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EPA Overreach: Higher Cost, Less Energy, Greater Risk

Cost Analysis of the PSO-EPA Settlement Agreement

By William Yeatman*

Executive Summary

Since President Barack Obama took office in 2009, the Environmental Protection Agency (EPA) has issued a suite of ideologically-charged regulations that collectively hamper the ability of utilities to deliver low-cost energy to American families. Under the banner of Regional Haze regulations, EPA has sought to aggressively execute the President's environmental agenda in Oklahoma by forcibly mandating utilities to add new costly emissions control systems to coal-fired power plants. In the face of this regulatory onslaught, Oklahoma's major utilities were left with two options: litigate and fight or settle and placate. Public Service Company of Oklahoma (PSO) opted for the latter and entered into settlement negotiations with the EPA, Sierra Club, and other parties which has resulted in a new plan which will cost far more than EPA recommended. Unfortunately, the utility's preferred "solution"—fuel switching from coal to gas—is an inferior option. Relative to retrofitting existing coal plants, PSO's fuel switching settlement would:

- Increase costs to PSO ratepayers by $529 million in net present value and $3 billion in nominal dollars;
- Reduce PSO system capacity by 210 megawatts, thereby stressing reserve margins—a key reliability metric—through at least 2021; and

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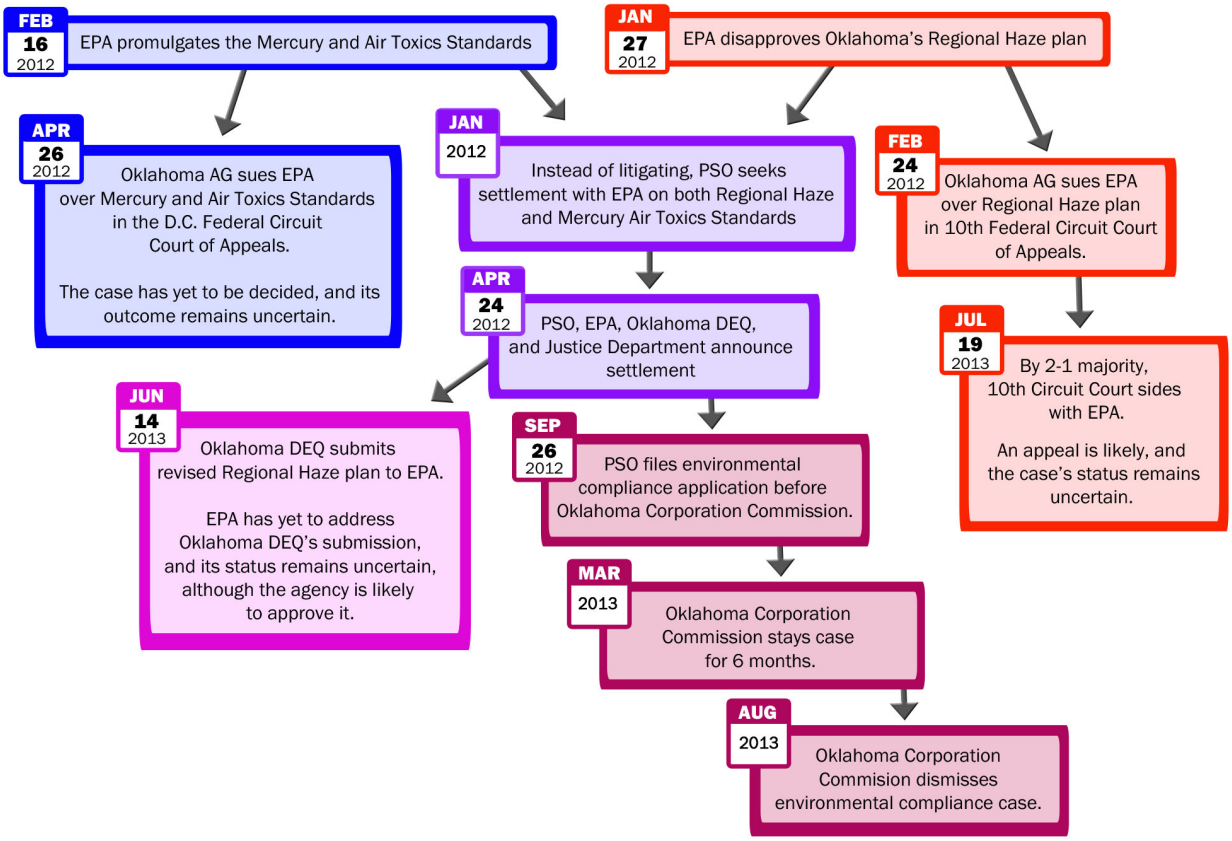
- Eliminate fuel diversity on the PSO system, rendering ratepayers vulnerable to rate shock.

