

STATE AND FEDERAL STANDARDS FOR MOBILE SOURCE EMISSIONS

Manufacturers of cars, trucks, and other engines are required to meet emissions standards for the equipment they sell as part of reducing air pollution under the Clean Air Act. The basis for California’s emissions standards, which are generally tougher than federal standards, are scientifically valid. California continues to play a pioneering role in setting mobile source emissions standards that help curb the state’s persistent air pollution and act as a proving ground for new emissions-control technologies. However, implementation of standards could be improved, including speeding up the federal waiver process and strengthening the process by which another state is allowed to opt-in to the California standards.



Emissions from fuel-powered mobile sources—including cars, trucks, heavy duty trucks, large construction equipments, lawn mowers, and other small hand-held gardening tools—contribute significantly to air pollution in the United States. Emissions controls for passenger cars and trucks first introduced in the 1960s have substantially reduced emissions, primarily through the development of cleaner engine and fuel technologies. In 2004, per-mile exhaust emissions of new cars and trucks had been reduced by 95-99% compared to 1967 model-year vehicles. However, continuing air quality problems in many locations in the country means that air quality managers will look to further reduce emissions from mobile sources, including vehicles, in the future.

The federal Clean Air Act establishes the framework for controlling mobile-source emissions, including emissions standards. During the development of the Clean Air Act in 1967, Congress recognized that having too many different state standards could result in inefficiencies in vehicle markets. Therefore, state-established emissions standards were preempted by federal emissions standards. A special exemption was made for California because the state’s air pollution was more severe than in the rest of the nation, and the state had a long history of establishing its own emissions standards for on-road vehicles. The Clean Air

Box 1. How Mobile Sources Affect Air Quality

Reducing mobile-source emissions plays a key role in attaining the goals outlined in the Clean Air Act and reducing pollutants that contribute to poor air quality. Mobile sources emit hydrocarbons, nitrogen oxides, particulate matter, and carbon monoxide, as well as greenhouse gases and hazardous air pollutants (HAPs). The volume and composition of emissions from mobile sources depend on such factors as engine type and age, engine load, engine temperature, emission controls, and quality of maintenance. The contribution of mobile-source emissions to air pollution varies from area to area due to factors like the relative mix of sources, the extent of pollutant transport, meteorology, and topography of the area.

Act Amendments of 1977 gave other states the option to adopt California emissions standards instead of the federal standards.

The role of state versus federal government in establishing mobile-source emissions standards remains an important environmental management issue. For California and other state decision makers, the primary consideration is the level of emissions benefits a standard will produce and how much it will cost residents. In response to a request of Congress, the US Environmental Protection Agency (EPA) asked the National Academies to conduct an independent study on the practices and procedures by which California develops its mobile-source emissions standards and other states adopt California standards. State and Federal Standards for Mobile Source Emissions compares the scientific and technical practices used by states to develop or adopt emissions standards with those used by EPA, reviews why states outside of California decide to adopt California's more stringent emissions standards, and assesses the impacts of California emissions standards on an array of factors including compliance costs and air pollutant emissions.

Box 2. The LEV Program: A Case Study in California Leadership

California's low-emission-vehicle (LEV) program, adopted in 1990, was an important milestone that helped define California and federal on-road emissions standards. It is the primary California mobile-source emissions standard adopted by non-California states. The program consisted of several regulations to reduce emissions from light- and medium-duty vehicles beginning in model year 1994 and continuing through model year 2003. Many Northeastern states actively pursued adoption of California's LEV program in the 1990s to achieve emissions reductions above those provided by federal emissions standards that would help them meet their air quality goals. As a result of the states' efforts, manufacturers proposed in 1993 that they would voluntarily provide low-emitting vehicles that exceeded the federal standards to the entire country if the Northeastern states abandoned the California LEV program. This led to the National Low Emissions Vehicle (NLEV) program that introduced California low emissions cars and light-duty trucks into the Northeast beginning with model year 1999 and the rest of the country for model year 2001. This was a major achievement since these vehicles meet voluntary low emissions tailpipe standards that were more stringent than can be mandated by EPA.

