policy, recommendations for resolution, and/or description of assistance needed for overcoming the obstacles.

Going Green

Promoting Sustainability in the City of Daly City

Steps that Daly City has taken to promote recycling:

- The City collects/recycles batteries at the Libraries and City Hall.
- The City purchases recycled paper and Energy Star certified products
- The City recycles waste materials (oil, tires, batteries…)
- The City has recycle bins (paper, plastic, aluminum cans) at all City facilities and offices.
- The City continues to make smart printer purchases such as duplex printers.
- The City purchases 20% biofuel/low sulfur diesel in bulk to avoid multiple plastic containers for recycling.
- They City provides a program for residents to drop off a variety of household items at a City site, once or twice a year.
- The City is working on going paperless with a "work flow" project, Agenda plus, digital documents and electronic timesheets.
- The City manages and implements the Construction and Debris Recycling Ordinance (a program that requires private homeowners and developers to recycle construction materials on projects valued over $10,000).
- The City requires recycling areas in new developments.
- The City has worked with Allied Waste to get single stream recycling in businesses and residences.
- The City made changes to the amendments for the recycling quotas in the franchise agreement with Allied Waste to increase to weekly recycling.
- The City composts food from Doelger Café and implements tea composting to create "natural" fertilizer for application to turf.
- The City practices Integrated Pest Management (IPM), a decision-making process and set of actions to determine if, where, when and how pest problems will be managed and primarily focuses on non-pesticide controls whenever possible.
- The City uses chips produced by tree removals or trimming as mulch, rather than purchasing chips.
- The City has subscribed to on-line legal documents rather than purchasing bound, printed copies.

Steps that Daly City has taken to reduce energy usage:

- The City changed the light fixtures in city hall to sensor lights and use fluorescent lighting in other city facilities to make them energy-efficient.
- The City continues to implement retrofits of all public buildings with and require in new public buildings more fixtures such as low-flow toilets and sensor lights and installs better windows and heating/cooling systems to improve insulation and reduce energy consumption.
- The City promotes the usage of natural lights through skylights and windows to save energy in city buildings.
- The City purchases Energy Star certified products whenever feasible.
- The City programs sleep mode on all computers.

- The City continues to replace monitors with LCD, as compared to the old CRT.
- The City is working towards converting multiple servers onto one main server.
- The City has lowered permit fees for solar panels to encourage their installation and use.
- The City did not install overhead lights in some “day use parks” (Thorton Vista, Mussel Rock)

Steps that Daly City has taken to reduce water consumption:

- The City continues to implement retrofits of all public buildings with and require in new public buildings low-flow toilets and sensor sinks.
- The City practices drip irrigation systems where applicable.
- The City installed two artificial turf fields (Gellert and TR Pollicita) to reduce water use.
- The City uses an advanced irrigation system to monitor use, reduce waste of water and assist in scheduling (including rain gauges and wind monitors)
- The City provides conservation incentives and financial rebates through a number of programs

Steps that Daly City has taken to reduce carbon emissions and toxins:

- The City purchases 20% biofuel/low sulfur diesel as it is cleaner
- The City purchased 5 hybrid cars
- The City uses decomposed crushed granite as pathways/trails, as appropriate, instead of asphalt.

Steps that Daly City has taken to educate the community:

- The City implemented a project at Ben Franklin Middle School to promote conservation, recycling, and composting in an urban setting.
- The City is working towards a zero tolerance policy and to implement/regulate code enforcement.
- The City is working on a policy document to become leaders/role models for a greener city.
- The City is working on signs to promote conservation.
- The City is working on a marketing campaign within the schools and the community at large to promote a greener Daly City.
- The City will establish a Green Committee for the city to assist in the coordination and implementation of the City’s Green Policy.

Appendix B

Resolution Adopting the U.S. Conference of Mayors Climate Protection Agreement

RESOLUTION NO. 09-104

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF DALY CITY ENDORSING THE US MAYORS CLIMATE PROTECTION AGREEMENT

NOW THEREFORE, THE CITY COUNCIL OF THE CITY OF DALY CITY, CALIFORNIA DOES HEREBY FIND, DETERMINE AND DECLARE AS FOLLOWS:

SECTION 1. The City Council hereby makes the following findings:

A. Recent, well-documented impacts of climate disruption include average global sea level increases of four to eight inches during the 20th century; a 40 percent decline in Arctic sea-ice thickness; and nine of the ten hottest years on record occurring in the past decade; and

B. Climate disruption of the magnitude now predicted by the scientific community will cause extremely costly disruption of human and natural systems throughout the world including: sea-level rises that interact with coastal storms to erode beaches, inundate land, and damage structures; more frequent and extreme heat waves; more frequent and greater concentrations of smog; and

C. Mayors from around the nation have signed the U.S. Mayors Climate Protection Agreement which, as amended at the 73rd Annual U.S. Conference of Mayors meeting, reads:

The U.S. Mayors Climate Protection Agreement

D. We urge the federal government and state governments to enact policies and programs to meet or exceed the target of reducing global warming pollution levels to 7 percent below 1990 levels by 2012, including efforts t: reduce the United States' dependence on fossil fuels and accelerate the development of clean, economical energy resources and fuel-efficient technologies such as conservation, methane recovery for energy generation, waste to energy, wind and solar energy, fuel cells, efficient motor vehicles, and biofuels; and

E. We urge the U.S. Congress to pass bipartisan greenhouse gas reduction legislation that includes: 1) clear timetables and emissions limits, and 2) a flexible, market-based system of tradable allowances among emitting industries, and

F. We will strive to meet or exceed Kyototo Protocol targets for reducing warming pollution by taking actions in our own operations and communities such as:

1. Inventory global warming emission in City operations and in the community, set reduction targets and create an action plan, if feasible;

2. Support land-use policies that preserve open space, and create compact, walkable urban communities;

3. Promote transportation options such as bicycle trails, commute trip reduction programs, incentives for car pooling and public transit;

4. Increase the use of clean, alternative energy by, for example, advocating for the development of renewable energy resources, recovering landfill methane for energy production, and supporting the use of waste to energy technology;

5. Support energy efficiency through retro-fitting City facilities with energy efficient lighting and urging employees to save energy which saves costs;

6. Where feasible, purchase "Energy Star" equipment and appliances for City use;

7. Practice and promote sustainable building practices using the U.S. Green Building Council's LEED program or a similar program;

8. Increase the average fuel efficiency of municipal fleet vehicles; launch and employee education program including anti-idling messages; convert diesel vehicles to bio-diesel;

9. Evaluate opportunities to increase pump efficiency in water and wastewater systems;

10. Where feasible, increase recycling rates in City operations and in the community;

11. Maintain healthy urban forests; promote tree planting to increase shading and to absorb CO2; and

12. Support education of the public, school children, and other jurisdictions, service organizations; business and industry about reducing global warming pollution.

THE CITY COUNCIL OF THE CITY OF DALY CITY DOES HEREBY RESOLVE AS FOLLOWS:

SECTION 2. That the City of Daly City endorsed the U.S. Mayors Climate Protection Agreement as amended by the 73rd annual U.S. Conference of Mayors meeting and urges mayors from around the nation to join the effort.

SECTION 3. The City Clerk shall make this Resolution reasonably available for public inspection within thirty (30) days of the date this Resolution is adopted.

SECTION 4. This Resolution shall take effect immediately.

SECTION 5. The City Clerk shall certify to the adoption of this Resolution and thenceforth and thereafter the same shall be in full force and effect.

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF DALY CITY
ENDORSING THE US MAYORS CLIMATE PROTECTION AGREEMENT

I hereby certify the foregoing to be a true copy of a Resolution adopted by the City Council of Daly City, California, at a regular meeting thereof held on the 22nd day of June, 2009, by the following vote of the members thereof:

AYES, and in favor thereof, Councilmembers: Canepa, Gomez, Klatt, Guingona

NOES, Councilmembers: None

ABSENT, Councilmembers: Torres

K. Annette Flippona
CITY CLERK OF THE CITY OF DALY CITY

APPROVED:

MICHAEL P. GUINGONA
VICE MAYOR OF THE CITY OF DALY CITY

Appendix C

City of Daly City 2005 Government Operations Greenhouse Gas Emissions Inventory Prepared by the International Council for Local Environmental Initiatives - Local Governments for Sustainability

City of Daly City
2005 Government Operations
Greenhouse Gas Emissions Inventory

Prepared by ICLEI - Local Governments for Sustainability USA.

Credits and Acknowledgements

City of Daly City

Sal Torres, Mayor
Michael P. Guingona, Vice Mayor
David J. Canepa, Council Member
Maggie Gomez, Council Member
Carol L. Klatt, Council Member
Patricia E. Martel, City Manager
Kerry E. Burns, Assistant City Manager
Donald McVey, Director of Finance
Michael Wilson, Deputy Director of Finance
Tim Nevin, Senior Management Analyst
Jeff Fornesi, Facilities Supervisor
Shirley Chan, Traffic Engineer
Jesse Myott, Administrative Intern

PG&E Contributors

Lynne Galal, Senior Project Manager
Corie Cheeseman, Program Manager

Joint Venture: Silicon Valley Network

Kara LaPierre Vice President and Executive Director, Silicon Valley Economic Development Alliance
Rachel Massaro, Associate Director, Climate Initiatives
Seth Fearey, Former Vice President, Chief Operating Officer, Smart Valley Initiative Director

Sustainable Silicon Valley

Marianna Grossman, President and Executive Director
Rick Row, Former Executive Director

Allied Waste

Anthony Boccaleoni, General Manager

This report was prepared by Alison Culpen, Program Associate, Jonathan Strunin, Program Officer, and Jamie O'Connell, Program Associate at ICLEI-Local Governments for Sustainability USA. The authors gratefully acknowledge the dedication of the staff of the City of Daly City, which provided much of the insight and local information necessary for the completion of this report. Thanks also to the San Mateo City/County Association of Governments, which provided funds to local governments in San Mateo County for the completion of this inventory.

Joint Venture: Silicon Valley Network

Russell Hancock, President and Chief Executive Officer

Established in 1993, Joint Venture provides analysis and action on issues affecting the Silicon Valley economy and quality of life. The organization brings together established and emerging leaders—from business, government, academia, labor, and the broader community—to spotlight issues, launch projects, and work toward innovative solutions.

http://www.jointventure.org

Sustainable Silicon Valley

Marianna Grossman, Executive Director

Sustainable Silicon Valley (SSV) is a collaboration of businesses, governments, and non-governmental organizations that are identifying and addressing environmental and resource pressures in the Valley. As its first initiative, SSV is engaging prominent Valley organizations to work toward self-imposed goals of reducing regional carbon dioxide (CO_2) emissions. The SSV approach is to facilitate strategies to reduce CO_2 emissions through increased energy and fuel efficiency and through the use of renewable sources of energy. SSV envisions a thriving Silicon Valley with a healthy environment, a vibrant economy, and a socially equitable community. Sustainable Silicon Valley's mission is to lead the Silicon Valley community to create a more sustainable future by engaging and collaborating with local government agencies, businesses, and community organizations to identify and help address the highest priority environmental issues in the Valley.

http://www.sustainablesiliconvalley.org

ICLEI-Local Governments for Sustainability USA

Michelle Wyman, Executive Director

ICLEI-Local Governments for Sustainability is a membership association of more than 1,000 local governments worldwide—more than 500 in the United States—committed to advancing climate protection and sustainability. Through technical expertise, direct network engagement, and the innovation and evolution of tools, ICLEI strives to empower local governments to set and achieve their emissions reduction and sustainability goals.

http://www.icleiusa.org

Table of Contents

Appendix A: The Local Government Operations Protocol

Appendix B: LGOP Standard Report VII

Appendix C: Employee Commute

Appendix D: Government-Generated Solid Waste Methodology

Appendix E: Conducting a Monitoring Inventory

List of Tables and Figures

List of Tables

List of Figures

Executive Summary

The City of Daly City has recognized that human-caused climate change is a reality, with potentially disruptive effects to the City's residents and businesses. Daly City also recognizes that local governments play a leading role in both reducing greenhouse gas emissions and mitigating the potential impacts of climate change. Local governments can dramatically reduce the emissions from their government operations by such measures as increasing energy efficiency in facilities and vehicle fleets, utilizing renewable energy sources, sustainable purchasing, waste reduction, and supporting alternative modes of transportation for employees. The co-benefits of these measures may include lower energy bills, improved air quality, and more efficient government operations.

The City has begun its efforts to address the causes and effects of climate change with the assistance of the partners in the Silicon Valley Climate Protection Partnership. These partners include Joint Venture: Silicon Valley Network; Sustainable Silicon Valley; local governments in San Mateo, Santa Clara, and Santa Cruz counties; and ICLEI-Local Governments for Sustainability USA.

This greenhouse gas emissions inventory represents the completion of an important first step in the City's climate protection initiative. As advised by ICLEI, it is essential to first quantify emissions to establish:

- A baseline emissions inventory, against which to measure future progress.
- An understanding of the scale of emissions from the various sources within government operations.

Presented here are estimates of greenhouse gas emissions in 2005 resulting from Daly City's government operations. With one exception,[1] all emissions estimates in this report refer to emissions generated from sources over which the City has direct operational control, exclusive of physical location.[2] This includes all government-operated facilities, streetlights, and other stationary sources; vehicle fleet and off-road equipment; and waste generated by government operations. The inventory *does not* estimate emissions from the larger community—these will be addressed in the community-scale greenhouse gas emissions inventory. Therefore, this inventory should be considered an independent analysis relevant only to Daly City's internal operations.

1 The exception is emissions from employee-owned vehicles that are used by employees during commuting.
2 Facilities, vehicles, or other operations wholly or partially owned by, but not operated by, Daly City are not included in this inventory. See Appendix A for more details on the boundaries of the inventory.

This inventory is one of the first inventories to use a new national standard developed and adopted by the California Air Resources Board (ARB) in conjunction with ICLEI, the California Climate Action Registry, and The Climate Registry. This standard, called the Local Government Operations Protocol (LGOP), provides standard accounting principles, boundaries, quantification methods, and procedures for reporting greenhouse gas emissions from local government operations. To that end, LGOP represents a strong step forward in standardizing how inventories are conducted and reported, providing a common national framework for all local governments to establish their emissions baseline. This and all emissions inventories represent an estimate of emissions using the best available data and calculation methodologies. Emissions estimates are subject to change as better data and calculation methodologies become available in the future. Regardless, the findings of this inventory analysis provide a solid base against which The City can begin planning and taking action to reduce its greenhouse gas emissions.

Figure ES.1 2005 Daly City Government Operations Emissions by Sector

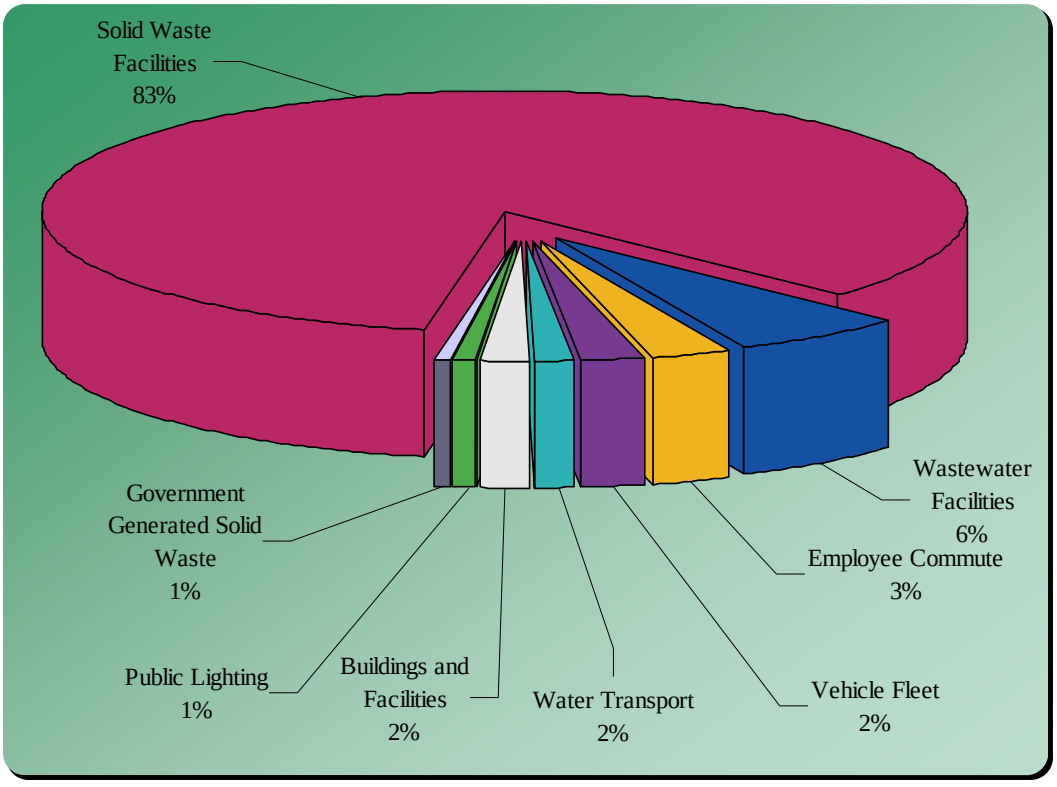
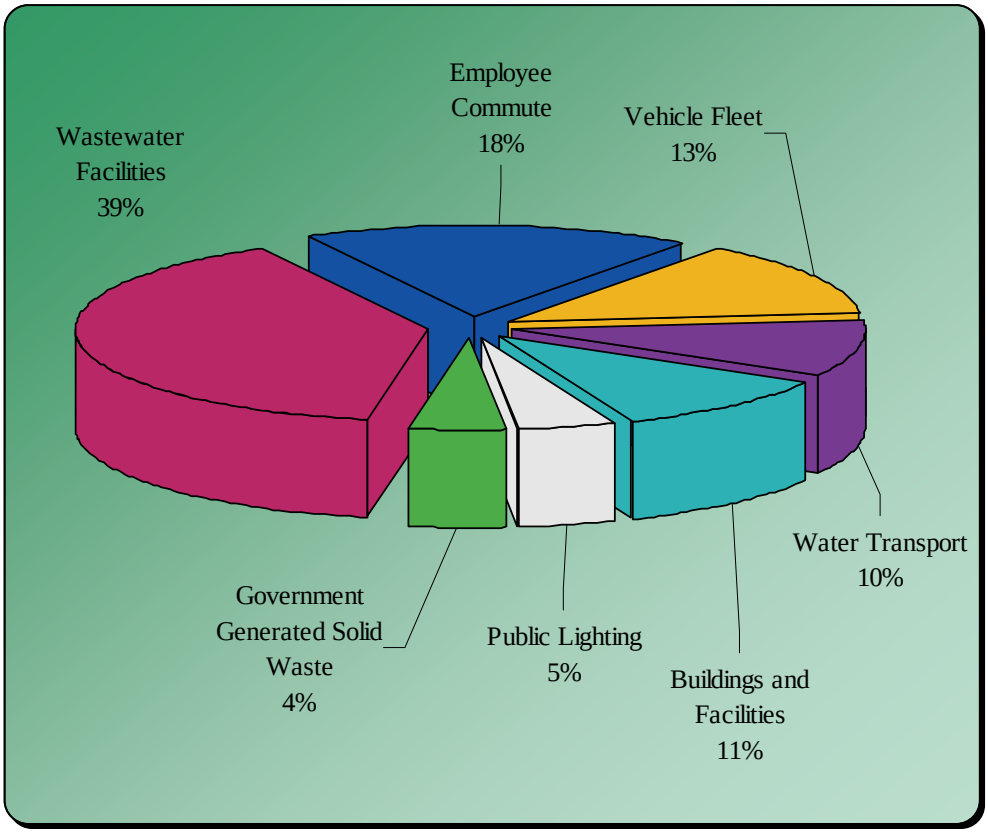


Figure ES.2 2005 Daly City Government Operations Emissions by Sector (excluding Solid Waste Facilities)



Inventory Results

In 2005, Daly City's direct emissions, emissions from electricity consumption, and select indirect sources totaled 80,530 metric tons of CO_2e.[3] Of the total emissions accounted for in this inventory, emissions from solid waste facilities (the Mussel Rock landfill) were overwhelmingly the largest source of estimated emissions (83 percent as shown in Figure ES.1 and Table ES.1).[4] Emissions from wastewater facilities (including the treatment plant) comprised the second highest source of emissions from the City's operations (6 percent). Emissions from employees commuting to and from work, from City buildings and facilities, the City vehicle fleet, and water pumps and irrigation devices also comprised major sources of emissions. Since solid waste facilities make up such a large

[3] CO_2e stands for "carbon dioxide equivalent," the standard unit for describing how much global warming different types and amounts of greenhouse gases (such as carbon dioxide, methane, and nitrous oxide) would cause. This number represents a "roll-up" of emissions, and is not intended to represent a complete picture of emissions from Daly City's operations. This roll-up number should not be used for comparison with other local government roll-up numbers without a detailed analysis of the basis for this total.

4 Since Daly City does not have a landfill gas collection system at Mussel Rock Landfill, see the master data sheet and the First Order Decay Model that were provided with this report for further detail on the calculations involved for this emissions estimate; all estimates are best estimates and are in line with LGOP guidance.

majority of the emissions, to get a better sense of the other sectors Figure ES.2 depicts emissions estimates excluding solid waste facilities.

Cumulatively, the City spent approximately $2.64 million on energy (electricity, natural gas, diesel, gasoline) for government operations in 2005. Of this total, 79 percent of these energy expenses ($2.08 million) resulted from electricity consumption, and 5 percent ($142,294) from natural gas purchases from PG&E. Fuel purchases (gasoline and diesel) for the vehicle fleet and mobile equipment totaled $421,862, or 16 percent of total costs included in this inventory.[5] Beyond reducing greenhouse gases, any future reductions in municipal energy consumption will have the potential to reduce these costs, enabling the City to reallocate limited funds toward other municipal services or leverage costs savings to support future climate protection activities.

