Attachment A

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City of

OAKLAND

2017 Greenhouse Gas Emissions Inventory Report

June 2020

Table of Contents

List of Figures

Credits and Acknowledgments

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California Air Resources Board
California Waste Solutions
Carnegie Mellon
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East Bay Municipal Utility District
Federal Transit Administration
ICLEI – Local Governments for Sustainability USA
Metropolitan Transportation Commission
Pacific Gas and Electric
Port of Oakland
Renewable & Appropriate Energy Laboratory, UC Berkeley
StopWaste
Union Pacific Railroad
U.S. Department of Transportation
U. S. Environmental Protection Agency
Waste Management
Water Emergency Transportation Authority

Introduction

Oakland, California

Nationally recognized as one of America's greenest cities, Oakland aims its award-winning sustainability efforts toward building an ecologically sustainable, economically dynamic, and socially equitable future for the community. With 19 miles of shoreline, Oakland is vulnerable to volatile weather patterns, warming oceans, and changing tides. The City's greenhouse gas (GHG) emissions reduction strategies, intended to address the ongoing impacts of a changing climate, have been established in the Oakland Energy and Climate Action Plan (2012-2020) and Equitable Climate Action Plan (2020-2030).

This GHG Emissions Inventory Report (Report) provides an update on the calculated emissions occurring in Oakland in 2017. It includes updates to the City's four previous GHG Emissions Inventories, covering the years 2005, 2010, 2013, and 2015.

Global Effort to Reduce Emissions

In recent years, local and regional governments across the world have been working to unify the approach to reducing GHG emissions. The City of Oakland has signed onto several of these efforts as part of its commitment, including the following:

- Compact of Mayors - Launched at the 2014 United Nations Climate Summit, the Compact of Mayors is the world's largest coalition of city leaders addressing climate change by pledging to reduce their greenhouse gas emissions, tracking their progress and preparing for the impacts of climate change. Beginning with the City's joining the Compact in 2015, this agreement requires the City of Oakland to inventory and report GHG emissions at least every three years, disclose climate vulnerabilities within two years, and disclose climate hazards within one year.
- Under 2 Memorandum of Understanding (Under 2 MOU) - This agreement was signed by Mayor Libby Schaaf in Paris at the U.N. Climate Change Conference of Parties, on December 6, 2015. Each signatory commits to limit emissions to 80 to 95 percent below 1990 levels, or below two metric tons per capita, by 2050, which is the level of emission

reduction believed necessary to limit global warming to less than 2°C by the end of this century.

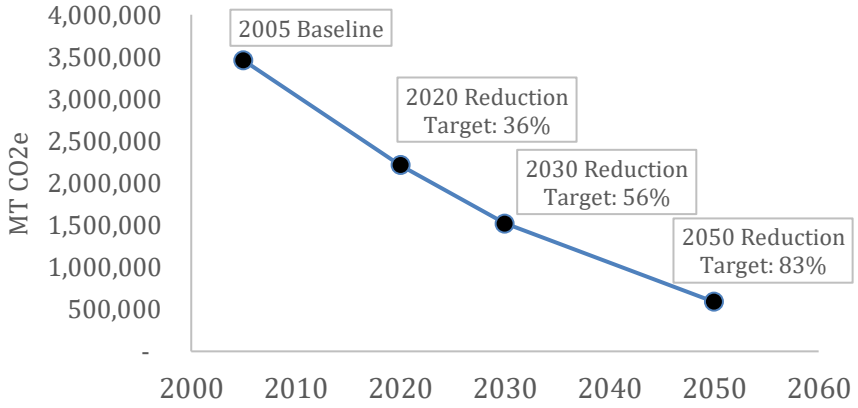
- Mayor's National Climate Action Agenda – This U.S.-based coalition of leading cities addressing climate change through policy and advocacy was started in 2015, and serves as a platform for furthering GHG reduction policies at the local and national levels.

Local Effort to Reduce Emissions

The City calculates and reports its greenhouse gas emissions because addressing the impacts of climate change is a core value of Oakland and its people. This Report provides an overview of Oakland's existing emissions and helps guide policy to better reduce emissions. By making a targeted and coordinated approach to reducing emissions, we can work to protect residents, businesses, and properties throughout the region from increased impacts of climate change over time.

Oakland City Council has adopted GHG reduction targets of 36% fewer emissions by 2020, 56% fewer emissions by 2050, and 83% fewer emissions by 2080 **(Figure 1)**. In pursuit of these targets, and in consistence with global agreements, such as the Compact of Mayors and the Under 2 MOU, Oakland has committed to report on city-wide emissions every two years and strategize to meet these targets. The periodic calculation and reporting of these emissions help the City to understand whether it is on track to meet its targets, and help the community understand how well Oakland is responding to this global challenge. Figure 1 illustrates these targets in GHG emissions.

Figure 1: GHG Reduction Targets



Prioritizing Equity in GHG Reduction

The City of Oakland strives to become a more livable and equitable city for all. Because climate change disproportionately affects low income residents and people of color in Oakland, the City's sustainability efforts prioritize projects and programs that improve equity while also addressing climate change. In pursuing its GHG emissions reduction targets, the City has adopted a strategy of focusing on the emissions that not only contribute to climate change but also improve the health, safety, and overall quality of life for its most underserved communities. Issues such as housing affordability, access to public transit, air quality and community health, and climate justice are all impacted by the City's approach to meeting its GHG emissions targets. By prioritizing strategies

that focus on these co-benefits of GHG reduction, the City ensures that its GHG reduction efforts are also part of our approach to meeting broader community needs.

Examples of social benefits to be gained from GHG emissions reduction programs in Oakland include the following:

- Improved health outcomes, as indicated by measured rates of asthma and life expectancy, from air quality improvements in neighborhoods adjacent to freeways, industry, and the Port of Oakland
- Enhanced flood protection for low-lying neighborhoods resulting from lower runoff in the hill areas and reduced sea level rise
- Improved educational outcomes and job training through collaboration with schools on building efficiency, urban sustainability, and urban food growing efforts
- Lower utility bills and increased home comfort from energy efficiency retrofits of homes and apartments
- Greater access to transit and active mobility through a cheaper, safe, reliable, expanded, and improved public transit system throughout the city's underserved areas

In assessing new opportunities for programs and policies, the City actively considers these and other co-benefits to ensure that the approach to reducing emissions will also help address inequity in the community. While this Report is focused on the data reporting of GHG emissions rather than the co-benefits described above, additional discussion and details on social and climate equity considerations can be found in the Oakland ECAP.

Inventory Methodologies - Local and Lifecycle Emissions

There are two methods of analyzing GHG emissions across a community. The first method, called the local emissions approach, looks at emissions produced within city limits from activities such as using natural gas in homes or from driving a car in Oakland. The local emissions approach is the standard used by cities across the United States, which makes drawing comparisons between one city to another easier. Thus, this Report includes local emissions accordingly.

The second method, referred to as the lifecycle emissions approach, employs a perspective that includes GHGs emitted globally during the material extraction, manufacturing, and shipping needed to satisfy local demand for goods and services. The lifecycle emissions approach provides a more thorough portrayal of the emissions for which the Oakland community is responsible, and holds the potential to induce deeper emissions reductions globally. For these reasons, the City also conducts a lifecycle analysis. Measurement of lifecycle emissions is a relatively new method, and will continue to evolve as better data become available and more local governments refine and improve the approach.

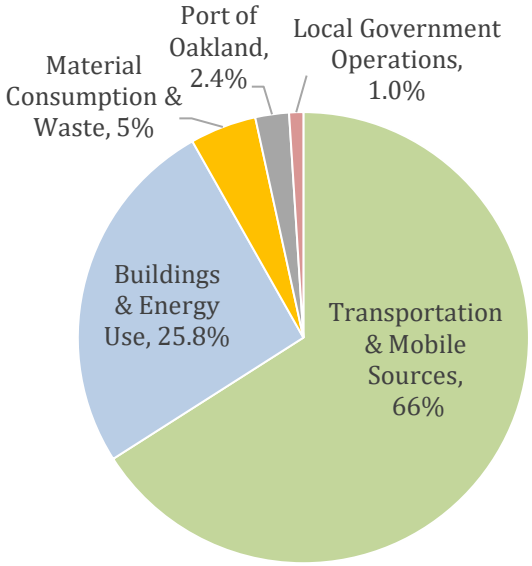
Each approach offers a different lens through which to see the emissions for which Oakland is responsible, and provides a method of determining which areas of focus are most appropriate in establishing policies to minimize these emissions. Since climate change is a global issue that requires solutions on a global scale, Oakland prioritizes the findings of the lifecycle emissions

approach. As a city, Oakland seeks to have a global impact by not only reducing the emissions from our local activities, but also addressing how activities within Oakland produce emissions worldwide.

Local Emissions Summary

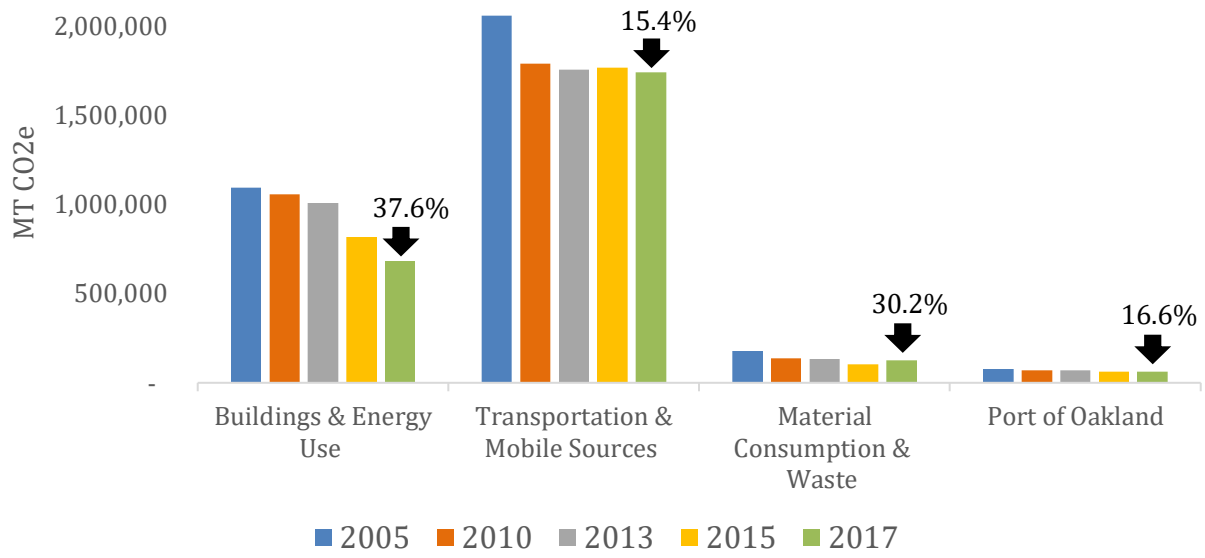
Local emissions are GHGs emitted within city limits, such as those resulting from using natural gas in homes or gasoline in cars. In 2017, local emissions equaled 2,643,884 metric tons of carbon dioxide equivalent (MT CO2e). As shown in **Figure 2**, 66% of local emissions were generated in the Transportation sector, totaling two-thirds of all of Oakland's local emissions. The Buildings and Energy sector made up 25.8%, including electricity and natural gas use in homes, businesses, and other buildings. Material Consumption and Waste accounted for 4.8%, specifically from emissions associated with landfilled materials thrown in the trash by Oakland homes and businesses. Finally, 2.4% came from the Port of Oakland and 1% from Local Government Operations.

Figure 2: 2017 Local Emissions



Overall, local emissions are down in all activities compared to 2005. **Figure 3** provides detail on the changes in local emissions since 2005, highlighting the areas in which emissions reductions have been achieved. The largest percentage reductions come from Buildings and Energy sector (37.6%). While Material Consumption and Waste is down by 30.2% since 2005, emissions did increase from 2015 to 2017 by 0.9%. Overall, local emissions are 23.5% lower in 2017 compared to 2005. This level of progress in reducing emissions locally is due to significant improvements in the deployment of renewable energy, the improvement in energy efficiency requirements for newly constructed buildings, the increased fuel economy for vehicles, and the retrofitting of existing residential and commercial buildings with energy efficient appliances and insulation.

Figure 3: Local Emissions by Sector



Lifecycle Emissions Summary

Lifecycle emissions are GHGs emitted around the world due to purchasing decisions made by Oaklanders. In 2017, Oakland's lifecycle emissions equaled 7,418,907 metric tons of carbon dioxide equivalent (MT CO2e), more than double our local emissions. As shown in **Figure 4**, 31.8% of these emissions were generated in the transportation sector of the community, compared to 66% in the local emissions analysis. The buildings and energy sector accounted for 19.8%, compared to 25.8% in the local analysis. Material Consumption and Waste emissions changed the most dramatically, increasing from 4.8% in the local analysis to 38.4% in the lifecycle analysis. This is due to the inclusion of emissions associated with manufacturing, processing, packaging, and shipping of materials consumed by those living and working in Oakland.

