

**Appendix A – Data Summary Reports, Data Sources, Assumptions and Notes  
for the Municipal Inventory**

# Union City

## Government Greenhouse Gas Emissions in 2005

### Summary Report

	Equiv CO <sub>2</sub> (tons)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)	Cost (\$)
<b>Buildings</b>	716	18.4	10,006	270,623
<b>Vehicle Fleet</b>	2,642	68.0	30,791	405,531
<b>Streetlights</b>	506	13.0	6,583	213,564
<b>Water/Sewage</b>	21	0.5	276	12,993
<b>Waste</b>	0	0.0		0
<b>Total</b>	3,886	100.0	47,656	902,710

## Government Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tons)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)	Cost (\$)
<b>Buildings</b>				
<i>Union City, California</i>				
<i>Bus Shelters</i>				
Electricity	0	0.0	2	543
<i>Subtotal Bus Shelters</i>	0	0.0	2	543
<i>Fire Stations</i>				
Electricity	51	1.3	660	26,686
Natural Gas	48	1.2	780	9,907
<i>Subtotal Fire Stations</i>	99	2.5	1,439	36,593
This record includes energy consumed in all Fire stations and Fire houses.				
<i>Public Works</i>				
Electricity	230	5.9	2,991	110,903
Natural Gas	102	2.6	1,652	5,964
<i>Subtotal Public Works</i>	332	8.5	4,643	116,867
This record includes public works department, public service central administration building, administration and police department, public works maintenance facility pump and city police department.				
<i>Recreation Facilities</i>				
Electricity	217	5.6	2,823	110,923
Natural Gas	68	1.7	1,099	5,697
<i>Subtotal Recreation Facilities</i>	285	7.3	3,922	116,620
This record includes senior center, community building, communications tower, leisure service facility, parks, reader/board, restroom, U.C. Corporation yard, youth program etc.				

## Government Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tons)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)	Cost (\$)
<b>Subtotal Buildings</b>	716	18.4	10,006	270,623
<b>Vehicle Fleet</b>				
<i>Union City, California</i>				
<i>Fire department fleet</i>				
Gasoline	39	1.0	452	7,868
Diesel	101	2.6	1,166	11,963
<i>Subtotal Fire department fleet</i>	140	3.6	1,618	19,831
<i>Parks Maintenance fleet</i>				
Diesel	158	4.1	1,809	32,154
CNG	0	0.0	0	5,798
Diesel (ULSD)	14	0.4	158	2,479
<i>Subtotal Parks Maintenance fleet</i>	171	4.4	1,967	40,430
<i>Police department vehicles</i>				
Gasoline	514	13.2	6,031	101,945
CNG	0	0.0	0	2,148
<i>Subtotal Police department vehicles</i>	514	13.2	6,032	104,092
<i>Staff fleet</i>				
Gasoline	42	1.1	487	8,364
CNG	0	0.0	0	4,755
<i>Subtotal Staff fleet</i>	42	1.1	488	13,119
<i>Streets maintenance fleet</i>				
Gasoline	38	1.0	441	7,674
CNG	0	0.0	1	11,144
Diesel (ULSD)	78	2.0	898	14,455
<i>Subtotal Streets maintenance fleet</i>	115	3.0	1,340	33,273
<i>Tri-Ced Fleet</i>				
Gasoline	601	15.5	7,132	0
<i>Subtotal Tri-Ced Fleet</i>	601	15.5	7,132	0

## Government Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tons)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)	Cost (\$)
<i>Union City Transit</i>				
Diesel	1,039	26.7	11,977	193,216
CNG	0	0.0	0	1,570
<b>Subtotal Union City Transit</b>	<b>1,039</b>	<b>26.7</b>	<b>11,977</b>	<b>194,786</b>

Data obtained on July 13, 2006 from Mike Klinkner, Public Works Superintendent / Fleet, Union City, mklinkner@ci.union-city.ca.us, 510-675-5371, with the help of Michael Rudolph.

Data collection coordinator for Union City, Roberto Munoz, Recycling Coordinator, Union City, RobertoM@ci.union-city.ca.us, (510) 675-5466.

Data entered on August 22, 2006 by Palak Joshi, Program Assistant, ICLEI, palak.joshi@iclei.org, (510)844 0699.

### *Waste Management Fleet*

Gasoline	20	0.5	237	0
<b>Subtotal Waste Management Fleet</b>	<b>20</b>	<b>0.5</b>	<b>237</b>	<b>0</b>

Notes:

1. 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.
2. The Union City 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.
3. 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.

Data Sources:

Data submitted by David Tucker at Waste Management, DTucker2@wm.com on Oct 03, 2006.

