



Operations



Environmental Protection: A Top Priority Every Day

Protecting Eagles While Generating Carbon-Free Energy

Gas Anti-Theft Team Makes a Difference

Leading the Way on Safety

On the Path to a Lower-Carbon Future

Gas Co-Firing Offers Many Positive Benefits

Collaboration Helps Preserve Shared Water Supply

Keeping Our Infrastructure and Information Secure

Predicting Breakdowns Before They Happen

Coal Plant Retirements

Coal Ash Basin Work Progressing Well

Reliable Power

Carbon-Free Nuclear Yields Another Stellar Year

Environmental Performance Metrics

Natural gas/oil ²			14,252	27.1%
Total higher-carbon	73,146	33.3%	18,159	34.6%
Coal	73,049	33.3%	17,788	33.9%
Oil	97	0.0%	371	0.7%
Pumped-storage hydro ³	(868)	-0.4%	2,140	4.1%
Total	219,422	100.0%	52,557	100.0%

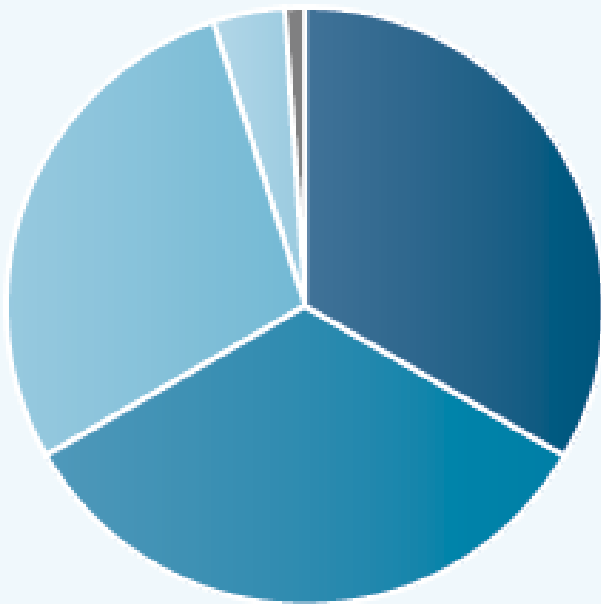
Purchased renewables	7,855	Equivalent to 3.6%	3,354	Equivalent to 6.4%
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1 All data, except for purchased renewables, based on Duke Energy's ownership share of generating plants as of Dec. 31, 2017. Totals may not add up exactly because of rounding.

2 Uses nearly all natural gas. Oil can be used as a backup fuel.

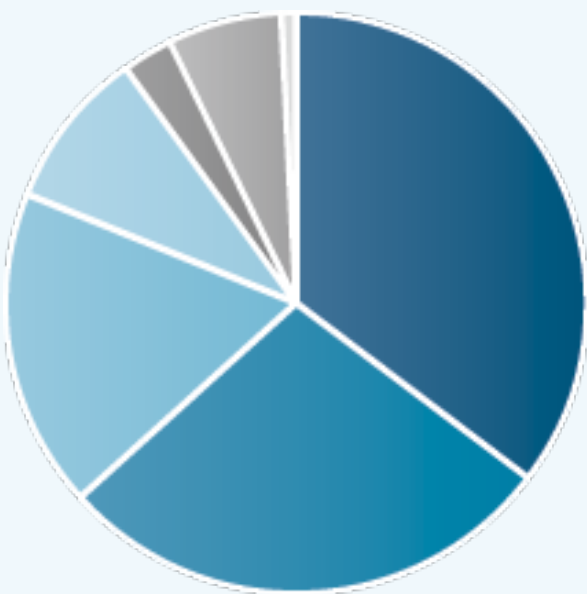
3 Pumped-storage hydro helps meet peak demand and, like other storage technologies, consumes more energy than it produces.

2017 Electricity Generated^{*}



33.7% Nuclear
33.3% Coal
28.4% Natural gas
3.9% Wind/solar
1.0% Conventional hydro
0.0% Oil

2017 Generation Capacity^{*}



33.9% Coal
27.1% Natural gas/oil
16.8% Nuclear
8.7% Natural gas
2.7% Conventional hydro
6.0% Wind/solar
0.7% Oil

^{*} Excludes pumped-storage hydro.

Fuels Consumed For Electric Generation⁴

Since 2008, the use of coal and oil as generation fuels has significantly decreased. These fuels have been replaced primarily by natural gas, mostly because it has become a relatively less expensive fuel and we have

added natural gas generation capacity.

