



# CITY OF HILLSBORO SUSTAINABILITY PLAN



SEPTEMBER 2010

Prepared for the City of Hillsboro



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# SUSTAINABILITY PLAN

SEPTEMBER 2010

## I. INTRODUCTION

Hillsboro is a community in transition. The City has experienced rapid growth and diversification in its population and economic base over the past 20 years. This growth has created new economic opportunities as well as pressures on economic, social and environmental resources. There is an increasing awareness among citizens and business owners of the need to be more resource efficient in the way we live and work. By following the principles of sustainability, the City of Hillsboro is leading the community to identify strategies for increasing the efficiency of service delivery, to facilitate long term sustainable development, and to contribute to regional prosperity for all citizens.

The City of Hillsboro has demonstrated a commitment to and leadership in sustainability through sustainable design and construction of City facilities, implementation of renewable energy systems and programs, sustainability policies and incentives, participation in local, regional and national sustainability networks, and other initiatives. This Sustainability Plan (Plan) details the structure and process of the City's sustainability efforts, including long-range goals, principles, committee and working group structure, past and ongoing efforts, and new opportunities. The Plan also outlines a process for capturing information that will allow for performance measurement going forward. The Plan utilizes a basic process of identifying what sustainability means to the City as an organization, where we are, where we want to go in the long term, and the process that will allow us to achieve our sustainability goals.

### City of Hillsboro Council Sustainability Goal

*Develop and maintain  
a comprehensive  
approach for the  
City's sustainability  
initiatives beginning  
internally and later  
engaging the  
community.*

## II. BACKGROUND

Since 1995, the population of Hillsboro has more than doubled to over 90,000 and it is expected to continue to grow in the coming decades. As the 5<sup>th</sup> largest city in Oregon and a growing recognition that preserving our hometown livability depends on economic, social and environmental health, City leaders have made sustainability a top priority and one of the Council's five goals.

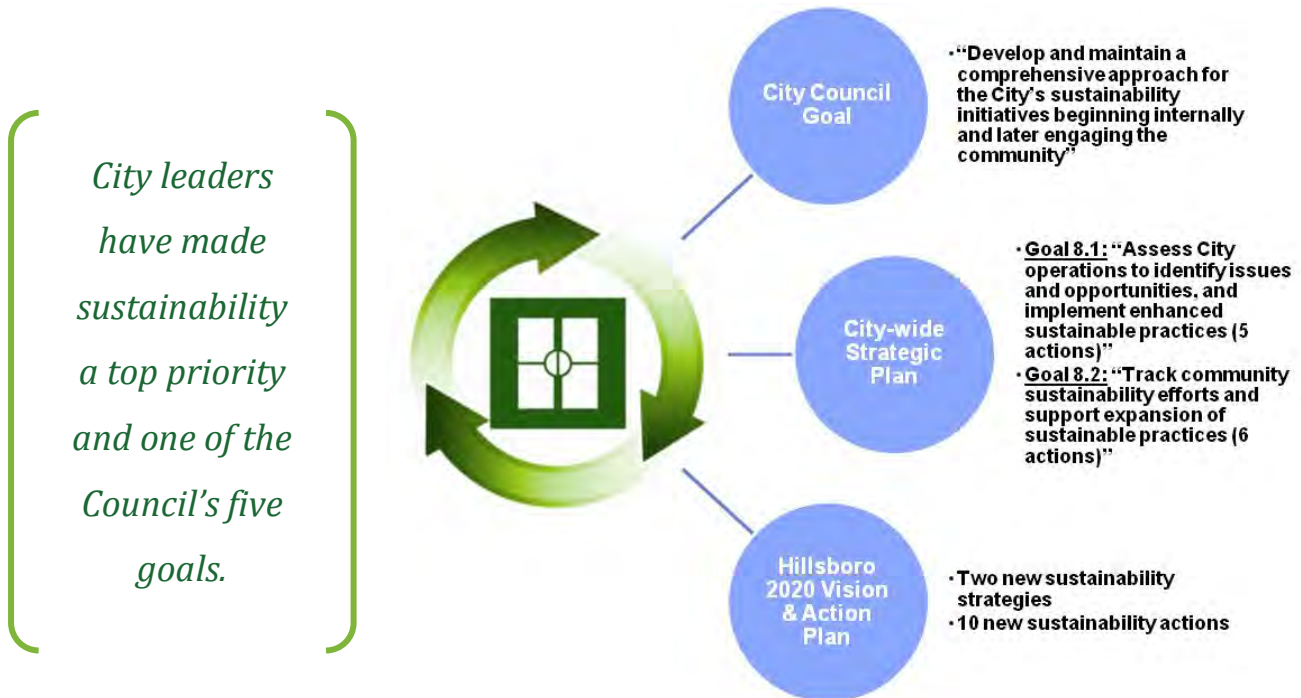
In developing the sustainability program, the City is focused initially on the City as an organization. With over 600 employees and facilities and infrastructure throughout the City under its purview, the City's sustainability goals and actions have had and will continue to impact the City in a positive way. The City's organization-wide Strategic Plan supports this imperative with a sustainability goal that requires us to

***“assess city operations to identify issues and opportunities and implement enhanced sustainable practices.”***

The services delivered by the City and the policies that it oversees also puts the City in a unique position to positively impact the community through sustainability goals and actions. The City-wide Strategic Plan also supports this imperative by committing us to ***“track community sustainability efforts and support expansion of sustainable practices.”***

The Hillsboro 2020 Vision and Action Plan has engaged the community for 10 years to develop and implement projects that strengthen the community, create economic opportunity and preserve the environment. The Plan has led to the implementation of over 80% of the nearly 150 actions in its first 10 years, including development of the new Civic Center and Tom Hughes Plaza community gathering place in 2005, at the time just the second Leadership in Energy and Environmental Design (LEED) Gold certified municipal building in the U.S.

**Figure 1: Sustainability Drivers**



**EARLY COMMITMENT AND ACTIONS**

Other past actions, such as reducing energy use through installation of high efficiency Light Emitting Diode (LED) traffic signal bulbs in 1996, procurement of a substantial alternative fuel vehicle fleet in 2000, development of a water reuse facility for parks maintenance operations in 2006, a commitment to reducing greenhouse gas emissions as a signatory to the U.S. Conference of Mayors Climate Protection Agreement in 2007, and deployment of a 99kW solar array in 2008, to name just a few, underscore a historical commitment by the City to reduce costs, wastes and resource use.

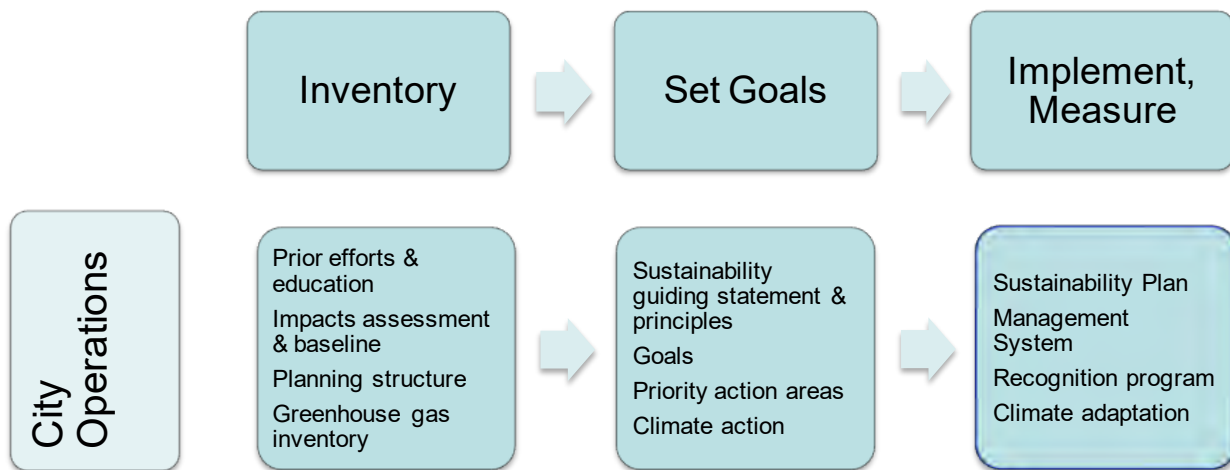
## PLANNING FOR SUSTAINABILITY

The City Council and management have recognized the need for a formal sustainability program that establishes a baseline of operations, defines long term goals, and establishes a strong cross-departmental sustainability planning effort to ensure coordination across City functions and stakeholders. This led to the hiring of the City’s first sustainability project manager in 2008 and the development of this Plan. This document describes the planning process and outcomes, and provides the guiding framework for implementation of sustainability across the City departments into the future. The Plan is designed to be flexible and ‘living,’ with annual reviews and updates on progress. The Plan also is intended to support future, broader community sustainability efforts.

### III. THE PLANNING PROCESS

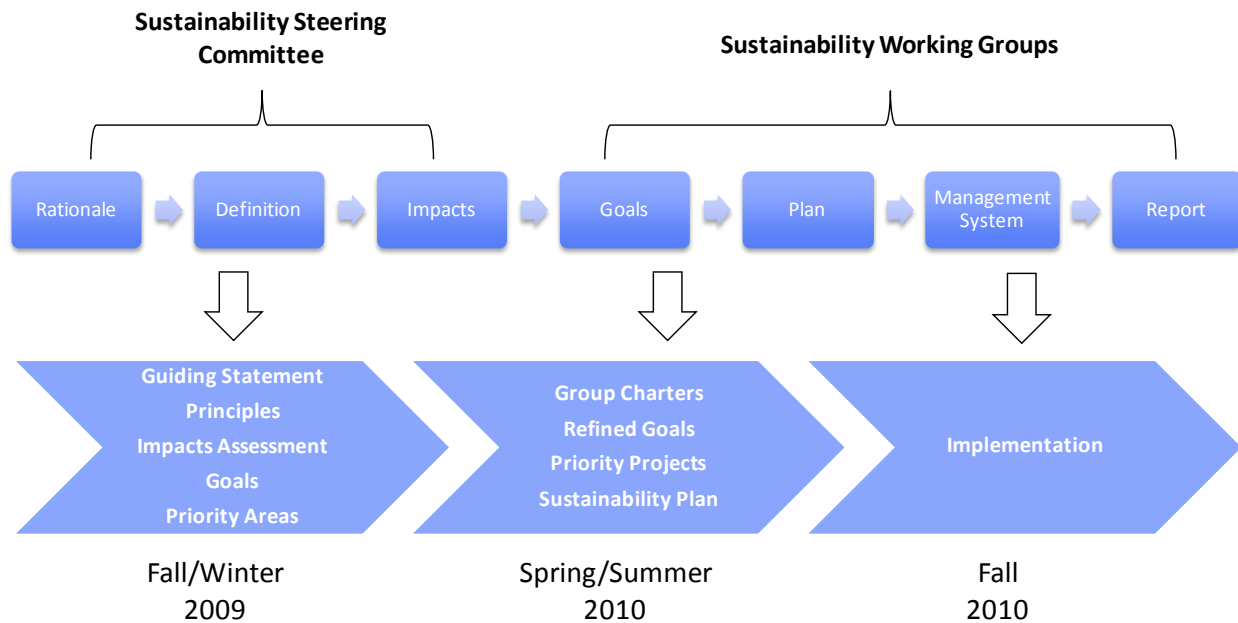
In the spring of 2009, the City of Hillsboro launched a formal sustainability initiative focused on the operations of the City and its departments. The goal of the effort is to create a comprehensive Sustainability Plan and management system that ensures a coordinated approach and guides the City’s efforts. A planning process was developed to establish a baseline of existing conditions, set goals and guiding principles, and to define the projects that will move the City toward the goals. Figure 2 shows the basic steps of the planning process.

**Figure 2: Sustainability Planning Process**



The City formed a Sustainability Steering Committee (SSC), working groups, and initial implementation model that coordinates staff across City departments. This structure was used to establish a sustainability guiding statement, principles, key operational areas to be addressed, a baseline of City operations, and long term and interim sustainability goals and projects. Figure 3 below shows the structure used to develop the contents of this Plan.

**Figure 3: Sustainability Planning Structure**



### Sustainability Steering Committee

In the fall of 2009, an inter-departmental, City staff Sustainability Steering Committee was established and began to lay the groundwork for the City’s coordinated approach to sustainability. The membership and construct of the SSC is found in Appendix B. Since there are many ways to define sustainability and just as many ways to approach it, the SSC first set out to determine what sustainability should mean for the City as a guiding framework for the organization.

