

SUMMARY OF ENVIRONMENTAL DATA

Energy (a)							
Type	Unit	2007	2012	2013	2014	2015	2016
Total Combustion On-site (Direct) (d)	1,000 GJ	2,151	1,790	1,828	1,744	1,828	1,660
Natural Gas	1,000 GJ	1,848	1,390	1,400	1,322	1,371	1,207
Diesel	1,000 GJ	303	390	416	411	448	443
Propane	1,000 GJ	-	10	11	11	10	9
Total Purchased Energy (Indirect) (e)	1,000 GJ	2,190	2,059	1,990	1,962	1,983	1,876
Fossil Fuel	1,000 GJ	1,541	1,545	1,435	1,418	1,419	1,314
Hydro	1,000 GJ	287	191	210	200	217	123
Nuclear	1,000 GJ	240	195	185	185	178	148
Nonspecified Renewables	1,000 GJ	106	114	152	144	156	277
Nonspecified	1,000 GJ	16	13	8	14	13	13
Total Energy	1,000 GJ	4,341	3,849	3,817	3,706	3,812	3,535
Total Energy Normalized to Net Sales	1,000 GJ/\$B net sales	303	231	210	192	182	161
Confirmed Results of Energy Reduction Projects (b,c)	1,000 GJ	-	919	106	131	175	244

Carbon (a)							
Type	Unit	2007	2012	2013	2014	2015	2016
Total Carbon Combustion On-site (Scope 1) (f)	1,000 MT CO ₂ Eq	126	98	101	96	103	94
Natural Gas	1,000 MT CO ₂ Eq	104	70	71	67	71	62
Diesel	1,000 MT CO ₂ Eq	22	27	29	29	32	31
Propane	1,000 MT CO ₂ Eq	-	0.63	1	1	1	1
Total Carbon Purchased Energy (Scope 2) (g)	1,000 MT CO ₂ Eq	290	287	263	258	266	198
Electricity	1,000 MT CO ₂ Eq	284	283	259	254	263	195
Steam	1,000 MT CO ₂ Eq	6	4	4	4	3	3
Total Carbon from Energy	1,000 MT CO ₂ Eq	416	385	363	354	369	291
Total Carbon Normalized to Net Sales	1,000 MT CO ₂ Eq/\$B net sales	29.1	23.1	20	18	18	13
Total Carbon Normalized to Total Energy	MTCO ₂ Eq/GJ	0.095	0.100	0.095	0.10	0.097	0.082
Confirmed Results of CO ₂ Reduction Projects (b,c)	1,000 MT CO ₂ Eq	-	84	8	10	13.5	20.2

SUMMARY OF ENVIRONMENTAL DATA

Other Carbon (h)							
Type	Unit	2007	2012	2013	2014	2015	2016
Carbon US Sales Fleet (Scope 1)	1,000 MT CO ₂ Eq	13	15	16	13	13	16
Carbon US Sales Fleet Emissions Avoided (Scope 1) (o)	1,000 MT CO ₂ Eq	-	4	1	2	2.3	2
Carbon Executive Air Fleet (Scope 1)	1,000 MT CO ₂ Eq	5	6	5	5	6	6
Carbon from Fugitive Refrigerant Emissions (Scope 1)	MT CO ₂ Eq	-	-	4,231	5,499	3,958	1,637
Carbon Business Travel - Commercial (Scope 3) (i,j)	1,000 MT CO ₂ Eq	-	65	67	65	74	78
Carbon from Amgen Materials Transportation (Scope 3) (i,j)	1,000 MT CO ₂ Eq	-	25	27	25	29	24

Water (a)							
Type	Unit	2007	2012	2013	2014	2015	2016
Total Water Withdrawal (k,c)	1,000 CM	3,286	2,720	2,725	2,487	2,520	2,351
Municipal	1,000 CM	3,249	2,707	2,712	2,482	2,453	2,341
Other - (Reservoir) Trucked In	1,000 CM	8	-	-	-	-	-
Ground	1,000 CM	29	13	13	5	68	10
Total Water Withdrawal Normalized to Net Sales	1,000 CM/\$B net sales	230	163	150	129	120	107
Water Fate (k)	1,000 CM	-	2,720	2,739	2,487	2,512	2,335
Consumed Into Products	1,000 CM	-	21	21	28	71	28
Lost to Evaporation	1,000 CM	-	713	684	657	736	603
Discharged to Treatment	1,000 CM	-	1,662	1,758	1,551	1,449	1,495
Discharged Directly to Environment	1,000 CM	-	324	276	250	256	210
Recycled	1,000 CM	-	535	655	525	759	642
Percentage of Water Recycled per Total Water Withdrawal	%	-	20	24	21	30	28
Confirmed Results of Water Reduction Projects (b)	1,000 CM	-	686	19	36	142	203

