



Leveraging Federal Funding to Meet and Exceed Soot Standards

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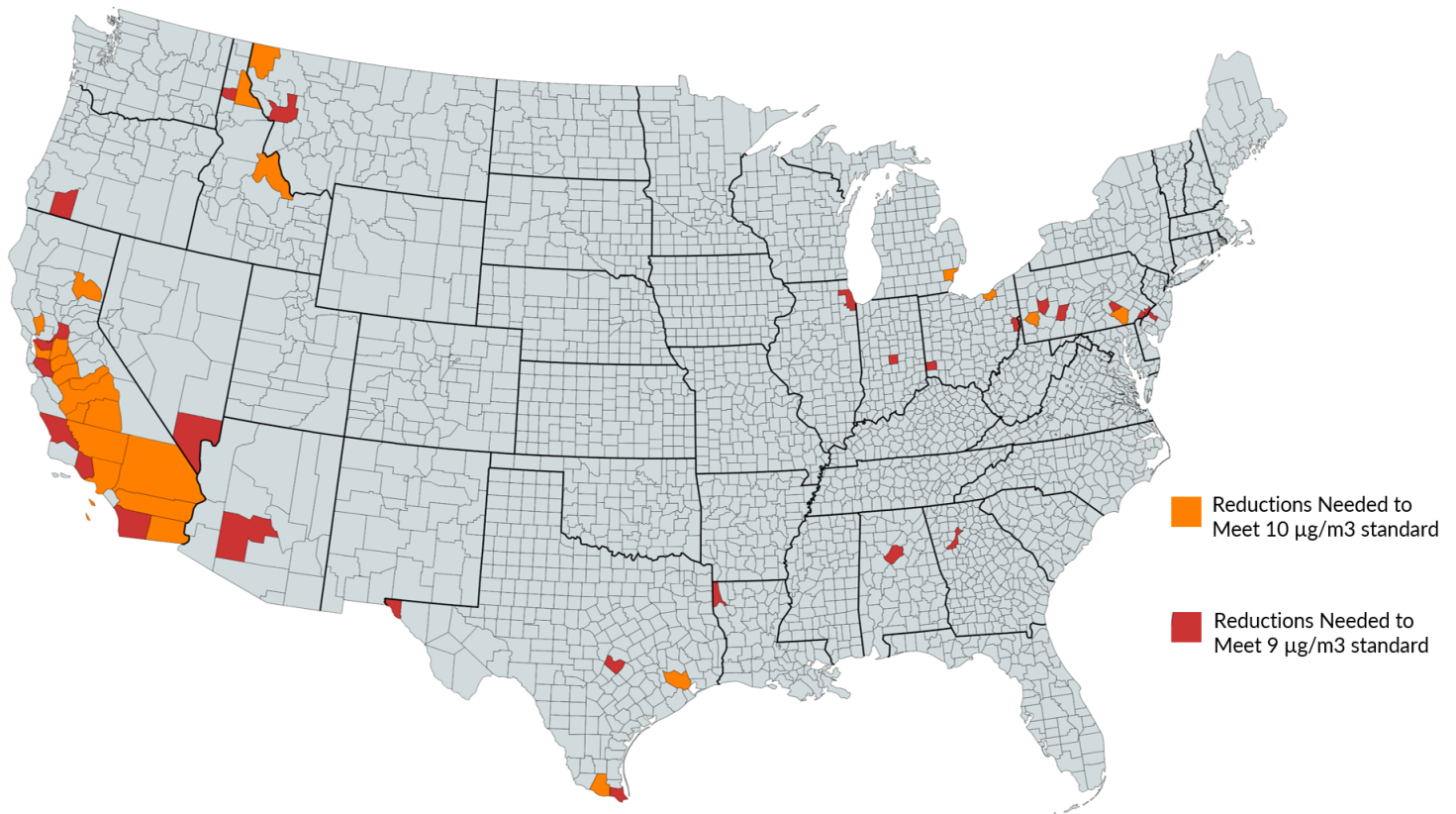
Provisions in the Inflation Reduction Act and the Bipartisan Infrastructure Law present opportunities for state and local governments to create safer, healthier communities and cost-effectively meet national air quality standards for particulate matter, also referred to as PM2.5 or soot.



Introduction

Exposure to air pollution has been linked to a number of adverse health impacts, including increased asthma rates, bronchitis, heart attacks, higher risk of severe illness from COVID-19, and premature death. The majority of this pollution is due to the combustion of fossil fuels, which creates tiny particles in the air. The smallest of these particles (those with diameters 2.5 micrometers and smaller; referred to as PM_{2.5} or 'particulate matter') cause the greatest risk to public health. A recent study from researchers at Harvard University, George Mason University, and the University of Texas, Austin shows that a staggering 460,000 deaths between 1999 - 2020 are attributable to coal PM_{2.5} pollution¹. In January 2023, the Environmental Protection Agency (EPA) released a long-awaited proposal to strengthen the PM_{2.5} National Ambient Air Quality Standard (NAAQS) from the current annual primary standard of 12 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) to a range of 9–10 $\mu\text{g}/\text{m}^3$ ².

