

Pollution Overview II

Fitting Policy Instruments
to the Problems

Broad Pollution Control Strategies

- End-of-pipe control (prevent waste from escaping by capturing it- scrubbers, bag houses, carbon from coal)
 - Problem: Then what do you do with it?
 - Carbon sequestration in underground wells
- Industrial symbiosis (use waste as a raw material)
- Pollution prevention (don't create waste or create less harmful waste in the first place)

Policy Instruments:
Air and Water Pollution Control

Regulating Behavior

Indoor Air Pollution

- Does this type of pollution involve an externality or not?
- What does that imply about the role of government for this particular pollutant?
- What role does the government actually play?
 - Making cheap tests available
 - Setting health standards so you know what level is safe
 - Mandatory testing and disclosure when a house is sold.
 - Assure that products used in house (e.g. carpets, adhesives, etc) are safe

Quantity-Based Instruments

Direct Control of
Emissions or Concentrations

Ambient Standards

- What are they?
 - Limits on concentrations in the ambient air.
 - These are the policy targets, but they do not specify polluter responsibility.
- How are they set?
 - In U. S. primary standards for conventional air pollutants based upon an adequate margin of safety for human health (see <http://www.epa.gov/air/criteria.html>)
 - Secondary standards are based upon other considerations such as visibility.
 - Except for drinking water, pollution standards for water are more commonly based upon ecosystem or recreational effects.

Aggregate Emission Quotas or “Caps”

- Whereas ambient standards control the level of pollution concentration, aggregate quotas or caps control the total amount of emissions into the air or water.
- Caps are usually pollutant-specific (eg SO₂) and defined for a specific geographic area (city, state, nation) depending upon the zone of influence of the pollutant.
- Used in the Kyoto Protocol on Climate Change and the US sulfur allowance program to control acid rain among many other applications (more details next week).

Source-Specific Policy Instruments

Moving from the policy targets to the policy instruments imposed on specific sources

Emission Standards

- What are they?
 - Legal limits on pollutant discharges from specific discharge points (stacks, vents, etc.)
- How are they set?
 - Government selects a favored technology from available control technologies.
 - What that technology can accomplish becomes the standard (grams/hour, grams/unit output, grams per mile)
 - Note that this does not control total emissions (unless the number of hours, the output, miles traveled and the number of emitters remains constant)
- Used for both air and water (typically called effluent or discharge standards for water).

Emissions Trading-(Credit Version)

- Complements emissions standards. Emitters that exceed legal requirements for reductions get excess reduction certified as “Emissions Reduction Credit” on the standard is tightened to reflect the permanent reduction
- Reduction credits are tradable and can be used to meet the standards of the purchaser.
- Flexibility added by this program allows achieving same emissions reduction at substantially lower cost.
- Example: US Offset Program (discussed next week)

Emissions Trading (Allowance or Cap and Trade Version)

- The allowance version imposes an authorized aggregate emissions cap. Cap normally declines over time
- Allocates these allowances (authorized emissions) on a prorata basis to individual sources (the sum equals the cap), but they are transferable.
- At end of year actual emissions cannot be greater than allocated plus acquired allowances
- Note that this approach does involve a limit on total emissions unlike emissions standards, which regulate a flow per unit time or per unit activity (such as BTUs of energy generated).
- More recent US emissions trading programs have all been of this type (will discuss later) rather than of the credit type.

Price-Based Instruments

Indirect Control of Pollution by Making Polluting Activity More Expensive

Environmental Taxation: the Concept

- Principle: Tax activities you want to discourage (such as pollution) rather than activities you want to encourage (such as income).
- Pollution taxes can raise revenue and reduce emissions at the same time.
- Allows firms flexibility in what methods they use to control emissions, but puts constant pressure on to reduce.
- In contrast to emissions trading it provides more control over price, but less control over the precise amount of emission reduction.

