

# Appendices

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# Appendix A: Baseline Emissions Detailed Reports

1/30/2009

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## Community Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tonnes)	Equiv CO <sub>2</sub> (%)	Energy (MWh)
<b>Hayward, CA</b>			
<b>Residential</b>			
<i>Hayward Community Residential</i>			
Electricity	54,252	4.6	242,674
Natural Gas	104,277	8.8	571,258
<b>Subtotal Hayward Community Residential</b>	<b>158,528</b>	<b>13.4</b>	<b>813,932</b>

1. The updated 2005 PG&E CO<sub>2</sub>e emission factor of 0.49 lbs/kWh of delivered electricity was verified by the California Climate Action Registry and was reported to ICLEI in January 2007 by Greg San Martin. The PG&E CO<sub>2</sub>e emissions factor of 53.05 kg/MMBtu of delivered natural gas, verified by the California Climate Action Registry and the CEC. The PG&E coefficient set does not have emissions factors for CH<sub>4</sub> and N<sub>2</sub>O as the CO<sub>2</sub>e emissions factor includes CH<sub>4</sub> and N<sub>2</sub>O emissions in CO<sub>2</sub> equivalents.

2. The business-as-usual projections for 2020 assume no change in the PG & E CO<sub>2</sub>e emissions factor.

3. Default criteria air pollutant emissions factors are based on the Region 13 - Western Systems Coordinating Council/CNV Average Grid Electricity Set.

4. Industrial consumption data is reported within the Commercial sector due to PUC confidentiality rules that prohibit the release of such data in certain cases. As a result, NO<sub>x</sub> and criteria air pollutants are underreported. Hence the commercial sector includes energy consumed in the industrial sector of the city. The commercial sector also includes energy consumed by city buildings/operations and facilities as well as the district facilities like the East Bay Municipal Utility District (EBMUD), Bay Area Rapid Transit (BART) and School Districts.

**Data Sources:**

1. Community electricity and natural gas data provided by Data collection coordinator by Vera Dahle Lacaze, Solid Waste Manager, Hayward City, Vera.Dahle-Lacaze@hayward-ca.gov, (510) 583-4725
2. Request for electricity and natural gas data processed by Greg San Martin, Climate Protection Program Manager, PG&E, GJS8@pge.com, (415)973-6905 and Jasmin Ansar, Manager, Environmental Policy, PG&E, JxA2@pge.com, (415)973-4570.

Data entry: Data entered on September 27, 2006 by Palak Joshi, Program Assistant, ICLEI, palak.joshi@iclei.org. ICLEI supervisor, Timothy Burroughs, timothy.burroughs@iclei.org. Last updated on July 15, 2008 by Jennifer Holzer, Program Associate, ICLEI, jennifer.holzer@iclei.org, 510-844-0699.

<b>Subtotal Residential</b>	<b>158,528</b>	<b>13.4</b>	<b>813,932</b>
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**Commercial**

*Community Commercial/Industrial*

Electricity	151,793	12.8	678,989
Natural Gas	86,434	7.3	473,507
<b>Subtotal Community Commercial/Industrial</b>	<b>238,226</b>	<b>20.1</b>	<b>1,152,497</b>

1. The updated 2005 PG&E CO<sub>2</sub>e emission factor of 0.49 lbs/kWh of delivered electricity was verified by the California Climate Action Registry and was reported to ICLEI in January 2007 by Greg San Martin. The PG&E CO<sub>2</sub>e emissions factor of 53.05 kg/MMBtu of delivered natural gas, verified by the California Climate Action Registry and the CEC. The PG&E coefficient set does not have emissions factors for CH<sub>4</sub> and N<sub>2</sub>O as the CO<sub>2</sub>e emissions factor includes CH<sub>4</sub> and N<sub>2</sub>O emissions in CO<sub>2</sub> equivalents.

This report has been generated for Hayward, CA using STAPPA/ALAPCO and ICLEI's Clean Air and Climate Protection Software developed by Torrie Smith Associates Inc.