Table ES.1: 2005 Daly City Government Operations Emissions by Sector

Sector	Greenhouse Gas Emissions (metric Tons CO_2e)
Solid Waste Facilities	68,040
Wastewater Facilities	4,910
Employee Commute	2,239
Vehicle Fleet	1,679
Buildings and Facilities	1,323
Water Transport	1,226
Public Lighting	570
Government Generated Solid Waste	544

[5] Costs for diesel and gasoline purchased to operate generators were not included in this analysis.

Section One: Introduction

Introduction

Local governments play a fundamental role in addressing the causes and effects of human-caused climate change through their actions at both the community and government operations levels. While local governments cannot solve the problems of climate change by themselves, their policies can dramatically reduce greenhouse gas emissions from a range of sources and can prepare their communities for the potential impacts of climate change.

Within the context of government operations, local governments have direct control over their emissions-generating activities. They can reduce energy consumption in buildings and facilities, reduce fuel consumption by fleet vehicles and equipment, reduce the amount of government-generated solid waste that is sent to a landfill, and increase the amount of energy that is obtained through alternative energy sources. By quantifying the emissions coming from its operations, this report will enable Daly City to choose the most effective approach to reducing its contribution to climate change.

1.1 Climate Change Background

A balance of naturally occurring gases dispersed in the Earth's atmosphere determines its climate by trapping solar radiation. This phenomenon is known as the greenhouse effect. Overwhelming evidence suggests that modern human activity is artificially intensifying the greenhouse gas effect, causing global average surface temperatures to rise. This intensification is caused by activities that release carbon dioxide and other greenhouse gases into the atmosphere—most notably the burning of fossil fuels for transportation, electricity, and heat generation.

Rising temperatures affect local and global climate patterns, and these changes are forecasted to manifest themselves in a number of ways that might impact Daly City. For example, the San Francisco Bay may experience rising sea levels and the Sacramento Delta may experience changes in salinity, affecting land uses, water sources, and agricultural activity. Changing temperatures will also likely result in more frequent and damaging storms accompanied by flooding and landslides. Reduced snow pack in the Sierra Nevada mountains may lead to water shortages, and the disruption of ecosystems and habitats is likely to occur.

In response to this threat, many communities in the United States are taking responsibility for addressing climate change at the local level. Since many of the major sources of greenhouse gas emissions are directly or indirectly controlled through local policies, local governments have a strong role to play in reducing greenhouse gas emissions within their boundaries. Through proactive measures around sustainable land use patterns, transportation demand management, energy efficiency, green building, and waste diversion, local governments can dramatically reduce emissions in their communities. In addition, local governments are primarily responsible for the provision of emergency services and the mitigation of natural disaster impacts. As the effects of climate change become more common and severe, local government adaptation policies will be fundamental in preserving the welfare of residents and businesses.

1.2 Purpose of Inventory

The objective of this greenhouse gas emissions inventory is to identify the sources and quantities of greenhouse gas emissions resulting from government operations in Daly City in 2005. This inventory is a necessary first step in addressing greenhouse gas emissions, serving two purposes:

- It creates an emissions baseline against which the City can set emissions reductions targets and measure future progress.
- It allows local governments to understand the scale of emissions from the various sources within their operations.

While Daly City has already begun to reduce greenhouse gas emissions through its actions (see Section 1.4 for more detail), this inventory represents the first step in a systems approach to reducing the City's emissions. This system, developed by ICLEI, is called the Five Milestones for Climate Mitigation. This Five-Milestone process involves the following steps:

Milestone One: Conduct a baseline emissions inventory and forecast

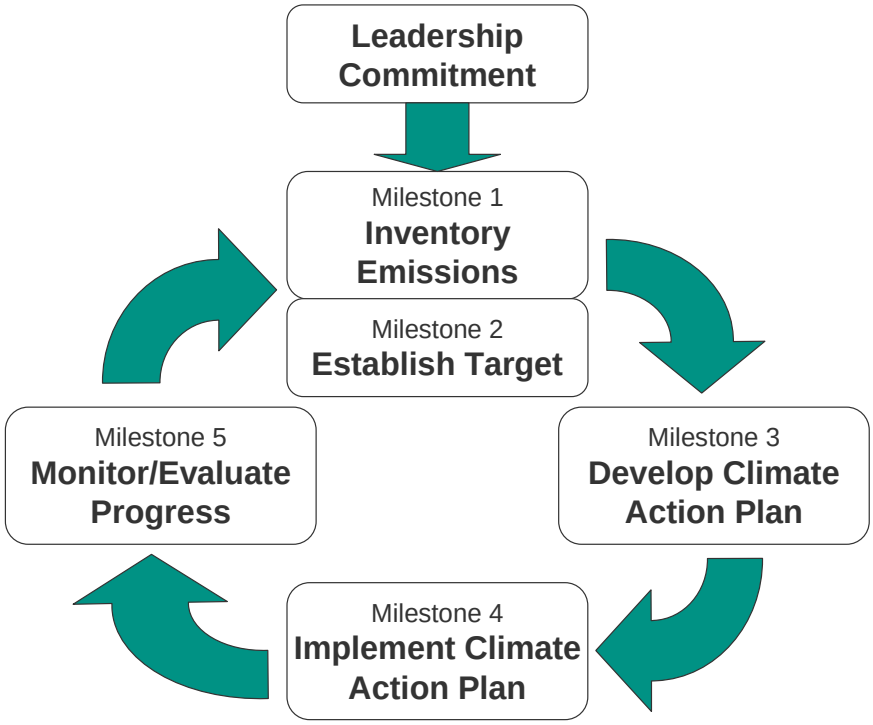
Milestone Two: Adopt an emissions reduction target for the forecast year

Milestone Three: Develop a local climate action plan

Milestone Four: Implement the climate action plan

Milestone Five: Monitor progress and report results

Figure 1.1 The Five-Milestone Process



1.3 Climate Change Mitigation Activities in California

Beginning in 2005, the State of California has responded to growing concerns over the effects of climate change by adopting a comprehensive approach to addressing emissions in the public and private sectors. This approach was officially initiated with the passage of the Global Warming Solutions Act of 2006 (AB 32), which required the state to reduce its greenhouse gas emissions to 1990 levels by 2020. It also required the California Air Resources Board (ARB) to regularly inventory emissions at the state level and to create a plan for reducing these emissions. The bill authorized ARB to adopt and enforce regulations targeted at greenhouse gas emissions reductions in the public and private sectors.

The resulting AB 32 Scoping Plan was adopted by ARB in December 2008. It established the following measures that the State will take to meet the greenhouse gas emissions reduction targets:

- Develop a California cap-and-trade program
- Expand energy efficiency programs
- Establish and seek to achieve reduction targets for transportation-related GHG emissions
- Support implementation of a high-speed rail system
- Expand the use of green building practices

- Increase waste diversion, composting, and commercial recycling toward zero-waste
- Continue water efficiency programs and use cleaner energy sources to move and treat water
- Implement the Million Solar Roofs Programs
- Achieve a statewide renewable energy mix of 33 percent
- Develop and adopt the low-carbon fuel standard
- Implement vehicle efficiency measures for light-, medium-, and heavy-duty vehicles
- Adopt measures to reduce high global warming potential gases
- Reduce methane emissions at landfills
- Preserve forest sequestration and encourage the use of forest biomass for sustainable energy generation
- Capture of methane through use of manure digester systems at dairies

Other measures taken by the state have included mandating stronger vehicle emissions standards (AB 1493, 2002), establishing a low-carbon fuel standard (EO # S-01-07, 2007), mandating a climate adaptation plan for the state (S-EO # 13-08, 2008), establishing a Green Collar Job Council, and establishing a renewable energy portfolio standard for power generation or purchase in the state. The state also has made a number of changes that will likely have potentially large effects on local governments:

- SB 97 (2007) required the Office of Planning and Research to create greenhouse gas planning guidelines for the California Environmental Quality Act (CEQA). In addition, ARB is tasked with creating energy-use and transportation thresholds in CEQA reviews, which may require local governments to account for greenhouse gas emissions when reviewing project applications.
- AB 811 (2007) authorized all local governments in California to establish special districts that can be used to finance solar or other renewable energy improvements to homes and businesses in their jurisdiction.
- SB 732 (2008) established a Strategic Growth Council charged with coordinating policies across state agencies to support a unified vision for land use development in the state. This vision will serve as a reference point for local land use policies.
- SB 375 (2008) mandated the creation of regional sustainable community strategies (SCS) by regional planning agencies. The SCS links regional housing and transportation planning processes in an attempt to meet regional greenhouse gas emissions targets.

1.4 Climate Change Mitigation Activities in Daly City

Prior to collaboration with ICLEI, and in follow-up to the Leadership Academy Green Team's work, the City convened a committee comprised of a staff representative from each City department. For the past several months, the Climate Protection Action Team has worked together to develop a framework for the City's climate action plan

for government operations. Recently, the Action Team completed the mission statement, guiding principles and goals for this action plan. Each City department will be instrumental in developing the overall Plan by identifying ways the department can modify current operating practices to reduce energy and resource consumption, maximize resource life-cycles and enhance energy efficiency. The City Council, by adopting the U.S. Mayors Climate Protection Agreement in June 2009, paved the way for further climate action initiatives. Additionally, the Climate Protection Action Team has been working with all City departments to complete the development of the City's Climate Action Plan in conjunction with the preparation of the City's next two-year budget (Fiscal Years 2010-2012).

Daly City has already made significant progress in minimizing greenhouse gas emissions resulting from government operations. Below is a brief list of the efforts already undertaken by the City:

- Operation of hybrid vehicles and of bio-diesel vehicles;
- Exploitation and sale of tertiary recycled water; and,
- Energy audits and facilities improvements

Daly City continues to explore and implement solutions to reduce the causes of global warming and preserve and protect our climate and environment. Through the adoption of the U.S. Mayors Climate Protection Agreement, as well as the completion of the ICLEI Greenhouse Gas Emissions Inventory and the Climate Action Plan, Daly City will again demonstrate its leadership on one of the most pressing social and environmental issues of our time.

1.5 The Silicon Valley Climate Protection Partnership

The Silicon Valley Climate Protection Partnership is a joint effort between Joint Venture: Silicon Valley Network (JV:SVN); Sustainable Silicon Valley (SSV); local governments in San Mateo, Santa Clara and Santa Cruz counties (hereby referred to as the "Silicon Valley area"); and ICLEI. The Partnership was initiated in 2008 to provide a solid regional platform for local governments to follow ICLEI's Five-Milestone process (described in Section 1.2), as well as a shared learning experience.

In early 2008, JV:SVN contracted with ICLEI to conduct government operations emissions inventories for participating local governments, using the standards outlined in the then soon-to-be-released Local Government Operations Protocol (LGOP—see Appendix A for details). For this project, 27 local governments have signed onto this contract. SSV joined the Partnership to provide additional educational and other services to facilitate more rapid progress by participating governments through the Five Milestones. While ICLEI created these inventories concurrently using the same tools and methods, each inventory was conducted independently using data specific to each local government's operations. For this reason, inventories from different jurisdictions will involve different sources of data and emissions calculation methods.

Alongside the activities of the Partnership, JV:SVN and SSV have been facilitating regional climate dialogues to further emissions reductions goals in the Silicon Valley area. JV:SVN supports the work of the Climate Protection Task Force, a group that includes staff members from 44 jurisdictions in the Silicon Valley area, including cities, counties, and special districts. In this neutral forum, the partners learn from each other and from expert guests about climate protection programs. They then work to develop effective, collaborative programs for the reduction of greenhouse gas emissions from public agency operations. SSV holds quarterly conferences and monthly meetings that discuss specific approaches to addressing climate change, including the pros and cons of regional climate planning. SSV also puts out annual reports highlighting successes of businesses and local governments that have voluntarily pledged to set and work toward their own carbon dioxide reduction goals. JV:SVN and SSV, along with ICLEI, the San Mateo City/County Association of Governments, and the Bay Area Air Quality Management District[6], have dramatically pushed forward the pace and scale of climate actions by local governments in the Silicon Valley area.

6 C/CAG and the Air Quality District have provided funding which have allowed a number of these inventories to occur and have been strong players in pushing forward local and regional actions on climate change.

Section Two: Methodology

Methodology

This greenhouse gas emissions inventory follows the standard methodology outlined in LGOP, which was adopted in 2008 by ARB and serves as the national standard for quantifying and reporting greenhouse emissions from local government operations. By participating in the Silicon Valley Climate Protection Partnership, Daly City has the opportunity to be one of the first in the nation to follow LGOP when inventorying emissions from government operations.

This chapter outlines the basic methodology utilized in the development of this inventory to provide clarity to how the inventory results were reported. Specifically, this section reviews:

- What greenhouse gases were measured in this inventory.
- What general methods were used to estimate emissions.
- How emissions estimates can be reported (the scopes framework, roll-up numbers).
- How emissions estimates were reported in this inventory.

A more detailed account of LGOP and the methodology used in this inventory can be found in Appendices A and B.

2.1 Greenhouse Gases

According to LGOP, local governments should assess emissions of all six internationally recognized greenhouse gases regulated under the Kyoto Protocol. These gases are outlined in Table 2.1, which includes the sources of these gases and their global warming potential (GWP).[7]

7 Global warming potential (GWP) is a measure of the amount of warming a greenhouse gas may cause, measured against the amount of warming caused by carbon dioxide.

Table 2.1 Greenhouse Gases

Gas	Chemical Formula	Activity	Global Warming Potential (CO_2e)
Carbon Dioxide	CO_2	Combustion	1
Methane	CH_4	Combustion, Anaerobic Decomposition of Organic Waste (Landfills, Wastewater), Fuel Handling	21
Nitrous Oxide	N_2O	Combustion, Wastewater Treatment	310
Hydrofluorocarbons	Various	Leaked Refrigerants, Fire Suppressants	12–11,700
Perfluorocarbons	Various	Aluminum Production, Semiconductor Manufacturing, HVAC Equipment Manufacturing	6,500–9,200
Sulfur Hexafluoride	SF_6	Transmission and Distribution of Power	23,900

2.2 Calculating Emissions

LGOP outlines specific methods for quantifying emissions from local government activities. What methods a local government can use to quantify emissions vary largely by how it gathers data, and therefore what data were available. In general, emissions can be quantified in two ways.

1. Measurement-based methodologies refer to the direct measurement of greenhouse gas emissions from a monitoring system. Emissions measured this way may include those emitted from a flue of a power plant, wastewater treatment plant, landfill, or industrial facility. This method is the most accurate way of inventorying emissions from a given source, but is generally available for only a few sources of emissions.

2. Calculation-based methodologies refer to an estimate of emissions calculated based upon some measurable activity data and emission factors. Table 2.2 demonstrates some examples of common emissions calculations in this report. For a detailed explanation of the methods an emissions factors used in this inventory, see Appendix B.

Table 2.2 Basic Emissions Calculations

Activity Data	Emissions Factor	Emissions
Electricity Consumption (kilowatt hours)	CO_2 emitted/kWh	CO_2 emitted
Natural Gas Consumption (therms)	CO_2 emitted/therm	CO_2 emitted
Gasoline/Diesel Consumption (gallons)	CO_2 emitted /gallon	CO_2 emitted
Waste Generated by Government Operations (tons)	CH_4 emitted/ton of waste	CH_4 emitted

2.3 Reporting Emissions

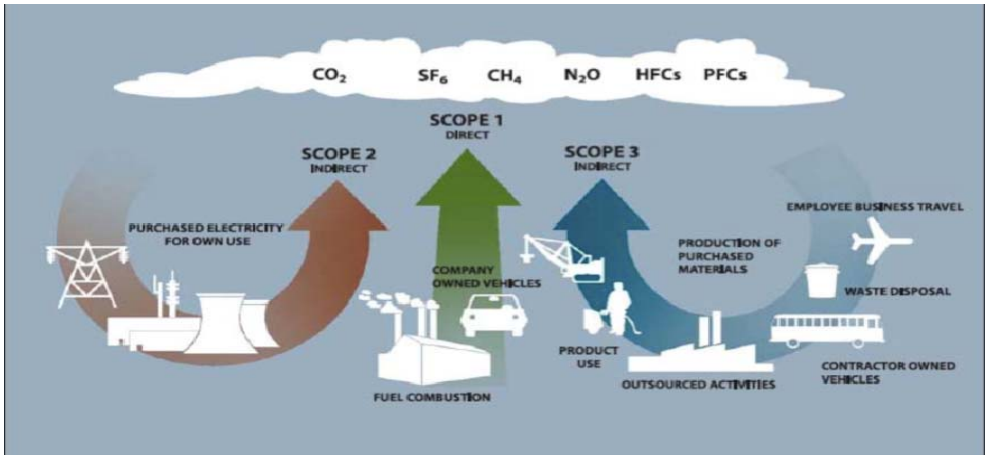
LGOP provides two reporting frameworks: reporting by scope and reporting by sector. This section defines the two reporting frameworks and discusses how they are used in this inventory. It also discusses the concept of "rolling up" emissions into a single number. This can assist local governments in communicating the results of the inventory and using the inventory to formulate emissions reductions policies.

2.3.1 The Scopes Framework

For local government operations, LGOP categorizes emissions according to what degree of control local governments have over the emissions sources. These categorizations (developed by the World Resources Institute and the World Business Council for Sustainable Development) are called *emissions scopes.* The scopes framework helps local governments to:

- Determine which emissions should be inventoried.
- Organize emissions by degree of control and therefore the potential for reduction of these emissions.
- Avoid "double counting" of emissions, i.e., summing up of different emissions sources that may result in reporting these emissions twice.

Figure 2.1 Emissions Scopes



Source: WRI/WBCSD GHG Protocol Corporate Accounting and Reporting Standard (Revised Edition), Chapter 4.

The emissions scopes are defined as follows:

Scope 1: Direct emissions from sources within a local government's operations that it owns and/or controls. This includes stationary combustion to produce electricity, steam, heat, and power equipment; mobile combustion of fuels; process emissions from physical or chemical processing; fugitive emissions that result from production, processing, transmission, storage and use of fuels; leaked refrigerants; and other sources.

Scope 2: Indirect emissions associated with the consumption of electricity and steam that are purchased from an outside utility.

Scope 3: All other emissions sources that hold policy relevance to the local government that can be measured and reported. This includes all indirect emissions not covered in Scope 2 that occur as a result of activities within the operations of the local government. Sources over which the local government does not have any financial or operational control over would be accounted for here. Scope 3 emission sources include (but are not limited to) tailpipe emissions from employee commutes, employee business travel, and emissions resulting from the decomposition of government-generated solid waste.

Table 2.3 Inventoried Emission Sources by Scope[8]

Scope 1	Scope 2	Scope 3
Fuel consumed to heat/cool facilities	Purchased electricity consumed by facilities	Solid waste generated by government operations
Fuel consumed for vehicles and mobile equipment	Purchased electricity consumed by electric vehicles	Fuel consumed for employee vehicles used for commuting
Fuel consumed to generate electricity	Purchased steam for heating or cooling facilities	
Leaked refrigerants from facilities and vehicles		
Leaked/deployed fire suppressants		
Wastewater decomposition and treatment at a municipal wastewater treatment plant		
Solid waste in government landfills		

2.3.2 Double Counting and Rolling Up Scopes

Many local governments find it useful for public awareness and policymaking to use a single number (a "roll-up" number) to represent emissions in its reports, target setting, and action plan. A roll-up number allows local governments to determine the relative proportions of emissions from various sectors (e.g., 30 percent of rolled up emissions came from the vehicle fleet). This can help policymakers and staff identify priority actions for reducing emissions from their operations.

For these reasons, this report includes a roll-up number as the basis of the emissions analysis in this inventory. This roll-up number is composed of direct emissions (Scope 1), all emissions from purchased electricity (Scope 2), and indirect emissions from employee commutes and government-generated solid waste (Scope 3).

[8] This only represents a list of emissions that were inventoried for the Silicon Valley Climate Protection Partnership inventories. This is not meant to be a complete list of all emissions that can be inventoried in a government operations inventory.

While this report uses a standard roll-up number, these numbers should be used with caution, as they can be problematic for three reasons:

First, a roll-up number does not represent all emissions from Daly City's operations, only a summation of inventoried emissions using available estimation methods. Reporting a roll-up number can be misleading and encourage citizens, staff, and policymakers to think of this number as the local government's "total" emissions. Therefore, when communicating a roll-up number it is important to represent it only as a sum of inventoried emissions, not as a comprehensive total.

Second, rolling up emissions may not simply involve adding emissions from all sectors, as emissions from different scopes can be double-counted when they are reported as one number. For example, if a local government operates a municipal utility that provides electricity to government facilities, these are emissions from both the power generation and facilities sectors. If these sectors are rolled up into a single number, these emissions are double counted, or reported twice. For these reasons, it is important to be cautious when creating a roll-up number to avoid double counting; the roll-up number used in this report was created specifically to avoid any possible double counting.

Third, local governments often wish to compare their emissions to those of other local governments. But it is very difficult to use a roll-up number as a common measure between local governments, for a number of reasons. First, as of now there is no national or international standard for reporting emissions as a single roll-up number. In addition, local governments provide different services to their citizens, and the scale of the services (and thus the emissions) is highly dependent upon the size of the jurisdiction. For these reasons, comparisons between local government roll-up numbers should not be made without significant analysis of the basis of the roll-up number and the services provided by the local governments being compared.

