2016 SUSTAINABILITY DATA AND TRENDS REPORT

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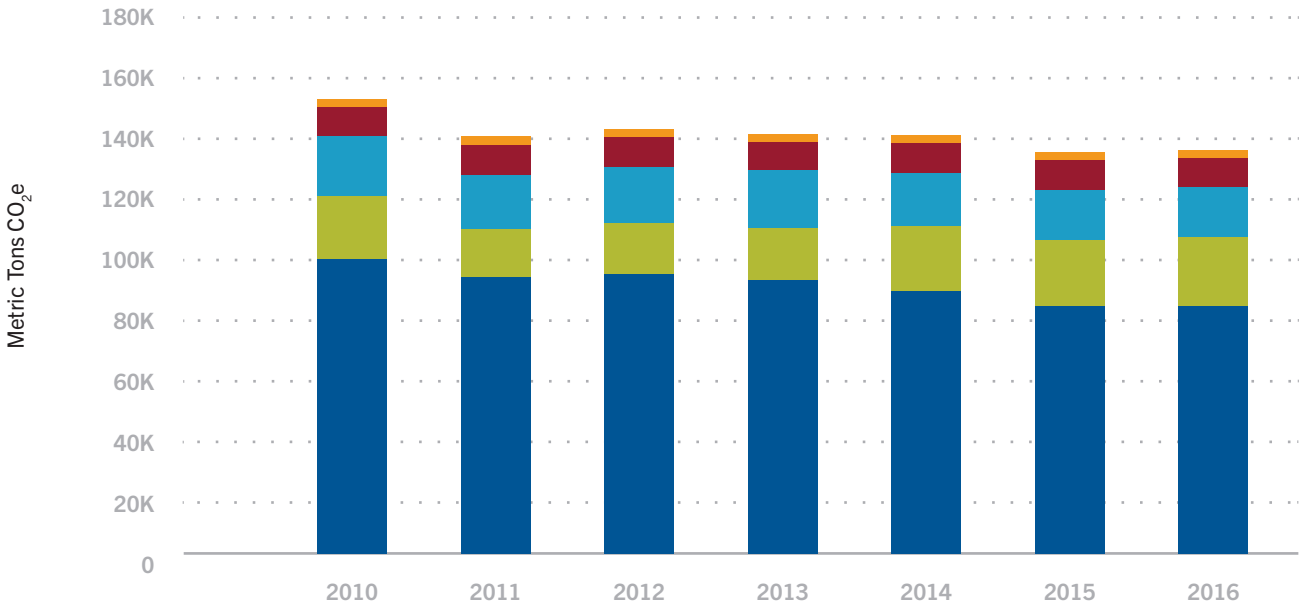
This document presents Genentech's company-wide environmental sustainability data and 2010-2016 performance trends.