Figure 4: 2017 Lifecycle Emissions

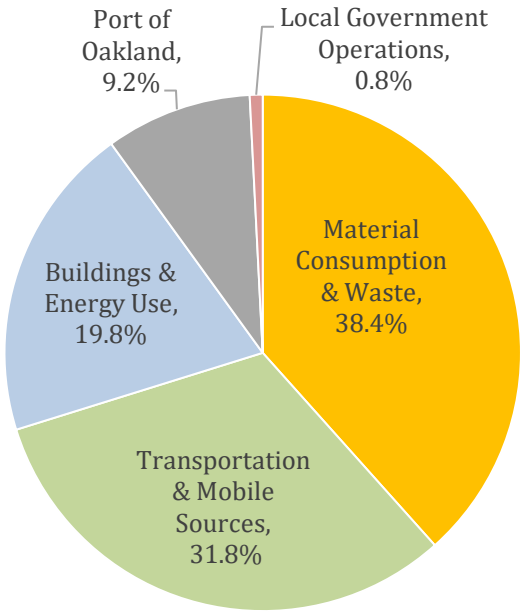
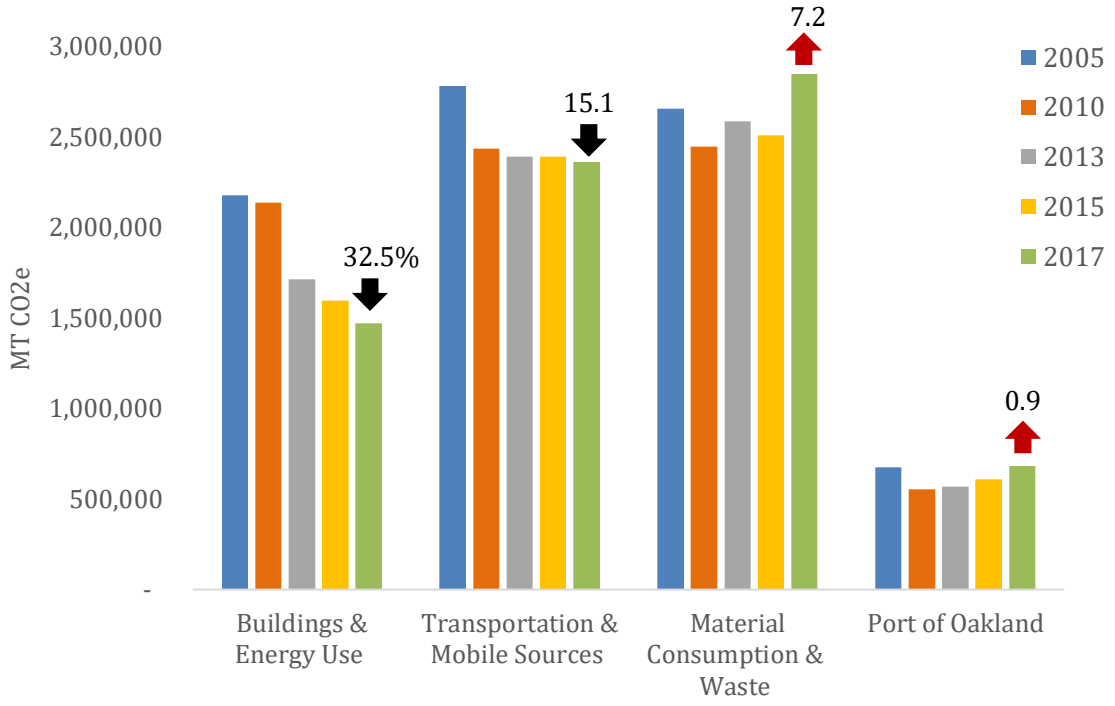


Figure 5 illustrates the lifecycle emissions associated with the same sectors measured in the City's local inventory. While the two largest sectors from the local analysis, buildings and transportation, have decreased lifecycle emissions significantly since 2005, both the Material Consumption and Waste sector and the Port of Oakland have increased their lifecycle emissions since 2005.

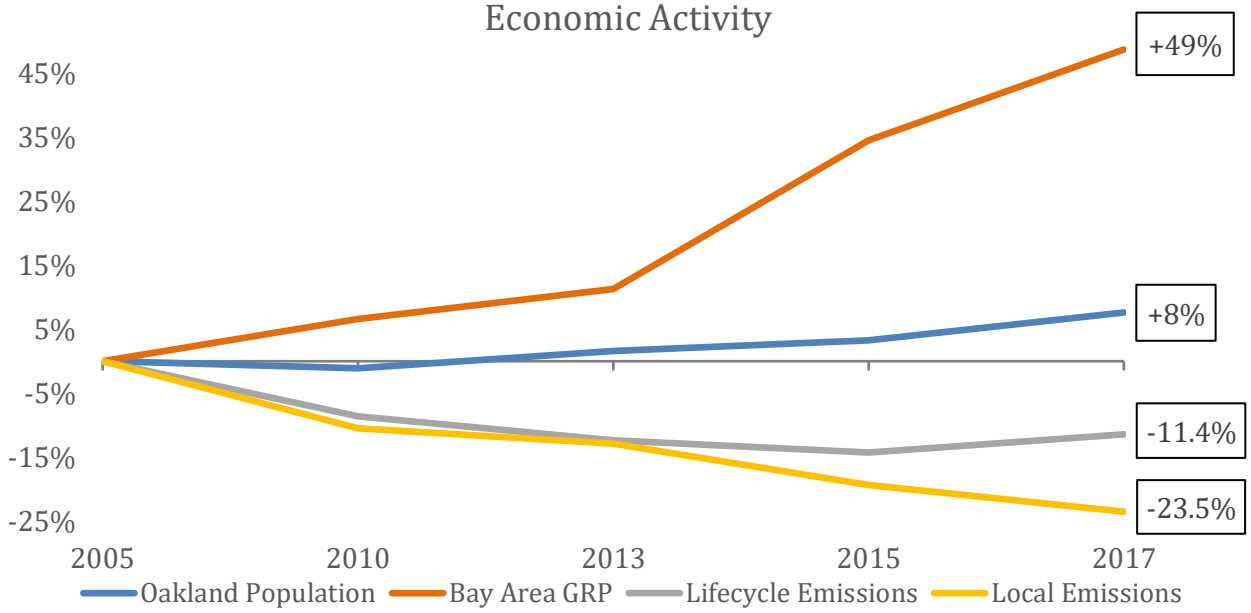
Figure 5: Lifecycle Emissions by Sector



As mentioned previously, the methodology to calculate lifecycle emissions is a recent effort and not a perfect science. Many cities choose not to because of the assumptions needed and the large possibility of error. While this is true, there are other data points the City can consult to support our lifecycle calculations. As **Figure 6** illustrates, Oakland's population has grown and the Bay Area's economy has boomed. These are two important indicators that more goods were purchased by Oaklanders and people in general. Because demand for goods increased, the demand for raw material extraction and product manufacturing also increased, and more products had to be transported via ships and trucks operating through the Port. At the same time, both old products and packaging from new products were disposed of -- either recycled, remanufactured and re-shipped, or left to end up in landfills. All this activity is reflected in the increase of lifecycle emissions at the Port and in the waste sector.

In this lifecycle analysis, the full impact of Material Consumption and Waste in Oakland's emissions profile becomes apparent. It can be inferred from this significant effect that a reduction in the consumption of goods, and particularly in the number of goods manufactured overseas and consumed in Oakland, would have on lowering GHG emissions.

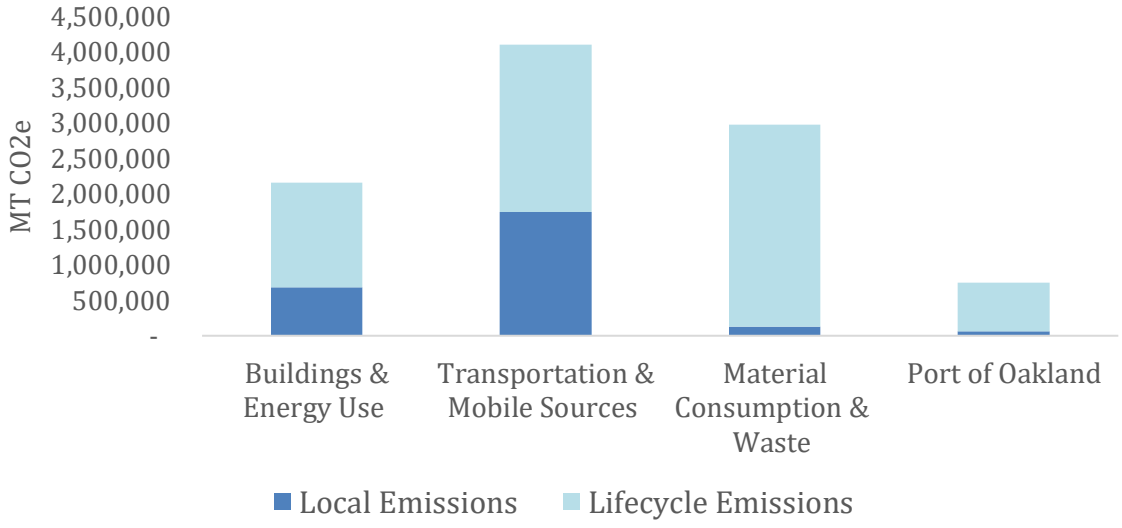
Figure 6: Growth Trends in GHG Emissions, Population, and Economic Activity



Local vs. Lifecycle Emissions

As shown in **Figure 7**, there is a significant difference in the local and lifecycle emissions across sectors. Solid waste emissions represent the largest difference between local and lifecycle emissions, but differences are present across all the sectors. Local government operations do not have a significant difference between local and lifecycle emissions, and are approximately one percent of total emissions.

Figure 7: 2017 Local and Lifecycle Emissions by Sector



Both emissions summaries illustrate that the City has made substantial progress in reducing overall emissions, but additional progress is needed, particularly regarding lifecycle emissions of the waste sector. **Figure 8 and 9** illustrate the progress made in meeting the emissions reduction targets from both the local and lifecycle approaches.

Figure 8: Local Emissions Progress Toward 2020 GHG Reduction Target

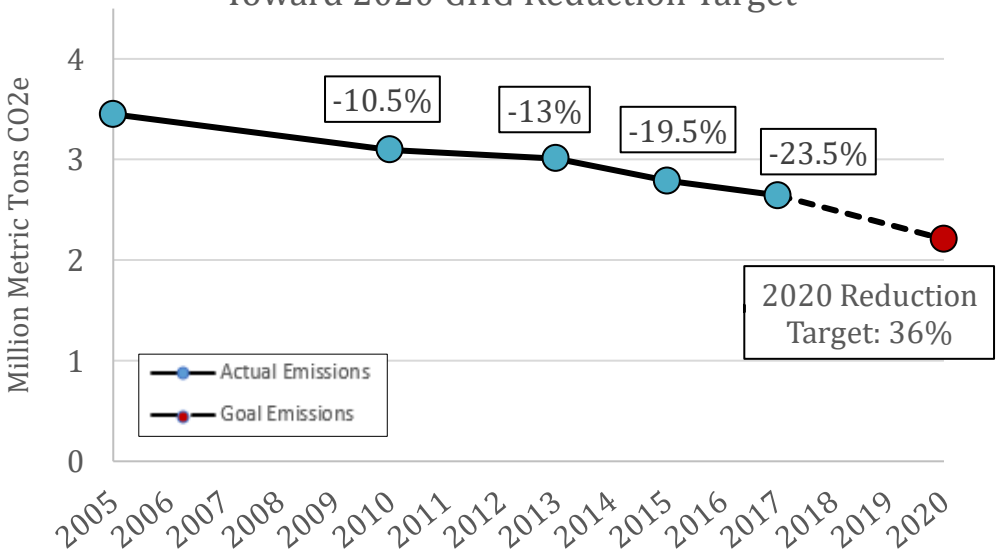
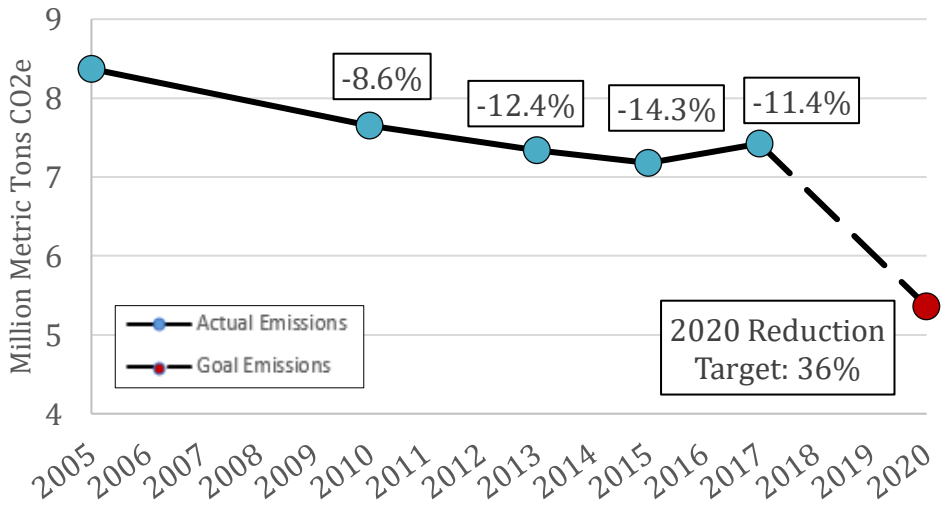


Figure 9: Lifecycle Emissions Progress Toward 2020 GHG Reduction Target

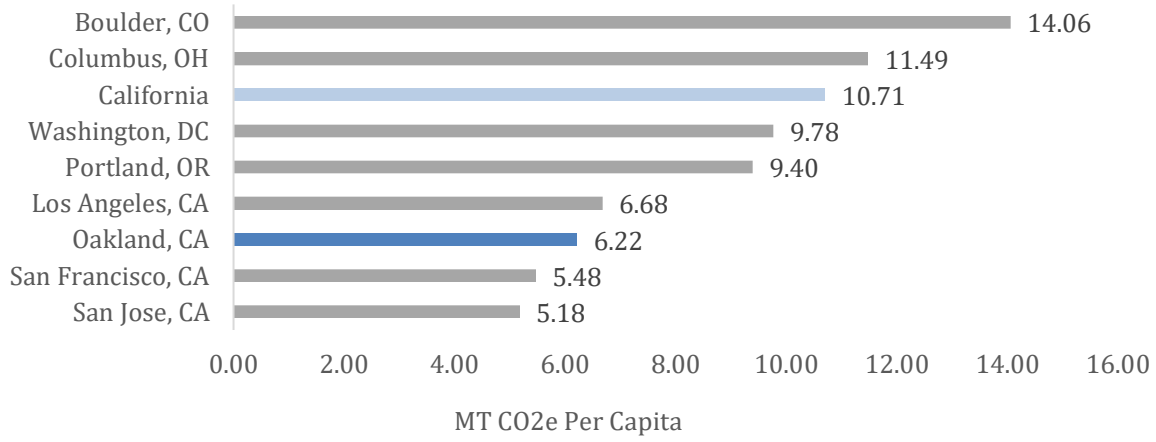


Local emissions are not on track to meet the 2020 target as of the 2017 data, but the COVID-19 epidemic of 2020 may result in significant short-term reductions for the 2020 calendar year. Overall emissions have been reduced by 23.5% since 2005. Lifecycle emissions are also not on track to meet the 2020 target but have been reduced over 11% since 2005. These shortfalls may result in the need for more aggressive GHG reduction strategies in coming years to achieve the targets.

Per Capita Emissions Comparison to Other Cities

Another method of understanding GHG emissions is by comparison of per capita emissions, showing the rate of emissions per person in the community. This type of comparison allows cities of different sizes to compare emissions, while also ensuring that emissions are counted using a consistent methodology. As shown in **Figure 10**, per capita local emissions for the City of Oakland in 2017 was very low by national standards, averaging 6.22MT CO2e, and are 58% lower than the California average.