2.3.3 Emissions Sectors

ICLEI recommends that local governments examine their emissions in the context of the part of their operations (sector) that is responsible for those emissions. This is helpful from a policy perspective, and will assist local governments in formulating sector-specific reduction measures and climate action plans. This inventory uses LGOP sectors as a main reporting framework, including the following sectors:

- Buildings and other facilities
- Streetlights, traffic signals, and other public lighting
- Water delivery facilities
- Wastewater facilities
- Solid waste facilities
- Vehicle fleet and mobile equipment
- Government-generated solid waste
- Emissions from employee commutes

Section Three: Inventory Results

Inventory Results

This chapter provides a detailed description of Daly City's emissions from government operations in 2005, rolling up and comparing emissions across sectors and sources as appropriate. This chapter also provides details on the greenhouse gas emissions from each sector, including a breakdown of emissions types and, where possible, an analysis of emissions by department. This information identifies more specific sources of emissions (such as a particular building) that can help staff and policymakers in Daly City to best target emissions reduction activities in the future.

For a report of emissions by scope, and a detailed description of the methodology and emission factors used in calculating the emissions from the City's operations, please see Appendix B: LGOP Standard Report.

In 2005, Daly City's direct emissions, emissions from electricity consumption and select indirect sources totaled 80,530 metric tons of CO_2e.[9] In this report, this number is the basis for comparing emissions across sectors and sources (fuel types), and is the aggregate of all emissions estimates used in this inventory.

3.1 Summary by Sector

Reporting emissions by sector provides a useful way to understand the sources of the City's emissions. By better understanding the relative scale of emissions from each of the sectors, the City can more effectively focus emissions reductions strategies to achieve the greatest emissions reductions.[10]

[9] This number represents a roll-up of emissions, and is not intended to represent a complete picture of emissions from Daly City's operations. This roll-up number should not be used for comparison with other local government roll-up numbers without a detailed analysis of the basis for this total. See section 2.3.2 for more detail.

10 The sectors with the largest scale of emissions do not necessarily represent the best opportunity for emissions reductions. Cost, administration, and other concerns may affect Daly City's ability to reduce emissions from any one sector.

Figure 3.1 2005 Daly City Government Operations Emissions by Sector

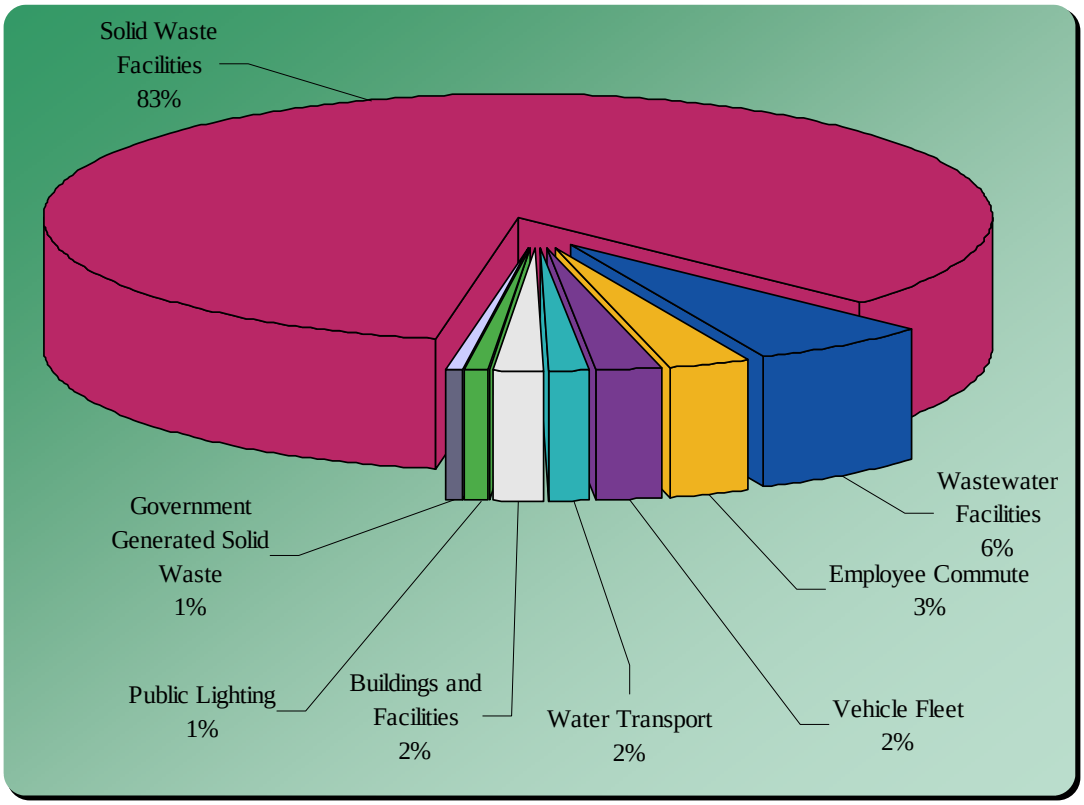


Figure 3.2 2005 Daly City Government Operations Emissions by Sector (excluding Solid Waste Facilities)

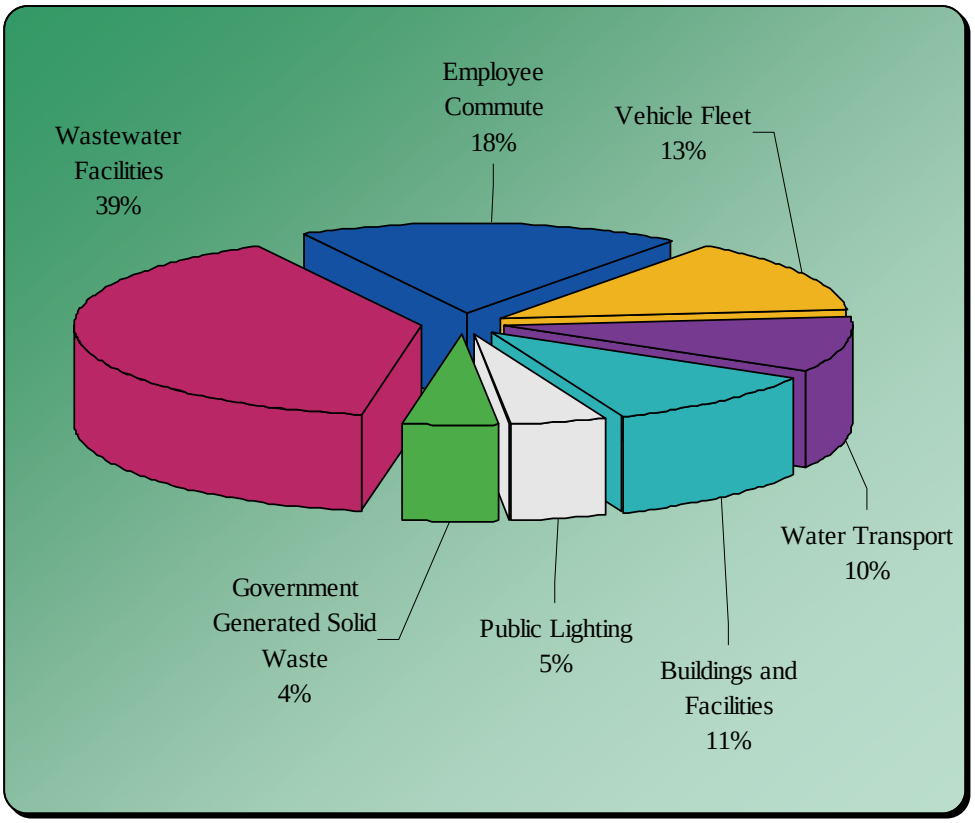


Table 3.1 2005 Daly City Government Operations Emissions by Sector

Sector	Greenhouse Gas Emissions (metric Tons CO_2e)
Solid Waste Facilities	68,040
Wastewater Facilities	4,910
Employee Commute	2,239
Vehicle Fleet	1,679
Buildings and Facilities	1,323
Water Transport	1,226
Public Lighting	570
Government Generated Solid Waste	544

As visible in Figure 3.1 and Table 3.1, organic waste decomposing in the Mussel Rock landfill was by far the largest source of greenhouse gas emissions (68,040 metric tons CO_2e) in 2005[11]. Emissions from wastewater facilities (including the treatment plant and sewage pumps) produced the second highest quantity of emissions, resulting in 4,910 metric tons of CO_2e. Daly City's vehicle fleet produced 1,679 metric tons of CO_2e of total emissions with the remainder coming from City facilities, water transport equipment, public lighting, and waste generated by City operations. Since solid waste facilities make up such a large majority of the emissions, to get a better sense of the other sectors Figure 3.2 depicts emissions estimates excluding solid waste facilities.

3.2 Summary by Source

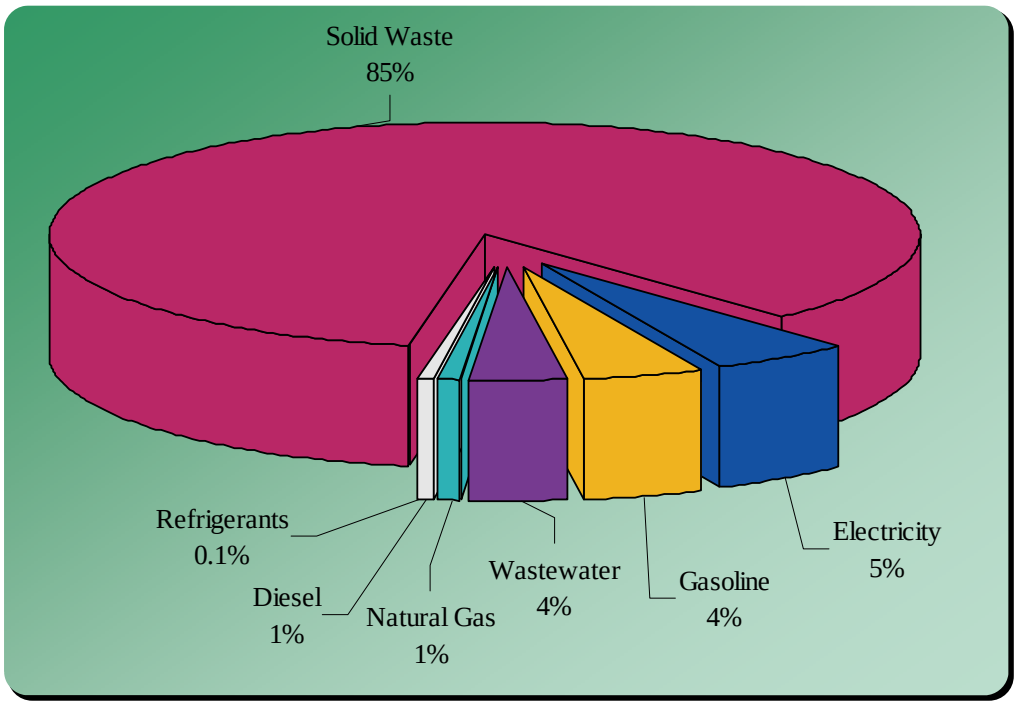
When considering how to reduce emissions, it is helpful to look not only at which sectors are generating emissions, but also at the specific raw resources and materials (gasoline, diesel, electricity, natural gas, solid waste, etc.) whose use and generation directly result in the release of greenhouse gases. This analysis can help target resource management in a way that will successfully reduce greenhouse gas emissions. Table 3.2 and Figure 3.3 provide a summary of Daly City's government operations 2005 greenhouse gas emissions by fuel type or material.

[11] Since Daly City does not have a landfill gas collection system at Mussel Rock Landfill, see the master data sheet and the First Order Decay Model that were provided with this report for further detail on the calculations involved for this emissions estimate; all estimates are best estimates and are in line with LGOP guidance.

Table 3.2 2005 Daly City Government Operations Emissions by Source

Fuel/Source	Greenhouse Gas Emissions (metric Tons CO_2e)
Solid Waste	68,584
Electricity	4,360
Gasoline	3,552
Wastewater	2,955
Natural Gas	623
Diesel	411
Refrigerants	46

Figure 3.3 2005 Daly City Government Operations Emissions by Source



3.3 Summary of Energy-Related Costs

In addition to tracking energy consumption and generating estimates on emissions per sector, ICLEI has calculated the basic energy costs of various government operations. During 2005, Daly City spent approximately $2.64 million on energy (electricity, natural gas, gasoline, and diesel) for its operations. Eighty-four percent of these energy expenses ($2.22 million) are the result of electricity and natural gas purchases from PG&E. The City spent approximately $421,862 on gasoline and diesel for the municipal fleet (16 percent of total costs). Beyond reducing harmful greenhouse gases, any future reductions in energy use will have the potential to reduce these costs, enabling

the City to reallocate limited funds toward other municipal services or leverage savings to support future climate protection activities.

Table 3.3 2005 Daly City Energy Costs by Sector

Activity	Costs ($)
Wastewater Facilities	$786,681
Water Transport	$606,053
Buildings and Facilities	$544,213
Vehicle Fleet	$421,862
Public Lighting	$285,554
TOTAL	**$2,644,363**

3.4 Detailed Sector Analyses

3.4.1 Buildings and Other Facilities

Through their use of energy for heating, cooling, lighting, and other purposes, buildings and other facilities operated by local governments constitute a significant amount of their greenhouse gas emissions. Daly City operates approximately 25 facilities, including city offices, six fire stations, and a number of libraries and community centers. Facility operations contribute to greenhouse gas emissions in two major ways. First, facilities consume electricity and fuels such as natural gas and diesel, and this consumption contributes the majority of greenhouse gas emissions from facilities. In addition, fire suppression, air conditioning, and refrigeration equipment in buildings can emit hydrofluorocarbons (HFCs) and other greenhouse gases when these systems leak refrigerants or fire suppressants.

In 2005, the operation of the City's facilities produced approximately 1,323 metric tons of CO_2e from the above sources. Table 3.4 shows estimated costs associated with the activities that generated these emissions, and Figure 3.4 depicts 2005 emissions per department. Of total facility emissions, 51 percent came from the consumption of electricity, 45 percent came from the combustion of natural gas, and much of the remaining percent (3 percent) came from the combustion of gasoline and diesel in generators (see Figure 3.5). The City spent approximately $544,213 in 2005 on the fuels and electricity that were the cause of these emissions. In addition to fuels consumed, estimated emissions from refrigerants leaked from HVAC, refrigeration, or fire suppression systems totaled 9 metric tons of CO_2e.[12]

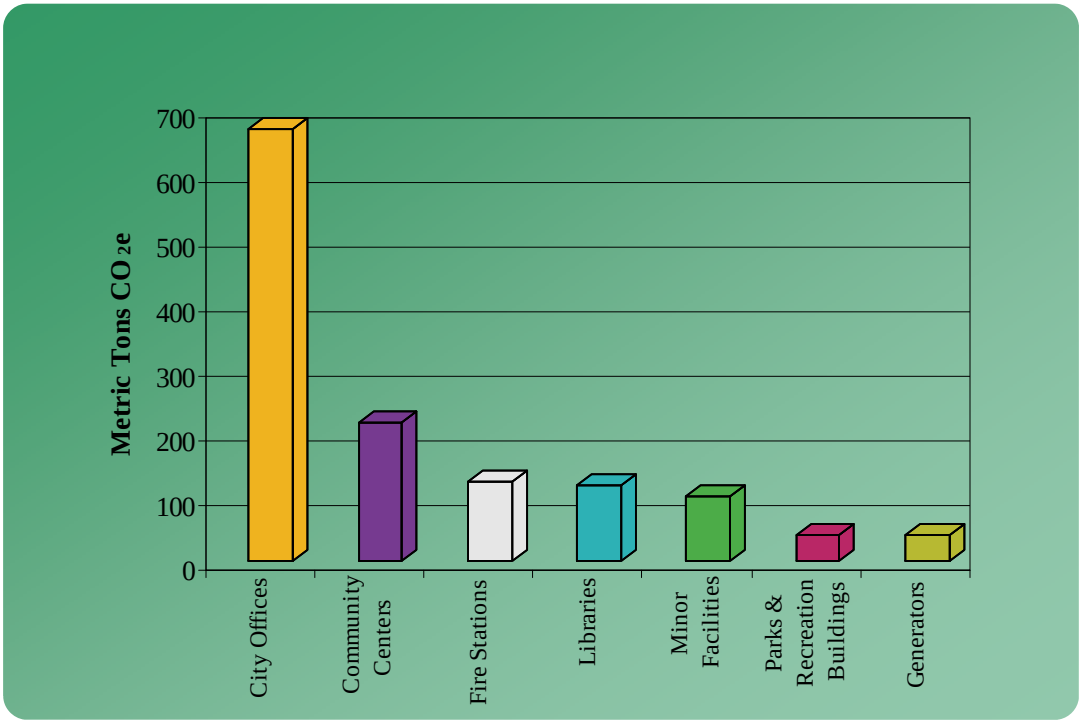
[12] Daly City used the default method to estimate emissions from leaked refrigerants, and this method results in a significant overestimate but in line with LGOP methods.

Table 3.4: Energy Use and Emissions from Major Facilities

Facility	Greenhouse Gas Emissions (metric tons CO_2e)	Percent Emissions of All Facilities[13]	Electricity Use (kWh)	Natural Gas Use (therms)	Total Energy Cost
City Offices	671	51%	1,589,010	59,263	$276,587
Community Centers	216	16%	442,752	22,009	$90,698
Fire Stations	124	9%	311,381	10,290	$55,129
Libraries	119	9%	377,299	6,476	$62,016
Minor Facilities	102	8%	188,191	11,317	$38,484
Parks & Recreation Buildings	41	3%	126,805	2,427	$21,299
Generators	41	3%	N/A	N/A	N/A
TOTAL*	**1,314**	**100%**	**3,035,438**	**111,782**	**$544,213**

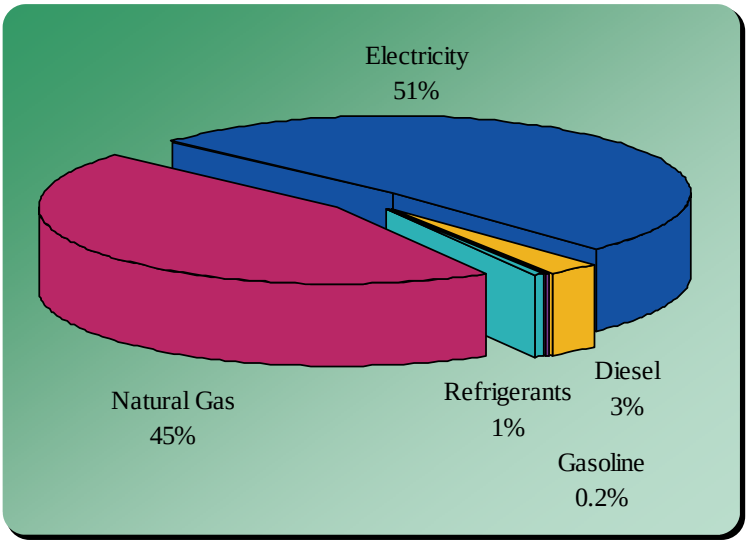
*Gasoline, diesel consumption not shown here but emissions are depicted in the appropriate facility. Emissions from leaked refrigerants are not included in this chart-these emissions totaled 9 metric tons of CO_2e.

Figure 3.4: Emissions from Major Facilities



[13] Estimated emissions from leaked refrigerants and fire suppressants were not reported by facility and therefore are not included in the total emissions used to calculate these percentages.

Figure 3.5: Emissions from Major Facilities by Source



3.4.2 Streetlights, Traffic Signals, and Other Public Lighting

Like most local governments, Daly City operates a range of public lighting, from traffic signals and sidewalk lighting to park lights. Electricity consumed in the operation of this infrastructure is a significant source of greenhouse gas emissions.

In 2005, public lighting in Daly City consumed a total of 2.54 kilowatt hours of electricity, producing approximately 570 metric tons CO_2e. Table 3.5 depicts 2005 emissions per lighting type and estimated electricity consumption and costs associated with the activities that generated these emissions. The City spent approximately $285,554 in 2005 on the fuels and electricity that were the cause of these emissions.

Table 3.5: Energy Use and Emissions from Public Lighting

Source	Greenhouse Gas Emissions (metric tons CO_2e)	Percent Emissions of All Lighting	Electricity Use (kWh)	Cost
Streetlights	458	80%	2,046,462	$217,375
Traffic Signals/ Controllers	76	13%	341,180	$51,258
Park Lighting	30	5%	135,344	$13,716
Other Outdoor Lighting	5	1%	24,383	$3,205
TOTAL	**570**	**100%**	**2,547,369**	**$285,554**

3.4.3 Water Transport

This section addresses any equipment used for the distribution of water and stormwater. Typical systems included in this section are water pumps/lifts and sprinkler and other irrigation controls.[14] The City operates a range of water transport equipment, including water pumps and sprinkler/irrigation controls. Electricity consumption and the on-site combustion of fuels such as natural gas are the most significant sources of greenhouse gas emissions from the operation of the City's water transport equipment.

In 2005, the operation of Daly City's water transport equipment produced approximately 1,226 metric tons of CO_2e from the above sources. Table 3.6 depicts 2005 emissions per equipment type and shows estimated activities and costs associated with the operation of this equipment. The City spent approximately $606,053 in 2005 on the fuels and electricity that were the cause of these emissions.

Table 3.6: Energy Use and Emissions from Water Transport Equipment

Source	Greenhouse Gas Emissions (metric tons CO_2e)	Percent Emissions of Water Transport Equipment	Electricity Use (kWh)	Natural Gas Consumption (therms)	Cost ($)
Water Pumps	1,072	87%	4,722,560	2,932	$522,663
Other Water Equipment	153	12%	683,099	N/A	$82,352
Irrigation / Sprinkler Systems	1	0.1%	3,850	N/A	$1,038
TOTAL	**1,226**	**100%**	**5,409,509**	**2,932**	**$606,053**

3.4.4 Wastewater Treatment Facilities

Wastewater coming from homes and businesses is rich in organic matter and has a high concentration of nitrogen and carbon (along with other organic elements). As wastewater is collected, treated, and discharged, chemical processes in aerobic and anaerobic conditions lead to the creation and emission of two greenhouse gases: methane and nitrous oxide. Local governments that operate wastewater treatment facilities, including wastewater pumps, treatment plants, septic systems, collection lagoons, and other facilities, must therefore account for the emission of these gases in their overall greenhouse gas emissions inventory.[15]

Daly City has operated a wastewater treatment plant since 1955. This facility serves thousands of people, including the residents and businesses located in parts of Colma, San Bruno, and South San Francisco.