2.0 Performance Trends

2.1 CO_2 from Onsite Energy Use

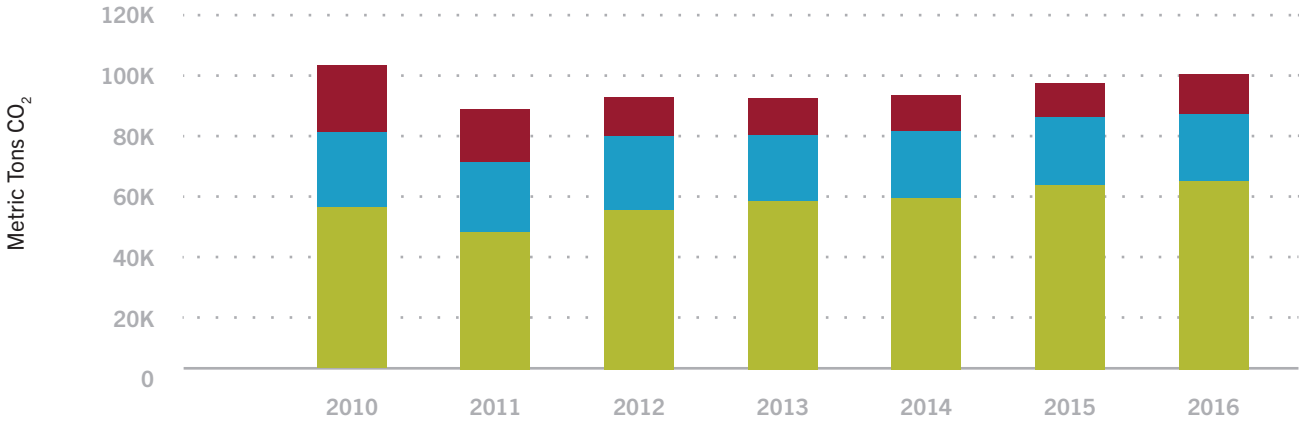


	2010	2011	2012	2013	2014	2015	2016
KENTUCKY	2,827	3,089	3,034	2,801	2,819	2,919	2,911
HILLSBORO	10,038	9,940	10,094	9,529	10,069	10,013	9,867
OCEANSIDE	20,091	18,330	18,804	19,471	18,036	16,992	17,015
VACAVILLE	21,335	16,469	17,326	17,899	22,134	22,346	23,239
SOUTH SAN FRANCISCO	100,144	93,818	95,118	92,826	89,108	84,272	84,109
TOTAL	**154,436**	**141,646**	**144,376**	**142,526**	**142,165**	**136,524**	**137,141**

Onsite energy use is responsible for 90% of Genentech's Scope 1 and 2 greenhouse gas (GHG) emissions. Since 2010, GHG emissions from onsite energy use have decreased by 11%. This has resulted from a combination of energy efficiency efforts (2016 onsite energy use was 7% lower than in 2010) and a greening of the electricity we purchase. In 2016, GHG emissions from onsite energy use were flat when compared with 2015. We experienced a small (3%) increase in natural gas use in 2016 due to a cool 2016 winter season driving up heating demand. This increase was somewhat offset by a small (2%) reduction in purchased electricity.

Looking ahead, we expect to deliver further reductions in GHG emissions due to a sustained focus on energy efficiency investments, a significant expansion of our onsite solar generation capacity and transitioning to lower carbon purchased electricity contracts, such as the Peninsula Clean Energy Community Choice contract that is now serving our South San Francisco site.

2.2 CO_2 from Transportation



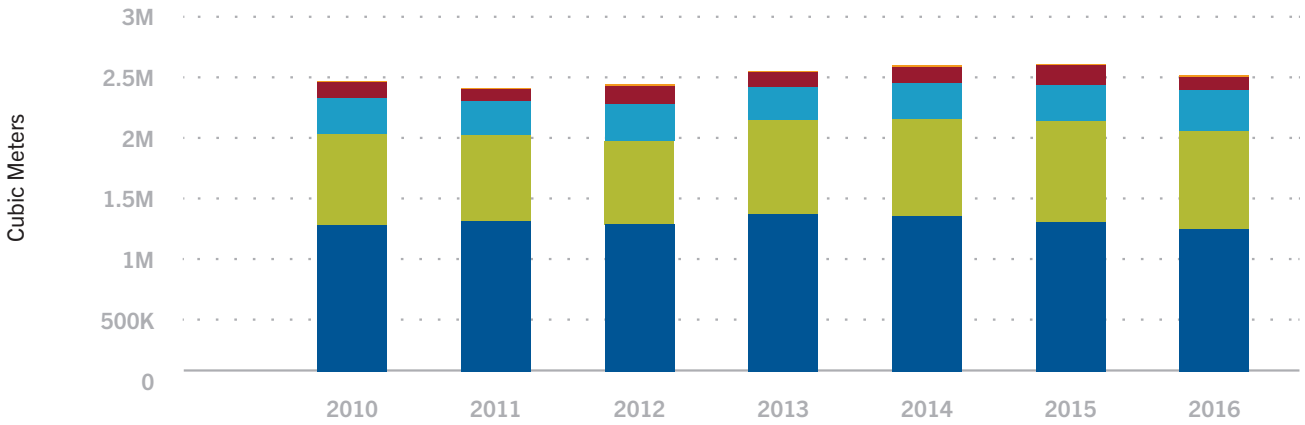
	2010	2011	2012	2013	2014	2015	2016
VEHICLE FLEET	22,635	18,176	13,008	12,321	12,457	11,798	12,402
EMPLO YEE COMMUTE (SSF)	25,829	23,906	25,034	22,584	22,556	22,899	22,979
AIR TRAVEL	54,644	46,658	54,458	57,263	58,432	62,830	64,008
TOTAL	**103,108**	**88,740**	**92,500**	**92,168**	**93,445**	**97,527**	**99,389**

Employee transportation GHG emission sources include the vehicle fleet used by our sales employees, business air travel and our employees' commute activities. While we have seen a reduction in total GHG emissions since 2010 we have experienced an increasing trend over the past several years, driven primarily by air travel which has become a larger percentage of the total transportation emissions over this period (64% in 2016). We continue to invest in virtual meeting technologies and train employees in strategies to reduce air travel while enhancing collaboration.