Instead of proceeding with the settlement, PSO could take immediate steps to achieve flexibility and lower costs to Oklahoma's job-creators and consumers. The utility could strive to keep its options open, and obtain the best possible solution for its ratepayers. Ideally, EPA's war on low-cost energy would be stifled in the courts, and Oklahomans won't be subject to senseless, costly regulations. At the very least, PSO should reconsider its choice to fuel switch, which is costlier and riskier than retrofitting its existing coal resources.

Figure 1: Timeline of Regulatory Activity



Introduction

While campaigning for the White House, candidate Barack Obama told *The San Francisco Chronicle* editorial board that his administration would "bankrupt" the coal industry.[1] The Environmental Protection Agency (EPA) has been fulfilling the president's promise ever since he took office. Since 2009, the agency has issued a suite of anti-coal regulations, collectively known as the "war on coal."[2] The EPA's strategy is to impose most onerous possible regulations on the industry, regardless of whether or not they are warranted.

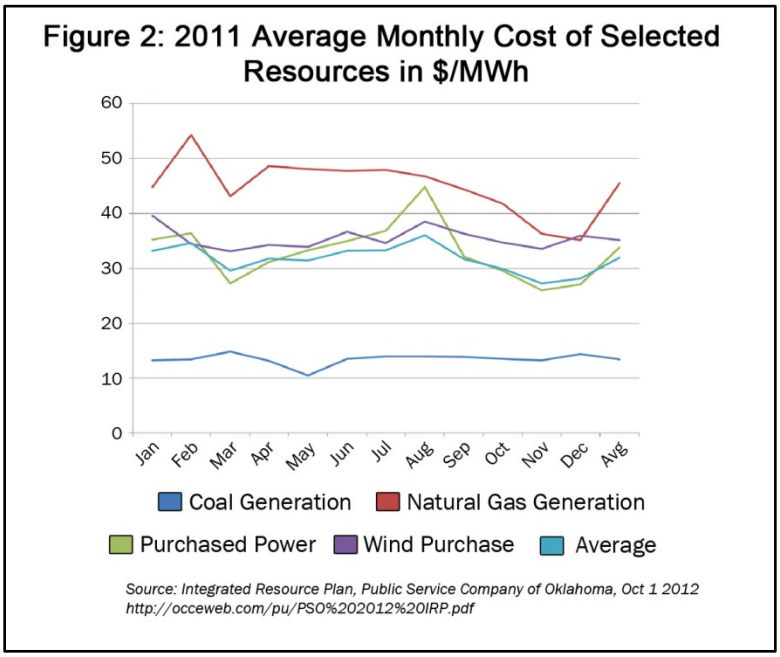
Two of the worst such regulations are the Regional Haze and Mercury and Air Toxics Standards under the Clean Air Act. Both of these rules would impose billions of dollars in costs on coal-fired power plants for zero benefits (See Appendix A).

- **Regional Haze** is a federal visibility regulation that has proven ineffective. Because it is strictly an aesthetic regulation intended solely to improve visibility in national parks and wildlife refuges—and not a public health rule—Congress intended for states to be the lead decision makers. But despite Congress's intent that states call the shots on Regional Haze, the EPA disapproved Oklahoma's visibility improvement plan and imposed a federal plan instead. The agency's plan imposed almost $1.8 billion in capital costs on six coal-fired power generators in Oklahoma. The side-by-side images in Appendix A depict the visibility "improvement" wrought by the EPA's controls over the states. As the table shows, the agency's preferred plan achieves an imperceptible "benefit."[3]

- **Mercury and Air Toxics Standards** are public health standards that fail to serve an actual public health purpose. The EPA's justification for this regulation is the need to protect a supposed population of pregnant, subsistence fisherwomen, who consume more than 225 pounds of self-caught fish from exclusively the top 10 percent most polluted bodies of fresh, inland water. Notably, the EPA never identified a single member of this putative population; rather, they were modeled to exist. Despite this absurd justification, the Mercury and Air Toxics Standards constitute one of the most expensive regulations ever. It would apply to all existing and new coal-fired power plants and cost almost $10 billion annually.[4]