California's Role in Mobile-Source Emissions Regulation

California sets its own mobile-source emissions standards through the actions of the California Air Resources Board (CARB). California has used its authority as Congress envisioned: to implement more aggressive measures than the rest of the country and to serve as a laboratory for technological innovation. California's standards are typically stricter than federal standards, in part because they include goals for reducing emissions for some of the state's most populated and worst polluted regions, including the Los Angeles area and the San Joaquin valley. The state has typically led EPA in establishing emissions standards on light-duty vehicles and small nonroad gasoline engines, while EPA has led California in establishing standards for on-road heavy-duty diesel vehicles and off-road diesel engines.

The mobile-source emissions standards developed by California and EPA have typically been "technology forcing," that requires manufacturers to achieve an emissions limit through use of unspecified technology or technologies that have not yet been developed for widespread commercial applications and have been shown to be feasible on an experiment or pilot-demonstration basis. In forcing technology development, California has been a laboratory for emission-control innovations.

California's authority to set its own mobile-source emissions standards imposes additional risks and costs, such as design, production, and distribution costs, although the costs and benefits are difficult to quantify. However, experience to date shows that the California program has been beneficial overall for air quality. California's pioneering role in setting mobile-source emissions standards will aid the state's efforts to achieve air quality goals and will allow it to continue to be a proving ground for new emission-control technologies that benefit California and the rest of the nation.

Improving EPA's Waiver Process

Each time California sets or substantially revises a mobile-source emissions standard, it must seek a waiver from EPA. The waiver review process can take several years and significant EPA resources to complete, even for relatively straightforward and uncontroversial waivers. In some cases, waivers have been approved after vehicles and engines that meet the standards are already in the market, creating uncertainty for California, states considering adopting California standards, and manufacturers.

To provide timelier waiver decisions for California emissions standards, EPA could establish a

two-track system waiver process. EPA could expedite waiver requests that it considers noncontroversial, approving the waiver without a full notice-and-comment process. The final decision would be published in the Federal Register, and if any interested party raises a substantive objection to the decision, it would be withdrawn and subjected to the full waiver process. This expedited process would allow EPA to process noncontroversial waiver requests quickly and efficiently.

In addition, a mandatory time limit for EPA to review and issue a waiver decision for controversial waiver requests could be considered based on existing timetables for the EPA waiver process. California is required to provide at least two years between adoption of state regulations and their implementation; a time limit of two years or less for EPA review would fit in that timetable.

Comparing Federal and California Regulatory Processes

It is important for states considering which standards to adopt to understand the similarities and differences between how EPA and California set mobile-source emissions. There are important similarities, including how these agencies assess technological feasibility, costs, and emissions impacts. EPA and California also have essentially the same starting point and motivation for setting new or stricter standards—attainment of ambient air quality standards mandated by the Clean Air Act. Each agency follows a series of procedural steps leading to a final regulation, including identifying the need for new emissions standards, evaluating potential control strategies, publicizing proposed regulations, and soliciting public comments on proposals before promulgating the regulations. But

Table 1. Major Differences Between How EPA and California Set Mobile Emissions Standards

	EPA	California
Rule-making Oversight	Subject to federal requirements defined in multiple acts and executive orders; overseen by Office of Management and Budget because emissions standards regulations typically deemed “significant”	Subject to state laws and to oversight by California Office of Administrative Law
Economic Analysis	Required to perform cost-benefit analysis to estimate monetary benefits of improved air quality to public health	Required to perform various California-specific economic impact assessments
Estimating Air Quality Effects	In recent years, EPA assessed the air quality impacts of its major mobile-source emissions standards individually	Air quality impacts of a set of emissions-control strategies are analyzed within the state implementation plans (SIPs). SIPs describe the programs a state will use to carry out its responsibilities under the CAA for complying with ambient air quality standards.
Estimating Public Health Effects	Required to assess public health effects and estimate monetary benefits	Does not directly consider public health benefits in regulatory analysis of emissions standards because it uses its proposed standards to attain health-based NAAQS, which EPA has already assessed for public health benefits
Coverage of Cost and Benefit Analysis	Accounts for costs and benefits for entire nation	Considers only costs and benefits of its standards in its jurisdiction and not in other states that might later adopt its standards
Public Involvement	Emissions standards subject to lengthy public-comment and technical-review periods; issued through final notice in Federal Register	Adopts emissions standards regulations in a public meeting with a public vote by board members. Public comments during this hearing can result in modifications to final standards. California may also include requirements for periodic review of standards during which standards can be modified.

there are important differences in the scope of California and EPA regulatory assessments as discussed in Table 1.