#### Guiding Statement

After an overview of sustainability and facilitated process, the SSC created the following guiding sustainability statement for the City as an organization:

*The City of Hillsboro envisions a sustainable future, in which the City responsibly satisfies the needs of its citizens, provides a healthy and satisfying work environment for its employees and minimizes its impact on the physical environment of the community.*

#### Principles

With a guiding statement established to define the City’s program, the SSC developed core principles that aligned with the guiding statement and that help embed sustainability into daily City decision making and operations. They are foundational principles by which all City policies and actions can be assessed relative to the long term sustainability goals. They are:





## Economic Viability

**Financial stability and independence** – Meet the needs of our growing community with minimal dependence upon outside resources.

**Sustainable development** – Promote development that contributes to the economic and social health of our community in harmony with the natural environment.

## Social Responsibility<sup>1</sup>

**Productive and nurturing work place** – Create an environment in which all employees can learn and contribute to outstanding customer service.



**High citizen trust** – Earn the trust of our citizens through partnership, collaboration and quality customer service.



## Environmental Stewardship

**Reduced consumption** – Use all resources and material inputs wisely to both increase the efficiency of our operations and buildings and minimize our environmental impact.

**Reduced emissions** – Limit emissions of toxins and other pollutants to our environment, including greenhouse gases.

**Renewable energy** – Reduce use and dependence on non-renewable fuel sources.

## An Organizing Framework

Development of the sustainability guiding statement and principles was informed by a framework for understanding sustainability as an operational principle (see more about sustainability in Appendix G). This framework, known as **The Natural Step**, is commonly used in Oregon and beyond as a way to understand and implement sustainability. The Natural Step defines sustainability with four rules or “system conditions.” The system conditions are based upon fundamental rules of natural systems, rules that when violated signal unsustainable activity. In

**Figure 3:  
The Natural Step System  
Conditions**

In a sustainable society,  
nature is not subject to  
systematically increasing...

- 1) Concentrations of substances from the Earth's crust
  - 2) Concentrations of substances produced by society
  - 3) Degradation by physical means
- and in that society,
- 4) People are not subject to conditions that systematically undermine their capacity to meet their needs.

<sup>1</sup> Social principles are also a priority action area within the City's organizational Strategic Plan.



order for an organization (or activity, community, country or other entity) to be considered sustainable in the long term, these conditions must *not* be violated:

In a **sustainable** society, nature is not subject to systematically increasing:

- 1. Concentrations of substances from the Earth’s crust;**
  - 2. Concentrations of substances produced by society;**
  - 3. Degradation by physical means;**
- and in that society,**
- 4. People are not subject to conditions that systematically undermine their capacity to meet their needs.**

The SSC also discussed the Triple Bottom Line as a tool for measuring impacts from sustainability actions. The Triple Bottom Line seeks to broaden what is commonly a singular economic measure of human activity to include social and environmental conditions or trends. In a Triple Bottom Line view, economic, social and environmental aspects are considered interdependent. Therefore, no organization or activity can be sustainable if it optimizes one of the three aspects at the expense of either of the other two.

## Establishing a Baseline and Goals

In order to establish goals – where the City wants to be in the future – the SSC understood that it first needed to establish a baseline of City operations against some measure of sustainability. This was done in two ways:

1. Management conducted a qualitative assessment of City operations based on the Sustainability Competency and Opportunity Rating and Evaluation (SCORE) rating process. The SCORE process is an organizational ‘self-assessment’ relative to what is considered more sustainable in terms of policies and practices. Appendix F contains the City’s full SCORE report. The SCORE assessment will be used to measure the City’s progress against this baseline.
2. City staff have collected quantitative data on a variety of operations in order to produce a baseline against which future efforts can be measured. Much of the data was needed for completion of the City’s first greenhouse gas (GHG) inventory, which was presented to City Council in February 2010 (the full report is found in Appendix D). Other aspects of City operations have also been captured and will be used to track individual project impacts as well as overall progress toward the sustainability goals.

The next step for the SSC was to establish long term goals using a “backcasting” process. Backcasting begins with a long range vision and casts back to the current state of affairs to determine the gap that exists between that vision and the current state. The current state was established through the SCORE and quantitative baseline measuring actions described above. The SSC then considered where they thought the City should be in 20 years. Backcasting from those 20-year goals allowed for development of interim goals necessary to achieve the long range goals. The goals are captured in the sections below,

and they provide the compass points for the City's efforts. The metrics associated with each goal form a dashboard of indicators. Data will be collected and entered into this Plan going forward.

## Working Groups

Following the development of goals and metrics, City staff working groups were formed around the key sustainability areas which were initially identified by the SSC. The purpose of the working groups is to develop and implement existing and new projects that move the City toward its sustainability goals. The working groups are:



**Construction and Maintenance Practices**



**Energy**



**Policy**



**Vendor Relations / Paper and Office Supplies**

## Process and Outcomes

The working groups were convened for two one-half day meetings: the first, in February 2010 introduced members to the effort, defined the process and expectations, and established priorities for their particular work area (e.g., energy). The second, in April 2010 refined the outcomes of the first meeting and the projects from each of the working groups, including a timetable for action to present to the SSC for approval. This information is summarized in Table 1 below, and forms the initial sustainability work program for the City.

## Membership

The SSC and other departmental management identified staff members for each of the working groups. Specific roles have been defined for the working groups so that key expertise is represented in spite of staff changes. Those specific assignments are found in Appendix C.

More detailed information will continue to be collected throughout the first year of the Plan to enable a further refinement of the projects and policies the City will implement to move toward its goals.

## Refining the Goals, Developing Metrics and Projects

Using the guiding statement and principles established by the SSC, the working groups refined the goals and developed metrics that would allow for measurement of progress toward achieving the goals. Ten goals (some are multi-part) were identified with a target for achievement by 2030, 20 years from Plan initiation. The 20 year timeline is intentionally aggressive due to the City's priority of achieving sustainability.

The working groups developed projects in alignment with their focus area (i.e., energy, policy, construction and maintenance practices, vendor relations and paper and office supplies) and created estimates of project duration, level of effort and cost, benefits, and degree of difficulty in

implementation. The project duration estimates how *long* the project will take, but not when they will begin. The working groups will prioritize and implement projects based on staff workloads and availability, as well as available resources. Projects will be initiated based on those priorities and therefore not all projects are expected to begin immediately. Sustainability project management has worked closely with the SSC and will continue to do so to ensure that sustainability projects are well coordinated with existing budgets and workloads. In total, 33 projects were identified by the groups.

It is also important to note that the City has implemented numerous projects through the years that have contributed to more efficient use of resources, and sample of those projects is listed in Appendix H. Table 1 below summarizes the City's sustainability goals and projects as developed by the working groups.

**Table 1. Sustainability Goals and Projects**

2030 Sustainability Goals (G) and Projects (P)		Est. Duration	Est. Cost*	Status
<b>G1</b>	<b>100% of City development investments meet a standard set for sustainable development, and City promotes and encourages sustainable development by others. To be developed in conjunction with affected stakeholders</b>			
<b>Metrics</b>	<b>% of City development that meets criteria for sustainable development % of private development that meets criteria for sustainable development</b>			
P1	Define 'sustainable development' & establish criteria for sustainable development in the built environment	6-18 Mos.	>\$25k	To be initiated
<b>G2</b>	<b>100% of applicable City policies incorporate the principles of sustainability</b>			
<b>Metrics</b>	<b>% of policies and incentives that support or enable sustainable practices internally and externally</b>			
P2	Define principles of sustainability and criteria for evaluating policies	<6 Mos.	<\$5k	To be initiated
P3	Review internal existing policies, procedures, practices, codes, and other legal requirements	18-36 Mos.	<\$25k	Identified as key project, but longer-term, more costly
<b>G3</b>	<b>City's rate of material consumption meets internal standards for sustainability</b>			
<b>Metrics</b>	<b>Volume of material inputs per employee (reasonable rate of consumption must be established)</b>			
P4	Establish reasonable rate of consumption	6-12 Mos.	<\$0	Initial effort will establish reasonable rate and metric
P5	Implement default duplex printing	6-18 Mos.	\$0	To be initiated
P6	Implement City-wide printer toner cartridge recycling	6-18 Mos.	\$0	To be initiated
P7	Capture and market white paper to recycle and generate revenue stream	<6 Mos.	<\$5k	To be initiated

2030 Sustainability Goals (G) and Projects (P)		Est. Duration	Est. Cost*	Status
<b>G4</b>	<b>100% of all inputs purchased by the City are sourced from sustainable sources or meet internally established criteria (e.g., zero waste, zero toxins) where technologically and financially feasible</b>			
<b>Metrics</b>	<b>% of purchased material that meets sustainability criteria</b>			
P8	Identify criteria for sustainable purchasing and define “toxins”	12 Mos.	\$0	Necessary project to define key terms for effort. To be initiated
P9	Complete audit of purchasing patterns	12-36 Mos.	TBD	Necessary project to baseline City purchasing. To be initiated
P10	Create & implement recycling guidelines and internal recycling education campaign	18-36 Mos.	<\$25k	Facility recycling audit underway. To be conducted ongoing by working group
P11	Implement pilot project to test rechargeable batteries (AAA-DD) in City battery powered devices that are conducive to rechargeables	6-18 Mos.	<\$5k	To be initiated
P12	Investigate green, non-toxic cleaning supplies and pesticides and use where appropriate	18-36 Mos.	<\$25k	To be initiated
P13	Establish process for recycling packaging materials, including and beyond curbside materials	6 Mos.	<\$5k	To be initiated
P14	Determine vendor packaging practices and give preference to vendors with sustainable packaging. Capture staff time needed for research of vendor packaging practices	18-36 Mos.	<\$5k	To be initiated
P15	Identify “approved” vendors that meet sustainability standard and “approved” products list	12-36 Mos.	TBD	Necessary project to meet goal. To be initiated
<b>G5</b>	<ul style="list-style-type: none"> <li>• <b>60% reduced City facility energy consumption per square foot</b></li> <li>• <b>100% of electricity and natural gas sourced from renewable sources for City facilities and exterior lighting infrastructure</b></li> <li>• <b>80% production of energy for City facilities from renewable energy sources</b></li> <li>• <b>100% fossil fuel-free staff vehicles^ and 40% reduction for other exempt vehicles^ (non-passenger emergency response, etc.)</b></li> </ul> <p>^Based on available technologies and cost effectiveness</p>			
<b>Metrics</b>	<b>Facility energy consumption per square foot relative to 2007 baseline</b> <b>% of energy from renewable sources</b> <b>% of City energy generated by renewable sources</b> <b>% City staff vehicles/exempt vehicles fossil fuel-free</b>			
P16	Create residential/commercial revolving energy loan fund	6-12 Mos.	>\$25k	Project to be funded with EECBG grant, initiation in 2011

2030 Sustainability Goals (G) and Projects (P)		Est. Duration	Est. Cost*	Status
P17	Implement City wide centralized PC power management	6-18 Mos.	<\$25k	To be initiated
P18	Create an internal sustainability revolving grant fund	12 Mos.	\$0	To be initiated. Cost will be to fund project (\$100k for 2010/11)
P19	Document 2007 City facility baseline and conduct facility energy audits	>36 Mos.	>\$25k	Project is underway. 2007 baseline in place and recorded. Facility energy audits ongoing. Shute Library, Parks Maintenance complete; SHARC in progress
P20	Assess renewable energy generation opportunities	6-24 Mos.	>\$25k	To be initiated
P21	Monitor energy usage at SHARC and maximize boiler performance	6-18 Mos.	<\$25k	In progress. \$10k Energy Trust incentive will fund study, beginning August 2010
P22	Optimize street signal timing on key City thoroughfares	12-18 Mos.	>\$25k	Funded with EECBG grant. To begin Fall 2010
P23	Develop City-owned solar installations and/or third party developer owned where cost effective	6-18 Mos.	>\$25k	Partially funded with EECBG grant. Solar facilities on ITF, Cherry Lane and 25 <sup>th</sup> Ave fire stations. Solar working group in place to assess additional site options
P24	Implement fleet utilization study relative to fuel efficiency	18-36 Mos.	>\$25k	To be initiated
P25	Assess and implement replacement of rooftop HVAC units with high efficiency units or heat pumps	<6 Mos.	>\$25k	Project is in progress as part of regular capital improvements
P26	Conduct streetlight inventory and lighting evaluation and implement efficiency measures	18-36 Mos.	>\$25k	To be initiated
<b>G6</b>	<b>25% reduction in water consumption by City facilities against established baseline (including re-use and other measures)</b>			
<b>Metrics</b>	<b>Facility water consumption per square foot relative to 2007 baseline</b>			
P27	Establish water consumption rate	12 Mos.	<\$5k	Necessary to achieve goal. Work on project has begun
P28	Develop and implement City facility water conservation project	36 Mos.	>\$25k	Initial audit and baseline will not require capital expense. Implementation will
<b>G7</b>	<ul style="list-style-type: none"> <li>• <b>80% reduction in greenhouse gas emissions</b></li> <li>• <b>100% of remaining emissions offset</b></li> <li>• <b>Zero toxic emissions</b></li> </ul>			

