

ENERGY MANAGEMENT BRIEF:

Before You Blame EPA for Texas Electricity Supply Problems, Consider This...

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The Texas electric grid faced electricity supply shortages during the extraordinary heat wave in the summer of 2011, which was itself an unnerving sequel to the phased blackouts and brownouts Texans experienced the previous February. Facing the prospect of another unusually hot summer, some [policymakers are pointing the finger of blame](#) for declining electric generating capacity reserves at the U.S. Environmental Protection Agency, which has imposed a series of new air pollution rules on power plants. In an election year, blaming the EPA may make political sense, but it ignores other causes of Texas' electricity supply woes, as well as the long and tortured history behind these new EPA rules.

The Controversy

Within the last few years, the EPA has established three new rules governing emissions from power plants:

1. The so-called "Cross State Air Pollution Rule," which limits emissions of nitrogen oxides and sulfur dioxide from upwind sources that cause or contribute to violations of air pollution standards for ozone and fine particles in downwind locations.
2. The "Mercury and Air Toxics Rule," which limits emissions of mercury and other heavy metals from power plants.
3. The "New Source Performance Standard for Power Plants," which will impose greenhouse gas emissions limits on new power plants.

Collectively, these rules impose significant costs on coal-fired power plants, in particular. All three of these new rules have provoked announcements by owners of existing coal-fired power plants that they plan to shut down older plants rather than pay the retrofit costs associated with complying with the rules.

We can view these claims with at least a dose of skepticism. Coal-fired power plants have had an increasingly difficult time competing in electricity markets because of rapid growth of gas-fired and wind energy generation. In competitive electricity markets like Texas, marginal

costs drive electricity pricing, and wind and natural gas-fired generation have very low marginal costs compared to coal. Thus, competition seems the most important driver of current coal-fired power plant woes.

Still, it is also true that the costs of compliance with the EPA's cross-state and mercury rules are contributing to those woes, at least at the margins.¹ The cross-state rule [has been stayed](#) by a federal court pending resolution of a legal challenge, but is expected to impose significant compliance costs on coal-fired power plants when it takes effect. The EPA has acknowledged the potentially significant impact of the mercury rule on electricity supplies, and has given power plants up to four years to comply with the rule: indeed, it has indicated that it will consider giving certain supply-essential plants additional compliance flexibility. When and if the greenhouse gas rule for power plants takes effect, it will require coal-fired plants to use expensive carbon capture technology to reduce their carbon emissions.

Other Causes of Our Supply Problems

Even if the EPA rules make some coal-fired power plants uneconomical, the question remains why the Texas electricity market has not incentivized sufficient new generation capacity to make up for the loss of older coal-fired plants? In early 2009, natural gas prices exceeded \$7/MMBTU; thanks to the availability of domestically produced shale gas, they have fallen below \$2/MMBTU in recent weeks. Why, then, hasn't a sufficient amount of new gas-fired generation stepped into the breach?

The Public Utility Commission of Texas (PUC) and Electric Reliability Council of Texas (ERCOT) have been grappling with this question for several months now. In Texas, we rely purely on the electricity price to send a signal to prospective new sources of supply that new generation is necessary. Spot prices of electricity in Texas have been low lately. This may be due to the economic downturn, to healthy competition among electricity retailers, and to increasing penetration of (subsidized and zero marginal cost) wind power, which drives down spot prices, providing less incentive for new capacity. Whatever the reason, [ERCOT projects sharply declining reserve margins in Texas](#), falling below the approximately 13% reserves target to as low as 6% in three years, with continuing reductions after that.

In most of the other parts of the country with competitive retail electricity markets (mainly in the northeast and middle Atlantic states), market regulators meet these reserves targets using so-called "capacity markets," which pay plant owners to make their plant capacity available in the future, irrespective of whether the plant ever dispatches any electricity to the grid. Thus, while Texas generators must recover all their capital and operating costs through electricity sales, generators in these other markets can count on these capacity payments even

¹ The new greenhouse gas rule for power plants does not affect existing plants, but will effectively preclude construction of new coal-fired power plants under current market conditions. It should have little to no effect on the construction of new combined cycle gas turbines.

if their electricity sales falter. Consequently, current projections show northeastern electricity markets meeting their reserve capacity targets.