<b>Subtotal Vehicle Fleet</b>	<b>2,642</b>	<b>68.0</b>	<b>30,791</b>	<b>405,531</b>
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### **Streetlights**

#### **Union City, California**

#### *Street Lights*

Electricity	472	12.1	6,136	192,651
<b>Subtotal Street Lights</b>	<b>472</b>	<b>12.1</b>	<b>6,136</b>	<b>192,651</b>

#### *Traffic Signals*

Electricity	34	0.9	447	20,912
<b>Subtotal Traffic Signals</b>	<b>34</b>	<b>0.9</b>	<b>447</b>	<b>20,912</b>

## Government Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tons)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)	Cost (\$)
<b>Subtotal Streetlights</b>	506	13.0	6,583	213,564
<b>Water/Sewage</b>				
Union City, California				
<i>Median Irrigation</i>				
Electricity	21	0.5	276	12,993
<b>Subtotal Median Irrigation</b>	21	0.5	276	12,993

Common Notes (Buildings, Streetlights and Water/Sewage):

1. PG&E specific eCO<sub>2</sub> emissions factor of 0.525 lbs/kWh (or 262.5 short tons CO<sub>2</sub>/GWh) of delivered electricity in 2005 provided by Greg San Martin used.
2. The PG&E coefficient set is based on the PG&E - specific eCO<sub>2</sub> emissions factor for 2005 and default criteria air pollutant emissions factors for the 2004 Region 13 - Western Systems Coordinating Council/CNV Average Grid Electricity Set. The PG&E coefficient set does not have emissions factors for CH<sub>4</sub> and N<sub>2</sub>O as the eCO<sub>2</sub> 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 eCO<sub>2</sub> emissions factor.
3. The eCO<sub>2</sub> emissions factor is pending independent verification and certification from the California Climate Action Registry; the confirmed eCO<sub>2</sub> factor will be made public by CCAR at the end of 2006, at which time the emissions factor used in this analysis should be updated if it has changed.

Data Sources (Buildings, Streetlights and Water/Sewage sectors):

Data obtained from the data collection coordinator for Union City, Roberto Munoz, Recycling Coordinator, Union City, RobertoM@ci.union-city.ca.us, (510) 675-5466.

Data entered on Oct 03, 2006 by Palak Joshi, Program Assistant, ICLEI, palak.joshi@iclei.org, (510)844 0699.

Reference file: ICLEI\_UnionCity\_Bldgs\_StrtLghts\_WtrSwg\_CY2005

<b>Subtotal Water/Sewage</b>	21	0.5	276	12,993
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### Waste

Union City, California			
<i>Union City Municipal Operations Waste</i>			<i>Disposal Method - Managed Landfill</i>
Paper Products	0	0.0	0
Food Waste	0	0.0	0
Plant Debris	0	0.0	0
Wood/Textiles	0	0.0	0
<b>Subtotal Union City Municipal Operations Waste</b>	0	0.0	0

Notes:

1. In 2005, the Union City sent approximately 822 tons of solid waste to landfills. Because 74.5% of the methane produced by Hayward's solid waste is estimated to be recovered, waste emissions appear to be negative: -263 tons. Many cities choose to eliminate this emissions "credit" by replacing the waste tonnage input data with zero. StopWaste.Org urged ICLEI to do so for the purposes of this inventory. For future reference, the notes below include the original waste data that resulted in the negative emissions number.
2. Hayward's municipal waste composition:
  - a. Paper products: 20%

## Government Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tons)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)	Cost (\$)
<ul style="list-style-type: none"> <li>b. Food Waste: 15%</li> <li>c. Yard Waste: 20%</li> <li>d. Wood, textile waste: 20%</li> <li>e. All other types: 25%</li> </ul>				
3. Weighted average methane recovery factor for Hayward was calculated based on tonnage - 74.5%				
4. Recycling and compost tonnage has been omitted from this analysis as complete recycling and compost data was not available.				
5. The amount of waste and the waste composition shown here are estimates.				
Data Sources:				
Data obtained on July 11, 2006 from Roberto Munoz, Recycling Coordinator, Union City, RobertoM@ci.union-city.ca.us, (510) 675-5466.				
Data entered on August 22, 2006 by Palak Joshi, Program Assistant, ICLEI, palak.joshi@iclei.org, (510)844 0699. Methane recovery factors obtained from EPA for individual landfill sites. Weighted average used.				
<b>Subtotal Waste</b>	0	0.0		0
<b>Total</b>	3,886	100.0	47,656	902,710

**Appendix B – Data Summary Reports, Indicator Report, Data Sources,  
Assumptions and Notes for the Community Inventory**

# Union City

## Community Greenhouse Gas Emissions in 2005

### Summary Report

	Equiv CO <sub>2</sub> (tons)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)
Residential	81,632	21.9	1,224,112
Commercial	132,271	35.4	1,902,262
Transportation	159,226	42.7	1,852,666
Waste	0	0.0	
<b>Total</b>	<b>373,128</b>	<b>100.0</b>	<b>4,979,040</b>

# Union City

## Community Greenhouse Gas Emissions in 2005

### Indicators Report

	Equiv CO <sub>2</sub> (tons)	Energy (MMBtu)
<b>Residential</b>		
Community Residential		
<i>Per household</i>	4.2	62.3
Sector Average		
<i>Per capita</i>	1.1	17.1
<i>Per household</i>	4.2	62.3
<b>Commercial</b>		
Sector Average		
<i>Per capita</i>	1.9	26.6
<b>Transportation</b>		
Sector Average		
<i>Per capita</i>	2.2	25.9
<b>Waste</b>		
Sector Average		
<i>Per capita</i>	0.0	

## Community Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tons)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)
<b>Residential</b>			
Union City, California			
<i>Community Residential</i>			
Electricity	30,519	8.2	396,797
Natural Gas	51,113	13.7	827,315
<i>Subtotal Community Residential</i>	81,632	21.9	1,224,112
<b>Subtotal Residential</b>	81,632	21.9	1,224,112
<b>Commercial</b>			
Union City, California			
<i>Community Commercial/Industrial</i>			
Electricity	74,952	20.1	974,514
Natural Gas	57,318	15.4	927,748
<i>Subtotal Community Commercial/Industrial</i>	132,271	35.4	1,902,262

Data Sources:

1. Community electricity and natural gas data provided by Data collection coordinator, Roberto Munoz, Recycling Coordinator, Union City, RobertoM@ci.union-city.ca.us, (510) 675-5466.
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.
3. PG&E specific eCO<sub>2</sub> emissions factor of 0.525 lbs/kWh (or 262.5 short tons CO<sub>2</sub>/GWh) of delivered electricity in 2005 provided by Greg San Martin.

