

# CONTRA COSTA COUNTY

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## Greenhouse Gas Emissions Inventory Report



AUGUST 2007

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**This report was prepared for the Contra Costa County Board of Supervisors  
by Dana Riley, Intern  
(edited by the County's Climate Change Working Group and their staff designees)**

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### Contra Costa County

Mitch Avalon, Deputy Director - Flood Control  
Richard Battersby, Fleet Manager  
Robin Bedell-Waite, Green Business Program Coordinator  
Kevin Berenson, Purchasing and Materials Manager  
Sam Cuzzocrea, Account Clerk  
Deidra Dingman, Solid Waste Program Manager  
Heba El-Guendy, Senior Transportation Planner  
Julie Enea, Senior Deputy County Administrator  
Lori Gentles, Director of Human Resources  
Steven Goetz, Deputy Director - Transportation Planning  
Andy Green, Energy Program Manager  
Roland Hindsman, Facilities Maintenance Manager  
Steve Jordan, Senior Capital Projects Manager  
Rob Lim, Capital Projects Division Manager  
Terry Mann, Deputy Director of General Services  
Maria Martinez, Account Clerk  
Doug Parker, Lead Stationary Engineer  
Les Richardson, Supervising Capital Projects Manager  
Steve Silveira, Administrative Services Officer  
Kristine Solseng, Senior Geographic Information Systems Planner  
Bob Tamori, Grounds and Workfare Services Manager

### Other Agencies and Organizations

Michelle Bennett, Contra Costa Transfer and Recovery Station  
Jon Carlson, City of Brentwood  
Sal Coniglio, Garaventa Enterprises  
Janna Coverston, Richmond Sanitary Service  
Brooke Lee, ICLEI - Local Governments for Sustainability  
Xico Manarolla, ICLEI - Local Governments for Sustainability  
Bill McLaren, Pacific Gas & Electric  
Chanel Patterson, Allied Waste Services  
Alex Ramel, ICLEI - Local Governments for Sustainability  
Randy Schmidt, Central Contra Costa Sanitary District  
Ayrin Zahner, ICLEI - Local Governments for Sustainability

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# 1. INTRODUCTION

## 1.1 Climate Change Legislation in California

California's *Assembly Bill No. 32: the Global Warming Solutions Act* (Nunez 2006) requires California to reduce its greenhouse gas (GHG) emissions to 1990 levels by 2020. Meeting this target will require that the state government record and report California's GHG emissions for 1990 and for future years through 2020, using periodic GHG emissions inventories. Additionally, many local governments are monitoring their own GHG emissions in order to reduce their impact on climate change.

## 1.2 Contra Costa County's Climate Protection Efforts

Contra Costa County's commitment to mitigating climate change began in May 2005, when the Board of Supervisors convened department heads in a Climate Change Working Group to identify existing County activities and policies that potentially reduced its GHG emissions. The County's Climate Change Working Group is comprised of the Agricultural Commissioner and the Directors of the following County departments: Building Inspection, Community Development, General Services, Health Services and Public Works. In November 2005, the Climate Change Working Group presented its Climate Protection Report to the Board of Supervisors, which included a list of existing and potential GHG reduction measures (available online at [www.cccrecycle.org/climate/](http://www.cccrecycle.org/climate/)). To quantify Contra Costa County's current GHG emissions and to evaluate the impact of these GHG reduction measures, the Board of Supervisors approved a resolution in February 2007 to join the International Council for Local Environmental Initiatives (ICLEI) and to conduct a GHG emissions inventory of Contra Costa County's countywide and municipal emissions, resulting in this report.

## 1.3 The Purpose of the GHG Emissions Inventory

Numerous federal, state, and local governments are conducting inventories of their GHG emissions in order to identify emissions sources and to plan for and track reductions over time. After conducting a GHG emissions inventory for a baseline year, municipalities can target their efforts to address the most significant emissions sources and effectively reduce their overall emissions. Projected "business-as-usual" forecasts provide a benchmark against which the municipality can measure reduction progress.

The GHG emissions inventory uses data on energy use, fuel use, and waste generation to capture emissions from both municipal operations and from countywide activities. However, the GHG inventory does not capture all sources of GHG emissions, such as emissions from air travel, the transportation of waste to disposal locations, or the burn-off of feed stock fuel components at refineries.

The GHG inventory is only the first of five milestones in ICLEI's Cities for Climate Protection Campaign. Upon completion of the GHG inventory, the municipality sets a GHG reduction target and then develops a Climate Action Plan to achieve this target.

## 2. CONTRA COSTA COUNTY GHG EMISSIONS INVENTORY

### 2.1 Baseline GHG Emissions Inventory

The GHG emissions inventory was conducted using 2006 as the baseline year due to data availability. After data was collected from various County departments and external agencies and organizations (see Appendix A for detailed notes on data collection methods), it was entered into ICLEI's Clean Air and Climate Protection (CACP) software to generate the results shown in Tables 2.1 through 2.3. Clean Air – Cool Planet's emissions calculator was used for the waste sector due to preferable methodology for the treatment of highly efficient landfills. The inventory examines emissions at two levels: countywide and County municipal operations. The County government has the most control over and, therefore, the greatest power to reduce emissions from its municipal operations.

This first table shows GHG emissions from countywide activities, including energy use, vehicle transportation, and waste disposal. Additionally, energy use is broken down into the residential, commercial, and industrial sectors. The sources that represent the largest percentages of total emissions tend to be the focus of reduction efforts.

Table 2.1. Countywide GHG emissions – 2006

EMISSIONS SOURCE	MTCO <sub>2</sub> E*	% OF TOTAL EMISSIONS
<b>Energy Use</b>	<b>12,376,133</b>	<b>68%</b>
Residential	2,189,540	12%
Commercial	1,306,787	7%
Industrial	8,879,806	49%
<b>Transportation</b>	<b>5,606,857</b>	<b>31%</b>
<b>Waste</b>	<b>183,386</b>	<b>1%</b>
<b>TOTAL</b>	<b>18,166,376</b>	<b>100%</b>

\* MTCO<sub>2</sub>e, or metric tons of carbon dioxide equivalent, describes the amount of carbon dioxide that would have the same climate change potential as the actual assortment of greenhouse gases.

Table 2.1 shows that a large proportion of Contra Costa County's countywide GHG emissions result from industrial energy use and transportation. The high emissions number for industrial energy use is largely due to natural gas use in the refineries located in Contra Costa County. However, as mentioned previously, the industrial emissions number shown is exclusively based on energy use and does not include emissions from refinery operations.

This second table spotlights GHG emissions generated by Contra Costa County municipal operations, broken down into the larger categories of energy use, fuel use by the vehicle fleet, and waste disposal. Note that the emissions in this table are a *subset* of the total countywide emissions reflected in Table 2.1.

Table 2.2. Municipal GHG emissions – 2006

EMISSIONS SOURCE	MTCO <sub>2</sub> E*	% OF TOTAL EMISSIONS
<b>Energy Use</b>	<b>29,183</b>	<b>71%</b>
Buildings**	27,758	68%
<i>Electricity</i>	18,643	45%
<i>Natural Gas</i>	8,857	22%
<i>Propane</i>	228	1%
<i>Stationary Diesel</i>	30	0%
Streetlights	1,359	3%
Water/Sewage	66	0%
<b>Vehicle Fleet</b>	<b>9,972</b>	<b>24%</b>
Gasoline	8,850	22%
Diesel	741	2%
B20 Biodiesel	241	1%
Compressed Natural Gas (CNG)	140	0%
<b>Waste</b>	<b>1,902</b>	<b>5%</b>
<b>TOTAL</b>	<b>41,057</b>	<b>100%</b>

\* MTCO<sub>2</sub>e, or metric tons of carbon dioxide equivalent, describes the amount of carbon dioxide that would have the same climate change potential as the actual assortment of greenhouse gases.

