

ENVIRONMENTAL REGULATION AND ELECTRIC SYSTEM RELIABILITY

FROM THE STAFF OF THE BIPARTISAN POLICY CENTER



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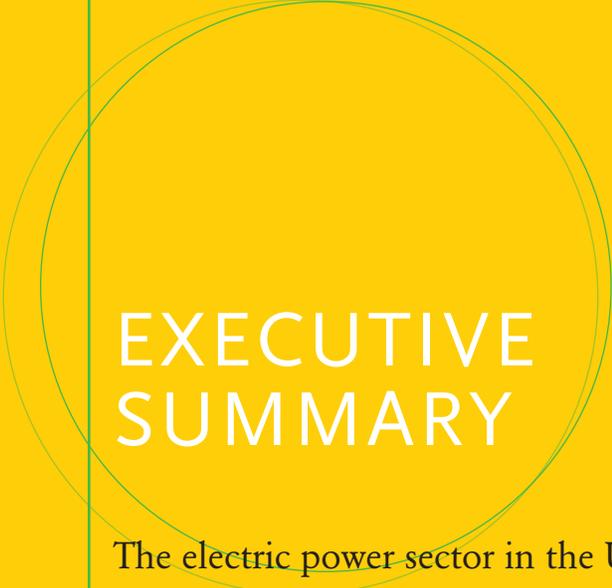
This report was prepared by the staff of the Bipartisan Policy Center to promote a better understanding of the possible impacts of U.S. Environmental Protection Agency regulation of the electric power sector and to identify a range of strategies for managing associated reliability concerns. The views expressed here do not necessarily reflect those of the BPC Energy Project or our workshop co-sponsors, presenters, and participants.

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EXECUTIVE SUMMARY

The electric power sector in the United States faces a changing market environment, one that features reduced or flattened demand, low natural gas prices, new environmental regulations, and continued uncertainty about the future regulation of carbon. Among the regulations recently proposed or currently under development by the U.S. Environmental Protection Agency (EPA) are rules to address air pollution transport, air toxics, coal ash, and cooling water intake structures at existing plants.¹ These regulations are expected to result in significant public health and environmental benefits that, when monetized, are well in excess of compliance costs.²

¹ These rules are being proposed under the Clean Air Act and other statutory authorities, which require EPA to protect public health, welfare, and the environment from adverse impacts of power plants.

² For example, EPA estimates the health and environmental benefits of the proposed Transport Rule range from \$120 to \$290 billion in 2014, while compliance costs for that year are estimated to be \$2.8 billion (estimates are in 2006 dollars). See United States Environmental Protection Agency. Proposed Air Pollution Transport Rule: Reducing Pollution, Protecting Public Health. http://www.epa.gov/airquality/transport/pdfs/TRPresentationfinal_7-26_webversion.pdf.

Key benefits of the suite of EPA regulations include the avoidance of tens of thousands of premature deaths annually, reductions in pollution-related illnesses, and improved visibility and ecosystem health. These new conditions in the power sector are expected to increase the number of coal-fired power plants that will be retired in the next several years; in fact, a number of plant shutdowns have recently been implemented or announced.

Environmental compliance deadlines are likely to have a strong influence on the timing of these retirements, as plant owners will not want to make significant capital investments in some older, marginal units that might otherwise be shut down soon for economic reasons. This has led to concerns that the power sector could face reliability issues as utilities comply with new regulations. Others have argued that power companies and regional, state, and federal authorities have recourse to a range of technology options and planning approaches that can help them avoid reliability impacts from the impending suite of environmental regulations.

To shed light on these complex issues, the Bipartisan Policy Center (BPC), together with the National Association of Regulatory Utility Commissioners (NARUC) and Northeast States for Coordinated Air Use Management (NESCAUM), hosted a series of workshops to assess the possible impacts of regulation and identify a range of strategies for managing associated reliability concerns.³ The three workshops featured presentations by leading experts on electric power system reliability, electricity market operations, power sector technology, and pollution control policies and regulations (see Appendix A).⁴ Building on the presentations and public dialogue at these workshops, our review of a range of existing analyses, and our own analytic work, BPC has developed a number of findings and recommendations. Our main conclusions are summarized below.

IMPACTS ON THE RELIABILITY OF THE ELECTRIC SYSTEM DUE TO EPA REGULATIONS ARE MANAGEABLE.