While absolute GHG emissions from employee commuting to our SSF campus increased slightly, the number of employees on campus increased even more, so this actually represents a 3% reduction in GHG emissions per employee in 2016 compared to 2015. This improvement is largely due to an expansion of our Genenbus program, bringing more employees from around the Bay Area to the SSF campus.

The increase in vehicle fleet emissions in 2016 was driven by an increase in the size of and overall distance traveled by our commercial sales fleet as well as a reduction in diesel usage relative to gasoline usage following the emissions testing scandal. Fuel efficiency is an important criterion for the group responsible for selecting vehicles for inclusion in our Leased Vehicle program and a range of hybrids have been made available to employees in this program.

2.3 Water Use by Site

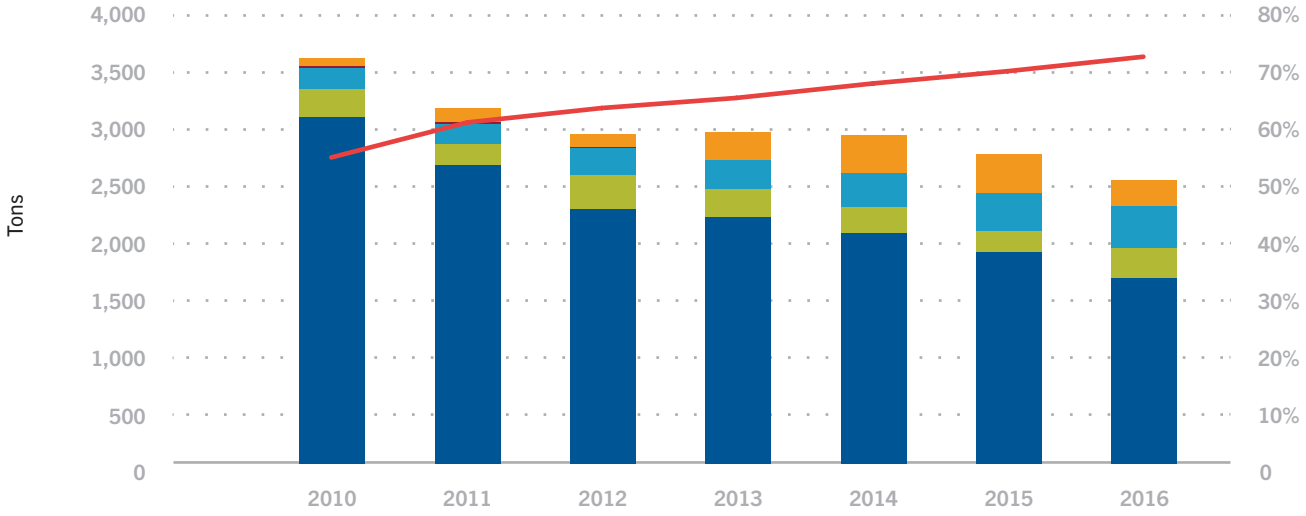


	2010	2011	2012	2013	2014	2015	2016
KENTUCKY	7,044	10,443	12,004	8,816	7,768	6,678	8,740
HILLSBORO	129,122	97,089	158,855	121,204	137,922	161,873	111,761
OCEANSIDE	308,868	287,642	304,00	274,264	303,163	304,489	340,217
VACAVILLE	768,608	722,774	708,081	796,853	822,617	857,724	832,368
SOUTH SAN FRANCISCO	1,234,092	1,272,797	1,239,602	1,329,602	1,308,386	1,256,373	1,201,628
TOTAL	**2,447,734**	**2,390,745**	**2,422,542**	**2,530,956**	**2,579,856**	**2,587,137**	**2,494,714**

Manufacturing operations at our South San Francisco (SSF), Vacaville and Oceanside facilities account for approximately 75% of our total water use. Following several years of increased water use driven largely by an increase in our manufacturing activity, we achieved an overall reduction in water use in 2016, using 24 million gallons less water than in 2015, thanks to a concerted effort to respond to the drought and implement water saving measures wherever possible. Our SSF campus, our biggest water using site, delivered a 4% reduction in total water use in 2016 driven by a project to reuse wastewater from our reverse osmosis process as make up water in cooling towers as well as continued efforts to cut back on our irrigation usage.

