Mercury Emissions from Electric Power Plants: States Are Setting Stricter Limits

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Summary

In March 2005, the U.S. Environmental Protection Agency (EPA) promulgated the first national emission standards for mercury emissions from electric power plants. EPA studies conclude that about 6% of American women of child-bearing age have blood mercury levels sufficient to increase the risk of adverse health effects (especially lower IQs) in children they might bear. Power plants account for 42% of total U.S. mercury emissions, according to EPA. Thus, there has been great interest in the agency's power plant regulations.

The regulations established a cap-and-trade program to address power plant emissions, but the program would have little impact on emissions before 2018. At that time, the regulations call for a 69% reduction in emissions as compared to the 1999 level.

In setting the limit so far in the future, EPA stated, in part, that mercury control technologies were not commercially available, and would not be generally available until after 2010. Many observers disagreed with that conclusion, including a growing number of states. As of February 2007, 18 states (Arizona, Colorado, Connecticut, Delaware, Florida, Illinois, Maryland, Massachusetts, Minnesota, Montana, Nevada, New Hampshire, New Jersey, New York, North Carolina, Oregon, Pennsylvania, and Virginia) have established more stringent emission limits, which take effect sooner than will EPA's, and four other states are developing regulations that would do so.

The state standards vary in stringency, in effective dates, and in numerous other details, but a number of generalizations can be made:

- Most of the state programs will require reductions of 80% to 90% in mercury emissions when fully implemented; by comparison, the federal program requires a 22% reduction in its first phase and 69% when fully implemented.
- The effective dates of the state programs range from 2007 at the earliest to 2015; the federal requirements will not be fully implemented until at least 2025.
- The state programs generally prohibit interstate trading of mercury credits, and many also prohibit in-state trading. The trading prohibitions address the concern that "hot spots" with high concentrations of mercury might persist if individual plants could avoid installing controls by buying credits.

This report reviews the state standards for mercury emissions from power plants and discusses issues raised by the promulgation of such standards. Among these are whether states can prevent the sale of credits generated by compliance with state regulations in EPA's national credit trading program, and the potential impact of state programs on court challenges to EPA's national regulations.

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Background

On May 18, 2005, the U.S. Environmental Protection Agency (EPA) promulgated the first national standards for mercury emissions from coal-fired electric power plants.[1] Mercury is a potent neurotoxin that can cause adverse health effects (principally delayed development, neurological defects, and lower IQ in fetuses and children) at very low concentrations.[2]

The principal route of exposure to mercury is through consumption of fish. Mercury enters water bodies, often through air emissions, and is taken up through the food chain, ultimately affecting humans as a result of fish consumption. According to the EPA, as of December 2004, 44 states had issued fish consumption advisories due to mercury.[3] Twenty-one states (primarily in the Midwest and Northeast) have issued advisories for mercury in all their freshwater lakes and/or rivers. Twelve states in the Southeast and New England, have advisories for mercury statewide in their coastal waters, and Hawaii has a statewide advisory for mercury in marine fish.

Mercury reaches water bodies from many sources, including combustion of fuels containing the substance in trace amounts. In the United States, coal-fired power plants are the largest emission source, accounting for 42% of total mercury emissions according to EPA. EPA's 2005 regulations, referred to as the Clean Air Mercury Rule (CAMR), establish a cap-and-trade program for power plant mercury that will take effect in 2010. CAMR will have little impact on emissions before 2018, however.[4] At that time, the regulations call for a 69% reduction in emissions as compared to the 1999 level.

In setting the limit so far in the future, EPA stated, in part, that mercury control technologies are not commercially available, and will not be generally available until after 2010. Many observers disagree with that conclusion, including a growing number of states. This report describes what those states that have chosen alternative forms of regulation are requiring.

Which States Are Setting Standards

As of February 2007, 18 states have established more stringent emission limits that will take effect sooner than will EPA's, and four other states are developing regulations that would do so. The states with regulations already promulgated (or laws enacted) represent a broad cross-section of states, including Arizona, Colorado, Connecticut, Delaware, Florida, Illinois, Maryland,

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[1] 70 *Federal Register* 28606.

[2] For a discussion of mercury's health effects, see CRS Report RL32868, *Mercury Emissions from Electric Power Plants: An Analysis of EPA's Cap-and-Trade Regulations*, by (name redacted), or CRS Report RL32420, *Mercury in the Environment: Sources and Health Risks*, by (name redacted).