[14] This section does not include emissions from decomposition or processing of wastewater in wastewater treatment facilities. These emissions are included in Section 3.4.4

[15] These emissions should not be confused with the emissions described in Section 3.4.3—those emissions refer to the *transportation* of water while this section refers exclusively to the *decomposition and treatment* of wastewater.

In 2005, the operation of wastewater treatment facilities produced approximately 4,910 metric tons of CO_2e from the above sources. Figure 3.6 and Table 3.7 break down emissions per emissions type. Of total wastewater facility emissions, 56 percent came from released treated effluent, 39 percent came from electricity consumption, and 2 percent came from nitrification/denitrification processes, with the remainder from non-combusted digester gas and other fuel consumption. Daly City spent approximately $786,681 in 2005 on the fuels and electricity that were the cause of these emissions.

Figure 3.6: Wastewater Treatment Emissions by Type

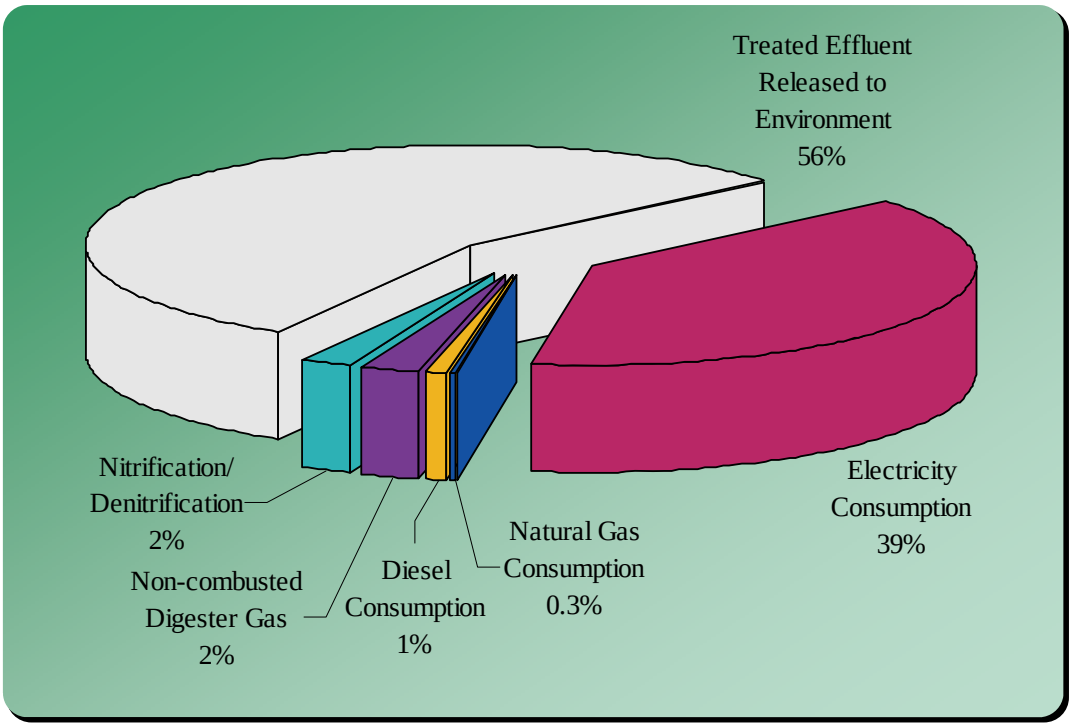


Table 3.7: Wastewater Treatment Emissions by Type

Gas	Source	Greenhouse Gas Emissions (metric tons CO_2e)
CO_2, CH_4, N_20	Electricity Consumption	1,901
CO_2, CH_4, N_20	Natural Gas Consumption	12
CO_2, CH_4, N_20	Diesel Consumption	42
CH_4	Non-combusted Digester Gas	112
N_20	Nitrification/ Denitrification	118
N_20	Treated Effluent Released to Environment	2,725
TOTAL		4,910
Biogenic CO_2	Flared Methane/Methane Burned for Energy	819

CO_2 emissions from flared methane are not counted towards total emissions as they are considered to be equivalent to the gases produced from natural decomposition processes. See Appendix A for more details.

3.4.5 Solid Waste Facilities

There are a variety of emissions associated with solid waste management services including the collection, processing, and storage of solid waste generated from residents and businesses. The most prominent source of emissions from solid waste facilities is fugitive methane released by the decomposition of organic waste over time in landfills. The scale of these emissions depends upon the size and type of the landfill and the presence of a landfill gas collection system.

Daly City has operated Mussel Rock landfill since 1957. This landfill closed in 1978, at which point it had approximately one million bank cubic yards deposited in the landfill.

Table 3.8: Solid Waste Facilities Emissions

Gas	Source	Greenhouse Gas Emissions (metric tons CO_2e)
CH_4	Decomposing Organic Waste	68,040

In 2005, the operation of the Mussel Rock landfill produced approximately 68,040 metric tons of CO_2e from the decomposition of organic waste in the landfill (Table 3.8). Due to the fact that Mussel Rock Landfill does not have a landfill gas collection system, ARB's First Order Decay Model (FOD model) was used (released in March 2009) to calculate emissions estimates. The FOD model requires a number of inputs which it then uses to calculate methane

emissions coming off of the deposited decomposing waste; a number of these inputs are provided as national default values. The main input that is required for each landfill is the estimated deposited waste for each year the landfill was open, and the average amount of rainfall in the area over that time period (from NOAA). Daly City provided the amount of waste in place (1,000,000 bank cubic yards) when the landfill closed (in 1978) and so ICLEI staff back casted the amount of waste deposited for each year using population growth rates and entered these values into the FOD model.[16]

3.4.6 Vehicle Fleet and Mobile Equipment

The majority of local governments use vehicles and other mobile equipment as an integral part of their daily operations—from maintenance trucks used for parks and recreation to police cruisers and fire trucks. These vehicles and equipment burn gasoline, diesel, and other fuels, which results in greenhouse gas emissions. In addition, vehicles with air conditioning or refrigeration equipment use refrigerants that can leak from the vehicle. Emissions from vehicles and mobile equipment compose a significant portion of emissions within most local governments.

Table 3.9: Vehicle Fleet and Mobile Equipment Emissions by Department

Function	GHG Emissions (metric tons CO_2e)	Percent of All Mobile Emissions	Gasoline Consumption (gal)	Diesel Consumption (gal)	Cost
Police	725	44%	79,244	1,241	$187,329
Water/Wastewater	306	19%	20,017	12,421	$78,315
Public Works	277	17%	19,475	10,035	$70,796
Fire	129	8%	9,503	4,288	$33,261
Parks & Recreation	121	7%	11,112	2,068	$30,776
Finance	60	4%	6,676	0	$15,244
Economic & Community Development	18	1%	2,037	0	$4,645
City Manager	6	0.4%	645	0	$1,495
TOTAL*	**1,641**	**100.0%**	**148,709**	**30,053**	**$421,862**

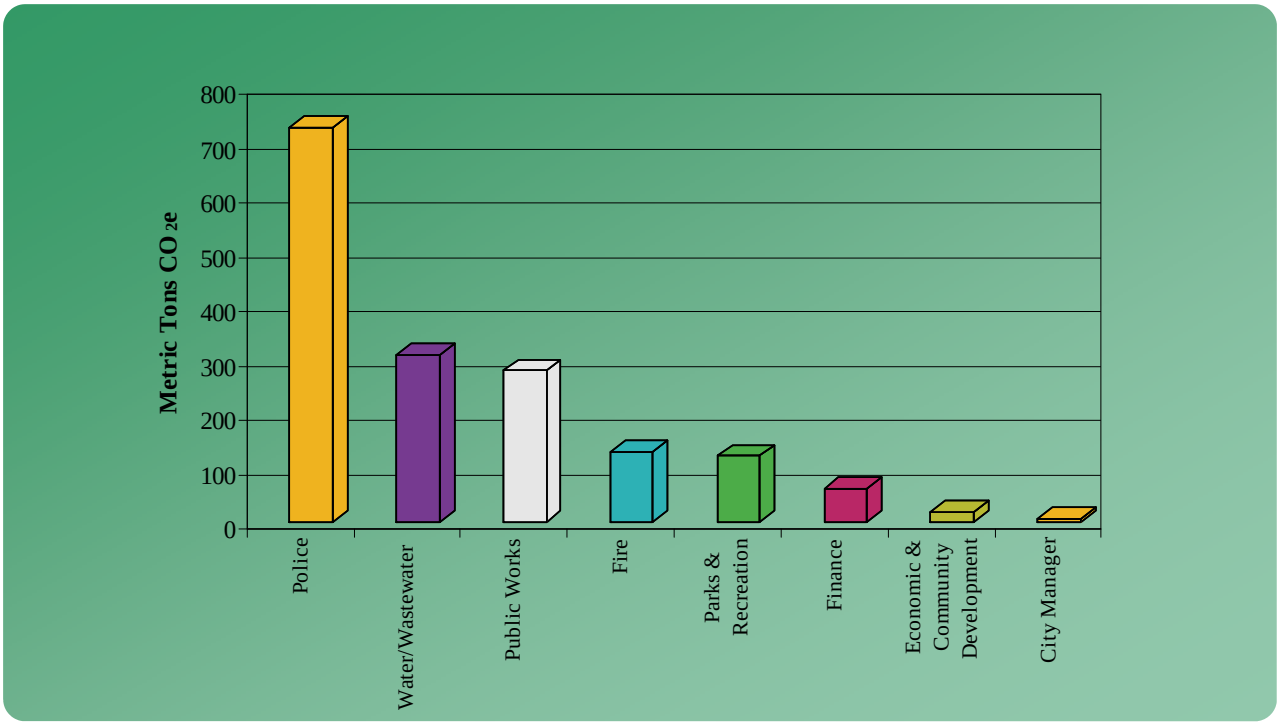
*Emissions from leaked refrigerants are not included in this chart-these emissions totaled 37 metric tons of CO2e.

In 2005, Daly City operated a vehicle fleet with approximately 200 vehicles and 100 pieces of equipment. performing a number of essential services, from street sweeping to emergency services. In 2005, Daly City emitted approximately a total of 1,641 metric tons of CO_2e as a result of the combustion of fuels to power the City's vehicle fleet. Table 3.9 shows estimated costs associated with the activities that generated these emissions, and Figure 3.7 depicts 2005 emissions per department. Across departments, the vehicles used by the police department were the largest emitters of greenhouse gases, representing 44 percent of total vehicle fleet combustion emissions.

[16] For more details regarding the calculations used to make these emission estimates, please see the master data sheet and the FOD model (in excel) provided with this report.

Water/wasterwater department vehicles and public works vehicles made up the majority of the rest of mobile emissions, with fire department and parks vehicles also emitting high levels of greenhouse gases. Across all government operations, emissions from vehicles represented 2 percent of all inventoried emissions from the City's operations in 2005. Of total fleet emissions, 80 percent came from the consumption of gasoline, 18 percent came from the combustion of diesel, and the remaining 2 percent came from the leakage of refrigerants. Daly City spent approximately $421,862 in 2005 on the fuels that were the cause of these emissions.

Figure 3.7: Emissions from Mobile Sources



3.4.7 Government-Generated Solid Waste

Many local government operations generate solid waste, much of which is eventually sent to a landfill. Typical sources of waste in local government operations include paper and food waste from offices and facilities, construction waste from public works, and plant debris from parks departments. Organic materials in government-generated solid waste (including paper, food scraps, plant debris, textiles, wood waste, etc.) generate methane as they decay in the anaerobic environment of a landfill. An estimated 75 percent of this methane is routinely captured via landfill gas collection systems;[17] however, a portion escapes into the atmosphere, contributing to the

17 This is a default methane collection rate per LGOP. This rate can vary from 0 to 99 percent based upon the presence and extent of a landfill gas collection system at the landfill/s where the waste is disposed. Most commonly, captured methane gas is flared into the

greenhouse effect. As such, estimating emissions from waste generated by government operations is an important component of a comprehensive emissions inventory.

Inventorying emissions from government-generated solid waste is considered optional by LGOP for two reasons. First, the emissions do not result at the point of waste generation (as with fuel combustion), but in a landfill located outside of Daly City's jurisdictional boundaries. In addition, the emissions are not generated in the same year that the waste is disposed, but over a lengthy decomposition period. Since inventorying these emissions is considered optional, LGOP does not provide guidance on recommended methods for quantifying these types of emissions. ICLEI therefore devised data collection and calculation methods based upon previous experience and national standards. See Appendix D for more information on quantifying emissions from government-generated solid waste.

It is estimated that the waste disposed by government facilities in 2005 will cumulatively produce 26 metric tons of methane gas, or 544 metric tons $C0_2e$. Please see Table 3.10 for a breakdown of emissions per facility.

Table 3.10: Emissions from Government Generated Solid Waste

Source	Greenhouse Gas Emissions (metric tons CO_2e)	Estimated Landfilled Waste (Tons)
Corporation Yard	313	1,233
Parks & Recreation	124	490
Municipal Buildings	64	253
Public Cans	32	125
Sanitary Dept.	11	42
TOTAL	**544**	**2,143**

3.4.8 Employee Commute

Fuel combustion from employees commuting to work is another important emissions source from Daly City's operations. Similar to the City's vehicle fleet, personal employee vehicles use gasoline and other fuels which, when burned, generate greenhouse gas emissions. Emissions from employee commutes are considered optional to inventory by LGOP because the vehicles are owned and operated privately by the employees. However, LGOP encourages reporting these emissions because local governments can influence how their employees commute to work through incentives and commuting programs. For this reason, employee commute emissions were included in this report as an area where the City could achieve significant reductions in greenhouse gases.

atmosphere, which converts the methane gas to CO_2 and effectively negates the human-caused global warming impact of the methane. Increasingly, landfill methane is being used to power gas-fired turbines as a carbon-neutral means of generating electricity.

To calculate emissions, Daly City administered a survey to all of its employees regarding their commute patterns and preferences. ICLEI then extrapolated the results of the survey to represent emissions from all employees. See Appendix C for a detailed description of the survey and methods used to calculate emissions.

In 2005, employees commuting in vehicles to and from their jobs at Daly City emitted an estimated 2,239 metric tons of CO_2e. Table 3.11 shows estimated emissions and vehicle miles traveled for all City employees.

Table 3.11: Emissions from Employee Commutes

	Greenhouse Gas Emissions (metric tons CO_2e)	Estimated Annual Vehicle Miles Traveled to Work	Average Estimated Annual Vehicle Miles Traveled to Work
All Employees	2,239	4,337,008	5,348

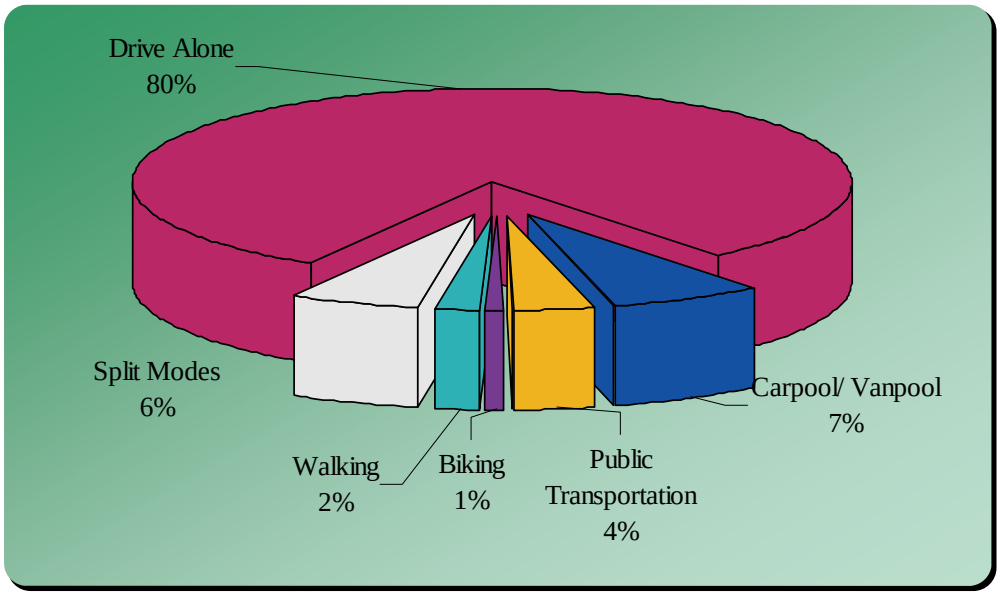
3.4.8.1 Employee Commute Indicators

In addition to estimating greenhouse gas emissions from employee commutes, ICLEI examined other policy-relevant information that was extracted from the employee commute survey—in this way, City staff can develop the most effective policies to reduce emissions from employee commutes. These measures often have co-benefits including increased productivity, reduced commute times and costs, and improvement in the quality of life for employees. No extrapolation was done with the following data; analyses were done using data from survey respondents only.

Commute Modes

In 2005, the majority (80 percent) of respondents commuted to work driving alone. Twenty percent of all respondents used some form of alternative transportation (bicycle, public transit, carpool, etc) to commute to work with carpooling being the most used form of alternative transportation (7 percent of total respondents), followed by split modes (such as biking and public transit, with 6 percent of total respondents) and public transportation (4 percent of total respondents). See Figure 3.8 for an analysis of the most common commute mode for employees who responded to the survey.

Figure 3.8: Employee Commute Modes



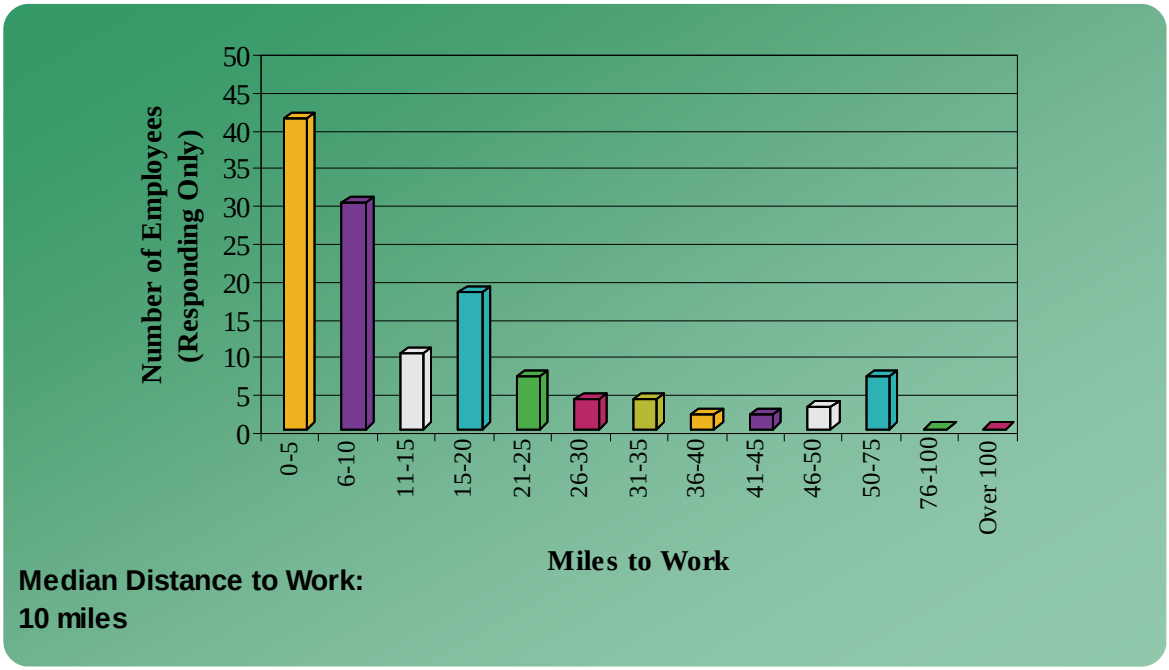
Commute Time and Costs

Table 3.12 shows the median time, cost, and distance of Daly City's employees' commutes. Figure 3.9 shows that the majority of employees live within 10 miles, suggesting that there may be good opportunities for the City to promote effective carpooling, biking, and public transportation programs. Encouraging telecommuting, if feasible, is also a viable option for the City. By encouraging employees to take public transit through incentives, Daly City could not reduce greenhouse gas emissions, but save employees money and time in the process.

Table 3.12: Distance and Time to Work and Cost of Employee Commutes (Responding Employees)

Median Time to Work (minutes)	Median Cost of Commute (weekly)	Median Distance To Work (Miles)
15	$20	10

Figure 3.9: Employee Commute Distance to Work



Commuter Preferences

When asked if employees would consider taking a list of alternative transportation modes (Figure 3.10), 30 percent of respondents indicated they would be interested in using public transportation, with carpooling and biking following with 20 percent and 17 percent of respondents respectively. Forty-three percent of respondents indicated that they had no interest in converting to an alternative mode of transportation.

Despite some employees' interest in public transit, only 40 percent of respondents indicated that there was a transit route available which they could take to and from work (Figure 3.11). This suggests that Daly City could reduce emissions from commutes by working collaboratively with (BART, Caltrain, SamTrans, VTA) to provide better service for employees. Respondents also indicated that they would be more encouraged to take public transit if (see Figure 3.12) Daly City offered a commuter shuttle (26 percent), improved transit options (24 percent), and subsidized public transit (22 percent).

