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# Efficiency and Environmental Impacts of Electricity Restructuring on Coal-fired Power Plants\*

H. Ron Chan   Harrison Fell   Ian Lange   Shanjun Li <sup>†</sup>

## Abstract

We investigate the efficiency and environmental impacts of electricity market restructuring by examining changes in fuel efficiency, cost of coal purchases, and utilization among coal-fired power plants based on a panel data set from 1991 to 2005. Our study focuses exclusively on coal-fired power plants and uses panel data covering several years after implementation of restructuring. The estimation compares how investor-owned (IOs) plants in states with restructuring changed their behavior relative to IOs in states without. Our analysis finds that restructuring led to: (1) a 1.4 percent improvement in fuel efficiency, (2) an 8 percent decrease in unit cost of heat input, and (3) a lower capacity factor even after adjusting for cross-plant generation re-allocation due to cost reductions. The estimates imply that restructuring has led to nearly 15 percent savings in operating expenses and up to 7.5 percent emissions reduction among these plants.

**Keywords:** Electricity Restructuring, Firm Behavior, Emissions

**JEL classification:** L51, L94, L98, Q48

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