

## COAL FACTS

We call this paper “Coal Facts” because it includes information related to coal-fired electricity and the coal fleet. Most of the data are taken from independent sources, in particular, the Energy Information Administration (EIA). The paper relies on the most current information available as of March 2018.

### ELECTRICITY SOURCES —

- ✓ Coal was responsible for 30.1% of electricity generated in the U.S. during 2017. Natural gas was responsible for 31.7%, nuclear power 20%, and renewable energy (including hydroelectric power) 17.1%. Non-hydroelectric renewables (wind, solar, geothermal, and biomass) were responsible for 9.7%.<sup>1</sup>
- ✓ Coal is projected by EIA to provide 28.6% of U.S. electricity in 2018 and 28.5% in 2019. Natural gas is projected to generate 33.9% of U.S. electricity in 2018 and 34.2% in 2019.<sup>2</sup>
- ✓ In 2030, coal is projected to provide 29% of U.S. electricity generation, with natural gas providing 31%.<sup>3</sup>

### COAL FLEET —

- ✓ At the end of 2016, there were 381 coal-fired power plants in the U.S.<sup>4</sup> As of February 2018, there were 810 individual coal-fired electric generating units (EGUs) at these power plants representing a total of approximately 260,000 megawatts (MW) of electric generating capacity.<sup>5</sup> For perspective, there were 317,000 MW of coal-fired electric generating capacity in 2010.<sup>6</sup>
- ✓ About two-thirds of the nation’s coal-fired electric generating capacity is located in RTO/ISO regions. The regions with the largest amounts of coal capacity are MISO (63,000 MW), PJM (60,000 MW), SPP (26,000 MW), and ERCOT (15,000 MW).<sup>7</sup>
- ✓ EIA projects that the U.S. coal fleet will total 190,000 MW by 2028 and thereafter.<sup>8</sup>
- ✓ The average capacity factor of the U.S. coal fleet was 53.5% in 2017, whereas it was 68% in 2010.<sup>9</sup>
- ✓ As of December 2017, the average coal plant burning subbituminous coal had a stockpile that represented 94 days of burn; plants burning bituminous coal had a stockpile representing 87 days of burn. Over the last five years, the average subbituminous coal plant had a stockpile of

- 74 days of burn; the average bituminous plant had a stockpile of 81 days of burn.<sup>10</sup>
- ✓ Since 2010, owners of coal-fired EGUs have announced that almost 111,000 MW of coal-fired generating capacity has retired, will be retiring, or will be converting to other fuels, with nearly two-thirds of these shutdowns occurring by the end of 2017. Ohio, Indiana, Pennsylvania, Texas, Illinois, Alabama, Florida, Michigan, North Carolina, and Kentucky have the most retirements.<sup>11</sup>
  - ✓ The average age at the time of retirement for the coal units that have retired through 2017 was 59 years, and the average size of these units was 141 MW. The average age of the remaining coal fleet (units greater than 25 MW) is 42 years, and the average size is 353 MW.<sup>12</sup>

**COAL AND NATURAL GAS PRICES —**

- ✓ The table below compares EIA-projected coal and natural gas prices (\$ per MMBtu) delivered to the electric power sector:<sup>13</sup>

	2018	2019	2020	2030	2040
<b>Natural gas</b>	<b>\$3.61</b>	<b>\$3.45</b>	<b>\$4.14</b>	<b>\$4.61</b>	<b>\$4.85</b>
<b>Coal</b>	<b>\$2.21</b>	<b>\$2.21</b>	<b>\$2.24</b>	<b>\$2.31</b>	<b>\$2.41</b>

- ✓ EIA projects that natural gas prices for electric power generation will increase by 34% in real terms (excluding inflation) between 2018 and 2040. Coal prices are projected to rise 9% over the same period.<sup>14</sup>

**CLEANER COAL —**

- ✓ Emissions per kilowatt-hour (kWh) of sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), and particulate matter (PM) from the coal fleet have been reduced by 93% over the period 1970-2017.<sup>15</sup>
- ✓ Approximately \$122 billion had been invested in emission controls through 2017. Owners of coal-fired power plants are expected to spend an additional \$5 billion for emission controls through 2020.<sup>16</sup>
- ✓ Virtually all U.S. coal-fired electric generating capacity has installed advanced controls to reduce emissions of SO<sub>2</sub>, NO<sub>x</sub>, PM, mercury, acid gases, and non-mercury metals.<sup>17</sup>

