

## Appendices

## Appendix A. Preparer's Note on Context

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At the time that this inventory was prepared between 2008 and 2009, the U.S. faced particular uncertainty about its direction. The second half 2008 saw a severe economic downturn. Stock markets dropped 40 percent in the last quarter (50 percent in the year), to a 13 year low, with single trading days seeing changes of over 10 percent.<sup>1</sup>

The federal government instituted a \$700 billion "bail-out" for the financial sector in an attempt to shield the nation from this economic crisis. The auto manufacturing industry threatened bankruptcy before year's end, and U.S. Congress could not agree to pass a bail-out package. Among financial stability concerns, the debate included discussions on vehicle efficiency standards, and whether the American car industry will be competitive in this regard with foreign companies.

The housing market crashed. Home values in the Bay Area fell 40% within a year to a median price of \$375,000.<sup>2</sup> In the Bay Area, one fifth of homeowners found that their mortgages are larger than the equity of their homes. Foreclosure rates were up 11 percent in Contra Costa County, and housing and commercial property development projects were halted by the developers.

National unemployment in October, 2008 was at 6.5 percent. California was one of the worst hit states, with an unemployment rate of 8.2 percent in October, up 2.5 points over the past year. Pittsburg has seen the large layoffs, as several major employers closed their doors. Small business owners and individuals are experiencing difficulty obtaining loans as a consequence of the damaged financial sector.

Oil prices fluctuated during 2008 between \$ 145 a barrel in July to \$ 49.62 a barrel in December.<sup>3</sup> National average gas prices fell below two dollars in December, when only four months earlier, they were between \$4.00 and \$4.50.<sup>4</sup>

The price of food was rising earlier in the year as transportation and fuel costs increased. The cost of maintaining electricity and heating in homes has also fluctuated dramatically. Natural gas prices in California rose 14% within one week (November 2008).

BART ridership increased during 2008. An article in the San Francisco Chronicle reported that ridership was nearing capacity during peak hours, sending the system into

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<sup>1</sup> New York Stock Exchange <http://www.nyse.com/> accessed December 2008

<sup>2</sup> *Home Prices in California Down 40 Percent*, by L.A. Times and Associated Press, 11/22/2008

<sup>3</sup> *Oil Falls Below \$50 a Barrel*, Brian Baskin, WSJ, 11/21/2008

[http://online.wsj.com/article/SB122719508911344363.html?mod=googlenews\\_wsj](http://online.wsj.com/article/SB122719508911344363.html?mod=googlenews_wsj), accessed November 2008

<sup>4</sup> *Oil Prices Up but Decline for the Month*, Associated Press, <http://www.msnbc.msn.com/id/12400801/>, accessed November 2008

alarm and raising the possibility of a peak-hour rate-hike. Usage of the Pittsburg/Bay Point station has increased 12 percent in the past five years.

People can expect that prices, though having dropped in the recent weeks, will increase, particularly for energy. If so, energy efficiency will become a cost-saving decision, especially if the economy does not recover at a comparable rate as energy cost increase.

The California Air Resource Board finalized the Scoping Plan in December. Much public comment was made that state funds will be necessary for local and regional entities to carry out the projects outlined in the plan.

President-elect Obama has declared a commitment to solve the energy and climate crisis. He has appointed scientific experts to advise him, and has created a new advisory position dedicated to climate issues. He promises a set of new government projects that will create 2.5 million jobs, and will be focused on growing the “green” economy, creating an infrastructure of energy independence. Gov. Schwarzenegger held a conference in December 2008 focused on the issue of climate action. At this conference, a video was shown of President-elect Obama recognizing California’s AB 32 as a model for the rest of the nation.

With state and federal support, specifically in the form of funding, a new set of initiatives may become possible. Regional planning will likely focus populations into the urban hubs. Pittsburg’s location may become a reason for less growth rather than the high growth it would have expected under business-as-usual. ABAG’s 2009 projections are less aggressive for the outlying Contra Costa areas. A recent conversation with an ABAG researcher indicated that this is because areas not around a transit corridor will experience discouragement for development in regional planning. On the other hand, if newly funded projects allow a transit extension to East County, Pittsburg may be included in the “smart growth” corridor, and experience larger, more concentrated growth around transit centers.

Pittsburg is proud of its industrial heritage, and may be a prime location to host part of the “green tech” wave of industrial development. If so, the industrial sector will continue to grow, and will emit more GHGs as they produce pieces of an infrastructure that will overall reduce GHG emissions. An increase for this reason should not be resisted just because it does not cooperate with a reduction target. This is another reason to keep the industrial point source emissions separate from the community inventory. The goods that would be produced will serve the larger economy, and the larger scope of GHG reduction plans.

## Appendix B. Data Sources

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This appendix details the data and data sources used for the calculations. Tables that combine the data and show the calculations are available in Appendix C.

### Emissions Factors

These emission factors were used in both the community and municipal operations inventories, unless otherwise noted under a specific sector's activity data.

#### Electricity and Natural Gas

1. **Emission coefficient for electricity and natural gas** were provided in ICLEI's CACPS software.

<b>Electricity (PG&amp;E)</b>	0.000224 Tonnes CO <sub>2</sub> e/kWh
<b>Electricity (DA)</b>	0.000311 Tonnes CO <sub>2</sub> e/kWh

Electricity data provided by PG&E, as 0.4928 lbs CO<sub>2</sub>e/kWh, reported to Pittsburg by ICLEI. The CO<sub>2</sub>e factor was used in absence of specific CH<sub>4</sub> and N<sub>2</sub>O emission factors. CO<sub>2</sub> only emissions certified as 0.489155 lbs/kWh by the Climate Registry is publicly available at [http://www.climateregistry.org/CarrotDocs/19/2005/2005\\_PUP\\_Report\\_V2\\_Rev1\\_PGE\\_rev2\\_Dec\\_1.xls](http://www.climateregistry.org/CarrotDocs/19/2005/2005_PUP_Report_V2_Rev1_PGE_rev2_Dec_1.xls)

For Direct Access Electricity, see DA emissions factor data under Commercial & Industrial

<b>Natural Gas Emission</b>	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> e
<b>Tonnes / Therm</b>	0.005305	0.00000059	0.0000001	0.005348

Natural gas data provided by ICLEI. CO<sub>2</sub> emission factor was derived from: California Energy Commission, Inventory of California Greenhouse Gas Emissions and Sinks: 1990-1999 (November 2002); and Energy Information Administration, Emissions of Greenhouse Gases in the United States 2000 (2001), Table B1, page 140. CH<sub>4</sub> and N<sub>2</sub>O Emission factors are derived from: U.S. EPA, "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2000" (2002), Table C-2, page C-2. EPA obtained original emission factors from the Intergovernmental Panel on Climate Change, Revised IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual (1996), Tables 1-15 through 1-19, pages 1.53-1.57.

## Transportation/Vehicles

1. **Vehicle type mix**, expressed as percent of vehicle-miles-traveled( VMT), and emissions factors per vehicle type provided by Ana Sandoval, BAAQMD [asandoval@baaqmd.gov; 415/749-4667], using the EMFAC2007 software and data from the California Air Resources Board. File name: tablesanddesc.xls. EMFAC2007 available at: [www.arb.ca.gov/msei/onroad/latest\\_version.htm](http://www.arb.ca.gov/msei/onroad/latest_version.htm) (accessed Nov. 2008)

Fuel Type	Percent of Total VMT	Avg. MPG	CO <sub>2</sub> Emissions Factor	CH <sub>4</sub> Emissions Factor	N <sub>2</sub> O Emissions Factor
Gasoline	95.2%	18.4 miles/gal	8,630 grams/gal	0.061 grams/mi	0.070 grams/mi
Diesel	4.8%	7.9 miles/gal	9,994 grams/gal	0.022 grams/mi	0.050 grams/mi

## Waste

1. **Content of MSW** derived from CIWMB Statewide Waste Characterization Study, Dec. 2004. File location: <http://www.ciwmb.ca.gov/Publications/default.asp?pubid=1097> (accessed Oct. 2008)

Waste Type	Percent of Total Waste Stream
Paper	20.99%
Food waste	14.55%
Plant debris	6.89%
Wood and textile	21.79%
Other materials	35.77%

2. **Methane emissions factors** for each type of waste disposed in Managed Landfill, Compost, or Controlled Incineration, provided in ICLEI's CACPS software (units below are tonnes of methane per tonne of disposed waste).