Figure 3.10: Interest in Alternative Commute Modes

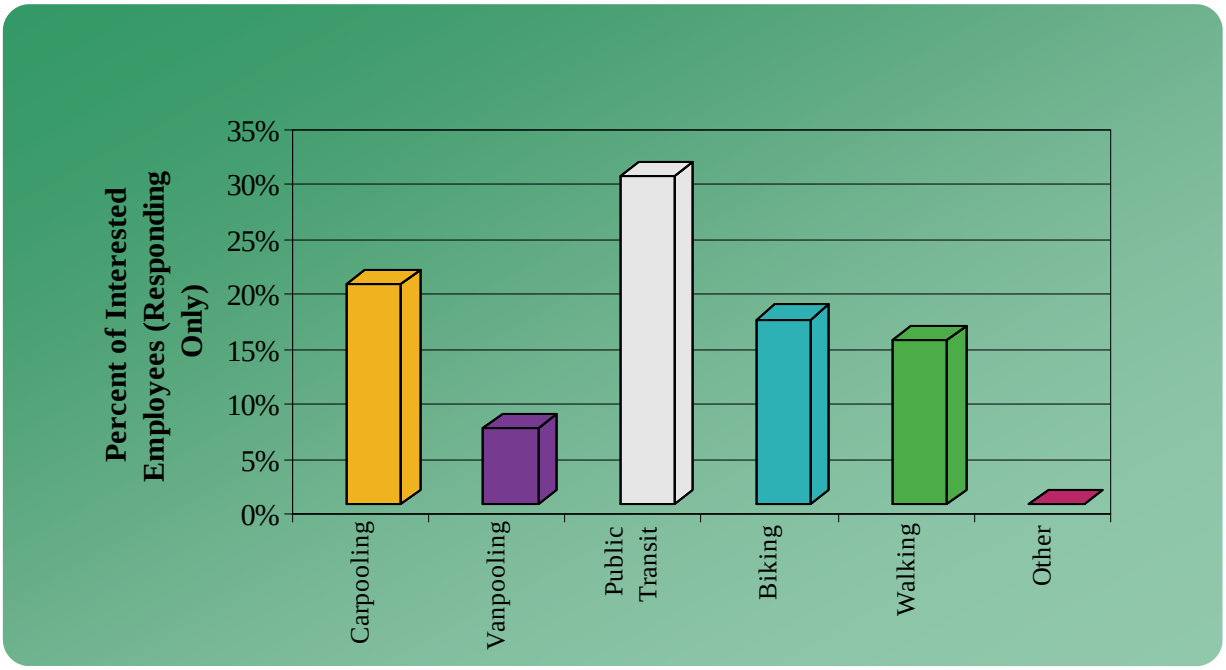


Figure 3.11: Employees with Available "Usable" Transit Route to Work

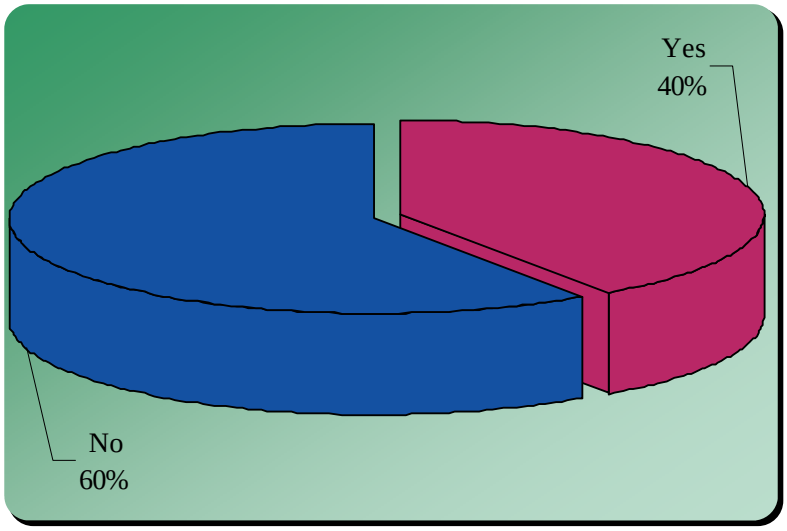
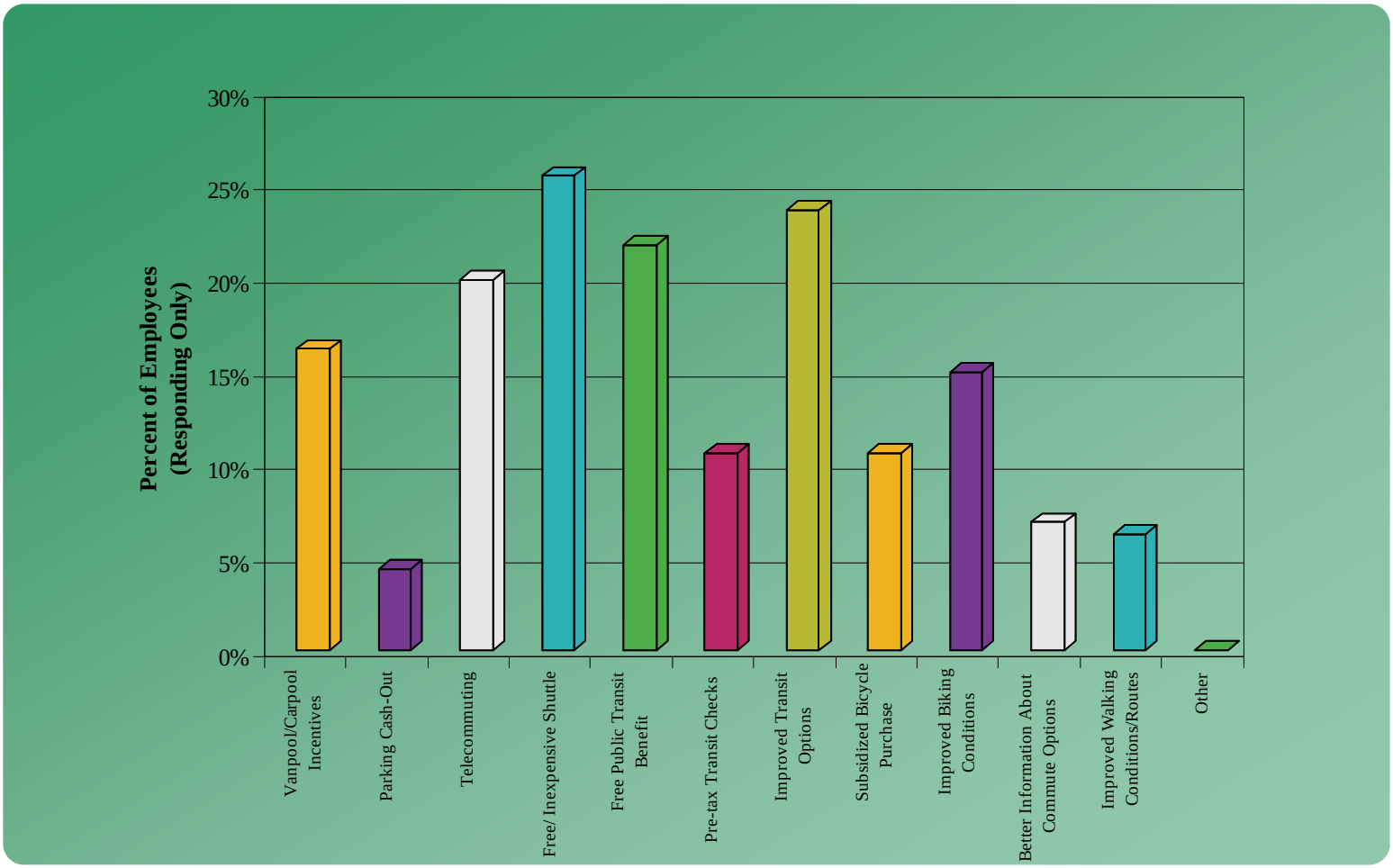


Figure 3.12: Employee Interest in Commute Benefits



Section Four: Conclusion

Conclusion

By committing itself to the Silicon Valley Climate Protection Partnership and through its previous actions on sustainability, Daly City has taken bold steps toward reducing its impacts on the environment. Staff and policymakers have chosen to take a leadership role in addressing climate change, and this leadership will allow the City to make tough decisions to create and implement innovative approaches to reduce its emissions. With increasing guidance and support from the state and the federal governments, Daly City should be increasingly empowered to make the necessary changes to promote its vision for a more sustainable future.

This inventory provides an important foundation for the City's comprehensive approach to reducing the greenhouse gas emissions from its operations. Specifically, this inventory serves to:

- Establish a baseline for setting emissions reductions targets.
- Identify the largest sources of emissions from local government operations.

This conclusion discusses the inventory as a baseline for emissions targets and suggests steps for the City to move forward to reduce emissions from its internal operations.

4.1 Toward Setting Emissions Reduction Targets

This inventory provides an emissions baseline against which the City can move forward to Milestone Two of ICLEI's Five-Milestone process—setting emissions reduction targets for its municipal operations. The greenhouse gas emissions reduction target represents the percentage by which Daly City plans to reduce total greenhouse gas emissions in its government operations below base year levels by a chosen future target year. An example target might be a 30 percent reduction in emissions below 2005 levels by 2020. A target provides an objective toward which to strive and against which to measure progress. It allows a local government to quantify its commitment to

fighting global warming—demonstrating that the Daly City is serious about its commitment and systematic in its approach.

In selecting a target, it is important to strike a balance between scientific necessity, ambition, and what is realistically achievable. The City will want to give itself enough time to implement chosen emissions reduction measures—but note that the farther out the target year is, the more that the City should pledge to reduce. ICLEI recommends that regardless of the City's chosen long-term emissions reduction target (e.g., 15-year, 40-year), it should establish interim targets for every two- to three-year period. Near-term targets facilitate additional support and accountability, and help to ensure continued momentum around Daly City's local climate protection efforts. To monitor the effectiveness of its programs, the City should plan to re-inventory its emissions at least every five years and more frequently if possible. See Appendix E for more information on how to re-inventory the City's emissions.

4.1.1 The Long-Term Goal

ICLEI recommends that Daly City's near-term climate work should be guided by the long-term goal of reducing its emissions by 80 percent to 95 percent from the 2005 baseline level by the year 2050. By referencing a long-term goal that is in accordance with current scientific understanding, the City can demonstrate that it intends to do its part towards addressing greenhouse gas emissions from its internal operations.

It is important to keep in mind that it will be next to impossible for local governments to reduce emissions by 80 to 95 percent without the assistance of state and federal policy changes that create new incentives and new sources of funding for emissions reduction projects and programs. However, in the next 15 years, there is much that local governments can do to reduce emissions independently. It is also important that the City works to reduce its emissions sooner, rather than later: the sooner a stable level of greenhouse gases in the atmosphere is achieved, the less likely we are to face some of the most dire climate change scenarios.

4.1.2 State of California Targets and Guidance

An integral component of the State of California's climate approach has been establishing three core emissions reduction targets at the community level. While these targets are specific to the community-scale, they can be used to inform emissions targets for government operations as well. Figure 4.1 highlights adopted emissions targets for the State. The AB 32 Scoping Plan also provides

Figure 4.1: California Greenhouse Gas Reduction Targets

On June 1, 2005, California Governor Schwarzenegger signed Executive Order S-3-05 establishing climate change emission reductions targets for the State of California. The California targets are an example of near-, mid- and long-term targets:

Reduce emissions to 2000 levels by 2010
Reduce emissions to 1990 levels by 2020
Reduce emissions to 80 percent below 1990 levels by 2050

further guidance on establishing targets for local governments; specifically the Plan suggests creating an emissions reduction goal of 15 percent below "current" levels by 2020. This target has informed many local government's emission reduction targets for municipal operations—most local governments in California with adopted targets have targets of 15 to 25 percent reductions under 2005 levels by 2020.

4.1.3 Department Targets

If possible, ICLEI recommends that the City consider department-specific targets for each of the departments that generate emissions within its operations. This allows staff to do a more in-depth analysis of what is achievable in each sector in the near, mid and long-term, and also encourages department heads to consider their departments' impact on the climate and institute a climate-conscious culture in its operations.

4.2 Creating an Emissions Reduction Strategy

This inventory identifies the major sources of emissions from Daly City's operations and, therefore, where staff and policymakers will need to target emissions reductions activities if they are to make significant progress toward adopted targets. For example, since solid waste facilities were a major source of emissions from the City's operations, it is possible that the City could meet near-term targets simply by implementing a few major actions within that sector. In addition, medium-term targets could be met by focusing emissions reduction actions on the wastewater treatment facilities, employee commutes, and the vehicle fleet; the long term (2050) target will not be achievable without major reductions in all of these sectors.

Given the results of the inventory, ICLEI recommends that Daly City focus on the following tasks in order to significantly reduce emissions from its government operations:

- Install a landfill gas collection/monitoring system
- Offer increased telecommuting options and vanpool/carpool incentives to eligible employees
- Convert fleet to more fuel-efficient vehicles on a replacement basis
- Adopt a green building ordinance
- Weatherize City facilities

Using these strategies as a basis for a more detailed emissions reductions strategy, Daly City should be able to reduce its impact upon global warming. In the process, it may also be able to improve the quality of its services, become more efficient with energy, and reduce long-term costs.

Appendices

Appendix A:
The Local Government Operations Protocol

This inventory follows the standard outlined in the Local Government Operations Protocol, which was adopted in 2008 by the California Air Resources Board (ARB) and serves as the national standard for quantifying and reporting greenhouse emissions from local government operations. This and the other inventories conducted for the Silicon Valley Climate Protection partnership are the first to follow LGOP, representing a strong step toward standardizing how inventories are conducted and reported.

A.1 Local Government Operations Protocol

A.1.1 Background

In 2008, ICLEI, ARB, and the California Climate Action Registry (CCAR) released LGOP to serve as a U.S. supplement to the International Emissions Analysis Protocol. The purpose of LGOP is to provide the principles, approach, methodology, and procedures needed to develop a local government operations greenhouse gas emissions inventory. It leads participants through the process of accurately quantifying and reporting emissions, including providing calculation methodologies and reporting guidance. LGOP guidance is divided into three main parts: identifying emissions to be included in the inventory, quantifying emissions using best available estimation methods, and reporting emissions.

The overarching goal of LGOP is to allow local governments to develop emissions inventories using standards that are consistent, comparable, transparent, and recognized nationally, ultimately enabling the measurement of emissions over time. LGOP adopted five overarching accounting and reporting principles toward this end: relevance, completeness, consistency, transparency and accuracy. Methodologies that did not adhere to these principles were either left out of LGOP or included as Scope 3 emissions. LGOP was created solely to standardize how emissions inventories are conducted and reported; as such it represents a currently accepted standard for inventorying emissions but does not contain any legislative or program-specific requirements. Mandates by the State of California or any other legislative body, while possibly using LGOP as a standard, do not currently exist, and California local governments are not currently required to inventory their emissions. Program-specific

requirements, such as ICLEI's Milestones or CCAR's reporting protocol, are addressed in LGOP but should not be confused with LGOP itself.

Also, while LGOP standardizes inventories from government operations, it does not seek to be a wholly accurate inventory of all emissions sources, as certain sources are currently excluded or otherwise impossible to accurately estimate. This and all emissions inventories therefore represent a best estimate of emissions using best available data and calculation methodologies; it does not provide a complete picture of all emissions resulting from Daly City's operations, and emissions estimates are subject to change as better data and calculation methodologies become available in the future.

A.1.2 Organizational Boundaries

Setting an organizational boundary for greenhouse gas emissions accounting and reporting is an important first step in the inventory process. The organizational boundary for the inventory determines which aspects of operations are included in the emissions inventory, and which are not. Under LGOP, two control approaches are used for reporting emissions: operational control or financial control. A local government has operational control over an operation if it has full authority to introduce and implement its operating policies at the operation. A local government has financial control if the operation is fully consolidated in financial accounts. If a local government has joint control over an operation, the contractual agreement will have to be examined to see who has authority over operating policies and implementation, and thus the responsibility to report emissions under operational control.[18] Local governments must choose which approach is the most applicable and apply this approach consistently throughout the inventory.

While both control approaches are acceptable, there may be some instances in which the choice may determine whether a source falls inside or outside of a local government's boundary. LGOP strongly encourages local governments to utilize operational control as the organization boundary for a government operations emissions inventory. Operational control is believed to most accurately represent the emissions sources that local governments can most directly influence, and this boundary is consistent with other environmental and air quality reporting program requirements. For this reason, all inventories in the Silicon Valley Climate Protection Partnership are being conducted according to the operational control framework.

[18] Please see Local Government Operations Protocol for more detail on defining your organizational boundary: http://www.icleiusa.org/programs/climate/ghg-protocol

A.1.3 Types of Emissions

The greenhouse gases inventoried in this report are described in Section 2.1 As described in LGOP, emissions from each of the greenhouse gases can come in a number of forms:

Stationary or mobile combustion: These are emissions resulting from on-site combustion of fuels (natural gas, diesel, gasoline, etc.) to generate heat, electricity, or to power vehicles and mobile equipment.

Purchased electricity: These are emissions produced by the generation of power from utilities outside of the jurisdiction.

Fugitive emissions: Emissions that result from the unintentional release of greenhouse gases into the atmosphere (e.g., leaked refrigerants, methane from waste decomposition, etc.).

Process emissions: Emissions from physical or chemical processing of a material (e.g., wastewater treatment).

A1.4 Quantifying Emissions

Emissions can be quantified two ways:

Measurement-based methodologies refer to the direct measurement of greenhouse gas emissions (from a monitoring system) emitted from a flue of a power plant, wastewater treatment plant, landfill, or industrial facility. This methodology is not generally available for most types of emissions and will only apply to a few local governments that have these monitoring systems.

The majority of the emissions recorded in the inventory can be and will be estimated using **calculation-based methodologies** to calculate their emissions using activity data and emission factors. To calculate emissions, the equation below is used:

Activity Data x Emission Factor = Emissions

Activity data refer to the relevant measurement of energy use or other greenhouse gas–generating processes such as fuel consumption by fuel type, metered annual energy consumption, and annual vehicle mileage by vehicle type. Emissions factors are calculated ratios relating emissions to a proxy measure of activity at an emissions source (e.g., CO_2 generated/kWh consumed). For a list of common emissions calculations see Table 2.2.

The guidelines in LGOP are meant to provide a common method for local governments to quantify and report greenhouse gas emissions by using comparable activity data and emissions factors. However, LGOP recognizes that local governments differ in how they collect data concerning their operations and that many are not able to meet the data needs of a given estimation method. Therefore, LGOP outlines both “recommended” and “alternative” methods

to estimate emissions from a given source. In this system, recommended methods are the preferred method for estimating emissions, as they will result in the most accurate estimate for a given emission source. Alternative methods often require less intensive data collection, but are likely to be less accurate. This approach allows local governments to estimate emissions based on the data currently available to them. It also allows local governments that are unable to meet the recommended methods to begin developing internal systems to collect the data needed to meet these methods.

This inventory has used the recommended activity data and emissions factors wherever possible, using alternative methods where necessary. For details on the methodologies used for each sector, see Appendix B.

A.1.5 Reporting Emissions

A.1.5.1 Significance Thresholds

Within any local government's own operations there will be emission sources that fall within Scope 1 and Scope 2 that are minimal in magnitude and difficult to accurately measure. Within the context of local government operations, emissions from leaked refrigerants, backup generators and septic tanks may be common sources of these types of emissions. For these small, difficult to quantify emission sources, LGOP specifies that up to 5 percent of total emissions can be reported using estimation methods not outlined in LGOP.[19]

In this report, the following emissions fell under the significance threshold and were reported using best available methods:

- Scope 1 fugitive emissions from leaked refrigerants from HV/AC and refrigeration equipment
- Scope 1 CH_4 and N_2O emissions from vehicle fleet

A.1.5.2 Units Used in Reporting Emissions

LGOP requires reporting of individual gas emissions, and this reporting is included in Appendix B. In this narrative report, emissions from all gases released by an emissions source (e.g., stationary combustion of natural gas in facilities) are combined and reported in metric tons of carbon dioxide equivalent (CO_2e). This standard is based on the global warming potential (GWP) of each gas, which is a measure of the amount of warming a greenhouse gas may cause, measured against the amount of warming caused by carbon dioxide. For the GWPs of reported greenhouse gases, see Table 2.1.

19 In the context of registering emissions with an independent registry (such as the California Climate Action Registry), emissions that fall under the significance threshold are called *de minimis*. This term, however, is not used in LGOP and was not used in this inventory.

A.1.5.3 Information Items

Information items are emissions sources that, for a variety of reasons, are not included as Scope 1, 2, or 3 emissions in the inventory. In order to provide a more complete picture of emissions from Daly City's operations, however, these emissions should be quantified and reported.

In this report, the following emissions are included as information items (emission quantities are reported in Appendix B):

- Scope 1 CO_2 emissions from flared methane from biogas emitted during wastewater treatment
- Ozone depleting chemical used as refrigerants (R-22)

A common emission type that is categorized as an information item is carbon dioxide caused by the combustion of biogenic fuels. Local governments will often burn fuels that are of biogenic origin (wood, landfill gas, organic solid waste, biofuels, etc.) to generate power. Common sources of biogenic emissions are the combustion of landfill gas from landfills or biogas from wastewater treatment plants, as well as the incineration of organic municipal solid waste at incinerators.

Carbon dioxide emissions from the combustion of biogenic fuels are not included in Scope 1 based on established international principles. **20** These principles indicate that biogenic fuels (e.g., wood, biodiesel), if left to decompose in the natural environment, would release CO_2 into the atmosphere, where it would then enter back into the natural carbon cycle. Therefore, when wood or another biogenic fuel is combusted, the resulting CO_2 emissions are akin to natural emissions and should therefore not be considered as human activity-generated emissions. The CH_4 and N_2O emissions, however, would not have occurred naturally and are therefore included as Scope 1 emissions.