2030 Sustainability Goals (G) and Projects (P)		Est. Duration	Est. Cost*	Status
Metrics	Greenhouse gas emissions relative to 2007 baseline Toxic emissions reductions relative to baseline (to be established and defined)			
P29	Identify and assess market mechanisms to offset greenhouse gas emissions (e.g., green credits)	<6 Mos.	<\$5k	To be initiated
P30	Develop criteria for tree plantings as offset for greenhouse gas emissions	6-18 Mos.	<\$25k	City tree planting project underway. Criteria development effort to be initiated
G8	<ul style="list-style-type: none"> <li>100% recycling of waste from City operations</li> <li>Zero construction and maintenance waste (no waste from construction and maintenance activities is sent to landfill). May be accomplished via public/private partnerships</li> </ul>			
Metrics	% of recycling relative to overall waste volume % of recycling relative to volume of construction and maintenance waste			
P31	Conduct waste audit of City construction & maintenance practices	18-36 Mos.	<\$5k	To be initiated
G9	<ul style="list-style-type: none"> <li>All city facilities constructed or renovated shall meet current Leadership in Energy and Environmental Design (LEED) standards or better, unless cost prohibitive based on Return on Investment (ROI) or cost/benefit analysis</li> <li>All City facilities zero net energy consumption, if feasible based on Return on Investment (ROI) or cost/benefit analysis</li> </ul>			
Metrics	% of City facilities built or renovated to Leadership in Energy and Environmental Design (LEED) or better standard			
P32	Develop minimum standards for all City building construction or renovation	18-36 Mos.	<\$5k	To be initiated
G10	Achieve a rate of construction material consumption that meets internal standards for sustainability (see standard as investigated and set by Policy working group)			
Metric	<b>Volume (e.g., tons) of materials re-used relative to total materials used</b> <b>% of construction &amp; demolition waste recycled relative to volume utilized</b> <b>% of asphalt, concrete and aggregate recycled relative to volume utilized</b> <b>% of organic material diverted from landfill</b>			
P33	Define or adopt rate of material consumption and metric	12 Mos.	\$0	Necessary to conduct projects. To be initiated

\*Includes costs for staff time

## IV. IMPLEMENTATION PLAN

In order to manage implementation of this Plan, the City has developed a supporting structure and implementation plan. This section details the suggested approach for managing the sustainability effort over time.

## Roles and Responsibilities

The Sustainability Project Manager and other Administration Department team members will support the work of the SSC and working groups, including maintaining and updating the Sustainability Plan, arranging and facilitating the relevant meetings according to the implementation calendar, supporting City staff in project implementation, and communicating aspects of program implementation to stakeholders, including City management, Mayor, City Council and the public.

The SSC will continue to provide oversight, approval, review and updates to the Plan during regular quarterly meetings, and to ensure that workloads across the departments are manageable.

The working groups will implement the projects contained in the Plan. Group members will prioritize projects and funding, establish cost/Return on Investment (ROI) plans, coordinate work and training within their departments, act as communication conduits with their department, oversee or conduct audits related to the Plan, manage projects, vet new ideas and submit decision requests to the SSC.

The Implementation Calendar in Table 2 below details the regular management structure of the SSC, working groups and project implementation. The calendar will guide the SSC and working group meetings and process, project implementation and communication of progress.

**Table 2: Implementation Calendar**

Task	Lead	Calendar Year			
		Q1	Q2	Q3	Q4
<b>Sustainability Steering Committee</b>					
Regular meetings to update SSC and discuss implementation (1/quarter minimally and more as needed)	Sustainability Project Manager	X	X	X	X
Employee communication	SSC	XXX	XXX	XXX	XXX
Policy - Review, send to Council (2/year or as needed)	Sustainability Project Manager		X		X
Goals and metrics review (2/year)	Working Group Lead & Sustainability Project Manager	X		X	
Action Plans/Project Status (every meeting, tied to budget cycle)	Sustainability Project Manager	X	X	X	X
Appoint new working group members (1/year and as needed)	SSC	X			
<b>Sustainability Working Groups</b>					



Task	Lead	Calendar Year			
		Q1	Q2	Q3	Q4
Meetings (as needed, determined by group)	Working Group Lead & Sustainability Project Manager	X	XX	XX	XX
Communication to Departments	Working Group Members	X	X	X	X
Assist/lead training	Working Group Members		X		X
Assess progress - auditing	Working Group Members	X	X	X	X
Review and recommend new multi-department projects, with budget requirements (tie to budget cycle)	Working Group Members	X	X	X	X
Report department-specific projects to highlight success and contribution to goal (every meeting)	Working Group Members	XX	XX	XX	XX
<b>Sustainability Project Manager</b>					
Check in on monthly project updates	Sustainability Project Manager	XXX	XXX	XXX	XXX
Annual Sustainability Report (on calendar year – January publish)	Sustainability Project Manager	X			
Annual Sustainability Recognition (April – Earth Day)	Sustainability Project Manager		X		
Updates to City Council – written report or work session	Sustainability Project Manager	X		X	
<b>Training and Employee Awareness</b>					
Annual employee awareness (around Earth Day)	Sustainability Project Manager		X		
Project updates (communicate internally, post to intranet and via newsletter)	Sustainability Project Manager	XXX	XXX	XXX	XXX
New-hire training	Sustainability Project Manager	X	X	X	X
Department-specific training	Sustainability Project Manager			X	X

## Reporting

The goals and associated projects will be reviewed quarterly as summarized in the table above, and the sustainability effort will undergo a more comprehensive planning process every three years. As part of the ongoing implementation, backcasting tables will be reviewed and updated and the working groups and SCC will review the direction in a more comprehensive and strategic manner.

This Plan serves as the City’s first annual Sustainability Report. Subsequent annual reports will detail progress on the goals and projects as well as maintain historical trend data on the key metrics.

## Policy Development

The Policy working group will serve as the review panel for new sustainability policy proposals. The format, schedule and process for the Policy working group will be developed by the Policy working group with support from the Sustainability Project Manager.

## Communications

At its first meeting, the SSC considered how the City’s sustainability efforts should be communicated to stakeholders. The intent was to present a clear, compelling and consistent rationale for why this makes sense to the City organization, and how it benefits the City’s future ability to deliver services and to contribute to the health and livability of the Hillsboro community. Table 3 below summarizes the SSC messaging about how sustainability benefits and impacts the various stakeholder groups.

**Table 3: Communication of Sustainability Value**

To government partners	To Hillsboro businesses	To City Council	To employees	To citizens
Makes us more accountable. Ensures good public relations for us all. Helps us create a sustainable financial base.	Helps us manage increasingly limited resources. Makes Hillsboro more attractive to new businesses, new investments, new talent and new customers. Local sourcing helps local businesses.	Helps to solve problems and make positive community changes. Increases the region’s economic and political independence. Supports action addressing concern about sustainability issues.	Creates a healthy work environment. Reduces the City’s environmental impact. Makes us more fiscally responsible. Aligns with employee values. Helps lead to sustainable jobs for future generations.	Ensures quality of life in Hillsboro. Ensures our ability to provide services into the future. Results in economic benefits for the community. Fulfills our ethical obligation to future generations.

## V. BEYOND CITY OPERATIONS

This Plan is focused primarily on internal City operations (though some goals and projects necessarily affect the broader community due to the nature of City services and policies). The intent is to ensure that the City actively pursues sustainability goals with an organized approach. The City has a large operational footprint and employee base and it can have a significant positive impact in the community.

This approach also harnesses the energy, creativity and expertise of City employees. Going forward, the City will play a key role in community sustainability efforts, and will help coordinate the planning, implementation and reporting of those efforts.

# APPENDICES

## APPENDIX A — CITY OF HILLSBORO SUSTAINABILITY POLICIES

In addition to significant prior projects that have been completed, several of which are described in Appendix H, to address sustainability, the City has implemented policies that require and incent further sustainability action. Though not a comprehensive list, some of the specific policies include:

- Resolution No. 2346 (October 2010) adopting the City’s first Sustainability Plan which includes a guiding statement, principles, goals and projects for pursuing more sustainable City operations;
- March 2010 Proclamation declaring the Green Power Challenge in partnership with PGE. Campaign challenge was 300 new sign ups; final total more than doubled goal;
- Ordinance No. 5899 (March 2009) establishing a Business Recycling Requirement and outreach program to assist City businesses with their recycling programs;
- Res No. 2207 (May 2007) for intention to join ICLEI (Local Governments for Sustainability), intent to conduct a Greenhouse Gas (GHG) inventory, intent to sign the US Mayors Climate Agreement, and to work toward the 7% below 1990 per capita emissions levels;
- Resolution No. 2174 (July 2006) and corresponding Ordinance No. 5668 (September 2006) for exemption from permit fees associated with Building Codes for specific renewable energy applications.

## APPENDIX B — SUSTAINABILITY STEERING COMMITTEE

### **Purpose**

The purpose of the Sustainability Steering Committee (SSC) is to identify the broad sustainability goals that will form the foundation of the sustainability program and to guide the work of the Sustainability Project Manager and working groups.

### **Process and Outcomes**

The SSC began its work in September 2009. An initial planning session provided the foundation for the initiative and accomplished the following tasks:

- Defined what sustainability would look like for the City of Hillsboro’s operations
- Crafted the message about sustainability for each key stakeholder group
- Completed an impacts analysis of City operations to identify the highest priority areas to address
- Established the elements of a charter for each of the working groups to facilitate development of the Sustainability Plan.

The SSC then reviewed the priority areas, assessed the extent to which sustainability is currently incorporated into City operational areas (SCORE process). It then received an update from the working groups, including all of the proposed projects that were developed by the groups, and approved projects for inclusion in the Sustainability Plan.

The SSC will meet quarterly to receive updates on sustainability projects, to review proposed sustainability-related policies, and to provide oversight of the program.

### **Membership**

The SSC is comprised of department managers from each of the 14 departments and Risk Management, as well as at least one Assistant City Manager. Additional department representatives may also participate as needed. The SSC shall consist of no more than 25 members, but specific representation may change as departmental needs change.

Members have a broad view of department operations and have decision making authority, so that sustainability principles, goals and objectives are well informed. The management-level support is crucial to success of the program. Participation and input from the Executive Team will be essential to ensure that the sustainability goals and objectives identified by the SSC are consistent with City policies and priorities.

The members of the SSC are identified in the table below.

<b>Department/Area</b>	<b>Representative</b>	<b>Title</b>
<b>Executive Team</b>	Ellen Conley	Assistant City Manager
<b>(optional)</b>	Bruce Warner	Interim City Manager
<b>(optional)</b>	Rob Dixon	Assistant City Manager
<b>Administration</b>	Erik Jensen	Director
<b>Building</b>	Philip Wu	Director
<b>Economic Development</b>	John Southgate	Director
<b>Engineering/Public Works</b>	Tina Bailey	Project Manager II
<b>Facilities And Fleet</b>	Bob Reitmajer	Director
<b>Finance</b>	Suzanne Linneen	Director
<b>Fire</b>	Gary Seidel	Fire Chief
<b>Human Resources</b>	Sherry Banaka	HR Program Manager
<b>Information Services</b>	Greg Mont	Director
<b>Library</b>	Mike Smith	Director
<b>Parks And Recreation</b>	Steve Greagor	Director
<b>Planning</b>	Colin Cooper	Planning Supervisor
<b>Transportation</b>	Don Odermott	Transportation Engineer
<b>Police</b>	Chris Skinner	Deputy Chief of Police
<b>Risk Management</b>	Tami Cockeram	Risk Manager
<b>Water</b>	Kevin Hanway	Director

## APPENDIX C — SUSTAINABILITY WORKING GROUPS

### Purpose

The purpose of the sustainability working groups (working groups) is to develop and implement existing and new projects to move the City toward its sustainability goals.