Figure 10: Per Capita Local Emissions of California and Selected Cities



Conclusions

Oakland has made substantial progress in reducing GHG emissions across the city. While much work remains to be done to meet the City's 2020, 2030, and 2050 targets, the City has set in place a wide variety of programs, policies, and efforts that have proven successful in lowering its carbon footprint. In its ongoing implementation of the ECAP, the City will continue this progress and capitalize on the opportunities presented to lower emissions, while continuing to grow and prosper. The ability of city government to work with residents, businesses, coalitions, and community advocates will increase the likelihood that the City's ambitious targets are met.

Consistent with the Compact of Mayors and the Under 2 MOU, the City of Oakland is committed to reporting on its GHG emissions every two years, using protocols agreed to by the international community and consistent with the best practices in the industry. The City's ongoing focus on equity as a priority in targeting emissions reductions strategies will serve to further strengthen the community.

Appendix A: GHG Emissions Data and Methodology

Table of Contents

List of Figures

List of Tables

Emissions Data and Methodology Overview

The updates to the 2005, 2010, 2013, and 2015 GHG Emissions Inventories, and the newly created 2017 Inventory, were conducted following a review of similar inventories in U.S. cities, discussions and guidance from ICLEI Local Governments for Sustainability, and in coordination with a wide range of local and regional partners who maintain data necessary to complete a comprehensive analysis. This appendix sets forth the details regarding how each of the inventories were completed, the sources and details of the data used, and demographic information used in completing the analysis.

In conducting full community and local government inventories across multiple reporting years dating back to 2005, the goal is to maintain a consistent methodology across all years so as to make each year as comparable as possible. However, the City is dependent on many external agencies and organizations for their data and is unable to control any changes to or gaps in those reporting practices. In some cases, we had to use 2007 as a proxy year for 2005 or perform linear extrapolation to estimate activity for our specific reporting year, or use 2015 emissions factors for 2017 activity. These downfalls in our data and methodology are documented thoroughly, and each reporting year we do our best to improve our methodology with newly available data and best practices.

Following the presentation of demographics and data sources used in the inventories, tables are provided showing the raw data, emissions in each of the major categories, and total carbon dioxide equivalent (CO2e) emissions for each activity type. These files are summaries of a broader range of inputs associated with the emissions model used. For more information on the model files, please contact the Environmental Services Division of Oakland Public Works.

Reporting Protocol

The City of Oakland used ICLEI U.S. Community Protocol for Accounting and Reporting Greenhouse Gas Emissions Version 1.1 as the overarching inventory methodology. ICLEI's ClearPath tool was used for many calculations and as a database. When applicable, updates were made per instruction from sources used within ICLEI protocol. The City has committed to measuring progress on a regular basis through various programs including the Compact of Mayors, Under 2 MOU, and the Mayor's National Climate Action Agenda. Per these requirements, the local inventory was also analyzed using the Global Protocol for Community-Scale Emissions (GPC). Both versions have been published and shared through the Global Covenant of Mayors.

Demographics of Oakland

Table 1: Demographics

	2000 Census		2010 ACS		2013 ACS		2015 ACS		2017 ACS		% Increase from 2000
	#	% of Total	#	% of Total	#	% of Total	#	% of Total	#	% of Total	
Population											
Population	399,484		386,909		397,011		408,073		417,442		4%
Race & Ethnicity											
White Alone	125,013	31.3%	145,859	37.7%	156,236	39.4%	159,650	39.1%	153,035	36.7%	22%
Black or African American Alone	142,460	35.7%	109,815	28.4%	107,015	27%	106,302	26%	101,482	24.3%	- 29%
American Indian or Alaska Native Alone	2,655	0.7%	2,533	0.7%	2,628	0.7%	3,150	0.8%	3,627	0.9%	37%
Asian Alone	60,851	15.2%	61,664	15.9%	65,354	16.5%	65,696	16.1%	66,531	15.9%	9%
Native Hawaiian and Other Pacific Islander Alone	2,002	0.5%	2,082	0.5%	2,370	0.6%	2,401	0.6%	2,504	0.6%	25%
Two or More Races	19,911	5%	16,699	4.3%	22,496	5.7%	25,563	6.3%	29,281	7%	47%
Hispanic or Latino (of any race)	87,467	21.9%	97,393	25.2%	102,090	25.7%	106,643	26.1%	112,690	27%	29%
Housing											
Housing Units	157,508		173,851		170,977		171,087		169,303		7%
Households	150,790		154,854		154,786		158,424		159,448		6%
Persons per Household	2.6		2.47		2.52		2.53		2.58		-1%

Data Sources

Table 2: Sources by Activity

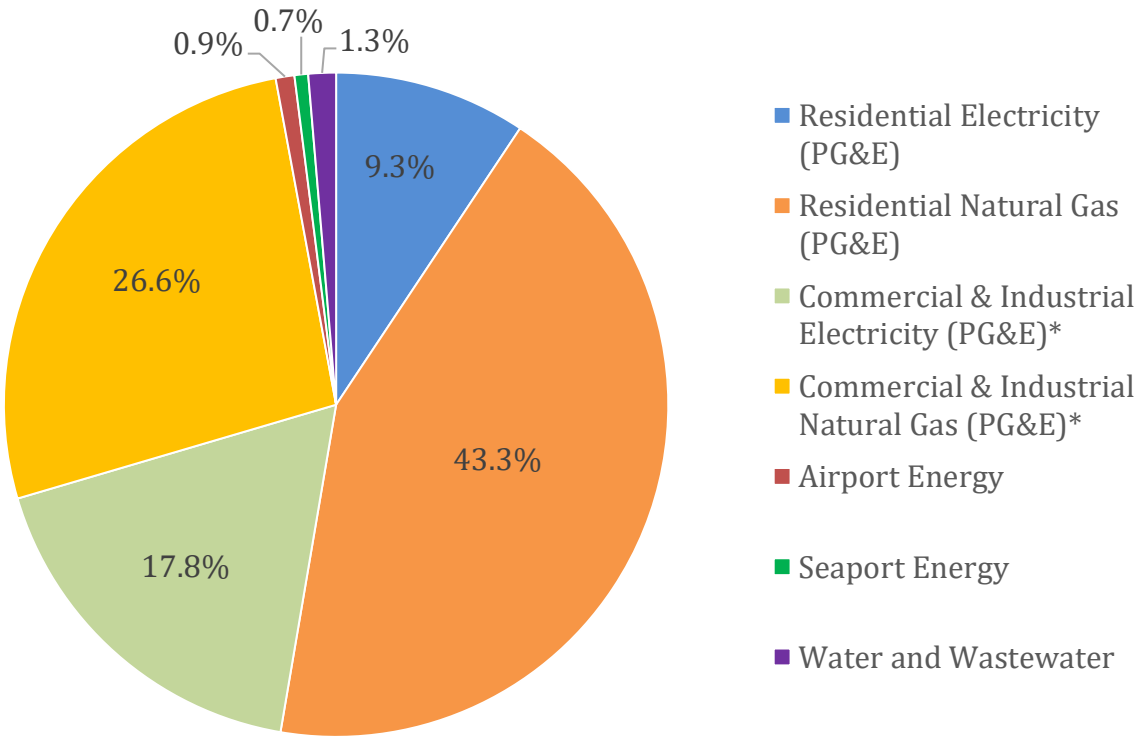
Activity	Local Emissions Sources	Lifecycle Emissions Sources
Buildings and Energy Use		
Residential Energy	Pacific Gas & Electric	ICLEI, Pacific Gas & Electric
Commercial & Industrial Energy	Pacific Gas & Electric	ICLEI, Pacific Gas & Electric
Port of Oakland - Airport	Port of Oakland	ICLEI, Pacific Gas & Electric
Port of Oakland - Seaport	Port of Oakland	ICLEI, Pacific Gas & Electric
Water & Wastewater	East Bay Municipal Utility District	---
Transportation & Mobile Sources		
Public Transit	Bay Area Rapid Transit, National Transit Database, CA Air Resources Board's EMFAC Model, Union Pacific Rail Sustainability Report, Amtrak	Argonne National Laboratory's GREET Model, WETA Ferry
On-Road Gasoline	CA Air Resources Board's EMFAC Model	Argonne National Laboratory's GREET Model
On-Road Diesel	CA Air Resources Board's EMFAC Model	Argonne National Laboratory's GREET Model
Port of Oakland - Airport	Port of Oakland	Argonne National Laboratory's GREET Model, Oakland Airport Master Plan
Port of Oakland - Seaport	Port of Oakland's Seaport Air Emissions Inventory	Argonne National Laboratory's GREET Model
Material Consumption & Waste		
Solid Waste	Waste Management, Alameda County Waste Management Authority (StopWaste), City of Oakland Waste Team, CalRecycle	EPA's WARM Model, California Waste Solutions, Waste Management, City of Oakland Waste Team
Solid Waste Transportation	Waste Management	ICLEI, Argonne National Laboratory's GREET Model
Food	---	UC Berkeley's Cool Climate Calculator
Construction	---	Vital Signs, Census Bureau, Carnegie Mellon's EIO-LCA Model

Sector Overview

Buildings & Energy

From 2005 to 2017, the Buildings and Energy sector decreased local emissions by 38% and lifecycle emissions by 33%. This sector looks at three major emission sources: energy procured by PG&E that is used in Oakland's residential, commercial, and industrial buildings; energy procured by the Port of Oakland for seaport and airport buildings; and energy used by East Bay Municipal Utility District (EBMUD) to process and transport Oakland's water and wastewater. The energy procured by PG&E and the Port of Oakland is split up into two dominant categories: electricity and natural gas. While annual energy use data from PG&E and EBMUD are readily accessible and fairly reliable, the Port of Oakland has not systematically tracked its energy use or fuel mix data back to 2005, resulting in less reliable calculations of Port emissions and changes over time.

Figure 1: 2017 Local Emissions from Building Energy



**Unable to separate Commercial and Industrial Buildings due to California's 15/15 Rule.*

Figure 1 displays the breakdown of building energy emissions for 2017. This pie chart demonstrates that natural gas accounts for at least 70% of total emissions from building energy.

Figure 2: Local Emissions from Building Energy (PG&E)