## Community Greenhouse Gas Emissions in 2005 Detailed Report

Equiv CO <sub>2</sub> (tonnes)	Equiv CO <sub>2</sub> (%)	Energy (MWh)
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2. The business-as-usual projections for 2020 assume no change in the PG & E CO<sub>2</sub>e emissions factor.
3. Default criteria air pollutant emissions factors are based on the Region 13 - Western Systems Coordinating Council/CNV Average Grid Electricity Set.
4. Industrial consumption data is reported within the Commercial sector due to PUC confidentiality rules that prohibit the release of such data in certain cases. As a result, NOx and criteria air pollutants are underreported. Hence the commercial sector includes energy consumed in the industrial sector of the city. The commercial sector also includes energy consumed by city buildings/operations and facilities as well as the district facilities like the East Bay Municipal Utility District (EBMUD).

**Data Sources:**

1. Community electricity and natural gas data provided by Data collection coordinator by Vera Dahle Lacaze, Solid Waste Manager, Hayward City, Vera.Dahle-Lacaze@hayward-ca.gov, (510) 583-4725
2. Request for electricity and natural gas data processed by Greg San Martin, Climate Protection Program Manager, PG&E, GJS8@pge.com, (415)973-6905 and Jasmin Ansar, Manager, Environmental Policy, PG&E, JxA2@pge.com, (415)973-4570.

Data entry: Data entered on September 27, 2006 by Palak Joshi, Program Assistant, ICLEI, palak.joshi@iclei.org. ICLEI supervisor, Timothy Burroughs, timothy.burroughs@iclei.org. Last updated on July 15, 2008 by Jennifer Holzer, Program Associate, ICLEI, jennifer.holzer@iclei.org, 510-844-0699.

Reference file: ICLEI Hayward Summary Report

<b>Subtotal Commercial</b>	238,226	20.1	1,152,497
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**Transportation**

*Community Transportation*

	Equiv CO <sub>2</sub> (tonnes)	Equiv CO <sub>2</sub> (%)	Energy (MWh)
Gasoline	227,502	19.2	926,325
Diesel	59,429	5.0	208,359
<b>Subtotal Community Transportation</b>	<b>286,931</b>	<b>24.2</b>	<b>1,134,684</b>

**Notes:**

1. The VMT data provided by MTC and Caltrans is in Daily VMT (DVMT) (000); Annual VMT = DVMT x 365x1000.
2. The VMT by fuel and vehicle type is calculated using Alameda County VMT % (by vehicle type) and the CACP fleet breakdown by fuel type provided by EMFAC.

**Data Sources:**

1. Local Roads Vehicle Miles Traveled (VMT) 2005 data provided by Harold Brazil, Air Quality Associate, Metropolitan Transportation Commission (MTC) [hbrazil@mtc.ca.gov](mailto:hbrazil@mtc.ca.gov) [-mailto:hbrazil@mtc.ca.gov-](mailto:hbrazil@mtc.ca.gov) (510) 817-5747. Data analyzed by Micah Lang, Program Officer, ICLEI.
2. State Highways Vehicle Miles Traveled (VMT) 2005 data provided by CalTrans, analyzed by Micah Lang, ICLEI Program Officer and Theresa Krebs, ICLEI. Data source file: 2005 Public Roads Data, HPMS division of CalTrans <http://www.dot.ca.gov/hq/tsp/hpms/hpmslibrary/hpmspdf/2005PRD.pdf>
3. EMFAC data provided in November, 2007 by Amir Fanai, Principal Air Quality Engineer, Bay Area Air Quality Management District, [AFanai@baaqmd.gov](mailto:AFanai@baaqmd.gov) [-mailto:AFanai@baaqmd.gov-](mailto:AFanai@baaqmd.gov)