Notes:

1. The PG&E coefficient set is based on the PG&E - specific eCO<sub>2</sub> emissions factor for 2005 and default criteria air pollutant emissions factors for the 2004 Region 13 - Western Systems Coordinating Council/CNV Average Grid Electricity Set. The PG&E coefficient set does not have emissions factors for CH<sub>4</sub> and N<sub>2</sub>O as the eCO<sub>2</sub> emissions factor includes CH<sub>4</sub> and N<sub>2</sub>O emissions in CO<sub>2</sub> equivalents.
2. The eCO<sub>2</sub> emissions factor is pending independent verification and certification from the California Climate Action Registry; the confirmed eCO<sub>2</sub> factor will be made public by CCAR at the end of 2006, at which time the emissions factor used in this analysis should be updated if it has changed.
3. 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 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.

Reference File: ICLEI\_UnionCity\_Community\_Res\_Com\_CY2005

## Community Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tons)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)
<b>Subtotal Commercial</b>	132,271	35.4	1,902,262
<b>Transportation</b>			
Union City, California			
<i>Untitled</i>			
Gasoline	101,355	27.2	1,185,581
Diesel	57,871	15.5	667,085
<b>Subtotal Untitled</b>	159,226	42.7	1,852,666

## Data Sources:

1. Citywide Vehicles Miles Traveled (VMT) data provided on July 18, 2006 by Harold Brazil, Air Quality Associate, Metropolitan Transportation Commission (MTC) hbrazil@mtc.ca.gov, (510) 817-5747
2. VMT by vehicle type data provided on July 5, 2006 by Amir Fanai, Principal Air Quality Engineer, Bay Area Air Quality Management District, AFanai@baaqmd.gov

## Notes:

1. VMT data for 2005 is not currently available. The estimated 2005 VMT data was calculated by applying an annual population growth rate to 2004 MTC VMT data.
2. The VMT data provided by MTC includes Daily VMT (DVMT) for weekdays only. VMT including weekends is calculated with the MTC's weekdays/weekends VMT ratio: 1.1489. Hence Annual VMT = DVMT x (number of weekdays in the base year) + DVMT/1.1489 x (365 - number of weekdays in the base year).
3. The VMT by fuel and vehicle type is calculated using Alameda County VMT % (by vehicle type) and the default CACP fleet breakdown by fuel type.

## 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.

<b>Subtotal Transportation</b>	159,226	42.7	1,852,666
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**Waste**

Union City, California

**ADC Tonnage***Disposal Method - Managed Landfill*

Plant Debris	0	0.0
<b>Subtotal ADC Tonnage</b>	0	0.0

## Notes:

1. In 2005, the City's waste was covered with 5,583 tons of Alternative Daily Cover (ADC). Because 74.7% of the methane produced by the City's ADC is estimated to be recovered, waste emissions appear to be negative: -3,364 tons. Many cities choose to eliminate this emissions "credit" by replacing the waste tonnage input data with zero. StopWaste.Org urged ICLEI to do so for the purposes of this inventory. For future reference, the notes below include the original waste data that resulted in the negative emissions number.
2. ADC includes Green Materials categorized as 'Plant Debris' and ADC like the Solidify Class II Cover, C & D, Roofing, Auto shred fluff, Roofing, Sludge/ biosolid waste categorized as 'All Other waste' categories of CACP software.
  - a. Plant Debris: 89.2%
  - b. All Other Waste: 10.8%
3. The weighted average methane recovery factor for the city is based on tonnage hauled to each landfill (74.7%).

## Data Sources:

This report has been generated for Union City, California 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> (tons)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)
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1. ADC tonnage data provided on July 20, 2006 by Meghan Starkey, Senior Program Manager, Alameda County Waste Management Authority (StopWaste.org), mstarkey@stopwaste.org, (510) 614-1699 - <http://www.stopwaste.org/home/index.asp?page=590>
2. Methane recovery factors for individual landfill sites (explained in the notes above) provided by Victoria Ludwig, Program Manager at EPA Landfill Methane Outreach Program, Ludwig.Victoria@epamail.epa.gov

Data entry by Palak Joshi, Program Assistant, ICLEI, palak.joshi@iclei.org  
Reference file: ICLEI\_UnionCity\_CommunityWaste\_CY2005

<i>Landfill waste</i>	<i>Disposal Method - Managed Landfill</i>	
Paper Products	0	0.0
Food Waste	0	0.0
Plant Debris	0	0.0
Wood/Textiles	0	0.0
<b>Subtotal Landfill waste</b>	<b>0</b>	<b>0.0</b>