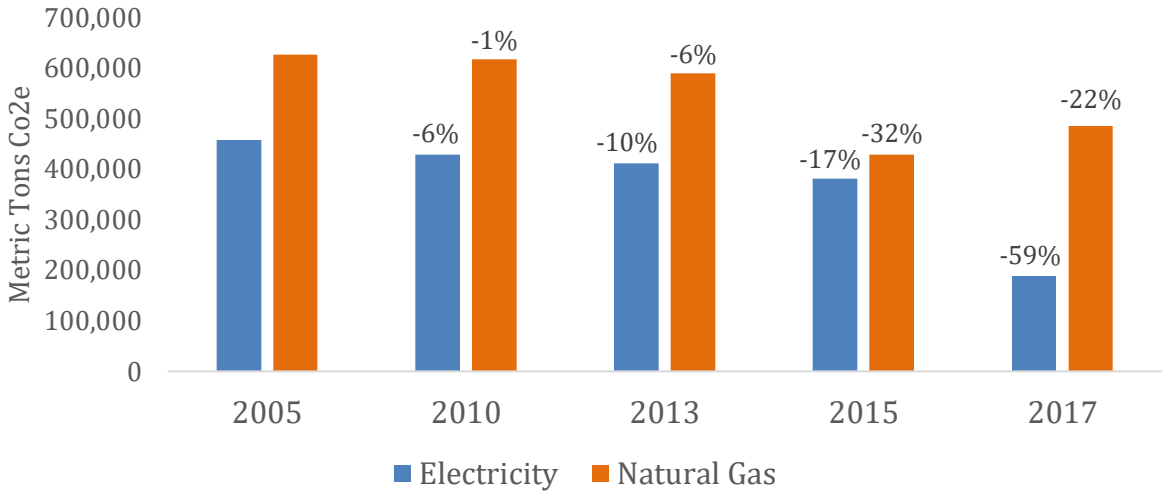


Figure 3: Lifecycle Emissions from Building Energy

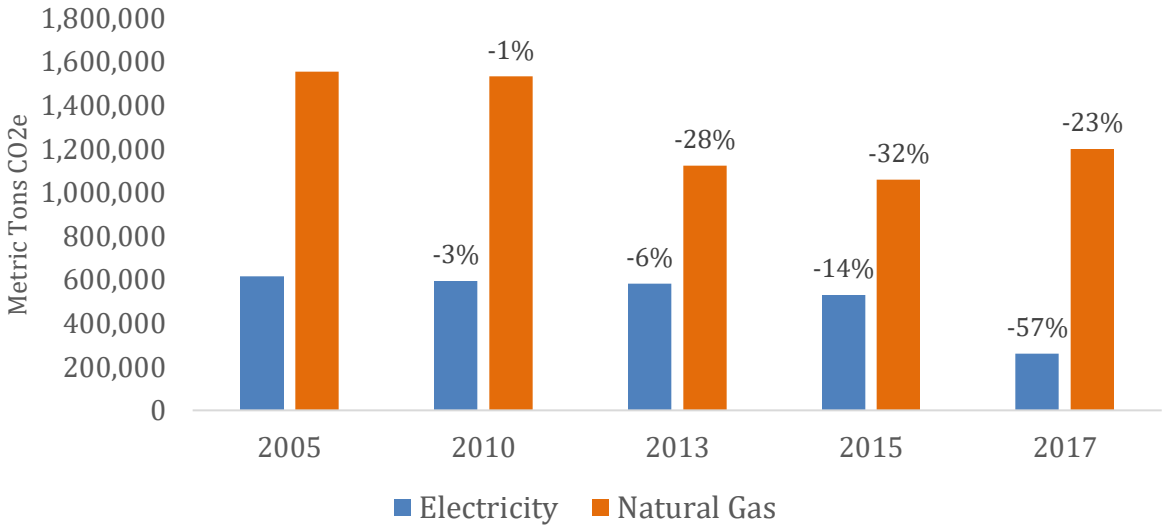


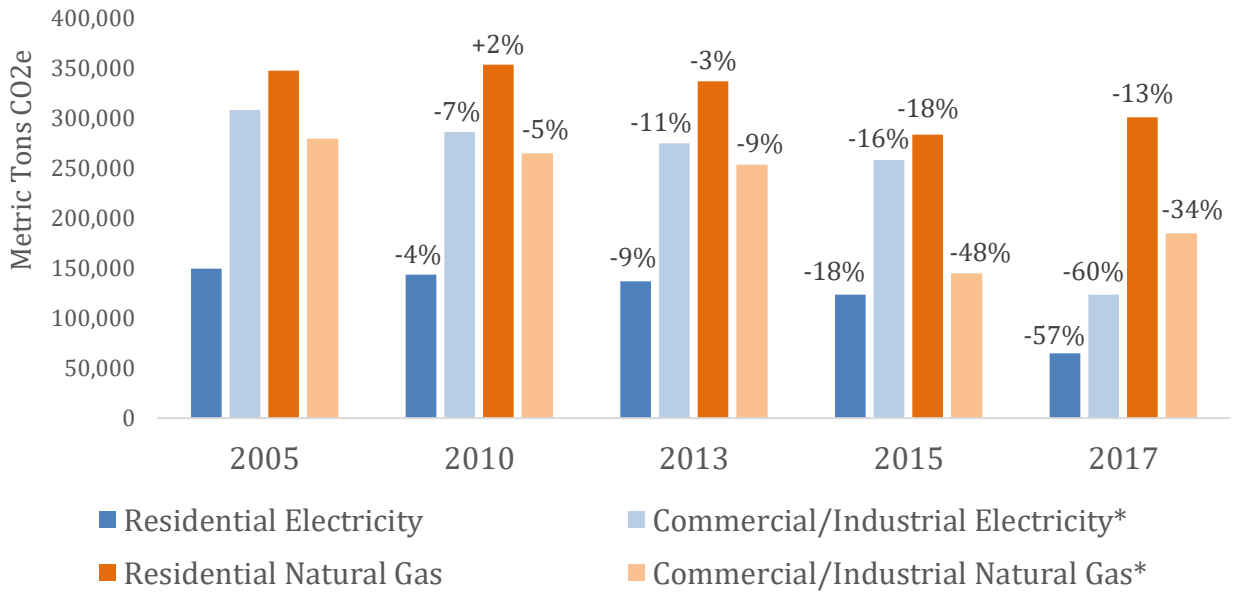
Figure 2 demonstrates that while the local emissions from electricity have continued to decrease every year, with a 59% decrease from 2005 to 2017, the emissions from natural gas lower at a much slower rate, and even increased from 2015 to 2017. This is due to the fact that Oakland's electricity is increasingly sourced from renewable energy, lowering its carbon footprint and full lifecycle emissions. The emissions that occur when natural gas is extracted from the Earth and used in our buildings will always remain the same, the only change can be in how much natural gas we use. This reality is displayed in **Figure 3**, which looks at the full lifecycle emissions, including natural gas extraction.

Figure 4 displays a breakdown of local emissions from energy by building type, showing that residential buildings have consistently been responsible for the highest amount of natural gas

emissions since 2005. Reducing the consumption of natural gas remains the largest source of emissions in the building sector to target in future GHG reduction efforts.

For a detailed look at both the local and lifecycle emissions from the Building and Energy sector, please refer to Tables 3-17.

Figure 4: Local Emissions by Building Type (PG&E)



**Unable to separate Commercial and Industrial Buildings due to California's 15/15 Rule.*

Transportation

From 2005 to 2017, the Transportation sector decreased local emissions by 15% and lifecycle emissions by 12%. This sector includes emissions from public transit (BART, AC Transit and other buses, Union Pacific Rail, WETA Ferry, and Amtrak), vehicles burning gasoline and diesel fuel on Oakland roads (passenger, medium-, and heavy-duty vehicles), and Port of Oakland transportation emissions from seaport and airport activities. The reliability of the data varies by source and activity.

Figure 5: 2017 Local Emissions from Transportation

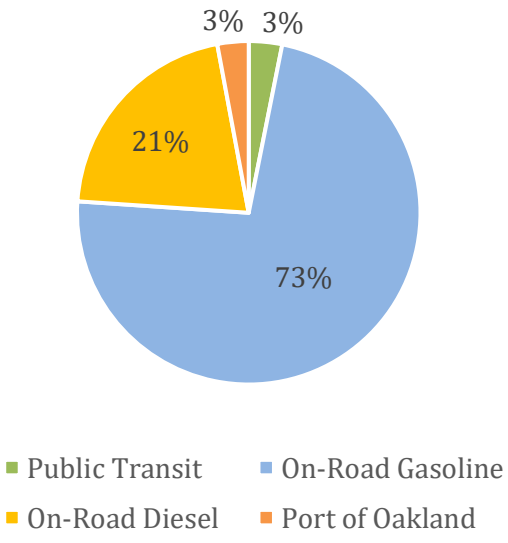
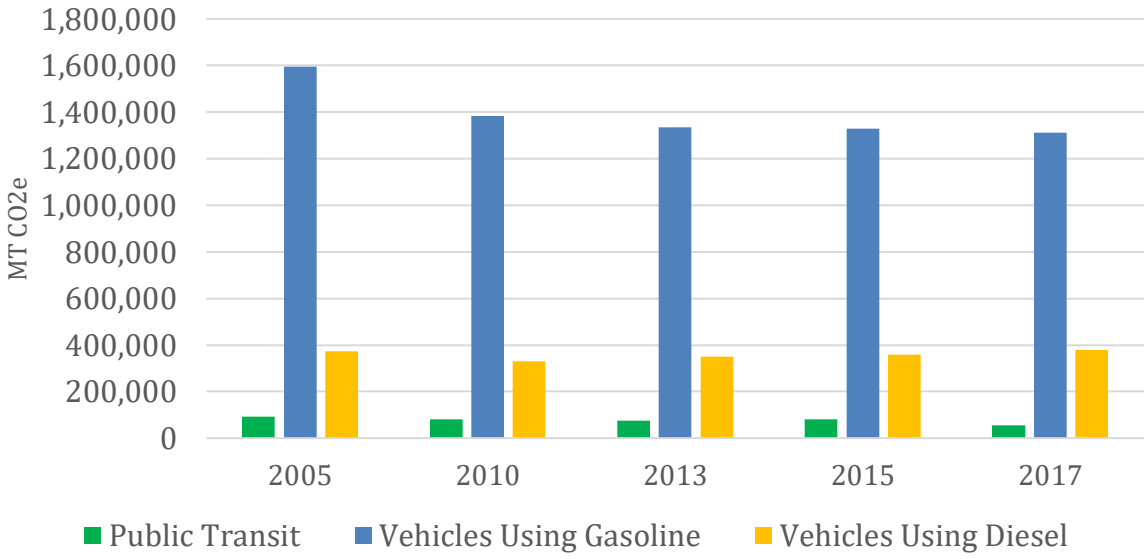


Figure 5 shows the breakdown of local emissions from the Transportation sector in 2017. **Figure 6** demonstrates that from 2005-2017, the highest source of carbon emissions on our roads came from vehicles burning gasoline, 95% of which were passenger vehicles. While reducing emissions from gasoline-fueled passenger vehicles is critical to decreasing overall Transportation emissions, reducing the use of diesel fuel is also a critical public health priority due to harmful co-pollutants that enter local air when diesel is burned by vehicles. On average from 2005 through 2017, 67% of diesel-fueled vehicles operating locally were heavy-duty trucks, and 31% were medium-duty trucks. This data demonstrates that to reduce gasoline emissions, Oakland must focus on passenger vehicles, and to reduce diesel emissions, Oakland must focus on trucks. It is important to note that truck data is limited and less reliable in Oakland, particularly regarding the number of trucks operating due to Port of Oakland activities.

Figure 6: Local Emissions of Public Transit vs Vehicles



Local Inventories

Table 3: 2005 Local Emissions Inventory – Community and Local Government

2005 Community Emissions	"raw" data	units	MMBtu	MTCO2	MTN2O	MTCH4	MTCO2e attributed to Oakland
Buildings & Energy Use							**1,116,559**
Residential Energy							**496,715**
Grid Electricity	669,162,847	kWh	2,283,800	148,474	3.339	9.106	149,696
Natural Gas Consumption	65,260,095	therms	6,526,000	346,009	0.653	32.630	347,019
Commercial & Industrial Energy							**586,839**
Grid Electricity	1,376,103,997	kWh	4,696,600	305,329	6.866	18.726	307,844
Natural Gas Consumption	52,467,499	therms	5,246,700	278,183	0.525	26.234	278,995
Port of Oakland Energy							**21,645**
Airport			166,916	10,841	0.243	0.663	10,930
Grid Electricity	48,656,102	kWh	166,062	10,796	0.243	0.662	10,885
Natural Gas	8,540	therms	854	45	0.000	0.001	45
Seaport			163,478	10,628	0.239	0.652	10,715
Grid Electricity	47,894,080	kWh	163,461	10,627	0.239	0.652	10,714
Natural Gas	174	therms	17	1	0.000	0.000	1
Water and Wastewater				5,102	37.821	0.314	**11,360**
Transportation & Mobile Sources							**2,116,238**
Public Transit							**91,779**
BART	289,071,795	kWh	236,782	15,393	0.346	0.944	15,520
All Buses			846,561	62,199	0.305	0.214	62,295
AC Transit - Gasoline	38,706	gallons gasoline	4,838	340	0.007	0.005	342
AC Transit - Diesel	1,736,050	gallons diesel	239,740	17,725	0.009	0.006	17,728
Union Pacific Rail	11.6	route miles in Oakland	--	--	--	--	10,565
Amtrak	329,687	gallons diesel	45,528	3,366	0.086	0.264	3,398
On Road - Gasoline							**1,595,454**
Gasoline Tailpipe Emissions:	3,827,635,425	VMT	23,928,002	1,553,939	129.634	115.295	1,595,454
Passenger Vehicles	3,715,205,927	VMT	22,321,000	1,449,503	123.716	111.085	1,489,148
Light/Medium-Duty Truck	111,115,031	VMT	1,566,800	101,952	5.900	4.167	103,815
Heavy-Duty Truck	1,314,466	VMT	40,202	2,484	0.018	0.044	2,491
On Road - Diesel							**374,181**
Diesel Tailpipe Emissions:	273,353,928	VMT	5,278,924	373,895	0.885	0.907	374,181
Passenger Vehicles	9,960,195	VMT	55,524	4,053	0.010	0.048	4,057
Light/Medium-Duty Truck	117,948,670	VMT	1,559,600	112,958	0.177	0.118	113,013
Heavy-Duty Truck	145,445,063	VMT	3,663,800	256,884	0.698	0.742	257,111
Port of Oakland Seaport Transportation				54,368	0.816696915	8.529945554	**54,825**
Materials Use & Waste							**180,455**
Solid Waste	605,329	tons			0.422	6,794	**180,455**
Solid Waste from Franchise Haul	225,270	tons				3,724	93,096
Solid Waste from ADC	201,625	tons				329	8,234
Solid Waste from Self Haul	178,434	tons				2,736	68,389
Transportation from Solid Waste					0.422	4.715	10,736
Collection Trucks - Diesel	584,066	VMT			0.003	0.003	2840.6
Collection Trucks - LNG	2,396,820	VMT			0.419	4.712	5214.8
Long Haul Trucks - Diesel	66.4	route miles - Transfer Station to Landfill					2,681
TOTAL COMMUNITY							**3,413,252**
Local Government Emissions	**"raw data"**	**units**	**MMBtu**	**MTCO2**	**MTCH4**	**MTN2O**	**MTCO2e**
Municipal Buildings & Facilities							**21,998**
Electricity	65,458,807	kWh	223,409	14,524	0.891	0.327	14,635
Natural Gas	1,384,412	therms	138,441	7,340	0.692	0.014	7,363
Streetlight & Traffic Controllers							**5,927**
	26,507,507	kWh	90,469	5,882	0.361	0.132	5,927
Municipal Vehicle Fleet							**10,224**
Fleet: Diesel							**2,557**
Diesel	249,659	gallons	34,463	2,549	0.030	0.029	2,557
Fleet: Gasoline							**6,997**
Gasoline	776,496	gallons	97,023	6,818	0.481	0.625	6,997
Fleet: CNG							**669**
Compressed Natural Gas	96,000	equivalent gallons	12,000	630	0.830	0.060	669
Municipal Waste Generation							**6,074**
	13,122	tons			216.92		**6,074**
TOTAL LOCAL GOVERNMENT							**44,222**
TOTAL COMMUNITY AND LOCAL GOVERNMENT							**3,457,474**

Table 4: 2010 Local Emissions Inventory – Community and Local Government

2010 Community Emissions	"raw" data	units	MMBtu	MTCO2	MTN2O	MTCH4	MTCO2e attributed to Oakland
Buildings & Energy Use							**1,071,908**
Residential Energy							**496,021**
Grid Electricity	704,867,306	kWh	2,405,700	142,277	1.928	9.109	143,079
Natural Gas Consumption	66,373,978	therms	6,637,400	351,915	0.664	33.187	352,942
Commercial & Industrial Energy							**550,664**
Grid Electricity	1,408,898,224	kWh	4,808,500	284,384	3.854	18.207	285,988
Natural Gas Consumption	49,774,714	therms	4,977,500	263,906	0.498	24.887	264,676
Port of Oakland Energy							**14,000**
Airport			137,138	8,076	0.177	0.516	8,142
Grid Electricity	38,846,442	kWh	132,582	7,835	0.176	0.511	7,900
Natural Gas	45,557	therms	4,556	242	0.000	0.005	242
Seaport			98,361	5,810	0.130	0.378	5,859
Grid Electricity	28,711,723	kWh	97,992	5,791	0.130	0.378	5,839
Natural Gas	3,694	therms	369	20	0.000	0.000	20
Water and Wastewater				5,034	37.403	0.310	**11,223**
Transportation & Mobile Sources							**1,846,220**
Public Transit							**79,896**
BART	267,635,305	kWh	219,223	12,965	0.176	0.830	13,038
All Buses			720,233	52,843	0.160	0.140	52,894
AC Transit - Gasoline	172,099	gallons gasoline	21,512	1,511	0.016	0.015	1,516
AC Transit - Diesel	1,915,785	gallons diesel	264,561	19,560	0.011	0.007	19,563
Union Pacific Rail	11.6	route miles in Oakland	--	--	--	--	10,565
Amtrak	329,687	gallons diesel	45,528	3,366	0.086	0.264	3,398
On Road - Gasoline							**1,382,097**
Gasoline Tailpipe Emissions:	3,302,050,452	VMT	21,127,284	1,363,119	58.095	66.640	1,382,097
Passenger Vehicles	3,217,807,378	VMT	19,930,000	1,285,687	55.990	64.678	1,303,989
Light/Medium-Duty Truck	83,451,964	VMT	1,173,200	75,937	2.095	1.936	76,609
Heavy-Duty Truck	791,110	VMT	24,084	1,495	0.011	0.026	1,499
On Road - Diesel							**329,221**
Diesel Tailpipe Emissions:	243,637,355	VMT	4,612,939	328,969	0.778	0.807	329,221
Passenger Vehicles	11,512,286	VMT	64,239	4,689	0.012	0.055	4,694
Light/Medium-Duty Truck	105,492,037	VMT	1,380,400	99,741	0.158	0.105	99,791
Heavy-Duty Truck	126,633,031	VMT	3,168,300	224,539	0.608	0.646	224,736
Port of Oakland Seaport Transportation				54,662	0.622245268	6.390977444	**55,007**
Materials Use & Waste							**137,625**
Solid Waste	541,959	tons			0.055	4,674	**137,625**
Solid Waste from Franchise Haul	170,774	tons				2,823	70,575
Solid Waste from ADC	264,995	tons				223	5,564
Solid Waste from Self Haul	106,189	tons				1,628	40,700
Transportation from Solid Waste					0.055	0.573	20,785
Collection Trucks - Diesel	817,320	VMT			0.004	0.004	17,525
Collection Trucks - CNG	183,540	VMT			0.032	0.361	18.593
Collection Trucks - LNG	105,600	VMT			0.018	0.208	1023.3
Long Haul Trucks - Diesel	66.4	route miles - Transfer Station to Landfill					1,975
Long Haul Trucks - CNG	66.4	route miles - Transfer Station to Landfill					243
TOTAL COMMUNITY							**3,055,753**