SUMMARY OF ENVIRONMENTAL DATA

Waste (a, c)							
Type	Unit	2007	2012	2013	2014	2015	2016
Recycling Rate (l)	%	34.9	52.8	51.3	50.4	52.1	54
Total Routine Waste	MT	10,146	9,018	8,780	8,929	10,054	10,330
Hazardous Waste	MT	1,343	1,180	1,157	1,113	1,455	1,815
Recycled	MT	251	245	105	84	190	286
Incinerated for Energy Recovery	MT	375	347	402	387	447	683
Incinerated Not for Energy Recovery	MT	523	422	468	473	683	726
Landfilled	MT	118	126	147	132	102	94
Treated (m)	MT	76	40	36	38	33	27
Nonhazardous Waste	MT	8,803	7,838	7,623	7,816	8,599	8,515
Composted	MT	260	583	532	628	947	814
Reused	MT	32	44	274	178	153	159
Recycled	MT	2,999	3,890	3,583	3,610	3,945	4,258
Incinerated for Energy Recovery	MT	432	576	604	605	700	762
Incinerated Not for Energy Recovery	MT	194	79	48	88	259	188
Landfilled	MT	4,885	2,662	2,530	2,661	2,543	2,273
Treated (m)	MT	-	4	52	47	52	61
Total Routine Waste Normalized to Net Sales	MT/\$B net sales	709	542	483	462	480	472
Total Nonroutine Waste (n)	MT	31,415	16,902	8,452	3,722	2,253	4,529
Confirmed Results of Routine Waste Reduction Projects (b)	MT	-	1,094	320	441	688	850

Fleet							
Type	Unit	2007	2012	2013	2014	2015	2016
US Sales Fleet Fuel Efficiency	MPG-US	19	23	25	26	27	26
US Sales Fleet Fuel Use Avoided (o)	1,000 GL	-	427	104	289	498	704
US Sales Fleet Fuel Use	1,000 GL	1,498	1,739	1,738	1,381	1,414	1,750

Compliance (a)							
Type	Unit	2007	2012	2013	2014	2015	2016
Environmental Notices of Violation (NOVs) (p)	1 NOV	8	2	2	6	0	1

SUMMARY OF ENVIRONMENTAL DATA - NOTES

General

(a)	Amgen has included data from 19 facilities covering energy and carbon, water and waste. The facilities represent approximately 94 percent of Amgen’s worldwide facility space based on total square feet. Included facilities are in Thousand Oaks, California, U.S.; West Greenwich, Rhode Island, U.S.; Longmont, Colorado, U.S.; Bothell, Washington, U.S.; Juncos, Puerto Rico, U.S.; Louisville, Kentucky, U.S.; South San Francisco, California, U.S.; Cambridge and Woburn, Massachusetts, U.S.; Burnaby, Canada; Breda, Netherlands; Dun Laoghaire, Ireland; Uxbridge, Abingdon and Cambridge, United Kingdom; São Paulo, Brazil; Yenibosna and Sekerpinar, Turkey; and Tuas, Singapore. This includes leased buildings where we have operational control over building infrastructure, including utilities.
(b)	Measurement and verification of conservation and reduction projects for energy and carbon, water and waste are based on adaptation of the International Performance Measurement and Verification Protocol (IPMVP), Concepts and Options for Determining Energy and Water Savings Volume 1, EVO 10000-1.2007, April 2007. Project measurements are conducted using reasonable means, including direct measurements and scientific estimations as appropriate. Values for conservation and reduction projects represent year-over-year, cumulative and continuing avoidance based on a 2007 baseline, then rebaselined in 2012 to match the next-generation 2020 Target design. Results from conservation and reduction projects from sites in Brazil, Turkey and Singapore are not included in the 2016 data.
(c)	Immaterial changes to 2007–2016 data may have occurred due to refinements in calculations. All changes have been confirmed through a documented change control process.

