
Command and Control Policies for the Environment

I. Command and Control (CAC) Regulation

Command and Control Regulation uses the setting of standards.

⇒ A standard is a mandated level of performance that is enforced in law.

⇒ A standard simply makes excessive amounts of pollution illegal.

II. Types of Standards

1. Ambient Standards

- Regulates the amount of pollutant present in the surrounding (ambient) environment.
- Examples:
 - Parts per million (ppm) of dissolved oxygen in a river
 - Sulfur dioxide (SO₂) in an airshed
 - Ground level ozone levels (ppm)
- Measures are often an average (e.g. over a 24 hour period, or per year). This is important, as concentrations vary by time of day and by season (e.g. due to changes in weather).
- Note that the level itself cannot be directly enforced. Rather, the sources of the pollution must be found and regulated to be sure that the ambient standard is met.

2. Emission standards

- Regulates the level of emissions that are legally allowed.
- Examples:
 - Emissions rates (pounds of SO₂ per hour)
 - Concentration (ppm of biochemical oxygen demand (BOD) in wastewater)
 - Total quantity of a pollutant
 - Residuals per unit of output (SO₂ per kWh of electricity)
 - Residual content per unit of output (sulfur content of coal)
 - Percentage removal of pollutant (90% of SO₂ scrubbed)
- But: Emissions standards do not guarantee a specific ambient level of pollution
 - Weather conditions affect the concentrations
 - Human behaviour affects pollution levels

3. Technology standards

- Require polluters to use certain technologies, practices, or techniques.
- Whereas emissions standards require polluters to meet a goal for the level of pollution, but give the polluter freedom to choose the technology he wants to use, technology standards require a specific technology (e.g. catalytic converters in cars).
- Often the government mandates that the Best Available Control Technology (BACT) must be used. But: BACT is often not clearly defined.

III. Economic Analysis of Standards

A. Setting the standard

- The first question, of course, is deciding at what level to set the standard.
- Efficiency calls for setting the standard where $MAC = MD$
 - But: in practice, it is difficult for the regulator to know MAC and MD
- Alternative guide to setting regulation:
 - a) “Zero-risk”
 - if we’re setting a standard at a level of “zero-risk”, that means, that we protect everyone from damage (no matter how sensitive he/she is);
 - appropriate for cases in which there is a threshold.
 - b) Allow “reasonable small” damages
 - Raises the question of how to decide what is reasonable.
 - Should abatement costs be considered?

B. Should standards be applied uniformly?

- Is it appropriate to have uniform standards across regions?
 - Are the needs of rural and urban areas similar?
 - If marginal damages differ across regions, a uniform standard cannot be efficient in both jurisdictions.
 - But: having different standards increases costs to the government.
 - Note: in this case the issue is variation in the marginal damage function.
- Should standards be the same across firms?
 - Efficiency is achieved when MAC is equal across firms, which won’t happen with uniform standards unless the MAC curves are the same.

C. Incentive to do innovation?

- Command and control provides little incentive to innovate.
- There are incentives to avoid the costs of regulation. However, there are no incentives to exceed the level of regulation.
- For example, even after costs are lower, firms have no need to control more pollution. Additional regulation would be needed.

D. Enforcement

- Self-monitoring is often used.
 - Firms keep their own records on emissions, and are subject to surprise audits.
- Enforceability helps to determine which types of standards are appropriate.
 - For non-point sources technology standards are easier to enforce than direct monitoring of emissions.