A.2 Baseline Years

Part of the local government operations emissions inventory process requires selecting a "performance datum" with which to compare current emissions, or a base year. Local governments should examine the range of data they have over time and select a year that has the most accurate and complete data for all key emission sources. It is also preferable to establish a base year several years in the past to be able to account for the emissions benefits of recent actions. A local government's emissions inventory should comprise all greenhouse gas emissions occurring during a selected *calendar* year.

20 Methane and nitrous oxide emissions from biogenic fuels are considered Scope 1 stationary combustion emissions and are included in the stationary combustion sections for the appropriate facilities.

For the Silicon Valley Climate Protection Partnership inventories, 2005 was chosen as the baseline year, since this year is increasingly becoming the standard for such inventories; the 1990 baseline year for California is usually difficult for most local governments to meet and would not produce the most accurate inventory.

After setting a base year and conducting an emissions inventory for that year, local governments should make it a practice to complete a comprehensive emissions inventory on a regular basis to compare to the baseline year. ICLEI recommends conducting an emissions inventory at least every five years.

Appendix B:
LGOP Standard Report

1. Local Government Profile

Jurisdiction Name:	City of Daly City
Street Address:	333 90th Street
City, State, ZIP, Country:	Daly City, CA 94109-San Mateo
Website Address:	www.dalycity.org
Size (sq. miles):	7.6
Population:	103,621 (2000)
Annual Budget:	153,300,000
Employees (Full Time Equivalent):	534 (2005)
Climate Zone:	3 (CA)
Annual Heating Degree Days:	3042
Annual Cooling Degree Days:	108
Lead Inventory Contact Name:	Kerry Burns
Title:	Assistant City Manager
Department:	City Manager
Email:	kburns@dalycity.org
Phone Number:	650.991.8552

Services Provided:

☑ Water treatment	☑ Mass transit (buses)	☑ Hospitals	☐ Natural gas utility
☑ Water distribution	☐ Mass transit (light rail)	☐ Airport	☐ Other (Specify below)
☑ Wastewater treatment	☐ Mass transit (ferries)	☐ Seaport/shipping terminal	
☑ Wastewater collection	☑ Schools (primary/secondary)	☐ Marina	
☐ Electric utility	☑ Schools (colleges/universities)	☐ Stadiums/sports venues	
☑ Fire Protection	☑ Solid waste collection	☐ Convention center	
☑ Police	☑ Solid waste disposal	☑ Street lighting and traffic signals	

Local Government Description:

Known as the "Gateway to the Peninsula", Daly City is located at the northernmost edge of San Mateo County adjacent to San Francisco and extends from the Pacific Ocean on the west to nearly San Francisco Bay on the east. Daly City, central to two of the Bay Area's major job growth zones of San Francisco and San Mateo counties, has become a regional hub for retail, healthcare and small business. Because of its central location, diversified economy, excellent transportation links, and a growing young and productive labor force, Daly City's future for economic growth is bright.

2. GHG Inventory Details

Reporting Year:	2005
Protocol Used:	Local Government Operations Protocol, Version 1.0 (September 2008)
Control Approach:	Operational Control

GHG Emissions Summary (All Units in Metric Tons Unless Stated Otherwise)

Note: CO_2e totals listed here are summed totals of the estimated emissions of each inventoried gas based upon their global warming potentials (Appendix E of LGOP)

BUILDINGS & OTHER FACILITIES

SCOPE 1

	CO_2e	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6
Stationary Combustion	635.182	633.432	0.062	0.001			
Fugitive Emissions	8.573				0.005		
Total Direct Emissions from Buildings & Facilities	643.755	633.432	0.062	0.001	0.005	0.000	0.000

SCOPE 2

	CO_2e	CO_2	CH_4	N_2O
Purchased Electricity	679.034	673.501	0.040	0.015
Purchased Steam				
District Heating & Cooling				
Total Indirect Emissions from Buildings & Facilities	679.034	673.501	0.040	0.015

STREETLIGHTS AND TRAFFIC SIGNALS

SCOPE 2

	CO_2e	CO_2	CH_4	N_2O
Purchased Electricity	569.852	565.208	0.034	0.013
Total Indirect Emissions from Streetlights and Traffic Signals	569.852	565.208	0.034	0.013

WATER DELIVERY FACILITIES

SCOPE 1

	CO_2e	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6
Stationary Combustion	15.597	15.557	0.001	0.000			
Total Direct Emissions from Water Delivery Facilities	15.597	15.557	0.001	0.000	0.000	0.000	0.000

SCOPE 2

	CO_2e	CO_2	CH_4	N_2O
Purchased Electricity	1,210.119	1,200.258	0.071	0.027
Purchased Steam				
District Heating & Cooling				
Total Indirect Emissions from Water Delivery Facilities	1,210.119	1,200.258	0.071	0.027

WASTEWATER FACILITIES

SCOPE 1

	CO_2e	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6
Stationary Combustion	166.746	54.335	5.347	0.000			
Fugitive Emissions							
Process Emissions	2,842.700	0.000	0.000	9.170			
Total Direct Emissions from Wastewater Facilities	3,009.446	54.335	5.347	9.170	0.000	0.000	0.000

SCOPE 2

	CO_2e	CO_2	CH_4	N_2O
Purchased Electricity	1,900.991	1,885.499	0.112	0.042
Purchased Steam				
District Heating & Cooling				
Total Indirect Emissions from Wastewater Facilities	1,900.991	1,885.499	0.112	0.042

SOLID WASTE FACILITIES

SCOPE 1

	CO_2e	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6
Stationary Combustion							
Fugitive Emissions	68,040.000	0.000	3,240.000	0.000			
Total Direct Emissions from Solid Waste Facilities	68,040.000	0.000	3,240.000	0.000	0.000	0.000	0.000

VEHICLE FLEET

SCOPE 1

	CO_2e	CO_2	CH_4	N_2O	HFCs	PFCs
Mobile Combustion	1,641.165	1,614.251	0.101	0.080		
Fugitive Emissions	37.440				0.029	
Total Direct Emissions from Vehicle Fleet	1,678.605	1,614.251	0.101	0.080	0.029	0.000

INDICATORS

Number of Vehicles	200
Vehicle Miles Traveled	
Number of Pieces of Equipment	100
Equipment Operating Hours	

WASTE GENERATION

SCOPE 3

	CO_2e	CO_2	CH_4	N_2O
Waste All Facilities	543.512	0.000	25.882	0.000

INDICATORS

Short tons of solid waste accepted for disposal	2,143.000

EMPLOYEE COMMUTE

SCOPE 3

	CO_2e	CO_2	CH_4	N_2O
Mobile Combustion	2,239.331	2,188.074	0.137	0.156

INFORMATION ITEMS

	CO_2e
Refrigerant R-22	23.011
Flared Methane	818.698
Total Information Items	841.709

Total Emissions

	CO_2e	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6
SCOPE 1	73,387.403	2,317.575	3,245.511	9.252	0.034	0.000	0.000
SCOPE 2	4,359.996	4,324.466	0.256	0.097	0.000	0.000	0.000
SCOPE 3	2,782.843	2,188.074	26.018	0.156			
INFORMATION ITEMS	841.709						

POSSIBLE SOURCES OF OPTIONAL SCOPE 3 EMISSIONS

- Employee Commute
- Employee Business Travel
- Emissions From Contracted Services
- Upstream Production of Materials and Fuels
- Upstream and Downstream Transportation of Materials and Fuels
- Waste Related Scope 3 Emissions
- Purchase of Electricity Sold to an End User
- Transmission and Distribution Losses from Consumed Electricity
- Other Scope 3

POSSIBLE INFORMATION ITEMS

- Biogenic $C0_2$ from Combustion
- Carbon Offsets Purchased
- Carbon Offsets Sold
- Renewable Energy Credits (Green Power) Purchased
- Renewable Energy Credits Sold (GreenPower)
- Ozone-depleting Refrigerants/Fire Suppressants not in LGOP
- Other Information Items

3. Activity Data Disclosure

Every emission source must be accompanied by a reference for the activity data. This worksheet is meant to assist in recording activity data and the methods used to gather those data for government operations. Activity data represent the magnitude of human activity resulting in emissions; data on energy use, fuel consumtion, vehicle miles traveled, and waste generation are all examples of activity data that are used to compute GHGs. Detailed disclosure should be made of the activity data used and at what quantities. This disclosure should also cite the source(s) of the data and the methodology used, including whether that methodology is a recommended method or an alternate method.

Deviations from the primary methodology should be explained in detail. All assumptions and estimations should be cited as such. Local governments may also use this space in the reporting format to discuss the rationale for the inclusion or exclusion of optional inventory components. It is good practice to include appropriate citations (such as website URL, report title, etc) and all contact information that is necessary to verify the source and accuracy of the activity data.

BUILDINGS & OTHER FACILITIES (Chapter 6)

SCOPE 1

Stationary Combustion

Emissions Source Name	GHG	Methodology Type	Methodology Name and Description	Resource Quantity	Fuel Unit	Data Sources and References
Natural Gas	CO_2e					
	CO_2	Primary	Known fuel use	111,782	therms	PG&E
	CH_4	Primary	Known fuel use	111,782	therms	PG&E
	N_2O	Primary	Known fuel use	111,782	therms	PG&E
	HFCs					
	PFCs					
	SF_6					
Diesel Generators	CO_2e					
	CO_2	Primary	Estimated run time and fuel efficiency	3,740	gallons	Jesse Myott, Intern, Daly City 650-991-8054
	CH_4	Primary	Estimated run time and fuel efficiency	3,740	gallons	Jesse Myott, Intern, Daly City 650-991-8054
	N_2O	Primary	Estimated run time and fuel efficiency	3,740	gallons	Jesse Myott, Intern, Daly City 650-991-8054
	HFCs					
	PFCs					
	SF_6					
Gasoline Generators	CO_2e					
	CO_2	Primary	Estimated run time and fuel efficiency	270	gallons	Jesse Myott, Intern, Daly City 650-991-8054
	CH_4	Primary	Estimated run time and fuel efficiency	270	gallons	Jesse Myott, Intern, Daly City 650-991-8054
	N_2O	Primary	Estimated run time and fuel efficiency	270	gallons	Jesse Myott, Intern, Daly City 650-991-8054
	HFCs					
	PFCs					
	SF_6					

Fugitive Emissions

Emissions Source Name	GHG	Methodology Type	Methodology Name and Description	Resource Quantity	Fuel Unit	Data Sources and References
Refrigerants	R410-A	Alternate	Estimating based upon equipment inventory and use	5	kg	Jesse Myott, Intern, Daly City 650-991-8054

SCOPE 2

Purchased Electricity

Emissions Source Name	GHG	Methodology Type	Methodology Name and Description	Resource Quantity	Fuel Unit	Data Sources and References
Electricity	CO_2e					
	CO_2	Primary	Known Electricity Use	3,035,438	kWh	PG&E
	CH_4	Primary	Known Electricity Use	3,035,438	kWh	PG&E
	N_2O	Primary	Known Electricity Use	3,035,438	kWh	PG&E
	HFCs					
	PFCs					
	SF_6					

STREETLIGHTS AND TRAFFIC SIGNALS (Chapter 6.2)

SCOPE 2

Purchased Electricity

Emissions Source Name	GHG	Methodology Type	Methodology Name and Description	Resource Quantity	Fuel Unit	Data Sources and References
Electricity	CO_2e					
	CO_2	Primary	Known Electricity Use	2,547,369	kWh	PG&E
	CH_4	Primary	Known Electricity Use	2,547,369	kWh	PG&E
	N_2O	Primary	Known Electricity Use	2,547,369	kWh	PG&E
	HFCs					
	PFCs					
	SF_6					

WATER DELIVERY FACILITIES (Chapter 6)

SCOPE 1

Stationary Combustion

Emissions Source Name	GHG	Methodology Type	Methodology Name and Description	Resource Quantity	Fuel Unit	Data Sources and References
Natural Gas	CO_2e					
	CO_2	Primary	Known Fuel Use	2,932	therms	PG&E
	CH_4	Primary	Known Fuel Use	2,932	therms	PG&E
	N_2O	Primary	Known Fuel Use	2,932	therms	PG&E
	HFCs					
	PFCs					
	SF_6					

SCOPE 2

Purchased Electricity

Emissions Source Name	GHG	Methodology Type	Methodology Name and Description	Resource Quantity	Fuel Unit	Data Sources and References
Electricity	CO_2e					
	CO_2	Primary	Known Electricity Use	5,409,509	kWh	PG&E
	CH_4	Primary	Known Electricity Use	5,409,509	kWh	PG&E
	N_2O	Primary	Known Electricity Use	5,409,509	kWh	PG&E
	HFCs					
	PFCs					
	SF_6					

WASTEWATER FACILITIES (Chapters 6 and 10)

SCOPE 1

Stationary Combustion

Emissions Source Name	GHG	Methodology Type	Methodology Name and Description	Resource Quantity	Fuel Unit	Data Sources and References
Natural Gas	CO_2e					
	CO_2	Primary	Known Fuel Use	2,333	therms	PG&E
	CH_4	Primary	Known Fuel Use	2,333	therms	PG&E
	N_2O	Primary	Known Fuel Use	2,333	therms	PG&E
	HFCs					
	PFCs					
	SF_6					
Diesel Generators	CO_2e					
	CO_2	Primary	Known fuel use	4,136	gallons	Tim Nevin, Water and Wastewater, Senior Management Analyst, 650.991.8205, tnevin@dalycity.org
	CH_4	Primary	Known fuel use	4,136	gallons	Tim Nevin, Water and Wastewater, Senior Management Analyst, 650.991.8205, tnevin@dalycity.org
	N_2O	Primary	Known fuel use	4,136	gallons	Tim Nevin, Water and Wastewater, Senior Management Analyst, 650.991.8205, tnevin@dalycity.org
	HFCs					
	PFCs					
	SF_6					
Incomplete Combustion of Digester Gas at a Centralized Wastewater Treatment Plant	CH_4	Alternate	Population Served	120,000	people	Tim Nevin, Water and Wastewater, Senior Management Analyst, 650.991.8205, tnevin@dalycity.org

Process Emissions

Emissions Source Name	GHG	Methodology Type	Methodology Name and Description	Resource Quantity	Fuel Unit	Data Sources and References
Centralized Wastewater Treatment Plant	N_2O	Alternate	Population Served	120,000	people	Tim Nevin, Water and Wastewater, Senior Management Analyst, 650.991.8205, tnevin@dalycity.org
Effluent Discharge to Aquatic Environments	N_2O	Alternate	Population Served	120,000	people	Tim Nevin, Water and Wastewater, Senior Management Analyst, 650.991.8205, tnevin@dalycity.org

SCOPE 2

Purchased Electricity

Emissions Source Name	GHG	Methodology Type	Methodology Name and Description	Resource Quantity	Fuel Unit	Data Sources and References
Electricity	CO_2e					
	CO_2	Primary	Known Electricity Use	8,497,862	kWh	PG&E
	CH_4	Primary	Known Electricity Use	8,497,862	kWh	PG&E
	N_2O	Primary	Known Electricity Use	8,497,862	kWh	PG&E
	HFCs					
	PFCs					
	SF_6					

SOLID WASTE FACILITIES (Chapters 6 and 9)

SCOPE 1

Fugitive Emissions

Emissions Source Name	GHG	Methodology Type	Methodology Name and Description	Resource Quantity	Fuel Unit	Data Sources and References
Waste In Place	CH_4	Primary	No LFG Collection System (see LGOP and FOD model)	1,000,000	bank cubic yards	Jesse Myott, Intern, Daly City 650-991-8054

VEHICLE FLEET (Chapter 7)

SCOPE 1

Mobile Combustion

Emissions Source Name	GHG	Methodology Type	Methodology Name and Description	Resource Quantity	Fuel Unit	Data Sources and References
Gasoline	CO_2e					
	CO_2	Primary	Known Fuel Use	148,709	gallons	Jesse Myott, Intern, Daly City 650-991-8054
	CH_4	Alternate	Fuel use by fuel type	148,709	gallons	Jesse Myott, Intern, Daly City 650-991-8054
	N_2O	Alternate	Fuel use by fuel type	148,709	gallons	Jesse Myott, Intern, Daly City 650-991-8054
	HFCs					
	PFCs					
	SF_6					
Diesel	CO_2e					
	CO_2	Primary	Known Fuel Use	30,053	gallons	Jesse Myott, Intern, Daly City 650-991-8054
	CH_4	Alternate	Fuel use by fuel type	30,053	gallons	Jesse Myott, Intern, Daly City 650-991-8054
	N_2O	Alternate	Fuel use by fuel type	30,053	gallons	Jesse Myott, Intern, Daly City 650-991-8054
	HFCs					
	PFCs					
	SF_6					

Fugitive Emissions

Emissions Source Name	GHG	Methodology Type	Methodology Name and Description	Resource Quantity	Fuel Unit	Data Sources and References
Refrigerants	R134-A	Alternate	Estimating based upon equipment inventory and use	29	kg	Jesse Myott, Intern, Daly City 650-991-8054

WASTE GENERATION (Scope 3)

SCOPE 3

Emissions Source Name	GHG	Methodology Type	Methodology Name and Description	Resource Quantity	Fuel Unit	Data Sources and References
Generated Waste	CH_4	Alternate	Estimated waste weight based upon volume and number of containers	2,143	tons	Anthony Boccaleoni, General Manager, Allied Waste, 650-756-1603

EMPLOYEE COMMUTE (Scope 3)

SCOPE 3

Stationary Combustion

Emissions Source Name	GHG	Methodology Type	Methodology Name and Description	Resource Quantity	Fuel Unit	Data Sources and References
Gasoline	CO_2e					
	CO_2	Alternate	Proxy Year Estimated Fuel Use-based upon daily vehicle miles traveled for all repspondents extrapolated to represent all local government employees	245,629	gallons	Online and paper surveys of all employees; see Appendix C of Narrative report for examples; Data in posession of Jesse Myott, Intern, Daly City 650 991-8054
	CH_4	Alternate	Proxy Year Estimated Fuel Use-based upon daily vehicle miles traveled for all repspondents extrapolated to represent all local government employees	245,629	gallons	Online and paper surveys of all employees; see Appendix C of Narrative report for examples; Data in posession of Jesse Myott, Intern, Daly City 650 991-8054
	N_2O	Alternate	Proxy Year Estimated Fuel Use-based upon daily vehicle miles traveled for all repspondents extrapolated to represent all local government employees	245,629	gallons	Online and paper surveys of all employees; see Appendix C of Narrative report for examples; Data in posession of Jesse Myott, Intern, Daly City 650 991-8054
	HFCs					
	PFCs					
	SF_6					
Diesel	CO_2e					
	CO_2	Alternate	Proxy Year Estimated Fuel Use-based upon daily vehicle miles traveled for all repspondents extrapolated to represent all local government employees	2,494	gallons	Online and paper surveys of all employees; see Appendix C of Narrative report for examples; Data in posession of Jesse Myott, Intern, Daly City 650 991-8054
	CH_4	Alternate	Proxy Year Estimated Fuel Use-based upon daily vehicle miles traveled for all repspondents extrapolated to represent all local government employees	2,494	gallons	Online and paper surveys of all employees; see Appendix C of Narrative report for examples; Data in posession of Jesse Myott, Intern, Daly City 650 991-8054
	N_2O	Alternate	Proxy Year Estimated Fuel Use-based upon daily vehicle miles traveled for all repspondents extrapolated to represent all local government employees	2,494	gallons	Online and paper surveys of all employees; see Appendix C of Narrative report for examples; Data in posession of Jesse Myott, Intern, Daly City 650 991-8054
	HFCs					
	PFCs					
	SF_6					

INFORMATION ITEMS

Stationary Combustion

Emissions Source Name	GHG	Methodology Type	Methodology Name and Description	Resource Quantity	Fuel Unit	Data Sources and References
Ozone Depleting Refrigerants	R-22	Alternate	Estimating based upon equipment inventory and use	14	kg	Jesse Myott, Intern, Daly City 650-991-8054
Biogenic CO_2 from combustion	CO_2e					
	CO_2	Primary	Known Flared Biogas	31,248,000	scf	Tim Nevin, Water and Wastewater, Senior Management Analyst, 650.991.8205, tnevin@dalycity.org
	CH_4					
	N_2O					
	HFCs					
	PFCs					
	SF_6					

POSSIBLE SOURCES OF OPTIONAL SCOPE 3 EMISSIONS

Employee Commute
Employee Business Travel
Emissions From Contracted Services
Upstream Production of Materials and Fuels
Upstream and Downstream Transportation of Materials and Fuels
Waste Related Scope 3 Emissions
Purchase of Electricity Sold to an End User
Transmission and Distribution Losses from Consumed Electricity
Other Scope 3

POSSIBLE INFORMATION ITEMS

Biogenic $C0_2$ from Combustion
Carbon Offsets Purchased
Carbon Offsets Sold
Renewable Energy Credits (Green Power) Purchased
Renewable Energy Credits Sold (GreenPower)
Ozone-depleting Refrigerants/Fire Suppressants not in LGOP
Other Information Items

4. Calculation Methodology Disclosure

In addition to activity data, every emission source must be accompanied by the emission factor used, a reference for each emission factor, and the calculation

BUILDINGS & OTHER FACILITIES (Chapter 6)

SCOPE 1

Stationary Combustion

Emissions Source Name	GHG	Default/Alternate	Emission Factor	Emission Factor Sources and References
Natural Gas	CO_2e			
	CO_2	Default	53.06 kg/MMBtu	LGOP v1 Table G.1
	CH_4	Default	5 g/MMBtu	LGOP v1 Table G.3
	N_2O	Default	0.1 g/MMBtu	LGOP v1 Table G.3
	HFCs			
	PFCs			
	SF_6			
Generators-Diesel	CO_2e			
	CO_2	Default	73.15 kg/MMBtu	LGOP v1 Table G.1
	CH_4	Default	11 g/MMBtu	LGOP v1 Table G.3
	N_2O	Default	.6 g/MMBtu	LGOP v1 Table G.3
	HFCs			
	PFCs			
	SF_6			
Generators-Gasoline	CO_2e			
	CO_2	Default	70.88 kg/MMBtu	LGOP v1 Table G.1
	CH_4	Default	11 g/MMBtu	LGOP v1 Table G.3
	N_2O	Default	.6 g/MMBtu	LGOP v1 Table G.3
	HFCs			
	PFCs			
	SF_6			