Waste Type	Emissions Factor in Managed Landfill	Tonnes sequestered in Compost	Emissions Factor in Controlled Incineration
Paper	2.138	(0.202)	
Food waste	1.210	(0.202)	
Plant debris	0.686	(0.202)	
Wood and textile	0.605	(0.202)	0.081
Other materials	--	--	

3. **Methane recovery rate** at Managed Landfills based on IPCC recommendation of 60%. (However, some landfills in this region report a recovery rate of 85%. Data provided by Contra Costa County Climate Planner Dana Riley, citing inquiries of Keller Canyon Landfill, and WCCSL.)

## Community Inventory – Activity Data

### Industrial

1. **Point source emissions** data were provided by Rochelle Henderson, Public Records Coordinator, BAAQMD (publicrecords@baaqmd.gov) to Miya Kitahara on 10/07/08. File name: TOPGREENHOUSEGASCOMPANIES.xls.

Plant Name	Plant Address	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Tonnes GHG (CO <sub>2</sub> e)
Delta Energy Center	Arcy Lane	1,993,155	46.28	3.31	1,995,152
Los Medanos Energy Center	750 E 3rd Street	1,385,245	144.73	2.30	1,388,997
GWF Power Systems,LP (Site 1)	895 E 3rd Street	199,215	13.22	3.13	200,462
GWF Power Systems,LP (Site 2)	1600 Loveridge Road	195,176	12.95	3.06	196,398
Calpine Pittsburg LLC	Loveridge Road	118,494	2.75	0.20	118,613
USS-POSCO Industries	900 Loveridge Road	55,057	1.28	0.09	55,112
Dow Chemical Company	901 Loveridge Road	21,690	0.48	0.03	21,711
<b>Total</b>					<b>3,976,444</b>

2. **Manufacturing facilities** data in the BAAQMD records for 2007 show that the emissions at USS-POSCO was all caused by **natural gas** combustion, and that emissions from Dow Chemical was 88% natural gas. According to PG&E's classification system, both of these facilities' natural gas consumption would be included in the total Commercial/industrial category. To avoid double counting this portion of natural gas combustion, the corresponding amount of emissions were subtracted from the commercial natural gas sector.

Plant Name	Total Emissions (BAAQMD)	2007 Percent of Emissions that is Natural Gas (BAAQMD)	Natural Gas Emissions (2005)
USS-POSCO Industries	55,112	100%	55,103
Dow Chemical Company	21,711	88%	19,138
	3,976,444		74,241

The natural gas usage that would have resulted in these emissions was estimated based on the natural gas emissions coefficient, and subtracted from the commercial natural gas use data.

Emissions	Coefficient	Natural Gas Usage
74,241 tonnes	0.005348 tonnes / therm	13,881,052 therms

- Direct access electricity** in Contra Costa County is estimated at 12.07% of total electricity consumed through PG&E (data from ICLEI; Xico Manarolla). To find amount of Direct Access used by non-residential accounts, the non-Direct Access non-governmental electricity use was divided by 100% - 12.07% to yield the total amount (DA and non-DA). Non-DA was backed out of the total to leave DA amount.

	Non-DA Amount	Percent DA/Tot	Total (DA and Non-DA)	DA Amount
<b>Ind/Com</b>	187,429,876	12.07%	213,158,053	25,728,177

Direct Access electricity is assumed to emit the average California grid energy mix. This mix has a higher emissions factor than PG&E. Emissions factor provided by ICLEI (Xico Manarolla) at 2/6/08 meeting, as 0.686625 lbs CO<sub>2</sub>e/kWh. However, other emission factors have been recommended since the initial compilation of this inventory. Direct Access emissions may need to be readjusted to more accurately reflect reality.

**Direct Access Emissions Factor**

0.000311 tonnes CO<sub>2</sub>e/kWh

**Regional Transportation**

- Highway daily vehicle-miles-traveled (VMT)** for average weekday provided by Matt Kelly, Associate Transportation Planner, Contra Costa Transportation Authority. The daily VMT was multiplied by 365 to roughly obtain annual VMT.

Highway Daily VMT	Highway Annual VMT
887,172 vehicle-miles	323,817,780 vehicle-miles

- Marine emissions** data for the Bay Area and Contra Costa County provided by Andy Alexis, California Air Resources Board. This was used to count transit emissions. County average berthing and hotelling emissions per vessel call were estimated based on Carquinez and Richmond port data. Number of calls to the two commercial ports in Pittsburg were provided by David Allen, USS-POSCO, and Ed Koerperich, Koch Carbon.

### Transit Emissions

Transit Segment	Metric Tons:			Total CO <sub>2</sub> e
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	
S761	47	0.1	0.5	47
S762	70	0.2	0.7	71
S763	25	0.1	0.3	26
S764	31	0.1	0.3	32
<b>Total</b>	<b>173</b>	<b>0.5</b>	<b>1.9</b>	<b>175</b>

### Hotelling (idling while docked)

Port	Calls	Metric Tons			Total Would Be w/o cold iron (CO <sub>2</sub> e)	Less Cold Ironing (CO <sub>2</sub> )
		CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O		
<i>CCC Avg per Call</i>		92.08	0.11	0.95		
USS POSCO	25	2,302	3	24	2,328	-
KOCH CARBON	20	1,842	2	19	1,863	1,863
<b>Total</b>	<b>45</b>	<b>4,144</b>	<b>5</b>	<b>43</b>	<b>4,191</b>	<b>1,863</b>

Data shown in metric tons CO<sub>2</sub>e

### Maneuvering

Port	Calls	Metric Tons			CO <sub>2</sub> e
		CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	
<i>CCC Avg per Call</i>		2.16	0.01	0.05	
USS POSCO	25	54	0	0	54
KOCH CARBON	20	43	0	0	44
<b>Total</b>	<b>45</b>	<b>97</b>	<b>0.81</b>	<b>0.04</b>	<b>98</b>

Data shown in metric tons CO<sub>2</sub>e

See more discussion on marine emissions in Appendix F.

### Local Transportation

1. **Local road daily vehicle-miles-traveled (VMT)** for average weekday provided by Matt Kelly, Associate Transportation Planner, Contra Costa Transportation Authority. The daily VMT was multiplied by 365 to roughly obtain annual VMT.

Local Road Daily VMT	Local Road Annual VMT
338,947 vehicle-miles	123,715,473 vehicle-miles



## Commercial Energy Use

1. **Electricity and natural gas use** data were provided by Jasmin Ansar, PG&E [jxa2@pge.com, 415/973-4570] to Laura Wright on 1/3/08. File name: pittsburg2005.xls.

<b>Electricity Use</b>	187,429,876 kWh
<b>Natural Gas Use - Total</b>	19,466,537 Therms
<b>Natural Gas Use – Less Industrial</b>	5,585,485 Therms

The natural gas consumption discussed in the Industrial sector data notes were subtracted from the commercial natural gas usage.

## Residential Energy Use

1. **Electricity and natural gas use** data were provided by Jasmin Ansar, PG&E [jxa2@pge.com, 415/973-4570] to Laura Wright on 1/3/08. File name: pittsburg2005.xls.

<b>Electricity Use</b>	135,750,067 kWh
<b>Natural Gas Use</b>	8,247,362 Therms

## Waste

1. **Volume of waste** and disposal methods and sites provided by Laura Wright, City of Pittsburg [lwright@ci.pittsburg.ca.us; 925/252-4350] File name: 97-08\_curbside tonnage.xls

<b>Total Solid Waste</b>	77,480 Tons
<b>Total Alternate Daily Cover (ADC)</b>	11,383 Tons
<b>Percent ADC Green Material</b>	16.90%
<b>Composted</b>	1,975.90 Tons
<b>Recycled</b>	3,660.48 Tons
<b>Special Waste</b>	9,354.12 Tons
<b>Biomass, controlled incineration</b>	13,594.35 Tons

## Municipal Operations Inventory

1. **PG&E records** of overall municipal operations electricity and natural gas use were provided by Corie Cheeseman, PG&E [C3CL@pge.com; 415-973-4999] to Miya Kitahara on 10/13/08. File name: PITTSBURG\_2005\_DTL.xls. This data set was used for facilities for which no City of Pittsburg records were available: Marina, Golf Course, Redevelopment District, the Housing Authority and CBDG.

