

Price Discrimination Based on Downstream Regulation: Evidence from the Market for SO₂ Scrubbers

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BACKGROUND

- In 1999, over 50% of electricity in the US was produced by some 1400 coal-fired power stations with each plant consisting of one or more generator-boiler units.
- Environmental regulation ideally both internalises externalities and at the same time provides adequate incentives both to develop and to adopt advanced abatement technologies.
- Sulphur dioxide scrubbers are an example of an abatement technology. SO₂ scrubbers represent a significant capital investment and so the decision to adopt them might be influenced by the type of regulation a power plant is subject to.

METHODOLOGY

- The paper examines the impact of different types of environmental regulation on the market for SO₂ scrubbers in the US until 1999.
- The analysis draws on installation decisions occurring during the same period of time but of boilers subject to different regulatory regimes: emission standards and tradable permits.
- The focus is on 830 boilers that were built before 1979, the year the 1977 Clean Air Act Amendments made scrubbing effectively mandatory for newly built boilers. All of these boilers were subject to emission standards at least until 1994.
- Starting in 1995, this changed for 247 boilers which were required by the 1990 Clean Air Act Amendments to take part in emission trading from 1995 to 1999. For this set of boilers, the adoption of scrubbers is voluntary and not mandated. All scrubbers installed had to be retro-fitted; they were not planned and built at the same time as the boiler itself.

KEY FINDINGS

- Price discrimination is prevalent in the market for scrubbers installed at coal-fired power plants in the US. The imperfectly competitive upstream eco-industry charges substantially higher prices to power plants regulated by tradable permits compared to those subject to emission standards.
- Market power and price discrimination have repercussions on the rate of diffusion and on innovation incentives. These factors have repercussions for the dynamic efficiency of environmental regulation.
- The main drivers of the adoption decision appear to be policy and not technical factors.
 - The stricter the emission standard that a boiler is subject to the higher the propensity to install a scrubber, despite the higher costs due to price discrimination.
 - Boilers in states which had deregulated electricity markets in 1999 were less likely to install scrubbers.

POLICY ISSUES

- The evidence suggests that mark-ups on scrubbers are substantial and hence adoption of scrubbers could be expected to be well below the socially optimal level. The effects identified in the paper need to be taken into account in policy design.

THE CCP

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