

1990 Amend CAA

SO<sub>2</sub> Permits → trading

- irreversibilities

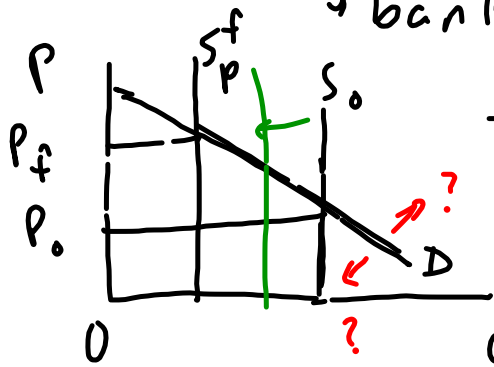
allocated permits  
use or sell

↳ mitigate  
↳ technology  
↳ Fixed costs

Choice → expectation of permit prices in future

Policy → planned draw down

↳ bankable - limited



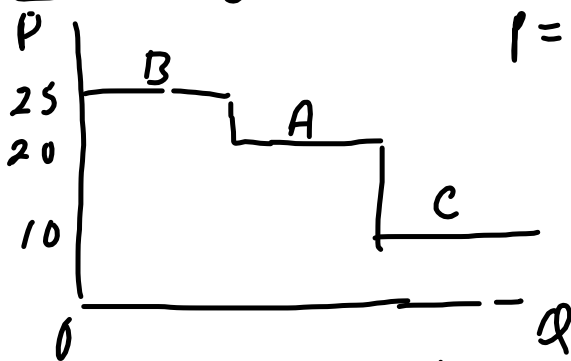
- uncertainty

D - driven by decisions of other

Q - supply uncertainty

Lab - test → predictions of direction

Heterogeneity -



$P = 20 -$

gains from trade  
for C

$WTP = 20$

$WTA = 10$

$B = 25$  Cost  
 $A = 22 - P = 22$   
 $C = 20$

} Transactions costs large

$SO_2 \rightarrow$  permits  
 - NAAQS in region \*  
 region  $\rightarrow$  vintage of technology  
 common across stationary  
 sources

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Compliance - cheat on having a permit  
 Stranlund } as price  $\uparrow$  = cheating  
 Murphy } but audit  $\uparrow$  cheating  $\downarrow$

- prevailing price = \$200/ton

- results  $SO_2$  as of 2012
  - 40% ↓ in emissions
    - Acid rain ↓
  - hit 2010 target in 2007
- too many permits initially \*

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Heterogeneity ↑ trades ↑  
prescription → expand airshed  
areas  
uncertainty → had to be very high  
uncertainty < 50% - market  
worked

Resources - Water  
- Air  
- Land use

- regulate land use for env. goals

Endangered Species - loss of habitat

- adverse modification - taking of species
- public lands (Fed)
- private lands - consult - modify development plans

Externality - fall under regulation  
re environment

- development modification

- "taking" - 5th Amend  
- 14th Amend holdout problem  
↳ public use/benefit -

- Compensation paid - market value

- "regulatory taking" - lose property  
right through a regulation

- principle: regulatory taking → no  
comp required

regulatory action & change prices of  
 property

CBA  
 Hicks-Kaldor  
 $NPV > 0$

- gainers / losers

- example - fuel efficiency

stds ↑

gainers - small cars

losers - large cars



Penn. Coal v Mahon -

Lucas v. Carolina Coastal  
Comm 1992

↙  
min lot size -  
bar to building