

Highlights of [GAO-11-473](#), a report to the Chairman, Subcommittee on Oversight, Committee on Environment and Public Works, U.S. Senate

## Why GAO Did This Study

Tall smokestacks—stacks of 500 feet or higher, which are primarily used at coal power plants—release air pollutants such as sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>) high into the atmosphere to help limit the impact of these emissions on local air quality. Tall stacks can also increase the distance these pollutants travel in the atmosphere and harm air quality and the environment in downwind communities. The 1977 amendments to the Clean Air Act encourage the use of pollution control equipment over dispersion techniques, such as tall stacks, to meet national air standards. Section 123 of the Act does not limit stack height, but prohibits sources of emissions from using the dispersion effects of stack heights in excess of a stack's good engineering practice (GEP) height to meet emissions limitations.

GAO was asked to report on (1) the number and location of tall stacks of 500 feet or higher at coal power plants and when they began operating; (2) what is known about such stacks' contribution to the interstate transport of air pollution and the pollution controls installed at plants with these stacks; and (3) the number of stacks that were built above GEP height since 1988 and the reasons for this. GAO analyzed Energy Information Administration (EIA) data on power plants, surveyed states with tall stacks, and interviewed experts on the transport of air pollution. GAO is not making recommendations in this report. The Environmental Protection Agency and the Department of Energy stated they had no comments on this report.

View [GAO-11-473](#) or key components. For more information, contact David Trimble at (202) 512-3841 or [trimbled@gao.gov](mailto:trimbled@gao.gov).

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## AIR QUALITY

### Information on Tall Smokestacks and Their Contribution to Interstate Transport of Air Pollution

## What GAO Found

According to analysis of EIA data, which were updated with GAO's survey results, a total of 284 tall smokestacks were operating at 172 coal power plants in 34 states, as of December 31, 2010. Of these stacks, 207 are 500 to 699 feet tall, 63 are 700 to 999 feet tall, and the remaining 14 are 1,000 feet tall or higher. About one-third of these stacks are concentrated in 5 states along the Ohio River Valley. While about half of tall stacks began operating more than 30 years ago, there has been an increase in the number of tall stacks that began operating in the last 4 years, which air and utility officials attributed to the need for new stacks when plants installed pollution control equipment.

Stack height is one of several factors that contribute to the interstate transport of air pollution. According to reports and stakeholders with expertise on this topic, tall stacks generally disperse pollutants over greater distances than shorter stacks and provide pollutants greater time to react in the atmosphere to form ozone and particulate matter. However, stakeholders had difficulty isolating the exact contribution of stack height to the transport of air pollution because this is a complex process that involves several other variables, including total emissions from a stack, the temperature and velocity of the emissions, and weather. The use of pollution controls, which are generally installed in boilers or the duct work that connects a boiler to a stack, has increased in recent years at coal power plants. However, GAO found that many boilers remain uncontrolled for certain pollutants, including several connected to tall stacks. For example, GAO found that 56 percent of boilers attached to tall stacks lacked scrubbers to control SO<sub>2</sub> and 63 percent lacked post-combustion controls to capture NO<sub>x</sub> emissions. In general, GAO found that boilers without these controls tended to be older, with in-service dates prior to 1980.

GAO identified 48 tall stacks built since 1988—when GEP regulations were largely affirmed in court—that states reported are subject to the GEP provisions of the Clean Air Act and for which states could provide GEP height information. Of these 48 stacks, 17 exceed their GEP height, 19 are at their GEP height, and 12 are below their GEP height. Section 123 of the Clean Air Act defines GEP as the height needed to prevent excessive downwash, a phenomenon that occurs when nearby structures disrupt airflow and produce high local concentrations of pollutants. Officials reported that a variety of factors can influence stack height decisions. For example, some utility officials reported that stacks were built above GEP to provide greater protection against downwash or to help a plant's emissions clear local geographic features, such as valley walls. GAO was unable to obtain GEP height information for an additional 25 stacks that were built since 1988 for two reasons: (1) some of these stacks were exempt from GEP regulations, and (2) states did not have GEP information readily available for some replacement stacks because the GEP calculation was sometimes made decades earlier and a recalculation was not required at the time the replacement stack was built.