**Notes:**

1. In 2005, the Union City sent approximately 67,456 tons of solid waste to landfills. Because 74.8% of the methane produced by the Union city's solid waste is estimated to be recovered, waste emissions appear to be negative: -12,662 tons. Many cities choose to eliminate this emissions "credit" by replacing the waste tonnage input data with zero. StopWaste.Org urged ICLEI to do so for the purposes of this inventory. For future reference, the notes below include the original waste data that resulted in the negative emissions number.
2. City's waste tonnage by landfill:
  - a. Altamont: 3,185 tons
  - b. Forward Inc. : 9,896 tons
  - c. Tricities : 52,937 tons
  - d. Others (This includes landfills that receive less than 1% of the total city waste land filled): 1,439 tons
2. City's waste composition:
  - a. Paper products: 28.8%
  - b. Food Waste: 17.0%
  - c. Yard Waste: 3.0%
  - d. Wood, textile waste: 13.2%
  - e. All other types: 38.0%
3. Weighted average methane recovery factor for Hayward was calculated based on tonnage - 74.7%
4. Recycling and compost tonnage has been omitted from this analysis as complete recycling and compost data was not available.

**Sources:**

1. Landfill data provided on July 20, 2006 by Meghan Starkey, Senior Program Manager, Alameda County Waste Management Authority (StopWaste.org), mstarkey@stopwaste.org, (510) 614-1699
2. Waste characterization of the Landfill waste data based on 2000 Alameda County Waste Characterization study available online at <http://www.stopwaste.org/home/index.asp?page=590>
3. Methane recovery factors for individual landfill sites provided by Victoria Ludwig, Program Manager EPA Landfill Methane Outreach Program, Ludwig.Victoria@epamail.epa.gov

**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.

<b>Subtotal Waste</b>	0	0.0	
<b>Total</b>	373,128	100.0	4,979,040

**Appendix C – Data Summary Report for the Community Emissions Forecast**

# Union City

## Community Greenhouse Gas Emissions in 2020

### Summary Report

	Equiv CO <sub>2</sub> (tons)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)
Residential	95,620	22.1	1,433,872
Commercial	154,936	35.8	2,228,229
Transportation	182,004	42.1	2,120,683
Waste	0	0.0	
<b>Total</b>	<b>432,560</b>	<b>100.0</b>	<b>5,782,783</b>

## Community Greenhouse Gas Emissions in 2020 Detailed Report

	Equiv CO <sub>2</sub> (tons)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)
<b>Residential</b>			
Union City, California			
<i>Community Residential</i>			
Electricity	35,748	8.3	464,791
Natural Gas	59,872	13.8	969,081
<b>Subtotal Community Residential</b>	<b>95,620</b>	<b>22.1</b>	<b>1,433,872</b>
<b>Subtotal Residential</b>	<b>95,620</b>	<b>22.1</b>	<b>1,433,872</b>
<b>Commercial</b>			
Union City, California			
<i>Community Commercial/Industrial</i>			
Electricity	87,796	20.3	1,141,504
Natural Gas	67,140	15.5	1,086,725
<b>Subtotal Community Commercial/Industrial</b>	<b>154,936</b>	<b>35.8</b>	<b>2,228,229</b>

**Notes:**

Projections are based on the assumption that consumption (and therefore emissions) will grow as the population increases. The annual population growth rate is extrapolated from the Association of Bay Area Governments' population projection data for 2000-2020 as published in Projections 2005.

- The PG&E coefficient set is based on the PG&E - specific eCO<sub>2</sub> emissions factor for 2005 and default criteria air pollutant emissions factors for the 2004 Region 13 - Western Systems Coordinating Council/CNV Average Grid Electricity Set. The PG&E coefficient set does not have emissions factors for CH<sub>4</sub> and N<sub>2</sub>O as the eCO<sub>2</sub> 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 eCO<sub>2</sub> emissions factor.
- The eCO<sub>2</sub> emissions factor is pending independent verification and certification from the California Climate Action Registry; the confirmed eCO<sub>2</sub> factor will be made public by CCAR at the end of 2006, at which time the emissions factor used in this analysis should be updated if it has changed.
- The residential sector includes energy consumed in all residential buildings of the city.
- 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 for the base year (2005):**

- 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.
- PG&E specific eCO<sub>2</sub> emissions factor of 0.525 lbs/kWh (or 262.5 short tons CO<sub>2</sub>/GWh) of delivered electricity in 2005 provided by Greg San Martin.

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.

Reference File: ICLEI\_UnionCity\_Community\_Res\_Com\_CY2005

## Community Greenhouse Gas Emissions in 2020 Detailed Report

	Equiv CO <sub>2</sub> (tons)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)
<b>Subtotal Commercial</b>	154,936	35.8	2,228,229

### Transportation

Union City, California

#### Untitled

Gasoline	114,350	26.4	1,340,817
Diesel	67,654	15.6	779,866
<b>Subtotal Untitled</b>	182,004	42.1	2,120,683

**Notes:**

Projections are based on the assumption that consumption (and therefore emissions) will grow as the population increases. The annual population growth rate is extrapolated from the Association of Bay Area Governments' population projection data for 2000-2020 as published in Projections 2005.