<b>Total City Electricity Use</b>	12,255,677 kWh
<b>Total City Natural Gas Use</b>	117,488 Therms

## Water Management

1. **Electricity and natural gas use** data for irrigation, pumps, and water and Water Treatment Plant provided by Christy Terry, City of Pittsburg [cterry@ci.pittsburg.ca.us; 925/252-4001] to Miya Kitahara on 10/06/08. File names: Data Source: WTP\_2005\_PG&E.xls, Sewer\_Maintenance\_2005\_PG&E.xls, Streetlights\_2005\_PG&E.xls, Landscaping\_2005\_PG&E.xls  
Identification of meters measuring water management energy use performed by Miya Kitahara, using Business Activity names for reference.

<b>Water Management Electricity use</b>	6,024,421 kWh
<b>Water Management Natural gas use</b>	17,889 Therms

## Municipal Facilities

1. **Electricity and natural gas use** data were provided by Christy Terry, City of Pittsburg [cterry@ci.pittsburg.ca.us; 925/252-4001] on 10/06/08. File names: Buchanan\_Pool\_2005\_PG&E.xls; Buildings\_2005\_PG&E.xls; Landscaping\_2005\_PG&E.xls. For Facilities sector data, Christy Terry files were used for all but Marina, Golf Course, Redevelopment District, and the Housing Authority and CBDG, which are not recorded by the Public Works Department. Identification of meters measuring Building and Facility energy use performed by Miya Kitahara, using Business Activity names for reference. Meters not clearly identifiable by name were identified by location by Laura Wright.

<b>Municipal Facilities Electricity Use</b>	3,717,996 kWh
<b>Municipal Facilities Natural Gas Use</b>	100,174 Therms

Facility Type	Electricity Use (kWh)	Electricity Cost (\$)	Natural Gas Use (therms)	Natural Gas Cost (\$)
City Hall	1,562,880	210,026	57,293	65,639
Community Centers	200,164	42,397	2,949	4,001
Public Works	97,963	14,952	4,861	6,368
Housing Authority & CDBG	36,658	4,756	851	1,406
Redevelopment District	15,880	2,741	0	0
Parks	454,744	58,616	666	249
Pool	163,560	22,780	19,119	20,173
Other (Misc, Rentals, Vacant, etc.)	94,760	15,255	15,280	16,844
Marina	912,124	134,699	0	0
Golf Course	183,506	0	131	0
<b>Totals</b>	<b>3,722,239</b>	<b>506,223</b>	<b>101,150</b>	<b>114,680</b>

## Streetlights

1. **Streetlight electricity use** data provided by Christy Terry, City of Pittsburg [cterry@ci.pittsburg.ca.us; 925/252-4001] to Miya Kitahara on 10/06/08. File names: Streetlights\_2005\_PG&E.xls, Oakhills\_St\_Lights\_2005\_PG&E.xls, Main\_Streetlights\_2005\_PG&E.xls Identification of meters measuring Streetlight electricity use performed by Miya Kitahara, using Business Activity names for reference.

Streetlights Electricity Use
2,437,026 kWh

## Vehicle Fleet

1. **Lists of fleet vehicles**, identifying make/model, 2005 VMT, and gas/diesel purchases for each vehicle provided by Christy Terry [cterry@ci.pittsburg.ca.us; 925/252-4001] to Miya Kitahara on 10/20/08. File names: Vehicle Miles Driven Log - FY 05-06.xls. Identification of energy source for each vehicle provided by Russell Tank, City of Pittsburg, on 10/23/08.

Fuel Type	Gallons	Miles
Gasoline	85,689	1,311,258
Diesel	27,148	178,025

Department	Gasoline Consumption (gal)	Gasoline Fleet (miles)	Diesel Consumption (gal)	Diesel Fleet (miles)
Public Works	44,446	334,505	27,148	178,025
Police	52,127	878,488	0	0
City Hall (Excl. Police)	5,453	62,305	0	0
Marina	1,694	22,926	0	0
Housing & CDBG	831	13,034	0	0
<b>TOTAL</b>	<b>104,551</b>	<b>1,311,258</b>	<b>27,148</b>	<b>178,025</b>

## Employee Commute

1. **An employee survey** was distributed to employees via email through surveymonkey.com, and in a paper survey to an additional 70 employees. A total of 125 respondents were included in the result analysis, to include regular employees that reported commute patterns for 2005, and seasonal employees' data for 2008 as a proxy for seasonal employee commutes in 2005. See Appendix I for the survey questions. Data was collected and analyzed on 11/13/08 by Miya Kitahara, to assess total miles driven by respondents on their commutes in 2005. Respondents who did not specify their vehicle's energy

source were assumed to use gasoline; those who did not specify their vehicle type were assumed to drive an average automobile. The mileages below have been multiplied out to represent the total employee body. The fuel type is gasoline except “Heavy truck (diesel)”.

Vehicle Type	Miles Traveled
Auto (all sizes)	1,537,943
Hybrid	5,472
Motorcycle	320,107
Van	5,472
Light truck	212,024
Heavy truck	1,368
Heavy truck (diesel)	34,199

2. **Number of employees** was 291 regular and 263 seasonal employees worked in 2005, as reported by Sandra Navarro in an email on 10/29/08. Respondent totals for regular employees were divided by 38% (111 participants / 291 employees), to find the commute total for all regular employees. Seasonal employees were divided by 11% [14 respondents / (263 employees x 50% FTE)]. We assume that “Seasonal” positions consist of an average 1,000 hours, or approximately 50% of one year’s full-time position.
3. **Fuel economy** for each vehicle type was derived from EMFAC2007 output by Miya Kitahara.

Gas auto	21.3 MPG
Gas light truck	16.4 MPG
Gas heavy truck	8.9 MPG
Diesel heavy truck	6.9 MPG

Other fuel economy figures used:

Gas hybrid	43 MPG -Estimated average for 2001 – 2005 Toyota Prius models, MPG data from fueleconomy.gov
Gas motorscooter/motorcycle	60.4 MPG - (reported by survey respondent)

## Waste

1. **Volume of waste** serviced for each City building or facility was provided by Sal Coniglio of Garaventa Enterprise [sal@garaventaent.com] to Laura Wright on 10/24/08. File name: City\_of\_Pittsburg\_Office\_Bins\_Report.xls

<b>Total City Waste Disposed</b>
<b>198.208 Tons</b>

## Appendix C. Calculating CO<sub>2</sub>e

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The activity data input into the CACP software is multiplied by emissions factors and Global Warming Potential values to yield total GHG emissions in the unit of tonnes CO<sub>2</sub>e.

$$\begin{aligned} & ( \text{Activity Data} \times \text{Emissions Factor CO}_2 ) + \\ & ( \text{Activity Data} \times \text{Emissions Factor CH}_4 \times \text{GWP CH}_4 ) + \\ & ( \text{Activity Data} \times \text{Emissions Factor N}_2\text{O} \times \text{GWP N}_2\text{O} ) = \\ & \text{Tonnes CO}_2\text{e of GHG Emissions} \end{aligned}$$

### Clean Air and Climate Protection Software

ICLEI developed the CACP software package in partnership with the State and Territorial Air Pollution Program Administrators (STAPPA), the Association of Local Air Pollution Control Officials (ALAPCO), and Torrie Smith Associates.

### Emissions Factors

The activity data are input into the CACP software, which multiplies each unit of activity by its corresponding emissions factor. Emissions factors have been determined through scientific measurement and research, and express the amount of greenhouse gases that are emitted as a result of a unit of activity. Activity data were multiplied by emissions factors for three major greenhouse gases: Carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O).<sup>5</sup>

ICLEI reports that the emissions factors used in the CACP software are consistent with national and international inventory standards established by the IPCC and U.S. Voluntary Greenhouse Gas Reporting Guidelines (EIA form 1605). Some emissions factors were adjusted to more accurately represent local conditions. See Appendix A for the emissions factors used in this inventory.

### Global Warming Potential

Methane and nitrous oxide have greater Global Warming Potential (GWP) than carbon dioxide. This means that a ton of methane or nitrous oxide has multiple times the impact on climate change than a ton of carbon dioxide (21 times for methane; 310 for nitrous oxide).<sup>6</sup> The software multiplies each gas by its GWP, then outputs an emissions total in tonnes of *carbon dioxide equivalent* (CO<sub>2</sub>e), which includes the emissions of all three

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<sup>5</sup> The Kyoto Protocol identifies a total of six gases and gas-groups. The three measured by CACP are the most common. The other three are not naturally occurring, and result mostly from chemical processes and leakage in refrigerants.

<sup>6</sup> Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report published in 1995.

gases. The CO<sub>2</sub>e unit allows comparisons between emission sources with different proportions of the gases.