**Data entry:**

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## Community Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tonnes)	Equiv CO <sub>2</sub> (%)	Energy (MWh)
2. State Highways Vehicle Miles Traveled (VMT) 2005 data provided by CalTrans, analyzed by Micah Lang, ICLEI Program Officer and Theresa Krebs, ICLEI. Data source file: 2005 Public Roads Data, HPMS division of CalTrans < <a href="http://www.dot.ca.gov/hq/tsp/hpms/hpmslibrary/hpmsodf/2005PRD.pdf">http://www.dot.ca.gov/hq/tsp/hpms/hpmslibrary/hpmsodf/2005PRD.pdf</a> >			
3. EMFAC data provided in November, 2007 by Amir Fanai, Principal Air Quality Engineer, Bay Area Air Quality Management District, <a href="mailto:AFanai@baaqmd.gov">AFanai@baaqmd.gov</a> < <a href="mailto:AFanai@baaqmd.gov">mailto:AFanai@baaqmd.gov</a> >			
Data entry: Palak Joshi, Program Assistant, ICLEI, <a href="mailto:palak.joshi@iclei.org">palak.joshi@iclei.org</a> , (510) 844-0699, on August 25, 2006. Timothy Burroughs, Supervisor, <a href="mailto:timothy.burroughs@iclei.org">timothy.burroughs@iclei.org</a> . Last updated by Jennifer Holzer, Program Associate, ICLEI, July 2008, <a href="mailto:jennifer.holzer@iclei.org">jennifer.holzer@iclei.org</a> , 510-844-0699. Reference file ICLEI Hayward Summary Report			
<i>Hayward State Hwy VMT</i>			
Gasoline	354,540	30.0	1,443,589
Diesel	92,615	7.8	324,707
<i>Subtotal Hayward State Hwy VMT</i>	447,155	37.8	1,768,296
<b>Subtotal Transportation</b>	<b>734,087</b>	<b>62.0</b>	<b>2,902,980</b>

### Waste

#### Hayward, CA

<i>ADC Tonnage</i>			<i>Disposal Method - Managed Landfill</i>
Plant Debris	119	0.0	
<i>Subtotal ADC Tonnage</i>	119	0.0	
<i>Landfill Waste</i>			<i>Disposal Method - Managed Landfill</i>
Paper Products	29,052	2.5	
Food Waste	9,094	0.8	
Plant Debris	2,276	0.2	
Wood/Textiles	11,898	1.0	
All Other Waste	0	0.0	
<i>Subtotal Landfill Waste</i>	52,319	4.4	

#### Notes:

- Community wide disposal figures provided by the California Integrated Waste Management Board (CIWMB) via the *Jurisdiction Disposal and Alternative Daily Cover (ADC) Tons by Facility* portion of the Disposal Reporting System (DRS): <<http://www.ciwmb.ca.gov/LGCentral/drs/reports/JurDspFa.asp>>
- Alternative Daily Cover (ADC) tons by material type provided by the CIWMB via the *Alternative Daily Cover (ADC) by Jurisdiction of Origin and Material Type* portion of the DRS website: <<http://www.ciwmb.ca.gov/LGCentral/drs/reports/ADC/ADCMatType.asp>>
- Waste characterization derived from the *Alameda County Waste Characterization Study 2000*: <<http://www.stopwaste.org/home/index.asp?page=590>>. Waste categories in the report were bundled to fit the waste categories of the Clean Air and Climate Protection (CACCP) software.
- Methane recovery factor derived from the US EPA AP 42 Emissions Factors report (<<http://www.epa.gov/ttn/chief/ap42/index.html>>), which

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## Community Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tonnes)	Equiv CO <sub>2</sub> (%)	Energy (MWh)
<hr/>			
Data entry: Palak Joshi, Program Assistant, ICLEI, palak.joshi@iclei.org, (510) 844-0699, on August 25, 2006. Timothy Burroughs, Supervisor, timothy.burroughs@iclei.org. Last updated by Jennifer Holzer, Program Associate, ICLEI, July 2008, jennifer.holzer@iclei.org, 510-844-0699.			
<b>Subtotal Waste</b>	52,438	4.4	
<b>Subtotal Hayward, CA</b>	1,183,279	100.0	4,869,409
<hr/>			
<b>Total</b>	1,183,279	100.0	4,869,409