Adoption of California Emissions Standards by Other States

Many states have had difficulty coming into compliance with ambient air quality standards of the Clean Air Act. To give states more flexibility in managing air quality, Congress passed the Clean Air Act Amendments of 1977 to give states the authority to adopt the cleaner California vehicle emissions standards. States first began using their new authority in the early 1990s when New York and Massachusetts adopted California emissions standards for new light-duty vehicles. To date, most Northeastern states have adopted the California light-duty-vehicle standards, and a growing number of states outside the Northeast are considering adopting California standards for both light-duty and heavy-duty vehicles.

Other reasons have been cited for adopting California standards. Some states consider the California standards to be a safety net in case EPA delays similar federal standards. Some states expect that California will continue to reduce standards earlier than the federal program. Some states have adopted or expressed interest in adopting the California greenhouse gas emissions standards.

Manufacturers of mobile sources have raised objections to the adoption of California standards by other states, arguing that states overestimate the emissions benefits, and that California standards often provide no significant air quality benefits over the federal standards. Other objections include the higher incremental costs of producing additional California-certified engines, and the additional com-

plexity of having to distribute products that attain different standards in different states. Manufacturers have also questioned the ability of California-certified vehicles to meet emissions standards and function properly in other states.

Up to this point, adopting states and manufacturers have resorted to the courts to resolve their technical and legal disputes. Among the issues that have been litigated are whether adopting states had to also adopt California fuel regulations, whether electric vehicles designed for California (under the zero-emission-vehicle [ZEV] mandate) could be mandated in Northeastern states where their batteries might not function properly during the winter months, and whether the California ZEV mandate met the definition of a standard that could be separately adopted by other states. Although it is appropriate for EPA to comment on some of these disputes, EPA has no authority over states' adoption decisions.

Improving Adoption of California Emissions Standards by Other States

Because a second set of standards imposes additional costs and complexity to manufacturers, states should continue to work with manufacturers to minimize compliance burdens. Additionally, the process by which a state adopts California emissions standards should be improved to help resolve legal and technical disputes that often arise. EPA could participate in the process of states adopting California standards. The committee considered two alternatives, either having EPA provide formal non-binding guidance or having EPA being given the power to review a state's adoption decision. The committee did not agree on which of these two options would be most effective.

Committee on State Practices in Setting Mobile Source Emissions Standards: **David Allen** (*Chair*), University of Texas, Austin, Texas; **John Bailar, III**, University of Chicago (Retired), Washington, DC; **Hugh Ellis**, Johns Hopkins University, Baltimore, Maryland; **Alison Geyh**, Johns Hopkins School of Public Health, Baltimore, Maryland; **David Greene**, Oak Ridge National Laboratory, Knoxville, Tennessee; **James Lents**, University of California, Riverside, Riverside, California; **Gary Marchant**, Arizona State University, Tempe, Arizona; **Virginia McConnell**, Resources for the Future, Inc., Washington, DC; **Alison Pollack**, ENVIRON International Corporation, Novato, California; **Harold Schock**, Michigan State University, East Lansing, Michigan; **Karl Springer**, Southwest Research Institute (retired), San Antonio, Texas; **K. John Holmes** (*Study Director*), National Research Council.

This report brief was prepared by the National Research Council based on the committee's report. For more information, contact the Board on Environmental Studies and Toxicology at (202) 334-3060 or visit <http://dels.nas.edu/best>. *State and Federal Standards for Mobile Source Emissions* is available from the National Academies Press, 500 Fifth Street, NW, Washington, D.C. 20001; (800) 624-6242; www.nap.edu.