Oklahoma Attorney General Scott Pruitt has been at the forefront fighting the EPA's burdensome and unnecessary regulations. His office is currently challenging both of the above rules in two different U.S. courts of appeals.[5]

Two investor-owned utilities in Oklahoma, Public Service Company of Oklahoma (PSO) and Oklahoma Gas & Electric (OG&E), have been affected by these anti-coal regulations. PSO has two coal-fired units subject to both the Regional Haze rule and Mercury and Air Toxics Standards; OG&E has four. In response to these regulatory threats, the two utilities took decidedly different tacks. OG&E joined Attorney General Pruitt's litigation. PSO, on the other hand, entered directly into settlement negotiations with the EPA, Sierra Club, U.S. Justice Department, and Oklahoma Department of Environmental Quality.



On June 22, 2012, Attorney General Pruitt and co-plaintiffs, including OG&E, won a stay of the Regional Haze rule, which gained some needed flexibility for OG&E. Unfortunately, PSO did not benefit, because it had entered into settlement negotiations with the EPA.

PSO's settlement discussion centered on two coal-fired electricity generating units, named Northeastern Units 3 and 4, located in Rogers County, Oklahoma. These two facilities, which total 930 megawatts of generating capacity, are subject to both the Regional Haze rule and the Mercury and Air Toxics Standards. PSO maximizes the use of these two units because they provide the cheapest power in its system by a significant margin (see Figure 2).[6] Northeastern Units 3 and 4 represented a fifth of PSO's capacity in 2011,[7] yet generated a third of its electricity.[8]

PSO had two possible options to comply with the EPA's regulations: retrofit or fuel switch. The former entailed the installation of emissions controls on Northeastern Units 3 and 4. The latter called for closing the units and switching to natural gas. Given the EPA's war on carbon, it is certainly plausible that the agency was pushing for fuel switching. The Sierra Club, one of the parties negotiating with PSO, is actively campaigning to ban the use of coal.

On April 24, 2012, the parties announced that they had reached a settlement,[9] which called for fuel switching. One Northeastern Unit would be retired in 2016, nearly 25 years early. The second would retire in 2026, about 15 years early. Their electricity generation would be replaced by natural gas power.[10]

Why PSO would rush into a settlement and then agree to switch fuels at Northeastern 3 and 4 is a mystery. It is possible that the settlement provided a financial incentive to the utility, by spurring the construction of new power plants.[11] Perhaps the EPA and Sierra Club proved to be astute bargainers. Maybe the utility wanted regulatory certainty, at any cost. But while PSO's motives are unclear, there is no doubt that fuel switching is the less effective of the two options that were on the table. Compared to what it would cost to retrofit Northeastern units 3 and 4, the settlement agreement costs more for less energy and creates a higher risk of rate shock for Oklahoma businesses and families. It's a lose-lose-lose proposition.

Problems with the Settlement: Higher Cost, Less Power, Greater Risk

Problem 1*: Higher Cost*

PSO's modeling purported to demonstrate that fuel switching would cost $203 million less than retrofitting Northeastern 3 and 4 on a net present value basis, and $553 million less expensive on a nominal basis.[12] Yet in 2011, coal-generated power in the PSO system was priced at roughly a third of natural gas-generated power,[13] so switching from coal to gas for 930 megawatts would result in significantly *higher* fuel costs. In addition, the settlement calls for building more gas power plants to offset the loss of coal, leading to even higher costs. So how did PSO come up with those figures?

On close scrutiny, it becomes apparent that PSO modeling results were skewed by accounting gimmicks.

Carbon tax trickery. First, PSO included a carbon tax in its base modeling scenario. Coal is roughly twice as carbon-intensive as natural gas, so a carbon tax would make coal retrofits seem more expensive. Yet, such a carbon tax is entirely speculative. Congress is not even considering a carbon tax; as recently as August 2, 2013, members of Congress expressed overwhelming opposition to such a policy.[14] By incorporating this accounting trick, PSO managed to make fuel switching appear less expensive than retrofitting Northeastern Units 3 and 4 by approximately $251 million in net present value and $1.2 billion in nominal dollars.[15]

Figure 3: Cost of Fuel-Switching vs. Cost of Coal Retrofit

To appreciate how inappropriate is PSO's use of a carbon tax, it is instructive to look at utility resource modeling practices in other jurisdictions. In Colorado, for example, Xcel Energy used a carbon tax in 2010, but dropped the practice from base case modeling in its 2011 Electric Resource Plan, due to "the uncertainties in forecasting carbon policy."[16] As these examples show, it is simply unreasonable for PSO to skew its economic modeling by including a carbon tax.