[3] U.S. EPA, Office of Water, "2004 National Listing of Fish Advisories," Fact Sheet, September 2005, p. 4, at http://www.epa.gov/waterscience/fish/advisories/fs2004.pdf.

[4] The conclusion regarding the rule's lack of impact is based on EPA's analysis. The rule establishes a cap of 38 tons of emissions from affected units between 2010 and 2017, but the agency estimates that actual emissions will be reduced to 31 tons in 2010 as the result of pollution controls installed under other (non-mercury) regulatory programs. Emissions will continue to decline, according to EPA, reaching 28 tons in 2015, while the cap remains at 38 tons. Thus, the CAMR rule's cap in the period 2010-2017 serves primarily to generate credits that will be used to delay full compliance with the 69% reduction otherwise required beginning in 2018. Full compliance with the 69% reduction, according to EPA's analysis, will not occur until after 2025. For additional information, see CRS Report RL32868, *Mercury Emissions from Electric Power Plants: An Analysis of EPA's Cap-and-Trade Regulations*, by (name red acted).

Massachusetts, Minnesota, Montana, Nevada, New Hampshire, New Jersey, New York, North Carolina, Oregon, Pennsylvania, and Virginia.[5] Together, these states have 177 coal-fired power plants, with a total of 414 electric generating units. The combined generation capacity of these units is estimated at 97,138 megawatts (Mw), 32% of total U.S. coal-fired electric generation.

The four states that have proposed but not yet finalized mercury standards (Georgia, Michigan, Washington, and Wisconsin) have an additional 51 plants. Their combined generation capacity is estimated at 33,986 Mw, an additional 11% of total U.S. coal-fired generation.

What the Standards Will Require

Rates, Dates, Compliance, and Trading

As shown in **Appendixes A** and **B**, the specifics of the state standards vary in stringency, in effective dates, and in numerous other details. Nevertheless, at least four generalizations, regarding rates, dates, compliance measurement, and allowance trading, can be made.

First, at least 15 of the state programs will require reductions of 80% to 90% in mercury emissions when fully implemented. Second, the effective dates range from 2007 at the earliest to 2015, with a majority of the programs imposing at least a first phase reduction by 2010. [The CAMR rule, as noted earlier, also imposes a cap in 2010, but it calls for a 22% reduction in that year, whereas most of the state requirements call for 80% to 90% reductions by then.] Third, in general, the programs provide some flexibility by measuring compliance as a rolling 12-month average of emissions, rather than setting an emission limit to be met at all times. CAMR, of course, is even more flexible, allowing utilities to exceed the standard at individual facilities and even company-wide, provided that they obtain allowances for each pound of mercury emitted. Fourth, unlike the CAMR program, a key feature of which is the trading of emission allowances, the state programs generally prohibit interstate trading of mercury credits; many prohibit in-state trading, as well. These prohibitions address the concern that mercury hot spots might persist if individual plants could avoid installing controls by buying credits. Also, the states that prohibit interstate trading are insuring that emission reductions within their state not generate credits that could be used to delay reductions by plants in other states (i.e., states participating in the CAMR program).

Measurement Issues and Other Complications

Beyond the four generalizations, there are a number of aspects to the state mercury control programs that vary from state to state. For one, there are varying forms in which the emission limits are expressed, the most commonly used being: 1) as a percentage reduction from the amount of "inlet" mercury; or 2) as a fixed emission limit (either pounds per gigawatt-hour of electricity produced or pounds per trillion Btu of energy consumed). At least one state (Montana)

[5] Many earlier discussions of state mercury requirements, including previous CRS reports, list Wisconsin as being among the states requiring more stringent limits. Wisconsin adopted regulations in 2004 to require a 40% reduction in emissions by 2010, and a 75% reduction by 2015. The regulations required, however, that if a federal standard limiting mercury emissions from utilities were promulgated under Section 111 or 112 of the Clean Air Act, Wisconsin would adopt it. Wisconsin has, therefore, adopted the CAMR rule's budget and is no longer to be counted among those states with more stringent limits. In August 2006, however, the state's Governor directed his Department of Natural Resources to develop regulations to achieve a 90% reduction in utility mercury emissions as soon as possible.

plans to vary the emission limit depending on the type of coal used (allowing substantially higher emissions for lignite). Others set different limits depending on the size of the plant or of the company that owns it. Thus, it can be difficult to compare the stringency of various state requirements. The common rule of thumb in press accounts describing these programs seems to be the percentage emissions reduction that they would require, but it is important to ask, first, compared to what, and, second, whether there is an alternate fixed limit or alternate method of compliance that provides a less stringent standard.

