2016 GRI Performance Indicators

Environmental Performance

GRI Indicator	Indicator Title	2014	2015	2016
Aspect: Materials				
G4-EN1	Materials used by weight or volume: Uncoated copy and printing paper only (pounds)	119,963	114,111	116,521
G4-EN2	Percentage of materials used that are recycled input materials: Uncoated copy and printing paper only	98%	97%	96%
Aspect: Energy				
G4-EN3	Energy consumption within the organization (kBtu)	494,519,851	450,252,702	447,834,483
	a. Fuel consumption from non-renewable sources	149,293,761	124,855,724	126,545,486
	Natural gas	137,089,500	111,859,764	115,853,400
	Propane	355,409	247,449	340,869
	Gasoline (equip't)	103,250	123,750	72,838
	Diesel (equip't)	398,763	387,250	480,323
	Jet Fuel	5,982,660	7,766,010	5,167,395
	Gasoline (vehicles)	2,918,804	2,689,400	2,805,475
	Diesel (vehicles)	1,026,064	903,667	1,040,917
	E85 (vehicles)	1,419,312	878,435	784,268
	b. Fuel consumption from renewable fuel sources	0	0	0
	c. Purchased electricity, heating, cooling, steam	344,704,281	324,788,280	320,665,207
	d. Self-generated electricity, heating, cooling, steam	521,809	608,697	623,790
	e. Energy sold	0	0	0
G4-EN4	Energy consumption outside of the organization			
	Business air travel (passenger miles)	65,830,475	68,822,299	74,447,745
	Business ground travel (miles reimbursed)	978,256	1,129,446	1,081,193
	Business ground travel (rental car miles)	37,348	37,895	33,538
G4-EN5	Energy intensity of all buildings on campus (kbtu/ft^2)	180	168	167
G4-EN6	Reduction of energy consumption	We calculate estimated energy savings relative to investment prior to implementing energy conservation measures. We only perform measurement and verification of major retrofits implemented through Energy Savings Performance Contracts due to the complexity of tracking these measures. See our <<Site Sustainability Plans>> for some of key the energy conservation measures we implemented in our facilities during FY2017.		
G4-EN7	Reductions in energy requirements of products and services	PNNL sells contract research services that produce technical information for use by others. We do not manufacture or sell physical products. There are no direct environmental impacts associated with the direct use of our research. Impacts associated with the production of this research are captured in other environmental performance indicators.		
Other-Energy Use[1]	Energy consumption subject to DOE energy use intensity (EUI) reduction goal (kBtu)	331,743	301,474	304,421
Other-SF[2]	Square footage subject to DOE EUI reduction goal (kft^2)	1,823	1,800	1,823
Other-EUI[3]	Energy intensity of buildings in the DOE EUI reduction goal (kbtu/ft^2)	182	167	167
Aspect: Water				
G4-EN8	Total water withdrawal (gallons)	652,359,189	512,606,153	514,245,939
	Municipal water	55,482,837	53,668,000	51,451,326
	River water	588,631,227	456,709,629	460,451,232
	Ground (well) water	8,245,125	2,228,524	2,343,381
G4-EN9	Water sources significantly affected by withdrawal of water	None	None	None
G4-EN10[4]	Percentage and total volume of water recycled and reused	43%, or 280.5 million gallons	63%, or 288.6 million gallons	64%, or 293.9 million gallons
Other-WUI[5]	Potable water use intensity (WUI) subject to DOE reduction goal (gallons/ft^2)	26	23	24
Other-ILA[6]	Water used for industrial, landscaping, and irrigation (ILA) (gallons) subject to DOE reduction goal	184,146,000	168,235,000	166,614,000
Aspect: Biodiversity				
G4-EN11	Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	PNNL features a network of facilities that house offices and laboratories. The PNNL site occupies about 378 acres (1.5 km^2) and is located in the Columbia Plateau ecoregion of south-central Washington State, just south of the U.S. Department of Energy (DOE) Hanford Site (586 square miles or 1,518 km^2), on the north end of the City of Richland adjacent to the Columbia River. The PNNL campus lies several miles south of the Hanford Reach National Monument (HRNM), which protects the Hanford Reach of the Columbia River and the remaining surrounding shrub-steppe ecosystem that once blanketed the Columbia Plateau. The HRNM occupies about 305 square miles (790 km^2) and is managed jointly by the U.S. Fish and Wildlife Service (USFWS) and DOE. The Columbia River harbors three fish species listed under the federal Endangered Species Act of 1973, two that occur regularly in the Hanford Reach (spring-run Chinook salmon [Oncorhynchus tshawytscha] and steelhead [Oncorhynchus mykiss]), and one that occurs on a transient basis (bull trout [Salvelinus confluentus]). Thirteen plant species and four bird species currently listed as either endangered or threatened by the Washington State Department of Fish and Wildlife (WDFW) occur or potentially occur on the Hanford Site. Shrub-steppe and Columbia River riparian habitat exist over a majority of the undeveloped portion of the PNNL site. This shrub-steppe area is approximately 306 acres (1.23 km^2). Shrub-steppe is listed as a priority habitat by the WDFW. Shrub-steppe has unique value to sagebrush obligate species such as the sage sparrow (Amphispiza belli) and sagebrush vole (Lemmiscus curtatus). There are currently no species federally listed or state-listed as threatened or endangered that are known to occur on the PNNL site.		