Energy

(d)	Direct energy use results from the operation of equipment that is owned or controlled by Amgen at the facilities listed in note (a). Data on the use of natural gas, propane and diesel in boilers, furnaces and HVAC are recorded from utility bills or purchase records. Data on the use of diesel in emergency generators are recorded from purchase records or meter readings and, in some cases, estimated from run-hours. Utility bills recorded in units of volume are converted to energy by using the Global Reporting Initiative Version 3.1, EN3 table, to convert volumes of primary sources (natural gas, diesel), or from specific fuel analysis data (diesel used in Juncos, Puerto Rico), and the U.S. Energy Information Administration/Annual Energy Review Table A1 (propane). Energy from emergency generators recorded as run-hours is estimated using the manufacturer’s specified fuel-feed rate for each generator.
(e)	Indirect energy use results from purchased energy in the forms of electricity and steam at the Amgen facilities listed in note (a). Data on the use of electricity and steam are recorded from utility bills. Utility bills for purchased steam that are recorded in units of mass (i.e., “lb steam”) are converted to energy based on conversion factors provided by the supplier.

Carbon

(f)	Scope 1 carbon emissions result from direct energy sources defined in note (d). Additional Scope 1 Carbon emissions from our U.S. sales fleet, executive air fleet and fugitive emissions from chillers, coolers and HVAC are found in the Other Carbon category in this data summary. Carbon data from natural gas sources are calculated using regional specific emission factors from U.S. EPA Rule Part 98A Table C-3 (U.S. weighted average) for all U.S. sites; from the Ireland UFCCC for Amgen’s facility in Dun Laoghaire, Ireland; from U.K. Defra/DECC’s 110819 Guidelines for Amgen’s facilities in the United Kingdom (Uxbridge, Abingdon and Cambridge); from the NL Agency standard CO2 emission factors for Amgen’s facility in the Netherlands (Breda); and from the Methodology for Reporting 2013 Ministry of Environment Victoria, B.C., 2013, for Amgen’s facility in Burnaby, Canada. Carbon emissions data from propane and diesel fuel sources (except Amgen’s facility in Juncos, Puerto Rico) are calculated using the Greenhouse Gas Protocol Cross-Sector Tools-Stationary Combustion-V.1.0 (August 2012). Carbon from diesel use in Amgen’s Juncos, Puerto Rico, facility are calculated using specific fuel analysis information and from U.S. EPA Rule Part 98A Table C-1. Carbon data from direct energy sources prior to 2011 were calculated using emission factors from the Greenhouse Gas Protocol Cross-Sector Tools-Stationary Combustion-V.1.0 (July 2009). Scope 1 emissions that are not included in this data summary include process-related emissions from cell respiration (carbon as a by-product) and pH adjustments (CO2 injection). Analysis of these sources in 2013 showed that cell respiration and emissions from pH adjustments are negligible (less than 0.1 percent of our total carbon emissions).
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SUMMARY OF ENVIRONMENTAL DATA - NOTES

Carbon (continued)

- (g) Scope 2 carbon emissions result from indirect energy sources defined in note (e). Carbon data from purchased electricity are calculated using emission factors from U.S. EPA eGRID 2014 version 2 for all U.S. locations except Amgen's facility in Puerto Rico, which has been determined by the 2017 Climate Registry Emissions Factors for non-eGRID U.S. territories; from the Greenhouse Gas Division, Environment Canada (2006 data)-V.1.0 (April 2009) for Amgen's facility in Burnaby, Canada; from specific utility annual providers' reports for Amgen facilities in the United Kingdom (Uxbridge, Abingdon and Cambridge), the Netherlands (Breda), and Dun Laoghaire, Ireland; and from 2017 Climate Registry Emissions Factors for facilities in Turkey, Brazil and Singapore. Carbon data from purchased steam are calculated using the utility bills for purchased steam that are recorded in units of mass (i.e., "lb steam") and are converted to energy and carbon based on conversion factors provided by the supplier for Amgen's facility in Cambridge, Massachusetts. Carbon data from indirect energy sources prior to 2011 were calculated using emission factors from U.S. EPA eGRID2007 Version 1.1 for U.S. facilities.