While we are pleased with the reductions we have achieved, we are committed to doing much more to reduce our potable water use. Having achieved some quick wins over the last 2 years, all three of our Californian sites are implementing longer term solutions to reuse and recycle water internally and we expect the expansion of such solutions to drive significant water savings over the next several years, making us more resilient to a future that we expect to feature longer and more severe periods of drought. For example, in late 2016, we opened our new SSF Employee Center which features a system to reuse greywater from showers and sinks for irrigation and toilet flushing, and we are installing purple pipes throughout our SSF campus to enable reclaimed water to be transported for internal reuse in the future.

2.4 Landfill Waste by Site



	2010	2011	2012	2013	2014	2015	2016
HILLSBORO	69	128	123	253	347	349	235
KENTUCKY	22	14	5	2	0	0	0
OCEANSIDE	190	180	248	262	304	340	376
VACAVILLE	246	189	303	246	238	189	267
SOUTH SAN FRANCISCO	3,129	2,695	2,295	2,227	2,077	1,911	1,676
TOTAL	**3,656**	**3,206**	**2,974**	**2,990**	**2,966**	**2,789**	**2,553**
DIVERSION RATE	53%	61%	63%	65%	68%	70%	73%

In 2016 we achieved a 30% reduction in landfill over our 2010 baseline. This translates to more than 1000 metric tons (2.4 million pounds) of materials prevented from going to landfill over that period. Our SSF site, which is responsible for 70% of our total general waste, reduced the amount of waste sent to landfill per employee by 15% compared with 2015 (equivalent to an 8% absolute reduction). This landfill reduction success have been achieved through a wide range of efforts, from expanded recycling programs to infrastructure improvements. For example, our composting programs for organic waste made significant landfill reductions even as our headcount grew. Consequently, we have seen an improvement in our landfill diversion rate from 53% in 2010 to 73% in 2016. In addition to diversion, we continue to target opportunities for waste minimization at source. These include internal material re-use programs and initiatives to reduce food waste through employee engagement and collaboration with catering vendors.

3.0 2010–2016 Environmental Sustainability Data

	Units	2010	2011	2012	2013	2014	2015	2016
Onsite Energy Use	1000 GJ							
Stationary Combustion		1,304	1,215	1,197	1,183	1,164	1,125	1,158
Purchased Electricity		1,125	1,081	1,044	1,069	1,115	1,115	1,093
Onsite Renewables		-	-	-	-	2	2	16
Total Energy Use		**2,429**	**2,296**	**2,241**	**2,252**	**2,279**	**2,240**	**2,267**
Scope 1 & 2 GHG Emissions	Metric tons CO_2e							
Stationary Combustion		65,958	61,458	60,485	59,668	58,718	56,748	58,485
Purchased Electricity - Market		91,083	87,762	82,215	86,125	88,146	84,193	78,656
Vehicle Fleet		22,635	18,176	13,008	12,321	12,457	11,798	13,402
Emissions from HFC Refrigerants		1,143	1,061	2,200	2,303	2,937	1,777	3,883
Process Gases		1,178	1,178	1,178	1,178	1,178	1,178	1,178
Total Scope 1 & 2 GHG Emissions		**181,998**	**169,635**	**162,086**	**161,595**	**163,437**	**155,695**	**155,603**
Scope 3 GHG Emissions	Metric tons CO_2e							
Business Travel (Air)		**54,644**	**46,658**	**54,458**	**57,263**	**58,432**	**62,830**	**64,008**
Employee Commuting (SSF only)		**25,829**	**23,906**	**25,034**	**22,584**	**22,556**	**22,899**	**22,979**
Non-GHC Emissions to Air	Metric tons R-11e							
Ozone-Depeleting Substances		**0.04**	**0.12**	**0.03**	**0.02**	**0.01**	**0.01**	**0.02**
Total Water Use	1000 m^3	**2,448**	**2,391**	**2,423**	**2,531**	**2,580**	**2,587**	**2,495**
General Waste	Metric tons							
Landfill		3,656	3,206	2,974	2,990	2,966	2,789	2,553
Recycling		3,133	3,547	3,056	3,026	3,609	3,571	3,489
Composting		753	1,030	1,772	2,249	2,387	2,512	2,949
e-waste		272	426	316	231	209	297	347
Incineration with energy recovery		-	-	-	-	6	7	7
Diversion Rate	%	**53**	**61**	**63**	**65**	**68**	**70**	**73**