1. Vehicles Miles Traveled data for 2005 is not currently available. The estimated 2005 VMT data was calculated by applying an annual population growth rate to 2004 MTC VMT data.
2. The VMT data provided by MTC includes Daily VMT (DVMT) for weekdays only. VMT including weekends is calculated with the MTC's weekdays/weekends VMT ratio: 1.1489. Hence Annual VMT = DVMT x (number of weekdays in the base year) + DVMT/1.1489 x (365 - number of weekdays in the base year).
3. The VMT by fuel and vehicle type is calculated using Alameda County VMT % (by vehicle type) and the default CACP fleet breakdown by fuel type.

**Data Sources:**

1. Citywide Vehicles Miles Traveled (VMT) data provided on July 18, 2006 by Harold Brazil, Air Quality Associate, Metropolitan Transportation Commission (MTC) hbrasil@mtc.ca.gov, (510) 817-5747
2. VMT by vehicle type data provided on July 5, 2006 by Amir Fanai, Principal Air Quality Engineer, Bay Area Air Quality Management District, AFanai@baaqmd.gov

**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.

<b>Subtotal Transportation</b>	182,004	42.1	2,120,683
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### Waste

Union City, California

#### ADC Tonnage

*Disposal Method - Managed Landfill*

Plant Debris	0	0.0	
<b>Subtotal ADC Tonnage</b>	0	0.0	

**Notes:**

Projections are based on the assumption that waste generation (and therefore emissions) will grow as the population increases. The annual population growth rate is extrapolated from the Association of Bay Area Government's population projection data for 2000-2020 as published in Projections 2005

1. In 2020, the Union City's waste is estimated to be covered with 6,540 tons of Alternative Daily Cover (ADC). Because 74.7% of the methane produced by the City's ADC is estimated to be recovered, waste emissions appear to be negative: -3,940 tons. Many cities choose to eliminate this emissions "credit" by replacing the waste tonnage input data with zero. StopWaste.Org urged ICLEI to do so for the purposes of this inventory.

For future reference, the notes below include the original waste data that resulted in the negative emissions number.

## Community Greenhouse Gas Emissions in 2020 Detailed Report

Equiv CO <sub>2</sub> (tons)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)
---------------------------------	------------------------------	-------------------

ADC includes Green Materials categorized as 'Plant Debris' and ADC like the Solidify Class II Cover, C & D, Roofing, Auto shred fluff, Roofing, Sludge/ biosolid waste categorized as 'All Other waste'.

ADC waste composition is estimated to be the following (all green materials are categorized as 'Plant Debris' in the software and all other types of ADCs are added together and categorized as 'All other types of wastes' in the software):

- a. Plant Debris: 89.2%
- b. All Other Waste: 10.8%

Sources for the base year (2005) data:

1. ADC tonnage data provided on July 20, 2006 by Meghan Starkey, Senior Program Manager, Alameda County Waste Management Authority (StopWaste.org), mstarkey@stopwaste.org, (510) 614-1699
2. Waste characterization of the data is based on the total waste generated in different categories.

Landfill waste	Disposal Method - Managed Landfill	
Paper Products	0	0.0
Food Waste	0	0.0
Plant Debris	0	0.0
Wood/Textiles	0	0.0
<b>Subtotal Landfill waste</b>	<b>0</b>	<b>0.0</b>

**Notes:**

Projections are based on the assumption that waste generation (and therefore emissions) will grow as the population increases. The annual population growth rate is extrapolated from the Association of Bay Area Governments' population projection data for 2000-2020 as published in Projections 2005

1. In 2020, the Union City will send approximately 79,015 tons of solid waste to landfills. Because 74.8% of the methane produced by the Union city's solid waste is estimated to be recovered, waste emissions would appear to be negative: -14,831 tons. Many cities choose to eliminate this emissions "credit" by replacing the waste tonnage input data with zero. StopWaste.Org urged ICLEI to do so for the purposes of this inventory. For future reference, the notes below include the original waste data that resulted in the negative emissions number.

2. Union City's waste composition is assumed to remain the same in 2020:

- a. Paper products: 28.8%
- b. Food Waste: 17.0%
- c. Yard Waste: 3.0%
- d. Wood, textile waste: 13.2%
- e. All other types: 38.0%
- Total: 100%

4. Weighted average methane recovery factor for Hayward was calculated based on tonnage - 74.7% in the base year and is assumed to remain the same in 2020.

5. Recycling and compost tonnage have been omitted from this analysis as complete recycling and compost data was not available.

Sources for the base year (2005) data:

1. Landfill data provided on July 20, 2006 by Meghan Starkey, Senior Program Manager, Alameda County Waste Management Authority (StopWaste.org), mstarkey@stopwaste.org, (510) 614-1699
2. Waste characterization of the Landfill waste data based on 2000 Alameda County Waste Characterization study available online at <http://www.stopwaste.org/home/index.asp?page=590>
3. Methane recovery factors for individual landfill sites provided by Victoria Ludwig, Program Manager EPA Landfill Methane Outreach Program, Ludwig.Victoria@epamail.epa.gov

**Data entry:**

Palak Joshi, Program Assistant, ICLEI, palak.joshi@iclei.org, (510) 844-0699, on August 25, 2006. Timothy Burroughs, Supervisor,

## Community Greenhouse Gas Emissions in 2020 Detailed Report

	Equiv CO <sub>2</sub> (tons)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)
<hr/>			
timothy.burroughs@iclei.org.			
<hr/>			
<b>Subtotal Waste</b>	0	0.0	
<hr/>			
<b>Total</b>	432,560	100.0	5,782,783

## **Appendix D – Revised Government GHG Emissions Detailed Report**

## Government Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tonnes)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)	Cost (\$)
<b>Buildings</b>				
<i>Union City, California</i>				
<i>Bus Shelters</i>				
Electricity	0	0.0	2	543
<b>Subtotal Bus Shelters</b>	<b>0</b>	<b>0.0</b>	<b>2</b>	<b>543</b>

Notes for Buildings, Streetlights and Water/Sewage sectors:

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.