Unnecessary early retirement. The second accounting trick used by PSO was to shorten the life of Northeastern Units 3 and 4. PSO assumed that the two generating units would retire after 50 years in the base model used to analyze the retrofit option for the settlement agreement. This is 10 years too early—in PSO's own experience. In response to questions submitted by the Oklahoma Industrial Energy Consumers, PSO admitted that the average service life of 24 other coal units on its parent company's system that have either been retired or are scheduled for retirement over the next decade is 59 years,[17] and PSO had originally intended to keep Northeastern Units 3 and 4 running for "60 years or more," as the company explained before the Oklahoma Corporation Commission.[18]

These early retirements inflated the cost of the coal retrofit option by requiring the purchase of 10 additional years of replacement power. This budgeting gimmick made fuel switching appear less expensive than retrofitting both Northeastern Units 3 and 4 by approximately $278 million in net present value and $1.8 billion in nominal dollars.[19]

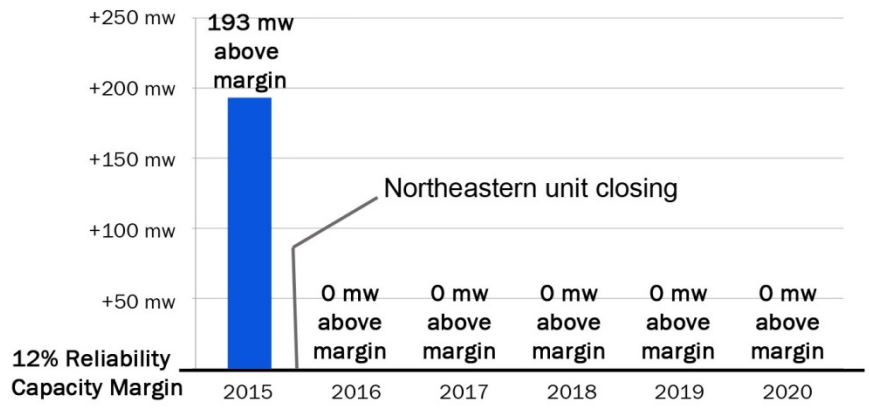
After correcting these two bookkeeping sleights of hand, fuel switching is *more* expensive than retrofitting coal by $529 million in net present value and slightly more than $3 billion in nominal dollars.

Problem 2: *Less Power*

The settlement, despite costing more, results in less energy over the next decade. The arithmetic is simple. One of the Northeastern Units will retire in 2016, leaving a void of 470 megawatts. This power is being replaced by 260 megawatts of contracted natural gas generation, resulting in a net reduction in capacity of 210 megawatts.

PSO's reserve margin—a key reliability metric[20]—will then fall to 13.6 percent, the minimum required by the utility's interstate grid operator, the Southwest Power Pool.[21] Had PSO chosen to retrofit the Northeastern coal-powered generator rather than retire it, the utility would operate with a reliability buffer beyond the minimum.