**STATES —**

- ✓ Coal is used to generate electricity in 48 states. Only Rhode Island (mostly natural gas) and Vermont (mostly renewables) do not generate any electricity from coal.<sup>18</sup>
- ✓ Coal provides at least half the electricity in 13 states and at least one quarter of the electricity in 24 states.<sup>19</sup>

- ✓ During 2017, the ten states that generated the most kWhs of electricity from coal were Texas, Indiana, Ohio, West Virginia, Missouri, Illinois, Kentucky, Pennsylvania, Michigan, and Wyoming.<sup>20</sup>
- ✓ During 2017, the ten states with the highest percentage of electricity generated by coal were West Virginia (93%), Wyoming (86%), Missouri (81%), Kentucky (79%), Indiana (72%), Utah (72%), North Dakota (66%), Nebraska (60%), Ohio (58%), and Wisconsin (55%).<sup>21</sup>

### **COAL PRODUCTION —**

- ✓ Coal is mined in 25 states and is responsible for over 500,000 U.S. jobs.<sup>22</sup> In 2016, Wyoming was the largest coal-producing state, followed by West Virginia, Pennsylvania, Illinois, and Kentucky.<sup>23</sup> Approximately 60% of coal was produced west of the Mississippi River and 40% from the east.<sup>24</sup>
- ✓ According to EIA, domestic coal production totaled 728 million tons in 2016 and 772 million tons in 2017. EIA projects U.S. coal production to be 736 million tons in 2018 and 745 million tons in 2019.<sup>25</sup>

March 2018

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<sup>1</sup> U.S. Energy Information Administration (EIA), *Electric Power Monthly*, February 2018 edition, with data through December 2017. Percentages are for utility-scale generation and do not include EIA's estimate of distributed solar generation.

<sup>2</sup> EIA, *Short Term Energy Outlook*, March 6, 2018.

<sup>3</sup> EIA, *Annual Energy Outlook 2018*.

<sup>4</sup> EIA, "Count of Electric Power Industry Power Plants By Sector, by Predominant Energy Sources Within Plant, 2006-2016," *Electric Power Annual 2016*, December 2017.

<sup>5</sup> EIA *Electric Power Monthly*, February 2018; SNL Energy data accessed March 5, 2018. Units includes those 10 MW or greater in size.

<sup>6</sup> EIA, *Electric Power Annual 2015*, November 2016.

<sup>7</sup> SNL Energy data accessed March 6, 2018

<sup>8</sup> EIA, *Annual Energy Outlook 2018*. Capacity represents EIA's reference case.

<sup>9</sup> EIA, *Electric Power Monthly*, February 2018; February 2014 (for 2010 data).

<sup>10</sup> EIA, *Electricity Monthly Update* with data for December 2017, February 27, 2018.

<sup>11</sup> ACCCE, *Retirement of Coal-Fired Electric Generating Units as of January 17, 2018*. Sources for the retirements are EIA, SNL Energy, and company announcements.

<sup>12</sup> ACCCE, *Retirement of Coal-Fired Electric Generating Units as of January 17, 2018*; SNL Energy data as of March 6, 2018.

<sup>13</sup> For 2018 and 2019, EIA, *Short Term Energy Outlook*, February 2018. For 2020, 2030, and 2040, EIA, *Annual Energy Outlook 2018*. (STEO \$ are nominal; AEO \$ are 2017\$.)

<sup>14</sup> EIA, *Annual Energy Outlook 2018*.

<sup>15</sup> EIA, *Electric Power Monthly*, February 2018; U.S. EPA, *National Emissions Inventory*, Air Pollutant Emissions Trends Data, 1970-2016, Fuel Combustion Electric Utilities; EPA Air Markets Program data queried March 7, 2018.

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<sup>16</sup> Energy Ventures Analysis, Inc., *Capital Investments in Emission Control Retrofits in the U.S. Coal-fired Generating Fleet through the Years – 2016 Update*, January 26, 2016.

<sup>17</sup> SNL Energy data.

<sup>18</sup> EIA, *Electric Power Monthly*, February 2018.

<sup>19</sup> *Ibid.*

<sup>20</sup> *Ibid.*

<sup>21</sup> *Ibid.*

<sup>22</sup> EIA, *Annual Coal Report*, November 2017, Table 1, Coal Production and Number of Mines by State and Mine Type; National Mining Association, *The Economic Contributions of U.S. Mining (2015 Update)*, September, 2016.

<sup>23</sup> EIA, *Annual Coal Report*, November 2017.

<sup>24</sup> *Ibid.*

<sup>25</sup> EIA, *Short Term Energy Outlook*, March 2018.