Environmental Economics
No.9

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Marketable Permit systems

Marketable permit systems:

Humans can be adversely affected by exposure to various types of pollutants

Pollution control instruments

In thinking about pollution policy, economists are interested in two issues:

- ✓ **What should be the target level of pollution?**
- ✓ **What is the best (cost-effective) method of achieving that level?**

What should be the target level of pollution?

Pollution is bad but prevention is costly

must balance benefits of prevention vs. costs.

Abatement of pollution is costly for the polluter:

- ✓ Purchase and installation of **pollution control equipment**
- ✓ More radical **changes of the production process** towards cleaner production processes
- ✓ Reduction in **the level of production**

The Target Level of Pollution

- Identify the social benefits and social costs of pollution

social costs of pollution describes the relationship between pollution and damage ($)

Marginal Cost of Pollution

- ✓ Identifies the extra cost arising from additional pollution (emissions)
- ✓ It is increasing function in level of emissions
- ✓ damages include any type of damage caused
  - Decrease in the value of other activities due to the pollution;
  - Estimated value of health effects.
  - value of a less beautiful landscape

Marginal Abatement Costs (MAC):

Abatement costs: costs of reducing pollution (emissions).

- increase in a firm's production costs resulting from efforts to reduce pollution.
- costs of a recycling program, increase in costs due to a change in technology, etc.

Increase in abatement costs caused by lowering emissions (raising abatement) by one unit.

(assume the firm uses the least cost way of lowering emissions → firm is maximizing profits)

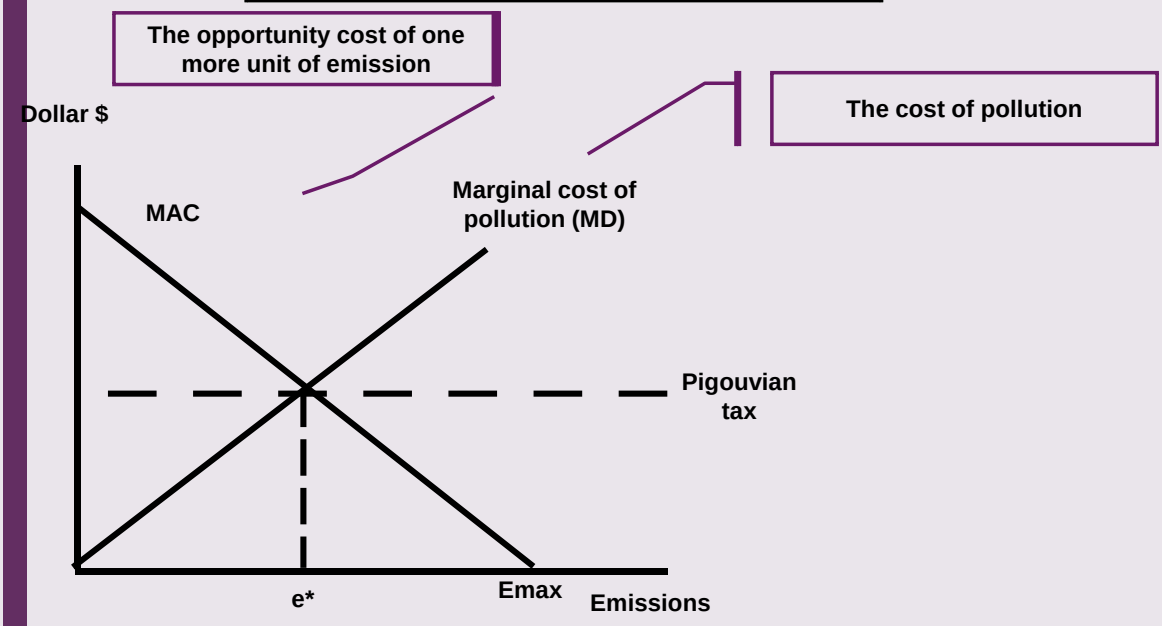
- MAC curve as downward sloping in emissions (pollution).

This implies

➡ low marginal cost of abatement for the first reductions in emissions.

MAC rises with more abatement activity.

The Efficient level of Pollution



Efficient level of emissions (abatement):

- **Start at the level of emissions with no abatement activity (Emax).**

In this case, costs are too high (no abatement reductions)

This is considered as the maximum level of pollution that occurs if the costs or damages of pollution are ignored in the society

If MD >MAC

Emissions should be reduced

- Keep reducing emissions until level where

MD = MAC

- The resulting level of emissions is **e***

the efficient level of emissions.

- Any further reductions cost more than the damages avoided (MD<MAC):
  - creates a loss to society.

- In general the greater the level of pollution the greater the level of damages and the greater the abatement costs required.
- More pollution is desirable as long as its marginal benefits outweigh its marginal costs.
- Less pollution is desirable whenever its marginal costs outweigh its marginal benefits.

Criteria for selection of pollution control instruments

Cost-effectiveness

- does the instrument attain the target at least cost?

long-run effects

- does the influence of the instrument strengthen, weaken, or remain cost over time?

Dynamic efficiency

- does the instrument create continual incentives to improve products or production processes in pollution-reducing ways?

ancillary benefits

- does the use of the instrument allow for a double dividend to be achieved?

Equity

- what implications does the use of an instrument have for the distribution of income or wealth?

Dependability

- to what extent can the instrument be relied upon to achieve the target?

flexibility

- is the instrument capable of being adapted quickly and cheaply as new information arises, as conditions change, or as targets are altered?

costs of use under uncertainty

- how large are the efficiency losses when the instrument is used with incorrect information?

information requirements

- how much information does the instrument require that the control authority possess, and what are the costs of acquiring it?

Several Forms of Emissions Trading Exist

- **Cap-and-Trade systems**
- **Project-Based Trading Systems**
- **Emissions Rate Trading Systems**

- **Project-Based Trading Systems**

Plant managers can propose their **own emission standards--tightening them** in places where it is least costly, and **relaxing or even eliminating them** where pollution control costs are high.

- **Emissions Rate Trading Systems**

-The regulatory authority establishes **a performance standard** or **emissions rate**.

-Sources with emission rates below the performance standard can **earn credits** and **sell them to sources** with emission rates above the standard.

(3) Hybrid Approaches

These approaches combine aspects of **command-and-control** and **market-based incentive** policies.

✓ Such approaches are appealing to policy makers because they often combine **the certainty associated with a given emissions standard** with **the flexibility** of allowing firms to pursue the least costly abatement method.

(4) Voluntary Initiatives (Non-Regulatory Approaches)

Voluntary programs can use the following four general methods to achieve environmental improvements:

(1) Require firms to set **specific environmental goals**;

(2) Promote firm **environmental awareness**;

(3) Publicly recognize **firm participation**;

(4) Support advertising campaigns that support environmental issues.

(5) Use labeling to identify environmentally responsible products.

Thank you