\*\* The building energy use number does not include all leased facilities.

Table 2.2 shows that a large proportion of Contra Costa County’s municipal GHG emissions result from building electricity and natural gas use and from fleet gasoline use. The disposal of waste generated by Contra Costa County facilities and operations represents a less significant part of the municipal emissions inventory.

There is currently a larger debate occurring about whether the local government should include, and therefore take responsibility for, the GHG emissions from employee commute; many governments choose not to include employee commute in their inventories. However, because Contra Costa County has this data readily available (from the Community Development Department), these emissions are included below—but separately from the previous table that focuses solely on municipal operations.

Table 2.3. Municipal GHG emissions, including employee commute – 2006

EMISSIONS SOURCE	MTCO <sub>2</sub> e*	% OF TOTAL EMISSIONS
<b>Energy Use</b>	<b>29,183</b>	<b>42%</b>
Buildings	27,758	40%
<i>Electricity</i>	18,643	27%
<i>Natural Gas</i>	8,857	13%
<i>Propane</i>	228	0%
<i>Stationary Diesel</i>	30	0%
Streetlights	1,359	2%
Water/Sewage	66	0%
<b>Vehicle Fleet</b>	<b>9,972</b>	<b>14%</b>
Gasoline	8,850	13%
Diesel	741	1%
B20 Biodiesel	241	0%
CNG	140	0%
<b>Waste</b>	<b>1,902</b>	<b>3%</b>
<b>Employee Commute</b>	<b>29,180</b>	<b>42%</b>
<b>TOTAL</b>	<b>70,237</b>	<b>100%</b>

\* MTCO<sub>2</sub>e, or metric tons of carbon dioxide equivalent, describes the amount of carbon dioxide that would have the same climate change potential as the actual assortment of greenhouse gases.

Table 2.3 demonstrates that, when included, employee commute is a very significant source of Contra Costa County’s municipal GHG emissions. In fact, employee commute represents as large a part as energy use in base year 2006.

Building energy conservation efforts are often focused on the buildings that use the most energy per unit area. Tables 2.4 and 2.5 illustrate the largest electricity and natural gas users, respectively, per square foot.

*Table 2.4. Top ten electricity-using buildings, per gross square foot*

<b>County Facility</b>	<b>GSF</b>	<b>kWh/SF</b>
048 40 Glacier - Sheriff's Dispatch (911)	17,268	44.81
277 595 Center Ave - Health Services/CC Health Plan	42,048	31.69
129 1960 Muir Rd - Forensic Sci Ctr (Morgue)	20,000	30.26
555 2500 Alhambra Ave - CC Regional Medical Center	228,000	29.23
387 847 C Brookside Dr - Homeless Shelter	7,500	26.17
613 1650 Cavallo Rd - Empl & Human Services	24,534	24.06
201 2500 Alhambra Ave - Old Co Hospital Bldgs	64,269	22.25
352 3052 Willow Pass - Concord Health Center	9,246	21.43
164 210 O'Hara Ave - Oakley PD/Sheriff Substn	3,921	20.52
007 1122 Escobar St - Crime Lab	8,764	19.69

*Table 2.5. Top ten natural gas-using buildings, per gross square foot*

<b>County Facility</b>	<b>GSF</b>	<b>therms/SF</b>
201 2500 Alhambra Ave – Old Co Hospital Bldgs	64,269	2.04
632 202 Glacier Dr - New Juvenile Hall	120,000	1.28
646 910 San Pablo Ave - West Co Animal Svcs	5,550	1.21
634 4800 Imhoff Dr - New Animal Shelter	38,633	1.16
129 1960 Muir Rd - Forensic Sci Ctr (Morgue)	20,000	1.02
387 847 C Brookside Dr - Homeless Shelter	7,500	0.89
390 5555 Giant Hwy - West Co Detention Facility	249,342	0.79
555 2500 Alhambra Ave - CC Regional Medical Center	228,000	0.70
010 1000 Ward St - Martinez Detention Facility	172,300	0.65
057 100 37 <sup>th</sup> St - Superior Court-Richmond	67,365	0.59

In an effort to compare Contra Costa County's GHG emissions totals with those of other counties, Table 2.6 uses population and employment data to calculate GHG emissions per person and per government employee. As counties are diverse in size, these metrics make it possible to compare emissions across counties.

Table 2.6. GHG emissions from three Bay Area counties

County	Base year	Community emissions (tons)	Community emissions per person (tons)	Residential emissions per person (tons)	Municipal emissions (tons)	Municipal emissions per employee (tons)
Contra Costa	2006	18,166,376	17.6	2.1	41,057*	5.0
Marin	2000	3,113,565	12.6	3.0	18,451	10.0
San Francisco	2000 2005**	9,700,000	13.0	2.5	213,898	7.7

\* This comparison uses Contra Costa County municipal emissions without employee commute as most municipalities do not include this in their GHG inventories.

\*\* San Francisco County's community emissions number represents year 2000, while their municipal emissions number (found in a subsequent report to the California Climate Action Registry) represents year 2005.

The emissions numbers above were obtained from the Marin County Greenhouse Gas Reduction Plan, California Climate Action Registry's Annual Emissions Report on San Francisco, and the Climate Action Plan for San Francisco. Population numbers were obtained from the U.S. Census Bureau, and government employment numbers were obtained from the Marin County Affirmative Action Report and the San Francisco Annual Report on Workforce Analysis. This data was obtained for the closest available year to the baseline inventory year.

These numbers suggest that Contra Costa County has relatively low municipal GHG emissions, but relatively high countywide GHG emissions. However, as illustrated in Table 2.7, even when controlling for population size, many other differences between counties make a direct comparison of countywide emissions misleading.

Table 2.7. Countywide source comparison for three Bay Area counties

Emissions source	% of total countywide emissions		
	Contra Costa	Marin	San Francisco
Energy Use	68%	47%	49%
Residential	12%	24%	19%
Commercial	7%	22%	20%
Industrial	49%	1%	10%
Transportation	31%	50%	51%
Waste	1%	3%	Included in industrial

Sources: The Marin County Greenhouse Gas Reduction Plan and the Climate Action Plan for San Francisco.

Table 2.7 shows that almost 50% of Contra Costa County's countywide emissions result from its significant industrial base, while this sector represents only 1% and 10% for Marin County and San Francisco County, respectively.

## 2.2 Impacts of Recently Implemented GHG Reduction Measures

Contra Costa County has already implemented many measures that have reduced its GHG emissions. These measures were originally identified in the November 2005 Climate Protection Report (#s listed in the below table originated from that report), and have been updated by the Climate Change Working Group staff designees for this report. Table 2.8 lists existing measures and summarizes the annual GHG reductions from these measures where activity reduction data was available (e.g. kilowatt hours of electricity reduced, commute miles traveled reduced, or waste tonnage diverted). The annual GHG reduction potentials were modeled by the CACP software (and Clean Air – Cool Planet’s software for the waste sector). The activity reduction data needed for modeling was not readily available for most measures, but could be derived by the listed departments in some cases.