Further complicating the emission reduction math are two other factors: first, the mercury content of coal varies (making it difficult to estimate inlet mercury); and second, many power plants are already achieving substantial emission reductions as a result of their existing emission control equipment. EPA estimates that existing controls are already reducing mercury emissions (as compared to inlet amounts of mercury) by about one-third nation-wide, with substantially greater reductions at some plants. Thus, to achieve a 90% reduction of inlet mercury does not require a reduction of 90% in current emission levels. In some cases, particularly at plants with baghouses (fabric filters), a 90% reduction may require little additional control.[6]

Data on current mercury emission levels are not generally available in any comprehensive fashion, either. The best national data come from a survey conducted by EPA in 1998, which relied on sampling at 80 of the nation's more than 1,000 coal-fired units rather than continuous emissions monitoring at them all.[7] The mercury content of coal is known to vary even within a given coal seam. Until better monitoring equipment is installed (which will be an effect of the state and federal programs), it will be difficult to establish with any precision both current emission levels and the exact reductions one can expect from emission control programs.

Other Aspects of State Laws

Other complicating features unique to some of the states laws and regulations are worth noting. New Jersey, for example, which has the earliest compliance deadline (December 15, 2007) would extend its deadline to 2012 for half of a company's capacity if the plants also make major reductions in sulfur dioxide, nitrogen oxides, and particulates. Virginia has different requirements for the state's largest utility (which controls 63% of the state's coal-fired generating capacity) than it has for others. Minnesota's law only applies to facilities with capacity above 500 Mw; most other states apply requirements to units 25 Mw or larger. Pennsylvania would presume that units with specific combinations of control technology are in compliance with the regulations' emission limitations.

Other, De Facto State Limits

States with No Allowances

In addition to the states that have enacted laws or are developing regulations to control mercury, three other states and the District of Columbia have de facto limits of zero for mercury emissions

[6] U.S. EPA, Office of Research and Development, "Control of Mercury Emissions from Coal-Fired Electric Utility Boilers," undated, posted March 2, 2004, available at http://www.epa.gov/ttn/atw/utility/hgwhitepaperfinal.pdf.

[7] For a discussion of EPA's data collection on mercury emissions, see CRS Report RL32744, *Mercury Emissions from Electric Generating Units: A Review of EPA Analysis and MACT Determination*, by (name redacted) et al.

as a result of the federal CAMR rule. An irony of the federal rule is that, because it grants allowances to each state based on current emissions of mercury from power plants larger than 25 Mw in that state, states that have no coal-fired power plants or that only have plants smaller than 25 Mw are given no allowances. The District of Columbia and the states of Idaho, Rhode Island, and Vermont fall into this category and, thus, have a limit of zero for power plant mercury emissions.

Under CAMR, states are not *required* to adopt the federal cap-and-trade program, but, if they do not do so, they are required to show that state regulations are at least as stringent as the federal. If D.C., Idaho, Rhode Island, and Vermont do not join the federal program, they have to demonstrate that they have limited emissions through in-state controls to zero; this would effectively prohibit the siting of new coal-fired power plants in these jurisdictions.

Table 1. States with Few CAMR Allowances

State	2018 Allowance (tons)	2018 Allowance (pounds)
Alaska	0.004	8
California	0.016	32
Hawaii	0.009	18
Maine	0.001	2
South Dakota	0.029	58

Source: U.S. EPA, Clean Air Mercury Rule, 40 CFR 60.4140, as revised May 31, 2006, available at http://www.epa.gov/air/mercuryrule/pdfs/camr_recon_fr_final_053106.pdf. Total allowances in 2018 are 15 tons (30,000 lbs.). States shown have allowances of less than 0.1 ton (200 lbs.). In addition, 7 other states (Connecticut, Delaware, Massachusetts, New Hampshire, New Jersey, Oregon, and Washington) have allowances below 0.1 ton, but, as shown in Appendices A and B, are opting out of the CAMR program.

