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## SNL Daily Coal Report

# Upcoming, recent coal-fired power unit retirements

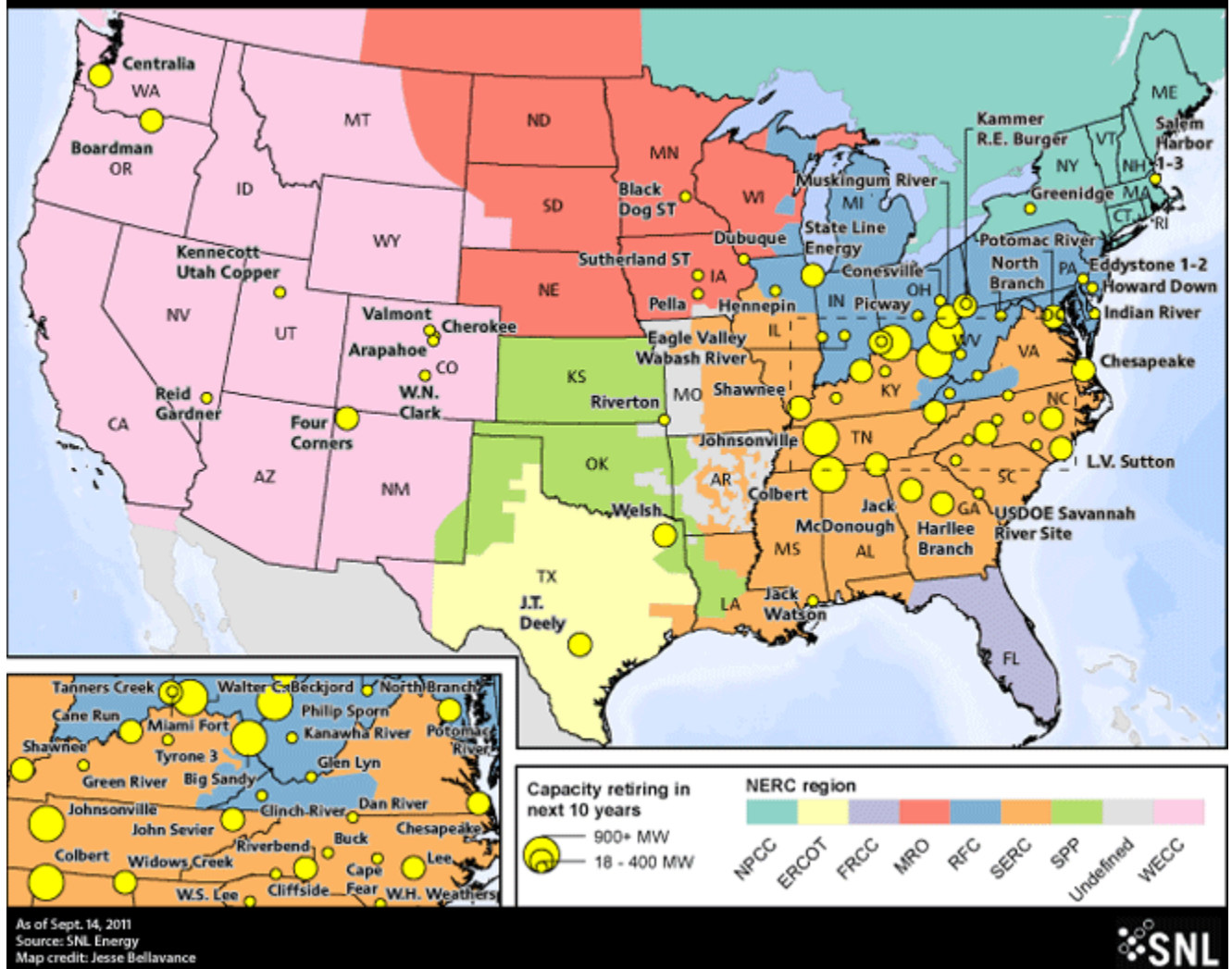
By [Michael Niven](#) and [Jesse Gilbert](#)

U.S. power companies are continuing to target more coal-fired generating units for retirement in the face of federal clean air regulations that are beginning to loom larger and larger over the industry.

An updated SNL Energy analysis finds that U.S. power companies have announced plans to retire nearly 26,000 MW of coal-fired capacity between 2011 and 2020, an increase of roughly 11% compared to three months ago. SNL Energy's last examination of announced coal-fired unit retirements, [published](#) in mid-June, showed that generators had announced plans to retire approximately 23,000 MW of coal capacity between 2011 and 2020. Announced coal retirements have nearly doubled since late February, when SNL Energy [reported](#) that approximately 14,000 MW of coal capacity was targeted for closure.

Data for SNL Energy's analysis is based on planned or projected coal unit retirements with a publicly announced retirement year.