Table 2.8. GHG reductions from existing measures and activities

Sector	#		Existing Measures to Reduce GHG Emissions	Dept	Annual MTCO <sub>2</sub> e reduction
<b>Countywide</b>					
land use	58	-	Establish urban growth boundaries	CDD	-
land use	61	a	Offer density bonuses for development projects that include specified number of affordable housing units	CDD	-
land use	62	a	Encourage mixed use development to limit some travel distances	CDD	-
buildings	64	a	Conduct a weatherization program to assist low and/or fixed income households in making their homes more energy efficient	BID	-
buildings	65	a	Adopt local ordinance to regulate wood burning appliances	BID	-
buildings	67	a	Allow use of cool roofing systems to reduce a building’s energy usage	BID	-
buildings	73	a	Adopt Green Building Guidelines for residential construction/remodeling	CDD	-
buildings	NEW		Require developers to provide information on commute alternatives available to residents or workers of their project (County Code, Chapter 82-32).	CDD	
site improvements	74	a	Require the preservation of trees in urban areas	CDD	-
site improvements	76	-	Require new developments to use drought-tolerant landscaping	CDD	-
site improvements	77	-	Require new developments to use water conserving irrigation systems	CDD	-
site improvements	78	a	Require new developments to install landscaping	CDD	-
site improvements	83	a	Require development projects to construct bicycle & pedestrian amenities	CDD	-
site improvements	85	a	Require certain large development projects to construct park-and-ride lots	CDD	-
site improvements	87	a	Require certain large development projects in designated transit areas to install features to support mass transit	CDD	-
waste	90	a	Inform local residents and business on how they can "Stop Junk Mail"	CDD	-
waste	91	a	Help businesses in unincorporated areas find opportunities to reduce waste	CDD	-
waste	92	a	Adopt residential variable can rate structures to promote reduction/recycling	CDD	-
waste	93	a	Curbside recycling is provided with all standard residential garbage service (2005: annual reduction of 13,642 tons)	CDD	2,206
waste	94	-	Offer home composting education and resources	CDD	-
waste	95	a	Provide residents and businesses with easily accessible information regarding local alternatives to disposal	CDD	-
waste	96	-	Encourage use of recycled materials by manufacturers	CDD	-
waste	97	a	Inform residents regarding the proper methods to manage their unwanted household chemicals and electronics (2005: annual reduction of 3,167 tons)	CDD	512
waste	98	-	Use methane from landfills to generate electricity	CDD	-
regional	104	-	Recognize businesses that adopt green business practices	HSD	-

Sector	#		Existing Measures to Reduce GHG Emissions	Dept	Annual MTCO2e reduction
<b>Countywide</b>					
regional	105	a	Adopt ordinance(s) to require the use of water conserving landscaping and irrigation systems in private development projects	CDD	-
regional	106	a	Work with member agencies to manage and fund development of HCP/NCCP to preserve & enhance habitats	CDD	-
<b>Municipal Operations</b>					
buildings	1	a	Require sustainable design and construction strategies for new projects	GSD	-
buildings	1	b	Implement a structural Integrated Pest Management (IPM) program for all County buildings (2007: all 135 County-owned facilities)	GSD	-
buildings	2	a	Design energy usage in new County buildings to be at least 10% below California's Title 24 requirements (2007: 3 buildings)	GSD	-
buildings	3	a	Install direct digital control (DDC) systems for heating, ventilating and air conditioning (HVAC) systems in major County facilities and new County buildings & remodels (2007: 33 buildings; annual reduction of 2,167,724 kWh and 208,143 therms*)	GSD	<b>2,462</b>
buildings	3	b	Improve, retrofit and replace HVAC systems in selected County buildings (2007: 15 buildings; annual reduction of 1,017,568 kWh and 45,004 therms)	GSD	<b>830</b>
buildings	4	a	Install state-of-the-art lighting technology and systems in selected County facilities (2007: 7 buildings; annual reduction of 1,271,421 kWh)	GSD	<b>690</b>
buildings	5	a	Install variable frequency motor drive technology in most possible buildings (2007: 9 buildings; annual reduction of 245,421 kWh)	GSD	133
buildings	5	b	Install vending misers on vending machines (2007: 60 misers installed, annual reduction of 87,600 kWh)	GSD	48
buildings	6	a	Perform energy assessments on major County facilities (2007: 5 facility assessments and 2 county-wide assessments)	GSD	-
buildings	7	a	Design/install cogeneration plants for the Martinez Detention Facility and the West County Detention Facility (annual reduction of 1,788,000 kWh)	GSD	<b>970</b>
buildings	8	a	Install photovoltaic (PV) solar panels on rooftops of certain County facilities (2007: 2 buildings; annual reduction of 346,928 kWh)	GSD	188
buildings	10	a	Use cool roofing systems for selected County buildings	GSD	-
buildings	10	b	Standard for cool roofing systems in new County buildings and remodels.	GSD	-
buildings	12	a	Install thermally resistant window films on selected County facilities	GSD	-
buildings	12	b	Standard for thermally resistant window film in new buildings and remodels.	GSD	-
buildings	13	a	Participate in energy demand response programs for selected County facilities (2007: 20 buildings; capability of reducing 1,000 kW)	GSD	-
buildings	16		Consider climate impacts and lifecycle cost analysis prior to investment in capital facilities as part of the FLIP program, <i>if approved in 12/07.</i>	GSD	-
buildings	new		Install LEDs in all exit signs (annual reduction of 404,615 kWh)	GSD	220
outdoor	17	-	Use LEDs in traffic signals (2007: 90% of traffic signals)	GSD	-
outdoor	18	a	Install LEDs in selected pedestrian signals (2007: 70% of pedestrian signals)	GSD	-
outdoor	19	a	Use solar energy in certain locations to energize flashers and retain excess power in storage batteries (2007: 6 locations, estimated annual reduction of 15,103 kWh based on a per-flasher electricity use average)	GSD	8
outdoor	20	a	Use the minimum amount of pavement necessary for safety and durability	PWD	-
outdoor	21	a	Explore alternative paving techniques, including reduced pavement thickness	PWD	-
outdoor	21	b	Test alternative paving materials	PWD	-
outdoor	25	-	Use water conserving landscaping and irrigation systems	GSD	-
outdoor	27	a	Maintain existing trees located on County owned and/or maintained land	GSD	-
fleet	29	-	Purchase electric vehicles (2006: 12 vehicles)	GSD	(89)
fleet	30	a	Purchase hybrid (gasoline and electric) fleet vehicles to increase overall fuel efficiency (2006: 72 vehicles)	GSD	23