Data Sources:

1. Community electricity and natural gas consumption data provided by PG&E. Request 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.

2. Data obtained from the data collection coordinator for Union City, Roberto Munoz, Recycling Coordinator, Union City, RobertoM@ci.union-city.ca.us, (510) 675-5466.

3. Reference file: ICLEI\_UnionCity\_Bldgs\_StrLghts\_WtrSwg\_CY2005

Data entry: Data entered on September 27, 2006 by Palak Joshi, Program Assistant, ICLEI, palak.joshi@iclei.org. Last updated by Jonathan Strunin in July 2008, jonathan.strunin@iclei.org, 510-844-0699 x333.

### *Fire Stations*

Electricity	43	1.2	660	26,686
Natural Gas	42	1.1	780	9,907
<b>Subtotal Fire Stations</b>	<b>85</b>	<b>2.3</b>	<b>1,439</b>	<b>36,593</b>

This record includes energy consumed in all Fire stations and Fire houses.

## Government Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tonnes)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)	Cost (\$)
<i>Public Works</i>				
Electricity	196	5.3	2,991	110,903
Natural Gas	88	2.4	1,652	5,964
<b>Subtotal Public Works</b>	<b>284</b>	<b>7.6</b>	<b>4,643</b>	<b>116,867</b>
This record includes public works department, public service central administration building, administration and police department, public works maintenance facility pump and city police department.				
<i>Recreation Facilities</i>				
Electricity	185	5.0	2,823	110,923
Natural Gas	59	1.6	1,099	5,697
<b>Subtotal Recreation Facilities</b>	<b>244</b>	<b>6.6</b>	<b>3,922</b>	<b>116,620</b>
This record includes senior center, community building, communications tower, leisure service facility, parks, reader/board, restroom, U.C. Corporation yard, youth program etc.				
<b>Subtotal Buildings</b>	<b>613</b>	<b>16.5</b>	<b>10,006</b>	<b>270,623</b>
<b>Vehicle Fleet</b>				
<i>Union City, California</i>				
<i>Fire department fleet</i>				
Gasoline	31	0.8	452	7,868
Diesel	97	2.6	1,166	11,963
<b>Subtotal Fire department fleet</b>	<b>128</b>	<b>3.5</b>	<b>1,618</b>	<b>19,831</b>
<i>Parks Maintenance fleet</i>				
Diesel	143	3.8	1,809	32,154
CNG	0	0.0	0	5,798
Diesel (ULSD)	12	0.3	158	2,479
<b>Subtotal Parks Maintenance fleet</b>	<b>155</b>	<b>4.2</b>	<b>1,967</b>	<b>40,430</b>
<i>Police department vehicles</i>				
Gasoline	466	12.5	6,031	101,945
CNG	0	0.0	0	2,148
<b>Subtotal Police department vehicles</b>	<b>466</b>	<b>12.5</b>	<b>6,032</b>	<b>104,092</b>

## Government Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tonnes)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)	Cost (\$)
<i>Staff fleet</i>				
Gasoline	38	1.0	487	8,364
CNG	0	0.0	0	4,755
<i>Subtotal Staff fleet</i>	38	1.0	488	13,119
<i>Streets maintenance fleet</i>				
Gasoline	34	0.9	441	7,674
CNG	0	0.0	1	11,144
Diesel (ULSD)	71	1.9	898	14,455
<i>Subtotal Streets maintenance fleet</i>	105	2.8	1,340	33,273
<i>Tri-Ced Fleet</i>				
Gasoline	545	14.7	7,132	0
<i>Subtotal Tri-Ced Fleet</i>	545	14.7	7,132	0
<i>Union City Transit</i>				
Diesel	942	25.3	11,977	193,216
CNG	0	0.0	0	1,570
<i>Subtotal Union City Transit</i>	942	25.3	11,977	194,786

## Notes:

1. Descriptions of vehicle types are available in the data source file.
2. Annual VMT was used for vehicles not reporting direct consumption data.
3. 2005 EMFAC factors were used for fleets reporting VMT instead of direct consumption.

## Data Sources:

1. Data provided by Mike Klinkner, Public Works Superintendent / Fleet, Union City, [mklinkner@ci.union-city.ca.us](mailto:mklinkner@ci.union-city.ca.us), 510-675-5371, with the help of Michael Rudolph on July 13, 2006.
2. EMFAC data provided in November, 2007 by Amir Fanal, Principal Air Quality Engineer, Bay Area Air Quality Management District, [AFanal@baaqmd.gov](mailto:AFanal@baaqmd.gov)
3. Data entered on August 22, 2006 by Palak Joshi, Program Assistant, ICLEI, [palak.joshi@iclei.org](mailto:palak.joshi@iclei.org), (510)844 0699.

