



Electricity Currents

A survey of trends and insights in electricity restructuring



More and More, Coal's Time Appears to Have Passed

Tightening environmental regulations plus looming prospects for future restrictions on carbon emissions – considered only as a matter of *when* and *how tight* rather than *if* – are gradually pushing U.S. generators towards cleaner sources of power generation including natural gas fired plants and more renewable resources. The former has become more affordable with the discovery of vast reserves of unconventional domestic gas; the latter enjoying continued subsidies and/or is mandated in a number of states.

This trend, already underway for over a decade, can be expected to accelerate. In fact, not only will new coal-fired power plants become an exception, many existing coal plants are likely to be converted to natural gas. *The Wall Street Journal*, for example, reported in late April that a number of regulated utilities including **Progress Energy**, based in Raleigh, N.C., and **Southern Company**, based in Atlanta, as well as independent power producers such as **Calpine Corp.** are in the process of converting existing coal plants to burn natural gas.

The cost of installing pollution control technologies required by environmental restrictions makes some

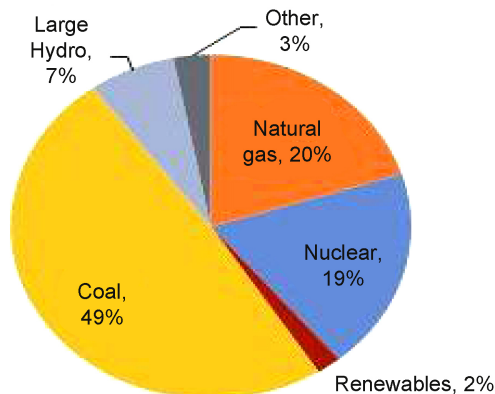
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Half Coal: US Electric Generation Mix



Wind Gains Ground, Hitting 33 GW of Installed Capacity

While coal languishes and nuclear awaits a long overdue renaissance, wind continues to gain ground, accounting for 42 percent of *new* capacity additions in the US in 2008 – and similarly impressive growth in several European countries. According to *Wind Powering America*, a report released in April by the **National Renewable Energy Laboratory** (NREL), based in Golden, Colo., the U.S. currently has 33 GW of installed wind capacity, ahead of runner-up **Germany** with 25 GW. Globally, there are now 146 GW of wind

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existing older plants uneconomic to operate. In many cases, it is cheaper to convert them to burn natural gas. Building new coal-fired plants is no longer a slamdunk either, especially in view of the fact that such units must consider the additional costs associated with future restrictions on carbon emissions. Getting environmental permits has become an uphill battle as the costs of building more advanced coal-fired plants continues to escalate.

Duke Energy Corp's *clean coal* Edwardsport project in Indiana, considered a showcase, has reportedly escalated from the original \$1.98 billion cost projected in 2007 to \$2.88 billion and counting – not an encouraging development for others.

According to **Jim Bernhard Jr.**, CEO of **Shaw Group**, an engineering and construction company based in Baton Rouge, La., roughly two-thirds of U.S. coal-fired plants would have to be equipped with costly pollution control equipment over the next decade – whether that means scrubbers to rein in mercury emissions or restrictions on coal ash following the recent accident at the **Tennessee Valley Authority**. In many cases, it is cheaper to convert them to burn natural gas – or, in the case of inefficient older units, to retire them altogether. The remaining one-third, according to the same article, is in the process of getting upgraded.

Progress Energy has already seen the writing on the wall. It is shutting down 11 coal-fired plants – one-third of its generation capacity – by 2017, leaving the company with only three, newer coal plants. The company is building two new natural gas plants to make up for some of the lost capacity.

America's Natural Gas Alliance, a trade group, could not have asked for a better turn of events. It promotes natural gas as the fuel of choice for power generation and declares that the U.S. can cut its carbon emissions in *half* by switching the existing fleet of coal-fired plants to natural gas.

The natural gas lobby aside, others are also in favor of natural gas, which emits roughly half of the carbon emitted from coal. Environmentalist **Robert F. Kennedy Jr.** avows that “coal is neither cheap nor clean” and points out that the U.S. is blessed with roughly 450 GW of natural-gas-fired generation vs. 336 GW of coal-fired out of a total of roughly 1,000 GW. Currently, however, natural gas plants are used mostly for peaking and mid-range duty – roughly 36 percent of the time – while most coal units are operated as baseload, that is, around the clock. This explains why, despite these clear advantages to gas, the U.S. currently gets roughly 50 percent of its electricity from coal but only 22 percent from natural gas.

Like the natural gas lobby, Kennedy favors a reversal of the relative roles of the two fuels, not just for environmental but also for cost reasons. “Around 920 U.S. coal plants – 78 percent of the total – are small, antiquated, and horrendously inefficient,” he wrote last year in an op-ed piece in the ***Financial Times***. “Their average age is 45 years, with many over 75.” He added: “These ancient plants burn 20 percent more coal per MWhr than modern large coal units and are 60–75 percent less fuel-efficient than combined-cycle gas plants. They account for only 21 percent of America's electric power but almost half of the sector's (greenhouse gas) emissions.”