Counties Required to Reduce Particulate Matter Pollution to Meet Alternative Standards³



¹ [Mortality risk from United States coal electricity generation](#)

² [Proposed Decision for the Reconsideration of the NAAQS for Particulate Matter](#)

³ Shaded counties represent reductions needed beyond the 2032 'Annual 12/35 Design Value' in Table 2A-8 of EPA's RIA for the proposed NAAQS

In its analysis of the proposal, EPA found that only 24 of 3,100+ counties⁴ in the U.S. would need to reduce ambient particulate matter levels to meet an alternative standard of 10 µg/m³ in comparison with the current standard⁵. An additional 27 counties would need to reduce ambient particulate matter levels to meet a stronger alternative standard of 9 µg/m³. Even under the stronger alternative standard, these 51 counties (shown in the map above) would only need to reduce ambient particulate matter levels by an average of 10%⁶. Although the number of counties impacted by the proposed alternative standards is small, and the average reductions required are modest, the benefits to public health are more than worthwhile. EPA's modeling estimates that achieving a stronger alternative standard of 9 µg/m³ would prevent up to 4,200 premature deaths each year⁷.

Federal Funding Paves the Way for Particulate Matter Reductions

Still, there would be a cost to reducing pollution to achieve a new standard. Under a stronger alternative standard, there would be 16 states responsible for reducing ambient particulate matter levels for the 51 counties projected to be in nonattainment. In its regulatory impact analysis, the EPA models control measures that these states could take to reduce local emissions and the approximate cost of those measures. These local control measures (e.g. installing particulate filters on industrial commercial and institutional boilers; filtering commercial cooking emissions; converting residential wood burning to gas logs; paving road shoulders and unpaved roads to control dust) could account for 45% of the reductions needed to achieve a standard of 9 µg/m³ at an estimated annual cost of \$393 million⁸. However, it's important to note that the control measures EPA modeled in its regulatory impact analysis are not prescriptive and that we're already on a path to achieve much of the particulate matter reductions needed under a stronger NAAQS. This path is achievable due to the billions of dollars of funding available in the Inflation Reduction Act (IRA) and Infrastructure Investment and Jobs Act (IIJA).

Opportunities to Cut Soot Pollution in the Electric Sector

In the **electric sector**, IRA and IIJA provide funding in the form of credits to manufacture and build clean energy, expand and modernize transmission, refinance or retire coal plants, and repurpose retired fossil fuel infrastructure. As a result of this funding, it's estimated that 99% of remaining U.S. coal plants are now more expensive to run than replacement by new local solar, wind, or energy storage⁹. For some counties, pollution from coal plants (both nearby and in other states) significantly contributes to ambient particulate matter levels¹⁰.

⁴ [EPA Regulatory Impact Analysis accompanying the Notice of Proposed Rulemaking](#)

⁵ In the RIA, EPA determined the pollution reductions required at a county level in comparison to baseline "design values". These design values project expected reductions in current particulate matter levels in 2032 from other finalized CAA rules (including compliance with the existing 12 µg/m³ PM_{2.5} standard). The design values also screen for the influence of "exceptional events", such as wildfires. EPA excludes counties impacted by these exceptional events from [nonattainment designation](#).

⁶ Reductions needed calculated as percentage difference between the 2032 'Annual 12/35 Design Value' in Table 2A-8 of the RIA and a value of 9 µg/m³

⁷ [EPA press release on the Proposed Rulemaking](#)

⁸ Note - 81% of the additional reductions needed would be in California. Total cost from Table ES-5, and total emissions reductions from Tables ES-3 and ES-4 of the [RIA](#).

⁹ [Coal Crossover 3.0](#), Energy Innovation

¹⁰ [Out of Control: The Deadly Impact of Coal Plant Pollution](#), Sierra Club

For counties where the majority of remaining coal plants are located, Sierra Club estimates that replacing remaining coal plants with clean energy alone would account for 41% of the total particulate matter reductions needed to achieve a 9 µg/m³ standard¹¹.

However, we won't need to retire every coal plant in the country to achieve meaningful particulate matter reductions. In Pennsylvania, for example, three of the four deadliest coal plants have recently retired (Homer City Station) or will retire by 2028 (Keystone and Conemaugh)¹². These three plant retirements could account for an average of 58% of the total particulate matter reductions needed to achieve a 9 µg/m³ standard¹³ in Pennsylvania.