## Table of GHG Calculations

The Tonnes CO<sub>2</sub>e per Unit of Activity emissions factor already incorporates the three greenhouse gases and their Global Warming Potentials. For Industrial point source and marine transportation emissions, the data were already presented in tonnes CO<sub>2</sub>e in their respective data sources.

<i>Sector</i>	<i>Emission Source</i>	<i>Activity Volume</i>	<i>Activity Unit</i>	<i>Tonnes CO<sub>2</sub>e per Unit of Activity</i>	<i>Total Tonnes CO<sub>2</sub>e</i>
<b>Industrial</b>	Point Source	3,976,444	Tonnes CO <sub>2</sub> e		
	Direct Access Electricity	25,728,177	kWh	0.000311	8,013
<b>Regional Transportation</b>	<b>Highway Gasoline</b>	308,210,590	VMT	0.000023	7,083
		16,777,729	gallons	0.008630	144,784
	<b>Highway Diesel</b>	15,607,190	VMT	0.000016	249
		1,984,702	gallons	0.009994	19,836
	<b>Marine</b>	2,136	Tonnes CO <sub>2</sub> e		
<b>Local Transportation</b>	<b>Local Roads Gasoline</b>	117,752,703	VMT	0.000023	2,706
		6,409,978	gallons	0.008630	55,315
	<b>Local Roads Diesel</b>	5,962,770	VMT	0.000016	95
		758,261	gallons	0.009994	7,578
<b>Commercial</b>	<b>Natural Gas</b>	5,585,485	therms	0.005348	29,873
	<b>Electricity</b>	187,429,876	kWh	0.000224	41,901
<b>Residential</b>	<b>Natural Gas</b>	8,247,362	therms	0.005348	44,110
	<b>Electricity</b>	135,750,067	kWh	0.000224	30,348
<b>Waste</b>	<b>Total MSW</b>	77,480			
	<b>Paper</b>	16,271		1.9398	31,562
	<b>Food Waste</b>	11,273		1.0992	12,392
	<b>Plant Debris</b>	5,338		0.6232	3,327
	<b>Wood/Textile</b>	16,883	short tons	0.5496	9,279
	<b>ADC Green</b>	1,924		0.6232	1,199
	<b>Biomass</b>	13,594		0.0736	1,000
	<b>Compost</b>	1,976		(0.1835)	(363)
	<b>Gross Total</b>				58,396
	<b>Methane Recovery Rate (for MSW + ADC)</b>				60%
	<b>Waste - Net Total</b>				23,741

## Appendix D. PG&E Power Mix

No data were available for 2005 PG&E power mix data. The 2008 power mix was available on the PG&E Website ([www.pge.com](http://www.pge.com)) and indicated the following mix. The national average percentages were taken from the U.S. EPA 2005 eGrid report (U.S. EPA, 2008 )

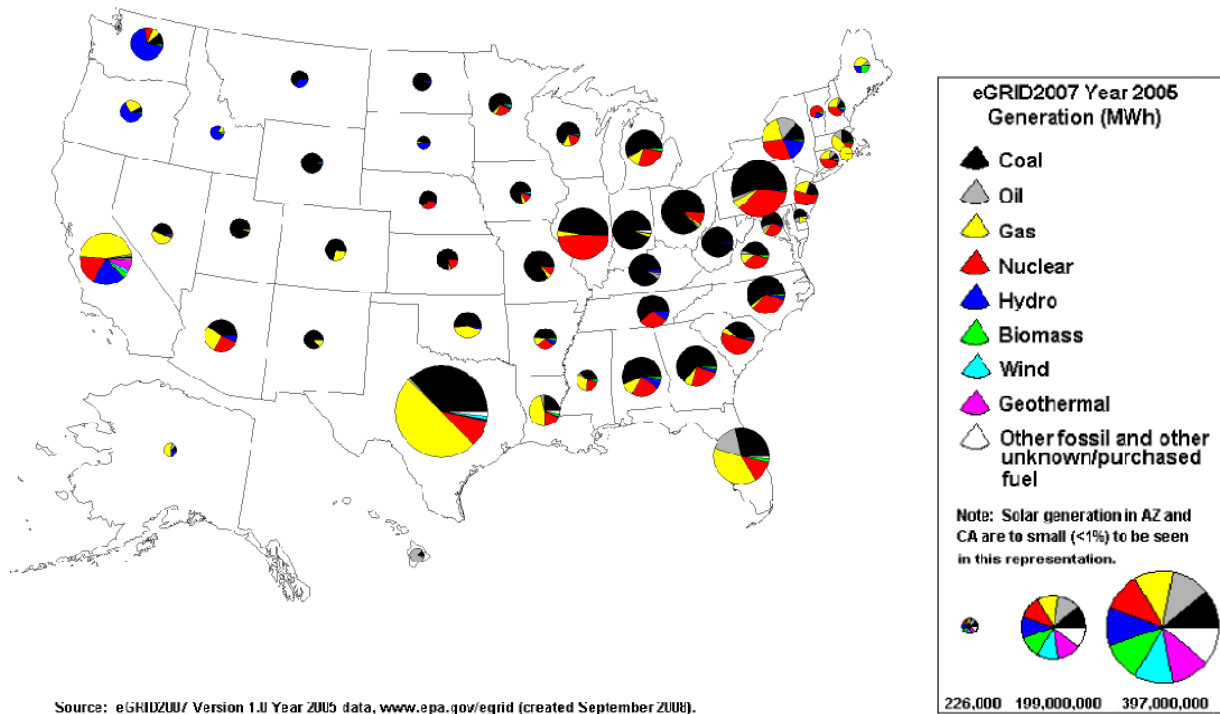
Fuel Type	PG&E	National Avg.
Natural Gas	44%	19%
Coal	2%	50%
Nuclear*	22%	19%
Large Hydro*	17%	7%
Renewable*	14%	<1%
Other	1%	5%

Note: Percentages may not add up to 100% due to individual rounding

\* "These resources are climate neutral and/or renewable" – PG&E Website

Below is a visual representation of the various power mixes across the U.S. (U.S. EPA, 2008 eGrid)

Generation by Fuel Type



## Appendix E. Scopes

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Both the community-wide and government operations inventories report emissions of GHGs that occur as a direct or indirect result of its activities. Greenhouse gas reporting protocols at the international, national, and state levels categorize emission sources by “Scopes” that correspond to the directness of relationship between the activity and the resulting emissions, and the economic “Sectors” in which the activities occur.

### Definition of Scopes

**Scope 1** emissions occur within the organizational boundary, as a direct result of on-site fuel combustion (gasoline, diesel, natural gas).

**Scope 2** emissions occur beyond the boundary, but are a direct result of energy consumption by the community or municipal operations.

**Scope 3** or *informational items* occur as an indirect result of community activities, beyond the organizational boundary, and often over a longer period of time. Scope 3 can at best be quantified as an estimate.

Although the actual emissions of Scope 2 and Scope 3 sources can occur in a distant location, the activities that directly or indirectly cause them can be influenced by the community. Therefore, this inventory includes emissions in all three scopes.

In most protocols, an organization’s boundaries are defined by financial or operational control. For this community inventory, the boundary is defined as the city limits. In the government operations inventory, the boundary is generally operational control.

Applied to the sectors in the community and municipal operations inventories, the scopes include the following emission sources:

- **Scope 1:** Natural gas, gasoline, diesel, and other fuel combustion
- **Scope 2:** Electricity consumption
- **Scope 3/Informational Items:** Waste disposed, employee commute

The following tables show how each source of emissions can be classified by its scope and sector. The scopes of the emissions sources from municipal operations are similar to the community inventory, with the addition of a Scope 3 source of gasoline and diesel usage by employee commutes. The sectors are more specific than in the community inventory.

Industrial emissions from power plants fall under Scope 1, because natural gas and petroleum coke are combusted on site, releasing the GHG emissions. This same set of emissions will also appear in other jurisdictions’ inventories, as Scope 2 emissions.



