

## Environmental Performance Metrics

### 2019 Electricity Generated and Generation Capacity<sup>1</sup>

	Electricity Generated (net megawatt-hours)		Generation Capacity (megawatts)	
	MWh (thousands)	Percent	MW	Percent
<b>Total Carbon-Free</b>	<b>85,885</b>	<b>39.7%</b>	<b>12,710</b>	<b>23.8%</b>
Nuclear	73,948	34.2%	8,889	16.7%
Wind	6,468	3.0%	1,457	2.7%
Conventional hydro	3,235	1.5%	1,357	2.5%
Solar	2,234	1.0%	1,007	1.9%
<b>Total Lower-Carbon</b>	<b>74,864</b>	<b>34.6%</b>	<b>20,261</b>	<b>38.0%</b>
Natural gas	74,834	34.6%	20,257	38.0%
Biomass	30	0.0%	4	0.01%
<b>Total Higher-Carbon</b>	<b>56,371</b>	<b>26.0%</b>	<b>18,264</b>	<b>34.2%</b>
Coal	56,276	26.0%	16,989	31.8%
Oil	95	0.0%	1,275	2.4%
Pumped-Storage Hydro <sup>2</sup>	(714)	(0.3)%	2,140	4.0%
<b>Total</b>	<b>216,406</b>	<b>100%</b>	<b>53,375</b>	<b>100%</b>
<b>Purchased Renewables</b>	<b>9,407</b>	<b>Equivalent to 4%</b>	<b>4,298</b>	<b>Equivalent to 8%</b>

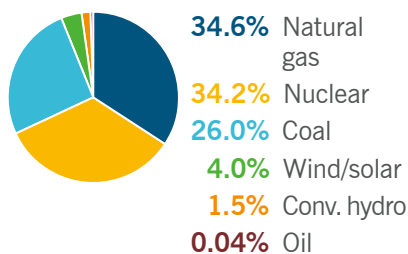
<sup>1</sup> All data, except for purchased renewables, based on Duke Energy's ownership share of generating plants as of December 31, 2019. Totals may not add up exactly because of rounding.

<sup>2</sup> Pumped-storage hydro helps meet peak demand and, like other storage technologies, consumes more energy than it produces.

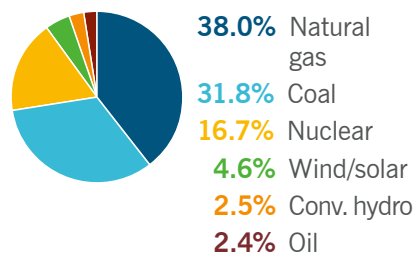
### 2019 electricity generated and generation capacity

Duke Energy has a diverse, increasingly clean generation portfolio. Almost 40 percent of the electricity we generated in 2019 was from carbon-free sources, including nuclear, wind, hydro and solar. Almost 35 percent was from lower-carbon natural gas, which emits about half as much carbon dioxide as coal when used for electric generation. The remaining 26 percent was from higher-carbon coal and oil. Taken together, owned and purchased renewables are equivalent to over 9 percent of our MWh generation. Duke Energy Renewables sells the electricity and/or Renewable Energy Certificates (RECs) it generates to its customers.

### 2019 Electricity Generated<sup>1</sup>



### 2019 Generation Capacity<sup>1</sup>



<sup>1</sup> Excludes pumped-storage hydro.

### Fuels Consumed For Electric Generation<sup>1</sup>

	2008	2017	2018	2019
Coal (million tons)	63.1	31.1	29.3	<b>24.3</b>
Oil (million gallons)	230.6	30.1	64.9	<b>26.0</b>
Natural gas (billion cubic feet)	163.4	496.6	610.3	<b>567.1</b>

<sup>1</sup> All data based on Duke Energy's ownership share of generating assets as of the end of each calendar year.

### Fuels consumed for electric generation

Since 2008, the use of coal and oil as generation fuels has significantly decreased. These fuels are being replaced by natural gas and renewables.

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## Water Withdrawn and Consumed for Electric Generation

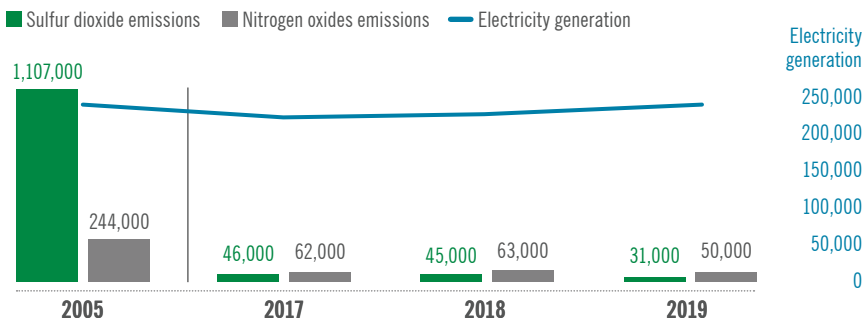
(billion gallons)

	2011	2017	2018	2019
Withdrawn	5,900	5,293	4,991	4,657
Consumed	105	71	84	73
Consumption intensity (gallons per MWh generated)	456	324	374	337