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## Government Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tonnes)	Equiv CO <sub>2</sub> (%)	Energy (MWh)	Cost (\$)
<b>Buildings</b>				
<b>Hayward, CA</b>				
<i>Hayward Centennial Hall</i>				
Electricity	76	0.8	340	39,177
Natural Gas	64	0.7	353	14,465
<i>Subtotal Hayward Centennial Hall</i>	140	1.5	692	53,642
Centennial Hall will be replaced with a larger conference center in near future.				
<i>Hayward City Ctr. Bldg Parking Garage</i>				
Electricity	34	0.4	153	17,726
<i>Subtotal Hayward City Ctr. Bldg Parking Garage</i>	34	0.4	153	17,726
No electricity will be consumed for the City Center Parking Garage for Hayward because it will no longer be owned by City Of Hayward after January 2007.				
<i>Hayward City Hall</i>				
Electricity	336	3.5	1,504	202,967
Natural Gas	190	2.0	1,039	40,860
<i>Subtotal Hayward City Hall</i>	526	5.5	2,544	243,827
<i>Hayward City Hall Parking Garage</i>				
Electricity	34	0.3	151	19,404
<i>Subtotal Hayward City Hall Parking Garage</i>	34	0.3	151	19,404
Data for usage levels for the City Hall Parking Garage reflects partial usage in 2005 and it would increase in 2020.				
<i>Hayward Equipment Management</i>				
Electricity	21	0.2	93	13,982
Natural Gas	15	0.2	83	2,303
<i>Subtotal Hayward Equipment Management</i>	36	0.4	176	16,285

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## Government Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tonnes)	Equiv CO <sub>2</sub> (%)	Energy (MWh)	Cost (\$)
<i>Hayward Facilities</i>				
Electricity	75	0.8	334	42,269
Natural Gas	171	1.8	936	27,778
<i>Subtotal Hayward Facilities</i>	245	2.5	1,270	70,047
This record includes Barnes Ct., Animal Shelter, Facilities Division and Landscape Division				
<i>Hayward Fire Stations</i>				
Electricity	113	1.2	505	68,028
Natural Gas	147	1.5	805	33,757
<i>Subtotal Hayward Fire Stations</i>	260	2.7	1,310	101,785
New Fire Station #7 will utilize slightly more gas and electricity than the current station for the forecast year because the facility's square footage is expected to increase. The current data includes 10 fire stations, 9 of which are operating and Fairview (formerly #8) used as storage and requires electricity usage for alarms, phones, etc.				
<i>Hayward Main Library</i>				
Electricity	64	0.7	285	41,118
Natural Gas	33	0.3	180	7,492
<i>Subtotal Hayward Main Library</i>	96	1.0	464	48,610
By 2020, Main Library will be replaced by a larger facility.				
<i>Hayward Police Department</i>				
Electricity	233	2.4	1,042	12,739
Natural Gas	153	1.6	840	24,656
<i>Subtotal Hayward Police Department</i>	386	4.0	1,882	37,395
The square footage for the Police Department building will increase by 5% by 2020.				
<i>Hayward Police Radio Tower</i>				
Electricity	12	0.1	53	8,139
<i>Subtotal Hayward Police Radio Tower</i>	12	0.1	53	8,139

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## Government Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tonnes)	Equiv CO <sub>2</sub> (%)	Energy (MWh)	Cost (\$)
<i>Hayward Streets and Water Department Buildings</i>				
Electricity	15	0.2	66	10,240
Natural Gas	24	0.2	130	5,375
<i>Subtotal Hayward Streets and Water Department Buildings</i>		0.4	195	15,615
<i>Hayward Utilities Building</i>				
Electricity	26	0.3	116	16,413
Natural Gas	9	0.1	50	2,164
<i>Subtotal Hayward Utilities Building</i>	35	0.4	166	18,577
<i>Hayward Weekes Library</i>				
Electricity	20	0.2	90	12,993
Natural Gas	6	0.1	33	1,516
<i>Subtotal Hayward Weekes Library</i>	26	0.3	123	14,509

1. The updated 2005 PG&E CO<sub>2</sub>e emission factor of 0.49 lbs/kWh of delivered electricity is verified by the California Climate Action Registry and was reported to ICLEI in January 2007 by Greg San Martin. The PG&E CO<sub>2</sub>e emissions factor of 53.05 kg/MMBtu of delivered natural gas, verified by the California Climate Action Registry and the CEC. The PG&E coefficient set does not have emissions factors for CH<sub>4</sub> and N<sub>2</sub>O as the CO<sub>2</sub>e emissions factor includes CH<sub>4</sub> and N<sub>2</sub>O emissions in CO<sub>2</sub> equivalents.