Local Government Emissions	"raw data"	units	MMBtu	MTCO2	MTCH4	MTN2O	MTCO2e
Municipal Buildings & Facilities							**23,324**
Electricity	69,133,236	kWh	235,950	13,954	0.893	0.189	14,030
Natural Gas	1,747,474	therms	174,747	9,265	0.874	0.017	9,294
Streetlight & Traffic Controllers							**5,912**
	29,132,671	kWh	99,429	5,880	0.376	0.080	5,912
Municipal Vehicle Fleet							**3,315**
Fleet: Diesel							**1,361**
Diesel	132,995	gallons	18,359	1,358	0.009	0.009	1,361
Fleet: Gasoline							**1,515**
Gasoline	168,372	gallons	21,038	1,478	0.136	0.124	1,515
Fleet: CNG							**440**
Compressed Natural Gas	63,400	equivalent gallons	7,925	416	0.500	0.035	440
Municipal Waste Generation							**6,486**
	14,012	tons			231.630		**6,486**
TOTAL LOCAL GOVERNMENT							**39,037**
TOTAL COMMUNITY AND LOCAL GOVERNMENT							**3,094,790**

Table 5: 2013 Local Emissions Inventory – Community and Local Government

2013 Community Emissions	"raw" data	units	MMBtu	MTCO2	MTN2O	MTCH4	attributed to Oakland
Buildings & Energy Use							**1,026,177**
Residential Energy							**472,983**
Grid Electricity	701,090,119	kWh	2,392,800	135,790	1.918	9.060	136,588
Natural Gas Consumption	63,262,073	therms	6,326,200	335,416	0.633	31.631	336,395
Commercial & Industrial Energy							**528,230**
Grid Electricity	1,410,052,888	kWh	4,812,500	273,105	3.857	18.222	274,710
Natural Gas Consumption	47,676,806	therms	4,767,700	252,782	0.477	23.838	253,520
Port of Oakland Energy							**15,447**
Airport			168,827	9,557	0.217	0.633	9,638
Grid Electricity	47,620,108	kWh	162,526	9,223	0.216	0.626	9,303
Natural Gas	63,005	therms	6,301	334	0.001	0.006	334
Seaport			101,480	5,759	0.135	0.391	5,809
Grid Electricity	29,733,638	kWh	101,480	5,759	0.135	0.391	5,809
Natural Gas	-	therms	-	-	0.000	0.000	-
Water and Wastewater				5,084	31.782	0.313	**9,517**
Transportation & Mobile Sources							**1,812,386**
Public Transit							**76,542**
BART	279,617,965	kWh	229,039	12,998	0.184	0.867	13,074
All Buses			674,289	49,460	0.139	0.130	49,505
AC Transit - Gasoline	205,951	gallons gasoline	26,435	1,857	0.018	0.018	1,863
AC Transit - Diesel	1,633,879	gallons diesel	231,687	17,130	0.009	0.006	17,133
Union Pacific Rail	11.6	route miles in Oakland	--	--	--	--	10,565
Amtrak	329,687	gallons diesel	45,528	3,366	0.086	0.264	3,398
On Road - Gasoline							**1,333,364**
Gasoline Tailpipe Emissions:	3,184,879,784	VMT	20,361,581	1,283,179	46.092	63.880	1,333,364
Passenger Vehicles	3,115,437,369	VMT	19,342,000	1,218,851	44.551	62.309	1,266,797
Light/Medium-Duty Truck	68,646,861	VMT	995,241	62,825	1.531	1.545	65,019
Heavy-Duty Truck	795,553	VMT	24,340	1,503	0.011	0.026	1,548
On Road - Diesel							**349,641**
Diesel Tailpipe Emissions:	256,144,905	VMT	4,933,677	340,238	0.812	0.877	349,641
Passenger Vehicles	19,864,291	VMT	108,077	7,683	0.020	0.097	7,897
Light/Medium-Duty Truck	103,682,921	VMT	1,448,200	101,914	0.156	0.104	104,700
Heavy-Duty Truck	132,597,693	VMT	3,377,400	230,641	0.636	0.676	237,044
Port of Oakland Seaport Transportation				52,550	0.544	5.082	**52,839**
Materials Use & Waste							**133,539**
Solid Waste	537,667	tons			0.046	4,534	**133,539**
Solid Waste from Franchise Haul	154,644	tons				2,556	63,909
Solid Waste from ADC	271,074	tons				261	6,518
Solid Waste from Self Haul	111,949	tons				1,716	42,907
Transportation from Solid Waste					0.046	0.472	20,205
Collection Trucks - Diesel	813,408	VMT			0.004	0.004	17,442
Collection Trucks - CNG	132,660	VMT			0.023	0.261	13.438
Collection Trucks - LNG	105,396	VMT			0.018	0.207	1021.3
Long Haul Trucks - Diesel	66.4	route miles - Transfer Station to Landfill					958
Long Haul Trucks - CNG	66.4	route miles - Transfer Station to Landfill					770
TOTAL COMMUNITY							**2,972,102**

Local Government Emissions	"raw data"	units	MMBtu	MTCO2	MTCH4	MTN2O	MTCO2e
Municipal Buildings & Facilities							**22,386**
Electricity	68,660,589	kWh	234,336	13,298	0.887	0.188	13,373
Natural Gas	1,694,597	therms	169,459	8,985	0.847	0.017	9,013
Streetlight & Traffic Controllers							**5,127**
	26,321,865	kWh	89,836	5,098	0.340	0.072	5,127
Municipal Vehicle Fleet							**4,945**
Fleet: Diesel							**1,470**
Diesel	143,665	gallons	19,832	1,467	0.009	0.009	1,470
Fleet: Gasoline							**2,998**
Gasoline	338,536	gallons	42,300	2,972	0.108	0.086	2,998
Fleet: CNG							**478**
Compressed Natural Gas	68,400	equivalent gallons	8,550	449	0.602	0.044	478
Municipal Waste Generation							**6,733**
	14,546	tons			240.450		6,733
TOTAL LOCAL GOVERNMENT							**39,190**
TOTAL COMMUNITY AND LOCAL GOVERNMENT							**3,011,293**

Table 6: 2015 Local Emissions Inventory – Community and Local Government

2015 Community Emissions	"raw" data	units	MMBtu	MTCO2	MTN2O	MTCH4	MTCO2e attributed to Oakland
Buildings & Energy Use							**834,424**
Residential Energy							**406,537**
Grid Electricity	667,931,952	kWh	2,279,600	122,554	1.224	10.028	123,170
Natural Gas Consumption	53,289,645	therms	5,329,000	282,542	0.533	26.645	283,367
Commercial & Industrial Energy							**402,983**
Grid Electricity	1,399,968,479	kWh	4,778,000	256,867	2.566	21.019	258,160
Natural Gas Consumption	27,235,342	therms	2,723,500	144,402	0.272	13.618	144,823
Port of Oakland Energy							**15,562**
Airport			163,617	8,792	0.086	0.703	8,835
Grid Electricity	46,443,690	kWh	158,511	8,522	0.085	0.698	8,564
Natural Gas	51,060	therms	5,106	271	0.001	0.005	271
Seaport			124,497	6,693	0.067	0.548	6,727
Grid Electricity	36,477,752	kWh	124,497	6,693	0.067	0.548	6,727
Natural Gas	-	therms	-	-	0.000	0.000	-
Water and Wastewater				5,363	31.204	0.330	**9,342**
Transportation & Mobile Sources							**1,816,072**
Public Transit							**80,119**
BART	287,600,509	kWh	393,403	22,429	0.209	1.731	22,535
All Buses			627,882	45,998	0.118	0.127	46,036
AC Transit - Gasoline	239,868	gallons gasoline	30,807	2,164	0.016	0.019	2,169
AC Transit - Diesel	1,599,620	gallons diesel	226,966	16,781	0.010	0.006	16,784
Union Pacific Rail	11.6	route miles in Oakland	--	--	--	--	8,150
Amtrak	329,687	gallons diesel	45,528	3,366	0.086	0.264	3,398
On Road - Gasoline							**1,327,784**
Gasoline Tailpipe Emissions:	3,285,857,608	VMT	20,245,810	1,279,876	36.523	61.546	1,327,784
Passenger Vehicles	3,222,184,662	VMT	19,308,000	1,220,564	35.444	60.255	1,266,479
Light/Medium-Duty Truck	62,839,464	VMT	913,080	57,765	1.068	1.263	59,710
Heavy-Duty Truck	833,481	VMT	24,730	1,548	0.011	0.028	1,595
On Road - Diesel							**359,812**
Diesel Tailpipe Emissions:	269,763,692	VMT	5,102,712	349,921	0.848	0.927	359,812
Passenger Vehicles	23,772,692	VMT	125,712	8,931	0.024	0.117	9,186
Light/Medium-Duty Truck	108,228,137	VMT	1,518,500	106,835	0.162	0.108	109,821
Heavy-Duty Truck	137,762,863	VMT	3,458,500	234,155	0.661	0.703	240,805
Port of Oakland Seaport Transportation				48,091	0.5	4.2	**48,357**
Materials Use & Waste							**101,917**
Solid Waste	491,928	tons			0.041	4,025	**101,917**
Solid Waste from Franchise Haul	168,806	tons				2,791	69,762
Solid Waste from ADC	249,325	tons				103	2,564
Solid Waste from Self Haul	73,797	tons				1,131	28,285
Transportation from Solid Waste					0.041	0.462	1,307
Collection Trucks - CNG	234,936	VMT			0.041	0.462	24
Long Haul Trucks - CNG	66.4	route miles - Transfer Station to Landfill					1,283
TOTAL COMMUNITY							**2,752,413**

Local Government Emissions	"raw data"	units	MMBtu	MTCO2	MTCH4	MTN2O	MTCO2e
Municipal Buildings & Facilities							**21,557**
Electricity	76,995,007	kWh	262,782	14,127	1.156	0.141	14,197
Natural Gas	1,383,777	therms	138,378	7,337	0.692	0.014	7,360
Streetlight & Traffic Controllers							**3,509**
	19,031,777	kWh	64,955	3,492	0.286	0.035	3,509
Municipal Vehicle Fleet							**5,219**
Fleet: Diesel							**1,314**
Diesel	128,545	gallons	17,744	1,312	0.006	0.006	1,314
Fleet: Gasoline							**3,606**
Gasoline	407,884	gallons	50,965	3,581	0.120	0.079	3,606
Fleet: CNG							**299**
Compressed Natural Gas	42,100	equivalent gallons	5,263	276	0.464	0.036	299
Municipal Waste Generation							**5,379**
	11,622	tons			192.120		5,379
TOTAL LOCAL GOVERNMENT							**35,664**
TOTAL COMMUNITY AND LOCAL GOVERNMENT							**2,788,077**

Table 7: 2017 Local Emissions Inventory – Community and Local Government

2017 Community Emissions	"raw" data	units	MMBtu	MTCO2	MTN2O	MTCH4	MTCO2e attributed to Oakland
Buildings & Energy Use							**694,019**
Residential Energy							**365,613**
Grid Electricity	674,595,752	kWh	2,302,400	64,258	1.224	10.098	64,875
Natural Gas Consumption	56,556,464	therms	5,655,600	299,862	0.566	28.278	300,738
Commercial & Industrial Energy							**308,148**
Grid Electricity	1,281,764,052	kWh	4,374,600	122,094	2.326	19.186	123,266
Natural Gas Consumption	34,768,794	therms	3,476,900	184,344	0.348	17.384	184,882
Port of Oakland Energy							**10,931**
Airport			193,193	6,286	0.087	0.727	6,330
Grid Electricity	46,178,922	kWh	157,607	4,399	0.084	0.691	4,441
Natural Gas	355,859	therms	35,586	1,887	0.004	0.036	1,889
Seaport			160,169	4,559	0.084	0.691	4,601
Grid Electricity	45,898,131	kWh	156,649	4,372	0.083	0.687	4,414
Natural Gas	35,195	therms	3,520	187	0.000	0.004	187
Water and Wastewater				5,417	31.227	0.334	**9,327**
Transportation & Mobile Sources							**1,797,052**
Public Transit							**56,369**
BART	309,320,994	kWh	86,344	2,410	0.046	0.379	2,433
All Buses			585,618	42,838	0.125	0.136	42,878
AC Transit - Gasoline	291,208	gallons gasoline	36,402	2,557	0.021	0.025	2,564
AC Transit - Diesel	1,548,650	gallons diesel	213,866	15,812	0.010	0.007	15,815
Union Pacific Rail	11.6	route miles in Oakland	--	--	--	--	7,659
Amtrak	329,687	gallons diesel	45,528	3,366	0.086	0.264	3,398
On Road - Gasoline							**1,310,551**
Gasoline Tailpipe Emissions:	3,492,509,633	VMT	19,916,783	1,297,334	38.775	65.406	1,310,551
Passenger Vehicles	3,432,314,891	VMT	19,052,000	1,241,014	37.755	64.184	1,253,896
Light/Medium-Duty Truck	59,274,928	VMT	838,911	54,643	1.008	1.191	54,974
Heavy-Duty Truck	919,813	VMT	25,872	1,676	0.012	0.031	1,681
On Road - Diesel							**377,267**
Diesel Tailpipe Emissions:	297,520,106	VMT	5,362,134	376,968	0.929	1.028	377,267
Passenger Vehicles	28,837,675	VMT	142,234	10,382	0.029	0.142	10,382
Light/Medium-Duty Truck	118,117,886	VMT	1,612,900	116,599	0.177	0.118	116,658
Heavy-Duty Truck	150,564,545	VMT	3,607,000	249,987	0.723	0.768	250,227
Port of Oakland Seaport Transportation	-			51,442	4.6	2	**52,866**
Materials Use & Waste							**125,977**
Solid Waste	622,709	tons			0.080	4,981	**125,977**
Solid Waste from Franchise Haul	164,277	tons				2,488	62,199
Solid Waste from ADC	282,000	tons				57	1,415
Solid Waste from Self Haul	176,432	tons				2,436	60,899
Transportation from Solid Waste					0.080	0.897	1,464
Collection Trucks - CNG	456,444	VMT			0.080	0.897	46
Long Haul Trucks - CNG	66.4	route miles - Transfer Station to Landfill					1,418
TOTAL COMMUNITY							**2,617,048**