By joining the federal program, on the other hand, these states (and D.C.) would become part of the federal allowance trading program; new coal-fired power plants would be able to operate in these jurisdictions by buying emission allowances from facilities outside the state that have reduced emissions sooner or to a greater extent than CAMR requires. As of February 2007, Idaho, Rhode Island, and Vermont had all decided not to participate in the CAMR program, effectively prohibiting the construction of new coal-fired power plants in their jurisdictions.

States with Few Allowances

Five additional states (Alaska, California, Hawaii, Maine, and South Dakota) have so little coal-fired generation that their *combined* 2018 allowances under CAMR are 118 pounds, substantially less than 1% of the national total. **Table 1** shows the 2018 allowances under CAMR for each of these states. For these states also, there would be little alternative to joining the CAMR program if the state wished to preserve the option of coal-fired power plants, since a state program would have to show that it would limit emissions to as little as 2 pounds in the case of Maine, or 32 pounds in the case of California. Thus, Alaska, Hawaii, and South Dakota have decided to participate in the CAMR program. Maine has decided to let EPA administer the program.

California, however, is reported to be considering a state program, and is unlikely to consider participating in CAMR.[8]

Model State Program

In addition to the programs developed by individual states, the State and Territorial Air Pollution Program Administrators (STAPPA) and Association of Local Air Pollution Control Officials (ALAPCO) developed a model rule in 2005 to encourage more stringent controls on power plant mercury emissions. (STAPPA and ALAPCO are now known collectively as the National Association of Clean Air Agencies, NACAA.) The model, which was publicly released November 14, 2005, offers two options. The first option calls for an average 80% capture of inlet mercury from existing units (or an equivalent output-based emission standard of 0.010 lbs./Gwh) based on a 12-month rolling average, beginning December 31, 2008. During this phase, owners or operators could comply by averaging emissions from all their existing units within the state. A second phase, beginning December 31, 2012, would require a 90-95% capture of inlet mercury or an output-based emission standard of 0.0060-0.0025 lbs./Gwh. During this phase, averaging would be limited to units located at a single electric generating plant. The rule would prohibit interstate trading of allowances.

A second option in the STAPPA/ALAPCO model rule, like a provision in New Jersey's law, would provide more flexibility to electric generating units in return for the installation of control technologies designed to capture additional pollutants. Under this option, an owner or operator could delay compliance with the mercury emission limits for four years at up to 50% of its generating capacity if it agreed to meet stringent standards for emissions of sulfur dioxide, nitrogen oxides, and particulate matter, in addition to mercury by the end of 2012.

While no state has adopted the STAPPA/ALAPCO model intact, the model serves as a window on what state and local officials closely involved in regulating power plant emissions believe is feasible. Nineteen of the 22 states that have proposed or adopted programs more stringent than the federal CAMR rule have done so since the model rule's unveiling.

Conclusions

With a few exceptions, it is a general precept of federal environmental laws that more stringent state standards are not preempted. Relying on this authority, some states (particularly, California and a number of Northeastern states) have adopted various environmental requirements that address problems that are judged to be unique to their state or more severe in their state than elsewhere. Thus, state actions to set more stringent limits on mercury emissions are not considered unprecedented or unusual. Nevertheless, the degree to which states are opting out of the federal program and the speed with which they are doing so appear noteworthy.

In part, the development of these state programs reflects a judgment by state regulators or legislators that the CAMR rule is not sufficiently stringent.[9] In part, it reflects a judgment that

[8] See National Association of Clean Air Agencies, "State Mercury Programs for Utilities," December 7, 2006, at http://www.4cleanair.org/Documents/StateTable.doc.

[9] For example, see statement of Eddie Terrill, Director of the Oklahoma Air Quality Division and President of STAPPA: "EPA's approach would allow too much mercury for too long." "State Local Government Officials Unveil (continued...)

EPA's assessment of the availability and cost of technology to control mercury emissions are unduly pessimistic.[10]

State actions were also dictated by a looming deadline for submission of programs for EPA approval. Under the CAMR rule, states had until November 17, 2006 to submit their programs (either programs adopting CAMR or programs at least as stringent) to EPA. Failure to submit can leave states liable to imposition of a Federal Implementation Plan (FIP), which would impose the CAMR rule's requirements on a state through an EPA-run program.