BPC analysis indicates that scenarios in which electric system reliability is broadly affected are unlikely to occur. Previous national assessments of the combined effects of EPA regulations reach different conclusions, in part because they make quite different assumptions about

the stringency and timing of new requirements and about the availability and difficulty of implementing control technologies. In some cases these assumptions deviate from the specifics of EPA's recent proposals in meaningful ways. Moreover, market factors, such as low natural gas prices, are as relevant as EPA regulations in driving coal plant retirements. A number of recent developments are especially relevant from the standpoint of addressing reliability concerns:

- EPA's proposed cooling water regulations are far less stringent than assumed in the vast majority of analyses, many of which considered worst-case scenarios in which cooling towers would be required on all existing units.
- Some commercially available, lower-cost technologies (e.g., dry sorbent injection) for treating hazardous air pollutants were not factored into most previous analyses. Including them significantly reduces retirement projections.
- Most of the units projected to retire are small, older units that are already operating infrequently. Some of these units may be needed to meet peak demand on the hottest and coldest days or to provide voltage support. In some cases, there may be viable mechanisms, other than one-to-one capacity replacement, available to serve these needs.⁵
- The industry has significant amounts of existing natural gas generating capacity that is currently under-utilized and may be available to take up the slack, depending on the region.
- Some previous assessments do not account for market responses to future retirements, specifically to the potential for adding new capacity to meet reserve margins. Assuming timely permitting, the need for modest new capacity resources could be met with quick-to-build natural gas turbines, as well as demand side resources.⁶



³ BPC gratefully acknowledges NARUC and NESCAUM as co-conveners of the workshop series. However, the report is solely a product of the staff of the Bipartisan Policy Center and does not necessarily represent the views of NARUC, NESCAUM, or any of the workshop participants.

⁴ Information from each of the workshops, including video and presentations, is available at www.bipartisanpolicy.org.

⁵ For example, demand response and energy efficiency programs, energy storage, and transmission upgrades.

⁶ Although many gas turbines have been built within 3 years in the recent past, some in industry have raised concern that the permitting process for new construction, including greenhouse gas best available control technology (BACT) determinations, might take up to two to three years, added on top of two year construction for a new gas turbine. BPC modeling projects only 200 MW of new gas capacity would be needed, beyond the 1200 MW of new gas turbines expected in the business as usual scenario to be built by 2015.

SUMMARY OF FORTHCOMING EPA REGULATIONS

TRANSPORT RULE – On July 6, 2010, EPA proposed the Transport Rule, a replacement for the Clean Air Interstate Rule (CAIR) which was previously remanded in a 2008 court decision.⁷ The newly proposed Transport Rule would require 31 states and the District of Columbia to meet state pollution limits for sulfur dioxide (SO₂) and nitrogen oxides (NO_x) as a means to ensure compliance with National Ambient Air Quality Standards (NAAQS) for ground-level ozone and fine particulate matter (PM).

UTILITY AIR TOXICS RULE – On March 16, 2011, EPA proposed its Utility Air Toxics Rule under a court-ordered deadline to control hazardous air pollutants, including mercury, acid gases and non-mercury metals.⁸ As specified by the Clean Air Act, the Utility Air Toxics Rule provides that plants must comply with emission limitations for hazardous air pollutants within three years, but allows an additional year for plants to come into compliance if such time is necessary to install pollution controls.

COAL COMBUSTION WASTE DISPOSAL REGULATIONS – On June 21, 2010, EPA published a proposed rule to take comment on whether or not coal combustion waste should be regulated as hazardous waste.⁹ These wastes, which primarily consist of coal ash, are generated in large quantities by the power sector. According to the proposal, ash could be regulated as “special waste” under the Clean Air Act’s hazardous waste provisions (Subtitle C). Alternatively, EPA could deem the coal ash non-hazardous and regulate under Subtitle D, with self-implementing requirements that are not subject to federal enforcement.

CLEAN WATER ACT SECTION 316(B) COOLING WATER INTAKE STRUCTURES – To protect fish and aquatic ecosystems, EPA proposed regulations on March 28, 2011 for cooling water intake structures at electric generating units (EGU) and other industrial facilities that draw large amounts of water out of rivers, lakes, and oceans. This proposed regulation responds to a settlement agreement that was reached after EPA’s earlier cooling water proposals were litigated.

GREENHOUSE GAS PERFORMANCE STANDARDS – On December 23, 2010, EPA announced that it will propose greenhouse gas performance standards for power plants by July 2011 and finalize standards by May 2012. This action is being taken under a settlement agreement. At public “listening sessions” to inform this rulemaking process, EPA indicated that its greenhouse gas performance standards would not be designed to induce “game-changing” technology improvements; rather the Agency aims to bring older plants up to modern standards of efficiency.

A NUMBER OF TOOLS FOR ADDRESSING RELIABILITY CONCERNS ARE AVAILABLE TO INDUSTRY AND TO STATE AND FEDERAL REGULATORS.