	2008	2015	2016	2017
Coal (million tons)	63.1	32.6	31.7	31.1
Oil (million gallons)	230.6	44.1	29.5	30.1
Natural gas (billion cubic feet)	163.4	501.1	545.2	496.6

4 All data based on Duke Energy's ownership share of generating assets as of the end of each calendar year.

Water Withdrawn and Consumed for Electric Generation (billion gallons)

Water withdrawn is the total volume removed from a water source, such as a lake or a river. Because of the once-through cooling systems on many of our coal-fired and nuclear plants, almost 99 percent of this water is returned to the source and available for other uses. *Water consumed* is the amount of water removed for use and not returned to the source.

	2011	2015	2016	2017
Withdrawn	5,900	5,723	5,341	5,293
Consumed	105	79	74	71
Consumption intensity (gallons per MWh generated)	456	361	337	324

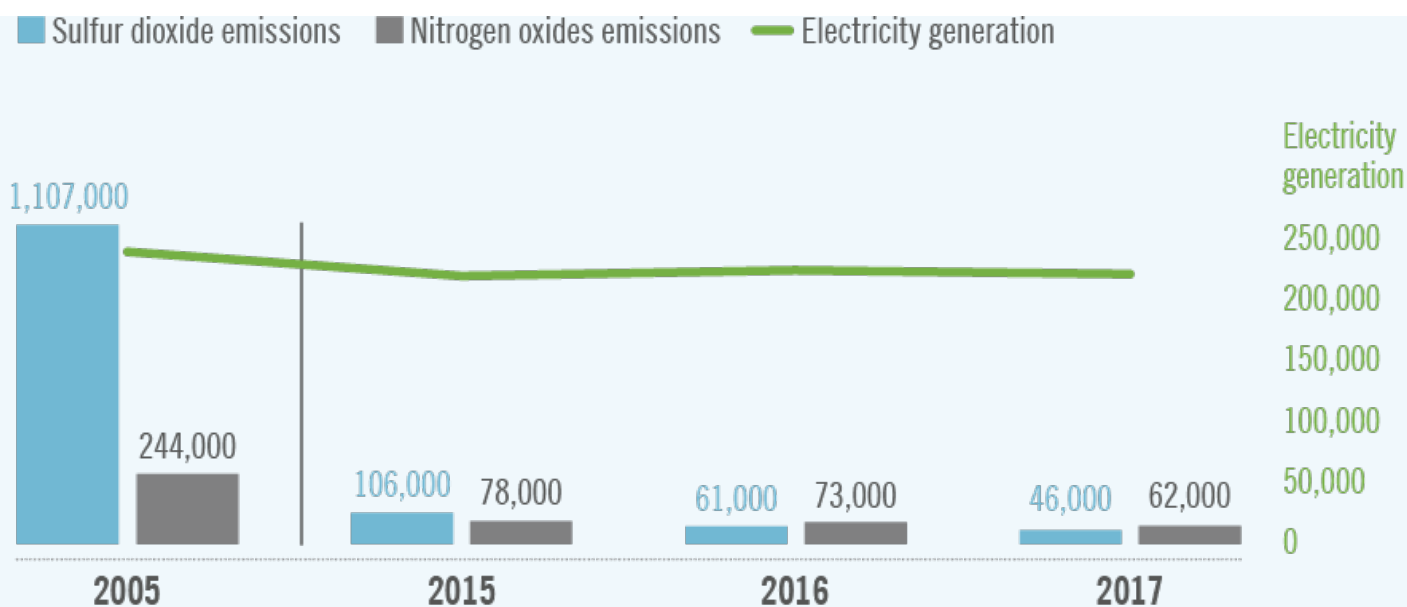
Emissions From Electric Generation⁵

Many factors influence emissions levels and intensities, including generation diversity and efficiency, demand for electricity, weather, fuel availability and prices, and emissions controls deployed. Since 2005, our carbon dioxide (CO₂) emissions decreased by 31 percent, sulfur dioxide (SO₂) emissions decreased by 96 percent and nitrogen oxides (NO_x) emissions decreased by 75 percent. These decreases are primarily due to addition of pollution control equipment, decreased coal generation, increased natural gas generation, and replacement of higher-emitting plants.

	2005	2015	2016	2017
CO₂ emissions (thousand tons)	153,000	109,000	108,000	105,000
CO₂ emissions intensity (pounds per net kWh)	1.29	1.00	0.97	0.96
SO₂ emissions (tons)	1,107,000	106,000	61,000	46,000
SO₂ emissions intensity (pounds per net MWh)	9.3	1.0	0.6	0.4
NO_x emissions (tons)	244,000	78,000	73,000	62,000
NO_x emissions intensity (pounds per net MWh)	2.1	0.7	0.7	0.6
CH₄ emissions (CO ₂ equivalent) (thousand tons)	420	244	236	230
N₂O emissions (CO ₂ equivalent) (thousand tons)	731	416	402	391

5 All data based on Duke Energy's ownership share of generating assets as of Dec. 31, 2017. Totals may not add up exactly due to rounding.