EPA officials have aggressively promoted CAMR and the threat of FIPs, testifying before state legislatures against the adoption of more stringent state programs, and questioning the authority of states to prohibit interstate trading of allowances. At the same time, many of the states adopting more stringent requirements are pursuing legal action to overturn EPA's rule and force the agency itself to adopt more stringent requirements.[11]

It may be some time before these issues are resolved. In the meantime, if state programs with stringent control requirements are successfully implemented, it will become more difficult for EPA to argue that technology is unavailable to more aggressively control power plant mercury emissions. Conversely, if the technology fails to do its job or proves to be more expensive than emissions control industry spokespersons have asserted, EPA's hand will be strengthened. Since the earliest state requirements take effect at the end of 2007 and early in 2008, these questions may continue to merit congressional oversight at least through that period.

(...continued)

'Model' Rule to Clean Up Toxic Mercury," STAPPA/ALAPCO Press Release, November 14, 2005.

[10] For example, New Jersey's regulatory package, written in late 2004, stated: "USDOE has been studying mercury control on coal-fired boilers for more than a decade. Technologies like ACI [activated carbon injection] are available now. USDOE has a goal to get costs of ACI down to 1/4th current costs. However, the current costs of activated carbon injection are justified now. ... There is over a decade of successful use of Activated Carbon Injection for Municipal Solid Waste (MSW) combustion. In New Jersey, MSW incinerators with baghouse control and ACI have achieved 99 percent mercury control. Transfer of such technology is clearly feasible from an engineering and cost perspective. The USDOE cost analyses indicate that retrofitting the coal-fired boilers with activated carbon injection (ACI) and baghouses (or polishing baghouses) can achieve 90 percent mercury emission reduction. ACI has a low capitol (sic) cost. It also has low operating costs if baghouse technology is used." See New Jersey Department of Environmental Protection, Summary of Public Comments and Agency Responses, Control and Prohibition of Mercury Emissions, December 6, 2004 New Jersey Register, pp. 83-84, available at http://www.nj.gov/dep/rules/adoptions/mercury_rule7-27.pdf.

[11] "EPA Fighting State Adoption of Strict Mercury Control Regulations," *Inside EPA Clean Air Report*, May 4, 2006. The question of whether states may prohibit interstate trading of allowances is an interesting one. In the only case law on the question (Clean Air Markets Group v. Pataki, 338 F.3d 82 (2d Cir. 2003)), the Second Circuit held that New York State's Air Pollution Mitigation Law, which restricted in-state electrical generating units' abilities to transfer emission allowances to upwind states under Title IV of the Clean Air Act, was preempted by the federal Clean Air Act. The court explained that federal preemption results when, notwithstanding that the federal and state law have the same goal, the state law interferes with the *methods* by which the federal law was designed to reach that goal. By effectively prohibiting the transfer of allowances to electric generating units in other states, the New York law interfered with the *nationwide* allowance transfer system contemplated by the Clean Air Act. Whether *Clean Air Markets* provides a basis for arguing that state prohibitions on trading mercury allowances are preempted is a slightly different question, however: the wording of the CAMR rule and its preamble leave some uncertainty as to whether states can retire excess allowances or whether they revert to EPA. In the latter case, allowances generated by more stringent state standards could be sold to electric generating units in other states, effectively negating state efforts to prohibit trading of their allowances.