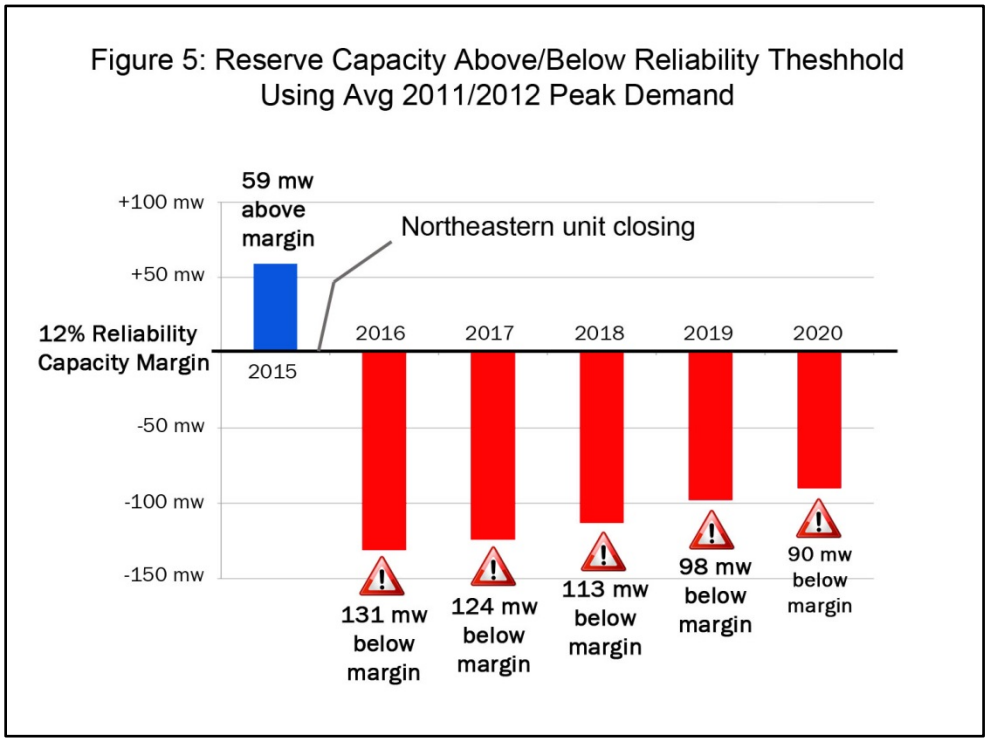
Figure 4: Projected Reserve Capacity Above/Below Repliability Threshhold Using PSO Demand Forecast



From a reliability standpoint, the settlement option renders the PSO system more vulnerable relative to retrofitting Northeastern Units 3 and 4. For example, if the historically high temperatures of 2011 and 2012 returned at any time between 2016 and 2020, reserve margins would dip precipitously to levels well below the minimum reliability threshold (See Figure 5).

Ratepayers would be even more exposed to reliability problems, because PSO artificially suppressed baseline energy demand by relying on unrealistic assumptions. PSO forecasted peak demand for electricity over the 10-year period 2012-2021 to increase by 0.3 percent compounded annually, which is essentially zero growth.[22] The utility concedes this is an "unprecedented" rate.[23]

Troublingly, PSO's ultra-optimistic demand forecast hinges on an unproven policy, known as demand-side management, which giving subsidies to ratepayers to incentivize lower energy consumption. Types of demand-side management strategies include home weatherization and financial incentives to industrial energy users to curtail their operations during periods of peak demand.[24]



PSO's demand-side management programs are expected to grow at a compound growth rate of 11.3 percent during 2012-2021. In total, these programs are projected to reduce peak demand by 269 megawatts by 2021.[25] These targets are highly speculative. PSO only began operating a demand-side management program in 2010, and virtually all of the growth of this program would occur after the settlement had gone into effect. Simply put, these demand-side management programs are untested. It is a matter of faith, not fact, that they will achieve their projected energy savings. If these savings do not materialize, actual peak demand will be higher and the threat to reliability would be greater.

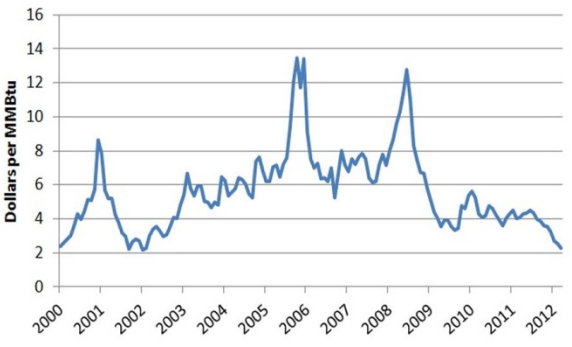
Problem 3: *Risk of Fuel Shock*

Coal power in the PSO system costs roughly a third of natural gas power. The utility disproportionately relies on its coal assets because coal is the most cost effective fuel in its system. As noted, Northeastern Units 3 and 4 represented a fifth of PSO capacity in 2011, yet they generated a third of its electricity. The settlement agreement requires that PSO close these units 25 to 15 years early, thereby eliminating a tremendous economic value.