## Emissions From Electric Generation<sup>1</sup>

	2005	2017	2018	2019
CO <sub>2</sub> emissions (thousand tons)	153,000	105,000	105,000	93,000
CO <sub>2</sub> emissions intensity (pounds per net kWh)	1.29	0.96	0.94	0.86
SO <sub>2</sub> emissions (tons)	1,107,000	46,000	45,000	31,000
SO <sub>2</sub> emissions intensity (pounds per net MWh)	9.3	0.4	0.4	0.3
NO <sub>x</sub> emissions (tons)	244,000	62,000	63,000	50,000
NO <sub>x</sub> emissions intensity (pounds per net MWh)	2.1	0.6	0.6	0.5
CH <sub>4</sub> emissions (CO <sub>2</sub> equivalent) (thousand tons)	420	230	218	186
N <sub>2</sub> O emissions (CO <sub>2</sub> equivalent) (thousand tons)	731	391	369	361

## Sulfur Dioxide and Nitrogen Oxides Emissions (tons)<sup>2</sup> and Electricity Generation (thousand net megawatt-hours)



## Methane Emissions from Natural Gas Distribution

(thousand tons)<sup>3</sup>

	2016	2017	2018	2019
CH <sub>4</sub> emissions (CO <sub>2</sub> equivalent)	184	175	176	185

1 All data based on Duke Energy's ownership share of generating assets as of December 31, 2019. Totals may not add up exactly due to rounding.

2 SO<sub>2</sub> and NO<sub>x</sub> reported from Duke Energy's electric generation based on ownership share of generating assets.

3 Methane emissions are calculated by applying EPA emission factors to the miles of pipeline and the number of services, and adding component leaks based on survey data.

## Water withdrawn and consumed for electric generation

*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, over 98 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.

## Emissions from electric generation

Many factors influence emissions levels and intensities, including generation diversity and efficiency, demand for electricity, weather, fuel and purchased power prices, and emissions controls deployed. Since 2005, our carbon dioxide (CO<sub>2</sub>) emissions decreased by 39 percent, sulfur dioxide (SO<sub>2</sub>) emissions decreased by 97 percent and nitrogen oxides (NO<sub>x</sub>) emissions decreased by 79 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.

## Methane emissions from pipeline operations

Methane (CH<sub>4</sub>) 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.

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## Sulfur Hexafluoride Emissions from Electric Transmission and Distribution (thousand tons)<sup>1</sup>

	2016	2017	2018	2019
SF <sub>6</sub> emissions (CO <sub>2</sub> equivalent)	573	536	337	535

## Toxic Release Inventory

(thousand pounds)<sup>2</sup>

	2007	2016	2017	2018
Releases to air	97,969	6,074	5,226	5,110
Releases to water	257	212	174	520
Releases to land	22,052	9,738	9,728	10,148
Off-site transfers	155	2,628	2,211	3,469
<b>Total</b>	<b>120,434</b>	<b>18,652</b>	<b>17,338</b>	<b>19,246</b>

## Waste

	2016	2017	2018	2019
Solid waste				
■ Total generated (thousand tons) <sup>3</sup>	102	109	104	118
■ Percent recycled	76%	80%	79%	77%
Hazardous waste generated (tons) <sup>4</sup>	1,195	126	281	232
Low-level radioactive waste (Class A, B and C) generated (cubic feet) <sup>5</sup>	193,996	148,188	126,123	—

## Reportable Oil Spills<sup>6</sup>

	2016	2017	2018	2019
Spills	40	46	32	17
Gallons	1,143	5,062	387	140

## Environmental Regulatory Citations<sup>7</sup>

	2016	2017	2018	2019
Citations	9	10	17	25
Fines/penalties (dollars)	\$7,114,090	\$19,797	\$533,776	\$97,558

1 SF<sub>6</sub> emissions fluctuations are due to maintenance, replacement and storm repair needs.

2 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.

3 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.

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

5 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 2019 will be available later in 2020.

6 Excludes Piedmont Natural Gas.

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

## Sulfur hexafluoride emissions

Sulfur hexafluoride (SF<sub>6</sub>) is an insulating gas used in high-voltage electric transmission and distribution switchgear equipment, and is a greenhouse gas. We work to minimize SF<sub>6</sub> emissions, but some is released during transmission and distribution operations and maintenance.

## Toxic Release Inventory (TRI)

Duke Energy's TRI releases for 2018 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. Recently increased releases were largely due to coal ash basins and their closure operations. These releases are expected to decrease significantly as coal ash basins are closed. (Data for 2019 will be available in August 2020.)

## Waste

Due to downturns in market demand for waste wood for biomass generation, we did not meet our goal to recycle 80 percent of our solid waste. We are working on strategies to improve performance on this goal in the future. (This goal excludes Duke Energy Renewables, which has a relatively small waste stream.)

## Reportable oil spills

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).

## Environmental regulatory citations

Fines/penalties were relatively large 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. The increase in the number of citations from 2018 to 2019 was due mostly to an increase in water discharge reporting and compliance issues, which have been resolved with regulatory authorities.