The initial sustainability working groups are:

#### **Vendor Relations / Paper and Office Supplies**

*Improve sustainability performance of City vendors and suppliers and create a process for reviewing current and new vendor-related policies. Reduce consumption and increase efficiencies in procurement of paper and office supplies; increase rate of reuse and recycling.*

#### **Construction and Maintenance Practices**

*Reduce construction waste and encourage sustainable construction and maintenance behaviors. Reduce waste and toxic materials in construction and maintenance practices. Increase rate of reuse and recycling.*

#### **Policy**

*Identify City policies that impact sustainability and modify and/or create policies that move the City toward sustainability goals (e.g., purchasing, building code, community development).*

#### **Energy**

*Reduce energy use and greenhouse gas emissions from City operations by increasing system efficiencies. Match correct energy expenditure to energy need. Use life cycle costing for energy.*

### Process and Outcomes

A set of four teams has been organized to draft an implementation plan based on the guidelines and vision established by the steering committee. The working groups will convene for one ½-day meeting to introduce members to the effort, to define the process and expectations, familiarize members with the outputs of the steering committee's efforts, and to establish priorities for their particular work area (e.g., energy). Members will be asked to consider the outcomes from this meeting and in a subsequent ½-day meeting the groups will refine the outcomes of the first meeting and aggregate the plans from each of the Groups to craft a comprehensive set of recommendations and timetable for action to present to the Steering Committee for approval and adoption. This information will form the City Sustainability Plan, which will ultimately be briefed to the Mayor and City Council for adoption.

The Working Groups will be facilitated by the Sustainability Project Manager with consultant support.



## Membership

The Sustainability Steering Committee and departmental management have identified individual staff members to staff each of the Working Groups. Specific “slots” have been identified to guide this process, based on the most important operational expertise and interest of City staff for each Working Group. The assignments are as follows:

### **Legend:**

TL =	Team Lead
TL alt =	Team Lead Alternate
P =	Presenter
P alt =	Presenter Alternate
RK =	Record Keeper
RK alt =	Record Keeper Alternate

<b>Vendor Relations / Paper and Office Supplies</b>		
<i>Improve sustainability performance of City vendors and suppliers and create a process for reviewing current and new vendor-related policies. Reduce consumption and increase efficiencies in procurement of paper and office supplies; increase rate of reuse and recycling.</i>		
<b>Expertise/Interest</b>	<b>Representative</b>	<b>Department</b>
1. Finance/purchasing	Paul Edwards	Finance
2. Finance/purchasing	Christie Tosch <b>(TL)</b>	Finance
3. Departmental purchaser – office supplies	Tonya Bilderbeck <b>(P alt)</b>	Water
4. Departmental purchaser – maintenance equipment and supplies	Toni Plunkett	Facilities and Fleet
5. Departmental purchaser – computer/elec. equipment	Ambrose Duda	Information Services
6. Departmental purchaser – program supplies	Kristi Turner <b>(RK alt)</b>	Police
7. Departmental purchaser – safety equipment	Jodi Sperling <b>(TL alt)</b>	Parks and Recreation
8. Departmental purchaser – vehicles	Chuck Heisler	Parks and Recreation
9. General interest – waste reduction	Melanie Grossen	Facilities and Fleet
10. General interest – reuse and recycling	Shauna Schmidlin	Information Services
11. At large member	Angie Bond <b>(RK)</b>	Human Resources
12. At large member	Barbara Simon <b>(P)</b>	Administration

### Construction and Maintenance Practices

*Reduce construction waste and encourage sustainable construction and maintenance behaviors. Reduce waste and toxic materials in construction and maintenance practices. Increase rate of reuse and recycling.*

Expertise/Interest	Member	Department
1. Water distribution/operations	Tyler Wubbena <b>(P)</b>	Water
2. Street maintenance	Michael Bakkum	Engineering/Public Works
3. Traffic maintenance	Brad Eckland	Engineering/Public Works
4. Sewer maintenance	Clarence Gladden	Engineering/Public Works
5. Street/sewer engineering & construction	Charlie Shell	Engineering/Public Works
6. Capital construction	Karl Dinger <b>(P alt)</b>	Facilities and Fleet
7. Building inspection	Mike Ditty	Building
8. Building maintenance	Darrell Cecil	Facilities and Fleet
9. Parks maintenance	Steve Heldt	Parks and Recreation
10. Risk and Safety	Michael Sorensen <b>(TL)</b>	Risk Management
11. General interest – reuse and recycling	Genny Bond <b>(RK)</b>	Planning
12. At large member	Paul Edwards	Finance

### Policy

*Identify City policies that impact sustainability and modify and/or create policies that move the City toward sustainability goals (e.g., purchasing, building code, community development).*

Expertise/Interest	Member	Department
1. Executive management	Ellen Conley	Administration
2. Economic Development	Sarah Garrison	Economic Development
3. Community development department	Jennifer Wells <b>(P alt)</b>	Planning
4. Community development department	Willie Tiffany <b>(P)</b>	Water
5. General fund department	Linda Lybecker	Library
6. General fund department	Mary Ordal <b>(RK)</b>	Parks and Recreation
7. Internal services department	Greg Mont	Information Services
8. Internal services department	Paul Edwards <b>(TL)</b>	Finance
9. Administration department representative	Chris Hartye <b>(TL alt)</b>	Administration
10. Transportation Engineering	Don Odermott	Planning
11. Building	Tim Drain	Building
12. At large member	Tacy Steele	Water

<b>Energy</b>		
<i>Reduce energy use and greenhouse gas emissions from City operations by increasing system efficiencies. Match correct energy expenditure to energy need. Use life cycle costing for energy.</i>		
<b>Expertise/Interest</b>	<b>Member</b>	<b>Department</b>
1. Facilities Maintenance	Nico Geerling <b>(TL alt)</b>	Facilities and Fleet
2. Water Treatment/Distribution	Kristel Fesler/Niki Iverson	Water/Water
3. Parks Administration	Erik Erikson	Parks and Recreation
4. Public Works	Doug Gresham	Engineering/Public Works
5. Transportation Engineering	Amica Bose <b>(RK)</b>	Engineering/Public Works
6. Fleet Maintenance	Phil Weber	Facilities and Fleet
7. Information Services	John Taylor	Information Services
8. Finance	Ben Rowe/Paul Edwards	Finance/Finance
9. Police	Henry Reimann <b>(P)</b>	Police
10. Fire	Scott Malone	Fire
11. Management Analyst representative	Andrew Bartlett <b>(TL)</b>	Administration
12. At-large member	Mike Barnes	Building

## Sustainability Learning Sessions

Beginning in late summer 2009 City staff conducted learning sessions on sustainability and the planning process for the purpose of laying the foundation for involvement and support of City employees. Learning sessions were conducted by the Sustainability Project Manager at the Civic Center, Ronler Acres Fire Station, Main Library, Water Treatment Plant, and Public Works/Facilities Maintenance.

The Sustainability Project Manager will conduct additional sessions and other education and outreach going forward. Additionally, sustainability information will be provided to City staff via the internal and external websites through a concerted communications effort.



# INVENTORY OF GREENHOUSE GASES

Local Government Operations for Calendar Year 2007



February 16, 2010

Prepared for the City of Hillsboro



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# INVENTORY OF GREENHOUSE GASES

FEBRUARY 2010

## INTRODUCTION AND POLICY CONTEXT

The Intergovernmental Panel on Climate Change (IPCC), the United Nations body that regularly convenes climate scientists, has identified human activity as the primary cause of the climate change that has occurred over the past few decades and quickened in recent years. Consensus statements from the IPCC suggest that human-caused emissions of greenhouse gases (GHGs) must be reduced significantly – perhaps more than 50% globally, and by 80% in wealthier nations that are the largest emitters – by mid-century in order to avoid the worst potential climate impacts on human economies.

Many individual corporations, government agencies, universities, non-profits and even individuals have proactively sought to take on this challenge. Emissions

of GHGs from city government operations are significant, so cities have a direct impact through emissions reductions. Cities also have a role in educating policy makers and citizens. By measuring emissions of GHGs from the City of Hillsboro's operations, this inventory is an important step in taking action, managing risk and leading the way forward.

In May 2007, the City of Hillsboro made a commitment to addressing the problem of climate change by signing the U.S. Conference of Mayors Climate Protection Agreement, which commits signatories, among other things, to establish a baseline of GHG emissions, in order to determine steps to reduce emissions.

**Table 1: Overview of Policy Activity Related to Greenhouse Gas Emissions Management**

Scale	Recent activity
<b>International</b>	The world's leaders met in Copenhagen in December 2009 to negotiate the next international climate agreement to follow the Kyoto Protocol, which is set to expire in 2012. While the Copenhagen Summit did not result in any legally binding emissions reductions targets, the Copenhagen Accord which was drafted by the United States, China, Brazil, India and South Africa calls for nations to take actions to keep increases in global temperatures below 2 degrees Celsius.
<b>Federal</b>	The US Congress is considering sweeping energy and climate legislation. In parallel, the US EPA has issued mandatory reporting guidelines for large emitters. Other energy and economic stimulus legislation recently passed by the federal government supports renewable energy development and other climate-related initiatives.
<b>Regional</b>	The three regional initiatives – Western Climate Initiative (WCI), Midwest Greenhouse Gas Accord (MGGA), and Regional Greenhouse Gas Initiative (RGGI) – continue to move forward and prepare for implementation (in the event that the federal government does not enact climate legislation) or pre-emption (if federal law takes over). RGGI is already underway as of 2008.
<b>State</b>	In Oregon, recent legislation includes climate and energy bills targeting fuels, solar power opportunities, and GHG emissions from land use and transportation. A number of statewide efforts are facilitating the widespread deployment of electric vehicles. Dozens of states are taking these and similar actions.
<b>Local</b>	At the local level, over 900 cities across the country have signed the US Mayors Climate Protection Agreement, including 13 in Oregon and the City of Hillsboro. A comprehensive GHG inventory is a critical step toward fulfilling a signatory's commitments. Most communities are still at early stages, so we hope Hillsboro's work here will provide encouragement, momentum and a good example to communities elsewhere. Additionally, efforts in the Portland Metro region, including discussions of a

Metro GHG inventory and policy options to encourage the reduction of GHG emissions, will further drive efforts to reduce emissions in the Metro area.

## CURRENT RELATED REGULATORY REQUIREMENTS OF THE CITY OF HILLSBORO

### Mandatory Reporting in Oregon

The Oregon Department of Environmental Quality (DEQ) will require GHG reporting for a wide range of entities, beginning in 2010 for the 2009 calendar year. The threshold for reporting is currently set at 2,500 MT CO<sub>2</sub>e (metric tons carbon-dioxide equivalent) annually. In general, the sources and entities required to report are holders of Title V air pollution permits or Air Contaminant Discharge Permits (ACDP), with at least one discrete permitted source emitting above the threshold.

For more information on Oregon's rules, visit DEQ's GHG reporting web page.

As currently articulated, rules will not require reporting from many organizations that have aggregate emissions from multiple sources (building energy, fleet fuel, etc.) that together exceed the reporting threshold. Municipal governments and other facilities organizations likely fall into this category of non-reporters. As a result, only a few Oregon municipalities will have regulatory reporting burdens, but many are likely to have total emissions from local government operations that well exceed 2,500 MT CO<sub>2</sub>e annually.

While this inventory is for 2007 emissions, if the results follow a similar trend for 2009, this will be the case for the City of Hillsboro. In 2007, Hillsboro's owned, direct emissions (Scope I as defined by the World Resources Institute in The Greenhouse Gas Reporting Protocol) totaled 3,244 MT CO<sub>2</sub>e (this includes fleet emissions, natural gas consumption and refrigerant emissions), but no single source of stationary fuels exceeded the 2,500 MT CO<sub>2</sub>e threshold. Additionally, the City of Hillsboro does not

hold a Title V air pollution permit or an Air Contamination Discharge Permit. Therefore, Hillsboro is unlikely to have state regulated reporting requirements.

### Mandatory Reporting at the Federal Level

The U.S. Environmental Protection Agency (EPA) has also issued mandatory reporting guidelines, finalized in September 2009.

The threshold is 25,000 MT CO<sub>2</sub>e per year. Therefore, the City of Hillsboro will not be required to report under the EPA guidelines.

It is possible that federal climate legislation will require participation by some large entities in carbon trading and auctions for emissions allowances. Given the current structure of proposed legislation, very few Oregon entities – and probably no government agencies – will have such responsibilities in the near term.