## Announced coal plant capacity retirements 2011-2020



Looming EPA regulations, including the Cross-State Air Pollution Rule set to take effect in 2012, remain the largest driver of newly announced coal unit retirements. Major additions to the retirements list since June include more than 1,000 MW of coal capacity operated by Tennessee Valley Authority. In late June, a federal judge approved a consent decree under which TVA will shut, retrofit or repower 16 additional coal-fired generating units by the end of 2018, on top of the 18 coal units the utility had already planned to retire. TVA coal units that are new to the list include Colbert unit 5 and Johnsonville units 1-6, all of which are targeted to be retired in 2015.

EPA regulations have also claimed all six coal-fired units at Duke Energy Corp.'s Walter C. Beckjord plant, which Duke said in July it intends to close by Jan. 1, 2015. The company attributed its decision specifically to EPA's pending Mercury and Air Toxics Standards Rule, also known as the utility MACT rule, which it said will be too costly to comply with, given the age of Beckjord's coal units.

More recently, [GenOn Energy Inc.](#) announced in late August that it will retire all five coal units at its 482-MW Potomac River station under an agreement with the city of Alexandria, Va. Potomac River has frequently been a [target](#) of environmentalists due to its proximity to Washington, D.C.

The updated retirements list does not include any coal units operated by [Luminant Generation Co. LLC](#), which has [threatened](#) to close two large units at its Monticello plant in response to EPA's cross-state rule, but the company has not yet said that those closures would be permanent retirements.

<b>Scheduled coal capacity retirements through 2020 (MW) by NERC region</b>											
<b>NERC Region</b>	<b>2011*</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>Total</b>
SERC	669	1,084	2,421	998	2,673	1,920	852	0	0	0	10,617
RFC	1,390	1,331	165	5,820	513	0	0	0	341	0	9,560
WECC	106	107	87	660	0	482	186	0	0	1,273	2,901
ERCOT	0	0	0	0	0	0	0	871	0	0	871
SPP	0	0	0	528	0	0	0	92	0	0	620
NPCC	461	0	0	150	0	0	0	0	0	0	611
MRO	0	34	0	0	94	282	58	80	0	0	548
<b>Total</b>	<b>2,626</b>	<b>2,556</b>	<b>2,672</b>	<b>8,156</b>	<b>3,280</b>	<b>2,684</b>	<b>1,096</b>	<b>1,043</b>	<b>341</b>	<b>1,273</b>	<b>25,727</b>

\* 2011 numbers include 1081.1 MW that has already been retired, made up of 775 MW in RFC, 193.1 MW in NPCC and 113 MW in SERC.  
As of Sept. 14, 2011  
Source: SNL Energy

<b>Scheduled coal capacity retirements through 2020 (MW) by ISO/RTO</b>											
<b>RTO/ISO</b>	<b>2011*</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>Total</b>
Outside of ISO	775	1,191	2,214	1,021	2,451	1,689	1,038	0	0	688	11,067
PJM Interconnection LLC	1,270	1,331	165	4,772	222	383	0	0	0	0	8,143
Midwest Independent Transmission System Operator Inc.	120	34	293	1,125	607	282	58	80	341	0	2,940
Electric Reliability Council of Texas Inc.	0	0	0	0	0	0	0	871	0	0	871
California Independent System Operator	0	0	0	560	0	330	0	0	0	585	1,475
Southwest Power Pool Inc.	0	0	0	528	0	0	0	92	0	0	620
ISO New England Inc.	269	0	0	150	0	0	0	0	0	0	419
New York Independent System Operator	192	0	0	0	0	0	0	0	0	0	192
<b>Total</b>	<b>2,626</b>	<b>2,556</b>	<b>2,672</b>	<b>8,156</b>	<b>3,280</b>	<b>2,684</b>	<b>1,096</b>	<b>1,043</b>	<b>341</b>	<b>1,273</b>	<b>25,727</b>

\* 2011 numbers include 1,081.1 MW that has already been retired, made up of 109.1 MW in ISO New England, 120 MW in Midwest ISO, 84 MW in New York ISO, 655 MW in PJM and 113 MW outside of ISO regions.  
As of Sept. 14, 2011  
Source: SNL Energy

Of the 25,727 MW of announced coal unit retirements in the U.S. between 2011 and 2020, the majority is still slated to occur in the mid-Atlantic and parts of the Midwest and South. Breaking them out by NERC region, the SERC region is poised to be most affected, with more than 10,600 MW of coal capacity scheduled to be retired. SERC is followed closely by the ReliabilityFirst Corp. region, where generators have announced plans to shutter approximately 9,600 MW of coal capacity. The other two NERC regions expected to be noticeably affected are the Western Electricity Coordinating Council and the Electric Reliability Council of Texas Inc. regions, with announced coal capacity retirements of 2,901 MW and 871 MW, respectively, between 2011 and 2020.

Looking at the impact of announced retirements on ISOs and RTOs, the PJM Interconnection would be hit the hardest, with more than 8,100 MW of coal capacity planned to be closed between 2011 and 2020. Other grid operators to be impacted include the Midwest Independent Transmission System Operator and the California Independent System Operator, where 2,940 MW and 1,475 MW, respectively, of coal retirements have been announced between 2011 and

2020. Approximately 11,000 MW of announced retirements would occur outside of an ISO. Figures for 2011, for both the NERC regions and ISOs/RTOs, include some units that have been retired this year.