As a result, coal's share of electricity generation on the PSO system will decline from 36 percent in 2011 to approximately 3 percent in 2027 (see Figure 7).[26] This precipitous decline in fuel diversity carries with it a heightened risk of rate shock. Natural gas is—and is projected to remain—much more expensive than coal, but the real threat is its volatility. Historically, gas prices have been subject to significant price swings. The most recent occurred in 2008 (see Figure 6).

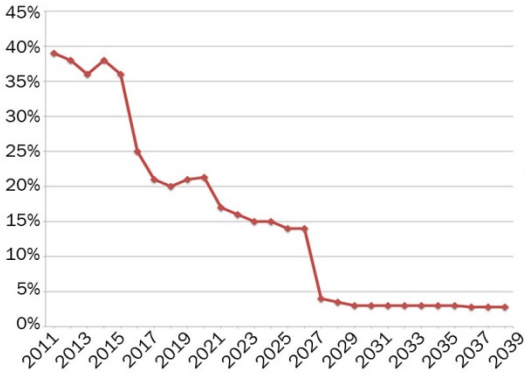
While it is true that tremendous advances in drilling technology have ushered in a period of low, relatively stable gas prices, it is also true that no one can predict what will happen in 10 years. Fuel switching at Northeastern Units 3 and 4, as stipulated for by the settlement agreement, renders PSO ratepayers much more vulnerable. If, for whatever cause, natural gas prices were to resume their historical volatility, a price spike would have devastating consequences for the PSO customers.

Figure 6: Natural Gas Futures Prices: 2000-2012



Source: "Why Are Natural Gas Prices So Low?" Bipartisan Policy Center. http://bipartisanpolicy.org/blog/2012/04/why-are-natural-gas-prices-so-low

Figure 7: Percentage of Total PSO System Energy Supplied from Coal



Source: Responsive Testimony of Scott Norwood on Behalf of Oklahoma Industrial Energy Consumers before the Corporation Commission of Oklahoma, Jan 8 2013

What Should PSO Do?

Ideally, Oklahoma Attorney General Scott Pruitt and his co-plaintiffs will prevail in court, and thereby spare the Sooner State of the EPA's absurd and costly regulations. Yet, even if these senseless regulations withstand judicial scrutiny, PSO would serve its ratepayers much better by retrofitting Northeastern Units 3 and 4 rather than by undertaking fuel switching. Fuel switching costs more than retrofitting and results in less energy and greater risk. So what should PSO do?

Above all else, the utility should keep its options open and win the best possible outcome for its ratepayers. Ultimately, it is PSO's customers who will bear the costs, not the EPA and Sierra Club.

There are several actions the utility could pursue to this end:

- Abandon the settlement agreement;
- Petition the EPA for a stay of implementation of the Regional Haze federal implementation plan;
- Work with the Oklahoma Department of Environmental Quality to rescind and revise the Regional Haze implementation plan submitted to EPA on June 14, 2013;

- Work with the Oklahoma Department of Environmental Quality to prepare a second, one-year extension of the Mercury and Air Toxics Standards, should the need for it arise; and
- Engage Oklahoma's Congressional delegation to pressure the EPA to work with the State of Oklahoma and PSO on these rules.

These are means by which PSO could achieve flexibility, in order to win the best possible outcome for its ratepayers. This is greatly needed. The EPA's deadlines are unreasonably tight, and compliance requires enormous capital investments that must be planned years in advance.

If PSO ultimately becomes a casualty of the EPA's war on coal, the utility will be hard pressed to explain how fuel switching is better for its ratepayers than retrofitting Northeastern Units 3 and 4, as coal-powered generation is significantly cheaper and entails far less risk of service disruptions or price shocks.

Appendix A: Regulatory Primer

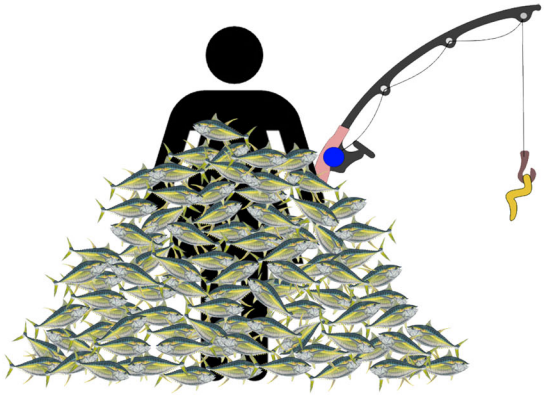
Regional Haze is a visibility regulation that has proven ineffective. Because it is an aesthetic regulation—and not a public health rule—Congress intended for states to be the lead decision makers. But despite Congress's intent that states call the shots on Regional Haze, the EPA disapproved Oklahoma's visibility improvement plan and imposed a federal plan instead. The agency's plan imposed almost $1.8 billion in capital costs on six coal-fired power generators in Oklahoma. The side-by-side images below depict the visibility "improvement" wrought by the EPA's controls over the state's. As the table shows, the agency's preferred plan achieves an imperceptible "benefit." *(The images below were created with Winhaze 2.9.9 Software.*[27]*)*