### Mandatory Reporting Resources

**Oregon:** Oregon's rules are posted at the Department of Environmental Quality web page.

**Federal:** EPA mandatory reporting guidelines are also posted online.

## BOUNDARIES

In many GHG inventory protocols, emissions sources and activities are classified as either producing direct or indirect GHG emissions. Direct emissions are those that stem from sources owned or controlled by a



particular organization. Indirect emissions occur because of the organization's actions, but the direct source of emissions is controlled by a separate entity.

To distinguish direct from indirect emissions sources, three "scopes" are defined for traditional GHG accounting and reporting purposes (WRI, The Greenhouse Gas Protocol, p. 25).

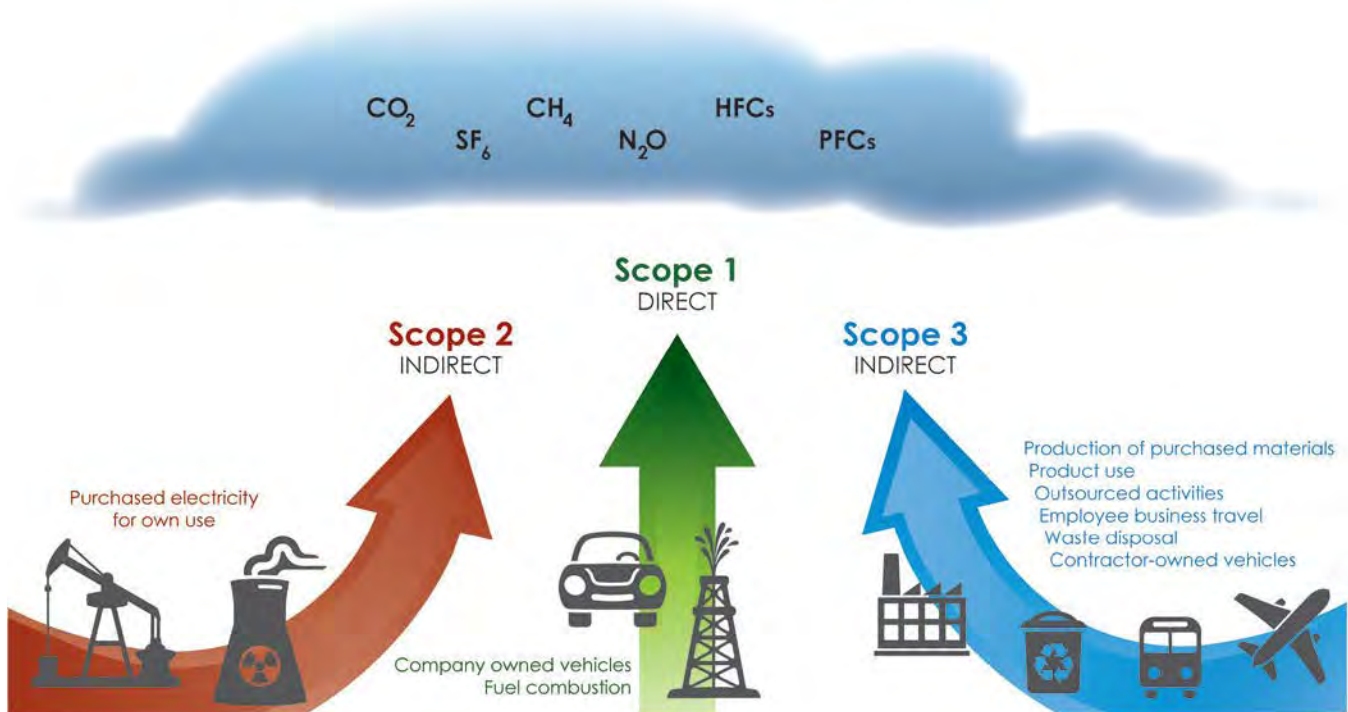
**Scope 1** – Direct sources of GHG emissions that originate from equipment and facilities owned or operated by the City of Hillsboro.

**Scope 2** – Indirect GHG emissions from purchased electricity, heat or steam.

**Scope 3** – All other indirect sources of GHG emissions that may result from the activities of the institution but occur from sources owned or controlled by another company or entity, such as: business air travel; embodied emissions in material goods purchased by the institution; emissions from landfilled solid waste; and the commuting habits of institution employees.

Scope 1 (direct) and Scope 2 (indirect) emissions must be reported for most protocols and registries. Scope 3 emissions are indirect and usually considered optional when reporting emissions, but serve to clarify an organization's entire carbon footprint and illuminate the potential regulatory and financial risks an institution may face due to its carbon footprint. Figure 1 illustrates the three scopes of emissions.

**Figure 1: Greenhouse Gases and Accounting and Reporting Scopes**



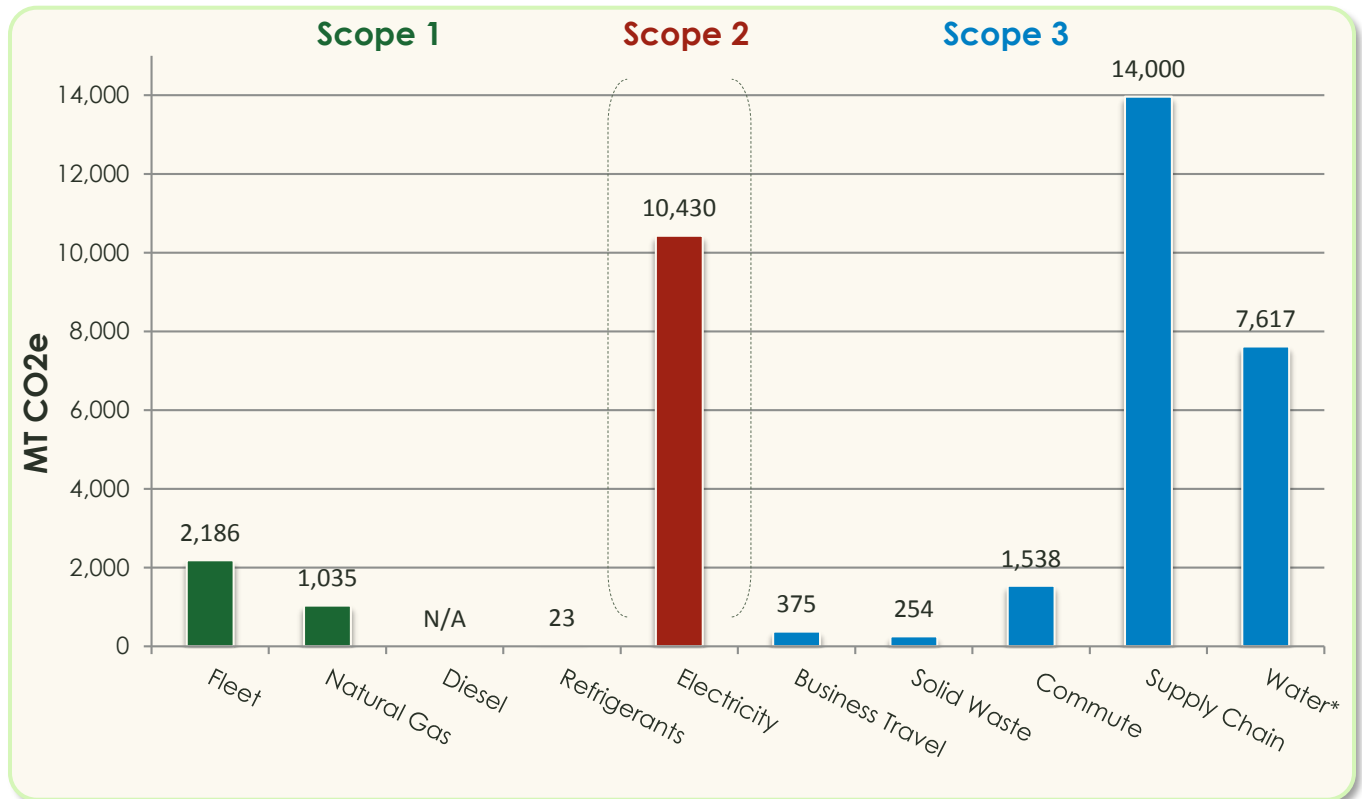
*Adapted from WRI/WBCSD Greenhouse Gas Protocol, Corporate Accounting and Reporting Standard (Revised Edition)*

## OVERVIEW OF RESULTS

The City of Hillsboro’s emissions from vehicle fuel and building energy consumption account for 13,674 metric tons carbon dioxide equivalent (MT CO<sub>2</sub>e), shown below in Figure 2 and described in Table 2 as Scope 1 and Scope 2 emissions. In addition, this inventory identified 23,746 MT CO<sub>2</sub>e of other

emissions from mission-critical activities related to City operations, but outside of its direct control (Scope 3). While the City of Hillsboro may not have direct control over these additional emissions sources, it can influence them. By calculating them here, the City of Hillsboro is able to explore these areas for emissions reduction opportunities.

**Figure 2: City of Hillsboro’s Greenhouse Gas Emissions from Local Government Operations (2007)**



(The inventory was carried out according to high-consensus protocols and tools, and in accordance with the guidelines of the Oregon Department of Environmental Quality. See Methods below for more detail.)

\* Water represents the City of Hillsboro portion of Joint Water Commissions (JWC) emission for water treatment and distribution.

Scopes I and II yield 13,674.1 MT CO<sub>2</sub>e. For sense of scale, this is *equivalent*<sup>2</sup> to:

- Annual emissions from 2,372 passenger vehicles
- Annual emissions from the energy consumed by 1,107 homes (US average)

Scope III emissions yield 23,745.8MT CO<sub>2</sub>e. For sense of scale, this is *equivalent* to:

- Annual emissions from 4,119 passenger vehicles
- Annual emissions from the energy consumed by 1,922 homes (US average)

**Table 2: Description of the City of Hillsboro’s Operational Greenhouse Gas Emissions Categories**

<sup>2</sup> Source: <http://www.epa.gov>

WRI Scope	Emissions Category	MT CO <sub>2</sub> e	Description
Scope 1 (Direct Emissions)	Fleet	2,186	This emissions category includes emissions from the following three sources: <ul style="list-style-type: none"> <li>• 401 owned fleet vehicles <ul style="list-style-type: none"> <li>○ 335 are powered by a blend of 90% unleaded gasoline mixed with 10% ethanol</li> <li>○ 49 are powered by ultra-low sulfur diesel</li> <li>○ 17 are powered by compressed natural gas (CNG)</li> </ul> </li> <li>• 40 owned other gasoline, diesel and propane equipment <ul style="list-style-type: none"> <li>○ 4 are powered by gasoline</li> <li>○ 35 are powered by diesel</li> </ul> </li> </ul>
	Natural gas	1,035	The City of Hillsboro uses natural gas for space heating at 25 facilities.
	Other fuels	N/A	The City of Hillsboro has nine diesel generators located at various buildings; however, a minimal amount of fuel is consumed by these generators. Data for this emissions source was not separated from diesel used in mobile vehicles; therefore, emissions from generators are accounted for in the fleet emissions.
	Refrigerants	23	The HVAC systems at the City of Hillsboro's facilities use HCFC-22 (commonly known as R-22) refrigerant. Though preferable to prior refrigerants including CFCs, the manufacture of R-22 contributes significant greenhouse gases to the atmosphere, and it still contains chlorine, which contributes to atmospheric ozone depletion. <sup>3</sup>
Scope 2 (Indirect Emissions)	Electricity	10,430	The City of Hillsboro calculated the electricity consumption from 30 buildings. Additionally, the city uses electricity for a range of other activities such as street lighting, traffic signals, and lighting at city parks. This electricity consumption totaled 13,731,652 kWh for 2007.  The GHG emissions shown here were calculated using the emissions factor for Portland General Electric, as reported to the EPA's Emissions & Generation Resource Integrated Database (eGRID). For a complete discussion of how this emissions factor compares to the regional mix, see the sensitivity analysis section below.
Scope 3 (Indirect Emissions)	Business travel	375	Business travel encompasses employees' use of airlines, rental cars, and personal vehicles for travel associated with training, conferences, and meetings.
	Solid waste	254	Six franchised waste haulers collect residential and commercial waste within City limits. Emissions for this section consist only of waste from City facilities. Waste includes dry (e.g., construction debris), wet (e.g., municipal solid waste), yard debris and recyclable materials including paper, plastic, metal and glass. Each of the two regional landfills (Columbia Ridge and Riverbend) where City waste is disposed currently capture and flare the methane GHG produced by the waste. According to the Metro government, Columbia Ridge has begun generating electricity from the methane, and Riverbend has plans to do so in the near term.
	Water Distribution	7,600	The City of Hillsboro purchases drinking water from the Joint Water Commission, the organization that treats water from the Tualatin River and the Barney Reservoir. The emissions reported here are based on a preliminary GHG inventory of the JWC and are prorated for Hillsboro based on the amount of water consumed by Hillsboro citizens (Hillsboro consumes roughly 40% of JWC water).