Environmental Performance (cont'd)

GRI Indicator	Indicator Title	2014	2015	2016
		PNNL's Marine Sciences Laboratory (MSL) features general-purpose, analytical, and wet lab space on a campus covering 150 acres (0.61 km²) located in the Puget Lowland ecoregion on Sequim Bay in Washington's Puget Sound. MSL is located several miles from the Protection Island Aquatic Reserve (23,778 acres, 9,623 hectares) and managed by the Washington State Department of Natural Resources for environmental, scientific, and educational purposes. The reserve encompasses 364-acre (147-hectare) Protection Island, the larger portion of which is operated by the USFWS as a National Wildlife Refuge, the other part of which consists of 48 acres (19 hectares) managed by the WDFW as the Zella M. Schultz Seabird Sanctuary. In addition, the USFWS manages a 343-acre (139-hectare) marine buffer area located within 200 yards (183 meters) around the perimeter of Protection Island. The island and buffer area support large nesting seabird and seal populations. The MSL campus supports a nesting area for bald eagles (Haliaeetus leucocephalus).		
G4-EN12	Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas	Field biological survey completed in August, 2014. No significant changes to baseline ecological conditions that had not been previously accounted for where identified.	Field biological survey completed in June, 2015. No significant changes to baseline ecological conditions that had not been previously accounted for where identified.	The annual field biological survey of the PNNL site was completed in June, 2016. The vegetation map for the PNNL site was improved and updated, but no significant changes to baseline ecological conditions that had not been previously accounted for where identified.
G4-EN13	Habitats protected or restored	PNNL is contracting through the National Fish and Wildlife Federation to restore habitat within Benton County, Washington as mitigation for approximately 16 acres of sagebrush steppe habitat that was lost to allow construction of the Physical Sciences Facilities on the PNNL Site. Initial field work by the partnering agency is expected to start during the fall of 2015.	PNNL is contracting through the National Fish and Wildlife Federation to restore habitat within Benton County, Washington as mitigation for approximately 16 acres of sagebrush steppe habitat that was lost to allow construction of the Physical Sciences Facilities on the PNNL Site. The USFWS is the partnering agency and started initial work during the fall of 2015.	PNNL is contracting through the National Fish and Wildlife Federation to restore habitat on the Arid Lands Ecology Reserve in Benton County, Washington as mitigation for approximately 16 acres of sagebrush steppe habitat that was lost to allow construction of the Physical Sciences Facilities on the PNNL Site. The USFWS is the partnering agency and started initial work during the fall of 2015, planting of sagebrush seedlings at the restoration sites will commence in mid-November 2016.