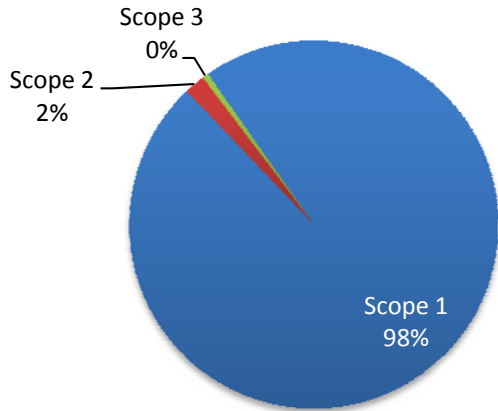
## Community Emissions Classified by Scopes

Sector	Scope 1	Scope 2	Scope 3
<b>Industrial</b>	<i>Natural Gas &amp; Process Emissions</i>	<i>Electricity</i>	
<b>Transportation</b>	<i>Gasoline &amp; Diesel</i>		
<b>Commercial</b>	<i>Natural Gas</i>	<i>Electricity</i>	
<b>Residential</b>	<i>Natural Gas</i>	<i>Electricity</i>	
<b>Waste</b>			<i>Methane from Decomposition</i>

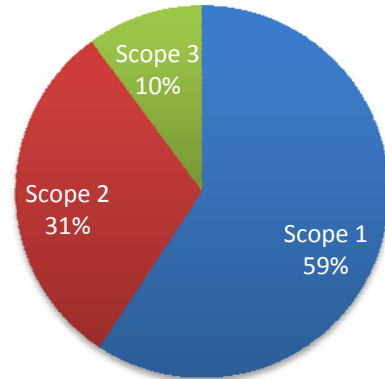
## Community Emissions Quantified by Scope

Sector	Scope 1	Scope 2	Scope 3
<b>Industrial</b>	3,976,444	8,013	
<b>Transportation (Regional)</b>	174,087		
<i>Transportation (Local)</i>	65,695		
<i>Commercial</i>	29,873	41,901	
<i>Residential</i>	44,110	30,348	
<i>Waste</i>			23,741
<b>Total Local Community</b>	<b>139,678</b>	<b>72,249</b>	<b>23,741</b>
<b>Total of All</b>	<b>4,290,210</b>	<b>80,262</b>	<b>23,741</b>

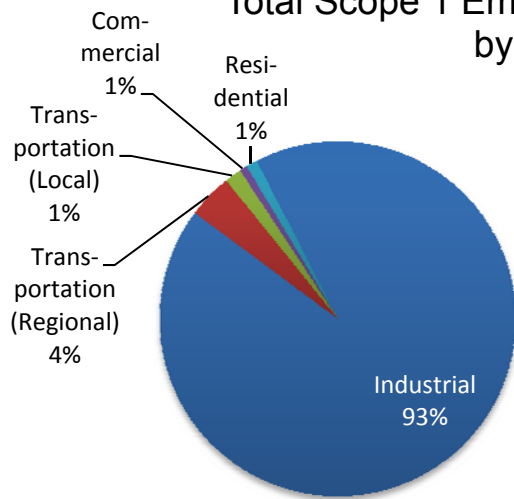
Total Emissions by Scope



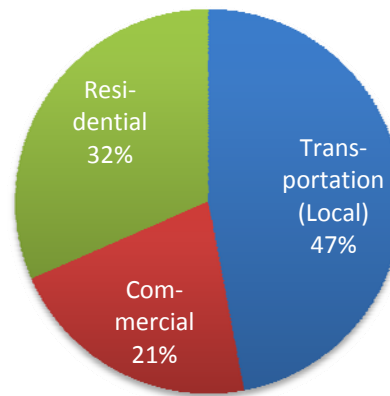
"Local Community" Emissions by Scope



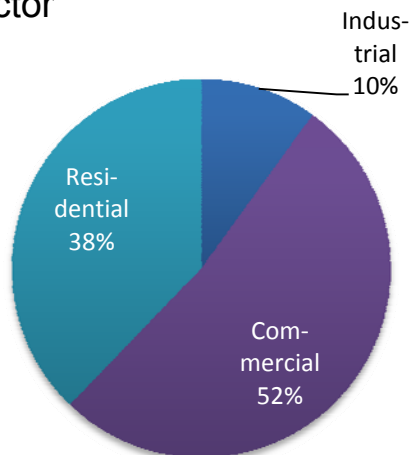
Total Scope 1 Emissions by Sector



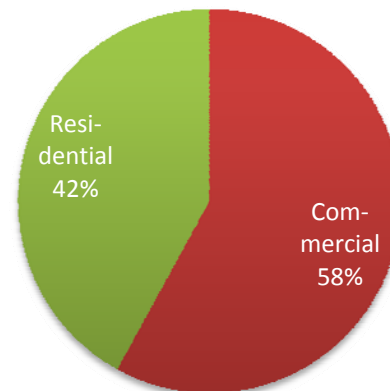
Local Community Scope 1 Emissions by Sector



Total Scope 2 Emissions by Sector



Local Community Scope 2 Emissions by Sector



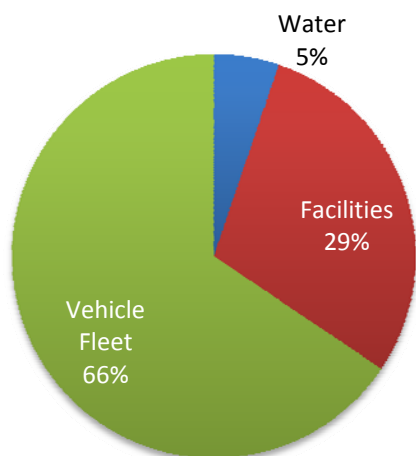
### Municipal Operations Emissions Classified by Scopes

Sector	Scope 1	Scope 2	Scope 3
Water	Natural Gas	Electricity	
Facilities	Natural Gas	Electricity	
Vehicle Fleet	Gas & Diesel		
Employee Commute			Gas & Diesel
Streetlights		Electricity	
Waste			Methane

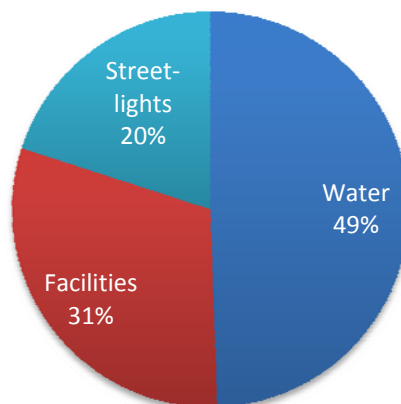
### Municipal Operations Emissions Quantified by Scopes

Sector	Scope 1	Scope 2	Scope 3
Water	96	1,347	
Facilities	538	832	
Vehicle Fleet	1,207		
Employee Commute			887
Streetlights		545	
Waste			58
<b>Total</b>	<b>1,840</b>	<b>2,724</b>	<b>944</b>

Municipal Operations  
Scope 1 Emissions by Sector



Municipal Operations  
Scope 2 Emissions by Sector



## Appendix F. Secondary Emission Sources

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ICLEI classifies some emissions sources as *secondary*, due to the difficulty of gathering data, the irrelevance to local government action plans, and the negligible emissions quantity in relation to the whole.

Emissions from some sources are currently impossible to quantify. The data necessary to calculate the emissions are not available or were never measured. Specifically, emission sources excluded due to inadequate data are rail and marine transportation. After consulting several government departments, these data were concluded to be unavailable at this time. These sectors are rarely included in GHG inventories for local governments. Since rail and marine transportation is typically intended for long-distance travel across regions, these sectors are best monitored by regional governing bodies. ICLEI staff agreed that the emissions from rail and marine can be prohibitively difficult to obtain. If and when data become available, these sectors may be added to an amended inventory. Also included in this appendix are explanations regarding large industrial process emissions and Pittsburg Power Company.

### Marine Transportation

Marine emissions were estimated based on modeling data from the California Air Resources Board. The transit emissions attributed to the vessel lane segments within Pittsburg's waterways totaled approximately 175 metric tons annually.

Segment	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Total
S761	47	0.1	0.5	47
S762	70	0.2	0.7	71
S763	25	0.1	0.3	26
S764	31	0.1	0.3	32
Total	173	0.5	1.9	175

All GHGs shown in tonnes CO<sub>2</sub>e.

Marine emissions for idling vessels in berths was initially estimated by applying the average per port call emissions for the Contra Costa County ports of Carquinez and Richmond (93 tonnes CO<sub>2</sub>e / call) to the number of calls per year to the two ports in Pittsburg. This would have totaled 6,800 tonnes CO<sub>2</sub>e. However, discussion with the private companies operating these ports revealed that they provide shore power to the berthing vessels, and therefore minimize idling emissions by marine vessels.