Appendix A. Enacted / Promulgated Mercury Controls

State	Effective Date	% Reduction	Coal-fired Plants		Additional Information
			Number	Mw	
Arizona	2013	90% or 0.0087 lbs. of mercury per gigawatt-hour (Gwh)	5 plants (11 units)	3,086	Compliance will be measured on a rolling 12-month basis. Regulation is effective 1/29/07.[a]
Colorado	January 1, 2012 January 1, 2014 December 31, 2018	80% or 0.0174 lbs./Gwh at 2 plants (5 units) 80% or 0.0174 lbs./Gwh at all other plants (except low emitters) 90% or 0.0087 lbs./Gwh	12 plants (22 units)	4,784	Colorado is participating in the federal program with state-specific provisions designed to achieve early significant reductions. Two plants must achieve an 80% reduction of inlet mercury (or a specific output-based limit) in 2012, with all other plants meeting this standard in 2014. Plants emitting less than 29 lbs. of mercury are exempt as low emitters. More stringent (90%) limit takes effect in 2018. Compliance generally determined on a 12-month rolling average. Allows trading. Provides for Best Available Control Technology Alternative Standard if a company operates appropriate controls but can't meet the limit. Rule adopted by the Colorado Air Quality Control Commission February 6, 2007.[r]
Connecticut	July 1, 2008	90% or 0.6 lbs. of mercury per trillion Btu (TBtu)	2 plants (2 units)	553	If the technology designed to achieve the law's requirements fails to reduce emissions sufficiently, a plant may request an alternative emissions rate. Law enacted June 3, 2003.[b]
Delaware	January 1, 2009 January 1, 2013	80% or 1.0 lbs./TBtu 90% or 0.6 lbs./TBtu	2 plants (6 units)	1,021	Compliance measured at each unit, based on quarterly average emissions. No trading or facility-wide averaging. Department will review standards, available technology, and cost-effectiveness by 1/11/10. Regulations effective 12/11/06.[c]
Florida	2012	30% below CAMR	15 plants (32 units)	11,867	Florida has adopted a modified version of the CAMR rule that will allocate only 70% of the emission allowances provided by CAMR for the years 2012-2017. No change in compliance dates. Under CAMR, Florida's Phase 1 cap is 2,466 lbs. of mercury. EPA estimates that 1999 emissions were only 1,923 lbs., and these will be further reduced as a result of the co-benefits of the Clean Air Interstate Rule. Thus, Florida DEP proposes a limit of 1,761 lbs., a 30% reduction, beginning in 2012. Even this cap would generate a large number of allowances, as actual Phase 1 emissions are estimated at 1,033 lbs. The state's Environmental Regulation Commission approved the rules at a June 29, 2006 public hearing.[d]
Illinois	July 1, 2009	90% or 0.0080 lb/GWh	21 plants (59 units)	14,880	Compliance measured on a rolling 12-month basis. No trading, but allows system-wide and plant-wide averaging through December 31, 2013, and plant-wide averaging thereafter. Until 12/31/13, individual plants using system-wide averaging must meet a standard of 0.020 lb/GWh or a 75% reduction. The state's second and third largest utilities have reached agreements that give

State	Effective Date	% Reduction	Coal-fired Plants		Additional Information
			Number	Mw	
					them additional time to meet the mercury reduction requirement in return for more stringent controls than otherwise required on SO_2 and NOx. Final order adopted December 21, 2006.[e]
Maryland	January 1, 2010 January 1, 2013	80% 90%	6 plants (13 units)	4,603	Emission reductions measured as a rolling 12-month average. Law affects state's 6 largest plants. Two units at a 7th facility may be subject to alternative regulations. Allows trading among facilities owned or operated by the same company. Law enacted April 6, 2006.[f]
Massachusetts	January 1, 2008 January 1, 2012	85% or 0.0075 lbs./GWh 95% or 0.0025 lbs./GWh	6 plants (12 units)	1,741	Emission reductions measured as a rolling 12-month average. Regulations promulgated May 2004.[g]
Minnesota	December 31, 2010 and December 31, 2014.	90%	3 plants (6 units)	1,807 by 2010 1,847 more by 2014	Plants with dry scrubbers must install equipment designed to reduce emissions 90% by 12/31/2010. Plants with wet scrubbers must install equipment designed to reduce emissions 90% by 12/31/2014. Allows performance-based incentives such as increased rates of return for reductions above 90%. Applies to facilities with capacity above 500Mw. Law enacted May 11, 2006.[h]
Montana	January 1, 2010	80% (0.9 lbs./TBtu) except for lignite (1.5 lbs./TBtu)	3 plants (6 units)	2,300	Compliance measured on a 12-month rolling average. Provides for Alternate Emission Limits if a company operates appropriate controls but can't meet the limit. Mercury-specific control technology review every 10 years. Rule adopted October 16, 2006.[i]
Nevada	Same as CAMR.	Same as CAMR, but with incentives for low emissions and new technology.	3 plants (8 units)	2,657	Nevada adopted the federal program, but it reserved 63% of its emissions allowances for new units, low emitting units, or to be placed in a special account that could be retired.[j]
New Hampshire	July 1, 2013	at least 80%	2 plants (5 units)	575	Prior to July 1, 2013, the owner is required to test and implement, as practicable, mercury reduction control technologies or methods to achieve early reductions. If mercury reductions greater than 80% are achieved, they shall be required by permit. Facility owners will also generate early reduction credits if they reduce emissions prior to 2013. Plants may be allowed to emit additional sulfur dioxide in return for lower mercury emissions. Law enacted May 9, 2006.[k]
New Jersey	December 15, 2007	90%	7 plants (10 units)	2,171	Allows facility-wide averaging. Deadline can be extended to 2012 for half of a company's capacity if the plants also make major reductions in sulfur dioxide, NOx, and fine particulate emissions. Regulations promulgated November 4, 2004.[l]