Texas policymakers have indicated that they will not impose capacity markets in Texas. Instead, they have [raised the \\$3000/mwh cap electricity prices in the ERCOT markets to \\$4500](#), and have discussed the imposition of price floors for the provision of certain short-term power and grid balancing services in an attempt to increase electricity prices. However, because electricity prices in ERCOT only hit the price cap for a few hours a year, some are skeptical that increasing the size of the cap by 50% will trigger significant new investment, particularly if inexpensive gas-fired and wind power continue to depress day-to-day spot prices.

History and Benefit of the EPA Rules

Furthermore, regardless of the causes of Texas' dwindling reserve margins, the current debate about the effect of the EPA rules ignores both the history and reasoning behind the rules. Both the cross-state and mercury rules have been a long time coming, and both would bring benefits (including tens of thousands of premature deaths averted) that greatly exceed their costs.

The cross-state rule's lineage dates back to the Clean Air Act of 1970, when Congress wisely recognized that state governments would have little incentive to protect people in downwind states, and authorized those downwind states to petition the EPA to order upwind polluters to curtail air pollution that caused violations of air quality standards downwind. For many years EPA was unresponsive to petitions alleging that upwind emitters of nitrogen oxides were causing violations of ozone standards in downwind states. Finally, the Clinton EPA promulgated so-called "ozone transport" rules that attempted to address this problem. The Bush administration replaced the Clinton-era rules with something called the "Clean Air Interstate Rule," but that rule was overturned by federal courts for failing to comply with the Clean Air Act's requirements. The Obama EPA's cross-state rule represents an attempt to comply with the court's edict. The less stringent, but legally defective, Bush-era rule remains in effect until the cross-state rule takes effect.

The mercury rule has an even more interesting pedigree. The original Clean Air Act directed the EPA to regulate emissions of seven toxic air pollutants (not including mercury), and to regulate additional toxic emissions as science and new information dictated. However, the EPA did virtually nothing to regulate additional toxic emissions until George H.W. Bush signed the Clean Air Act Amendments of 1990, mandating that EPA regulate a long list of toxic pollutants, including mercury. Those 1990 amendments also directed EPA to determine whether it ought specifically to regulate mercury emissions from coal-fired power plants under the statute's strict rules governing toxic pollutants. The Clinton EPA concluded that the answer to that question was yes, and began the process of regulating those emissions as toxic pollutants. The Bush EPA reversed the Clinton EPA conclusion, and proposed to regulate

mercury emissions less stringently, under provisions of the Clean Air Act governing non-toxic pollutants. A federal court overturned the Bush EPA mercury rules, and ordered the agency to regulate emissions of mercury from coal-fired power plants as the toxic emissions that they are. The Obama EPA's mercury rule is the agency's reaction to that court decision.

Thus, while the greenhouse gas rule for power plants is of recent vintage, the cross state rule and the mercury rule have a long and litigious history. More importantly, each addresses an important public health problem: that is, these rules not only impose costs, they also do significant good.

The EPA claims that the benefits of the rules far exceed their costs, and the agency attributes most of these rules to reductions in the emissions of fine particles, which cause tens of thousands of premature deaths each year. The EPA's conclusions are supported by two recent academic studies examining the environmental and social costs of our reliance on coal as a source of energy. The [first study](#), by a group of academic medical and public health professionals and published in the *Annals of the N.Y. Academy of Sciences*, focused on the full lifecycle costs of coal, which were estimated to be about \$500 million; the authors concluded that if internalized these costs would "double or triple" the cost of electricity. The [second study](#), conducted by economists and published in the *American Economic Review*, focused on the costs associated with air emissions from coal combustion, and estimated that internalizing those costs would increase electric rates by 2.8 cents/kwh (15-40%, depending upon where you live).

Pressure on Coal

So yes, the future of coal-fired power is not particularly bright. Nor, some might say, should it be. Given the damage done by our reliance on coal and the promise of inexpensive, domestically produced, cleaner-burning natural gas, it makes sense that EPA policies are nudging dirtier coal plants into retirement. Furthermore, while these nudges come at a time when electricity supply in Texas is tight, it does not seem fair to blame the EPA rules for those supply difficulties. Even though natural gas looks likely to remain inexpensive for the foreseeable future, the Texas electricity market does not seem to be doing a particularly good job of incentivizing construction of new gas-fired power plants. The PUC and ERCOT are working on that problem, and may well solve it soon – which, in my opinion, is a wiser use of their time than pointing the figure of blame at the EPA.



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