Do polluters strategically locate near borders? The geography of US power plants and their emissions

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Abstract

While federal law sets air-quality standards in the US, the law cedes substantial authority to local and state governments. The resulting patchwork of local and state authorities—combined with air pollution's ability to travel long distances—creates the potential for strategic avoidance. Previous research documents strategic responses from polluters (*e.g.*, timing their emissions to avoid monitoring) and local regulators (*e.g.*, siting monitors to reduce recorded pollution levels). This paper identifies strategic siting among coal-fueled power plants. Specifically, we show that coal plants are sited so as to reduce the area downwind of the plants within their counties and/or states—avoiding/complicating monitoring and regulation. First, we document the tendency of electricity-generating units (EGUs) to locate near county and state borders. We consider both strategic reasons (regulatory avoidance) and non-strategic explanations (*e.g.*, water is both an input to EGUs' and often forms county/state borders). To identify strategic siting, we develop a simple, non-parametric test. This test demonstrates that while demand for water may draw EGUs toward administrative borders, demand for water cannot explain the tendency for coal plants to be located in a manner that reduces the area downwind of the plant in its county/state. Natural-gas plants—who face much lower regulatory pressure regarding their emissions—do not exhibit this behavior. Interestingly, this strategic siting appears to have been unfettered by the passage of the Clean Air Act—an act that aimed to reign in trans-jurisdictional pollution problems. Motivated by this strategic siting of coal plants, we then use the particle-trajectory model HYSPLIT to document just how transportable NO_x and SO_2 emissions are: within 6 hours of release, the majority of coal-plant-generated emissions have left their source state, and 99% have left their source county. Together, these results underscore the potential for strategic responses to (federalist-inspired) regulation and emphasize the importance of both substantial federal oversight and transport-focused air-quality regulations.

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