Other Carbon

- (h) The Other Carbon category contains additional Scope 1 and Scope 3 carbon emissions that are tracked. Carbon emissions from our executive air fleet are calculated using emission factors from the Greenhouse Gas Protocol Cross-Sector Tools-Transport-Fuel-Use (August 2012). Carbon emissions from our U.S. sales fleet are calculated using emission factors from the GHG Protocol Emission Factors for Petrol passenger cars (volume) (GHG Protocol) = 8.81 kg/gal. Fuel use and mileage data are collected at the pump for each vehicle. Carbon emissions from our commercial business travel are calculated by Amgen's travel provider using the Defra tool. Carbon emissions from Amgen's material transportation have been provided by the carrier using its own specific methods. Fugitive emissions from process equipment (e.g., refrigerant from refrigeration and HVAC equipment) are calculated using emission factors from the Greenhouse Gas Protocol Cross-Sector Tools-Transport-Fuel-Use (August 2012). Processes are in place to maintain chillers, coolers and HVAC equipment to prevent unintended emissions.
- (i) Scope 3 carbon emissions are a consequence of the activities of the company but occur from sources not owned or controlled by the company. Scope 3 carbon emissions that are currently tracked include emissions from Amgen's commercial business travel (air and rail) and material transportation.
- (j) Commercial business travel was not tracked in 2007 or 2008. Material transportation was not tracked from 2007 to 2011. The accuracy of carbon emissions tracking from chillers, coolers, and HVAC improved in 2013 and will now be reported going forward.

Water

- (k) Immaterial discrepancy between values for total water fate and total water withdrawal is due to rounding and compilation of individual facility totals.

Waste

- (l) The recycle rate is the total routine recycled, composted and reused weight divided by the total weight of routine waste.
- (m) Treatment means the physical, thermal, chemical or biological processes that change the characteristics of the waste in order to reduce its volume or hazardous nature, facilitate its handling or enhance recovery.
- (n) Nonroutine waste constitutes waste generated outside the normal operations of our facilities and consists mainly of construction and demolition waste.

Fleet

- (o) Emissions and fuel use avoided are the result of improvements in fleet efficiency from years 2007 through 2012 based on a 2007 baseline and years 2013+ based on a 2012 baseline.

Compliance

- (p) Environmental notices of violation (NOVs) reported that resulted from agency inspections.

SUMMARY OF ENVIRONMENTAL DATA - ASSURANCE



INDEPENDENT ASSURANCE STATEMENT

Introduction and objectives of work

Bureau Veritas North America, Inc. (BVNA) has been engaged by Amgen to conduct an independent assurance of selected environmental and safety data.

This Assurance Statement applies to the related information included within the scope of work described below.

The data presented in Amgen's 2016 Responsibility Highlights Report (the Report) and in the Environment and Safety and Wellness sections on amgen.com is the sole responsibility of the management of Amgen. BVNA was not involved in the drafting of content for the Report or for amgen.com. Our sole responsibility was to provide independent verification of the accuracy of selected information included in the Report and on amgen.com.

Scope of work

Amgen requested BVNA to verify the accuracy of the following data summarized in Amgen's Report for the Calendar Year 2016 reporting period:

- Energy Use (Total, Direct and Indirect)
- Greenhouse Gas Emissions (Direct Scope 1 and Indirect Scope 2 location-based)
- Water Withdrawal and Fate
- Waste Quantities and Disposition
- Recordable Case Rate
- Days Away Case Rate
- Environmental Notices of Violation

Excluded from the scope of our work is any verification of information relating to:

- Text or other written statements associated with Amgen's 2016 Responsibility Highlights Report and amgen.com
- Activities outside the defined verification period of Calendar Year 2016

Methodology

As part of its independent verification, BVNA undertook the following activities:

1. Interviews with relevant personnel of Amgen regarding data collection and reporting systems;
2. Review of Amgen's data and information systems and methodology for collection, aggregation, analysis and internal audit of information used to determine the environmental and safety data;
3. Review of documentary evidence produced by Amgen;
4. Audit of Amgen's data traced back to the source during site visits to facilities located in Dublin, Ireland and San Francisco, California; and
5. Review of the centralized data, methods for consolidation of site data and site data available in the centralized data management system during a visit to Amgen's headquarters location in Thousand Oaks, California.

SUMMARY OF ENVIRONMENTAL DATA - ASSURANCE

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Our assurance work was conducted in accordance with Bureau Veritas procedures based on the International Standard on Assurance Engagements (ISAE) 3000 and ISO Standard 14064-3 Greenhouse Gases - Part 3: Specification with Guidance for the Validation and Verification of Greenhouse Gas Assertions. In accordance with our internal procedures for limited assurance, we use these as our reference standards.

The work was planned and carried out to provide data verification to a limited assurance level and we believe it provides an appropriate basis for our conclusions.

Our conclusions

On the basis of our methodology and the activities described above:

- Nothing has come to our attention to indicate that the reviewed information within the scope of our verification is not materially correct.
- Nothing has come to our attention to indicate that the reviewed information is not a fair representation of the actual environmental and safety data for calendar year 2016.
- It is our opinion that Amgen has established appropriate systems for the collection, aggregation and analysis of quantitative data within the scope of this assurance.

