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## Transferable Emission Permits

### I. How it works

1. Government begins by setting the desired level of emissions (considering MAC and MD).

⇒ Thus, like command and control policies, the government has control over the final amount of pollution.

2. Firms are issued permits to emit pollutants. Only the desired number of permits is issued.

Thus, the quantity is assured (e.g. if the goal is 1000 tons of emissions, government may give 100 firms permits for 10 tons each).

3. Then allow firms to buy and sell permits

⇒ Firms with higher MAC will be willing to buy permits from firms with lower MAC

- If the price paid is less than the MAC of the high-cost firm, it is better off.
- Similarly, if the price is greater than the MAC of the low-cost firm, it is better off. It can take the money it gets from selling the permit, use it to reduce pollution, and still have some left over.
- Such trades are possible until MAC is equal across firms.
- Thus, permit trading allows a given level of pollution control to be achieved for the least possible cost. Economists consider this least-cost solution to be efficient.

### II. Implementation Issues

**The initial distribution of permits can be done in several ways:**

- The government can auction permits to highest bidder
  - At least initially, additional trading shouldn't be needed, as permits go to firms willing to pay the most.
  - Raises revenue for the government.
- Equal distribution among firms.
  - May seem fairer, but what if firms are of different sizes.
- Historical emissions rates (more permits to bigger polluters).
  - For example, if government wants to reduce pollution by 10%, it gives each firm

permits equal to 90% of their current emissions.

- But: this penalizes early actors (and raises the question if firms that have already reduced their emissions should get fewer permits?).
- Combined systems are also possible (e.g. all firms receive a basic volume of emission permits, but government holds back some permits for auction).

Note: Firms will prefer getting permits for free, as this is an additional asset. Auctioning permits makes the plan more like a tax. Thus, free distribution is more politically feasible.

### **Establishing trading rules**

- For a market to work, transactions costs must be low.
- However, at the same time, monitoring and enforcement will be necessary (need to track both emissions and the number of permits each firm has).
- Who should be able to participate? Should environmental groups or private individuals be able to buy permits and then not use them?

### **Geographic considerations**

- For some types of pollution (e.g. CO<sub>2</sub>), it doesn't matter where it is emitted.
- For others (e.g. carbon monoxide in a city) location does matter.
- A tax system would deal with this by charging higher fees in areas where pollution is a bigger concern.
- Ways for permit system to deal with geographic concerns:
  - Ambient-based permit system: permits needed for pollution as measured at each receptor. Example: a firm downwind might need to buy two permits from a firm upwind to be able to emit one unit of pollution.
  - Limit trading to within regions:
    - Limits trades to areas where the emissions have the same effect.
    - But: such rules may prohibit some beneficial trades.
    - Also, competition would be limited, which might keep the market from working correctly.

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**Incentives for innovation**

- The incentives for innovation are the same as with an emissions fee.
- Consider two cases:
  1. A firm has enough permits to cover its pollution.
    - The opportunity cost of polluting the firm faces is that it cannot sell a permit.
    - Thus, innovation not only lowers marginal abatement costs, but allows the firm to sell more permits.
  2. A firm does not have enough permits to cover its pollution.
    - The opportunity cost of polluting is that the firm must buy a permit.
    - Thus, innovation not only lowers marginal abatement costs, but saves the firm from the need to buy additional permits.
- *But:* Keep in mind that although individual firms have more incentives to develop technologies than under command and control policies, the *total* level of emissions need not fall, since the permits that are sold may be used by someone else.
  - It may, however, allow new sources to come on-line, so that more output is produced for the same level of pollution.