Emissions Charges

- A per unit charge on each unit of emissions (eg. \$20/ton).
- To provide more reduction for more dangerous substances higher charge rates are imposed for more toxic substances.
- Requires good monitoring of emissions
 - Used for water pollution in Europe.
 - Used to produce revenue for compensating victims of pollution in Japan.

Presumptive Charges

- Used when monitoring emissions is difficult (developing countries for example)
- Set charge rate based upon assumed emission level for that type of source.
- If source can prove it emitted less than presumed, they get a rebate for those extra emissions controlled
- Shifts monitoring burden from government to sources, which is very useful when the government monitoring capability is weak

Indirect Charges

- Used when can't directly tax emissions (perhaps because the monitoring is insufficient - can't track emissions)
- Solution: Tax an activity contributing to pollution rather than emissions.
- Examples:
 - Tax on gasoline rather than on auto emissions
 - Sewer charges based on water use (which is monitored) rather than on discharges (which are not monitored).
 - Gas guzzler charge on large vehicles (Hummers)

Deposit-Refund Systems

- A deposit is required when buying a product, but it is returned when the item is returned to an approved collection facility.
- Reduces littering or illegal disposal.
- No government budget impact. Uses customer's money.
- Uses
 - Returnable bottles
 - Tires
 - Batteries
 - Waste Oil
 - Scrapped Automobiles (Scandinavia)

Liability Law

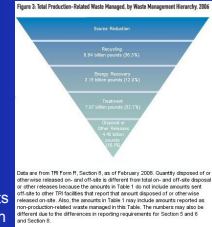
- Used to control accidental pollution.
- Polluters ordered by courts to pay for clean up and damages caused by their pollution
- Makes it clear that investing in precaution may save the firm money in the long run by avoiding liability for an incident
- Difficulty: Proving causation (Remember book and film "A Civil Action" about Woburn, MA)?
- Examples:
 - Bhopal, India (Union Carbide)
 - Prince William Sound, Alaska (Exxon Valdez)

Disclosure Strategies: Regulation by Revelation

- Empowering communities with information as a stimulus for action
- Original purpose ethical, but it promotes pollution control as well
- Works through capital markets (investors), labor markets (employees) as well as product markets (consumers)
- Complements enforcement (shaming)
- Two Models : Indonesia and the Toxic Release Inventory

The US Toxic Release Inventory

- U. S. Toxic Release Inventory Program started in 1986. Expanded coverage in 1995. Industries must report on approximately 650 chemicals.
- The USEPA reported a 43% decrease in toxic releases from 1988-1999 (definitions then changed)
- Studies have shown that decreases were greatest for plants in communities with relatively high incomes and education levels.



Pollutant Release and Transfer Registers

- This approach went European with the U.N. Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters -- known as the Aarhus Convention.
- Registers now exist in Canada, Australia, the European Union, Japan, South Korea, Mexico and the Czech Republic

Indonesia Disclosure Program

- Initiated in June 1995. Full disclosure implemented in December 1995
- A single index approach to water pollution control.
- Based on a five category rating system. (From gold, signifying world class performers, to black, signifying no attempt to control pollution resulting in serious damage.)

Indonesia Disclosure Program: Results

Number of Firms in Each Classification Category, Various Dates

Color	June 1995	December 1995	September 1996
Gold	0	0	0
Green	5	4	5
Blue	61	72	94
Red	115	108	87
Black	6	3	1

Source: Data from the World Bank site:
<http://www.NIPR.org/propres/sld036.htm>.

Proposition 65

- Enacted by California in 1986.
- Required companies to warn all users of listed products unless exposure falls below a "safe threshold".
- Creates an incentive for industry to establish a safe harbor standard. (Usually the incentive is to delay the creation of a standard as long as possible.)
 - The lead example.

Conclusions

- We have a large menu of policy options
- The last few years have witnessed an increased willingness to use new approaches
- The ultimate objective will be to move society closer to a closed system based upon pollution prevention with any remaining residuals from one process becoming inputs to another, thereby minimizing both the drain on natural resources and the damaging impact of pollution.
- Changing values, information and incentives will all play a role in the transition.