Local Government Emissions	"raw data"	units	MMBtu	MTCO2	MTCH4	MTN2O	MTCO2e
Municipal Buildings & Facilities							**15,145**
Electricity	67,984,401	kWh	232,029	6,476	1.018	0.123	6,537
Natural Gas	1,618,429	therms	161,843	8,581	0.809	0.016	8,608
Streetlight & Traffic Controllers							**1,582**
	16,451,750	kWh	56,149	1,567	0.246	0.030	1,582
Municipal Vehicle Fleet							**6,420**
Fleet: Diesel							**1,741**
Diesel	170,274	gallons	23,505	1,739	0.009	0.009	1,741
Fleet: Gasoline							**4,396**
Gasoline	497,728	gallons	62,191	4,370	0.131	0.084	4,396
Fleet: CNG							**283**
Compressed Natural Gas	40,100	equivalent gallons	5,013	263	0.414	0.032	283
Municipal Waste Generation							**3,688**
	8,698	tons			131.730		3,688
TOTAL LOCAL GOVERNMENT							**26,836**
TOTAL COMMUNITY AND LOCAL GOVERNMENT							**2,643,884**

Lifecycle Inventories

Table 8: 2005 Lifecycle Inventory – Community

2005 Community Emissions	"raw" data	units	MMBtu	MTCO2	MTN2O	MTCH4	MTCO2e attributed to Oakland
Buildings & Energy Use							**2,205,460**
Residential Energy							**1,061,567**
Grid Electricity	669,162,847	kWh	2,283,800	148,474	3.339	9.106	149,696
Natural Gas Consumption	65,260,095	therms	6,526,000	346,009	0.653	32.630	347,019
Upstream Electricity Generation							41,492
Upstream Natural Gas Generation							513,519
Transmission Losses	43,992,488	kWh	170,852	10,104	0.137	0.647	9,841
Commercial & Industrial Energy							**1,105,260**
Grid Electricity	1,376,103,997	kWh	4,696,600	305,329	6.866	18.726	307,844
Natural Gas Consumption	52,467,499	therms	5,246,700	278,183	0.525	26.234	278,995
Upstream Electricity Generation							85,326
Upstream Natural Gas Generation							412,856
Transmission Losses	90,468,619	kWh	341,502	20,197	0.274	1.293	20,238
Port of Oakland Energy							**27,273**
Airport			166,916	10,841	0.243	0.663	13,772
Grid Electricity	48,656,102	kWh	166,062	10,796	0.243	0.662	10,885
Natural Gas	8,540	therms	854	45	0.000	0.001	45
Upstream Electricity Generation							2,831
Upstream Natural Gas Generation							10
Seaport			163,478	10,628	0.239	0.652	13,502
Grid Electricity	47,894,080	kWh	163,461	10,627	0.239	0.652	10,714
Natural Gas	174	therms	17	1	0.000	0.000	1
Upstream Electricity Generation							2,787
Upstream Natural Gas Generation							0
Water and Wastewater				5,102	37.821	0.314	**11,360**
Transportation & Mobile Sources							**3,426,496**
Public Transit							**130,219**
BART							32,338
Electricity	289,071,795	kWh	236,782	15,393	0.346	0.944	15,520
Upstream Electricity Generation							16,818
All Buses				75,262	0.759	177.486	79,925
AC Transit - Gasoline	38,706	gallons	4,838	340	0.007	0.005	342
Gasoline Well to Pump Emissions				85	0.014	1.057	116
AC Transit - Diesel	1,736,050	gallons	239,740	17,725	0.009	0.006	17,728
Diesel Well to Pump Emissions				3,626	0.049	49.891	4,888
Other Buses - Gasoline	808,870	gallons	101,109	7,102	0.264	0.186	7,185
Gasoline Well to Pump Emissions				1,775	0.291	22.088	2,414
Other Buses - Diesel	3,627,015	gallons	500,874	37,032	0.026	0.017	37,040
Diesel Well to Pump Emissions				7,576	0.101	104.235	10,212
Union Pacific Rail							11,967
Diesel	11.6	route miles in Oakland					10,574
Diesel Well to Pump Emissions				1,033	0.014	14.218	1,393
WETA Ferry				1,558	0.036	3.734	1,662
Diesel	506,700	gallons	17,493	1,293	0.033	0.094	1,306
Diesel Well to Pump Emissions				265	0.004	3.640	357
Amtrak				4,055	0.095	9.738	4,326
Diesel	329,687	gallons	45,528	3,366	0.086	0.264	3,398
Diesel Well to Pump Emissions				689	0.009	9.475	928
On Road - Gasoline							**2,166,755**
Gasoline Tailpipe Emissions:	3,827,635,425	VMT	23,928,002	1,553,939	129.634	115.295	1,595,454
Passenger Vehicles	3,715,205,927	VMT	22,321,000	1,449,503	123.716	111.085	1,489,148
Light/Medium-Duty Truck	111,115,031	VMT	1,566,800	101,952	5.900	4.167	103,815
Heavy-Duty Truck	1,314,466	VMT	40,202	2,484	0.018	0.044	2,491
Gasoline Well to Pump Emissions, All Vehicle Types:				420,130	68.750	5,227	571,301
On Road - Diesel							**481,815**
Diesel Tailpipe Emissions:	273,353,928	VMT	5,278,924	373,895	0.885	0.907	374,181
Passenger Vehicles	9,960,195	VMT	55,524	4,053	0.010	0.048	4,057
Light/Medium-Duty Truck	117,948,670	VMT	1,559,600	112,958	0.177	0.118	113,013
Heavy-Duty Truck	145,445,063	VMT	3,663,800	256,884	0.698	0.742	257,111
Diesel Well to Pump Emissions, All Vehicle Types:				79,851	1.069	1098.576	107,634

Port of Oakland Seaport Transportation							**259,142**
Onshore Diesel				54,368	0.817	8.530	54,825
Offshore Diesel				146,085	7.8	24.0	148,996
Diesel Well to Pump Emissions				41,041	0.550	564.639	55,321
Port of Oakland Airport Transportation			1,714,542	311,286	8.505	2,989.77	**388,566**
Total Jet Fuel	17,345,402	gallons	1,708,369	310,750	8.48	2,988.06	387,980
Jet Fuel - Passenger	13,876,322	gallons	1,665,200	132,796	4.30	3.75	134,172
Upstream Emissions				170,422	3.97	2,914.28	244,463
Jet Fuel - Freight	3,469,080	gallons	43,169	3,443	0.11	0.10	3,478
Upstream Emissions				4,090	0.10	69.94	5,867
Total Aviation Gas	51,443	gallons	6,173	536	0.02	1.71	586
Aviation Gas - Passenger	41,155	gallons	4,939	342	0.005	0.29	351
Aviation Gas - Freight	10,289	gallons	1,235	85	0.001	0.07	88
Aviation Gas - Upstream Emissions				108	0.018	1.35	147
Materials Use & Waste							**2,655,462**
Solid Waste							**2,461,462**
Landfill Methane	605,329	tons				6,793.57	180,455
Upstream from Franchise Hauled Waste	225,270	tons					436,453
Upstream from Self-Hauled Waste	178,434	tons					249,930
Upstream from Alternate Daily Cover	201,625	tons					270,022
Upstream Recycling	43,901	tons					113,561
Upstream Organics	150,709	households					1,198,783
Total Transportation from Solid Waste					0.422	4.72	12,259
Transportation from Solid Waste					0.422	4.72	10,736
Collection Trucks - Diesel Upstream	278,126	gallons					783
Long Haul Trucks - Diesel Upstream	262,630	gallons					739
Construction Upstream Emissions							**194,000**
Construction	1,274	new buildings					194,000
TOTAL COMMUNITY							**8,287,418**
TOTAL COMMUNITY AND LOCAL GOVERNMENT							**8,376,614**

Table 9: 2005 Lifecycle Inventory – Local Government Operations

2005 Local Government Emissions	"raw data"	units	MMBtu	MTCO2	MTCH4	MTN2O	MTCO2e
Municipal Buildings & Facilities							**36,562**
Buildings and Facilities Electricity							**18,305**
Electricity	65,458,807	kWh	223,409	14,524	0.891	0.327	14,635
Upstream Electricity							3,670
Buildings and Facilities Natural Gas							**18,257**
Natural Gas	1,384,412	therms	138,441	7,340	0.692	0.014	7,363.2
Upstream Natural Gas							10,894
Streetlight & Traffic Controllers							**5,927**
	26,507,507	kWh	90,469	5,882	0.361	0.132	5,927
Municipal Vehicle Fleet							**15,210**
Fleet: Diesel							**3,841**
Diesel	249,659	gallons	34,463	2,549	0.030	0.029	2,557
Upstream Diesel				605	7.529	0.099	1,283
Fleet: Gasoline							**10,207**
Gasoline	776,496	gallons	97,023	6,818	0.481	0.625	6,997
Upstream Gasoline				1,468	20.191	0.020	3,210
Fleet: CNG							**1,163**
Compressed Natural Gas	96,000	equivalent gallons	12,000	630.350	0.830	0.060	669
Upstream CNG				171	3.735	0.002	493
Municipal Waste Generation							**31,497**
Landfill Methane	13,122	tons			216.92		6,074
Upstream from Franchise Hauled Waste							25,423
TOTAL LOCAL GOVERNMENT							**89,196**

Table 10: 2010 Lifecycle Inventory – Community

2010 Community Emissions	"raw" data	units	MMBtu	MTCO2	MTN2O	MTCH4	MTCO2e attributed to Oakland
Buildings & Energy Use							**2,154,189**
Residential Energy							**1,073,085**
Grid Electricity	704,867,306	kWh	2,405,700	142,277	1.928	9.109	143,079
Natural Gas Consumption	66,373,978	therms	6,637,400	351,915	0.664	33.187	352,942
Upstream Electricity Generation							44,619
Upstream Natural Gas Generation							522,284
Transmission Losses	50,057,755	kWh	170,852	10,104	0.137	0.647	10,161
Commercial & Industrial Energy							**1,051,828**
Grid Electricity	1,408,898,224	kWh	4,808,500	284,384	3.854	18.207	285,988
Natural Gas Consumption	49,774,714	therms	4,977,500	263,906	0.498	24.887	264,676
Upstream Electricity Generation							89,185
Upstream Natural Gas Generation							391,667
Transmission Losses	100,056,112	kWh	341,502	20,197	0.274	1.293	20,311
Port of Oakland Energy							**18,053**
Airport			137,138	8,076	0.177	0.516	10,493
Grid Electricity	38,846,442	kWh	132,582	7,835	0.176	0.511	7,900
Natural Gas	45,557	therms	4,556	242	0.000	0.005	242
Upstream Electricity Generation							2,296
Upstream Natural Gas Generation							55
Seaport			98,361	5,810	0.130	0.378	7,560
Grid Electricity	28,711,723	kWh	97,992	5,791	0.130	0.378	5,839
Natural Gas	3,694	therms	369	20	0.000	0.000	20
Upstream Electricity Generation							1,697
Upstream Natural Gas Generation							4
Water and Wastewater				5,034	37.403	0.310	**11,223**
Transportation & Mobile Sources							**2,968,023**
Public Transit							**116,997**
BART							28,856
Electricity	267,635,305	kWh	219,223	12,965	0.176	0.830	13,038
Upstream Electricity Generation							15,818
All Buses				66,310	0.726	152.179	70,331
AC Transit - Gasoline	172,099	gallons	21,512	1,511	0.016	0.015	1,516
Gasoline Well to Pump Emissions				365	0.059	4.725	501
AC Transit - Diesel	1,915,785	gallons	264,561	19,560	0.011	0.007	19,563
Diesel Well to Pump Emissions				5,029	0.115	55.440	6,449
Other Buses - Gasoline	708,916	gallons	88,615	6,224	0.115	0.106	6,261
Gasoline Well to Pump Emissions				1,505	0.243	19.462	2,064
Other Buses - Diesel	2,502,226	gallons	345,545	25,548	0.018	0.012	25,554
Diesel Well to Pump Emissions				6,568	0.150	72.411	8,423
Union Pacific Rail				1,299	0.03	14.32	12,239
Diesel	11.6	route miles in Oakland					10,574
Diesel Well to Pump Emissions				1,299	0.03	14.32	1,666
WETA Ferry				997	0.025	2.306	1,063
Diesel	310,855	gallons	10,732	793	0.020	0.058	801
Diesel Well to Pump Emissions				204	0.005	2.249	262
Amtrak				4,231	0.105	9.804	4,508
Diesel	329,687	gallons	45,528	3,366	0.086	0.264	3,398
Diesel Well to Pump Emissions				865	0.020	9.541	1,110
On Road - Gasoline							**1,874,101**
Gasoline Tailpipe Emissions:	3,302,050,452	VMT	21,127,284	1,363,119	58.095	66.640	1,382,097
Passenger Vehicles	3,217,807,378	VMT	19,930,000	1,285,687	55.990	64.678	1,303,989
Light/Medium-Duty Truck	83,451,964	VMT	1,173,200	75,937	2.095	1.936	76,609
Heavy-Duty Truck	791,110	VMT	24,084	1,495	0.011	0.026	1,499
Gasoline Well to Pump Emissions, All Vehicle Types:				358,709	58.0	4,640.14	492,004
On Road - Diesel							**441,663**
Diesel Tailpipe Emissions:	243,637,355	VMT	4,612,939	328,969	0.778	0.807	329,221
Passenger Vehicles	11,512,286	VMT	64,239	4,689	0.012	0.055	4,694
Light/Medium-Duty Truck	105,492,037	VMT	1,380,400	99,741	0.158	0.105	99,791
Heavy-Duty Truck	126,633,031	VMT	3,168,300	224,539	0.608	0.646	224,736
Diesel Well to Pump Emissions, All Vehicle Types:				87,680	1.998	966.670	112,442