Sector	#		Existing Measures to Reduce GHG Emissions	Dept	Annual MTCO2e reduction
<b>Municipal Operations</b>					
fleet	31	a	Purchase compressed natural gas (CNG) vehicles (2006: 39 vehicles)	GSD	48
fleet	32	a	Install a "fast fill" CNG fueling facility	GSD	-
fleet	33	-	Install diesel particulate traps on heavy-duty vehicles (2006: 34 vehicles)	GSD	-
fleet	34	-	Minimize purchase of sport utility vehicles	GSD	-
fleet	35	-	Capture evacuated vehicle air conditioning freon & refrigerant	GSD	-
fleet	new		All diesel fleet (168 vehicles) switched to B20 biodiesel fuel in 9/2006	GSD	216
procurement	36	a	Require that all County business cards be printed on recycled-content paper	GSD	-
procurement	37	a	Purchase recycled-content toner cartridges (2007: 45% of cartridges)	GSD	-
procurement	37	b	Purchase recycled-content office paper (2007: 35% of paper)	GSD	-
procurement	37	c	As of August 2007, more than 100 items on the county office supply contract have been replaced with recycled-content equivalents.	GSD	-
procurement	38	-	Purchase recycled-content office furniture (contracts in place for seating and workstation products that are 100% recycled-content and 99% recyclable.)	GSD	-
procurement	40	-	Purchase recycled-content carpeting (GSD has purchased over 100,000 square yards of 50% recycled-content, 100% recyclable carpet.)	GSD	-
procurement	41	-	In the process of requiring bids for building materials to include pricing for environmental specifications	GSD	-
procurement	42	a	Require contractors/vendors to provide recycled-content/recyclable products	GSD	-
waste	44	a	Conduct ongoing program to facilitate reuse and recycling of office furniture and equipment from County buildings (2005: annual reduction of 41 tons)	GSD	7
waste	45	a	Require contractors to recycle waste from building/remodeling projects	GSD	-
waste	45	b	Direct consulting architects and engineers to reuse as much of the existing structures and building materials as possible	GSD	-
waste	47	a	Recycle paper from County buildings (2005: annual reduction of 1,634 tons)	GSD	<b>264</b>
waste	47	b	Collect and recycle beverage containers from County buildings & parks	GSD	-
waste	48	-	Recycle municipal landscaping debris (2007: 20yd 3x/mo of greenwaste ~ annual reduction of 196 tons; 10 acres of grass recycling)	GSD	32
commute	49	a	Implement Telecommuting Program for employees to reduce vehicle trips (2003: 0.2% of employees; estimated annual reduction of 38,255 VMT)	CDD	22
commute	50	a	Provide financial incentives to County employees participating in a vanpool (25% off monthly costs) (2003: 1% of employees; 2007: 11 employees; estimated annual reduction of 382,551 VMT)	CDD	223
commute	51	a	Offer financial incentives to County employees for using transit or forming a new carpool (2003: 11% of employees; estimated annual reduction of 3,506,721 VMT)	CDD	<b>2,045</b>
commute	52	a	Allow County employees to work using flex schedules and compressed work weeks (2003: 54% of employees, most with a 9 80 schedule; estimated annual reduction of 2,582,222 VMT)	ALL	<b>1,506</b>
commute	53	a	Limit purchase of large vehicles (e.g. SUVs) to cases where justified based on work assignments	GSD	-
commute	55	a	Provide free preferred parking for County employees' vehicles used for carpooling (2007: 30 parking stalls)	CDD	-
commute	56	a	Provide bicycle lockers and/or racks at work sites to encourage County employees to bike to work (2003: 0.5% of employees; estimated annual reduction of 239,095 VMT)	CDD	139
commute	57	a	Provide shower facilities at certain work sites to encourage County employees to bike, walk or run to work	CAO	-

\* Total energy reductions for measure 3a were derived by using known electricity and natural gas reductions from DDC systems to identify average energy reductions per square foot, then applying these values to the total or partial square footage of all buildings with DDC systems, depending on the extent of the system (verified by Andy Green).

Updates and activity reductions were obtained from Andy Green and Rob Lim for buildings, Roland Hindsman for outdoor, Kevin Berenson for procurement, Deidra Dingman and Bob Tamori for waste, Richard Battersby for fleet, and Heba El-Guendy for commute.

While Contra Costa County has already implemented many GHG reduction measures, many of these measures could be expanded to further reduce emissions.

## 2.3 2020 GHG Emissions Projections

Based on projected population growth, commercial/industrial employment growth, and a “business-as-usual” scenario, Contra Costa County’s countywide GHG emissions would increase 23% to over 22 million MTCO<sub>2e</sub> by 2020. Additionally, projected municipal employment growth would increase Contra Costa County’s municipal GHG emissions (including employee commute) by 37% to almost 100,000 MTCO<sub>2e</sub> by 2020. Fortunately, Contra Costa County has numerous opportunities to implement projects and policies that could further reduce GHG emissions from their current levels. Some measures, such as municipal energy conservation projects, could potentially save money as well.

# 3. NEXT STEPS

## 3.1 Recommended GHG Emissions Reduction Target

Upon the completion of the GHG emissions inventory for the baseline and forecast year, the municipality should next set a GHG reduction target to drive its emissions reduction efforts. To inform the selection of a GHG reduction target for Contra Costa County, Table 3.1 illustrates targets that have been set by some other Bay Area cities and counties.

Table 3.1. GHG reduction targets set by other cities and counties

Municipality	GHG Reduction Targets
Berkeley, CA	15% below 1990 levels by 2010 80% below current levels by 2050
Oakland, CA	15% below 1990 levels by 2010
Alameda County, CA	80% below current levels by 2050
Marin County, CA	15-20% below 2000 levels by 2020
San Francisco County, CA	20% below 1990 levels by 2012 (Equivalent to 35% below 2000 levels by 2012)

Sources: ICLEI’s Milestone Guide, the City of Berkeley’s Measure G, the Cool Counties Climate Stabilization Declaration, the Marin County Greenhouse Gas Reduction Plan, and the Climate Action Plan for San Francisco.

Note that the baseline years vary significantly between these studies. Contra Costa County’s recent baseline year (2006) should be considered in target-setting, as Contra Costa County’s target may be lower due to reductions already achieved from existing measures implemented prior to the 2006 baseline year.

To demonstrate this point, consider that adopting a reduction target of 15% below 2006 levels by 2020, would require a reduction of 10,536 metric tons of carbon dioxide equivalent from the County's annual municipal emissions inventory, as well as compensation for projected growth. For countywide emissions, this would require a reduction of 2,724,956 metric tons of carbon dioxide equivalent from the annual countywide emissions inventory, as well as compensation for projected growth. This reduction would be equivalent to Marin County reducing almost 90% of their countywide emissions. Considering the existing quantity and sources of countywide GHG emissions in Contra Costa, it is clear that the County will not be able to achieve substantial long-term countywide emissions reductions solely by implementing measures that fall within the County's existing authority and jurisdiction.

Therefore, Contra Costa County should consider adopting the long-term reduction target set by the U.S. Cool Counties Climate Stabilization Declaration (see Appendix B), which Alameda County has already adopted and recently invited Contra Costa County to do the same. This declaration calls for the County to work closely with local, state, and federal governments and other leaders to develop a regional plan to reduce county geographical GHG emissions to 80% below current levels by 2050. Additionally, the declaration states that the regional plan (a Climate Action Plan that includes countywide measures) should establish short-, mid-, and long-term GHG reduction targets, with recommended goals to stop increasing emissions by 2010, and to achieve a 10 percent reduction every five years thereafter through to 2050. Because this target year is far in the future, adoption of several interim GHG reduction targets can help municipalities stay on track toward this long-term target.

Contra Costa County can achieve GHG emission reductions most efficiently and effectively by evaluating existing and potential GHG reduction measures as the first step in the development of a Climate Action Plan.

### **3.2 Actions to Meet the Reduction Target**

When selecting potential GHG reduction measures to meet the reduction target, the following should be considered: GHG reduction potential (if available), operational feasibility, cost, payback period (if applicable), and availability of rebates and funding.