Sulfur Dioxide and Nitrogen Oxides Emissions (tons)⁶ and Electricity Generation (thousand net megawatt-hours)



6 SO₂ and NO_x reported from Duke Energy's electric generation based on ownership share of generating assets.

Methane Emissions from Pipeline Operations (thousand tons)⁷

Methane (CH₄) is the primary component of natural gas, and is a greenhouse gas. We work to minimize methane emissions, but some is released during pipeline operations and maintenance. Duke Energy is a founding partner of the U.S. EPA's Natural Gas Star Methane Challenge program, which is aimed at cost-effective technologies and practices that improve operational efficiency and reduce methane emissions.

	2015	2016	2017
CH ₄ emissions (CO ₂ equivalent)	184	184	248

7 Piedmont Natural Gas is included beginning in 2017.

Sulfur Hexafluoride Emissions from Electric Transmission and Distribution Operations (thousand tons)⁸

Sulfur hexafluoride (SF₆) is an insulating gas used in high-voltage electric transmission and distribution switchgear equipment, and is a greenhouse gas. We work to minimize SF₆ emissions, but some is released during transmission and distribution operations and maintenance.

	2015	2016	2017
SF ₆ emissions (CO ₂ equivalent)	291	570	552

8 SF₆ emissions fluctuations are due to maintenance, replacement and storm repair needs.

Toxic Release Inventory (thousand pounds)⁹

Duke Energy's TRI releases for 2016 were down 84 percent from 2007, primarily due to the significant investments we've made in environmental controls for our power plants, and decreased coal generation. (Data for 2017 will be available in August 2018.)

	2007	2014	2015	2016
Releases to air	97,969	18,297	10,396	6,074
Releases to water	257	152	145	212
Releases to land	22,052	12,948	9,666	9,738
Off-site transfers	155	3,579	1,363	2,628
Total	120,434	34,976	21,570	18,652

9 Data pertain to electric generation facilities Duke Energy owns or operates and where Duke Energy is the responsible reporting party. Totals may not add up exactly due to rounding.

Waste

We met our goal of increasing the percentage of solid waste that is recycled from 69 percent in 2013 to 80 percent in 2018 one year early. (This goal excludes Duke Energy Renewables, which has a relatively small waste stream.)

	2014	2015	2016	2017
Solid waste				
■ Total generated (thousand tons) ¹⁰	85	88	102	109
■ Percent recycled	71%	72%	76%	80%
Hazardous waste generated (tons) ¹¹	48	317	1,195	126
Low-level radioactive waste (Class A, B and C) generated (cubic feet) ¹²	104,636	200,667	193,996	—

10 Weights are estimated based on volumes where necessary. Excludes Duke Energy Renewables which has smaller volumes, and large nonreplicable projects such as plant demolitions. Piedmont Natural Gas is included beginning in 2017.

11 Excludes Duke Energy Renewables. Hazardous waste generation fluctuates mainly due to maintenance projects.

12 Total of Class A, B and C waste disposal as reported to the Nuclear Regulatory Commission. Crystal River Unit 3 is not included in these statistics, because it is not part of the operating fleet, and is retired. Data for 2017 will be available later in 2018.

Reportable Oil Spills¹³

Oil spills include releases of lubricating oil from generating stations, leaks from transformers, or damage caused by weather or by third parties (typically because of auto accidents).

	2014	2015	2016	2017
Spills	26	23	23	18
Gallons	12,006	3,425	3,970	728

13 Excludes Piedmont Natural Gas.

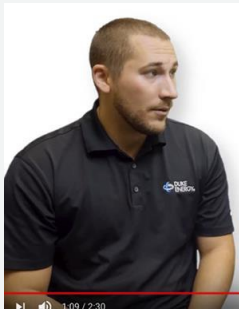
Environmental Regulatory Citations¹⁴

Fines/penalties were relatively large in 2015 because of the May 2015 coal ash enforcement agreement; and in 2016 because of a 2014 oil spill at the Beckjord Station in Ohio, and a 2014 coal ash spill. See the “Legal Cases Resolved” article in the 2015 Sustainability Report.

	2014	2015	2016	2017
Citations	33	9	9	10
Fines/penalties (dollars)	\$236,058	\$114,585,735	\$7,114,090	\$19,797

14 Includes international and U.S. federal, state and local citations and fines/penalties.

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