### Hotelling (idling while docked)

Port	Total CO <sub>2</sub> e	Calls	CO <sub>2</sub> e / Call
Carquinez	42,530	460	92.46
Richmond	42,411	452	93.83
Total / Avg	84,942	912	93.14

## Maneuvering

Port	Total CO <sub>2</sub> e	Calls	CO <sub>2</sub> e / Call
Carquinez	1,026	460	2.23
Richmond	996	452	2.20
<b>Total / Avg</b>	<b>2,021</b>	<b>912</b>	<b>2.22</b>

The chart below identifies other methods of estimating marine vessel emissions. It shows what activity indicators are necessary to attempt an estimate at marine transportation GHG emissions. There is some data possibly available regarding fuel purchasing behaviors within Pittsburg, but a calculation based on this data would not be consistent with the measurements made for the other transportation sectors.

Measurement Method	Data Needed	Examples of Possible Calculations
Direct measurement	Tailpipe emissions measured by an air quality monitoring authority	
Fuel usage X emissions factor for fuel	Vessel Miles Traveled within Pittsburg	Miles of waterways in Pittsburg X Number of vessels that travel through Pittsburg annually or daily
		Direct measurement
	Fuel Economy of Vessels	Average fuel economy of all vessels that travel through Pittsburg
		Use percentage detail of what types of vessels travel through Pittsburg AND fuel economy of each of these types to calculate weighted average fuel economy
Emissions Factors	This data, expressed as CO <sub>2</sub> /gallon, are available from emission factor tables, and CH <sub>4</sub> /mile and N <sub>2</sub> O/mile is available for the average motor technology, though specificity of vessel technology types may be impossible to account for.	

Inquiries for these or any similar sets of data were made to BAAQMD and the United States Coast Guard. Both authorities reported that no data of this sort is maintained by their offices.

## Contacts

BAAQMD: Rochelle Henderson, Public Records 415/749-4784  
 publicrecords@baaqmd.gov

UCSG: Gary Johnson, 510-437-3148

## Rail Transportation

CalTrans Division of Rail

*Voicemail notes 10/17/08 10:00 AM*

From Alan Miller (916) 651-8476

### Locomotive Types & Emissions

There are several different types of locomotives, any of which could have been on any given train, with emissions rates varying between locomotive types.

- Tier 0, 1, and 2 with 2 being the most modern.
- Under Tier 0, there are also 0 non compliant and 0 compliant [emissions standards].

There is a fuel that has changed, to a low sulfur diesel, [apparently since 2005].

They are rebuilding old locomotives to Tier 2 standards, which is a reduction of 25% of the NOx.

### VMT Estimation

Looking on an online map that does not have the city limits identified, Alan Miller judged there to be about 7 miles of rail that pass through Pittsburg, from Bay Point to Antioch.

On any given day, there are four trains each direction that pass through that portion of the route, and also in 2005.

### Varying Conditions

The other thing that makes it difficult to quantify something like this is that a train accelerating coming out of Antioch depot would put out significantly more than one coming in. Without a model, this is difficult to measure.

Wind conditions could blow it out of town, or it could blow it in. [This is probably referring to the exhaust emissions. This is irrelevant as we are not measuring the impact on the local community's air, but total emissions into *any* atmosphere.]

### Comments on Necessity and Feasibility

The difficulty with measuring emissions from rail in a jurisdiction is that they do not have specific emissions information.

Alan Miller reports not ever receiving this request (that he knows of at least) from other towns. He wonders if this is something that is really needed as such.

There really is no way of putting a number on what is being emitted as it passes through.

He is unconvinced the data even exists in a form that is meaningful [for our analysis].

### **Pittsburg Power Company**

Pittsburg Power Company (PPC) operates Island Energy, which supplies natural gas and electricity to Mare Island in Vallejo. Because the natural gas and electricity are not generated, processed, nor consumed within Pittsburg city limits (and not transmitted by the City) the emissions from this energy transaction can only be classified as a Scope 3 informational item.

PPC's 2007 power content matches the California average power mix (see below). There is no WAPA power content label for 2005, so 2007's correspondence to 2007 CA average will be used as a proxy to indicate a correspondence in 2005. The grid average for California's power mix emitted 0.000437 tonnes CO<sub>2</sub>e per kWh consumed in 2004. The most recent data are for 2004.

In 2005, customers served by PPC consumed 18,060,588 kWh of electricity. With the CA grid average emissions factor, this electricity consumption emitted 7,892 tonnes CO<sub>2</sub>e.

<b>POWER CONTENT LABEL</b>		
<b>ENERGY RESOURCES</b>	<b>WAPA* (projected)</b>	<b>2007 CA POWER MIX** (for Comparison)</b>
<b>Eligible Renewable</b>	10%	10%
--Biomass & waste	0%	0%
--Geothermal	2%	2%
--Small Hydroelectric	6%	6%
--Solar	0%	0%
--Wind	2%	2%
<b>Coal</b>	32%	32%
<b>Large Hydroelectric</b>	24%	24%
<b>Natural Gas</b>	31%	31%
<b>Nuclear</b>	3%	3%
<b>Other</b>	0%	0%
<b>Total</b>	100%	100%

\* 0% of Product Name is specifically purchased from individual suppliers.  
\*\* Percentages are estimated annually by the California Energy Commission based on electricity sold to California consumers during the previous period.  
For specific information about this electricity product, contact The Pittsburg Power Company. For general information about the Power Content Label, contact the California Energy Commission at 1-800-555-7794 or [energy.ca.gov/consumer](http://energy.ca.gov/consumer).

The 2007 CA Power Mix represents the Net System power which is a mix of electricity without a direct tie between electric consumers and generators. The Total System Power label represents all of the generation consumed by customers in California. Net System Power is the component of Total System Power that is not directly generated for electric consumption.

Net system power estimates are not representative of the actual power mix in California, they cannot be used to monitor the progress of the California Renewable Portfolio Standard or establish a representative greenhouse gas profile of electricity imports.



## Appendix G. Industrial Emissions

BAAQMD provided public records for the 200 top emitters in the Bay Area in 2005. Among them were several Pittsburg facilities, including power plants and manufacturing facilities. Most of the emissions reported in the BAAQMD record occur from natural gas emissions. This causes potential for double-counting, because PG&E also reports natural gas usage in the commercial gas usage data. Some assumptions were made in order to correctly assign the portion of emissions resulting from *industrial* uses of natural gas to the industrial sector.

BAAQMD identified the emission source fuels for each of the facilities. Those identified to have natural gas emissions are listed below.

Facility	Tonnes CO <sub>2</sub> e	Coke	Diesel	Fuel Oil	Liquid waste	Natural Gas	Process Gas	Propane
<b>NATURAL GAS POWER PLANTS</b>								
Calpine Pittsburg LLC	118,613					X		
Delta Energy Center	1,995,152		X			X		
Los Medanos Energy Center	1,388,997		X			X		
<b>COKE POWER PLANTS</b>								
GWF Power,LP (Site 1)	200,462	X	X	X		X		
GWF Power,LP (Site 2)	196,398	X	X	X		X		
<b>MANUFACTURING</b>								
USS-POSCO Industries	55,112		X			X		
Dow Chemical Company	21,711		X		X	X	X	X
<b>Total</b>	<b>3,976,445</b>							

### Assumptions

1. All natural gas use except for those used by heavy power plants ARE included in PG&E data.
2. Natural gas consumed by gas powered generators are NOT included in PG&E data.
3. Natural gas consumed by large industrial manufacturing sites and coke powered power plants ARE included in PG&E data.
4. Separation of total GHG emissions, identifying what portion of the total resulted from natural gas combustion. This was based on a proxy year data (2007) for which emissions data were available for totals with and without natural gas emissions.

Industrial Facility Name	Proxy Year Data for % Nat Gas		
	2007 GHG Emissions	2007 GHG Emissions from Nat Gas	% Emissions from Nat Gas
Calpine Pittsburg LLC	116,440	116,440	100%
Delta Energy Center	1,895,320	1,895,318	100%
Los Medanos Energy Center	1,368,588	1,368,583	100%
GWF Power Systems,LP (Site 1)	200,700	0	0%
GWF Power Systems,LP (Site 2)	196,800	0	0%
USS-POSCO Industries	68,215	68,204	100%
Dow Chemical Company	22,900	20,187	88%

5. All non-natural gas emission sources that did not come from the top 200 GHG emitters list are excluded for lack of data availability.