A summary of data within the scope of assurance for 2016 is attached.

Statement of independence, impartiality and competence

BVNA is part of The Bureau Veritas Group, an independent professional services company that specializes in Quality, Health, Safety, Social and Environmental management with almost 180 years of history in providing independent assurance services, and an annual 2016 revenue of 4.55 Billion Euros.

No member of the verification team has a business relationship with Amgen, its Directors or Managers beyond that required of this assignment. We have conducted this verification independently, and there has been no conflict of interest.

BVNA has implemented a Code of Ethics across the business to maintain high ethical standards among staff in their day to day business activities.

Attestation:

Lisa S. Barnes, Lead Verifier
Practice Line Leader
Sustainability and Climate Change Services
Bureau Veritas North America, Inc.
Denver, Colorado

April 14, 2017

John Rohde, Project Reviewer
Senior Project Manager
Sustainability and Climate Change Services
Bureau Veritas North America, Inc.

SUMMARY OF ENVIRONMENTAL DATA - ASSURANCE

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Summary of 2016 Data Subject to Assurance

Metric Type	Units ⁽¹⁾	2016 ⁽²⁾
Total Combustion On-site (Direct)	1,000 GJ	1,660
Natural Gas	1,000 GJ	1,207
Diesel	1,000 GJ	443
Propane	1,000 GJ	9
Total Purchased Energy (Indirect)	1,000 GJ	1,876
Fossil Fuel	1,000 GJ	1,314
Nuclear	1,000 GJ	148
Renewables	1,000 GJ	400
Nonspecified	1,000 GJ	13
Total Energy	1,000 GJ	3,535
Total Carbon Combustion On-site (Scope 1 GHG emissions)	1,000 MT CO2Eq	94
Natural Gas	1,000 MT CO2Eq	62
Diesel	1,000 MT CO2Eq	31
Propane	1,000 MT CO2Eq	1
Total Carbon Purchased Energy (Scope 2 GHG emissions – location based)	1,000 MT CO2Eq	198
Electricity	1,000 MT CO2Eq	195
Steam	1,000 MT CO2Eq	3
Total Carbon From Energy	1,000 MT CO2Eq	291
Total Carbon Normalized to Total Energy	MTCO2Eq/GJ	0.082
Carbon U.S. Sales Fleet (Scope 1)	1,000 MT CO2Eq	16
Carbon Executive Air Fleet (Scope 1)	1,000 MT CO2Eq	6
Carbon From Fugitive Refrigerant Emissions (Scope 1)	MT CO2Eq	1,637
Total Water Withdrawal	1,000 CM	2,351
Municipal	1,000 CM	2,341
Other - (Reservoir) Trucked In	1,000 CM	-
Ground	1,000 CM	10
Water Fate	1,000 CM	2,335
Consumed Into Products	1,000 CM	28
Lost to Evaporation	1,000 CM	603
Discharged to Treatment	1,000 CM	1,495
Discharged Directly to Environment	1,000 CM	210
Recycled	1,000 CM	642
Percentage of Water Recycled per Total Water Withdrawal	%	28%
Waste Recycling Rate (includes routine waste recycled, reused, composted and treated)	%	54%
Total Routine Waste	MT	10,330
Routine Hazardous Waste	MT	1,815
Recycled	MT	286
Incinerated for Energy Recovery	MT	683

SUMMARY OF ENVIRONMENTAL DATA - ASSURANCE

Amgen



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Metric Type	Units ⁽¹⁾	2016 ⁽²⁾
Incinerated Not for Energy Recovery	MT	726
Landfilled	MT	94
Treated	MT	27
Routine Nonhazardous Waste	MT	8,515
Composted	MT	814
Reused	MT	159
Recycled	MT	4,258
Incinerated for Energy Recovery	MT	762
Incinerated Not for Energy Recovery	MT	188
Landfilled	MT	2,273
Treated	MT	61
Total Nonroutine Waste	MT	4,529
U.S. Sales Fleet Fuel Efficiency	MPG	26.1
U.S. Sales Fleet Fuel Use	1,000 GL	1,750
Injury and Illness Rate	Recordable Cases per 100 Employees	0.43
Lost Day Case rate	Lost Day Cases per 100 Employees	0.14
Environmental Notices of Violation	number	1

⁽¹⁾ Unit abbreviations:
 GJ= gigajoules
 MT CO2Eq = metric tons of carbon dioxide equivalents
 CM = cubic meters
 MT = metric tons
 MPG = miles per gallon
 GL = gallons

⁽²⁾ Numbers in this table have been rounded