Fugitive Emissions

Emissions Source Name	GHG	Default/Alternate	Emission Factor	Emission Factor Sources and References
Refrigerants	R410-A	none	GWP-1,725	LGOP v1 Table E.1&E.2

SCOPE 2

Purchased Electricity

Emissions Source Name	GHG	Default/Alternate	Emission Factor	Emission Factor Sources and References
Electricity	CO_2e			
	CO_2	Default	489.2 lbs/MWh	PG&E (2005); LGOP v1 Table G.5
	CH_4	Default	0.029 lbs/MWh	CA Grid Average (2004 proxy); LGOP v1 Table G.6
	N_2O	Default	0.011 lbs/MWh	CA Grid Average (2004 proxy); LGOP v1 Table G.6
	HFCs			
	PFCs			
	SF_6			

STREETLIGHTS AND TRAFFIC SIGNALS (Chapter 6.2)

SCOPE 2

Purchased Electricity

Emissions Source Name	GHG	Default/Alternate	Emission Factor	Emission Factor Sources and References
Electricity	CO_2e			
	CO_2	Default	489.2 lbs/MWh	PG&E (2005); LGOP v1 Table G.5
	CH_4	Default	0.029 lbs/MWh	CA Grid Average (2004 proxy); LGOP v1 Table G.6
	N_2O	Default	0.011 lbs/MWh	CA Grid Average (2004 proxy); LGOP v1 Table G.6
	HFCs			
	PFCs			
	SF_6			

WATER DELIVERY FACILITIES (Chapter 6)

SCOPE 1

Stationary Combustion

Emissions Source Name	GHG	Default/Alternate	Emission Factor	Emission Factor Sources and References
Natural Gas	CO_2e			
	CO_2	Default	53.06 kg/MMBtu	LGOP v1 Table G.1
	CH_4	Default	5 g/MMBtu	LGOP v1 Table G.3
	N_2O	Default	0.1 g/MMBtu	LGOP v1 Table G.3
	HFCs			
	PFCs			
	SF_6			

SCOPE 2

Purchased Electricity

Emissions Source Name	GHG	Default/Alternate	Emission Factor	Emission Factor Sources and References
Electricity	CO_2e			
	CO_2	Default	489.2 lbs/MWh	PG&E (2005); LGOP v1 Table G.5
	CH_4	Default	0.029 lbs/MWh	CA Grid Average (2004 proxy); LGOP v1 Table G.6
	N_2O	Default	0.011 lbs/MWh	CA Grid Average (2004 proxy); LGOP v1 Table G.6
	HFCs			
	PFCs			
	SF_6			

WASTEWATER FACILITIES (Chapters 6 and 10)

SCOPE 1

Stationary Combustion

Emissions Source Name	GHG	Default/Alternate	Emission Factor	Emission Factor Sources and References
Natural Gas	CO_2e			
	CO_2	Default	53.06 kg/MMBtu	LGOP v1 Table G.1
	CH_4	Default	5 g/MMBtu	LGOP v1 Table G.3
	N_2O	Default	0.1 g/MMBtu	LGOP v1 Table G.3
	HFCs			
	PFCs			
	SF_6			
Generators-Diesel	CO_2e			
	CO_2	Default	73.15 kg/MMBtu	LGOP v1 Table G.1
	CH_4	Default	11 g/MMBtu	LGOP v1 Table G.3
	N_2O	Default	.6 g/MMBtu	LGOP v1 Table G.3
	HFCs			
	PFCs			
	SF_6			
Incomplete Combustion of Digester Gas at a Centralized Wastewater Treatment Plant	CH_4	Alternate		LGOP v1 Equation 10.1; LGOP v1 Equation 10.2
	CH_4	Alternate		LGOP v1 Equation 10.1

Process Emissions

Emissions Source Name	GHG	Default/Alternate	Emission Factor	Emission Factor Sources and References
Centralized Wastewater Treatment Plant	N_2O	Alternate		LGOP v1 Equation 10.9; LGOP v1 Equation 10.10
Effluent Discharge to Aquatic Environments	N_2O	Alternate		LGOP v1 Equation 10.9; LGOP v1 Equation 10.10

SCOPE 2

Purchased Electricity

Emissions Source Name	GHG	Default/Alternate	Emission Factor	Emission Factor Sources and References
Electricity	CO_2e			
	CO_2	Default	489.2 lbs/MWh	PG&E (2005); LGOP v1 Table G.5
	CH_4	Default	0.029 lbs/MWh	CA Grid Average (2004 proxy); LGOP v1 Table G.6
	N_2O	Default	0.011 lbs/MWh	CA Grid Average (2004 proxy); LGOP v1 Table G.6
	HFCs			
	PFCs			
	SF_6			

SOLID WASTE FACILITIES (Chapters 6 and 9)

SCOPE 1

Fugitive Emissions

Emissions Source Name	GHG	Default/Alternate	Emission Factor	Emission Factor Sources and References
Waste in Place	CO_2e			
	CO_2			
	CH_4	Default	FOD model factors-see LGOP Section 9.3.1	Jesse Myott, Intern, Daly City 650-991-8054
	N_2O			
	HFCs			
	PFCs			
	SF_6			

VEHICLE FLEET (Chapter 7)

SCOPE 1

Mobile Combustion

Emissions Source Name	GHG	Default/Alternate	Emission Factor	Emission Factor Sources and References
Gasoline	CO_2e			
	CO_2	Default	8.81 kg/gallon	LGOP v1 Table G.9
	CH_4	Default	Varies by model year	LGOP v1 Table G.10; Table G.12 for other equipment
	N_2O	Default	Varies by model year	LGOP v1 Table G.10; Table G.12 for other equipment
	HFCs			
	PFCs			
	SF_6			
Diesel	CO_2e			
	CO_2	Default	10.15 kg/gallon	LGOP v1 Table G.9
	CH_4	Default	Varies by model year	LGOP v1 Table G.10; Table G.12 for other equipment
	N_2O	Default	Varies by model year	LGOP v1 Table G.10; Table G.12 for other equipment
	HFCs			
	PFCs			
	SF_6			

Fugitive Emissions

Emissions Source Name	GHG	Default/Alternate	Emission Factor	Emission Factor Sources and References
Refrigerants	R134-A	None	GWP-1,300	LGOP v1 Table E.1&E.2

WASTE GENERATION (Scope 3)

SCOPE 3

Emissions Source Name	GHG	Default/Alternate	Emission Factor	Emission Factor Sources and References
Generated Waste	CH_4	Alternate	Varies by waste type	EPA Waste Reduction Model http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.html; Public Administration waste charaterization provided by CIWMB

EMPLOYEE COMMUTE (Scope 3)

SCOPE 3

Stationary Combustion

Emissions Source Name	GHG	Default/Alternate	Emission Factor	Emission Factor Sources and References
Gasoline	CO_2e			
	CO_2	Default	8.81 kg/gallon	LGOP v1 Table G.9
	CH_4	Default	0.03451 g/mi (trucks)	LGOP v1 Table G.13
	N_2O	Default	0.04935 g/mi (trucks)	LGOP v1 Table G.13
	HFCs			
	PFCs			
	SF_6			
Diesel	CO_2e			
	CO_2	Default	10.15 kg/gallon	LGOP v1 Table G.9
	CH_4	Default	0.00098 g/mi (trucks)	LGOP v1 Table G.13
	N_2O	Default	0.00148 g/mi (trucks)	LGOP v1 Table G.13
	HFCs			
	PFCs			
	SF_6			

INFORMATION ITEMS

Stationary Combustion

Emissions Source Name	GHG	Default/Alternate	Emission Factor	Emission Factor Sources and References
Ozone Depleting Refrigerants	R-22	None	GWP-1,700	http://www.epa.gov/ozone/science/ods/classone.html
Biogenic CO2 from combustion	CO_2e			
	CO_2	Default	0.0262 kg/scf	LGOP v.1 Table G.2
	CH_4			
	N_2O			
	HFCs			
	PFCs			
	SF_6			

POSSIBLE SOURCES OF OPTIONAL SCOPE 3 EMISSIONS	POSSIBLE INFORMATION ITEMS
Employee Commute	Biogenic $C0_2$ from Combustion
Employee Business Travel	Carbon Offsets Purchased
Emissions From Contracted Services	Carbon Offsets Sold
Upstream Production of Materials and Fuels	Renewable Energy Credits (Green Power) Purchased
Upstream and Downstream Transportation of Materials and Fuels	Renewable Energy Credits Sold (GreenPower)
Waste Related Scope 3 Emissions	Ozone-depleting Refrigerants/Fire Suppressants not in LGOP
Purchase of Electricity Sold to an End User	Other Information Items
Transmission and Distribution Losses from Consumed Electricity	
Other Scope 3	

Appendix C: Employee Commute

Emissions from employee commutes make up an important optional source of emissions from any local government's operations. The scale of emissions from employee commutes is often large in comparison with many other facets of local government operations, and local governments can affect how their employees get to and from work through a variety of incentives. For this reason, ICLEI recommends estimating emissions from employee commutes as part of a complete government operations greenhouse gas emissions inventory.

To assist in the data collection process, ICLEI provided the jurisdictions with both an online and a paper copy of an employee commute survey.[21] The questions in the survey were aimed at finding three categories of information:

- **Activity data** to calculate emissions from employee commute (vehicles miles traveled, vehicle type, vehicle model year) both current and in 2005.
- **Indicator data** to help Daly City understand how much time and money employees spend as they commute, as well as how many employees use alternative modes of transportation to get to work.
- **Policy data** that will serve as guidance for Daly City as it adopts policies aimed at reducing emissions from employee commutes. These questions asked employees for their interest in alternative modes of transportation as well as what policies would be most effective in allowing them to switch modes of transportation away from driving alone.

This section provides the emissions estimation methodology and both surveys. Individual survey results are in the possession of Daly City staff.

C.1 Methodology Summary

The methodology for estimating the employee commute emissions portion of the inventory is similar to the mobile emissions methodology outlined in the mobile emissions section of Appendix B. Daly City administered the employee commute survey to 811 current employees working for the City, and 161 employees responded to the survey (a response rate of 20 percent). The survey was administered in 2008 and current data was used as a proxy for 2005 data. Both full time and part-time employee data were included.

[21] The paper survey was administered only to employees that do not have access to a computer. The survey asked slightly different questions but was aimed at garnering the same emissions and policy-relevant data as the electronic survey.

To calculate emissions, the survey collected the following information:

- The number of days and number of miles employees drive alone to work (one-way) in an average week
- The number of days they carpooled and how often they drove the carpool in an average week
- The vehicle type of their vehicle and the type of fuel consumed

These weekly data were then converted into annual VMT estimates by the following equation:

Number of days driven to work/week x to-work commute distance x 2 x 48 weeks worked/year

Actual CO_2e emissions from respondents' vehicles were calculated by converting vehicle miles traveled per week by responding employees into annual fuel consumption by fuel type (gasoline, diesel). The VMT data collected were converted to fuel consumption estimates using fuel economy of each vehicle type.[22]

ICLEI then extrapolated estimated fuel consumption to represent all 811 of Daly City's employees in 2005. This was a simple extrapolation, multiplying the estimated fuel consumption number by the appropriate factor to represent all current employees. For example, if 33.3 percent of employees responded, fuel consumption numbers were tripled to estimate fuel consumption for all employees. This is not a statistical analysis and no uncertainty has been calculated as there is uncertainty not only at the extrapolation point but also in the calculation of actual emissions. Therefore, the resulting calculated emissions should be seen as directional and not as statistically valid.

22 Fuel efficiency estimates from www.fueleconomy.gov, EPA *Green Fleets Guide* and other national sources.

Appendix D: Government-Generated Solid Waste Methodology

Emissions from the waste sector are an estimate of methane generation that will result from the anaerobic decomposition of all organic waste sent to landfill in the base year. It is important to note that although these emissions are attributed to the inventory year in which the waste is generated, the emissions themselves will occur over the 100+ year timeframe that the waste will decompose. This frontloading of emissions is the approach taken by EPA's Waste Reduction Model (WARM). Attributing all future emissions to the year in which the waste was generated incorporates all emissions from actions taken during the inventory year into that year's greenhouse gas release. This facilitates comparisons of the impacts of actions taken between inventory years and between jurisdictions. It also simplifies the analysis of the impact of actions taken to reduce waste generation or divert it from landfills.

D.1 Estimating Waste Tonnages from Daly City's Operations

Like most local governments, Daly City does not directly track the amount of waste generated from its operations. Therefore, to estimate the amount of waste generated, ICLEI worked with Allied Waste, the hauler of waste for Daly City in 2005. The amount of waste was estimated by compiling pick-up accounts owned by Daly City. Garbage trucks do not weigh waste at each pick-up; therefore, it is not possible to directly track disposal figures in mass per facility. Mass of waste generation was estimated using volumetric container size (gallons, yards, etc.) data, along with pick-up frequency and average fill of containers. These data produced a comprehensive annual volumetric figure, which was then converted to mass using standard conversion factors supplied by the California Integrated Waste Management Board (CIWMB). Estimated waste *generation* was converted to final *disposal* (quantity sent to landfill) by applying average waste diversion percentages for each account. Where applicable, self-haul waste (waste brought directly from the local government to landfills) was included as part of this total.

D.2 Emissions Calculation Methods

As some types of waste (e.g., paper, plant debris, food scraps, etc.) generate methane within the anaerobic environment of a landfill and others do not (e.g., metal, glass, etc.), it is important to characterize the various

components of the waste stream. Waste characterization for government-generated solid waste was estimated using the CIWMB's 2004 statewide waste characterization study.[23]

Most landfills in the Bay Area capture methane emissions either for energy generation or for flaring. EPA estimates that 60 percent to 80 percent[24] of total methane emissions are recovered at the landfills to which Daly City sends its waste. Following the recommendation of LGOP, ICLEI adopted a 75 percent methane recovery factor.

Recycling and composting programs are reflected in the emissions calculations as reduced total tonnage of waste going to the landfills. The model, however, does not capture the associated emissions reductions in "upstream" energy use from recycling as part of the inventory.[25] This is in-line with the "end-user" or "tailpipe" approach taken throughout the development of this inventory. It is important to note that, recycling and composting programs can have a significant impact on greenhouse gas emissions when a full lifecycle approach is taken. Manufacturing products with recycled materials avoids emissions from the energy that would have been used during extraction, transporting and processing of virgin material.

D.2.1 Methane Commitment Method

CO_2e emissions from waste disposal were calculated using the methane commitment method outlined in the EPA WARM model. This model has the following general formula:

$CO_2e = W_t * (1-R)A$

Where:

W_t is the quantify of waste type "t"

R is the methane recovery factor,

A is the CO_2e emissions of methane per metric ton of waste at the disposal site (the methane factor) While the WARM model often calculates upstream emissions, as well as carbon sequestration in the landfill, these dimensions of the model were omitted for this particular study for two reasons:

This inventory functions on an end-use analysis, rather than a life-cycle analysis, which would calculate upstream emissions), and this inventory solely identifies emissions sources, and no potential sequestration "sinks."

23 CIWMB Waste Characterization Study-Public Administration Group available at http://www.ciwmb.ca.gov/WasteChar/BizGrpCp.asps.
24 AP 42, section 2.4 Municipal Solid Waste, 2.4-6,
25 "Upstream" emissions include emissions that may not occur in your Daly City resulting from manufacturing or harvesting virgin materials and transportation of them.

Appendix E: Conducting a Monitoring Inventory

The purpose of this appendix is to assist Daly City staff in conducting a monitoring inventory to measure progress against the baseline established in this inventory report. Conducting such an inventory represents milestone five of the Five Milestone process, and allows a local government to assess how well it is progressing toward achieving its emissions reduction targets.

This inventory was conducted by ICLEI in conjunction with Jesse Myott, Administrative Intern at Daly City, who served as the lead data gathering coordinator for the inventory. To facilitate a monitoring inventory, ICLEI has documented all of the raw data, data sources, and calculation methods used in this inventory. Future inventories should seek to replicate or improve upon the data and methods used in this inventory. Wherever possible, however, ICLEI strongly recommends institutionalizing internal data collection in order to be able to meet the recommended methods outlined in LGOP.

E.1 ICLEI Tools for Local Governments

ICLEI has created a number of tools for Daly City to use to assist in future monitoring inventories. These tools were designed specifically for the Silicon Valley Climate Protection Partnership, and comply with the methods outlined in LGOP. These tools are designed to work in conjunction with LGOP, which is, and will remain, the primary reference document for conducting an emissions inventory. These tools include:

- A "master data sheet" that contains most or all of the raw data (including emails), data sources, emissions calculations, data templates, notes on inclusions and exclusions, and reporting tools (charts and graphs and the excel version of LGOP reporting tool).
- A copy of all electronic raw data, such as finance records or Excel spreadsheets.
- LGOP reporting tool (included in the master data sheet and in Appendix B) that has all activity data, emissions factors, and methods used to calculate emissions for this inventory.
- Sector-specific instructions that discuss the types of emissions, emissions calculations methods, and data required to calculate emissions from each sector, as well as instructions for using the data collection tools and calculators in the master data sheet.

- The appendices in this report include detailed methodologies for calculating emissions from Scope 3 employee commute and government-generated solid waste, as well as two versions of the employee commute survey.

It is also important to note that all ICLEI members receive on-demand technical assistance from their ICLEI liaison, which local staff should feel free to contact at any point during this process.

E.2 Relationship to Other Silicon Valley Climate Protection Partnership Inventories

While the emissions inventories for the 27 participating local governments were conducted simultaneously using the same tools, a local government operations inventory is based on data specific to each local government's operations. For this reason, data must be collected internally within each local government, and the availability of data (and thus emissions estimation methods) will vary between local governments.

That said, local governments in the Silicon Valley Climate Protection Partnership may benefit by cooperating during the re-inventorying process. For example, by coordinating inventories, they may be able to hire a team of interns to collectively perform the inventories – saving money in the process. In addition, local staff may be able to learn from each other during the process or conduct group training sessions if necessary. As a whole, the Silicon Valley Climate Protection Partnership provides the basis for a continuing regional platform for climate actions, and ICLEI recommends taking advantage of this opportunity during all climate actions, including conducting future greenhouse gas emissions inventories.

E.3 Improving Emissions Estimates

One of the benefits of a local government operations inventory is that local government staff can identify areas in their current data collection systems where data collection can be improved. For example, a local government may not directly track fuel consumption by each vehicle and instead will rely upon estimates based upon VMT or purchased fuel to calculate emissions. This affects both the accuracy of the emissions estimate and may have other implications for government operations as a whole.

During the inventory process, ICLEI and local government staff identified the following gaps in data that, if resolved, would allow Daly City to meet the recommended methods outlined in LGOP in future inventories.

- Direct tracking of refrigerants recharged into HVAC and refrigeration equipment
- Direct tracking of fire suppressants recharged into fire suppression equipment
- Fuel consumption by individual vehicles
- Odometer readings of individual vehicles
- Fuel consumption by mobile equipment

- Refrigerants recharged into vehicles in the vehicle fleet
- Waste generated from government facilities

ICLEI encourages staff to review the areas of missing data and establish data collection systems for this data as part of normal operations. In this way, when staff are ready to re-inventory for a future year, they will have the proper data to make a more accurate emissions estimate.

E.4 Conducting the Inventory

ICLEI recommends the following approach for Silicon Valley Partnership local governments that wish to conduct a monitoring inventory:

Step 1: Identify a Climate Steward

This steward will be responsible for the City's climate actions as a whole and could serve as an ICLEI liaison in all future climate work. In the context of a monitoring inventory, the steward will be responsible for initiating discussions on a new inventory.

Step 2: Determine which Sectors to Inventory

There are many ways to determine which sectors apply to a local government's operations, but the easiest to review will be LGOP Standard Report, which is located both in Appendix B and in the master data sheet. This document clearly delineates which sectors will need to be inventoried within a local government's operations and which LGOP sectors do not apply to a jurisdiction.

Step 3: Gather Support: Identify Data Gathering Team and Leads

Coordination and acceptance among all participating departments is an important factor in coordinating a successful inventory. To that end, the inventory coordinator should work with the City administrator to identify all staff who will need to be part of the inventory. To facilitate this process, ICLEI has documented all people associated with the inventory in the master data sheet—these names are located in the final completed data form for each sector. Once this team has been identified, the inventory coordinator should hold a kickoff meeting with the administrator, all necessary staff, and relevant department heads which clearly communicates the priority of the inventory in relationship to competing demands. At this meeting, the roles of each person, including the inventory coordinator, should be established.

Step 4: Review Types of Emissions and Available Methodologies for Applicable Sectors

Local staff should then review LGOP and the instructions documents provided through this inventory to better understand the types of emissions for each sector (for example, within Mobile Emissions, CO_2 emissions and CH_4/N_2O emissions represent two different data requirements and emissions calculations methodologies). Each

emissions type may have more than one possible estimation methodology, and it is important that the inventory coordinator understands all possible methodologies and be able to communicate this to all parties assisting in the data gathering.

Step 5: Review Methodologies Used for the 2005 Inventory to Determine Data to Collect

In order to duplicate or improve upon the methods used in this inventory, local staff should again review the methods used for this inventory—these methods are again located in Appendix B—and within the master data sheet. These methods reflect the data limitations for each local government (as many local governments could not obtain data necessary to meet the recommended methods in LGOP). Wherever possible, these methods should be duplicated or, if it is possible, replaced with the recommended methods outlined in LGOP. Using these methodologies, staff will determine what data needs to be collected and communicate this effectively to the data gathering team.

