"Inferring Carbon Abatement Costs in Electricity Markets: A Revealed Preference Approach using the Shale Revolution"

Joseph A. Cullen, Erin T. Mansur

Discussant Remarks:

Carl Fuchshuber

ATCO Power Ltd.

Carbon Pricing to Motivate Coal → Gas Fuel Switching

- Fuel switching may offer immediate and inexpensive emission reductions
  - How much?
  - At what cost?
- This paper estimates the short run potential by analyzing the sector's observed response to changing fuel prices
  - Carbon pricing would raise the cost of burning coal relative to gas (similar to low gas prices)

Main Observations

- Short run responses are likely to be constrained
  - 6-10% out of a potential 40% CO_2 reduction
- Very dependent on gas price
- With expected gas (and coal) prices, most of the reductions could be achieved by a $10/t carbon price

Volume

- A 40% reduction in CO_2 is a lot (in the short term)

  (100% replacement of coal with efficient gas → ~ 60% reduction)

  – Peaking gas capacity likely required for reserves
- Short term fuel switching constraints
  – Coal supply (contract obligations, stockpiling…)
  – Turndown flexibility (increased gas firing)
  – Re-start capability (warm re-start)

Cost

- Very dependent on gas price:
  - $1/GJ ↔ $7/MWh incentive ↔ $12/t CO2
- NOx and SO_2 co-benefits can increase the incentive to fuel switch

Maximizing Efficient Abatement

- Cost effectiveness ↔ cost/intensity of replacement energy
- Investment in overcoming constraints → increase responsiveness
- Link GHG, NOx, SO2 → increase responsiveness
- Cap (vs. Tax)? → motivate preparation, environmental certainty

- What has been the historic motivation to plan for fuel switching?
  - How often and for how long has it materialized?
  - How big has the incentive been?
- Would there be value in analyzing Alberta data?
  - Market behaviour often driven by portfolios