

Assumptions that lead to overestimation of the cost of regulations

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In response to new and upcoming EPA air regulations for the electric power fleet, in particular the proposed Utility NESHAP (Toxics Rule) and the final Cross-State Air Pollution Rule (CSAPR), the nation's fleet of coal-fired power plants is expected to install additional air pollution control systems—such as scrubbers and fabric filters—over the next several years. There have been various forecasts of retirements of coal units, increases in electricity costs due to the cost of controls, and the resulting impacts on the US economy.

It is important to bear in mind that these forecasts are generally made using large, complex, models that rely on thousands of assumptions about how markets behave, future economic conditions, what fuels will cost in the future, alternative generating resources and their costs, the costs of environmental compliance, and many other variables. The US Environmental Protection Agency (EPA) uses ICF Consulting's Integrated Planning Model (IPM). DOE's Energy Information Administration uses the National Energy Modeling System (NEMS), and there are other models used in the private sector as well. Because of the complexity of these models, and the many "knobs" that can be turned that affect the results, it is crucial that the assumptions that underlie the model be sound, transparent, and understood. Otherwise, model results could be misleading.

A recent study by NERA Economic Consulting examined the effects of several EPA rules.¹ The study relied on the NEMS model to develop forecasts of behavior and costs for the electric sector in response to EPA regulations, and the resulting costs were used in other models to forecast the implications for the US economy. One of the regulations evaluated is the proposed Utility Air Toxics Rule. The control technology assumptions used in that modeling effort are examined here, including how they compare to actual practice, and what the impact would be on the model results.

Some of the assumptions for application of control technologies that were used by NERA in their analysis of the Air Toxics Rule are summarized in Table 1 along with actual practice and the impacts of the assumptions on forecasted cost of compliance with the rule. Background on actual practices can be found in a March 2011 report released by NESCAUM and by an April 2011 report by URS.^{2, 3} As shown in Table 1, NERA makes several assumptions that are inconsistent with actual practice.ⁱ These assumptions, when used in the NEMS model, will result in a significantly higher forecasted need for equipment retrofits and a resulting higher cost for utilities to comply with the Air Toxics Rule than will actually result from the rule. The implications of this overestimation of compliance cost are that any forecasts for power plant retirements, the cost of energy and any adverse impacts for the US economy will be overstated.

ⁱ Although some of the assumptions used by NERA have also been used by others, they are nevertheless inconsistent with industry practice and will result in an overestimation of the cost of compliance.

Table 1. NERA Assumptions, Actual Practice and Impacts of the Assumptions

NERA Assumption	Unit-by-unit compliance requirements
Actual Practice	The proposed rule allows facility-wide averaging in demonstrating compliance. This will mean that smaller units co-located with larger units may not need to install additional controls if the larger unit is achieving sufficiently low emissions.
Impact of Assumption	This incorrect assumption will result in forecasting an apparent need for more technology retrofits and higher costs than will actually be necessary.
NERA Assumption	All coal units will require HCl Controls – DSI with a fabric filter, wet FGD or Dry FGD
Actual Practice	Most western fuels, especially PRB fuels, have low intrinsic chlorine and have high free lime in the fly ash. In most cases, the inherently low HCl is neutralized very effectively by the ash without any additional equipment and this is supported by the coal and stack test data companies reported to EPA. Few subbituminous coal units are likely to need HCl controls.
Impact of Assumption	This incorrect assumption will result in forecasting an apparent need for more DSI and scrubber retrofits and higher costs than will actually be necessary.
NERA Assumption	DSI is not applicable for boilers larger than 300 MW
Actual Practice	This assumption is simply untrue. Dominion’s Kinkaid plant, with two 660 MW boilers burning PRB coal, has been utilizing DSI for SO ₂ control upstream of the existing ESPs as part of its BART compliance strategy.
Impact of Assumption	This incorrect assumption will result in forecasting an apparent need for more scrubber retrofits and higher costs than will actually be necessary.
NERA Assumption	All DSI installations require a fabric filter
Actual Practice	While beneficial, a fabric filter is generally not necessary for DSI. In fact, DSI using trona or sodium bicarbonate actually <u>improves</u> the performance of the existing ESP.
Impact of Assumption	This incorrect assumption will result in forecasting an apparent need for more fabric filter retrofits and higher costs than will actually be necessary.
NERA Assumption	Only remedy for Hg emissions is ACI with a fabric filter
Actual Practice	Some ACI installations may need a fabric filter, but many will not. Experience thus far has found that fabric filters have generally <u>not</u> been necessary for ACI systems. Moreover, scrubbed units can generally increase Hg capture through chemical addition (such as bromide addition), or other approaches that are far less expensive than ACI with a fabric filter.
Impact of Assumption	This incorrect assumption will result in forecasting an apparent need for more fabric filter retrofits and higher costs than will actually be necessary.
NERA Assumption	Only remedy for PM emissions is a fabric filter
Actual Practice	Many ESPs can be upgraded to meet the PM standard at a much lower cost than a fabric filter. In fact, retrofit of DSI can improve ESP performance and provide acid gas reductions.
Impact of Assumption	This incorrect assumption will result in forecasting an apparent need for more fabric filter retrofits and higher costs than will actually be necessary.

References

- ¹ NERA Economic Consulting, “Potential Impacts of EPA Air, Coal Combustion Residuals, and Cooling Water Regulations”, September 2011
- ² Staudt, J., Andover Technology Partners, and MJ Bradley and Associates, “Control Technologies to Reduce Conventional and Hazardous Air Pollutants from Coal-Fired Power Plants”, prepared for Northeast States for Coordinated Air Use Management (NESCAUM), March 31, 2011
- ³ Lipinski, G., Leonard, J., Richardson, C., URS Corporation, “Assessment of Technology Options Available to Achieve Reductions of Hazardous Air Pollutants,” April 5, 2011