G4-EN14	Number of IUCN Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk	Species listed as endangered, threatened, candidate, or of concern to the USFWS, the National Marine Fisheries Service, WDFW, or Washington Department of Natural Resources are listed in Chapter 1 of the PNNL Annual Site Environmental Report (PNNL-23523). Most of the listed species or species of concern at the PNNL site and the MSL site either have not been evaluated for the IUCN Red list or are listed as "least concern." The Townsend's ground squirrel (Spermophilus townsendii), which occurs on or near the PNNL site, is listed as "vulnerable" and the western toad (Anaxyrus boreas), which occurs at MSL, is listed as "near threatened."	Species listed as endangered, threatened, candidate, or of concern to the USFWS, the National Marine Fisheries Service, WDFW, or Washington Department of Natural Resources are listed in Chapter 1 of the PNNL Annual Site Environmental Report (PNNL-24668). Most of the listed species or species of concern at the PNNL site and the MSL site either have not been evaluated for the IUCN Red list or are listed as "least concern." The Townsend's ground squirrel (Spermophilus townsendii), which occurs on or near the PNNL site, is listed as "vulnerable".	Species listed as endangered, threatened, candidate, or of concern to the USFWS, the National Marine Fisheries Service, WDFW, or Washington Department of Natural Resources are listed in Chapter 1 of the PNNL Annual Site Environmental Report (PNNL-25738). Most of the listed species or species of concern at the PNNL site and the MSL site either have not been evaluated for the IUCN Red list or are listed as "least concern." The Townsend's ground squirrel (Spermophilus townsendii), which occurs on or near the PNNL site, is listed as "vulnerable". PNNL prepares biological assessments and works with the USFWS and /or the National Marine Fisheries Service to evaluate potential impacts of proposed PNNL research and other activities to species listed under the federal Endangered Species Act.
Aspect: Emissions				
G4-EN15	Direct greenhouse gas (GHG) emissions (Scope 1) ($MTCO_2e$)	11,326	10,067	11,455
G4-EN16	Energy indirect GHG emissions (Scope 2) ($MTCO_2e$)	39,726	36,470	29,443
G4-EN17	Other indirect GHG emissions (Scope 3) ($MTCO_2e$)	23,637	24,279	22,804
G4-EN18[7]	GHG emissions intensity			
	Scope 1 & 2 emissions (lbs of CO_2e) per dollar of operating budget	0.11	0.11	0.10
	Scope 3 ($MTCO_2e$) per employee	6.0	6.1	5.1
G4-EN19	Reduction of GHG emissions	Most of PNNL's scope 1 and 2 GHG emissions are from energy use in our buildings, therefore initiatives to manage these emissions focus on building energy conservation measures. Scope 3 emissions are managed through efforts to reduce commute and business travel. See Focus Areas and Goals for total reductions in building energy use and scope 1, 2, and 3 GHG emissions. Specific conservation measures are described in the annual Site Sustainability Plans. GHG emission reporting is done in accordance with the Revised Federal Greenhouse Gas Accounting and Reporting Guidance and includes CO_2, CH_4, N_2O, HFCs, PFCs, and SF^6.		