Step 6: Begin Data Collection

With the exception of electricity and natural gas for stationary sources, all data collection will be internal. To obtain stationary source energy consumption data, staff will need to contact the ICLEI representative to determine who the contact is for PG&E data (other utilities will need to be contacted directly).

Step 7: Use the Data Forms as a Resource During Data Gathering

A number of questions will come up during the data gathering process that may be difficult to answer. ICLEI has attempted to capture all of the questions that arose during the 2005 inventory and how they were addressed through the master data sheet. Within the master data sheet, staff should review the raw data, working data, and completed data forms to review how raw data was converted to final data, and also to review any notes taken by ICLEI staff during the 2005 inventory process.

For example, reviewing the stationary sources PG&E data within the master data sheet will allow local staff to review how individual accounts were separated into each category and which counts may have been excluded from the inventory.

Step 8: Use Emissions Software to Calculate Emissions

ICLEI has provided the staff lead on the 2005 inventory with a backup of the software used to calculate many of the emissions included in this report. Staff should use this (or more current ICLEI software) to calculate emissions by inputting the activity data into the software. ICLEI staff and ICLEI trainings are available to assist local government staff in calculating emissions.

Step 9: Report Emissions

The master data sheet also contains the LGOP Standard Reporting Template, which is the template adopted by ARB as the official reporting template for government operations emissions inventory. This tool, as well as the charts and graphs tool provided by ICLEI can be used to report emissions from government operations. Also, local government staff should utilize this narrative report as guide for a narrative report if they so choose.

Step 10: Standardize and Compare to Base Year

Conducting a monitoring inventory is meant to serve as a measuring point against the baseline year represented in this report. In order to make a more accurate comparison, it is necessary to standardize emissions from stationary sources based upon heating and cooling degree days (staff can use a ratio of heating /cooling degree days to standardize across years).

In addition, it is important, when comparing emissions across years, to clearly understand where emissions levels may have changed due to a change in methodology or due to excluding an emissions source. For example, if the default method was used to estimate refrigerant leakage in 2005 (this method highly overestimates these emissions), and the recommended method was available in a monitoring year, this would appear as a dramatic reduction in these emissions even though actual leaked refrigerants may be similar to the base year. Changes such as these should not be seen as progress toward or away from an emissions reduction target, but emissions estimates should be adjusted to create as much of an apples-to-apples comparison as possible. If such an adjustment is not possible, staff should clearly note the change in methodology between years when comparing emissions.

Appendix D

County of San Mateo 2005 Community-Scale Greenhouse Gas Emissions Inventory for the City of Daly City

County of San Mateo 2005 Community-Scale Greenhouse Gas Emissions Inventory

1. City of Daly City Community-Scale Greenhouse Gas Emissions Inventory

1.1 Background

The County of San Mateo RecycleWorks and City and County Association of Governments (C/CAG) have been working to support all the cities in San Mateo County through the process of completing both their government operations and community-scale greenhouse gas emission inventories. This community-scale inventory has been completed on behalf of the City of Daly City through CO_2 San Mateo County, a program funded in part by the Bay Area Air Quality Management District (BAAQMD).

In 2009, C/CAG contracted with ICLEI, Local Governments for Sustainability (ICLEI) to support this effort through trainings and technical support. ICLEI had previously been involved in the county, hosting two community-scale inventory trainings in 2007 and 2008 for San Mateo and Santa Clara County local governments. ICLEI has also supported a number of local governments in the county in performing community and government operations inventories. This inventory culminates all of that work and creates a standard emissions inventory for all local governments in the county.

Using the results of this community inventory, each of the San Mateo County local governments may now use these inventory results to move forward into the target setting and climate action planning milestones of ICLEI's Five-Milestone process (see Section 1.2).

1.2 Purpose of Inventory

The objective of this greenhouse gas emissions inventory is to identify the sources and quantify the volumes of greenhouse gas emissions resulting from activities taking place throughout the community of City of Daly City in 2005. This inventory serves two purposes:

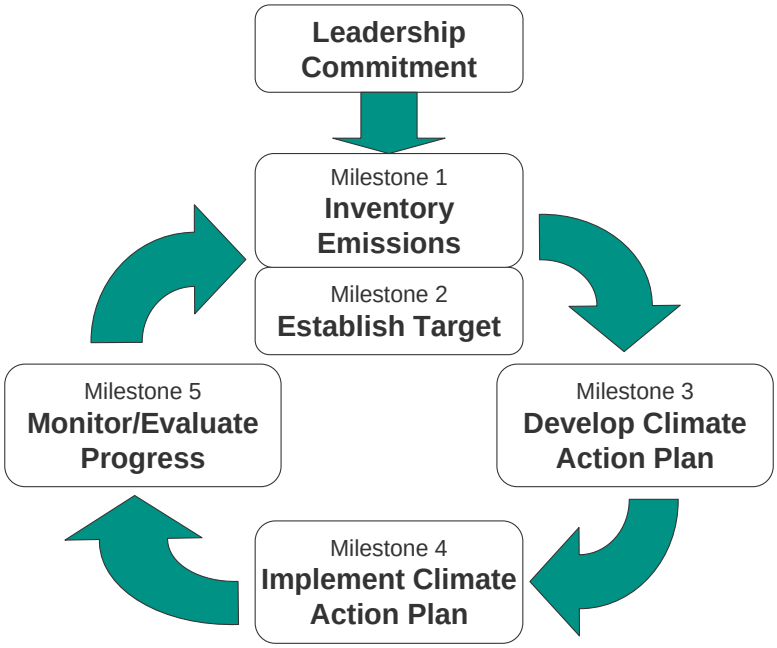
- It creates an emissions baseline against which the City can set emissions reductions targets and measure future progress.
- It demonstrates the largest sources of emissions from community activities, and therefore allows the City to most effectively target its emissions reductions policy

While the City of Daly City has already begun to reduce greenhouse gas emissions through its actions, this inventory represents the first step in a systems approach to reducing the City's emissions. This system, developed

by ICLEI, is called the Five-Milestone Process and is utilized by over 550 local governments in the U.S. to structure their climate protection efforts. The process is as follows:

- Milestone 1: Conduct a baseline emissions inventory and forecast
- Milestone 2: Adopt an emissions reduction target for the forecast year
- Milestone 3: Develop a local climate action plan
- Milestone 4: Implement the climate action plan
- Milestone 5: Monitor progress and report results

Figure 1.1 The Five-Milestone Process



2. Emissions Inventory Methodology

2.1 Methodology Standards

As local governments all over the world continue to rapidly join the climate protection movement, the need for a standardized approach to quantifying greenhouse gas (GHG) emissions is more pressing than ever. The community emissions inventory follows the standard outlined in the draft International Local Government GHG Emissions Analysis Protocol (IEAP). ICLEI has been developing this guidance since the inception of its Cities for Climate Protection Campaign in 1993, and has recently formalized version 1 of the IEAP as a means to set a common framework for all local government worldwide. Using this framework, ICLEI has worked with California Air Resources Board (ARB), the Bay Area Air Quality Management District, the Metropolitan Transportation

Commissions, and other state and regional agencies to develop a common method for inventorying community emissions in the Bay Area. This method has been used by the majority of local governments in the Bay Area.

ARB is currently working to establish a community greenhouse gas methodology specifically for California local governments. This methodology will serve as a corollary to the recently adopted Local Government Operations Protocol (LGOP). The LGOP, which ARB adopted in 2008, serves as the national standard for quantifying and reporting greenhouse emissions from local government operations.

2.2 Baseline Years

An initial aspect of the emissions inventory process is the requirement to select a base year for emissions, which will be used to establish a baseline emissions inventory against which all future inventories will be compared. A good baseline year is the earliest year where there is accurate and complete data for all key emission sources. It is also preferable to establish a base year several years in the past to be able to account for the emissions benefits of recent actions. A local government's emissions inventory should comprise of all greenhouse gas emissions occurring during a selected *calendar* year.

For the reasons mentioned above, this inventory utilizes 2005 as the baseline year, as this year is increasingly becoming the standard for such inventories. This is in line with state guidance, which, while establishing its baseline year as 1990, has recognized that locla governments do not have complete data going back that far. Therefore, ARB recommended that local governments use a "current" or recent year as a baseline. .

After setting a base year and conducting an emissions inventory for that year, local governments should make it a practice to complete a comprehensive emissions inventory on a regular basis to compare to the baseline year. ICLEI recommends conducting an emissions inventory at least every five years.

2.3 Boundaries of Greenhouse Gas Inventory Analysis

Any inventory is a subset of measurable emissions based upon a certain boundary. The boundary of this community inventory is emissions that result from activities taking place within the geopolitical boundary of the local government's community, over which the local government has direct control.[26] This boundary is used because activities that occur within the community boundary can be controlled or influenced by jurisdictional policies and programs. Though a local government cannot maintain direct control of all emissions sources within its boundaries, it is still important to inventory these emissions as local government policies and programs can still have an indirect influence on these emissions. For example, although much of the traffic on state highways within a jurisdiction can

[26] Sphere of Influence areas are generally not considered in community-scale inventories since a local government maintains only indirect control over these areas.

be pass-through, inventorying emissions from this source encourages a local govenment to collaborate in regional transportation planning and further examine its own transportation and land use policies.

Within the boundaries of this inventory, emissions are organized according to sectors.

2.4 Emissions Sectors

ICLEI recommends that local governments examine their emissions in the context of the sector that is responsible for those emissions. Many local governments will find a sector-based analysis more directly relevant to policy making and project management, as it assists in formulating sector-specific reduction measures and climate action plan components.

Community Sectors

The IEAP outlines the following sectors, in accordance with the Intergovernmental Panel on Climate Change (IPCC):

Stationary Combustion: Including utility delivered fuel consumption at stationary sites , utility delivered electricity / heat consumption at stationary sites, decentralized fuel consumption at stationary sites (e.g. propane, kerosene, stationary diesel from small vendors), utility consumed fuel for electricity / heat generation, etc.

Mobile Combustion: Including tailpipe emissions from vehicles traveling on roads within the geopolitical boundary of the local government, tailpipe emissions from off-road vehicles operating within the geographical boundaries, rail traffic occurring within geographical boundaries, marine transportation occurring between two jurisdictions, etc.

Fugitive and Other Energy Emissions: Including leaked natural gas from distribution infrastructure located within geopolitical boundaries, leaked refrigerants from residential and commercial / industrial facilities, etc.

Industrial Processes and Product Use: Including non-energy related emissions generated in the production of cement, in the refining of fuels, in the processing of coal, etc.

Agriculture, Forestry and Other Land Use: Including emissions from the use of nitrogenous fertilizers, methane emissions from livestock farms, negative net biogenic carbon flux, etc.

Waste: Including fugitive methane emissions at landfills, fugitive methane and nitrous oxide emissions at waste water treatment facilities, estimated future emissions associated with base 2005 waste disposal, etc.

In most cases, a local government can enhance this inventory by further subdividing these sectors in a manner consistent with the way that the local government is accustomed to considering their community (for example, splitting stationary combustion into residential, commercial and industrial sectors) . It is not mandatory that a local

government conduct an analysis of all sectors listed by the IPCC, and this emissions inventory contains the sectors indicated in Table 2.1.

Table 2.1 Emissions Inventory Sectors

Sector	Description
Residential	Electricity and natural gas usage in homes
Commercial/Industrial	Electricity and natural gas usage in businesses
Transportation	Fuel consumption in on-road vehicles and off-road equipment
Waste Generation	Future emissions from the expected decomposition of waste generated by the community in the base year
Wastewater	Emissions from the decomposition of wastewater
Agriculture	Emissions from farm equipment, biomass burning, soil management and animal methane

2.5 Units Used in Reporting Greenhouse Gas Emissions

In this narrative report, emissions from all gases released by an emissions source (e.g. stationary combustion of natural gas in facilities) are combined and reported in metric tons of carbon dioxide equivalent (CO_2e). This standard is based on the Global Warming Potential (GWP) of each gas, which is a measure of the amount of warming a greenhouse gas may cause, measured against the amount of warming caused by carbon dioxide. See Table 2.2 below for the GWPs of the gases discussed in this section.

2.6 Quantification Methods

It is important to understand that all emissions inventories are almost always a sum of *estimated,*and not actual , emissions. Emissions are quantified using the best available methods and best available data, and are subject to change as better data or estimation methods become available. Emissions can be quantified in two ways:

Table 2.2: Greenhouse Gases

Gas	Chemical Formula	Activity	Global Warming Potential (CO_2e)
Carbon Dioxide	CO_2	Combustion	1
Methane	CH_4	Combustion, Anaerobic Decomposition of Organics (Landfills, Wastewater), Fuel Handling	21
Nitrous Oxide	N_2O	Combustion, Wastewater Treatment	310
Hydrofluorocarbons	Various	Leaked Refrigerants, Fire Suppressants	43-11,700
Perfluorocarbons	Various	Aluminum Production, Semiconductor Manufacturing, HVAC Equipment Manufacturing	6,500-9,200
Sulfur Hexafluoride	SF_6	Transmission and Distribution of Power	23,900

Measurement-based methodologies refer to the direct measurement of greenhouse gas emissions (from a monitoring system) emitted from a flue of a power plant, wastewater treatment plant, landfill, or industrial facility. This methodology is not generally available for most types of emissions and will only apply to a few local governments that have these monitoring systems.

The majority of the emissions recorded in this inventory have been calculated using **calculation-based methodologies** to calculate emissions using activity data and emission factors. To calculate emissions accordingly, this basic equation is used:

Activity Data x Emission Factor = Emissions

Activity Data

Activity data refer to the relevant measurement of energy use or other greenhouse -gas-generating processes such as fuel consumption by fuel type, metered annual electricity consumption, and annual vehicle miles traveled. Please see appendices for detailed listing of the activity data used in composing this inventory.

Emission Factors

Emission factors are used to convert energy usage or other activity data into associated emissions quantities. They are usually expressed in terms of emissions per unit of activity data (e.g. lbs CO_2/kWh). Please see Appendix B for a listing of emissions factors used in this report. Table 2.3 demonstrates an example of common emission calculations that use this formula.

Table 2.3: Basic Emissions Calculations

Activity Data	Emissions Factor	Emissions
Electricity Consumption (kWh)	CO_2 emitted/kWh	CO_2 emitted
Natural Gas Consumption (therms)	CO_2 emitted/therm	CO_2 emitted
Gasoline/Diesel Consumption (gallons)	CO_2 emitted /gallon	$CO_2$2 emitted
Vehicle Miles Traveled	CH_4, N_2O emitted/mile	CH_4, N_2O emitted

3 Community Inventory Summary

In 2005, activities and operations taking place within the City of Daly City's boundary resulted in approximately 555,027 metric tons of CO_2e. This number includes emissions from the combustion of fuels in the residential, commercial / industrial, transportation, and agricultural sectors within the City's boundaries. It also consists of

emissions from wastewater treatment facilities and from the decompostion of organic waste in community landfills in 2005. In addition, this number contains emissions associated with community electricity consumption (emissions

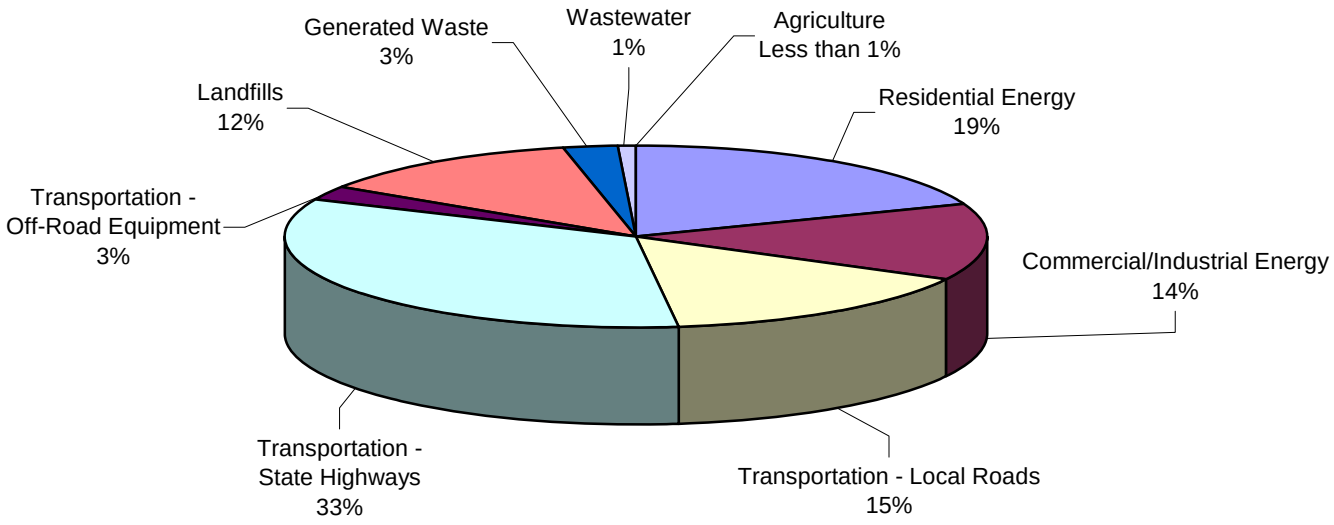
that occur as a result of electricity consumption within the geopolitical boundary of the City, but that occur at sources located outside of the City's jurisdiction), and future emissions from waste generated by the community.[27]

3.1 Summary by Sector

By better understanding the relative scale of emissions from each primary sector, the City can more effectively focus emissions reductions strategies to achieve the greatest emission reductions. For this reason, an analysis of emissions by sector is included in this report, based on the total of 555,027 metric tons of CO_2e.

As visible in Figure 3.1 and Table 3.1, the largest source of emissions in 2005 is transportation on state highways, which accounts for 33% of total emissions. Residential energy use is the next largest source of emissions at 19%. Transportation on local roads generates 15% of total emissions, while commercial/industrial energy use makes up 14% of total emissions. Community landfills produce 12% of total emissions. Smaller emissions-generating sources include transportation on off-road equipment (3%), generated waste (3%), wastewater treatment plants (1%), and agriculture (less than 1%), . Please see detailed sector emissions analyses below for more detail.

Figure 3.1 2005 City of Daly City Emissions by Sector



[27] For more information, please see Appendix A: International Local Government GHG Emissions Analysis Protocol Community Scopes Framework

Table 3.1: 2005 Community Emissions by Sector

Sector	Greenhouse Gas Emissions (metric tons CO_2e)	Percentage of Greenhouse Gas Emissions
Residential	106,119	19%
Commercial / Industrial	76,404	14%
Transportation-Local Roads	84,114	15%
Transportation-State Highways	186,450	33%
Transportation - Off-Road Equipment*	14,750	3%
Landfills	68,040	12%
Generated Waste	14,237	3%
Wastewater	4,910	1%
Agriculture	3	Less than 1%
TOTAL	**555,027**	

Table 3.2: 2005 Community Emissions by Sector and Source

Sector	Source	Greenhouse Gas Emissions (metric tons CO_2e)	Percentage of Greenhouse Gas Emissions
Residential	**Electricity**	34,018	6%
	Natural Gas	72,101	13%
Commercial/Industrial	**Electricity**	30,022	5%
	Natural Gas	22,064	4%
Direct Access	**Electricity**	12,251	2%
(Non-PG&E Industrial Customers)	**Natural Gas**	12,067	2%
Transportation	**Local Roads-Gasoline**	77,072	14%
	Local Roads-Diesel	7,042	1%
	State Highways-Gasoline	170,840	31%
	State Highways-Diesel	15,610	3%
	Off-Road Equipment (Residential)	1,702	Less than 1%
	Off-Road Equipment (Commercial)*	13,048	2%
Landfills	**Mussel Rock**	68,040	12%
	Doelger	No data available	-
Generated Waste	**Paper Products**	7,783	1%
	Food Waste	3,063	1%
	Plant Debris	820	Less than 1%
	Wood or Textiles	2,287	Less than 1%
	All Other Waste	0	0
Waste – Landfill Cover	**Plant Debris**	284	Less than 1%
	All Other Waste	0	0
Wastewater		4,910	1
Agriculture	Agricultural Equipment	1	Less than 1%
	Animal Waste	1	Less than 1%
	Soil Management	1	Less than 1%

	Biomass Burning	0	0
TOTAL		**555,027**	

*Please note that emissions from agricultural equipment are not included in the transportation/off-road equipment sector; they are included in the Agricultural Sector.

3.3 Per Capita Emissions

Per capita emissions can be a useful metric for measuring progress in reducing greenhouse gases and for comparing one community's emissions with neighboring cities and against regional and national averages. That said, due to differences in emission inventory methods, it can be difficult to produce directly comparable per capita emissions numbers, and one must be cognizant of this margin of error when comparing figures.

As detailed in Table 3.3, dividing the total community-wide GHG emissions by population yields a result of *approximately 5 metric tons of CO_2e per capita*. It is important to understand that this number is not the same as the carbon footprint of the average individual living in the City of Daly City, as the per capita number includes emissions from activities by people who work or drive through Daly City, not only those who live in the community.

Table 3.3: 2005 Community Per Capita Emissions

Estimated 2005 Population[28]	104,594
Community GHG Emissions (metric tons CO_2e)	555,027
Per Capita GHG Emissions (metric tons (CO_2e)	~5.31

3.4 Recommendations

Based on the findings from this Inventory, the following are suggested steps for the City of Daly City:

- Set emissions-reduction targets.
- Continue to monitor progress and re-inventory emissions every five years.
- Near-term climate goals should be guided by the long-term goal of reducing emissions by 80 percent by 2050.
- Follow AB 32 suggestions of achieving at least 15 percent lower emissions by 2020.

[28] State of California, Department of Finance, E-4 Population Estimates for Cities, Counties and the State, 2001-2007, with 2000 Benchmark. Sacramento, California, May 2007

- Consider sector-specific targets.

- Meet near-term targets by implementing simple actions for highest emitting sectors.