Port of Oakland Seaport Transportation							**262,410**
Onshore Diesel				54,662	0.6	6.4	55,007
Offshore Diesel				140,999	4.7	18.3	142,848
Diesel Well to Pump Emissions				50,338	1.147	554.980	64,555
Port of Oakland Airport Transportation			1,214,274	218,826	5.985	2,089.74	**272,852**
Total Jet Fuel	10,081,977	gallons	1,209,837	218,444	5.97	2,088.50	272,434
Jet Fuel - Passenger	8,065,582	gallons	967,870	77,188	2.50	2.18	77,987
Upstream Emissions				99,036	2.31	1,693.76	142,068
Jet Fuel - Freight	2,016,395	gallons	241,967	19,297	0.63	0.54	19,497
Upstream Emissions				22,922	0.53	392.03	32,882
Total Aviation Gas	36,973	gallons	4,437	383	0.02	1.23	418
Aviation Gas - Passenger	29,579	gallons	3,550	246	0.003	0.21	252
Aviation Gas - Freight	10,289	gallons	887	61	0.001	0.05	63
Aviation Gas - Upstream Emissions				75	0.012	0.97	103
Materials Use & Waste							**2,444,445**
Solid Waste							**2,426,545**
Landfill Methane	541,959	tons				4,674.14	137,625
Upstream from Franchise Hauled Waste	170,774	tons					330,869
Upstream from Self-Hauled Waste	106,189	tons					148,737
Upstream from Alternate Daily Cover	264,995	tons					438,933
Upstream Recycling	44,220	tons					118,818
Upstream Organics	153,791	households					1,224,348
Total Transportation from Solid Waste					0.055	0.57	27,214
Transportation from Solid Waste					0.055	0.57	20,785
Collection Trucks - Diesel Upstream	1,716,372	gallons					5,778
Long Haul Trucks - Diesel Upstream	193,470	gallons					651
Construction Upstream Emissions							**17,900**
Construction	108	new buildings					17,900
TOTAL COMMUNITY							**7,566,656**
TOTAL COMMUNITY AND LOCAL GOVERNMENT							**7,652,298**

Table 11: 2010 Lifecycle Inventory – Local Government Operations

2010 Local Government Emissions	"raw data"	units	MMBtu	MTCO2	MTCH4	MTN2O	MTCO2e
Municipal Buildings & Facilities							**40,997**
Buildings and Facilities Electricity							**17,952**
Electricity	69,133,236	kWh	235,950	13,954	0.893	0.189	14,030
Upstream Electricity							3,922
Buildings and Facilities Natural Gas							**23,045**
Natural Gas	1,747,474	therms	174,747	9,265	0.874	0.017	9,294
Upstream Natural Gas							13,751
Streetlight & Traffic Controllers							**5,912**
	29,132,671	kWh	99,429	5,880	0.376	0.080	5,912
Municipal Vehicle Fleet							**5,099**
Fleet: Diesel							**2,035**
Diesel	132,995	gallons	18,359	1,358	0.009	0.009	1,361
Upstream Diesel				312	4.032	0.050	674
Fleet: Gasoline							**2,297**
Gasoline	168,372	gallons	21,038	1,478	0.136	0.124	1,515
Upstream Gasoline				400	4.409	0.009	782
Fleet: CNG							**768**
Compressed Natural Gas	63,400	equivalent gallons	7,925	416	0.500	0.035	440
Upstream CNG				107	2.514	0.017	329
Municipal Waste Generation							**33,633**
Landfill Methane	14,012	tons			231.63		6,486
Upstream from Franchise Hauled Waste							27,148
TOTAL LOCAL GOVERNMENT							**85,642**

Table 12: 2013 Lifecycle Inventory – Community

2013 Community Emissions	"raw" data	units	MMBtu	MTCO2	MTN2O	MTCH4	MTCO2e attributed to Oakland
Buildings & Energy Use							**1,731,700**
Residential Energy							**832,304**
Grid Electricity	701,090,119	kWh	2,392,800	135,790	1.918	9.060	136,588
Natural Gas Consumption	63,262,073	therms	6,326,200	335,416	0.633	31.631	336,395
Upstream Electricity Generation							46,186
Upstream Natural Gas Generation							303,200
Transmission Losses	50,996,435	kWh	174,052	9,877	0.139	0.659	9,935
Commercial & Industrial Energy							**869,606**
Grid Electricity	1,410,052,888	kWh	4,812,500	273,105	3.857	18.222	274,710
Natural Gas Consumption	47,676,806	therms	4,767,700	252,782	0.477	23.838	253,520
Upstream Electricity Generation							92,890
Upstream Natural Gas Generation							228,504
Transmission Losses	102,565,517	kWh	350,059	19,866	0.281	1.326	19,982
Port of Oakland Energy							**20,274**
Airport			168,827	9,557	0.217	0.633	12,639
Grid Electricity	47,620,108	kWh	162,526	9,223	0.216	0.626	9,303
Natural Gas	63,005	therms	6,301	334	0.001	0.006	334
Upstream Electricity Generation							2,924
Upstream Natural Gas Generation							77
Seaport			101,480	5,759	0.135	0.391	7,635
Grid Electricity	29,733,638	kWh	101,480	5,759	0.135	0.391	5,809
Natural Gas	-	therms	-	-	0.000	0.000	-
Upstream Electricity Generation							1,826
Upstream Natural Gas Generation							-
Water and Wastewater				5,084	31.782	0.313	**9,517**
Transportation & Mobile Sources							**2,939,577**
Public Transit							**114,301**
BART							30,245
Electricity	279,617,965	kWh	229,039	12,998	0.184	0.867	13,074
Upstream Electricity Generation							17,171
All Buses				62,342	0.682	137.437	65,982
AC Transit - Gasoline	205,951	gallons	26,435	1,857	0.018	0.018	1,863
Gasoline Well to Pump Emissions				445	0.073	5.815	613
AC Transit - Diesel	1,633,879	gallons	231,687	17,130	0.009	0.006	17,133
Diesel Well to Pump Emissions				4,524	0.103	46.469	5,717
Other Buses - Gasoline	623,489	gallons	80,028	5,621	0.094	0.094	5,651
Gasoline Well to Pump Emissions				1,348	0.220	17.605	1,854
Other Buses - Diesel	2,370,488	gallons	336,139	24,852	0.018	0.012	24,858
Diesel Well to Pump Emissions				6,564	0.149	67.418	8,294
Union Pacific Rail				1,334	0.03	13.70	12,259
Diesel	11.6	route miles in Oakland					10,574
Diesel Well to Pump Emissions				1,334	0.03	13.70	1,686
WETA Ferry				1,217	0.030	2.681	1,293
Diesel	377,090	gallons	13,019	963	0.025	0.070	972
Diesel Well to Pump Emissions				254	0.006	2.611	321
Amtrak				4,255	0.106	9.395	4,522
Diesel	329,687	gallons	45,528	3,366	0.086	0.264	3,398
Diesel Well to Pump Emissions				889	0.020	9.131	1,123
On Road - Gasoline							**1,805,082**
Gasoline Tailpipe Emissions:	3,184,879,784	VMT	20,361,581	1,283,179	46.092	63.880	1,333,364
Passenger Vehicles	3,115,437,369	VMT	19,342,000	1,218,851	44.551	62.309	1,266,797
Light/Medium-Duty Truck	68,646,861	VMT	995,241	62,825	1.531	1.545	65,019
Heavy-Duty Truck	795,553	VMT	24,340	1,503	0.011	0.026	1,548
Gasoline Well to Pump Emissions, All Vehicle Types:				343,081	55.891	4,479.3	471,718
On Road - Diesel							**471,373**
Diesel Tailpipe Emissions:	256,144,905	VMT	4,933,677	340,238	0.812	0.877	349,641
Passenger Vehicles	19,864,291	VMT	108,077	7,683	0.020	0.097	7,897
Light/Medium-Duty Truck	103,682,921	VMT	1,448,200	101,914	0.156	0.104	104,700
Heavy-Duty Truck	132,597,693	VMT	3,377,400	230,641	0.636	0.676	237,044
Diesel Well to Pump Emissions, All Vehicle Types:				96,343	2.183	989.527	121,732

Port of Oakland Seaport Transportation							**270,367**
Onshore Diesel				52,550	0.5	5.1	52,839
Offshore Diesel				148,778	3.7	16.8	150,291
Diesel Well to Pump Emissions				53,214	1.206	546.554	67,237
Port of Oakland Airport Transportation			1,237,216	223,282	6.103	2,134.16	**278,454**
Total Jet Fuel	10,300,885	gallons	1,236,106	223,187	6.10	2,133.85	278,349
Jet Fuel - Passenger	8,240,708	gallons	988,885	78,864	2.55	2.23	79,680
Upstream Emissions				101,187	2.36	1,730.53	145,153
Jet Fuel - Freight	2,060,177	gallons	247,221	19,716	0.64	0.56	19,920
Upstream Emissions				23,420	0.55	400.54	33,596
Total Aviation Gas	9,253	gallons	1,110	96	0.004	0.31	105
Aviation Gas - Passenger	7,402	gallons	888	62	0.001	0.05	63
Aviation Gas - Freight	1,851	gallons	222	15	0.000	0.01	16
Aviation Gas - Upstream Emissions				19	0.003	0.24	26
Materials Use & Waste							**2,587,333**
Solid Waste							**2,527,933**
Landfill Methane	537,667	tons				4,533.90	133,539
Upstream from Franchise Hauled Waste	154,644	tons					299,618
Upstream from Self-Hauled Waste	111,949	tons					216,608
Upstream from Alternate Daily Cover	271,074	tons					504,981
Upstream Recycling	44,800	tons					112,050
Upstream Organics	154,786	households					1,234,792
Total Transportation from Solid Waste					0.046	0.47	26,345
Transportation from Solid Waste					0.046	0.47	20,205
Collection Trucks - Diesel Upstream	1,708,157	gallons					5,820
Long Haul Trucks - Diesel Upstream	93,853	gallons					320
Construction Upstream Emissions							**59,400**
Construction	305	new buildings					59,400
TOTAL COMMUNITY							**7,258,610**
TOTAL COMMUNITY AND LOCAL GOVERNMENT							**7,340,961**

Table 13: 2013 Lifecycle Inventory – Local Government Operations

2013 Local Government Emissions	"raw data"	units	MMBtu	MTCO2	MTCH4	MTN2O	MTCO2e
Municipal Buildings & Facilities							**34,724**
Buildings and Facilities Electricity							**17,589**
Electricity	68,660,589	kWh	234,336	13,298	0.887	0.188	13,373
Upstream Electricity							4,216
Buildings and Facilities Natural Gas							**17,135**
Natural Gas	1,694,597	therms	169,459	8,985	0.847	0.017	9,013
Upstream Natural Gas							8,122
Streetlight & Traffic Controllers							**5,127**
	26,321,865	kWh	89,836	5,098	0.340	0.072	5,127
Municipal Vehicle Fleet							**7,586**
Fleet: Diesel							**2,196**
Diesel	143,665	gallons	19,832	1,467	0.009	0.009	1,470
Upstream Diesel				334	4.363	0.054	726
Fleet: Gasoline							**4,559**
Gasoline	338,536	gallons	42,300	2,972	0.108	0.086	2,998
Upstream Gasoline				826	8.484	0.019	1,561
Fleet: CNG							**830**
Compressed Natural Gas	68,400	equivalent gallons	8,550	449	0.602	0.044	478
Upstream CNG				111	2.740	0.019	353
Municipal Waste Generation							**34,915**
Landfill Methane	14,546	tons			240.45		6,733
Upstream from Franchise Hauled Waste							28,182
TOTAL LOCAL GOVERNMENT							**82,351**