<sup>3</sup> Source: <http://www.epa.gov>

Commute	1,540	The City of Hillsboro employs 646 people. The majority of employees (83.5%) drive alone as the method of commuting. The average distance of travel was 15.2 miles one way. Of the 16.5% of employees who use alternative modes to commute to work, approximately 7% use light rail, 5% carpool, 2% ride the bus, 1.5% ride a bike, and 1% walk.
Embodied emissions in purchased goods and services	14,000	Embodied emissions in purchased goods and services accounts for emissions that result from all of the products and services the City of Hillsboro purchases. In 2007 there were over \$35.6 million worth of goods and services purchased by the City. These purchases were broken into four broad-based categories: Facilities and Construction (64%); Equipment (15%); Materials and Services (13%); and Professional Services (8%).

The results shown above indicate a substantial opportunity to reduce the emissions of GHGs from City operations. Scope 1, direct emissions, arise from sources over which the City has direct control and which reflect the greatest opportunity for reductions. Scope 2, indirect emissions, from electricity are substantial and also provide a significant opportunity for reductions. They are indirect because while Hillsboro demands and ultimately consumes the electricity, the City has no control over the types of fuels (coal, gas, etc.) that are used to generate the electricity at the utility level. Scope 3, indirect emissions, are those which are shared with entities providing the product or service (e.g., airplane for travel or from the production of purchased goods).

Given the anticipated growth of population in Hillsboro over the next several decades, this challenge will likely grow due to an increase in needed services by the growing population. However, improved efficiencies that reduce emissions are crucial to ensure that per-employee or per-capita emissions are reduced. This inventory allows City management and staff to understand in quantified terms which activities produce GHG emissions. With this information climate action teams will be better able to set reduction targets and to identify and implement projects to reduce emissions.

This inventory also provides an important stepping stone toward the development of a community-wide GHG inventory, which will be needed to engage the

broader community in actions to reduce GHG emissions.

## METHODS: DATA, PROTOCOLS, AND SENSITIVITY ANALYSIS

This inventory follows the Local Government Operations Protocol, which provides the highest-consensus guidelines for minimum reporting scope and was developed jointly by The Climate Registry and other organizations<sup>4</sup>. However, the protocol only requires the reporting of emissions in Scopes 1 and 2. This inventory has gone further to include several shared emissions categories from Scope 3. This use of additional high-quality public-domain tools to estimate Scope 3 emissions makes this inventory more state-of-the-art than inventories focused only on mandatory or bare-minimum boundaries. This more integrated and holistic approach paints a more accurate portrait of total emissions associated with the City of Hillsboro's mission-critical business activities.

All emissions are reported in metric tons of carbon-dioxide equivalent (MT CO<sub>2</sub>e). The analysis attempts to cover all six "Kyoto gases" including: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), sulfur hexafluoride (SF<sub>6</sub>) and the groups of high-GWP (global warming potential) gases, perfluorocarbons (PFCs) and hydrofluorocarbons (HFCs). Overwhelmingly, the direct and indirect CO<sub>2</sub>-equivalent emissions are CO<sub>2</sub> from combustion of fossil fuels.

<sup>4</sup> The Local Government Operations (LGO) Protocol was developed as a collaboration of The Climate Registry (TCR), the California Air Resources Board (CARB), the California Climate Action Registry (CCAR, now the Climate Action Reserve), and ICLEI Local Governments for Sustainability. The LGO Protocol follows the same format as The Climate Registry's General Reporting Protocol (GRP).

The analysis drew on high-consensus public-domain tools for emissions factors and methods. Some sources (such as natural gas consumption) are based on highly accurate data and accepted emissions factors. Other sources (such as employee commute) are estimated by combining available data with careful assumptions and sensitivity analyses. Still other sources (such as embodied emissions in purchased goods and services) were calculated using estimated data and emissions factors based on averages for the U.S. economy as a whole.

This section is designed to describe where the data was collected and the basic methodology, assumptions and level of estimation / accuracy for each emissions source.

## Fleet

The City of Hillsboro works with Bretthauer Oil as a primary fuel vendor (including compressed natural gas, CNG). Upon request, Bretthauer Oil provided City staff with reports outlining the amount of fuel purchased in 2007. The City of Hillsboro's Facilities and Fleet Department provided a vehicle list and information about overall fleet fuel efficiency. The Local Government Operations Protocol provided emissions factors for gasoline, diesel and CNG.

With two minor exceptions noted below, data related to vehicle fuel consumption is complete and results for this category of emissions should be considered highly accurate. A small amount of fuel may be unaccounted for due to employee use of personal vehicles for City business which wasn't expensed or if an employee purchased fuel for a City vehicle from a vendor other than Bretthauer. This would be a rare occurrence and is unlikely to change the stated emissions significantly. Additionally, the City owns one propane-powered stadium turf sweeper for which fuel is not accounted in the inventory. The equipment consumes a relatively small amount of propane which is purchased directly from a local vendor. Therefore, data for this fuel was not available for the inventory. However, staff verified that the vehicle is not frequently used and emissions are relatively insignificant and will not impact the overall emissions for the City fleet.

## Natural Gas

Northwest Natural, the City of Hillsboro's natural gas utility, provided consumption records for all City owned and leased facilities for 2007. Data related to natural gas consumption is complete and results for this category should be considered highly accurate. The Local Government Operations Protocol provided the emissions factor for natural gas based on an unspecified average heat content for the U.S.

## Other Stationary Fuels

The City of Hillsboro has nine generators located at various facilities. A relatively minimal amount of fuel is consumed by the generators. Data on fuel consumed by the generators was not differentiated from other fuel sources; therefore, the emissions from the fuel consumed by the generators were captured in the fleet emissions.

## Refrigerants

The City of Hillsboro uses refrigerants in facility HVAC systems and in several data storage rooms. Refrigerant is supplied by Johnstone Supply. The type of refrigerants used are R-22 and R-410A. Although the City has facilities that use both R-22 and R-410A refrigerants, for 2007 only R-22 was purchased. Purchasing reports indicate the City purchased 30 pounds of R-22 refrigerant in 2007.

## Electricity

Portland General Electric (PGE) is the utility that serves City of Hillsboro facilities with electricity. PGE provided the City of Hillsboro with an Annual Service Report showing total kWh annual consumption for 2007. This information was cross-referenced to the inventory of City facilities that was provided by Facilities and Fleet department.

The calculations reported in Figures 2 and 3 of this report are calculated using the emissions factor for PGE, as reported by PGE to the EPA's Emissions & Generation Resource Integrated Database for the most recent reporting period. The available data is from 2005; subsequent inventories will utilize the

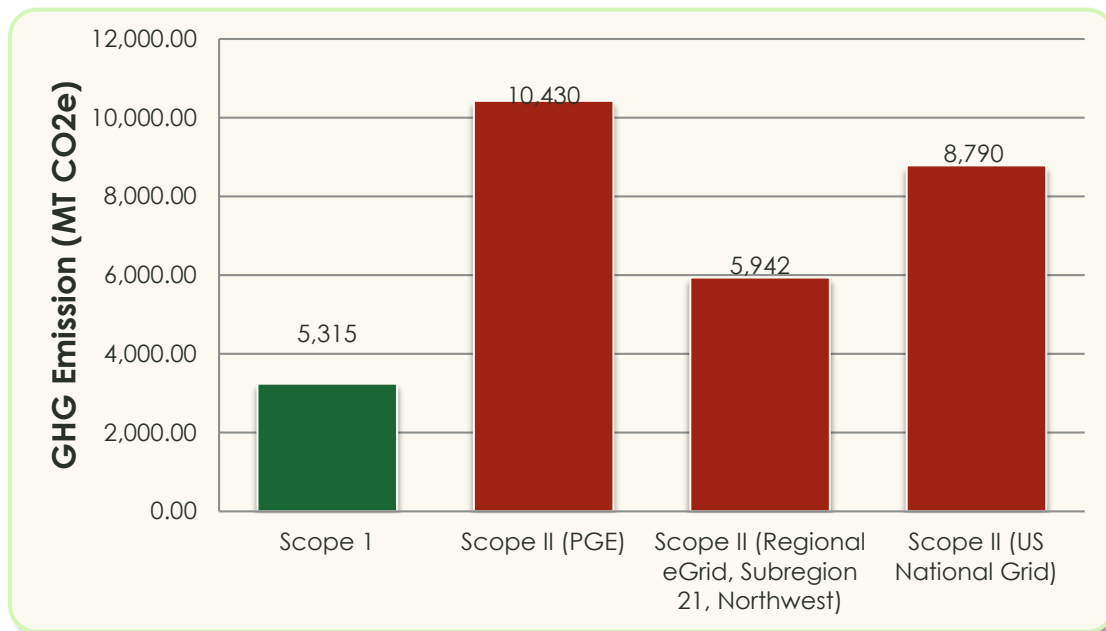
most current available data on the utility grid mix in order to ensure the most accurate emissions factor from electricity. The carbon intensity of PGE's generation is distinctly different from (i.e., higher than) the emissions of the regional and national grids. Since PGE is the utility directly serving the City of Hillsboro, it is considered to be the most accurate emissions factor to use in these calculations.

Virtually no utility is an island unto itself, and utilities are connected (often at peaks and troughs) to many outside power sources. Therefore, it is possible to argue that, because of this connectedness, the regional grid is the more meaningful number. Indeed,

in many cases, electricity is traded over long distances, so the national grid also has some meaning. When these differences exist, it is important to acknowledge the differences in order to be able to compare emissions to other organizations more accurately that may use one or more emissions factors in their calculations.

Figure 3 below shows how the emissions totals would differ for City of Hillsboro's Scope 2 emissions when using the local utility emissions factor for PGE, the regional mix for the Northwest Power Pool or the national mix for the United States.

**Figure 3: Electricity Emissions Scenarios for the City of Hillsboro using Local, Regional, and National Emissions Factors (2007)**



### Business Travel

Data for business travel was gained by collecting travel reimbursement forms submitted to the Finance Department. The travel reimbursement forms require employees to attach copies of airline tickets or mileage traveled by vehicle. Total airline miles for all trips were calculated using webflyer.com, which provided the mileage for given itineraries.

Emissions from rental vehicles was estimated based on the number of days vehicles were rented by

employees; specific data on mileage was unavailable. A range of mileage was averaged and applied to the total number of days that vehicles were rented. The range used was 10 to 75 miles; the average range was 43 miles resulting in 0.4 MT CO<sub>2</sub>e. If emission were based on the low end estimate of 10 miles, emissions for rental vehicles would be 0.1 MT CO<sub>2</sub>e; similarly, if the high range of 75 miles were used the emissions would be 0.7 MT CO<sub>2</sub>e.



The data for business travel does not include business travel by light rail or bus. At the time the GHG inventory was being conducted there was not an accurate source of data to indicate usage of public transportation for business travel, and therefore these emissions are not captured in this inventory. Additionally, there is inherent scientific uncertainty related to the impact of fuel combustion emissions on the upper atmosphere. Based on the best scientific data currently available, the air travel emissions reported here were calculated using a Radiative Forcing Index of 2.0.

### Solid Waste

Data on solid waste collection and disposal was provided by the City's departments, to ensure that all City-generated solid waste was accounted for, and from the City's 6 franchised waste haulers (Aloha Garbage, Cornelius Disposal, Garbarino Disposal, Hillsboro Garbage Disposal, Valley West Refuse Disposal, and Washington County Drop Box Service). Due to the limitations of the solid waste data, the numbers in this report are calculated based on the number of containers and frequency of collection from City facilities. In this methodology all containers are assumed to be full. Therefore, the total does not account for partially-full containers and is not 100% accurate. City staff continue to work with the waste haulers to devise methods to more accurately capture volume and/or weight of solid waste generated by City facilities.

### Water

Drinking water treatment and distribution to City facilities, residents and businesses is a major source of GHG emissions, since it takes a substantial amount of electricity to treat water and pump it throughout the community, and are therefore an important component of the City's GHG inventory. The City of Hillsboro shares water treatment and distribution infrastructure with and is the managing partner of the Joint Water Commission (JWC), a consortium of local government entities including Hillsboro, Forest Grove, Beaverton, Tigard and Tualatin Valley Water District (TVWD). As the JWC managing agency, the City of

Hillsboro Water Department maintains data for the JWC and provided data for this inventory.