State	Effective Date	% Reduction	Coal-fired Plants		Additional Information
			Number	Mw	
New York	January 1, 2010 January 1, 2015	EPA Phase I emission caps (50% reduc-tion) for 2010-2014 0.6 lbs./TBtu beginning in 2015 (a 90% reduction from the statewide 1999 emissions estimate)	18 plants (48 units)	4,216	Compliance to be measured on a 30-day rolling average. No trading. No banking after 2018. New York State Environmental Board approved regulations December 18, 2006. Regulations take effect 1/27/07.[m]
North Carolina	December 31, 2013 2018	74% 88%	20 plants (62 units)	12,755	14 plants (49 units) operated by Duke Energy and Progress Energy must install controls for NOx and SO_2 by 12/31/13. These controls will have a cobenefit of reducing state-wide mercury emissions by 74%. Other coal-fired plants (6 plants, 13 units) must install similar controls by 2018, resulting in an estimated state-wide mercury emission reduction of 88%. Trading allowed, but all units must install controls. Rules adopted Nov. 9, 2006.[n]
Oregon	July 1, 2012	90% (or 0.6 lbs./TBtu)	1 plant (1 unit)	556	Allows up to a 1-year compliance extension if it is not practical to install control equipment due to supply limitations or other extenuating circumstances. Also allows alternative limits if technology is unable to achieve the required limits. Limited interstate trading until 2018; no trading thereafter. Regulation adopted 12/15/06.[o]
Pennsylvania	January 1, 2010 January 1, 2015	at least 80% (or 0.024 lbs./Gwh) at least 90% (or 0.012 lbs./Gwh)	35 plants (73 units)	20,000	Emission reductions measured on a rolling 12-month basis. Stricter limits for new units. Compliance may be demonstrated on a unit-by-unit basis, facility-wide emission averaging, or system-wide compliance. Units that utilize specific combinations of control technology would be presumed to be in compliance with the emission limitations. Adopted by the PA Environmental Quality Board 10/17/06. Effective February 17, 2007.[p]
Virginia	January 1, 2015 for Dominion Virginia Power plants (63% of total state generating capacity)	64%	16 plants (38 units)	5,719	Legislation adopted by Virginia in 2006[q] adopts the federal emission limits but requires compliance 3 years early at plants owned by the state's largest utility. It also prohibits the purchase of allowances by most facilities: owners of facilities whose combined emissions of mercury exceeded 200 pounds in 1999 are limited to their own allowances (these facilities represent at least 80% of total generating capacity in the state.) Virginia generators may, however, bank and sell allowances.

Source: Compiled by the Congressional Research Service, largely from state information sources. If not reported by the state, the generating capacity of coal-fired plants is summer capacity, as of January 1, 2005, as reported by Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

a. http://www.azsos.gov/public_services/Register/2006/51/final.pdf

b. http://www.cga.ct.gov/2003/act/Pa/2003PA-00072-R00HB-06048-PA.htm

c. http://www.awm.delaware.gov/NR/rdonlyres/3B571C5A-080A-43D7-A3F2-032AE9748BD7/1312/Reg1146final.pdf

d. http://www.dep.state.fl.us/Air/rules/regulatory/CAMR_Allowance_Allocations_Rule_with_DEP_Substitute_Language_6-29-06.pdf

e. http://www.ipcb.state.il.us/cool/external/CaseView2.asp?referer=coolsearch&case=R2006-025

f. http://mlis.state.md.us/2006rs/bills/sb/sb0154e.pdf

g. http://www.mass.gov/dep/images/hgreg.pdf

h. http://www.revisor.leg.state.mn.us/bin/bldbill.php?bill=H3712.3.html&session=ls84

