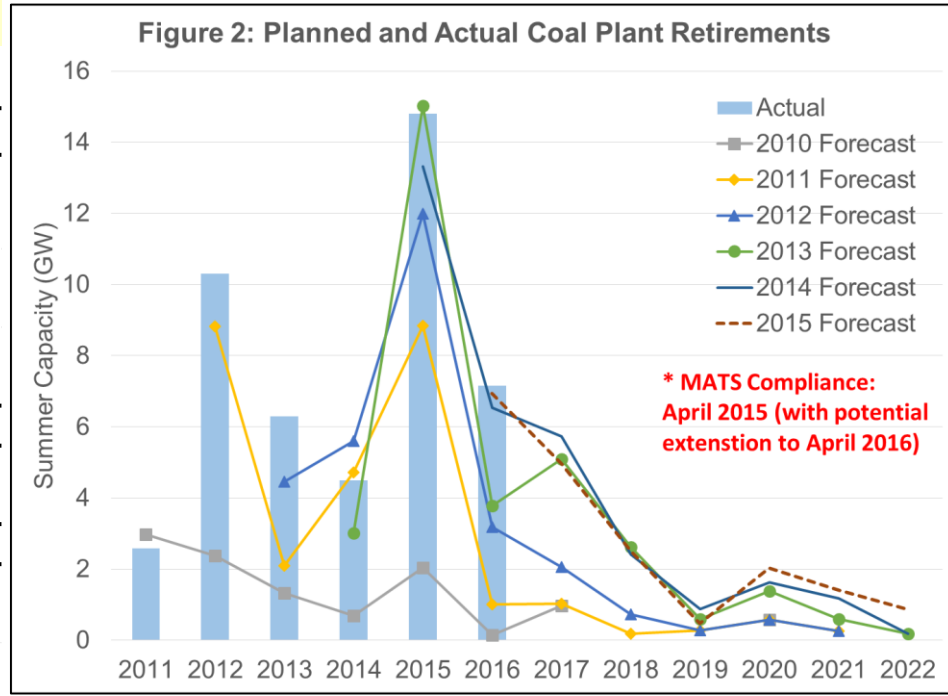
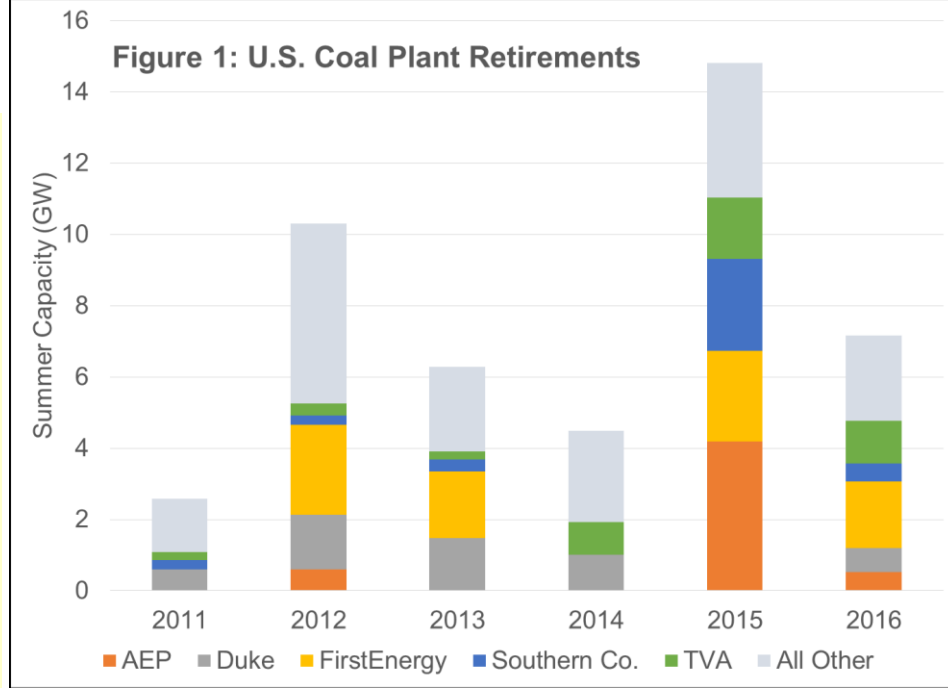


U.S. coal plant retirements slow down

- **45.6 GW of coal generation capacity retired since 2011 (Figure 1).**
- The pursuit of cleaner environment have brought unprecedented challenges to U.S. coal plants (see table below).
- MATS appears to be the key driver of retirements, which peaked in 2015, the deadline for MATS compliance (Figure 2).
 - As 87 GW of coal capacity have invested in MATS compliance, the pace of retirements slowed down in 2016.*
- Inexpensive natural gas and subsidized renewables probably contributed to retirement decisions as well. Forecasted retirements increased from one year to the next as NG prices remained low (Figure 2).