4.0 Notes to Support Our Data

General Notes

The data presented in this report are for the following production and fill/finish facilities: South San Francisco, Vacaville and Oceanside, California, and Hillsboro, Oregon. The data also include the research, development, commercial and administrative offices at our South San Francisco headquarters and our Louisville, Kentucky distribution facility.

This report includes data from 2010 to 2016 for all facilities. The annual Roche internal reporting timeline is in November and requires reporting of Jan-Oct data, extrapolated to provide a full year estimate. In general, the reported data are extrapolated in line with Roche policy, with a few exceptions where forcasting is used in place of extrapolation[1] or 12 months of actual data is reported[2]. This report does not include performance data for joint ventures or outsourced operations, nor does it include data for sales offices. No data are shown for buildings that Genentech leases out to other parties.

Data are reported for new owned facilities and buildings from the point at which Genentech becomes responsible for payment of utilities and other services, such as waste disposal. Data are reported for new leased buildings from the point at which the building becomes occupied by Genentech.

All figures in the data table, with the exception of figures less than 1, are rounded to the nearest whole number. Due to this rounding, the individual elements of the data table may not always add up to the totals. All electricity, natural gas and water data are based on meter readings provided by our utility vendors.

Greenhouse Gas Emissions

The greenhouse gases included in the reported data are carbon dioxide, methane, nitrous oxide and hydrofluorocarbons. The GHG emissions data are reported as CO_2 equivalents (CO_2e).

Small emission sources (i.e. those accounting for <1% of the total emissions) are held flat from 2010-2016.

Greenhouse Gas Emissions from Energy Use

In order to align with the WRI GHG Protocol Scope 2 guidance published in January 2015, we have calculated our 2010-2016 purchased electricity emissions per the location- and market-based methods. The data presented in our Data Table and in our GHG emissions graphs follow the market-based method. Our location-based emissions are presented in the table below.

Scope 2 Location-Based Emissions

	2010	2011	2012	2013	2014	2015	2016
Scope 2 location-based emissions (metric tons CO_2e)	99,529	92,569	89,499	85,516	89,219	93,218	91,664

Electricity-Related Emission Factors

Location-Based Emission Factors

Site	Year	Emission Factor	Source
South San Francisco, Vacaville, Oceanside, California	2010	681.01 lb CO_2/MWh 0.021 lb CH_4MWh 0.006 lb N_2O/MWh	U.S. EPA eGRID2010 v1.1 Regional emission factors for WECC California (CAMX)
	2011-2012	658.68 lb CO_2/MWh 0.029 lb CH_4/MWh 0.006 lb N_2O/MWh	U.S. EPA eGRID2012 v1.0 (2009 data) Regional emission factors for WECC California (CAMX)
	2013-2014	610.82 lb/CO_2/MWh 0.029 lb CH_4/MWh 0.006 lb N_2O/MWh	US EPA eGRID 9th Edition (2010 data) Regional emission factors for WECC California (CAMX)
	2015-2016[3]	650.31 lb CO_2/MWh 0.031 lb CH_4/MWh 0.006 lb N_2O/MWh	US EPA eGRID2012, Oct 2015 Regional emission factors for WECC California (CAMX)
Louisville, Kentucky	2010	1540.85 lb CO_2/MWh 0.020 lb CH_4/MWh 0.026 lb N_2O/MWh	U.S. EPA eGRID2010 v1.1 Regional emission factors for SERC Tennessee Valley (SRTV)
	2011-2012	1357.71 lb CO_2/MWh 0.017 lb CH_4/MWh 0.022 lb N_2O/MWh	U.S. EPA eGRID2012 v1.0 (2009 data) Regional emission factors for SERC Tennessee Valley (SRTV)
	2013-2014	1389.20 lb CO_2/MWH 0.018 lb CO_2/MWH 0.022 lb N_2O/MWH	US EPA eGRID 9th Edition (2010 data) Regional emission factors for SERC Tennessee Valley (SRTV)
	2015-2016	1337.15 lb CO_2/MWH 0.017 lb CO_2/MWH 0.021 lb N_2O/MWH	US EPA eGRID2012, Oct 2015 Regional emission factors for SERC Tennessee Valley (SRTV)