EPA should take advantage of its existing statutory authorities to structure clear regulations that include sensible timelines and encourage cost-effective compliance strategies. Specifically, EPA should finalize the flexibilities proposed in its Utility Air Toxics Rule (which sets “maximum achievable control technology” standards for hazardous air pollutants) and 316(b) cooling water rule. Where needed and allowed by statute, EPA and state permitting agencies should grant utilities time extensions – with as much advance notice as possible – to install pollution control technologies and to build the new capacity required to achieve compliance.¹⁰

Regional, state, and utility analyses should continue to examine the potential localized impacts of retirement and retrofit schedules, as well as opportunities to attract non-conventional capacity resources, such as demand resources, distributed generation, and grid-scale energy storage capacity. While most studies have taken a national approach to reliability assessments, more study is warranted to assess localized reliability impacts in the most vulnerable regions, and efforts should be made to refine and improve analytical tools.

If specific issues are identified, federal and state agencies should consider implementing strategies to assure reliability while utilities complete upgrades or bring new generation online. As a backstop, DOE has emergency powers to keep essential generation on-line, and the President has emergency powers to delay requirements in order to protect national security. In addition, EPA may enter into consent decrees – which set forth the steps needed to resolve non-compliance – to enforce the provisions of the Rule. Such consent decrees, however, should aim to eliminate any economic advantage that companies may otherwise have as a result of operating out of compliance. Consent decrees are negotiated once a company is deemed in violation, and stakeholders may not view this legal mechanism as an acceptable option that could be built into company planning. However, consent decrees do offer an additional means of backstop reliability protection.

⁷ *State of North Carolina v. Environmental Protection Agency, Et. al.* (D.C. Cir. 2008)

⁸ U.S. Environmental Protection Agency. Proposed Utility Air Toxics Rule. National Emission Standards for Hazardous Air Pollutants from Coal- and Oil-fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units. Signed March 16, 2011. Page 59. Available at <http://www.epa.gov/ttn/atw/utility/pro/proposal.pdf>.

⁹ For additional information and the proposed rule see: <http://www.epa.gov/wastes/nonhaz/industrial/special/fossil/ccr-rule/index.htm>.

¹⁰ Some stakeholders endorse efforts to preempt reliability concerns and provide extra time up front in the process, rather than wait for problems and rely on emergency powers and consent decrees.

NEVERTHELESS, THE ELECTRIC POWER SECTOR AND ITS REGULATORS FACE PLANNING CHALLENGES IF THE AIM IS TO AVOID LOCALIZED RELIABILITY PROBLEMS AND MINIMIZE IMPACTS ON ELECTRIC RATES.

A rapidly shifting market and regulatory environment will create planning challenges for the electric power industry. The compliance deadlines of the Utility Air Toxics Rule, in particular, will accelerate and concentrate the decision-making timeframe for plant retirements, retrofits, and new infrastructure into a short period over the next few years. At the same time, many states are weighing new or stronger approaches to incentivize clean energy, energy efficiency, and/or non-conventional capacity resources. This convergence of issues and planning needs offers an opportunity for the industry and its regulators to work together to optimize policies and investment decisions so as to minimize consumer costs, avoid stranded assets, and maximize the benefits achieved by modernizing the nation's electric power infrastructure. At the same time, it will undoubtedly also present challenges, particularly in heavily affected regions where the resources available to support thoughtful planning and regulatory processes—both in terms of people and funding—are already under severe pressure.

Compliance planning can and should begin early and should take into account existing regulations as well as the expected regulations. If plant owners begin planning now and obtain a one year extension from their permitting authority, they will have almost five years from the date of the proposed rule to the date of the extended compliance deadline. Multi-pollutant planning and efforts to integrate non-conventional capacity resources and transmission planning will help to minimize rate impacts for electric consumers. At the same time, federal, regional, and state entities have appropriate roles to play in supporting planning efforts and mitigating anticipated reliability challenges and costs.

Specifically, state public utility commissions (PUCs) and regional transmission organizations or independent system operators (RTO/ISOs) should coordinate closely with power companies to ensure early multi-pollutant compliance planning and to coordinate retrofit outage schedules. To help with the pacing of control retrofits, states should continue to look for incentives and opportunities to encourage retrofit installations that begin well in advance of compliance deadlines.

Federal agencies, including the Department of Energy (DOE), the Federal Energy Regulatory Commission (FERC), and EPA, should provide analytic and technical support and coordinate with state and regional authorities to facilitate a smooth transition.

This convergence of issues and planning needs offers an opportunity for the industry and its regulators to work together to minimize consumer costs, avoid stranded assets, and maximize the benefits achieved by modernizing the nation's electric power infrastructure.

In light of the tight timeframes involved, state legislatures as well as EPA, DOE, and FERC should pursue strategies to help state utility regulators deal with increased workloads, particularly in the years 2012 through 2014, in order to facilitate timely decisions and allow the design and building of pollution controls and infrastructure, as needed.