At this time, the analysis includes only emissions from the City of Hillsboro's portion of JWC's electricity consumption and supply chain (embodied emissions from purchased goods and services). The City's portion was calculated by applying the City's percentage (39.3%) of water use from the overall JWC electricity and supply chain. As the JWC completes its own inventory during 2010, other emissions sources will be added to the City inventory, as appropriate. However, electricity and supply chain are expected to be by far the largest emissions sources related to drinking water. The results for drinking water-related emissions are presented in this report for a sense of scale. In order to fully contextualize emissions related to drinking water treatment and distribution, a community-wide inventory will be needed. An approach for a community-wide inventory is under consideration by City staff and relevant neighboring jurisdictions.

For both the City and JWC inventories, the PGE grid mix has been utilized in order to provide consistency in methodology.

### Commute

To calculate the emissions from employees commuting to and from work, a survey was sent to all employees asking the distance they commute, what methods they use to get to work (i.e., drive alone, carpool, ride the bus, bike or walk), and their vehicle fuel efficiency. Approximately 220 responses (34% of all employees) were received; the responses were averaged and applied to all employees.

This data assumes that employees estimate their commute distance and fuel efficiency for their vehicles. A survey response rate of 34% is more than sufficient to apply this information for a reasonable estimate of commute emissions for the organization as a whole. While this methodology is reasonable and provides a useful sense of scale in understanding the impacts from this mission-critical activity, the amount of estimation inherent in the calculations means that it is less precise than other Scope 1 and 2 emissions

sources. This is indicated in our results by our use of fewer significant figures.

### Embodied Emissions in Purchased Goods and Services

For estimating the emissions associated with producing the goods and services purchased by the City of Hillsboro, this analysis relied on Economic Input-Output Life-Cycle Analysis (EIO-LCA), a public-domain tool developed by Carnegie Mellon University.<sup>5</sup>

The EIO-LCA tool provides GHG emissions data per dollar of product purchased for 491 sectors of the U.S. economy. City of Hillsboro staff collected information about categories and dollar value of purchases made in 2007. The data was then sorted into categories matching those in the EIO-LCA model and the emissions factors from the model were applied to each. The model provides emissions data per 1997 dollar, so a correction factor was applied to account for inflation based on the change in the Consumer Price Index for all goods and services minus food and energy between 1997 and 2007.

While City staff worked hard to collect information for purchases made by all City departments, it was impossible to know the specifics of each purchase, so categories were assigned based on the best information available and reasonable assumptions. Additionally, the model is based on averages of the

U.S. economy as a whole and does not differentiate between types of purchases such as virgin paper vs. 100% post-consumer recycled content paper. Approximately 2.5% of the aggregate purchases were excluded from the inventory because the purchased item(s) were unknown (specifically, credit card transactions with unlisted vendors).

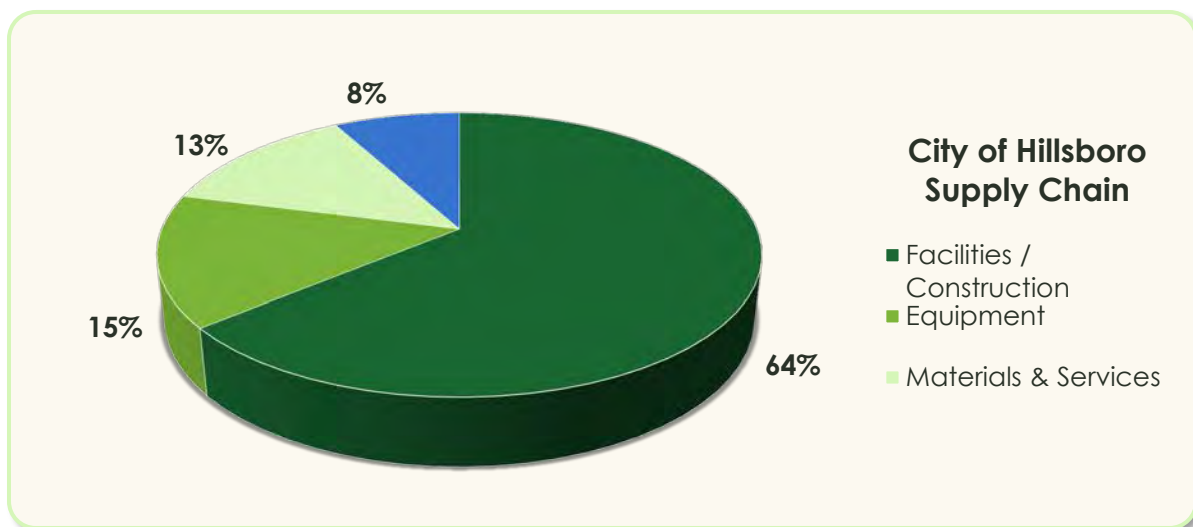
The emissions reported within this category are an estimation used for sense of scale purposes. They are different from all other Scope 1, 2, and 3 emissions sources in the degree of data estimation and methodological uncertainty. However, given the magnitude of the results it is important to understand that this area of emissions should not be ignored. In fact, supply chain management (purchasing) is arguably one of the most critical areas where the City may identify and implement efficiencies, including a reduction in overall purchases, which could have a significant impact on GHG emissions. Further, the City has an opportunity to influence emissions by reviewing its purchasing policies in consideration of the full supply chain, including manufacturing processes, resources required, and shipping locations of the materials and services the City utilizes. In this way the City can lead vendors and suppliers to improve product life cycle efficiencies and delivery of services. The City might also influence change in cooperation with neighboring jurisdictions by identifying opportunities to reduce volume, redundancies and life cycle impacts of purchases.

**Figure 4: Embodied Emissions in Purchased Goods and Services for the City of Hillsboro (2007)**

<sup>5</sup> Carnegie Mellon University Green Design Institute. (2008) Economic Input-Output Life Cycle Assessment (EIO-LCA), US 1997

Industry Benchmark model [Internet], Available from: <http://www.eiolca.net> Accessed 1 January, 2008.





## COST OF CARBON: QUANTIFICATION AND RISK

Assembling a GHG inventory is an opportunity to analyze a particular kind of financial risk, i.e., the implications of a “cost of carbon” – a direct or indirect cost associated with GHG emissions, as a result of policy. Many analyses of proposed legislation have indicated a likely range of this cost, and we can see examples in countries that have already capped CO<sub>2</sub> emissions.

A recent EPA analysis<sup>6</sup> of proposed climate policy suggests that, within a few years of implementing a cap-and-trade system, the cost of carbon could be around \$15 per MT CO<sub>2</sub>e. One proposed “reserve price” (or price floor) is \$10, while short-term “escape hatch” prices (or price ceilings) have been around \$30. This range provides a sense of the City of Hillsboro’s total direct and indirect financial exposure related to a cost of carbon.

This total financial risk is unlikely to be borne entirely by the City. Indeed, just as part of the carbon footprint is shared with others – from employees who commute to vendors that supply the organization with goods and services – the cost-of-carbon risk will likely be shared. The prices quoted above are an

approximation of the financial risk that could emerge under likely climate policy scenarios.

## SUSTAINABILITY EFFORTS AND CLIMATE ACTION AT THE CITY OF HILLSBORO

The City of Hillsboro has demonstrated a commitment to increasing efficiencies within its operations in order to reduce costs, improve the quality of life for City residents, and to make a significant contribution to the reduction of environmental impacts, including emissions of GHGs. In 2007, the City signed the U.S. Conference of Mayors Climate Protection Agreement to regularly measure GHG emissions, continue to implement emissions-reducing projects, and to reduce emissions to 7% below 1990 levels.

Specific actions that the City has taken include conversion of all City red, green and stop-hand traffic signals to high efficiency light emitting diode (LED) bulbs, rebates to citizens to purchase high efficiency clothes washers to reduce water use and associated energy, building permit fee waivers for renewable energy systems, procurement of alternative fuel fleet vehicles and electric vehicle charging stations, purchase of renewable energy, flex work schedules to reduce commuting, photovoltaic solar energy systems, and construction of the nation’s second

<sup>6</sup> [http://www.epa.gov/climatechange/economics/pdfs/HR2454\\_Analysis.pdf](http://www.epa.gov/climatechange/economics/pdfs/HR2454_Analysis.pdf)

Leadership in Energy and Environmental Design (LEED) Gold certified municipal building in 2005.

To further its commitment to sustainability and GHG reduction, the City has hired a full-time sustainability project manager to develop a comprehensive program including a baseline of internal operations and corresponding data, formation of a City-wide sustainability steering committee, and coordination of sustainability projects across all City departments.

The City is also a recipient of U.S. Department of Energy (DOE) Energy Efficiency and Conservation Block Grant (EECBG) funding that will allow the City to develop a comprehensive Energy Efficiency and Conservation Strategy (EECS) and Climate Action Plan that will contain goals strategies and projects to reduce City energy use and GHG emissions. This report is a key tool that will allow City staff to measure the impact of projects going forward and to report on progress.

**Table 3: Potential Climate Action Opportunities and Existing Efforts by the City of Hillsboro**

Category	Climate Action Opportunities	Current Level of Action at the City of Hillsboro
<b>Policy</b>	-Signatory to the U.S. Conference of Mayors Climate Protection Agreement	-Building permit fee waiver for renewable energy systems -Completed initial internal GHG inventory
<b>Planning</b>	-Targeted sustainability and energy planning efforts -Leveraged federal funding for energy use reduction and greenhouse gas reduction efforts	-Established goals/targets for energy use and GHG reduction -Established working groups to identify energy and GHG reducing projects -Developed Energy Efficiency and Conservation Strategy -Creating Climate Action Plan
<b>Transportation</b>	-Alternative and fuel efficient vehicles -Electric vehicle charging infrastructure -Low-carbon fuels for fleets -Bicycle and pedestrian facilities and incentives -Flex work schedules -Employee mass transit benefit program -Street signal timing projects	-Substantial fleet of alternative fuel and hybrid vehicles -TriMet pass -Flex work schedules -Streetlight signal timing optimization -Installation of electric vehicle charging stations -Retrofit school and pedestrian crossing "beacons" to solar
<b>Buildings and Energy</b>	-Building systems efficiency -On-site renewable power generation -Renewable power purchasing -Other green building strategies -Refrigerant management / phase-out	-LEED Gold City Hall -City Hall 100% Clean Wind renewable energy program through electric utility -Conducted energy efficiency assessments and retrofits -Installed two solar energy systems; plans for three more
<b>Solid Waste and Recycling</b>	-Recycling -Source reduction / use less -Ensure landfill management (vendor specifications)	-City facilities provide recycling for employees

Category	Climate Action Opportunities	Current Level of Action at the City of Hillsboro
<b>Purchasing / Procurement</b>	<ul style="list-style-type: none"> <li>-Green / sustainable purchasing guidelines/policies</li> <li>-Specifications for vendors</li> <li>-Building standards</li> </ul>	<ul style="list-style-type: none"> <li>-City guidelines that encourage selection of more sustainable products (e.g., recycled content paper)</li> <li>-City contracts encourage vendors to recycle and use sustainable materials</li> <li>-Contractors for design/build of City facilities scored in part on sustainability aspects</li> </ul>
<b>Water</b>	<ul style="list-style-type: none"> <li>-Energy generation through renewable energy systems, including solar, hydro</li> <li>-Water conservation</li> <li>-Water re-use</li> </ul>	<ul style="list-style-type: none"> <li>-Solar system incorporated into City reservoir (also noted above)</li> <li>-Comprehensive water conservation program, including education and outreach and incentives for efficient appliances</li> <li>-Parks maintenance facility utilizes water reuse system for equipment washing</li> <li>-Installed variable flow pumps (VFD)</li> </ul>
<b>Infrastructure construction / development Maintenance</b>	<ul style="list-style-type: none"> <li>-Alternative paving options</li> <li>-Materials reuse and recycling</li> <li>-High efficiency traffic and street lighting</li> <li>-Mechanical aspects, such as variable flow/speed devices, upgraded controls, boilers, etc</li> </ul>	<ul style="list-style-type: none"> <li>-Implementing porous concrete ally</li> <li>-Operational reuse of aggregate, other materials</li> <li>-Replaced all red and green traffic signals with high efficiency LEDs</li> <li>-Deployed HVAC control systems to maximize efficiency of heating/cooling systems</li> <li>-Installed high efficiency boilers</li> <li>-Variable speed water pumps in fountains</li> </ul>
<b>Business travel</b>	<ul style="list-style-type: none"> <li>-Other fuels/vehicles strategies</li> <li>Videoconferencing</li> </ul>	<ul style="list-style-type: none"> <li>-Efforts to teleconference are made</li> <li>-Considering videoconferencing</li> </ul>

## CONTACT INFORMATION AND ADDITIONAL RESOURCES

Acknowledgments: Peter Brandom, Rene Heade and Andrew Bartlett conducted this inventory for the City of Hillsboro. Numerous City staff contributed data to the GHG inventory, including Michael Bakkum, George Cartales, Ambrose Duda, Nico Geerling, Roberta Heim Mueller, Steve Heldt, Nicki Iverson, Brian Kennedy, Suzanne Linneen, Brian Lovelin, Scott Magers, Ken Pipher, Toni Plunkett, Henry Reimann, Mike Smith, and Jennifer Weiland Engstrom.

