States keep up with ozone mandates: Study finds federal efforts most effective at cutting pollutants

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States are doing an effective job of monitoring air quality, but the federal government remains the primary player in clearing the air, according to a new study by Rice University.

In a recent study published by the *Journal of the Air & Waste Management Association*, the Rice research group of environmental engineer Daniel Cohan looked at state implementation plans (SIPs) mandated by the United States Clean Air Act. SIPs detailed how states would attain standards set by the Environmental Protection Agency (EPA) for cutting ozone and other ground-level contaminants by 2009.

The study found a "remarkable amount of progress in just six years," as ozone levels declined over six years by an average 13 parts per billion (ppb) at monitors in nonattainment regions, areas where the level of air pollutant was higher than that allowed by federal standards that went into effect in 2004. Most of these regions reached federal standards by 2009. The researchers determined that, apart from California, the majority of emission reductions documented by SIPs were due to federal policies for the likes of vehicle and power plant emissions.

Cohan, an assistant professor of civil and environmental engineering, set students led by Rice senior Andrew Pegues to the task of analyzing how states reacted to federal mandates and how successful they were in reducing levels of ozone and nitrogen oxides (a precursor of ozone).

Narrowing their focus from the 22 available SIPs, the team analyzed six state plans and one for the Los Angeles South Coast, all of which were categorized by the EPA for "moderate" nonattainment of standards and for which actual air-quality measurements from 2009 (the most recent data available) could be matched to levels predicted by the plans. (California is the only state allowed to set its own vehicle emission standards, as long as they are more stringent than federal standards.)

The other SIPs centered on the metropolitan areas of Dallas-Fort Worth, Baltimore, Washington, D.C., Philadelphia, Boston and Springfield, Mass.

The timing was right for such a study, Cohan said. He cited the current gap between states' efforts to attain the previous standard for ground-level ozone -- 84 ppb in any eight-hour period -- and implementation of the current standard of 75 ppb, which will soon set off another round of SIPs by states in nonattainment. The EPA is also considering further tightening of the ozone standard.

"Overall, it's a success story because it shows that nationally, ozone levels have improved substantially," Cohan said. "In the report, we suggest that much of that improvement is coming from federal and EPA efforts, and not as much is coming from the individual state plans.

"But pollutants such as ozone and particulate matter cross state boundaries, so often it's not within the state's power to totally control air quality," he said. While states are responsible for developing air-quality plans and meeting standards, most of the ability to effectively control pollutants from motor vehicles (through setting tailpipe emission standards) and industry lies with the federal government, he said.

Cohan said Pegues did most of the legwork to gather data for the study. "He's a multitalented student," Cohan said. "He's pursuing a Bachelor of

Science in civil engineering and degrees in economics, policy studies and political science, so he has all of the technical and programming abilities to work effectively as a scientist, but also the interest in delving into state policies."

Pegues spent months, including one entire summer, calling state officials and found it best to approach them from an engineering perspective. "I think if I'd come at this from the political science area, they would think I didn't have the necessary science background," he said. "When I told them I was from Rice Civil Engineering, they (thought), 'We can deal with engineers. He speaks our language.'"

Pegues, who plans to attend law school in the fall, began working with Cohan as a freshman through Rice's Century Scholars program, which matches freshmen with faculty mentors to pursue specific projects.

Cohan said analysis showed five states claimed attainment with standards not borne out by the 2009 observations. In most of those cases, the states' air-quality modeling correctly predicted nonattainment, but deviations from EPA methodology allowed the SIPs to claim attainment. The National Research Council has recommended that a more collaborative approach to air pollution between states and the federal government would cut costs and achieve better results.

Still, Cohan was happy to see progress in the most recent round of monitoring and remediation.

"It was a rare opportunity to look at how well policies worked in fulfilling their goals and how models of air quality for 2009 matched actual air quality," Cohan said. He noted the EPA is using the study as it considers more stringent ozone standards. "I think the paper gives them the encouraging news that when their modeling protocol is followed, it does reasonably predict whether the standards are going to be achieved."

More information: Read the abstract at www.tandfonline.com/doi/abs/10 … 10473289.2011.646049
EPA ground-level ozone standards: www.epa.gov/ozonedesignations/

Provided by Rice University