Genentech Sustainability Data and Notes

2010 - 2015 Performance Data

	Units	2010	2011	2012	2013	2014	2015
Onsite Energy Use	1000 GJ						
Stationary Combustion		1,304	1,215	1,197	1,183	1,164	1,125
Purchased Electricity		1,125	1,081	1,044	1,069	1,115	1,115
Total Energy Use		**2,429**	**2,296**	**2,241**	**2,252**	**2,279**	**2,240**
Scope 1 & 2-Market GHG Emissions	Metric tons CO_2e						
Stationary Combustion		65,958	61,458	60,485	59,668	58,718	56,748
Purchased Electricity - Market		91,083	87,762	82,215	86,125	88,146	84,193
Vehicle Fleet		22,635	18,176	13,008	12,321	12,457	11,798
Emissions from HFC Refrigerants		1,143	1,061	2,200	2,303	2,937	1,777
Process Gases		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**
Scope 3 GHG Emissions	Metric tons CO_2e						
Business Travel (Air)		**54,644**	**46,658**	**54,458**	**57,263**	**58,432**	**62,830**
Employee Commuting (SSF only)		**25,829**	**23,906**	**25,034**	**22,584**	**22,556**	**22,899**
Ozone Depleting Substances (ODS)	Metric tons R-11e						
Emissions to Air		**0.04**	**0.12**	**0.03**	**0.02**	**0.01**	**0.01**
Total Water Use	Cubic meters	**2,447,734**	**2,390,745**	**2,422,542**	**2,530,956**	**2,579,856**	**2,587,137**
General Waste	Metric tons						
Landfill		3,656	3,206	2,974	2,990	2,966	2,789
Recycling		3,133	3,547	3,056	3,026	3,609	3,571
Composting		753	1,030	1,772	2,249	2,387	2,512
e-waste		272	426	316	231	209	297
Incineration with energy recovery		-	-	-	-	6	7
Diversion Rate	%	**53**	**61**	**63**	**65**	**68**	**70**

NOTES TO SUPPORT THE DATA TABLE

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 2015 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 10, 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 2010-2015.

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 2010-2015 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
Scope 2 location-based emissions (metric tons CO_2e)	99,529	92,569	89,499	85,516	89,219	93,218

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	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	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	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	2010	445	PG&E
	2011	393	PG&E
	2012	445	PG&E
	2013-2015	427	PG&E
South San Francisco, CA (Direct Access contract), Hillsboro, OR, and Vacaville, CA	2010-2015	960.73	Green-E - WECC NERC Region Residual Mix Data
Louisville, KY	2010-2015	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	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)

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)
	2011-2015	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
2014-2015	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 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 2010-2015.

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 2010-2015 as they are also a small source.

Greenhouse Gas Emissions from HFC Gases

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

For 2010-2015, 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.

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
2014-2015	Intergovernmental Panel on Climate Change (IPCC) (2007): Fourth Assessment Report

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.

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

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.

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. 2012-2015 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.

Vehicle Fleet Emission Factors (Gasoline)

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) and Caltrain. The model used to estimate employee commute emissions is updated and refined as better data and more detailed information becomes available. The 2015 estimates include:

- Updated commute mode share based on cordon count at South San Francisco campus
- Updated drive alone emissions factors from the 2015 US Department of Energy Transportation and Energy Data Book (34th Edition)
- Updated GenenBus emissions based on B20 fuel consumed in the previous 12 months

The 2015 estimates incorporate updated emissions from the Alameda-Oyster Point ferry based on ridership increases since its first year of operation in 2012.

Ozone Depleting Substances

Emissions to Air

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.

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

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 and/or external sources is not included.

General Waste

General waste includes trash, recyclables, food waste and other compostable materials and used electronic and electrical equipment. 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.

In 2014, we added a new waste category, "incineration with energy recovery" to account for new waste diversion efforts at our Kentucky facility.

2010-2015 general waste data for our SSF site have been revised to include waste generated at our leased Gateway campus.