

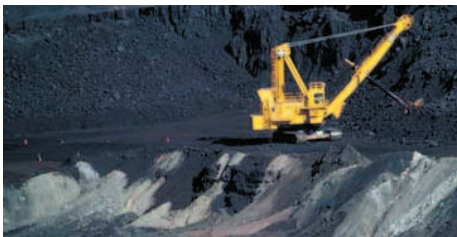
## ***Policy Shocks and Contract Renegotiation: Who Gets Raked Over the Coals?***

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**C**hanges in climate policy have large influence on businesses. Firms anticipate and respond to such changes, but what if they have already engaged in a long-term relationship with other firms or customers at the time of policy change?

For example, coal supply to power stations is typically based on long-term contracts, while the nature of the buyer-supplier relationship may well be affected substantially by climate regulations. However, there has been little evidence on whether or how firms amend their contractual agreements in response to a change in policy.



Surface coal mining in Wyoming in the United States.

New policy initiatives have the ability to substantially shift asset values within an economy. As a result, entities which previously made investments tied to the initial state of affairs (for example capital developments, or long-term purchasing contracts) will be affected by any proposed policy changes. To date, there is a lack of evidence concerning how these stakeholders contractually respond to the imposition of a change in policy.

### **Research project**

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This leaves policymakers without an objective evaluation of the impact of their proposals on stakeholders' profits, compared to the claims they put forward. The research discussed here attempts to address this void by investigating how long-term contracts for coal delivery in the U.S. electricity generation industry responded to passage of the 1990 Clean Air Act Amendments (CAAA). More broadly, within the contextual example of coal contracts, we seek an understanding of what aspects of contract design affect the propensity to renegotiate when a policy shock occurs in the midst of a long-term contracting environment.

The 1990 CAAA initiated a system of tradable permits for sulphur dioxide (SO<sub>2</sub>) emissions, which increased the demand for low-sulphur coal and greatly reduced the demand for high-sulphur coal. SO<sub>2</sub> is formed when the sulphur contained within the coal combines with oxygen during the combustion process similar to the formation of carbon dioxide. The coal contracts then in existence allowed a range of sulphur to be delivered in satisfaction of the contract terms. In addition, contracts are written with inherently different degrees of flexibility. As 1991 Nobel Laureate in Economics Ronald Coase and 2009 Nobel Laureate in Economics Oliver Williamson argue, contracts are costly to write thus many contingencies are left unspecified which makes the agreement flexible. Flexibility in a contract can come from the price adjustment mechanism (fixed price versus price re-opener provisions), the length of the agreement, and/or the minimum quantity deliverable.

The hypothesis tested is that more flexibility in a contract allows the parties more room to implicitly alter future transactions, thus making explicit renegotiation less likely.

Using data on coal contracts that were in effect both when the 1990 CAAA passed and when it was implemented (1995), the flexibility of these contracts and whether they were renegotiated was ascertained. With this information, the determinants of renegotiating a contract were estimated. Results show that contracts which are most likely affected by the policy, those which allowed a wide range of sulphur to be delivered, are also the ones that are statistically more likely to be renegotiated. Support is also found for the hypothesis that more flexible contracts are statistically less likely to be renegotiated.

From a policy perspective, this analysis is instructive in a couple of ways. The similarities between sulphur and carbon emissions imply that this historical look back at the effect of the 1990 CAAA on long-term coal contracts is contemporary given the current policy debate concerning greenhouse gas emissions legislation and its resulting impact on the distribution of income. Further, many economic-engineering models of the electricity sector have suggested that these long-term contracts are restricting the tradable permit markets ability to minimize the costs of this policy. Our results do not support this conclusion; however it helps guide future research in this area to improve our understanding of tradable permits systems.



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