## Conclusions

Following the above assumptions, the BAAQMD emissions data for the top 200 GHG emitters in 2005 were classified as follows:

1. 3,976 thousand tonnes CO<sub>2</sub>e from 3 natural gas power plants, 2 coke power plants, and 2 industrial facilities were included in the “industrial” sector.
2. 100% of USS-POSCO emissions and 88% of Dow Chemical emissions, totaling 74,241 tonnes CO<sub>2</sub>e were subtracted from the commercial sector natural gas emissions.

## Reason for Excluding Industrial Emissions from “Local Community” Emissions

1. There is little that the City of Pittsburg can do to influence industrial sector processes or business decisions.
2. These emissions are tracked and regulated through permitting processes by regional agencies, such as the Bay Area Air Quality Management District (BAAQMD). The largest of these industrial facilities fall under the AB 32 regulation for large industry, and will be regulated directly by the State.
3. BAAQMD reports that the top 11 emitters in Pittsburg emit 4.6 million metric tons of CO<sub>2</sub>e. If this amount were included in the Inventory, it would account for 84% of the total community emissions. It would dwarf all other activities in comparison. This would diminish the importance of reduction actions in all other sectors, and would be counter-productive to purpose of climate action.

4. One benefit of the inventory process is to have some basis for comparison with other cities and regions. Comparison facilitates the exchange of GHG reduction measures and strategies. Case studies are more meaningful when their impacts can be translated to other jurisdictions. Including these large industrial emission sources would prohibit comparison with cities in neighboring counties that may not have heavy industry, but do share many other conditions, and with whom collaboration and exchange would be valuable.
5. The vast majority of the industrial emissions are Scope 1 emissions related to electricity generation. These will be counted in the GHG inventories of the jurisdictions hosting the end-users of the generated electricity. Therefore the industrial emissions will be accounted for through other inventories, and would also result in double-counting if all jurisdictions do report Scope 1 and 2 emissions.

## Appendix H. Growth Indicators 2005 – 2020

### Community GHG Emissions Growth

#### Growth Indicators

Sector	Indicator	2005	2020	2005-2020	% per Year	Projection Authority	Data Source
Industrial Emissions	Industrial Jobs	3,030	3,611	19.2%	1.18%	ABAG	More detail below
Transportation (SR4)	1,000 VMT	323,817	425,060	31.3%	1.83%	CCTA	Matt Kelly, Associate Transportation Planner
Transportation (Local)	1,000 VMT	123,715	170,791	38.1%	2.17%	CCTA	
Commercial Energy	Commer. Jobs	12,740	19,529	53.3%	2.89%	ABAG	More detail below
Residential Energy	Population	62,400	76,200	22.1%	1.34%	ABAG	2009 ABAG Projections
Waste (residential)	Population	62,400	76,200	22.1%	1.34%	ABAG	
Waste (commercial)	Total Jobs	15,770	23,140	46.7%	2.59%	ABAG	
Waste Total	Tons	77,480	107,014	38.1%	2.18%	ABAG	More detail below

#### Commercial / Industrial Jobs

The ABAG 2009 growth projections indicate the number of *total* jobs. In order to distribute these job projections to the industrial and commercial sectors, data from the most recent General Plan was used. Based on the land use designations in the General Plan, projected jobs for industrial and commercial facilities were as follows:

	2005	2020	Rate of Growth
<b>Jobs</b>			
Commercial	17,450	52,240	199%
Industrial	4,150	7,130	72%
<b>Total Jobs</b>	<b>21,600</b>	<b>59,370</b>	<b>175%</b>
<b>Square Feet</b>			
Commercial	4,799,330	14,367,150	
Industrial	3,735,620	6,419,860	
<b>Total SF</b>	<b>8,534,950</b>	<b>20,787,010</b>	

The General Plan growth projections show a ratio between commercial to industrial growth rate (expressed as a percentage, 199% for commercial and 72% for industrial) to be 2.8:1. That is, for every one percent increase in industrial jobs, the City expects a 2.8% increase in commercial jobs. Although the actual growth projections have changed since the General Plan, the ratio of distribution of the growth is expected to remain about the same as in the General Plan. Applying this ratio between commercial growth

and industrial growth to the overall 47% growth projected by ABAG, the following sector-specific growth projections were established for the GHG Inventory.

	2005	2020	% Growth
Commercial Jobs	12,740	19,529	53.3%
Industrial Jobs	3,030	3,611	19.2%
<b>Total</b>	<b>15,770</b>	<b>23,140</b>	<b>46.7%</b>

## Waste

### Waste Total

Notes: The projected growth rate of the commercial sector (indicated by jobs) is greater than that of residential sector (indicated by population).

The 2004 CIWMB Waste Composition report indicates that residential waste accounts for 35.6% of the waste stream; commercial waste accounts for 64.3%.

Sector	2005 Tons of Waste	2005 of Total Waste	Percent Total Sector Growth	2020 Tons of Waste
Residential	27,583	35.6%	13.8%	31,384
Commercial	49,820	64.3%	60.7%	80,084
<b>Waste Total</b>	<b>77,480</b>	<b>100%</b>	<b>48.0%</b>	<b>111,469</b>

## Municipal Operations GHG Emissions Growth

### Growth Indicators

Sector	Indicator	2005	2020	Percent 2005-2020	Projection Data
Water/Sewage	Population growth	62,400	76,200	22.1%	2009 ABAG
Facilities	Employee growth	554	628	13.3%	See below
Vehicle Fleet	Employee growth	554	628	13.3%	See below
Employee Commute	Employee growth	554	628	13.3%	See below
Streetlights	Population growth	62,400	76,200	22.1%	2009 ABAG
Waste	Employee growth	554	628	13.3%	See below

### Employee Growth

YEAR	REGULAR	SEASONAL	TOTAL FTE	PERCENT CHANGE
2008	326	254	453	0.2%
2007	317	270	452	4.9%
2006	298	266	431	2.0%
2005	291	263	423	1.6%
2004	295	242	416	-4.5%
2003	302	267	436	-
<b>Average annual growth:</b>				<b>0.84%</b>

## Appendix I. Employee Commute Survey

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This information is being gathered as part of Pittsburg's participation in the ICLEI Cities for Climate Protection program. All information will be kept confidential. This survey should only take five minutes. Thank you in advance for your participation!

1. First and Last Name
2. Department
3. Type of Employment Status
  - Regular
  - Seasonal

**Please give us your best estimates about your commuting pattern IN THE CURRENT YEAR: 2008.**

1. On average, how many DAYS PER WEEK do you work?
2. On an average day, how many MILES DO YOU TRAVEL to work round-trip?
3. Please mark the number of days that you use a particular mode of transit during an average week of commuting?

Drive alone  
Carpool (I drive)  
Carpool (someone else drives)  
Take public transit (BART, bus)  
Bike  
Walk  
Combination of two or more means  
Other(please specify)

4. If you carpool, how many other Pittsburg employees travel with you on average?
5. If you drive or carpool, what type of vehicle do you take most often?
  - Auto-full size
  - Auto-mid size
  - Auto-compact
  - Hybrid
  - Heavy truck
  - Light truck/SUV
  - Motorcycle
  - Van
  - Other (please specify)

6. What type of fuel does this vehicle use?

- Gasoline
- Diesel
- Ultra-low sulfur diesel
- Bio-diesel B20
- Bio-diesel B100
- Ethanol
- Electric
- LPG
- CNG
- Other (please specify)

**Which special commuting events have you participated in? (Check all that apply.)**

- Spare the Air
- Bike to Work Day
- Walk In Lunch

How often have you participated in these events? Please describe your participation in these or any other special commuting events.

**Now please think back to the year 2005. Were you a City of Pittsburg employee in 2005? Y/N**

Have you changed your commute pattern IN ANY WAY since 2005? This includes changes like moving to a new place, buying a new car, taking BART more often, etc. Y/N

If Yes, please describe what you have changed.

**Please give us your best estimates about your commute pattern in the year 2005.**

1. On average, how many DAYS PER WEEK did you work in 2005?

2. On an average commute day in 2005, how many MILES DID YOU TRAVEL to work round-trip?

3. Please mark the number of days that you use a particular mode of transit during an average week of commuting?

Drove alone

Carpooled (I drove)

Carpooled (someone else drove)

Took public transit (BART, bus)  
(please specify)

Biked

Walked

Combination of two or more means

Other

4. If you carpooled in 2005, how many other City of Pittsburg employees traveled with you on average?

5. If you drove or carpooled, what type of vehicle did you take most often?

- Auto-full size
- Auto-mid size
- Auto-compact
- Hybrid
- Heavy truck
- Light truck/SUV
- Motorcycle
- Van
- Other (please specify)

6. What type of fuel did this vehicle use?

- Gasoline
- Diesel
- Ultra-low sulfur diesel
- Bio-diesel B20
- Bio-diesel B100
- Ethanol
- Electric
- LPG
- CNG
- Other (please specify)



## Acronyms and Glossary

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**4CL** – Contra Costa County Climate Leaders: a network assisting the county and its 19 cities to inform, support and encourage the measurement and reduction of greenhouse gas emissions. Through education and sharing of best practices we will ensure sustainable, healthy and livable cities.