## Government Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tonnes)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)	Cost (\$)
<i>Waste Management Fleet</i>				
Gasoline	18	0.5	237	0
<i>Subtotal Waste Management Fleet</i>	18	0.5	237	0

## Notes:

1. 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.
2. The Union City 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.
3. 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.

## Data Sources:

Data submitted by David Tucker at Waste Management, DTucker2@wm.com on Oct 03, 2006.

<b>Subtotal Vehicle Fleet</b>	2,398	64.5	30,791	405,531
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**Streetlights**

## Union City, California

*Street Lights*

Electricity	402	10.8	6,136	192,651
<i>Subtotal Street Lights</i>	402	10.8	6,136	192,651

*Traffic Signals*

Electricity	29	0.8	447	20,912
<i>Subtotal Traffic Signals</i>	29	0.8	447	20,912

<b>Subtotal Streetlights</b>	431	11.6	6,583	213,564
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**Water/Sewage**

## Union City, California

*Median Irrigation*

Electricity	18	0.5	276	12,993
<i>Subtotal Median Irrigation</i>	18	0.5	276	12,993

## Government Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tonnes)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)	Cost (\$)
<b>Subtotal Water/Sewage</b>	18	0.5	276	12,993
<b>Waste</b>				
Union City, California				
<i>Union City Municipal Operations Waste</i>				
			<i>Disposal Method - Managed Landfill</i>	
Paper Products	128	3.4		0
Food Waste	54	1.5		0
Plant Debris	41	1.1		0
Wood/Textiles	36	1.0		0
<b>Subtotal Union City Municipal Operations Waste</b>	<b>259</b>	<b>7.0</b>		<b>0</b>
Notes:				
1. Government operations disposal figures and waste characterization were derived from an estimation conducted by Data collection coordinator for Union City, Roberto Munoz, Recycling Coordinator, Union City, RobertoM@ci.union-city.ca.us, (510) 675-5466.				
Union City's municipal waste composition:				
a. Paper products: 20%				
b. Food Waste: 15%				
c. Yard Waste: 20%				
d. Wood, textile waste: 20%				
e. All other types: 25%				
2. Methane recovery factor derived from the US EPA AP 42 Emissions Factors report (< <a href="http://www.epa.gov/ttn/chieff/ap42/index.html">http://www.epa.gov/ttn/chieff/ap42/index.html</a> >), which states that "reported collection efficiencies typically range from 60 to 85 percent" (AP 42, section 2.4 Municipal Solid Waste, 2.4-6). Following the recommendation of the Alameda County Waste Management Authority, and keeping with general IPCC guidelines to err towards conservative estimation, ICLEI adopted the 60% end of the range.				
3. All disposal figures included in this inventory refer specifically to tons of waste sent to a landfill. Therefore, the tonnage figures used do not reflect total waste <i>generation</i> , but the amount of waste <i>disposed in a landfill</i> . This means that, in the case of MSW, any waste that was diverted from the landfill through recycling, composting, construction material re-use programs, etc. is not included in the tonnage figures used to calculate emissions.				
Data entered by Palak Joshi, Program Assistant, ICLEI, palak.joshi@iclei.org, (510) 844-0699, on August 25, 2006. Data last updated by Jonathan Strunin, jonathan.strunin@iclei.org, 510-844, 0699 x333.				
<b>Subtotal Waste</b>	<b>259</b>	<b>7.0</b>		<b>0</b>
<b>Total</b>	<b>3,719</b>	<b>100.0</b>	<b>47,656</b>	<b>902,710</b>

## **Appendix E – Revised GHG Community Gas Emissions Detailed Report**

## Community Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tonnes)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)
<b>Residential</b>			
<i>Union City, California</i>			
<i>Community Residential</i>			
Electricity	25,991	6.8	396,797
Natural Gas	44,248	11.5	827,315
<b>Subtotal Community Residential</b>	<b>70,239</b>	<b>18.3</b>	<b>1,224,112</b>

## Notes:

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.

## Data Sources:

1. Community electricity and natural gas data provided by Data collection coordinator, Roberto Munoz, Recycling Coordinator, Union City, RobertoM@ci.union-city.ca.us, (510) 675-5466.
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.
3. Reference File: ICLEI\_UnionCity\_Community\_Res\_Com\_CY2005

Data entry: Data entered on September 27, 2006 by Palak Joshi, Program Assistant, ICLEI, palak.joshi@iclei.org. Last updated by Jonathan Strunin in July 2008, jonathan.strunin@iclei.org, 510-844-0699 x333.

<b>Subtotal Residential</b>	<b>70,239</b>	<b>18.3</b>	<b>1,224,112</b>
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### Commercial

<i>Union City, California</i>			
<i>Community Commercial/Industrial</i>			
Electricity	63,833	16.6	974,514
Natural Gas	49,620	12.9	927,748
<b>Subtotal Community Commercial/Industrial</b>	<b>113,452</b>	<b>29.5</b>	<b>1,902,262</b>

## Notes:

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

## Community Greenhouse Gas Emissions in 2005 Detailed Report

Equiv CO <sub>2</sub> (tonnes)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)
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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. The commercial sector includes energy consumed by city buildings/operations and facilities, district facilities such as the East Bay Municipal Utility District (EBMUD) and school districts, as well as industrial customers who failed the 15/15 rule. For this reason, commercial and industrial sectors have been combined in reporting.