EPA's Controls

Oklahoma's Controls

Cost: $1.8 billion

Mercury and Air Toxics Standards is a public health standard that fails to serve an actual public health purpose. The EPA's justification for this regulation is the need to protect a supposed population of pregnant, subsistence fisherwomen, who consume more than 225 pounds of self-caught fish from exclusively the top 10 percent most polluted bodies of fresh, inland water. Notably, the EPA never identified a single member of this putative population; rather, they were modeled to exist. Despite this absurd justification, the Mercury and Air Toxics Standard is one of the most expensive regulations ever. It would apply to all existing and new coal-fired power plants and cost almost $10 billion annually.



EPA's Utility Mact would cost $10 billion per year to protect pregnant fisherwomen who eat 225 lbs of fish self- or family-caught from the top 90th percentile of polluted fresh water bodies.

Notes

[1] P.J. Gladnick, "Audio: Obama Tells SF Chronicle He Will Bankrupt Coal Industry," NewsBusters, November 2, 2008.
[2] For a description of all regulations that make up the "war on coal," see William Yeatman, "Yes, America, There is a War on Coal," GlobalWarming.org, September 23, 2012.
[3] William Yeatman, "EPA's New Regulatory Front: Regional Haze and the Takeover of State Programs," U.S Chamber of Commerce, June 2012.
[4] Marlo Lewis, William Yeatman, and David Bier, "All Pain and No Gain: The Illusory Benefits of the Utility MACT," Competitive Enterprise Institute *Issue Analysis*, June 2012.
[5] Attorney General Pruitt is a plaintiff in *State of Oklahoma, et al v. EPA*, brought by Oklahoma and industry against EPA's Regional Haze actions. The case is before the 10th Circuit Court of Appeals. Pruitt is also a plaintiff in *White Stallion Energy Center LLC, et al. v. EPA*, brought by multiple states and industry against EPA over the Mercury and Air Toxics Standards.
[6] "PSO is able to effectively manage its fuel mix by maximizing the use of lower cost coal," A. Naim Hakimi, Public Service Company of Oklahoma, supporting testimony, Cause No. PUD 2012 000168, p. 6, October 1, 2012
[7] Table 7-1, PSO 2012 Integrated Resource Plan
[8] Kenneth Howsen, Public Service Company of Oklahoma, supporting testimony, Cause No. PUD 201200168, Table 1, p. 7, October 1, 2012.
[9] Public Service Company of Oklahoma, "PSO, State Reach Agreement with EPA on Emissions Reduction Plans," News Release, April 24, 2012.
[10] This is a simplified version of the settlement. The Northeastern Unit retired in 2016 would be partially replaced with a 15-year contract for 260 megawatts of natural gas generating capacity. The remaining unit would be retrofitted with Dry Sorbent Injection (to control sulfur dioxide), a fabric filter (to control particulate matter), and Activated Carbon Injection (to control mercury), and would be subject to maximum capacity caps of 70 percent (in 2021 and 2022), 60 percent (in 2023 and 2024), and 50 percent (in 2025 and 2026), before closing at the end of 2026. Its power would be replaced primarily by new natural gas power plants.
The retrofit option—the alternative to fuel switching—would require the Northeastern Units 3 and 4 to be retrofitted with sulfur scrubbers (to control SO2; this technology is much costlier than Dry Sorbent Injection), fabric filters (to control particulate matter), and Activated Carbon Injection systems (to control mercury).
[11] As is explained in the second section of the paper, the settlement agreement results in a 210 megawatt decrease in capacity relative to the retrofitting option, thereby leaving reserve margins at the minimum threshold. If demand-side management energy savings do not materialize, or there's an increase in demand due to expanded oil and gas operations in the state, or better than expected economic growth, then PSO would have a reason to build new generating capacity, which would be beneficial to its bottom line.
[12] Scott Weaver, Public Service Company of Oklahoma, Substituted Exhibit SCW-8, November 28, 2012, and Public Service Company of Oklahoma Response to Attorney General questions 1-4, as cited in Scott Norwood, Oklahoma Industrial Energy Consumers, responsive testimony, Table 9, Cause No. PUD 201200054, January 8, 2013.
[13] Coal used at Northeastern Units 3 and 4 is priced at $1.2/MMBtu. See Charles West, Public Service Company of Oklahoma, supporting testimony, Cause No. PUD 201200168, October 1, 2012. Assuming an average heat rate of 10,450 btu/kWh, Northeastern Units 3 and 4 produce power at approximately $12.54/MWh, the average price of gas on the PSO system in 2011 was $4.48/MMBtu (see PSO Annual Fuel Prudence filings with OCC, as cited in Table 4, p. 25, Scott Norwood, Oklahoma Industrial Energy Consumers, responsive testimony, January 8, 2013). Assuming an average heat rate of 7,071 Btu/kWh, the average price of natural gas energy is $31.67/MWh.
[14] Congressional opposition to a carbon tax was expressed most recently on August 2, 2013, when the U.S. House of Representatives passed the REINS Act (H. R. 367), which included an amendment that would effectively bar EPA from imposing a carbon tax without Congress's consent. The amendment, offered by Rep. Steve Scalise, was adopted by a bipartisan vote of 237 to 176.
[15] Scott Weaver, Public Service Company of Oklahoma, Substituted Exhibit SCW-8, November 28, 2012, and Public Service Company of Oklahoma Response to Attorney General questions 1-4, as cited in Scott Norwood, Oklahoma Industrial Energy Consumers, responsive testimony, Table 9, Cause No. PUD 201200054, January 8, 2013. In rebuttal testimony PSO witness Mark Becker noted that this estimate of the impact of the carbon tax was static, in that it represents the subtraction of a carbon tax impact after the model was run. This means that the carbon tax estimate does not capture how a carbon tax would affect the altered interplay between the coal and natural gas