Most of the measures listed in Tables 3.2 and 3.3 were originally identified in the November 2005 Climate Protection Report (#s listed in the below table originated from that report, unless noted as NEW). The measures that are highlighted in this report represent those that were identified by County staff to be the most operationally feasible and/or expected to have the greatest GHG reduction potential based on information currently available. Potential GHG reduction measures to be considered or evaluated during the development of a Climate Action Plan should not necessarily be limited to those identified in this report or the Climate Protection Report dated November 2005.

It is important to note that some of the potential measures identified in these two Reports are similar to measures identified in previous initiatives that addressed public policy issues such as traffic congestion, air pollution, energy conservation, waste reduction or open space preservation. These previous initiatives identified financial, institutional and market barriers that can limit the effectiveness of certain reduction measures. The Climate Action Plan will need to address these same barriers in order to achieve the GHG reductions.

Table 3.2. Potential countywide GHG reduction measures

Sector and #	Potential countywide GHG reduction measures
Land Use # 63	Analyze potential climate impacts prior to making recommendations regarding approval or denial of development projects.
Land Use # NEW	Revise the County's ordinances for development impact fees to include fees for pedestrian, bicycle, transit and traffic calming improvements.
Land Use # NEW	Revise the County's roadway standards to balance the needs of motorists, bicyclists and pedestrians in the design and construction of streets.
Land Use # NEW	Update general plan policies and design standards to encourage pedestrian and bicyclist activity.
Land Use # NEW	Encourage employers to comply with state-mandated employee parking cash-out programs (Chapter 554, California Statutes of 1992).
Land Use # NEW	Revise zoning ordinance to include limitations on the maximum number of parking spaces to serve new development.
Buildings # 68	Adopt energy efficiency standards for all development projects.
Buildings # 72	Require that adequate space for storage and collection of recyclables be provided in all development projects.
Buildings # 73c	Adopt a green building rating/point system based on the Green Building Guidelines.
Buildings # 73d	Utilize third-party green building certification process.
Landscape & Lighting # 75	Require new developments to plant native trees in medians and common areas.
Landscape & Lighting # 78b	Require new developments to use permeable pavements in place of impervious pavements.
Landscape & Lighting # 78c	Revise the County's landscape standards to increase the amount of overall landscaping required and specify the best types of vegetation to use in designated areas.
Landscape & Lighting # 84	Implement the Neighborhood Traffic Management Program.
Landscape & Lighting # 89a	Revise street lighting standards to require use of LEDs in all new outdoor lighting.
Landscape & Lighting # 89b	Require use of solar energy to power specific types of outdoor lighting (e.g. flashers).
Waste # 92b	Expand variable can rate structures to the remaining unincorporated areas in Central and East County.
Waste # 93b	Mandate recycling collection at all multi-family complexes in the unincorporated areas.
Waste # 97b	Identify additional opportunities and potential funding sources to expand education programs regarding toxic discards.
Agriculture # 99	Adopt a local manure management ordinance for horse boarding facilities.
Agriculture # 103	Use agricultural materials to generate fuel, which produces renewable energy and manages waste.

While countywide reduction measures may result in greater overall GHG reductions, the County government has greater control over its municipal emissions. Additionally, the County can take this opportunity to really lead by example and inspire changes in the greater community by first focusing on development and implementation of a Municipal Climate Action Plan focused on reduction measures that target emissions generated by municipal operations. Furthermore, data on current municipal GHG reduction measures (listed in Section 2.2) suggests that there is great potential to expand existing measures, such as increasing use of commute programs or expanding energy reduction efforts to additional buildings.

Table 3.3. Potential municipal GHG reduction measures

Sector and #	Potential municipal GHG reduction measures
Buildings # 1c	Further increase the sustainable building design and construction standards for all new and remodeled buildings to meet LEED Silver standards.
Buildings # 2b	Further increase the energy efficiency construction standards for new County buildings.
Buildings # 3c	Expand HVAC improvement and retrofit program to additional County buildings.
Buildings # 4b	Expand lighting retrofit program to additional County buildings (14 projects planned).
Buildings # 4c	Optimize County building lighting efficiency through the use of lighting controls, and include daylight harvesting technologies.
Buildings # 7b	Design/install cogeneration plants for other County facilities that operate 24-hours per day (planned for the Regional Medical Center and the Juvenile Hall).
Buildings # 8b	Evaluate additional renewable power projects (such as solar) for County facilities.
Buildings # 14	Incorporate efficiency and sustainability criteria when selecting sites for new buildings and leases.
Buildings # NEW	Locate County buildings in walkable neighborhoods with high frequency transit service.
Buildings # NEW	Institute user fee for parking spaces owned or leased by the County and allocate surplus revenue to incentives for use of commute alternatives.
Outdoor # 18b	Install LEDs in the remaining 30% of pedestrian signals (planned to be upgraded as they fail).
Outdoor # 27b	Plant shade trees on the east and west sides of County buildings to save energy.
Outdoor # 28	Use natural vegetation and landscaping around paved surfaces.
Fleet # 30b	Add more hybrid vehicles to the fleet.
Fleet # 31b	Add more CNG vehicles to the fleet.
Fleet # 32b	Consider additional alternative fueling stations or infrastructure (such as E85 ethanol fuel).
Fleet # 33	Continue to install diesel particulate traps on heavy-duty vehicles.
Procurement # 36b	Adopt Administrative Bulletin directing all departments to print business cards on recycled-content paper.
Procurement # 37c	Replace more of the office supplies on the County's core list with acceptable recycled-content equivalents (currently over 100 items have been replaced with recycled-content equivalents).
Procurement # 39	Purchase high efficiency motors, appliances and equipment (planned to be upgraded as they fail).
Procurement # 42b	Expand requirements for future bids to include additional environmental specifications.
Procurement # 43	Adopt and enforce an environmental purchasing ordinance.
Waste # 44b	Amend policy that allows departments to destroy hard drives before sending them to Surplus (this may require expensive degaussing equipment for Health Services due to Hipaa requirements).
Waste # 44c	Amend policy to require that Surplus property only be disposed with Board approval after exhausting any local donation or recycling options.
Waste # 45a	Require contractors to recycle a specific percentage of construction waste from County building and remodeling projects
Waste # 46b	Increase the amount of double-sided copying and printing, including voluntary to mandatory actions.
Waste # 47c	Expand the recycling collection program for beverage containers to additional County facilities.
Waste # 47d	Establish notification system to inform County Recycling Program staff of all office location changes.
Commute # 49c	Identify opportunities to increase the number of employees that participate in the Telecommuting Program.
Commute # 51b	Allow County employees to use pre-tax dollars to pay for mass-transit or carpool expenses.
Commute # 52b	Increase the number of County departments that institute compressed work weeks.

If data can be obtained on the estimated energy/transportation/waste reductions and implementation costs for these measures, the CACP software can model potential GHG emissions reductions and cost savings resulting from the selected measure.

Tables 3.4 and 3.5 illustrate different activity reduction scenarios and their associated GHG reduction potentials, as modeled by the CACP software (and Clean Air – Cool Planet's software for the waste sector). The extent to which any of these reduction scenarios could be achieved

by implementing an assortment of the measures listed above has not yet been determined pending further analysis as a part of the development of a Climate Action Plan.