[1] South San Francisco electricity and natural gas use

[2] South San Francisco water use (actual data reported for full calendar year) and air travel (data is for 1 October - 30 September)

Electricity-Related Emission Factors (Continued)

Location-Based Emission Factors

Site	Year	Emission Factor	Source
Hillsboro, Oregon	2010	858.79 lb CO_2/MWh 0.016 lb CH_4/MWh 0.014 lb N_2O/MWh	U.S. EPA eGRID2010 v1.1 Regional emission factors for WECC Northwest (NWPP)
	2011-2012	819.21 lb CO_2/MWh 0.015 lb CH_4/MWh 0.013 lb N_2O/MWh	U.S. EPA eGRID2012 v1.0 (2009 data) Regional emission factors for WECC Northwest (NWPP)
	2013-2014	842.58 lb CO_2/MWh 0.016 lb CH_4/MWh 0.013 lb N_2O/MWh	US EPA eGRID 9th Edition (2010 data) Regional emission factors for WECC Northwest (NWPP)
	2015-2016	665.75 lb CO_2/MWh 0.013 lb CH_4/MWh 0.010 lb N_2O/MWh	US EPA eGRID2012, Oct 2015 Regional emission factors for WECC Northwest (NWPP)

Market-Based Emission Factors

Site	Year	lb CO_2/MWh	Supplier Specific Emission Factors
South San Francisco, CA (PG&E Contract) and Vacaville, CA	2016	435	PG&E
	2013-2015	427	PG&E
	2012	445	PG&E
	2011	393	PG&E
	2010	445	PG&E
Oceanside, CA	2014-2016	630	SDG&E
	2013	729	SDG&E
	2012	750	SDG&E
	2011	616	SDG&E
	2010	664	SDG&E
South San Francisco, CA (Direct Access contract), Hillsboro, OR	2010-2016	960.73	Green-E - WECC NERC Region Residual Mix Data
Louisville, KY	2010-2016	Location-based emission factors used as these are higher than the available residual mix emission factors	See Location-based Emission Factors Table

Natural Gas-Related Emission Factors

Site	Year	Emission Factor	Source
All Sites	2010-2011	5.306 kg CO_2/therm 0.5 g CH_4/therm 0.01 g N_2O/therm	U.S. EPA Climate Leaders Stationary Combustion Protocol (May 2008)
	2012-2014	5.302 kg CO_2/therm 0.1 g CH_4/therm 0.01 g N_2O/therm	Federal Register (2009) EPA; 40 CFR Part 98 et al; Mandatory Reporting of Greenhouse Gases; Final Rule, 30Oct09, Tables C-1 and C-2, pp. 54609-54610.
	2015-2016	5.306 kg CO_2/therm 0.1 g CH_4/therm 0.01 g N_2O/therm	EPA Emission Factors for Greenhouse Gas Inventories (November 2015)

[3] A significant methodology change was made for assigning plants to eGRID subregions in eGRID2014, resulting in large changes in subregion emission factors. Whereas in eGRID2012 and earlier, plants were assigned based on the utility company/territory that they supplied, in eGRID2014 plants were assigned based on geography where they are physically located. Because the U.S. EPA is considering reverting back to the previous methodology, Genentech has elected to use eGRID2012 to calculate Scope 2 location-based emissions for all U.S. operations.