**AB 32** – Assembly Bill 32: Also known as the *Global Warming Solutions Act of 2006*, passed by the California State Assembly in 2006, calls for a reduction in GHG emissions to 1990 levels by 2020 and commissioned the development of a plan on how to achieve this target. This plan, published in December 2008, is called the AB 32 Scoping Plan.

**ABAG** – Association of Bay Area Governments: a regional planning agency incorporating various local governments in the San Francisco Bay Area in California. It deals with land use, housing, environmental quality, and economic development. Non-profit organizations as well as governmental organizations can be members. All nine counties and 101 cities within the Bay Area are voluntary members of ABAG.

**ADC** – Alternate Daily Cover: cover material other than earthen material placed on the surface of the active face of a municipal solid waste landfill at the end of each operating day to control vectors, fires, odors, blowing litter, and scavenging.

**AVMT** – Annual vehicle miles traveled. *See VMT.*

**BAAQMD** – Bay Area Air Quality Management District: public agency that regulates the stationary sources of air pollution in the nine counties of California's San Francisco Bay Area: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, southwestern Solano, and southern Sonoma. The BAAQMD is governed by a Board of Directors composed of 22 elected officials from each of the nine Bay Area counties, and the board has the duty of adopting air pollution regulations for the district.

**CACP** – Clean Air and Climate Protection Software: a software developed and provided by ICLEI for calculating greenhouse gas and criteria air pollutants from a given set of activities.

**CCCCL** – Contra Costa County Climate Leaders. *See 4CL*

**CCP** – Cities for Climate Protection: a program of ICLEI for local governments to inventory and reduce their GHG emissions. *See ICLEI*

**CCTA** – Contra Costa Transportation Authority: a public agency formed by Contra Costa voters in 1988 to manage the county's transportation sales tax program and to do countywide transportation planning. The Authority is also the county's designated

Congestion Management Agency, responsible for putting programs in place to keep traffic levels manageable.

**CEC** – California Energy Commission: California’s primary energy policy and planning agency.

**CH<sub>4</sub>** – Chemical formula for Methane, a greenhouse gas with 21 times the global warming potential (see *GWP*) as carbon dioxide. Main sources of methane are agriculture (mainly livestock), sewage, and decomposition of organic matter.

**CIWMB** – California Integrated Waste Management Board: the state’s leading authority on recycling and waste reduction, was created by legislation (AB 939) adopted in 1989 by the California Legislature.

**CO<sub>2</sub>** – Chemical formula for Carbon Dioxide: the most abundant greenhouse gas. The main source of human-created carbon dioxide is the burning of carbon-intensive fuels for energy (gasoline, diesel, natural gas, coal, etc.)

**CO<sub>2e</sub>** – Carbon Dioxide Equivalents: unit of measurement that describes, for a given mixture and amount of greenhouse gas, the amount of CO<sub>2</sub> that would have the same global warming potential (*GWP*)

**CPUC** – California Public Utilities Commission: regulates privately-owned utilities in the state of California, including electric power, telecommunications, natural gas and water companies.

**DA** – Direct Access: allows customers to purchase their electricity directly from competitive Energy Service Providers (ESP) rather than from Pacific Gas and Electric Company. Under DA, PG&E will continue to transport and deliver electricity to your home or business. The State regulates whether direct access is allowable or not.

**DVMT** – Daily Vehicle Miles Traveled. See *VMT*.

**EIA** – Energy Information Administration: independent statistical agency within the U.S. Department of Energy. EIA's mission is to provide policy-independent data, forecasts, and analyses to promote sound policy making, efficient markets, and public understanding regarding energy and its interaction with the economy and the environment.

**Energy Star**: A federal governmental program that rates the energy efficiency of certain appliances and equipment and labels those that meet certain minimum efficiency criteria for their type and class of equipment.

**EPA** – Environmental Protection Agency: an agency of the federal government of the United States charged to protect human health by safeguarding the natural environment: air, water, and land.

**FTE** – Full-time equivalent: a way to measure a worker's involvement in a project, or a student's enrollment at an educational institution. An FTE of 1.0 indicates a staff position of one full time worker.

**GHG** – Greenhouse gas: gases in an atmosphere that absorb and emit radiation within the thermal infrared range.

**GWh** – Giga-watt-hours: one million kilo-watt-hours (kWh)

**GWP** – Global Warming Potential: a measure of how much a given mass of greenhouse gas is estimated to contribute to global warming. It is a relative scale which compares the gas in question to that of the same mass of carbon dioxide. In this GHG inventory, a 100 year horizon is used, for which the GWP for carbon dioxide is 1, the GWP for methane is 21, and the GWP for nitrous oxide is 310. The synthetic (man-made) greenhouse gases (hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) have extremely high GWPs, in the thousands. The synthetic GHGs occur in very small quantities and are difficult to track at the local government level, and are therefore left out of this GHG inventory.

**ICLEI** – Local Governments for Sustainability: an international association of local governments and national and regional local government organizations that have made a commitment to sustainable development. More than 1000 cities, towns, counties, and their associations in 68 countries comprise ICLEI's growing membership. It was originally named 'International Council for Local Environmental Initiatives' (ICLEI), and was officially renamed in 2003.

**IPCC** – Intergovernmental Panel for Climate Change: a scientific intergovernmental body<sup>[1][2]</sup> tasked to evaluate the risk of climate change caused by human activity. The panel was established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP), two organizations of the United Nations.

**kWh** – kilo-watt-hour: a unit of energy equal to 3,600,000 joules. Energy in watt-hours is the multiplication of power in watts and time in hours. A kilo-watt-hour is equivalent to one thousand watt-hours.

**MMTCO<sub>2</sub>e** – Million metric tons in carbon dioxide equivalent. See CO<sub>2</sub>e.

**MSW** – Municipal solid waste: a waste type that includes predominantly household waste (domestic waste) with sometimes the addition of commercial wastes collected by a municipality within a given area.

**MTC** – Metropolitan Transportation Commission: a regional planning, financing, and funding government agency in the San Francisco Bay Area.

**MTCO<sub>2</sub>e** – Metric tons carbon dioxide equivalent. See CO<sub>2</sub>e.

**MWh** – Mega-watt-hour: one thousand kilo-watt-hours (kWh)

**N<sub>2</sub>O** – Chemical formula for Nitrous Oxide, a greenhouse gas with 310 times the global warming potential (see *GWP*) of carbon dioxide. Main sources of nitrous oxide are industrial and agricultural processes.

**PG&E** – Pacific Gas and Electric Company: the utility that provides natural gas and electricity to most of the northern two-thirds of California, from the Oregon border to Bakersfield.

**S-3-05** – State Executive Order signed by Governor Arnold Schwarzenegger that set a reduction target for state-wide GHG emissions for 80% below 1990 levels by 2050.

**Scope** – method of categorizing emission sources. The intention of the use of scopes is to improve transparency, and to provide utility for different types of climate policies and goals. The Scopes used in this GH inventory follow those of the World Resources Institute/World

**Scoping Plan** – The California Air Resources developed strategic plan to reduce greenhouse gas emissions in compliance with Assembly Bill 32, the *Global Warming Solutions Act of 2006*. See AB 32.

**SR4** – State Route 4: the freeway passing through Pittsburg in the East-West direction.

**VMT** – Vehicle miles traveled: the total number of miles traveled by vehicles on a given segment of roadway, within a given period of duration.

**WRI/WBCBG** – World Resources Institute: an independent, non-partisan and nonprofit organization with a staff of more than 100 scientists, economists, policy experts, business analysts, statistical analysts, mapmakers, and communicators developing and promoting policies with the intention of protecting the Earth and improving people's lives.

World Business Council for Sustainable Development: a CEO-led, global association of some 200 international companies dealing exclusively with business and sustainable development.

**WTP** – Water Treatment Plant, operated by the City of Pittsburg, treats 32 million gallons per day for use by the Pittsburg community.

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