The Future

National and regional regulations will make major reductions in ambient $PM_{2.5}$ levels over the next 10 to 20 years. In particular, the proposed Clean Air Interstate Rule (CAIR) and the existing NO_x SIP Call, will reduce SO_2 and NO_x emissions from certain electric generating units and industrial boilers across the eastern half of the United States. Regulations to implement the ambient air quality standards for $PM_{2.5}$ will require direct $PM_{2.5}$ and $PM_{2.5}$ precursor controls in nonattainment areas. New national mobile source regulations affecting heavy-duty diesel engines, highway vehicles, and other mobile sources will reduce emissions of NO_x, direct $PM_{2.5}$, SO_2, and VOCs.

EPA estimates that current and proposed regulations for stationary and mobile sources will cut SO_2 emissions by 6 million tons annually in 2015 from 2001 levels. NO_x emissions will be cut 9 million tons annually in 2015 from 2001 levels. VOC emissions will drop by 3 million tons, and direct $PM_{2.5}$ emissions will be cut by 200,000 tons in 2015, compared to 2001 levels. Figure 19 shows anticipated emission reductions. Most of the SO_2 reductions are associated with electric generating sources, while NO_x and VOC reductions for mobile sources are associated with continuing improvements in onroad and nonroad vehicles.

Models predicting the effect of these emission reductions on air quality show that all areas in the eastern United States will have lower $PM_{2.5}$ concentrations in 2015 relative to present-day conditions. In most cases, the predicted improvement in $PM_{2.5}$ ranges from 10% to 20%. EPA estimates that the proposed CAIR combined with existing regulations will bring the majority of the counties in the East into attainment for the $PM_{2.5}$ standards. As Figure 20 shows, 99 eastern counties are estimated to have exceeded the annual $PM_{2.5}$ standard in the 1999–2002 period, but only 13 of those counties are projected to exceed the $PM_{2.5}$ standard by 2015. More information on CAIR can be found at: www.epa.gov/interstateairquality/.

Figure 19. Projected emission reductions by 2015.

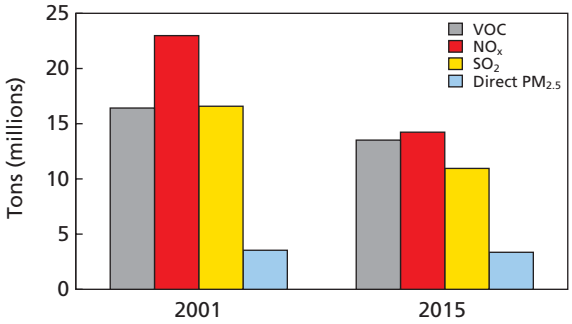
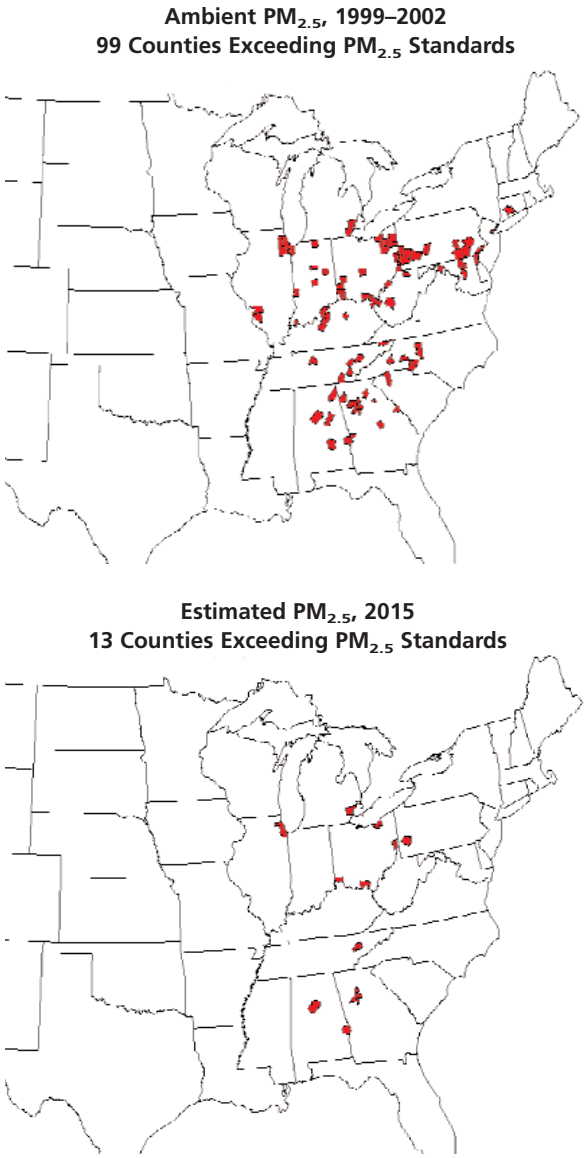


Figure 20. Estimated reduction in number of counties exceeding $PM_{2.5}$ standards from 2001 (99) to 2015 (13), based on current programs plus the Clean Air Interstate Rule as proposed in December 2003.



Upcoming $PM_{2.5}$ Designations

EPA designates areas as attaining or not attaining the National Ambient Air Quality Standards for fine particulate matter ($PM_{2.5}$). EPA designates an area as "nonattainment" if it has violated the annual or 24-hour national $PM_{2.5}$ standard (assessed over a 3-year period) or if it has contributed to a violation of one of the standards. Once designated, nonattainment areas must take actions to improve their $PM_{2.5}$ air quality on a certain timeline. Designations are a crucial first step in the efforts of states, tribes, and local governments to reduce harmful levels of fine particles. For more details on $PM_{2.5}$ designations, visit www.epa.gov/pmdesignations.

Note: Designations are based on 3 years of data, and the boundaries of defined nonattainment areas may differ from the county boundaries used in this report.

$PM_{2.5}$ and Other Pollutants

Areas that experience $PM_{2.5}$ concentrations that exceed the National Ambient Air Quality Standards can also have air quality problems associated with other pollutants. This association in the presence of different pollutants is not unexpected. A 2004 report by the National Academies of Sciences *(Air Quality Management in the United States)* indicates that air pollutants "often share similar precursors and similar chemical reactions once in the atmosphere." For example, nitrogen oxides, which contribute to $PM_{2.5}$ formation, are also a key ingredient in ground-level ozone.

Pollutants may also be emitted from the same types of sources. Industries that emit air toxics may also emit chemicals that contribute to ozone or PM formation. Data indicate that millions of people likely live in areas where particle pollution levels are elevated along with ozone and/or air toxics. EPA will continue to analyze this information as we work to protect public health across the country.