<b>Unit retirement summary</b>										
	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
Average age at retirement (years)	54	55	51	54	60	55	59	44	66	44
Units retired/retiring	25	22	21	44	27	18	8	5	6	2
Units retiring with available heat rate	20	22	17	41	27	18	8	5	6	2
Weighted average heat rate (Btu/kWh)*	12,287	11,448	11,313	10,766	10,618	10,793	12,493	10,639	12,363	10,424
Units retiring reporting 2010 capacity factor	17	19	15	40	22	16	7	4	6	2
2010 capacity factor of units (%)**	29.47	41.38	43.47	47.78	49.63	60.97	62.12	71.25	39.47	76.94
2010 net generation of retiring units (MWh)**	5,667,253	9,058,605	9,486,834	32,394,822	12,824,479	13,410,449	5,648,488	6,010,649	1,178,963	8,579,680
% of capacity represented in generation	83.60	97.77	93.22	94.90	89.93	93.55	94.71	92.33	100.00	100.00

A weighted average heat rate was calculated for units retiring in the specified year that have heat rate data. For each unit retired/retiring, the heat rate used was the last reported heat rate value.

A weighted average 2010 capacity factor was calculated for all units retiring in the specified year and reporting 2010 capacity factor. Net generation shown represents the same sample of plants reporting 2010 capacity factor.

As of Sept. 14, 2011  
Source: SNL Energy

While there are a significant number of coal units retiring over the next 10 years, the retiring units are largely older and less efficient. Despite the outcry over pressures caused by EPA regulations, the data does not currently indicate large-scale retirement of units that would not typically be retired within this time frame absent additional regulation. Overall, 178 units have been retired or are scheduled to be retired between 2011 and 2020, with the average expected age at retirement for these units ranging from 44 years to 66 years. This is well in line with average historical coal unit retirement ages of 45 to 55 years old. Units slated to retire in seven of the next 10 years have an average retirement age of at least 54 years old, at or above the upper bounds for typical retirement ages.

Average heat rates for units retiring over the next decade are largely above the average for all coal units of about 10,500 Btu/kWh. Units retiring in 2011, 2017 and 2019 have average last-reported heat rates of more than 12,000 Btu/kWh, with units retiring in 2012 and 2013 recording last-reported heat rates of more than 11,000 Btu/kWh. Only units expected to retire in 2020 had average heat rates below typical averages for all U.S. coal plants.

For the 148 coal units expected to retire in the next 10 years and reporting 2010 net generation, aggregate 2010 net generation was 104,260,222 MWh, roughly 5% of total production for coal plants in the year. Utilization of these units was much lower than the average for all coal plants in 2010. The weighted average capacity factor in 2010 was 29.47% for units retiring in 2011, 41.38% for units retiring in 2012 and 43.47% for units retiring in 2013. This can be compared to the average capacity factor of approximately 66% in 2010 for all U.S. coal units. Only units retiring in 2018 and 2020 had capacity factors exceeding the average for all U.S. coal units.

### Top 10 companies with coal capacity retiring in 2011-2015

Company	Number of units retired/ retiring 2011-2015	Owned retiring coal capacity (MW)					Total
		2011*	2012	2013	2014	2015	
American Electric Power Co. Inc.	26	615	0	0	5,276	0	5,891
Duke Energy Corp.	27	0	477	0	1,234	1,223	2,934
Tennessee Valley Authority	18	127	356	226	226	1,741	2,676
Progress Energy Inc.	11	177	0	1,033	323	0	1,533
Southern Co.	7	252	251	850	0	0	1,353
Dominion Resources Inc.	8	160	515	0	227	222	1,124
Pinnacle West Capital Corp.	3	0	0	0	560	0	560
GenOn Energy Inc.	5	0	482	0	0	0	482
Exelon Corp.	1	0	311	0	0	0	311
Dynegy Inc.	2	0	0	293	0	0	293

\* Includes data for plants which have already retired in 2011  
As of Sept. 14, 2011  
Source: SNL Energy

On a company-specific level, [American Electric Power Co. Inc.](#), the nation's largest coal burner, is leading the pack in amount of coal capacity scheduled to be retired between 2011 and 2015, during which the company plans to shutter 26 units encompassing nearly 5,900 MW of coal capacity. Other generators with a significant amount of retiring capacity during the 2011-2015 window include [Duke Energy](#) at 2,934 MW, [TVA](#) at 2,676 MW, [Progress Energy Inc.](#) at 1,533 MW and [Southern Co.](#) at 1,353 MW.

The coal-fired generation landscape remains greatly in flux while various interests debate the timing for implementation of EPA's pending clean air regulations. The cross-state rule is set to take effect Jan. 1, 2012, but lawsuits seeking to stay the regulation have been [piling up](#) rapidly from both electric generators and states that claim they are being targeted unfairly by the rule. The pace of future coal unit retirement announcements and the fate of units slated to be closed could be impacted if the cross-state rule or other EPA rules were delayed or if emissions reduction limits were altered.