*Table 3.4. Countywide reduction scenarios and their GHG reduction potentials*

<b>Emissions source</b>	<b>Reduction scenario</b>	<b>Activity reduction</b>	<b>Annual MTCO<sub>2</sub>e* reduction potential</b>
Electricity	Reduce residential electricity use by 10%	279,345,424 kWh	<b>151,577</b>
Electricity	Reduce commercial electricity use by 10%	247,778,654 kWh	134,448
Electricity	Reduce industrial electricity use by 10%	109,983,000 kWh	59,678
Natural Gas	Reduce residential natural gas use by 10%	18,074,940 therms	111,671
Natural Gas	Reduce commercial natural gas use by 10%	5,749,055 therms	35,519
Natural Gas	Reduce industrial natural gas use by 10%	136,890,760 therms	<b>845,741</b>
Transportation	Increase overall vehicle fuel efficiency by 5 mpg	N/A	<b>1,035,262</b>
Waste	Reduce waste by 10%	113,405 tons	18,339

\* MTCO<sub>2</sub>e, or metric tons of carbon dioxide equivalent, describes the amount of carbon dioxide that would have the same climate change potential as the actual assortment of greenhouse gases.

*Table 3.5. Municipal reduction scenarios and their GHG reduction potentials*

<b>Emissions source</b>	<b>Reduction scenario</b>	<b>Activity reduction</b>	<b>Annual MTCO<sub>2</sub>e* reduction potential</b>
Electricity	Reduce building electricity use by 10%	4,743,111 kWh	<b>2,574</b>
Electricity	Reduce outdoor lighting electricity use by 10%	353,899 kWh	192
Natural Gas	Reduce building natural gas use by 10%	140,969 therms	<b>871</b>
Fleet	Increase gasoline fleet fuel efficiency by 10 mpg	N/A	168
Waste	Reduce waste by 10%	1,176 tons	190
Commute	Reduce commute vehicle miles traveled by 10%	4,781,893 VMT	<b>2,788</b>

\* MTCO<sub>2</sub>e, or metric tons of carbon dioxide equivalent, describes the amount of carbon dioxide that would have the same climate change potential as the actual assortment of greenhouse gases.

### 3.3 Monitoring Progress Toward the Reduction Target

The County should consider conducting interim inventories to monitor progress toward the reduction target. While the countywide emissions inventory requires only a few data items from three sources (as countywide totals are calculated for other purposes), the municipal emissions inventory requires data from many different County departments and external agencies. However, additional research proves that the County possesses the ability to quickly monitor municipal GHG emissions using only data and software that the County keeps internally. This finding is explained below and shown in detail in Appendix C.

The 2006 municipal emissions inventory was completed using two methods: a method based on usage data, which generated the data shown in Section 2 of this report; and a method based on cost data (which can be obtained easily from the County’s own Auditor’s Office and the software program *Utility Manager*) coupled with price assumptions. This “cost method” was completed in less than one week, and generated results that were very similar to those generated by the more detailed “usage method.”

Table 3.6 compares the results derived by these two data collection methods. The total municipal GHG number derived by the cost method is only 4% greater than that derived by the usage method. Furthermore, the most policy-relevant data from the inventory is the source composition (or the percentage of emissions that come from each source), as this informs which sources should be the focus of reduction efforts. The similarity of the source composition between the two methods suggests that the cost method can predict the results of the usage method with acceptable accuracy. This implies that the cost method can be used for future municipal GHG inventories to easily and accurately monitor progress toward the reduction target, as long as the target is applied to the 2006 numbers derived by the cost method.

*Table 3.6. 2006 municipal GHG emissions derived by the usage and cost methods*

SOURCE	USAGE MTCO <sub>2</sub> E	USAGE % OF TOTAL	COST MTCO <sub>2</sub> E	COST % OF TOTAL
<b>Energy Use</b>	<b>29,183</b>	<b>71%</b>	<b>30,533</b>	<b>72%</b>
Electricity	20,068	49%	22,052	52%
Natural gas	8,857	22%	8,232	19%
Propane (jail kitchens)	228	1%	232	1%
Diesel (generators)	30	0%	17	0%
<b>Fleet</b>	<b>9,972</b>	<b>24%</b>	<b>10,058</b>	<b>24%</b>
Gasoline	8,850	22%	8,871	21%
Diesel	741	2%	850	2%
B20 biodiesel	241	1%	252	1%
CNG	140	0%	85	0%
<b>Landfilled Waste</b>	<b>1,902</b>	<b>5%</b>	<b>2,075</b>	<b>5%</b>
<b>TOTAL</b>	<b>41,057</b>	100%	<b>42,666</b>	100%

While Table 3.6 does not include emissions from employee commute, the Community Development Department's Transportation Planning Division has the data and tools necessary to estimate the cost of employee fuel purchases for commute. Furthermore, a subsequent commute survey is planned for Fall 2007, which will include questions (relating to Contra Costa County employees' willingness to alter commute behavior) that can help the County to determine the feasibility of successfully implementing certain GHG reduction measures in the commute sector.

### **3.4 Funding Opportunities**

Many of the GHG reduction measures listed in Section 3.2 will require additional funding to implement. The following funding opportunities, as described by Deputy Director of General Services Terry Mann and Administrative Services Officer Steve Silveira, could be utilized for certain measures:

- Internal Service Fund (ISF) - An ISF proposal for Fleet Services will be presented to the Finance Committee in September 2007. If approved, it will be implemented in FY 08/09. Financially, this would move Fleet Services out of the General Fund to an Internal Service Fund. One benefit is that the Fleet Manager would have more authority over the type of vehicles that are purchased, creating an opportunity to purchase hybrids and alternative fuel vehicles. Departments would be charged based on mileage rather than actual costs, and the mileage rate could include a replacement cost based upon hybrid or alternative fuel vehicles.
- Deferred Maintenance Fund - A Facility Condition Assessment (FCA) is currently underway to identify the County's deferred maintenance backlog for its buildings. The results of the FCA will be presented to the Finance Committee in December 2007. Approval will be sought to initiate a Facility Life-cycle Investment Program (FLIP). The FLIP program would be implemented in FY 08/09. Under the FLIP program, occupants of County buildings would be charged annually for deferred maintenance based on the square feet of occupancy. These funds would go into a Reserve for Deferred Maintenance (RDF) each year. Funds in the RDF would be appropriated annually when deferred maintenance projects are scheduled. Critical or immediate priority deferred maintenance projects would be funded in FY 08/09. The cost of the Energy Manager would be incorporated into a FLIP charge, as each building's energy needs fall under the review and management of the Energy Manager.
- Energy Rebates – Contra Costa County is a member of Energy Watch through the Association of Bay Area Governments (ABAG) and strives to implement projects that have available rebates.
- Third Party Involvement – Contra Costa County has met with a third party that would implement the installation of cogeneration units at the County Hospital and Juvenile Hall. There would be no upfront funding by the County for these projects, and the third party would handle permitting, contracting, procurement, and construction management for the projects. The advantage of a third party turn-key agreement is that the project can be implemented faster while reducing risk to the County. The annual utility savings would exceed the annual debt service payments resulting in a net annual savings.
- Bay Area Air Quality Management District (BAAQMD) Vehicle Incentive Program – As part of the BAAQMD Vehicle Incentive Program, BAAQMD offers a \$2,000 grant for each hybrid or

electric vehicle that the County purchases and a \$4,000 grant for each CNG vehicle that the County purchases.