markets. Becker's point is conceded by OIEC witness Scott Norwood in Surrebuttal Testimony. While not comprehensive, the carbon tax estimate is nonetheless instructive.

[16] Jack Ihle, Public Service Company of Colorado, Direct Testimony, PUC Docket 11A-869E.

[17] Ibid., p. 51.

[18] Oklahoma Corporation Commission, Final Order Cause No. PUD 200600285, p. 79.

[19] Weaver, Public Service Company of Oklahoma, Substituted Exhibit SCW-8.

[20] The reserve margin is a straightforward calculation: (total generating capacity – load responsibility)/(load responsibility).

[21] Southwest Power Pool Criteria, Section 2.1.9.

[22] Scott Weaver, Public Service Company of Oklahoma, Responsive Testimony, Exhibit SCW 1, Cause No. PUD 201200054, September 26, 2012.

[23] Mark Becker, Public Service Company, Rebuttal Testimony, p. 21, Case No. PUD 201200054, February 11, 2012.

[24] See: generally, Public Service Company of Oklahoma, 2012 Integrated Resource Plan, Appendix Exhibit A "Demand Side Resources," October 1, 2012.

[25] Scott Weaver, Public Service Company of Oklahoma, Responsive Testimony, p. 13, Case No. PUD 201200054, September 26, 2012.

[26] After 2026, PSO's only coal asset would be Oklaunion, a coal fired power plant in Texas, of which PSO has the rights to 101 megawatts. Assuming the plant runs 80 percent of the time, that is approximately 707,808 megawatt hours in 2027. PSO's projected internal load for 2027 is 20,426 GWh (see Scott Weaver, Public Service Company of Oklahoma, Responsive Testimony, Exhibit SCW-1). Oklaunion would account for approximately 3.4 percent of this total internal load.

[27] Winhaze 2.9.9 Software was used to create images depicting the visibility improvement engendered by both EPA and state preferred controls. Winhaze is a computer imaging software program that simulates visual air quality differences in various National Parks and Wilderness Areas. Users can select a scene and then model the visibility that corresponds to an input value, of which there are three: extinction, visual range, and deciview. For Regional Haze modeling, deciview is the standard metric of visibility improvement. Winhaze is available for free at ftp://ftp.air-resource.com/WINHAZE/.