i. http://www.deq.state.mt.us/ber/MercuryRuleSummary.pdf

j. http://ndep.nv.gov/mercury/camr06/camr_state_plan06.pdf

k. http://www.gencourt.state.nh.us/legislation/2006/HB1673.html

l. http://www.nj.gov/dep/rules/adoptions/mercury_rule7-27.pdf

m. http://www.dec.state.ny.us/website/dar/air_regs.html#recent

n. http://daq.state.nc.us/news/pr/2006/hg_rule_11092006.shtml

o. http://www.deq.state.or.us/aq/mercury/index.htm

p. http://www.pabulletin.com/secure/data/vol37/37-7/37-7.pdf

q. http://leg1.state.va.us/cgi-bin/legp504.exe?061+ful+HB1055ER+pdf

r. http://www.cdphe.state.co.us/ap/reg6/CAMRfinal.pdf

Appendix B. Other State Actions

State	Action	Date / % Reduction	Coal-fired Plants		Details	Status
			Number	Mw		
Georgia	Georgia has proposed to adopt the CAMR rule with some additions. The Scherer power plant, 4 units with a combined capacity of 3,430 Mw, would be required to install sorbent injection (ACI) and a baghouse for mercury control between 12/ 31/08 and 4/30/10. Other units with a combined capacity of 5,510 Mw, would have to install scrubbers and SCR technology by 2010 or earlier. New units would be required to install best available control technology.	As described in the Action column, 62% of the state's coal-fired capacity would be required to install specific control technology by 2010 or earlier, making it likely that reductions would be greater and would occur sooner than under the CAMR program.	10 plants (32 units)	14,369	The state's proposed option would not allow interstate trading of mercury allowances, but would allow trading within the state.	Proposal dated December 21, 2006.[a] Hearings have been held and the state is conducting negotiations with stakeholders.
Michigan	4/17/06 letter from Governor directed Michigan Department of Environmental Quality to develop a rule.[e]	90% reduction of input mercury or an output limit of 0.008 lbs. of mercury per Gwh by 2015.	23 plants (55 units)	11,295	Compliance measured on a calendar year basis. Interstate trading would not be allowed, nor would banking of allowances. Could allow utility system-wide approach if it does not result in hot spots. Could allow additional time for technical or cost reasons.	Regulations proposed 1/30/07.[b]
Washington	Department of Ecology initiated rulemaking June 5, 2006. State is considering opting out of the federal mercury trading program after 2012 and may adopt more stringent emission reduction requirements.	Possibilities under consideration include 0.6 lb mercury/TBtu, 0.0087 lb/Gwh, or 0.0088 lb/Gwh by 2013. These represent reductions of 85%-90% of input mercury.	1 plant (2 units)	1,405	State is considering opting out of the federal trading program after 2012, with the possibility of allowing intrastate trading.	Department of Ecology produced an emissions standard discussion paper and a draft rule for a 10/26/06 stakeholder meeting.[c]
Wisconsin	Wisconsin adopted regulations in 2004 to require a 40% reduction in	Same as federal.	17 plants	6,917		On August 25, 2006, Governor Doyle directed the Wisconsin

State	Action	Date / % Reduction	Coal-fired Plants		Details	Status
			Number	Mw		
	emissions by 2010, and 75% by 2015.[d] The regulations required, however, that if a federal standard limiting mercury emissions from utilities were promulgated under Section 111 or 112 of the Clean Air Act, Wisconsin would adopt it. Wisconsin has, therefore, adopted the CAMR rule's budget.		(49 units)			Department of Natural Resources to develop a rule achieving a 90% reduction of mercury emissions from coal-fired power plants "as soon as possible."[e] In a presentation, December 15, 2006, DNR staff proposed to sunset interstate mercury trading 1/1/18, and require 90% emission reductions 1/1/20.[f]

Source: Compiled by the Congressional Research Service, largely from state information sources. If not reported by the state, the generating capacity of coal-fired plants is summer capacity, as of January 1, 2005, as reported by Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

a. http://www.air.dnr.state.ga.us/airpermit/cair/CAMR.html

b. http://www.michigan.gov/deq/0,1607,7-135-3310-142890—,00.html

c. http://www.ecy.wa.gov/laws-rules/activity/wac173406.html.

d. http://dnr.wi.gov/org/aw/air/reg/mercury/nr446.pdf

e. Governor's press release at http://www.wisgov.state.wi.us/journal_media_detail.asp?locid=19&prid=2278.

f. http://dnr.wi.gov/org/aw/air/pdf/hg1206caatf.pdf

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