- Bay Area Air Quality Management District (BAAQMD) Climate Protection Grant Program – On November 10, 2006 the BAAQMD announced a \$3 million dollar grant program for climate protection activities in the Bay Area. The BAAQMD anticipates inviting grant solicitations (a call for projects) by Fall 2007.
- Transportation Fund for Clean Air (TFCA) – The County has applied for multiple grants from the TFCA for fleet projects. A \$262,500 grant was approved to retrofit existing County heavy-duty diesel vehicles to comply with California Air Resources Board Regulations, and two additional grants are pending: a \$50,000 grant to offset the incremental cost of purchasing a CNG powered street sweeper for Public Works, and an \$85,000 grant to install particulate matter (PM) traps on 5 diesel powered prisoner transport busses.
- Revolving Fund – As many GHG reduction projects will eventually lead to financial savings, these savings could be placed in a revolving fund to pay for future GHG reduction projects. For instance, planned cogeneration projects for the Regional Medical Center and the Juvenile Hall are projected to net a savings of over \$1 million in 15 years, including \$260,000 of rebates from PG&E.

### **3.5 Action Items for Consideration**

The GHG inventory is only the first step toward developing and implementing a Climate Action Plan. The second step is the establishment of a GHG reduction target as discussed in Section 3.1. The third step is development of a Climate Action Plan, which involves gathering data (where it is available) on the predicted activity reduction and implementation cost associated with each of the existing and potential reduction measures. Reduction measures to be considered or evaluated should include, but not necessarily be limited to, those identified in Tables 3.2 and 3.3 of this report and the Climate Protection Report dated November 2005. Using this data, the CACP software can model potential GHG emissions reductions and cost savings resulting from each measure. This will allow the County to identify the most cost effective measures (including those with available funding, low cost or short payback periods) as well as those with the potential to reduce the most GHG emissions. Using this information, the County can prioritize measures for implementation.

Thus, the next steps the County should consider to most efficiently and effectively move forward with climate protection using ICLEI's Cities for Climate Protection Campaign framework are:

- Adopt a GHG reduction target consistent with the US Cool Counties Climate Stabilization Declaration (see Section 3.1 & Appendix B).
- Dedicate staff person(s) to manage the next phase of the County's climate protection effort who would be responsible for the following key activities:
  1. Identify which activity reduction data for existing and potential measures can actually be derived or estimated;
  2. Identify the implementation cost associated with each measure (where it is available) in order to model reduction potential and indicate whether there is adequate funding to implement each measure;

3. Develop a Municipal Climate Action Plan focused on reduction measures that target emissions generated by municipal operations, including identification of potential funding shortfall and any potential funding sources;
4. Seek opportunities to work with local cities to develop and implement a Communitywide Climate Action Plan focused on reduction measures that target non-municipal sources of GHG emissions (e.g. land use, private buildings, transportation, private-sector waste, etc.), such as participating in the “Contra Costa County Climate Protection Project” recently launched by ICLEI – Local Governments for Sustainability;
5. Engage regional, state and federal agencies to advocate adoption and implementation of reduction measures that target significant non-municipal sources of GHG emissions that fall outside of the County’s existing jurisdiction or authority (e.g. adopt legislation/regulations, establish cross-jurisdictional funding & incentive programs, increase fuel efficiency standards, etc.).

With further research on the GHG reduction potentials and the implementation costs associated with the identified measures, Contra Costa County can develop and implement the most cost-effective Climate Action Plan that will reduce its GHG emissions and, therefore, its impact on climate change.

After the County adopts has begun implementing a Climate Action Plan, interim inventories can tell the County whether the identification of additional reduction measures will be necessary to meet the adopted reduction target(s).

## APPENDIX A. Data Collection Methods

### Countywide Data

GHG Emissions Source	Methods
<b>Residential, Commercial, and Industrial Energy Use</b>	<ul style="list-style-type: none"> <li>Usage data from PG&amp;E, as three sector totals.</li> <li>2020 projections based on ABAG projected growth in households, commercial employment, and industrial employment.</li> </ul>
<b>Transportation</b>	<ul style="list-style-type: none"> <li>Total daily vehicle miles traveled (DVMT) data from MTC, via Xico Manarolla at ICLEI.</li> <li>2020 projections based on population growth.</li> </ul>
<b>Waste</b>	<ul style="list-style-type: none"> <li>2005 waste disposal data from Deidra Dingman in Community Development.</li> <li>Assume a percent increase in 2006 from the average annual increase.</li> <li>2020 projections based on population growth.</li> </ul>

### Municipal Operations Data

GHG Emissions Source	Methods
<b>Electricity and Natural Gas Use</b>	<ul style="list-style-type: none"> <li>Usage data for all accounts from PG&amp;E.</li> <li>Match PG&amp;E accounts with their County descriptors in Utility Manager.</li> <li>Sort accounts into categories for analysis using County descriptors.</li> <li>GSF values from the County property list (revised by Terry Mann where necessary).</li> <li>2020 projections based on employment growth.</li> </ul>
<b>Propane Use</b>	<ul style="list-style-type: none"> <li>Usage data from Utility Manager.</li> <li>Assume constant to 2020, as advised by Andy Green.</li> </ul>
<b>Diesel Use</b>	<ul style="list-style-type: none"> <li>Diesel data for emergency generators from Doug Parker in Facilities Maintenance.</li> <li>Assume constant to 2020, as advised by Andy Green.</li> </ul>
<b>Fleet</b>	<ul style="list-style-type: none"> <li>Fuel consumption data from Richard Battersby, Fleet Manager.</li> <li>2020 projections based on trends between 2004 and 2006 fuel consumption data.</li> </ul>

<b>Waste</b>	<ul style="list-style-type: none"> <li>• Generate lists of addresses and account numbers of all Contra Costa County accounts from Utility Manager, and send to different vendors.</li> <li>• Routine waste data from hauling facilities; illegal dumping data from transfer stations, landfills, and internal records.</li> <li>• When only volume data is available, use a density assumption from ICLEI.</li> <li>• 2020 projections based on employment growth.</li> </ul>
<b>Employee Commute</b>	<ul style="list-style-type: none"> <li>• 2003 employee commute survey results from Heba El-Guendy in Transportation Planning.</li> <li>• Employment data from the 05-06 Comprehensive Annual Financial Report (CAFR).</li> <li>• Use survey results to obtain an estimate of the average trip distance and work days/year, and to calculate total vehicle miles.</li> <li>• Assume that all vehicles use gasoline fuel (verified by Xico Manarolla at ICLEI).</li> <li>• 2020 projections based on employment growth.</li> </ul>

This activity data was entered into ICLEI’s software to generate GHG emissions numbers. For the waste sector, an emissions factor from Clean Air – Cool Planet was used due to preferable methodology.