2. Default criteria air pollutant emissions factors are based on the Region 13 - Western Systems Coordinating Council/CNV Average Grid Electricity Set.

3. In calculating the cost - Assumption: average cost of kwh = \$.14 average cost of therm = \$1.22

**Data Source:**

Data submitted on July, 27, 2006 by Vera Dahle Lacaze, Solid Waste Manager, Hayward City, Vera.Dahle-Lacaze@hayward-ca.gov, (510) 583-4725.

Data entered on Aug. 18, 2006 by Palak Joshi, Program Assistant, ICLEI, palak.joshi@iclei.org, (510) 844-0699. Last updated by Jennifer Holzer, Program Associate, ICLEI, July 2008, jennifer.holzer@iclei.org, 510-844-0699.

**Data Source Files:**

- For Municipal Operations and facilities - ICLEI\_Hayward\_Buildings\_CY2005
- For Street Lights - ICLEI\_Hayward\_Streetlights\_CY2005
- For Water/Sewage - ICLEI\_WstWtrTrtmtPlnt\_CY2005
- For Waste - ICLEI\_Hayward\_MunicipalSolidWaste\_CY2005

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## Government Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tonnes)	Equiv CO <sub>2</sub> (%)	Energy (MWh)	Cost (\$)
<b>Subtotal Buildings</b>	1,870	19.4	9,180	665,561
<b>Vehicle Fleet</b>				
<b>Hayward, CA</b>				
<i>Building Inspection fleet - Hayward</i>				
Gasoline	36	0.4	136	9,110
CNG	0	0.0	0	1,096
<i>Subtotal Building Inspection fleet - Hayward</i>	36	0.4	136	10,206
<i>Community Preservation fleet - Hayward</i>				
Gasoline	5	0.1	19	1,273
<i>Subtotal Community Preservation fleet - Hayward</i>	5	0.1	19	1,273
<i>Construction Inspection fleet - Hayward</i>				
Gasoline	35	0.4	133	9,076
CNG	0	0.0	0	2,505
<i>Subtotal Construction Inspection fleet - Hayward</i>	35	0.4	133	11,581
<i>Engineering department fleet - Hayward</i>				
Gasoline	6	0.1	22	1,525
<i>Subtotal Engineering department fleet - Hayward</i>	6	0.1	22	1,525
<i>Equipment Management fleet- Hayward</i>				
Gasoline	21	0.2	78	5,228
<i>Subtotal Equipment Management fleet- Hayward</i>	21	0.2	78	5,228
<i>Facilities department fleet - Hayward</i>				
Gasoline	40	0.4	152	10,094
<i>Subtotal Facilities department fleet - Hayward</i>	40	0.4	152	10,094
<i>Fire department fleet - Hayward</i>				
Gasoline	80	0.8	301	18,709
Diesel	49	0.5	183	11,038
<i>Subtotal Fire department fleet - Hayward</i>	129	1.3	484	29,747
<i>Hayward Airport fleet</i>				
Gasoline	60	0.6	229	14,354
Diesel	9	0.1	32	1,917
<i>Subtotal Hayward Airport fleet</i>	69	0.7	261	16,271

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## Government Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tonnes)	Equiv CO <sub>2</sub> (%)	Energy (MWh)	Cost (\$)
<i>Hayward Housing (Conservation and Inspection)</i>				
Gasoline	9	0.1	32	2,185
<i>Subtotal Hayward Housing (Conservation and Inspection)</i>		0.1	32	2,185
<i>Hayward Landscape Department</i>				
Gasoline	173	1.8	655	43,772
Diesel	10	0.1	36	2,726
<i>Subtotal Hayward Landscape Department</i>	183	1.9	691	46,498
<i>Hayward Library</i>				
Gasoline	3	0.0	10	698
<i>Subtotal Hayward Library</i>	3	0.0	10	698
<i>Hayward Mayor fleet</i>				
Gasoline	2	0.0	6	403
<i>Subtotal Hayward Mayor fleet</i>	2	0.0	6	403
<i>Hayward Police Department Fleet</i>				
Gasoline	935	9.7	3,543	235,794
<i>Subtotal Hayward Police Department Fleet</i>	935	9.7	3,543	235,794
<i>Hayward Source Control</i>				
Gasoline	19	0.2	70	4,651
<i>Subtotal Hayward Source Control</i>	19	0.2	70	4,651
<i>Hayward Streets Maintenance</i>				
Gasoline	71	0.7	269	18,252
Diesel	50	0.5	187	13,700
<i>Subtotal Hayward Streets Maintenance</i>	121	1.3	456	31,952
<i>Hayward Traffic Maintenance</i>				
Gasoline	18	0.2	68	4,496
<i>Subtotal Hayward Traffic Maintenance</i>	18	0.2	68	4,496