DUE TO DIFFERENCES AMONG THE STATES, THERE IS NO SINGLE APPROACH TO COMPLIANCE AND RELIABILITY THAT WILL WORK EVERYWHERE. HOWEVER, A NUMBER OF STRATEGIES ARE ALREADY BEING EMPLOYED TO SUPPORT EARLY PLANNING IN DIFFERENT TYPES OF MARKETS.

In regulated states, the integrated resource planning (IRP) process informs state utility regulators who approve rate plans. State policy makers should consider a multi-pollutant approach for rate recovery and planning decisions. States should also advance policies that encourage and place responsibility with utilities for long term decision-making that avoids stranded assets and minimizes consumer costs. In addition, state regulators should recognize the value of long-term natural gas supply contracts to provide price stability and facilitate project financing. Finally, traditionally regulated states should encourage the development of non-conventional capacity resources as one means to help preserve a reliable bulk electricity system and minimize consumer costs.

In restructured states, the transparency of regional or state wholesale markets makes it easier to anticipate planned retirements and outages; in addition, competitive markets create financial incentives for timely investment in new transmission, generation, and non-conventional capacity. In these states, RTOs and ISOs typically facilitate orderly planning for power plant retirements by requiring utilities to provide advance notice if they intend to retire a unit and by conducting reliability impact studies. In light of the large number of pollution control equipment installations expected under upcoming EPA regulations, these regional entities should also play a more active role in coordinating outages, including between neighboring regions that might rely on each other to meet electricity demand during this transition period.

ENSURING A SMOOTH TRANSITION TO A CLEANER ELECTRIC POWER SECTOR WILL REQUIRE NEW INVESTMENTS IN SUPPLY AND DEMAND-SIDE CAPACITY, AS WELL AS TRANSMISSION AND OTHER INFRASTRUCTURE. STATE AND FEDERAL AGENCIES SHOULD LOOK FOR OPPORTUNITIES TO STREAMLINE THE SITING AND PERMITTING OF NEW INFRASTRUCTURE.

A smooth transition to a cleaner and more efficient generation system will require investments in energy efficiency, demand response strategies, and cleaner new generation capacity along with associated transmission and pipeline infrastructure. Fortunately retired capacity will not need to be replaced on a one-to-one basis to meet energy needs, simply because many of the units likely to be retired are not operating at full capacity now and many other existing units are under-utilized.¹¹ In some instances, of course, the retirement of an existing generator may give rise to new capacity or transmission needs within a relatively brief period of time. And while the industry has generally been able to add capacity on the scale and within the timeframes needed in the past, policy makers at the state and federal levels should explore approaches to facilitate this process by streamlining procedures for siting and permitting new infrastructure.

THERE MAY BE A SHORT WINDOW OF OPPORTUNITY TO ENACT A LEGISLATIVE FIX THAT COULD GUARANTEE THE ENVIRONMENTAL BENEFITS OF THE CLEAN AIR ACT AND PROVIDE A LOWER COST TRANSITION FOR THE POWER SECTOR.

Although BPC believes that the benefits of power sector regulation, including new regulations such as the Utility Air Toxics Rule, far outweigh the cost, we also recognize that associated compliance costs will not be trivial. EPA estimates that compliance costs for the Utility Air Toxics Rule alone will total \$10.9 billion annually. For the average electricity consumer, this translates to an increase of \$3 to \$4 per month.¹² BPC estimates annual costs of \$14.5 billion in 2015 and \$18.1 billion in 2025 to comply with the suite of EPA air, water, and waste rules.¹³

Some workshop participants suggested that a legislative fix could provide equivalent or greater environmental benefits at a lower cost than regulatory approaches under existing law, particularly for air pollutants. To be successful, multi-pollutant legislation would need to provide certainty on requirements and timing, and encourage rational and timely investment decisions in pollution controls and new capacity. Further, multi-pollutant legislation should ultimately guarantee the environmental benefits available under current authority, while offering a smoother transition. Several market-based, multi-pollutant legislative proposals have been debated in recent years. While recognizing that it would be politically difficult to advance new legislation, the BPC believes that this approach could provide public health and economic benefits and should be explored in the coming months.

¹¹ According to EPA, for units projected to retire from the Utility Air Toxics rule, the average capacity factor is 56 percent, the average age is 51 years, and the average size is 109 Megawatts.

¹² U.S. Environmental Protection Agency. Power Plant Mercury and Air Toxics Standards: Overview of Proposed Rule and Impacts. <http://www.epa.gov/airquality/powerplanttoxics/pdfs/overviewfactsheet.pdf>.

¹³ See Section III and Appendix B for details on BPC analysis of the impacts of EPA regulations.