Diesel-Related Emission Factors

Site	Year	Emission Factor	Source
All Sites	2010	10.15 kg CO_2/gallon 0.0014 kg CH_4/gallon 0.0001 kg N_2O/gallon	U.S. EPA Climate Leaders Stationary Combustion Protocol (May 2008)
	2011-2016	10.21 kg CO_2/gallon 0.0041 kg CH_4/gallon 0.00008 kg N_2O/gallon	Federal Register (2009) EPA; 40 CFR Part 98 et al; Mandatory Reporting of Greenhouse Gases; Final Rule, 30Oct09, Tables C-1 and C-2, pp.54609-54610

Global Warming Potentials (GWP) Used to Calculate CO_2e

Year	Source
2010 - 2013	Intergovermental Panel on Climate Change (IPCC) (1995): Second Assessment Report
2014-2016	Intergovermental Panel on Climate Change (IPCC) (2007): Fourth Assessment Report

In 2014, we updated the global warming potential (GWP) used to calculate CO_2 equivalents from CH_4 and N_2O. We did not update the GWPs used for calculating 2010-2013 emissions as the impact on the total GHG inventory was determined to be insignificant.

Greenhouse Gas Emissions from Vehicle Fleet

This category comprises emissions from the Genentech commercial fleet and on-site vehicles. In 2014, we added data for our South San Francisco intra-campus shuttles. The commercial fleet represents 95% of the total vehicle fleet emissions. Emissions from non-sales road business travel by employees (a scope 3 emission source) have not been included in the reported data.

The commercial fleet includes both employee-owned vehicles and vehicles leased by Genentech. In the case of employee-owned vehicles, fleet mileage is calculated from employee expense claims, and gallons are calculated using an average fuel economy. The average fuel economy value is obtained from annual employee surveys. In the case of leased vehicles and onsite vehicles, actual fuel use data is tracked in and extracted from a proprietary database.

As part of the integration of Genentech with Roche, the entire US commercial organization and associated vehicle fleet transitioned to Genentech SSF's responsibility early in 2010.

2010-2011 greenhouse gas emissions were calculated using the emission factors in the tables below. 2012-2016 greenhouse gas emissions were calculated using emission factors of 0.069 tons CO_2 / GJ for gasoline and 0.074 tons CO_2/GJ for diesel. These are the emission factors used across the Roche organization.

GWPs from methane and nitrous oxide from combustion of gasoline and diesel are as shown in the Greenhouse Gas Emissions from Energy Use section above.

Global Warming Potentials (GWP) Used to Calculate CO_2e from HFCs

Year	Source
2010-2013	US EPA (Climate) Leaders Direct HFC and PFC Emissions from Use of Refrigeration and Air Conditioning Equipment
2014-2016	Intergovernmental Panel on Climate Change (IPCC) (2007): Fourth Assessment Report

Greenhouse Gas Emissions from HFC Gases

This category includes emissions from stationary air conditioning, cooling and fire suppression equipment.

For 2010-2016, the reported data are based on leak reports generated during servicing and maintenance. In 2014, we updated the global warming potentials (GWP) used to calculate CO_2 equivalents from HFCs. We did not update the GWPs used for calculating 2010 - 2013 emissions as the impact on the total GHG inventory was determined to be insignificant.

Greenhouse Gas Emissions from Process Gases

CO_2 emissions from dry ice and liquid and gas CO_2, were estimated in 2008 using purchase data from vendors. In the absence of standard calculation methods, Genentech assumes that 100% of the CO2 used for these purposes is vented to the atmosphere. As these gases are a small source, the 2008 emissions have been held flat for 2010-2016.

GHG emissions from Genentech's use of CH_4 and N_2O in manufacturing and research and development were also calculated in 2008 using vendor purchase data and US EPA Climate Leaders emission factors. Emissions are reported as CO_2 equivalents and have been held flat for 2010-2016 as they are also a small source.

Greenhouse Gas Emissions from Business Travel (Air)

Air travel includes the use of commercial aircraft for the purpose of business travel. Genentech does not own, operate or charter private aircraft.

The air travel data present CO_2 emissions arising from flights made by Genentech employees, which were booked through Genentech's official travel agencies. Travel booked through alternative means is not included.

GWPs for methane and nitrous oxide are as shown in the Energy Use section above.

Air travel greenhouse gas emissions are calculated using an emission factor of 0.071 tons CO_2 / GJ which is the emission factor used across the Roche organization.