Opportunities to Cut Soot Pollution in the Transportation Sector

In the transportation sector, IRA and IIJA funding primarily takes the form of personal tax credits to purchase electric vehicles (EVs), commercial EV tax credits, clean heavy-duty vehicle credits, domestic supply-chain incentives, and charging infrastructure credits. The IRA and IIJA also include grant and rebate programs that will provide funding for electric school buses, electric transit buses, electric trucks and equipment at ports, and charging infrastructure. These incentives are projected to significantly accelerate sales of electric cars, trucks, and buses. Recent analysis shows that the 2030 national sales share of both light/medium and heavy-duty electric trucks could more than double thanks to incentives in the IRA and IIJA¹⁴. The transportation incentives in the infrastructure bills, along with enacted state-level policies like Advanced Clean Cars II¹⁵ and Advanced Clean Trucks are projected to decrease national gasoline and diesel consumption by as much as 15-20% in the next decade¹⁶.

Both light-duty and heavy-duty vehicles are also significant sources of particulate matter emissions. In fact, air pollution from diesel emissions contributes an average of 0.3 µg/m³ across the counties projected by EPA to be in nonattainment under a 9 µg/m³ PM_{2.5} standard¹⁷. The projected reduction in diesel consumption associated with the IRA and IIJA alone could give these counties an average of 15% of the reductions needed to meet the 9

¹¹ Estimate of ambient particulate matter levels attributable to remaining coal plants (at a county level) detailed [here](#). U.S. counties included in this calculation (based on having 2032 Annual 12/35 Design Values exceeding 9 µg/m³): Jefferson, AL; Fulton, GA; Cook, IL; Marion, IN; Caddo, LA; Wayne, MI; Camden, NJ; Butler, OH; Cuyahoga, OH; Jefferson, OH; Allegheny, PA; Armstrong, PA; Cambria, PA; Delaware, PA; Lancaster, PA; Lebanon, PA; Philadelphia, PA; Cameron, TX; El Paso, TX; Harris, TX; Hidalgo, TX; Travis, TX. Percentage represents the average across these counties.

¹² Based on stated plans to retire in compliance with EPA's Effluent Limitation Guidelines.

¹³ Estimate of ambient particulate matter levels attributable to remaining coal plants (at a county level) detailed [here](#). Eastern U.S. counties included in this calculation (based on having 2032 Annual 12/35 Design Values exceeding 9 µg/m³): Jefferson, AL; Fulton, GA; Cook, IL; Marion, IN; Caddo, LA; Wayne, MI; Camden, NJ; Butler, OH; Cuyahoga, OH; Jefferson, OH; Allegheny, PA; Armstrong, PA; Cambria, PA; Delaware, PA; Lancaster, PA; Lebanon, PA; Philadelphia, PA; Cameron, TX; El Paso, TX; Harris, TX; Hidalgo, TX; Travis, TX. Percentage represents the average across these counties.

¹⁴ [Modeling the infrastructure bills Using the Energy Policy Simulator](#), Energy Innovation

¹⁵ [Sierra Club Clean Vehicle Program state tracker](#)

¹⁶ [Taking Stock 2023](#), Rhodium Group

¹⁷ Estimate of county-level ambient PM_{2.5} pollution from diesel from [Clean Air Task Force](#). This amount was compared to the counties with 2032 Annual 12/35 Design Values exceeding 9 µg/m³ in EPA's PM NAAQS RIA.

µg/m³ PM_{2.5} standard. In fact, a 20% reduction in diesel particulate emissions would account for over 50% of the reductions San Diego county, California; El Paso and Travis county TX would need to be in compliance with a stronger NAAQS.

Additional Opportunities to Cut Soot Pollution

There are numerous incentives in the IRA and IJJA to cut industrial and residential fossil fuel pollution as well. For example, instead of homes reducing particulate emissions by switching from burning wood to gas logs, homeowners can get a \$2,000 tax credit to install a heat pump from the IRA¹⁸. If states, electric utilities, and homeowners take advantage of the billions of dollars available in these bills to accelerate clean energy and stop burning fossil fuels, cleaner air and healthier lungs will follow. EPA's own modeling showed a stronger PM_{2.5} standard of 9 µg/m³ could result in as much as \$43 billion in net health benefits in 2032. And that standard is well within reach; if this funding is utilized as intended, these programs could generate enormous public health and jobs benefits, preventing up to 4,500 premature deaths from air pollution in 2030 and creating up to 1.3 million jobs¹⁹.

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¹⁸ [A Holiday Shopping Guide for Healthy and Affordable Home Upgrades](#), Sierra Club

¹⁹ [Updated IRA Modeling Using the Energy Policy Simulator](#), Energy Innovation