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## Government Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tonnes)	Equiv CO <sub>2</sub> (%)	Energy (MWh)	Cost (\$)
<i>Hayward Trans. Services</i>				
Gasoline	3	0.0	10	670
<i>Subtotal Hayward Trans. Services</i>	3	0.0	10	670
<i>Hayward Utilities</i>				
Gasoline	44	0.5	168	11,302
Diesel	15	0.2	58	4,075
CNG	0	0.0	0	3,300
<i>Subtotal Hayward Utilities</i>	60	0.6	226	18,677
<i>Hayward Waste Management Fleet</i>				
Gasoline	1	0.0	3	0
Diesel	2,227	23.1	8,294	0
CNG	0	0.0	0	0
<i>Subtotal Hayward Waste Management Fleet</i>	2,228	23.1	8,297	0

*Data Sources:*

1. The City of Hayward does not own or operate the Waste Management Inc. fleet. However, it is included in the emissions inventory because waste hauling is an essential municipal service. This record comprises the portion of fuel consumed by the WM fleet for all service within the city, including the commercial/industrial, residential and government sectors. This particular data entry, the "Hayward Waste Management Fleet" was provided by David Tucker at Waste Management, DTucker2@wm.com on Oct 03, 2006. The record represents the fuel consumed by vehicles of Waste Management Company that are used to manage the waste of the city.

2. Cost data provided by Waste Management, Inc. for gasoline is currently under review by Waste Management staff. ICLEI will provide updated cost data should the numbers need to be revised.

3. CNG data provided by Waste Management, Inc. is currently under review by Waste Management staff. ICLEI will provide updated CNG data should the numbers need to be revised.

Data entered on Aug. 18, 2006 by Palak Joshi, Program Assistant, ICLEI, palak.joshi@iclei.org, (510) 844-0699. Last updated by Jennifer Holzer, Program Associate, ICLEI, July 2008, jennifer.holzer@iclei.org, 510-844-0699.

*Hayward Waste Water Fleet*

Gasoline	23	0.2	85	5,393
Diesel	5	0.1	19	998
<i>Subtotal Hayward Waste Water Fleet</i>	28	0.3	104	6,390

*Hayward Water Distribution Fleet*

Gasoline	110	1.1	415	27,774
Diesel	48	0.5	179	13,116

This report has been generated for Hayward, CA using STAPPA/ALAPCO and ICLEI's Clean Air and Climate Protection Software developed by Torrie Smith Associates Inc.

## Government Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tonnes)	Equiv CO <sub>2</sub> (%)	Energy (MWh)	Cost (\$)
CNG	0	0.0	0	2,654
<i>Subtotal Hayward Water Distribution Fleet</i>	158	1.6	593	43,544

Data submitted on July, 27, 2006 by Vera Dahle Lacaze, Solid Waste Manager, Hayward City, Vera.Dahle-Lacaze@hayward-ca.gov, (510) 583-4725 with the help of Scott Estes, Equipment Manager, Scott.Estes@hayward-ca.gov <mailto:Scott.Estes@hayward-ca.gov>, (510) 881-7914.

Data entered on Aug. 21, 2006 by Palak Joshi, Program Assistant, ICLEI, palak.joshi@iclei.org, (510) 844 0699.

Notes:  
1. Vehicles classified into types using the [www.fueleconomy.gov](http://www.fueleconomy.gov).  
2. CNG vehicles will be phased out by 2020 and so zero fuel consumption is noted. The projections for 2020 is provided by Scott Estes, Equipment Manager, Hayward.