GHG	Year	Emission Factor	Source
CO_2	2010	8.8 kg/gallon	US EPA (2008); GHG Inventory Protocol Core Module Guidance - Direct Emissions from Mobile Combustion Sources, EPA Climate Leaders, Table 5.
	2011	8.78 kg/gallon	Federal Register (2009) EPA; 40 CFR Part 98 et al; Mandatory Reporting of Greenhouse Gases; Final Rule, 30Oct09, Tables C-1 and C-2, pp. 54609-54610.
CH_4	2010-2011	0.0051 g/mile	US EPA (2011) Inventory of U.S. GHG Emissions and Sinks: 1990-2009, EPA 430-R-11-005. All Values are calculated from Tables A-97 through A-100. Based on an assumed SUV: passenger car mix.
N_2O	2010-2011	0.0168 g/mile	

Vehicle Fleet Emission Factors (Diesel)

GHG	Year	Emission Factor	Source
CO_2	2010	10.15 kg/gallon	US EPA (2008); GHG Inventory Protocol Core Module Guidance - Direct Emissions from Mobile Combustion Sources, EPA Climate Leaders, Table 5
	2011	10.21 kg/gallon	Federal Register (2009) EPA; 40 CFR Part 98 et al; Mandatory Reporting of Greenhouse Gases; Final Rule, 30Oct09, Tables C-1 and C-2, pp. 54609-54610.
CH_4	2010-2011	0.001 g/mile	US EPA (2008); GHG Inventory Protocol Core Module Guidance - Direct Emissions from Mobile Combustion Sources, EPA Climate Leaders, Table 3. Emission factor for 1996-present for advanced light trucks.
N_2O	2010-2011	0.0015 g/mile	

Greenhouse Gas Emissions for Employee Commute

Employee commuting emissions estimates are based on the results of cordon counts to establish modal split at the points of entry to Genentech's South San Francisco facility. These data are supported by additional information related to the Genentech shuttle fleet and data available from third parties, such as emission factors for local public transit providers including Bay Area Rapid Transit (BART), Caltrain, and the Oyster Point Ferry. The model used to estimate employee commute emissions is updated and refined as better data and more detailed information becomes available. The 2016 estimates include:

- Updated commute mode share based on 2016 cordon count at South San Francisco campus
- Updated private vehicle emissions factors from the 2016 US Department of Energy Transportation and Energy Data Book (35th Edition)
- An estimate of emissions of the journey from home to the bus stop based on a postcard survey of GenenBus riders
- Updated number of people working remotely, on business travel, or offsite for other reasons

Non-GHG Emissions to Air

Ozone Depleting Substances (ODS)

This category includes emissions of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbon (HCFCs) gases from stationary air conditioning, cooling and fire suppression equipment.

The reported data are taken from leak reports generated during servicing and maintenance.

In accordance with the Global Reporting Initiative reporting guidelines, we have reported CFC and HCFC releases as R-11 equivalents, using the ozone depletion potentials below.

Water Use

Water use is the withdrawal of potable water from municipal sources. It would also include water withdrawn directly from surface and/or groundwater resources which is currently not applicable to Genentech. Grey water sourced from internal sources is not included. Genentech does not currently source grey water from external sources.

Gas Name	ODP	Source
R-11	1.0	http://www.epa.gov/ozone/science/ods/classone.html
R-12	1.0	
R-22	0.055	http://www.epa.gov/ozone/science/ods/classtwo.html
R-123	0.02	
R-502	0.25	http://www.uneptie.org/ozonaction/topics/hcfcblends.htm

General Waste

General waste includes landfill, recyclables, food waste and other compostable materials and used electronic and electrical equipment. Our recycling streams include lab plastics, paper, cardboard, bottles and cans, heavy plastics, amber glass, styrofoam, light ballasts, metals, and other materials. General waste excludes wastes that are managed by the Genentech Environmental, Health and Safety group, due to their regulated and/or hazardous nature.

Before 2011, most categories of waste from the SSF facility had been estimated using a standard weight per container multiplied by the number of container pick-ups during the reporting year. In 2011, SSF began to receive actual weight data from its waste vendor for the landfilled waste stream and several of the recycling streams. SSF estimates for 2010 have been updated based on the average per container weight calculated in 2011.

We show reused/recycled electronic waste as an individual line item in the General Waste category. Included are electronic items such as computers, monitors, keyboards, lab equipment, cold storage units and cell phones.