Table 14: 2015 Lifecycle Inventory – Community

2015 Community Emissions	"raw" data	units	MMBtu	MTCO2	MTN2O	MTCH4	attributed to Oakland
Buildings & Energy Use							**1,617,167**
Residential Energy							**871,334**
Grid Electricity	667,931,952	kWh	2,279,600	122,554	1.224	10.028	123,170
Natural Gas Consumption	53,289,645	therms	5,329,000	282,542	0.533	26.645	283,367
Upstream Electricity Generation							39,853
Upstream Natural Gas Generation							417,042
Transmission Losses	42,845,061	kWh	146,238	7,862	0.079	0.643	7,901
Commercial & Industrial Energy							**716,218**
Grid Electricity	1,399,968,479	kWh	4,778,000	256,867	2.566	21.019	258,160
Natural Gas Consumption	27,235,342	therms	2,723,500	144,402	0.272	13.618	144,823
Upstream Electricity Generation							83,531
Upstream Natural Gas Generation							213,143
Transmission Losses	89,802,164	kWh	306,512	16,478	0.165	1.348	16,561
Port of Oakland Energy							**20,274**
Airport			163,617	8,792	0.086	0.703	11,502
Grid Electricity	46,443,690	kWh	158,511	8,522	0.085	0.698	8,564
Natural Gas	51,060	therms	5,106	271	0.001	0.005	271
Upstream Electricity Generation							2,604
Upstream Natural Gas Generation							62
Seaport			124,497	6,693	0.067	0.548	8,772
Grid Electricity	36,477,752	kWh	124,497	6,693	0.067	0.548	6,727
Natural Gas	-	therms	-	-	0.000	0.000	-
Upstream Electricity Generation							2,045
Upstream Natural Gas Generation							-
Water and Wastewater				5,363	31.204	0.330	**9,342**
Transportation & Mobile Sources							**2,978,775**
Public Transit							**115,469**
BART							38,661
Electricity	287,600,509	kWh	393,403	22,429	0.209	1.731	22,535
Upstream Electricity Generation							16,126
All Buses				57,907	0.649	124.385	61,210
AC Transit - Gasoline	239,868	gallons	30,807	2,164	0.016	0.019	2,169
Gasoline Well to Pump Emissions				513	0.082	6.768	707
AC Transit - Diesel	1,599,620	gallons	226,966	16,781	0.010	0.006	16,784
Diesel Well to Pump Emissions				4,423	0.100	43.807	5,548
Other Buses - Gasoline	655,580	gallons	84,198	5,914	0.076	0.090	5,939
Gasoline Well to Pump Emissions				1,402	0.224	18.498	1,931
Other Buses - Diesel	2,015,062	gallons	285,911	21,139	0.016	0.010	21,144
Diesel Well to Pump Emissions				5,572	0.125	55.184	6,989
Union Pacific Rail				1,024	0.02	10.14	9,441
Diesel	11.6	route miles in Oakland					8,157
Diesel Well to Pump Emissions				1,024	0.02	10.14	1,284
WETA Ferry				1,552	0.039	3.295	1,646
Diesel	481,101	gallons	16,609	1,228	0.031	0.089	1,240
Diesel Well to Pump Emissions				324	0.007	3.206	406
Amtrak				4,253	0.106	9.051	4,511
Diesel	329,687	gallons	45,528	3,366	0.086	0.264	3,398
Diesel Well to Pump Emissions				887	0.020	8.787	1,113
On Road - Gasoline							**1,792,110**
Gasoline Tailpipe Emissions:	3,285,857,608	VMT	20,245,810	1,279,876	36.523	61.546	1,327,784
Passenger Vehicles	3,222,184,662	VMT	19,308,000	1,220,564	35.444	60.255	1,266,479
Light/Medium-Duty Truck	62,839,464	VMT	913,080	57,765	1.068	1.263	59,710
Heavy-Duty Truck	833,481	VMT	24,730	1,548	0.011	0.028	1,595
Gasoline Well to Pump Emissions, All Vehicle Types:				337,071	53.873	4,448	464,326
On Road - Diesel							**484,541**
Diesel Tailpipe Emissions:	269,763,692	VMT	5,102,712	349,921	0.848	0.927	359,812
Passenger Vehicles	23,772,692	VMT	125,712	8,931	0.024	0.117	9,186
Light/Medium-Duty Truck	108,228,137	VMT	1,518,500	106,835	0.162	0.108	109,821
Heavy-Duty Truck	137,762,863	VMT	3,458,500	234,155	0.661	0.703	240,805
Diesel Well to Pump Emissions, All Vehicle Types:				99,439	2.239	984.884	124,729

Port of Oakland Seaport Transportation							**290,080**
Onshore Diesel				48,091	0.5	4.2	48,357
Offshore Diesel				168,405	4.2	18.2	170,094
Diesel Well to Pump Emissions				57,106	1.286	565.594	71,629
Port of Oakland Airport Transportation			1,317,620	237,809	6.499	2,273.12	**296,575**
Total Jet Fuel	10,971,793	gallons	1,316,623	237,723	6.50	2,272.85	296,481
Jet Fuel - Passenger	8,777,435	gallons	1,053,300	84,000	2.72	2.37	84,870
Upstream Emissions				107,778	2.51	1,843.26	154,608
Jet Fuel - Freight	2,194,359	gallons	263,323	21,000	0.68	0.59	21,218
Upstream Emissions				24,946	0.58	426.63	35,785
Total Aviation Gas	8,309	gallons	997	86	0.004	0.28	94
Aviation Gas - Passenger	6,647	gallons	798	55	0.001	0.05	57
Aviation Gas - Freight	1,662	gallons	199	14	0.000	0.01	14
Aviation Gas - Upstream Emissions				17	0.003	0.22	23
Materials Use & Waste							**2,509,003**
Solid Waste							**2,455,303**
Landfill Methane	491,928	tons				4,024.91	101,917
Upstream from Franchise Hauled Waste	168,806	tons					327,056
Upstream from Self-Hauled Waste	73,797	tons					103,366
Upstream from Alternate Daily Cover	249,325	tons					504,981
Upstream Recycling	50,000	tons					130,992
Upstream Organics	161,104	households					1,285,682
Total Transportation from Solid Waste					0.041	0.46	1,307
Construction Upstream Emissions							**53,700**
Construction	299	new buildings					53,700
TOTAL COMMUNITY							**7,104,945**
TOTAL COMMUNITY AND LOCAL GOVERNMENT							**7,180,977**

Table 15: 2015 Lifecycle Inventory – Local Government Operations

2015 Local Government Emissions	"raw data"	units	MMBtu	MTCO2	MTCH4	MTN2O	MTCO2e
Municipal Buildings & Facilities							**36,703**
Buildings and Facilities Electricity							**18,514**
Electricity	76,995,007	kWh	262,782	14,127	1.156	0.141	14,197
Upstream Electricity							4,317
Buildings and Facilities Natural Gas							**18,189**
Natural Gas	1,383,777	therms	138,378	7,337	0.692	0.014	7,360
Upstream Natural Gas							10,829
Streetlight & Traffic Controllers							**3,509**
	19,031,777	kWh	64,955	3,492	0.286	0.035	3,509
Municipal Vehicle Fleet							**7,924**
Fleet: Diesel							**1,959**
Diesel	128,545	gallons	17,744	1,312	0.006	0.006	1,314
Upstream Diesel				295	3.898	0.047	645
Fleet: Gasoline							**5,452**
Gasoline	407,884	gallons	50,965	3,581	0.120	0.079	3,606
Upstream Gasoline				993	9.837	0.022	1,846
Fleet: CNG							**513**
Compressed Natural Gas	42,100	equivalent gallons	5,263	276	0.464	0.036	299
Upstream CNG				65	1.687	0.011	214
Municipal Waste Generation							**27,896**
Landfill Methane	11,622	tons			192.12		5,379
Upstream from Franchise Hauled Waste							22,517
TOTAL LOCAL GOVERNMENT							**76,032**

Table 16: 2017 Lifecycle Inventory – Community

2017 Community Emissions	"raw" data	units	MMBtu	MTCO2	MTN2O	MTCH4	MTCO2E attributed to Oakland
Buildings & Energy Use							**1,485,119**
Residential Energy							**833,467**
Grid Electricity	674,595,752	kWh	2,302,400	64,258	1.224	10.098	64,875
Natural Gas Consumption	56,556,464	therms	5,655,600	299,862	0.566	28.278	300,738
Upstream Electricity Generation							21,084
Upstream Natural Gas Generation							442,608
Transmission Losses	43,272,516	kWh	147,697	4,122	0.079	0.648	4,162
Commercial & Industrial Energy							**628,215**
Grid Electricity	1,281,764,052	kWh	4,374,600	122,094	2.326	19.186	123,266
Natural Gas Consumption	34,768,794	therms	3,476,900	184,344	0.348	17.384	184,882
Upstream Electricity Generation							40,060
Upstream Natural Gas Generation							272,099
Transmission Losses	82,219,841	kWh		7,832	0.149	1.231	7,908
Port of Oakland Energy							**14,110**
Airport			193,193	6,286	0.087	0.727	8,119
Grid Electricity	46,178,922	kWh	157,607	4,399	0.084	0.691	4,441
Natural Gas	355,859	therms	35,586	1,887	0.004	0.036	1,889
Upstream Electricity Generation							1,356
Upstream Natural Gas Generation							433
Seaport			160,169	4,559	0.084	0.691	5,992
Grid Electricity	45,898,131	kWh	156,649	4,372	0.083	0.687	4,414
Natural Gas	35,195	therms	3,520	187	0.000	0.004	187
Upstream Electricity Generation							1,348
Upstream Natural Gas Generation							43
Water and Wastewater				5,417	31.227	0.334	**9,327**
Transportation & Mobile Sources							**3,026,282**
Public Transit							**83,995**
BART							11,518
Electricity	309,320,994	kWh	86,344	2,410	0.046	0.379	2,433
Upstream Electricity Generation							9,085
All Buses				53,894	0.659	116.496	57,003
AC Transit - Gasoline	291,208	gallons	36,402	2,557	0.021	0.025	2,564
Gasoline Well to Pump Emissions				606	0.097	7.998	835
AC Transit - Diesel	1,548,650	gallons	213,866	15,812	0.010	0.007	15,815
Diesel Well to Pump Emissions				4,166	0.094	41.284	5,226
Other Buses - Gasoline	703,062	gallons	87,885	6,173	0.081	0.095	6,199
Gasoline Well to Pump Emissions				1,463	0.234	19.308	2,016
Other Buses - Diesel	1,791,947	gallons	247,465	18,296	0.013	0.009	18,300
Diesel Well to Pump Emissions				4,821	0.109	47.770	6,048
Union Pacific Rail				964	0.02	9.55	8,875
Diesel	11.6	route miles in Oakland					7,666
Diesel Well to Pump Emissions				964	0.02	9.55	1,209
WETA Ferry				1,970	0.049	4.183	2,089
Diesel	610,711	gallons	21,084	1,559	0.040	0.113	1,573
Diesel Well to Pump Emissions				411	0.009	4.070	515
Amtrak				4,253	0.106	9.052	4,511
Diesel	329,687	gallons	45,528	3,366	0.086	0.264	3,398
Diesel Well to Pump Emissions				887	0.020	8.789	1,113
On Road - Gasoline							**1,767,327**
Gasoline Tailpipe Emissions:	3,492,509,633	VMT	19,916,783	1,297,334	38.775	65.406	1,310,551
Passenger Vehicles	3,432,314,891	VMT	19,052,000	1,241,014	37.755	64.184	1,253,896
Light/Medium-Duty Truck	59,274,928	VMT	838,911	54,643	1.008	1.191	54,974
Heavy-Duty Truck	919,813	VMT	25,872	1,676	0.012	0.031	1,681
Gasoline Well to Pump Emissions, All Vehicle Types:				331,589	52.998	4,376	456,776
On Road - Diesel							**508,305**
Diesel Tailpipe Emissions:	297,520,106	VMT	5,362,134	376,968	0.929	1.028	377,267
Passenger Vehicles	28,837,675	VMT	142,234	10,382	0.029	0.142	10,382
Light/Medium-Duty Truck	118,117,886	VMT	1,612,900	116,599	0.177	0.118	116,658
Heavy-Duty Truck	150,564,545	VMT	3,607,000	249,987	0.723	0.768	250,227
Diesel Well to Pump Emissions, All Vehicle Types:				104,459	2.355	1035.093	131,038

Port of Oakland Seaport Transportation							**248,981**
Onshore Diesel				51,442	4.6	1.8	52,866
Offshore Diesel				127,122	3.2	13.8	137,404
Diesel Well to Pump Emissions				47,084	1.062	466.559	58,711
Port of Oakland Airport Transportation			1,943,903	350,885	9.59	3,354.21	**417,675**
Total Jet Fuel	16,190,591	gallons	1,942,874	350,797	9.59	3,353.92	417,578
Jet Fuel - Passenger	12,952,473	gallons	1,554,300	123,955	4.02	3.50	125,239
Upstream Emissions				159,042	3.71	2,720.00	228,147
Jet Fuel - Freight	3,238,118	gallons	388,574	30,989	1.00	0.87	31,310
Upstream Emissions				36,811	0.86	629.56	32,882
Total Aviation Gas	8,571	gallons	1,029	88	0.004	0.29	97
Aviation Gas - Passenger	6,857	gallons	823	57	0.001	0.05	58
Aviation Gas - Freight	1,714	gallons	206	14	0.000	0.01	15
Aviation Gas - Upstream Emissions				17	0.003	0.23	24
Materials Use & Waste							**2,847,725**
Solid Waste							**2,729,725**
Landfill Methane	622,709	tons				4,981.40	125,977
Upstream from Franchise Hauled Waste	164,277	tons					282,784
Upstream from Self-Hauled Waste	176,432	tons					291,757
Upstream from Alternate Daily Cover	282,000	tons					630,273
Upstream Recycling	56,652	tons					129,310
Upstream Organics	158,851	households					1,268,160
Total Transportation from Solid Waste					0.080	0.90	1,464
Construction Upstream Emissions							**118,000**
Construction	631	new buildings					118,000
TOTAL COMMUNITY							**7,359,126**
TOTAL COMMUNITY AND LOCAL GOVERNMENT							**7,418,907**

Table 17: 2017 Lifecycle Inventory – Local Government Operations

2017 Local Government Emissions	"raw data"	units	MMBtu	MTCO2	MTCH4	MTN2O	MTCO2e
Municipal Buildings & Facilities							**29,807**
Buildings and Facilities Electricity							**8,534**
Electricity	67,984,401	kWh	232,029	6,476	1.018	0.123	6,537
Upstream Electricity							1,997
Buildings and Facilities Natural Gas							**21,274**
Natural Gas	1,618,429	therms	161,843	8,581	0.809	0.016	8,608
Upstream Natural Gas							12,666
Streetlight & Traffic Controllers							**1,582**
	16,451,750	kWh	56,149	1,567	0.246	0.030	1,582
Municipal Vehicle Fleet							**9,732**
Fleet: Diesel							**2,596**
Diesel	170,274	gallons	23,505	1,739	0.009	0.009	1,741
Upstream Diesel				391	5.164	0.063	855
Fleet: Gasoline							**6,648**
Gasoline	497,728	gallons	62,191	4,370	0.131	0.084	4,396
Upstream Gasoline				1,212	12.005	0.027	2,252
Fleet: CNG							**487**
Compressed Natural Gas	40,100	equivalent gallons	5,013	263	0.414	0.032	283
Upstream CNG				62	1.607	0.011	204
Municipal Waste Generation							**18,660**
Landfill Methane	8,698	tons			131.730		3,688
Upstream from Franchise Hauled Waste							14,972
TOTAL LOCAL GOVERNMENT							**59,781**

City of Oakland Elected Officials

Mayor Libby Schaaf

Members of the City Council
Rebecca Kaplan (At Large), Council President

Dan Kalb (District 1)
Nikki Fortunato Bas (District 2)
Lynette Gibson Mclhaney (District 3)
Sheng Thao (District 4)
Noel Gallo (District 5)
Loren Taylor (District 6)
Larry Reid (District 7)

Sustainable Oakland

This report was developed under the leadership of Oakland Public Works—Environmental Services Division with contributions from numerous City Staff and partners.

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CITY OF OAKLAND