<b>Subtotal Vehicle Fleet</b>	4,105	42.6	15,391	481,884
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### Streetlights

Hayward, CA				
<i>Streetlights</i>				
Electricity	1,122	11.6	5,017	552,000
<i>Subtotal Streetlights</i>	1,122	11.6	5,017	552,000

1. The updated 2005 PG&E CO<sub>2</sub>e emission factor of 0.49 lbs/kWh of delivered electricity is verified by the California Climate Action Registry and was reported to ICLEI in January 2007 by Greg San Martin. The PG&E CO<sub>2</sub>e emissions factor of 53.05 kg/MMBtu of delivered natural gas, verified by the California Climate Action Registry and the CEC. The PG&E coefficient set does not have emissions factors for CH<sub>4</sub> and N<sub>2</sub>O as the CO<sub>2</sub>e emissions factor includes CH<sub>4</sub> and N<sub>2</sub>O emissions in CO<sub>2</sub> equivalents. The business-as-usual projections for 2020 assume no change in the PG & E CO<sub>2</sub>e emissions factor.

2. Default criteria air pollutant emissions factors are based on the Region 13 - Western Systems Coordinating Council/CNV Average Grid Electricity Set.

<i>Traffic Signals - City Owned</i>				
Electricity	97	1.0	435	74,000
<i>Subtotal Traffic Signals - City Owned</i>	97	1.0	435	74,000

<i>Untitled</i>				
Electricity	224	2.3	1,000	0
<i>Subtotal Untitled</i>	224	2.3	1,000	0

<b>Subtotal Streetlights</b>	1,442	15.0	6,452	626,000
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This report has been generated for Hayward, CA using STAPPA/ALAPCO and ICLEI's Clean Air and Climate Protection Software developed by Torrie Smith Associates Inc.

## Government Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tonnes)	Equiv CO <sub>2</sub> (%)	Energy (MWh)	Cost (\$)
<b>Water/Sewage</b>				
<b>Hayward, CA</b>				
<i>Hayward Lift Stations</i>				
Electricity	125	1.3	561	151,401
<i>Subtotal Hayward Lift Stations</i>	125	1.3	561	151,401
The record includes energy consumed in the Lift stations only.				
<p>1. The updated 2005 PG&amp;E CO<sub>2</sub>e emission factor of 0.49 lbs/kWh of delivered electricity is verified by the California Climate Action Registry and was reported to ICLEI in January 2007 by Greg San Martin. The PG&amp;E CO<sub>2</sub>e emissions factor of 53.05 kg/MMBtu of delivered natural gas, verified by the California Climate Action Registry and the CEC. The PG&amp;E coefficient set does not have emissions factors for CH<sub>4</sub> and N<sub>2</sub>O as the CO<sub>2</sub>e emissions factor includes CH<sub>4</sub> and N<sub>2</sub>O emissions in CO<sub>2</sub> equivalents. The business-as-usual projections for 2020 assume no change in the PG &amp; E CO<sub>2</sub>e emissions factor.</p> <p>2. Default criteria air pollutant emissions factors are based on the Region 13 - Western Systems Coordinating Council/CNV Average Grid Electricity Set.</p>				
<i>Wastewater Treatment Plant - Hayward</i>				
Electricity	1,056	10.9	4,723	521,000
Natural Gas	156	1.6	855	34,000
<i>Subtotal Wastewater Treatment Plant - Hayward</i>	1,212	12.6	5,578	555,000
Current inflow for the treatment plant is 13.5 MGD. The Water Pollution Control Facilities (WPCF) produces and uses electricity through bio-methane generation. Hence its consumption is not covered here. Bio-methane is produced by anaerobic digestion process and burned in the co-generation equipment.				
<i>Water supply - Hayward</i>				
Electricity	717	7.4	3,208	378,854
<i>Subtotal Water supply - Hayward</i>	717	7.4	3,208	378,854
This record includes energy consumed in pump stations, reservoir, wells, cathodic protection system, PR station, underpass etc.				
<b>Subtotal Water/Sewage</b>	<b>2,055</b>	<b>21.3</b>	<b>9,348</b>	<b>1,085,255</b>