## **APPENDIX B. U.S. Cool Counties Climate Stabilization Declaration**

WHEREAS, there is a consensus among the world's leading scientists that global warming caused by human emission of greenhouse gases is among the most significant problems facing the world today;

WHEREAS, documented impacts of global warming include but are not limited to increased occurrences of extreme weather events (i.e., droughts and floods), adverse impacts on plants and wildlife habitats, threats to global food and water supplies – all of which have an economic impact on communities and their local governments;

WHEREAS, leading scientists have projected that stabilization of climate change in time to minimize such impacts will require a reduction of global warming emissions to 80 percent below current levels by the year 2050;

WHEREAS, currently the United States is responsible for producing approximately 25 percent of the world's global warming pollutants;

WHEREAS, many leading U.S. companies that have adopted greenhouse gas reduction programs to demonstrate corporate and operational responsibility have also publicly expressed preference for the federal government to adopt precise and mandatory emissions targets and timetables as a means by which to provide a uniform and predictable regulatory environment to encourage and enable necessary and long-term business investments;

WHEREAS, state, regional and local governments throughout the United States are adopting emissions reduction targets and programs and that this effort is bipartisan, coming from Republican and Democratic leadership;

WHEREAS, the U.S. Conference of Mayors has endorsed the U.S. Mayors Climate Protection Agreement, which commits cities to reduction of global warming emissions to 7 percent below 1990 levels by 2012, and calls for a federal limit on emissions;

WHEREAS, the State of California has mandated statewide reduction of greenhouse gas emissions to 80 percent below 1990 levels by 2050;

WHEREAS, more than 100 county leaders signed a letter written by Dane County, Wisconsin, that was sent to the President in March 2006 calling for increased energy investment and development of jobs focused on clean energy technologies;

WHEREAS, counties have a unique role to play in reducing greenhouse gas emissions and preparing for the impacts of climate change through their regional jurisdiction over policy areas such as air quality, land use planning, transportation, zoning, forest preservation, water conservation, and wastewater and solid waste management;

WHEREAS, the economic arguments for implementing climate solutions are compelling, from the near-term economic gains of energy efficiency to the long-term climate stabilization that can prevent irreparable harm from catastrophic climate change impacts;

WHEREAS, many counties throughout the nation, both large and small, are reducing global warming pollutants through programs that provide economic and quality of life benefits such as reducing energy bills, preserving green space, implementing better land use policies, improving air quality, promoting waste-to-energy programs, expanding transportation and work choices to reduce traffic congestion, and fostering more economic development and job creation through energy conservation and new technologies;

NOW, THEREFORE WE DECLARE,

We as Cool Counties will take immediate steps to help the federal, state, and our governments within our county to achieve the 2050 climate stabilization goal by making the following commitments:

- i. Create an inventory of our county government (operational) greenhouse gas (“GHG”) emissions and implement policies, programs and operations to achieve significant, measurable and sustainable reduction of those operational GHG emissions to help contribute to the regional reduction targets as identified in paragraph ii;
- ii. Work closely with local, state, and federal governments and other leaders to reduce county geographical GHG emissions to 80 percent below current levels by 2050, by developing a GHG emissions inventory and regional plan that establishes short-, mid-, and long-term GHG reduction targets, with recommended goals to stop increasing emissions by 2010, and to achieve a 10 percent reduction every five years thereafter through to 2050.
- iii. Urge Congress and the Administration to enact a multi-sector national program of requirements, market-based limits, and incentives for reducing GHG emissions to 80 percent below current levels by 2050. Urge Congress and the Administration to strengthen standards by enacting legislation such as a Corporate Average Fuel Economy (“CAFE”) standard that achieves at least 35 miles per gallon (mpg) within 10 years for cars and light trucks.

We will take immediate steps to identify regional climate change impacts; we will draft and implement a county plan to prepare for and build resilience to those impacts.

*The excerpt above is taken directly from the “U.S. Cool Counties Climate Stabilization Initiative,” which can be found at <http://www.kingcounty.gov/exec/coolcounties>.*

## APPENDIX C. Cost Method

GHG Source	Cost Method
<b>Electricity and Natural Gas Use</b>	<ul style="list-style-type: none"> <li>• Cost data from Utility Manager.</li> <li>• According to the USDOE:EIA, the average price in CA in 2006 of electricity was \$0.1328/kWh and of natural gas was \$1.182/therm.</li> <li>• Assume that 5% of the electricity and natural gas cost is taxes and fees.</li> </ul>
<b>Propane Use</b>	<ul style="list-style-type: none"> <li>• Cost data from Utility Manager.</li> <li>• 2006 propane price derived from averaging the price on a January CCC bill (\$2.50/gallon) and a November CCC bill (\$2.70/gallon) = \$2.60/gallon.</li> <li>• Assume that 10% of the propane cost is taxes and fees.</li> </ul>
<b>Diesel Use</b>	<ul style="list-style-type: none"> <li>• Diesel cost data from Maria Martinez in Accounting.</li> <li>• Average price in CA in 2006, according to the USDOE:EIA, of diesel was \$2.922/gallon.</li> <li>• Doug Parker/Facilities Maintenance estimates that about 50% of the total purchased fuel is actually consumed for routine testing and emergencies.</li> </ul>
<b>Fleet</b>	<ul style="list-style-type: none"> <li>• Cost data from Maria Martinez in Accounting.</li> <li>• Average price in CA in 2006, according to the USDOE:EIA, of gasoline (\$2.855/gallon) and diesel (\$2.922/gallon); Average price in the U.S. in 2006, according to the USDOE:EERE, of B20 biodiesel (\$2.740/gallon), and CNG (\$1.887/GGE); CA diesel/biodiesel prices were generally about \$0.25 higher than the U.S. average in 2006, which yields a CA B20 biodiesel price of (\$2.990/gallon).</li> <li>• However, the County Government is exempt from all state and federal excise taxes, which are included in these prices (Richard Battersby); 2006 CA and federal excise tax totals, according to the California Energy Commission, for gasoline (\$0.364/gallon), diesel (\$0.424/gallon), B20 biodiesel after a federal tax credit of \$0.20/gallon (\$0.224/gallon), and CNG (\$0.0984/GGE).</li> </ul>
<b>Waste</b>	<ul style="list-style-type: none"> <li>• Cost Data from Utility Manager (haulers) and Auditor's intranet site (transfer stations and landfills).</li> <li>• Recovery rates from Deidra Dingman in Community Development with supporting annual summaries; assume a recovery rate of 50% when unknown.</li> <li>• From online sources and glancing at a few bills, the average fee for hauling waste is about \$65/ton.</li> </ul>

After these assumptions were used to derive activity data from cost data, this activity data was entered into ICLEI's software to generate GHG emissions numbers. For the waste sector, an emissions factor from Clean Air – Cool Planet was used due to preferable methodology.

Below is an example of the methods used to obtain activity data from cost data:

Emissions Source	Total Cost (\$)	Total Cost – taxes/fees (\$)	Activity/\$		Activity data	
			amount	units	amount	units
<b>Energy Use</b>						
Electricity	\$8,026,452	\$7,625,129	7.530	kWh/\$	57,418,143	kWh
Natural gas	\$1,657,789	\$1,574,900	0.846	therms/\$	1,332,402	therms
Propane (jail kitchens)	\$99,341	\$89,407	0.385	gallons/\$	34,387	gallons
Diesel (generators)	\$9,582	-	0.342	gallons/\$	1,640	gallons
<b>Fleet</b>						
Gasoline	\$2,057,518	-	0.401	gallons/\$	825,981	gallons
Diesel	\$199,716	-	0.400	gallons/\$	79,950	gallons
B20 biodiesel	\$82,635	-	0.362	gallons/\$	29,875	gallons
CNG	\$19,224	-	0.559	GGE/\$	10,748	GGE
<b>Landfilled Waste</b>						
Haulers	\$782,269					
Transfer, Landfills	\$51,721					
Total	\$833,990	-	0.015	tons/\$	12,831	tons

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