Kennedy recognizes that, like coal, natural gas is a fossil fuel that produces carbon emissions, but he argues that its environmental footprint is “dwarfed by the disaster of coal.” Crucially, it's also a far less expensive alternative than building more nuclear plants or windmills to replace coal in the time frame required to avert ruinous climate change.

In late April, **Calpine Corp.**, a major independent power producer (IPP), acquired 19 power plants from **Pepco Holdings Inc.** for \$1.65 billion. Most of the units are natural-gas-fired, and the others will be

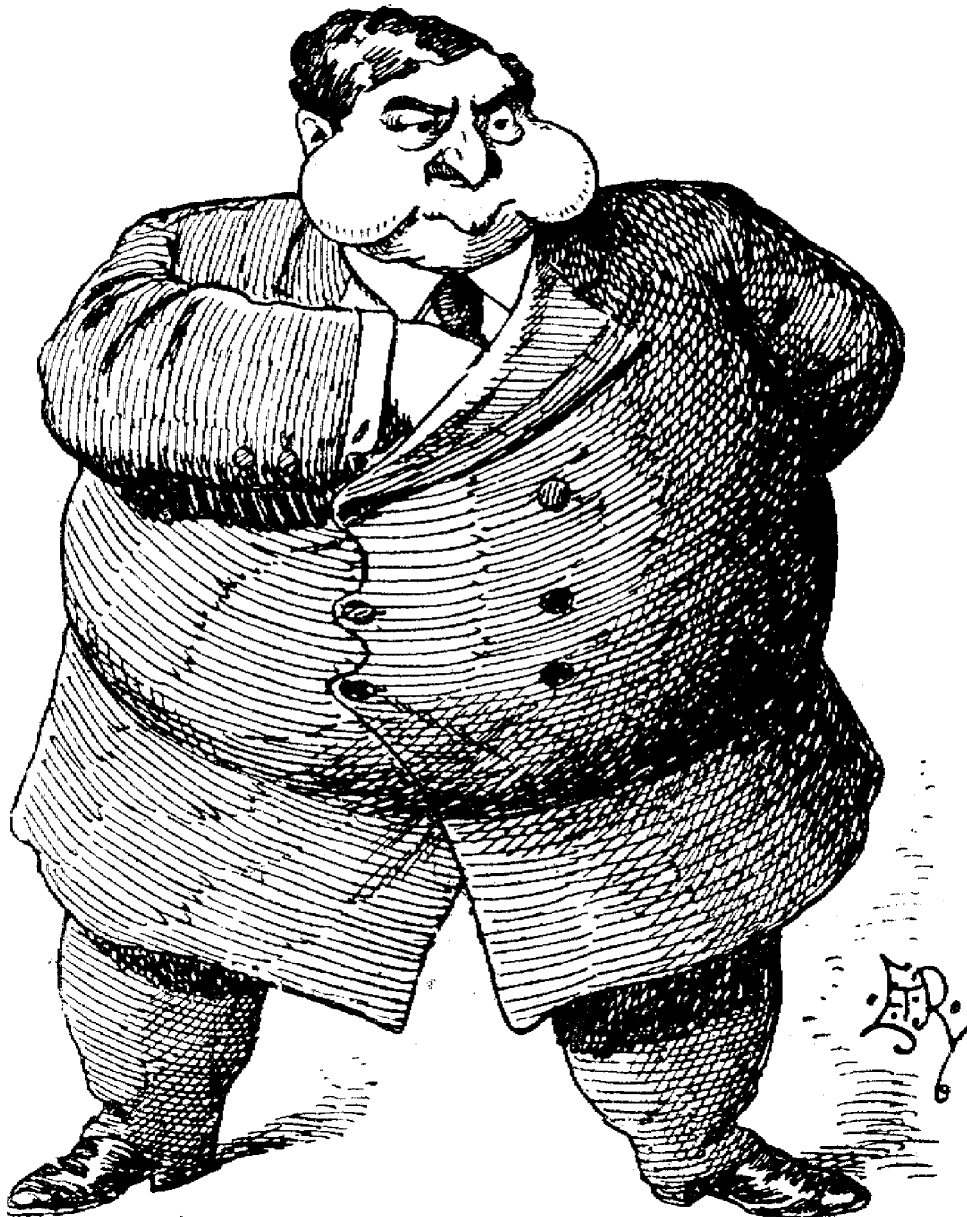
converted to burn natural gas, according to **Jack Fusco**, Calpine's CEO. The acquisition will make Houston-based Calpine the biggest U.S. IPP by output. The company is clearly betting its future on natural gas. Talking to reporters following the announcement, **Thad Hill**, Calpine's chief commercial officer, said bluntly, "We think coal's time has passed."

The powerful coal lobby has its job cut out – especially if the current glut of natural gas and relatively low prices persist. Currently the dominant fuel in many regions of the country, its future growth prospects appear threatened. **Carbon capture and**

storage (CSS) technology, coal's sole salvation, offers some promise but is many years from commercial-scale deployment with uncertain cost and performance.

Climate and energy legislation, when they come to pass, will make it even harder on coal. The picture is, of course, different in developing countries such as China, India, or South Africa, which are intent on using coal to feed their economic growth. But at least in the U.S., and perhaps in Europe, conventional coal's best days may be behind it. ■

doi:/10.1016/j.tej.2010.05.007



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