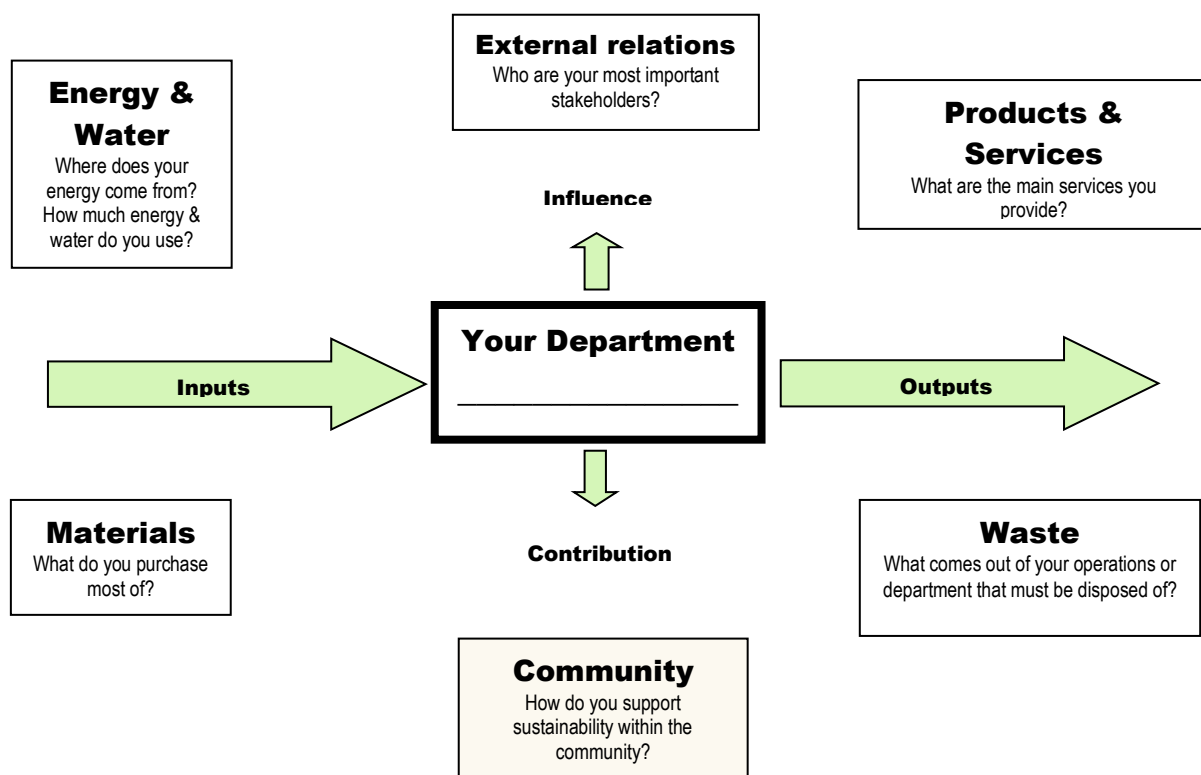
Contact Peter Brandom at [peterb@ci.hillsboro.or.us](mailto:peterb@ci.hillsboro.or.us) or 503-681-6191 for more information.

This GHG inventory was completed as a part of the City of Hillsboro's participation in Operation Climate Collaborative (OCC), a multi-jurisdictional process led by Good Company. Good Company facilitated the use of its proprietary calculation tool (Good Company's Carbon Calculator, or G3C), technical assistance related to and quality checks of the calculator's use, offered support and guidance in data gathering and the development of estimation methods, and provided the template for this document. Staff of the City prepared this report. For more information about OCC, contact Good Company at 541-341-4663.

## APPENDIX E — BASELINE DATA: IMPACTS ASSESSMENT

The City assessed the current state of City operations relative to sustainability using an impacts assessment which allowed them to paint a high level picture of current operations as they relate to sustainability. The impacts assessment augments other quantitative baseline data to form a baseline of operations.

In the impacts assessment, the SSC applied the sustainability criteria it established to current operations in order to identify gaps between current City operations and more sustainable operations. The SSC examined each of the following key aspects of the City’s operations<sup>7</sup>.



Below are the current impacts from City operations drawn from this analysis. After examining the lists, the SSC identified those impacts that were of highest priority either because they represent a major part of operations or because of the potential for improving the City’s overall environmental/social footprint. Those priorities are **bolded** in the chart, and became the initial focus areas around which the working groups have been organized.

<sup>7</sup> The scope of this Plan is internal City operations and therefore does not include community impacts at this time.

<p><b>Energy and water impacts</b> Biggest: <b>electrical</b>; CNG; natural gas; air travel; <b>gasoline</b>; <b>diesel</b>; oils; propane</p>	<p><b>External relations</b> Biggest: <b>contractors</b>, architects/engineers, industrial customers, construction, citizens, other utilities, other governments, <b>developers/real estate</b>, <b>vendors/suppliers</b>, existing and future businesses. Non-profits. Elected and appointed officials. Employees/applicants. <b>Chamber of Commerce</b></p>	<p><b>Products and services</b> Biggest: less paper-based; wireless; e-permits, codes, electronic document retention, field lights, different treatments methods, new equipment, education, pre-fire plans. Land use/transport planning. Reuse of construction &amp; maintenance materials. Inspection frequency/duplication; funding models. <b>Policies for sustainable practices</b></p>
<p><b>Materials</b> Biggest: <b>construction</b>, asphalt, oils, concrete, gravel, sand, wood, magnesium chloride, herbicides, steel, chemicals (treatment), land. <b>Paper</b>, computer services, telephones, computers. Safety equipment/ <b>disposables</b>. Extinguishing agents, operations, solvents, landscape, pool chemicals. Office equipment/supplies. Consulting services</p>	<p><b>Community</b> [Future effort]</p>	<p><b>Waste</b> Biggest: <b>paper products</b>, <b>construction materials</b>, concessions/imported waste, hazardous waste, old vehicles, e-waste</p>

## APPENDIX F — SUSTAINABILITY AS AN OPERATIONAL PRINCIPLE

Sustainability has emerged as a key organizing principle for public and private organizations throughout the United States and the world to address environmental, economic, and social challenges within and outside their organizations. Sustainability reflects a shift from concern and action on *environmental* issues to the broader understanding that depletion of environmental resources and services has a significant, direct impact on economic opportunity and social equity.

The roots of the sustainability paradigm are traced to the origins of the environmental movement that led to passage in the 1970's of key global treaties related to the environment, as well as new U.S. environmental laws and amendments, including the National Environmental Policy Act, Clean Water Act, Clean Air Act (amendments), and the Endangered Species Act.

In 1983, the Brundtland Commission was formed by the United Nations to study and pursue global environmental strategies to achieve sustainable development by 2000. The 1987 publication of the Brundtland Commission's work, *Our Common Future*, established what has now become the widely accepted definition of sustainability.<sup>8</sup> This definition<sup>9</sup> seeks consideration of resource availability and equity for current generations as well as for future generations. In 1992, the United Nations Conference on Environment and Development in Rio de Janeiro (Earth Summit) was organized with sustainability as the central theme, further cementing it as a key organizing principle. A key outcome of the Earth Summit was the recognition that regional and local action is crucial in order to realize the implementation of sustainability. This was expressed by the Earth Summit delegation through the adoption of Agenda 21 which, among other things, called for action by local governments to implement sustainability.

Beginning in the mid-1990's, implementation of sustainability began, largely among multi-national corporations and national governments, as well as in some regions and localities. These efforts helped organizations clarify the purpose and goals of programs and policies related to sustainability, and it provided a framework for reporting on performance. For example, global companies began to issue annual sustainability reports, allowing shareholders and citizens to better understand the impacts of company operations and efforts to reduce negative impacts.

In the early 2000's, some larger cities in the U.S. began to develop sustainability programs. At that time, private companies and public organizations began to more clearly see the benefits of sustainability for their employees, stakeholders, image, and bottom line. Several cities in Oregon have been at the leading edge of these efforts, and in some cases have implemented sustainability projects and activities. Today, more small and medium-sized cities in the U.S. are developing and implementing sustainability programs in order to capture and measure the impact of these types of projects, and to organize efforts across city departments. Some of the City of Hillsboro's efforts are listed in Appendix H.

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<sup>8</sup> "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs"

<sup>9</sup> Definitions for *sustainable development* and *sustainability* are often the same and are used interchangeably here

## APPENDIX G — SELECTED PRIOR SUSTAINABILITY PROJECTS

The City of Hillsboro continues to move forward on critical sustainability projects and programs. Some, though not all, of these efforts are listed below. These efforts will be captured in the Sustainability Plan going forward, including quantitative impacts of their implementation. Projects include:

- Installation of high efficiency LED traffic signal bulbs beginning in 1996;
- February 2010 completion of the City's first local government operations greenhouse gas inventory, which provides an important baseline for emissions reducing actions. The inventory satisfies the commitment made by the City as a signatory to the U.S. Conference of Mayors Climate Protection Agreement and will be reviewed and updated annually;
- Initiate the development of a Climate Action Plan 2009;
- Maxicom watering system throughout City parks system waters parks based on climatic conditions, reducing overall water use;
- Water re-use system at Parks Maintenance facility reduces potable water use for equipment washing;
- Replacement of City holiday lights with high efficiency LED lights;
- Design and construction of Hillsboro Hometown Tap watering station for use at public events to provide alternative to disposable plastic water bottles;
- Public/private DEQ grant funded food waste reduction pilot project at Intel cafeterias;
- Renewable energy:
  - Total of nearly 200kW of solar installed by end of 2010: installation of solar array on Civic Center, 99kW solar array installed 2008, 61kW solar array installed on ITF building 2010, 20kW solar array installed on Cherry Lane Fire Station 2010, conversion of all City pedestrian and school crossings to solar 2010.
  - Hydrogen fuel cell at Ronler Acres Fire Station powers part of facility;
- Green building program – continue to incorporate sustainability into every new building we develop in order to reduce energy use, exposure to toxic materials, and overall resource use and environmental impacts. Projects include:
  - Hillsboro Civic Center achieved LEED Gold certification upon completion in 2005, just the 2<sup>nd</sup> LEED Gold municipal building in the U.S. at that time;
  - Main Library incorporates many of the Leadership in Energy and Environmental Design (LEED) standards in its design and construction;

- Inter-modal Transit Facility (ITF), adjacent to the light rail line in downtown Hillsboro constructed with locally and regionally sourced materials, has recycled 97.5% of all construction waste to date, will include a roof-mounted solar array to produce nearly all of the daytime energy needs of the facility, and will include a secured bicycle parking facility with shower rooms and changing areas;
- Two new fire stations have been designed to achieve Leadership in Energy and Environmental Design (LEED) certification. When completed, will use 30% less water and 25% less energy than conventional buildings, and solar panels will generate as much as 18% of each station's energy needs;
- Energy efficiency retrofits – 2009/10 retrofits at three facilities estimated to save City \$16,000 per year in energy costs. Further retrofits underway;
- Installation of 16 electric vehicle charging stations, beginning in summer 2009, including State's first level II charging station in summer 2010;
- February 2010 recognition by the Columbia-Willamette Clean Cities Coalition with the Government Fleet of 2009 Award for commitment to alternative fuel vehicles;
- Fleet operation certified as an EcoBiz 2010;
- Street signal timing optimization project will alleviate delays on City arterials, reducing idling, fuel consumption and emissions;
- In partnership with our local utility, PGE, recently completed Green Power Challenge campaign to increase the purchase of renewable power. More than doubled goal of 300 with 731 total new sign-ups, including 51 new businesses;
- Recognized as an EPA Green Power Community 2010;
- 2009 Business Recycling Ordinance requires City businesses to recycle and supports business recycling programs.



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