Environmental Updates

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Cost-Benefit Analysis and the US Mercury and Air Toxic Standards

Burning fossil fuels to generate electricity results in the release of numerous toxic pollutants into the atmosphere. During the Obama administration, standards were put in place to limit emissions of some of the most dangerous toxins in the power generation industry, including mercury. These standards are currently under fire, as the Trump administration is questioning the way the human health benefits of regulation were calculated. This creates not only a challenge to these particular standards, but could also set a precedent that would make it harder to enact other environmental regulations that benefit human health.

The Mercury and Air Toxic Standards

In 2011 the Environmental Protection Agency (EPA) under the Obama administration drafted strict regulations on the emissions of mercury and other toxins from coal- and oil-fired power plants. Known as the Mercury and Air Toxic Standards, or MATS, these standards were considered necessary as the Clean Air Act did not regulate mercury emissions at the national level. MATS targeted power plants because they are responsible for around 50% of all mercury emissions in the U.S. Under MATS, existing power plants had four years to adopt new control technologies or switch fuel sources before the standards went into full effect in 2015. Implementation of these standards has largely been considered to be a success, with coal-and oil-fired power plants reporting a 69% reduction of regulated toxins between 2014 and 2016.

Health Impacts of Mercury and Other Toxins

When mercury is emitted into the air through the burning of fossil fuels, it eventually settles on land where it can be washed into waterways and converted to methylmercury. There, it builds up in fish and other aquatic animals, especially in larger fish who consume smaller fish in a process known as biomagnification. Consumption of fish and shellfish is the main way that humans are exposed to mercury. This exposure leads to increased risk of cancer and respiratory illness, and is especially harmful to young children and pregnant women as it can interfere with nervous system development, resulting in lower IQ and developmental problems. These effects are so severe that the Food and Drug Administration recommends that pregnant women and young children eat no more than 2-3 servings of fish per week, and that they avoid certain larger species of fish (including swordfish, marlin, and tuna) altogether.

Other toxins regulated under MATS, including arsenic, chromium, nickel, and acid gases are also responsible for cancer and other cardiovascular issues, while fine particulates are responsible for heart disease and respiratory illnesses, including asthma. All of these diseases contribute to increased medical bills, lost days of work, and premature deaths across the U.S.

MATS Cost-Benefit Analysis

The EPA evaluates proposed regulations using cost-benefit analysis. When the MATS standards were developed, the total compliance costs to power plants was estimated to be between $7.4 billion to $9.6 billion annually. Though the costs are high, the EPA's cost-benefit analysis showed that the human health benefits of reducing emissions were even greater. The figure below shows the anticipated health impacts per year, which were monetized to show an annual benefit of $37 billion to $90 billion in health impacts alone. These values include the benefits of reducing emissions of fine particulates, sulfur dioxide, and nitrogen oxides, which occurs as a side effect of fuel switching or using new technologies to remove mercury. These additional benefits are called "co-benefits" since they are not attributed to the pollutants being directly regulated by the policy. Overall, the EPA's cost-benefit analysis concludes that benefits of MATS exceed the costs by a ratio of about 4:1, and possibly as high as 12:1.

The Mercury and Air Toxics Standards Will Prevent:	*Once Implemented (cases each year)*
Premature Death	*Up to 11,000*
Chronic Bronchitis	*2,800*
Heart Attacks	*4,700*
Asthma Attacks	*130,000*
Hospital and Emergency Room Visits	*5,700*
Restricted Activity Days	*3,200,000*

Proposed Changes to the Standards

In December of 2018 the EPA under the Trump administration proposed changes to the way the benefits of MATS are calculated, arguing that the co-benefits should not be included in cost-benefit analysis. Without including these secondary health benefits, the administration argues that the annual health benefits are only $4 to $6 million, which does not justify the $7.4 to $9.6 billion in annual costs to electricity generators. Although the Obama-era standards were not repealed, this new quantification will make it easier for power companies or the coal industry to challenge MATS in court. Further, this change in cost-benefit analysis protocol could become the new norm for environmental standards, making it difficult to include co-benefits when estimating the benefits of pollution reduction.

The Politics of MATS

The proposed changes to the Mercury and Toxic Air Standards are in line with President Trump's commitment to support U.S. coal production and revive the industry, which has declined rapidly since the early 2000s as coal has been increasingly replaced by alternative cleaner and cheaper energy sources. The acting EPA administrator, Andrew Wheeler, previously worked as a coal lobbyist with clients including the CEO of Murray Energy Corporation, one of the largest independent coal mine operators in the United States. Murray Energy challenged the MATS standards in court in 2016 and has praised the proposed changes. But as MATS remains in effect as of early 2019, many electrical generation plants have already purchased the necessary control technology and are encouraging the Trump administration to keep the regulation in place.

This update specifically relates to *Environmental and Natural Resource Economics: A Contemporary Approach* Chapters 7-8. For more information about the books, teaching materials, and research, see www.gdae.org

Sources:

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