#### Data Sources:

1. Community electricity and natural gas data provided by Data collection coordinator, Roberto Munoz, Recycling Coordinator, Union City, RobertoM@ci.union-city.ca.us, (510) 675-5466.
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.
3. Reference File: ICLEI\_UnionCity\_Community\_Res\_Com\_CY2005

Data entry: Data entered on September 27, 2006 by Palak Joshi, Program Assistant, ICLEI, palak.joshi@iclei.org. Last updated by Jonathan Strunin in July 2008, jonathan.strunin@iclei.org, 510-844-0699 x333.

<b>Subtotal Commercial</b>	113,452	29.5	1,902,262
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#### Transportation

##### Union City, California

##### State Highways VMT

Gasoline	58,711	15.3	815,885
Diesel	15,337	4.0	183,518
<b>Subtotal State Highways VMT</b>	<b>74,048</b>	<b>19.3</b>	<b>999,403</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. Citywide Vehicles Miles Traveled (VMT) data provided on July 18, 2006 by Harold Brazil, Air Quality Associate, Metropolitan Transportation Commission (MTC) hbrazil@mtc.ca.gov, (510) 817-5747
2. VMT by vehicle type data provided on July 5, 2006 by Amir Fanai, Principal Air Quality Engineer, Bay Area Air Quality Management District,

## Community Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tonnes)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)
AFanai@baaqmd.gov			
3. 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/tsip/hpms/hpmslibrary/hpmspdf/2005PRD.pdf">http://www.dot.ca.gov/hq/tsip/hpms/hpmslibrary/hpmspdf/2005PRD.pdf</a> >			
Data entry: Palak Joshi, Program Assistant, ICLEI, palak.joshi@iclei.org, (510) 844-0699, on August 25, 2006. Data last updated by Jonathan Strunin, jonathan.strunin@iclei.org, 510-844, 0699 x333.			
<i>Union City Community VMT</i>			
Gasoline	80,169	20.9	1,114,077
Diesel	20,942	5.5	250,590
<i>Subtotal Union City Community VMT</i>	101,111	26.3	1,364,668
<b>Subtotal Transportation</b>	<b>175,159</b>	<b>45.6</b>	<b>2,364,070</b>

### Waste

#### Union City, California

#### ADC Tonnage

*Disposal Method - Managed Landfill*

Plant Debris	1,238	0.3
<i>Subtotal ADC Tonnage</i>	1,238	0.3

#### Landfill waste

*Disposal Method - Managed Landfill*

Paper Products	15,118	3.9
Food Waste	5,051	1.3
Plant Debris	589	0.2
Wood/Textiles	3,328	0.9
<i>Subtotal Landfill waste</i>	24,086	6.3

#### 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 states that "reported collection efficiencies typically range from 60 to 85 percent" (AP 42, section 2.4 Municipal Solid Waste, 2.4-6). Following the recommendation of the Alameda County Waste Management Authority, and keeping with general IPCC guidelines to err towards conservative estimation, ICLEI adopted the 60% end of the range.
- All disposal figures included in this inventory refer specifically to tons of waste and ADC sent to a landfill. Therefore, the tonnage figures used do

## Community Greenhouse Gas Emissions in 2005 Detailed Report

	Equiv CO <sub>2</sub> (tonnes)	Equiv CO <sub>2</sub> (%)	Energy (MMBtu)
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not reflect total waste *generation*, but the amount of waste *disposed in a landfill*. This means that, in the case of MSW, any waste that was diverted from the landfill through recycling, composting, construction material re-use programs, etc. is not included in the tonnage figures used to calculate emissions.

All Community Waste Sector data analyzed and gathered by Wesley Look, ICLEI-Local Governments for Sustainability, [wesley.look@iclei.org](mailto:wesley.look@iclei.org), (510) 844-0699. Data entry: Palak Joshi, Program Assistant, ICLEI, [palak.joshi@iclei.org](mailto:palak.joshi@iclei.org), (510) 844-0699, on August 25, 2006. Data last updated by Jonathan Strunin, [jonathan.strunin@iclei.org](mailto:jonathan.strunin@iclei.org), 510-844, 0699 x333.

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<b>Subtotal Waste</b>	25,324	6.6	
<b>Total</b>	384,174	100.0	5,490,444

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**Appendix F – Revised Community Emissions Forecast by Sector**

## Appendix F – Revised Community Emissions Forecast by Sector

<b>2005 Community Emissions Growth Forecast by Sector</b>	<b>2005</b>	<b>2020</b>	<b>Annual Growth Rate</b>	<b>Percent Change from 2005 to 2020</b>
<b>Residential</b>	70,239	81,257	0.976%	15.7%
<b>Commercial/ Industrial</b>	113,452	198,769	3.809%	75.2%
<b>Transportation</b>	175,159	219,265	1.509%	25.2%
<b>Waste</b>	25,324	29,296	0.976%	15.7%
<b>TOTAL</b>	<b>384,174</b>	<b>528,587</b>	<b>--</b>	<b>37.6%</b>

## **Appendix G - Community GHG Inventory Methodology**