Environmental Performance (cont'd)

GRI Indicator	Indicator Title	2014	2015	2016
G4-EN20	Emissions of ozone-depleting substances by weight (in CFC-11 Equivalent, Tonnes)	0.0276	0.0048	0.0028
	R12	0.018866	0.000454	0.00021
	R22	0.006139	0.002689	0.00187
	R123	0	0.00166	0.00054
	403B	0	0	0
	414B	0	0	0.000179
	502	0	0	0
Other-Scope1&2[8]	Direct (Scope 1) and energy indirect (Scope 2) GHG emissions subject to DOE reduction goals, before renewable energy credits ($MTCO_2e$)	50,699	46,537	40,898
Other-Scope1&2_RECs[9]	Direct (Scope 1) and energy indirect (Scope 2) GHG emissions subject to DOE reduction goals, after renewable energy credits ($MTCO_2e$)	18,030	0	12,609
Other-Scope3[10]	Other indirect GHG emssions (Scope 3) subject to DOE reduction goals ($MTCO_2e$)	21,463	21,190	22,804
G4-EN21	NOx, SOx, and other significant air emissions by type and weight (Kg)			
	NOx	4,336	3,671	3,694
	SO_2	39	33	33
	VOC	978	789	800
	HAPs	385	334	357
	PM	502	429	451
	CO	6,601	5,369	5,723
Aspect: Effluents and Waste				
G4-EN22[11]	Total water discharge by quality and destination (Gallons)	626,346,698	485,980,399	514,245,939
	Discharge to Municipal Sewer	25,282,500	29,134,334	25,435,732
	Discharge to Ground	318,975,300	168,235,575	168,293,098
	Discharge to River	282,088,898	288,610,490	293,876,391
	Discharge to Air	26,012,491	26,625,754	26,640,718
G4-EN23	Total weight of waste by type and disposal method (Tons)			
	Recycled	656	518	646
	Recycled Demolition	533	95	309
	Landfilled	578	629	562
	Compost	31	218	16
	Regulated Hazardous Waste	31	24	34
	Rad-Containing Waste - Landfilled	168	138	295
G4-EN24	Total number and volume of significant spills	0	0	0
G4-EN25	Weight of waste deemed hazardous under the terms of the Basel Convention and percentage of transported waste shipped internationally	0	0	0
G4-EN26	Water bodies and related habitats significantly affected by the organization's discharges of water and runoff	PNNL has a small discharge from Hanford 300 Area Facilities to the Columbia River. This discharge does not meet any criteria requiring a discharge permit therefore it does not have a significant impact on the Columbia River. It is extremely small compared to average flow of the Columbia River, which is not considered to be a sensitive or unusually diverse water body. The MSL has a small permitted discharge into Sequim Bay. This water goes through a multistage treatment process prior to discharge, rendering it insignificant. Sequim Bay is a relatively large receiving water body, connected to the marine environment. It is not considered to be sensitive or unusual in biodiversity, thus this discharge does not significantly affect the receiving water body.		
Other-Waste	Rate of recycling and composting of non-hazardous waste	54%	54%	54%
Aspect: Compliance				
G4-EN29	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations	0	0	0
Aspect: Environmental Grievance Mechanisms				
G4-EN34[12]	Number of grievances about environmental impacts	0	0	0

(1) This is numerator for the EUI reduction goal shown in our scorecard. This represents the portion of energy use reported in G4-EN3 that is subject to our EUI reduction goals established by the Department of Energy for the PNNL campus. Energy-intensive facilities required to meet our research mission (e.g. supercomputer facilities) are exempt from this goal.
(2) This is the denominator for EUI reduction metric.
(3) This is the EUI associated with the EUI reduction goals established by the DOE for the PNNL campus.
(4) The PNNL cooling ponds and the aquatics research program both recycle and reuse process water, which eliminates the need for wastewater treatment.
(5) Water use intensity is not a GRI indicator but is reported here to track progress against our WUI reduction goal established by the Department of Energy for the PNNL campus.
(6) Industrial, landscaping, and irrigation water is not a GRI indicator but is reported here to track progress against our ILA water reduction goal established by the DOE for the PNNL campus. This excludes process water used in the Aquatics Research Lab, and water used by the Battelle farmland, LSL II, BIL, and the Battelle staff association restroom and the ballfield. FY11 is baseline year. While 2010 is the baseline year for federal ILA goals, PNNL was approved by DOE to use 2011 due to a significant Capital Line Item construction effort for eight new buildings.
(7) Use full-time employee equivalents rather than total number of employees.
(8) This is the portion of GHG emissions reported in G4-EN15 and G4-EN16 that is subject to GHG reduction goals established by the DOE for the PNNL campus. Renewable energy credits have not been removed from this value.
(9) This is the portion of GHG emissions reported in G4-EN15 and G4-EN16 that is subject to GHG reduction goals established by the DOE for the PNNL campus. Total emissions have been reduced by purchased renewable energy credits as permitted by the DOE's GHG accounting methodology.
(10) This is the portion of Scope 3 GHG emissions reported in G4-EN 17 that is subject to Scope 3 GHG reduction goals established by the DOE for the PNNL campus. The DOE GHG accounting methodology includes a credit for T&D losses associated with renewable electricity purchases.
(11) Discharge to air represents estimated evaporation from cooling tower and cooling ponds.
(12) PNNL's Environmental Protection and Regulatory Program (EPRP) has a procedure for managing "significant environmental communications" as part of our ISO 14001 Environmental Management System. Grievances may be submitted via a feedback form PNNL's external website, which is accessible from our EMS page. <<http://www.pnnl.gov/ems/env_impacts.asp>>