* US EIA Today In Energy. "[EIA electricity generator data show power industry response to EPA mercury limits.](#)"



Data source: US EIA Form 860

Major Environmental Regulatory Actions for Power Plants; 2011-2015

Air Quality	
National Ambient Air Quality Standard (NAAQS) and Regional Haze	Ozone nonattainment area finalized in 2012; Changes in State Implementation Plans
Mercury and Air Toxics Standards (MATS)	Finalized in 2012; compliance by April 2015, with potential one-year extension
Cross-State Air Pollution Rule (CSAPR) / Clean Air Interstate Rule (CAIR)	CSAPR finalized in 2011; Phase I in 2015 and Phase II in 2017. CAIR remains effective until CSAPR is implemented.
Water Quality	
Cooling Water Intake Structure 316(b)	Effective in 2014; Compliance deadlines between November 1, 2018 and December 31, 2023
Solid Waste	
Coal Combustion Residuals	Effective in 2015; compliance deadlines depending on relevant state Solid Waste Management Plan.

Companies operating in regulated and competitive markets were both responding to environmental regulations, particularly MATS.

- In 2010, the Southern Company estimated the capital investment for environmental compliance in 2014 to exceed \$3 billion, including \$1.6 billion for MATS (Figure 3).
- Instead, the company spent \$1.1 billion in 2014, and retired more than 2 GW of coal capacity in 2015.

- American Electric Power, mainly operating in the PJM market through both regulated and merchant subsidiaries, estimated \$1.1 billion of capital investment for environmental compliance in 2014 (Figure 4).
- Instead, AEP spent less than \$600 million in 2014, and retired 4.2 GW of coal capacity in 2015.

Figure 3: The Southern Co. Environmental Compliance Investment

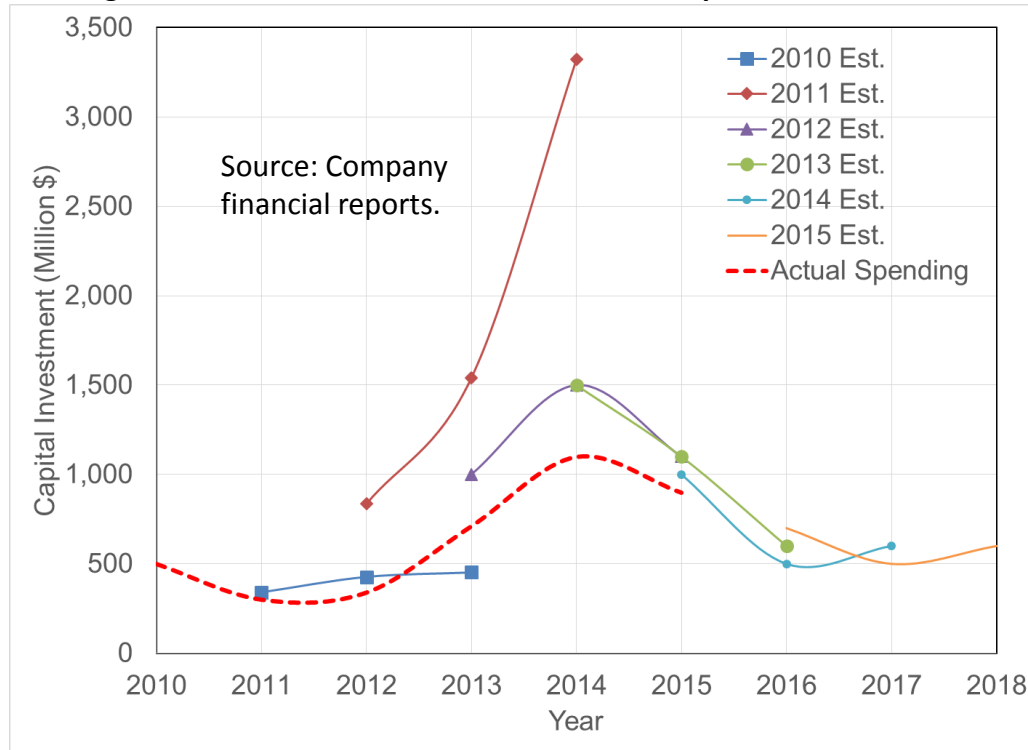


Figure 4: AEP Environmental Compliance Investment

