

**LECTURE OBJECTIVES**

The aim of this lecture is to give an overview of price and quantity based regulatory instruments. Particular emphasis will be put on the various standards available to policy-makers. An example of policy changes in practice, the case of Switzerland, will be detailed in the final section.

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1 | AN OVERVIEW OF PRICE AND QUANTITY REGULATORY INSTRUMENTS

Reaching the optimal level of pollution abatement (from an economic perspective) underlined in previous lectures requires the use of regulatory instruments. These instruments can set standards or limits on the quantity or price of pollution. Table I summarizes the various instruments available to policy-makers.

Table I: Synopsis of various regulatory instruments

	Quantity Regulation	Negative Prices	Near-market Prices	Market Prices
Principles	polluting rights granted in exchange for depolluting obligations	rewarding the non-use of the environment	price put on the use of the environment	exchange of emission rights
Generic Instruments	Standards	Financial Assistance	Taxes and Charges	Tradable permits
Implementation	<ul style="list-style-type: none"> • quality standards • emission standards • products • processes 	<ul style="list-style-type: none"> • subsidies • low interest loans • foreign aid 	<ul style="list-style-type: none"> • ecological taxation <ul style="list-style-type: none"> - ecological taxes - ecological charges • induced private expenditure 	<ul style="list-style-type: none"> • quotas emissions • quotas use • environmental bonds

The columns of the table show the different institutional principles regarding the allocation of property rights, the gains from the non-use of the environment, the prices associated with environmental amenities, and auction prices of environmental property rights. The rows of the table relate each of the above to its designated instrument and to the relevant implementation procedures.

2 | REGULATION THROUGH QUANTITY STANDARDS

Environmental standards vary according to what they are applied to — they can be emission standards, product standards, standards regarding the quality of an amenity or regarding the use of a particular production process. They are based on different environmental, technical and political (e.g. lobbies) criteria. In practice, standards are a regulatory limit that is designed to ensure the well-being of a population is safeguarded whilst making sure the standards are economically acceptable.

The issues of ecological irreversibility (e.g. species and ecosystems) and moral choices (e.g. is there an acceptable rate of cancer linked to air pollution?) are in contrast related to pollution bans.

STANDARDS REGARDING THE QUALITY OF AN ENVIRONMENTAL AMENITY

Standards regarding the quality of an environmental amenity tend to specify quality objectives. For air, water and soil these tend to be expressed as maximum acceptable values of pollution concentration (limits). For noise, the standards relate to a threshold noise pollution level (these can differ depending on whether the area is inhabited or not, etc.).

EMISSION STANDARDS

These relate to limit values for emission rates which are fixed according to production processes. An example of this type of standard is the quantity of dust per cubic meter that is emitted by a cement factory. The most recent available production technologies can be ten times as efficient as older ones which can emit up to seven to fifteen times the norm.

PRODUCT STANDARDS

Product standards define the characteristics of potentially polluting products (e.g. paint) or products that can be dangerous for an individual's health (e.g. pesticides in food). Standards regarding noise pollution levels for vehicles and planes are also part of this category.

PRODUCTION PROCESS STANDARDS

These specify the production process or treatment processes for emissions (e.g. water treatment). Using current available technology allows the immediate use of technology and processes whilst best available technology or the experimental standard approach refer to processes that have been put in place or conceived by the highest performing units.

In summary, standards correspond to the rights to pollute given to polluters by victims, in exchange for their pollution abatement. These rights are not free of charge; they are simply the result of an exchange of rights between polluters and victims in order to reach a pollution abatement optimum.

3 | ENVIRONMENTAL PROTECTION IN SWITZERLAND

Switzerland is an example of environmental policy where various instruments were tried and tested. Regulation ranged from outright bans to police laws and finally economic instruments. A Federal Law for the protection of the environment was instituted in 1986 but only gained importance in 1995 due to international developments.

The first constitutional article in 1971 stated that the objective was to fight against emissions considered harmful and a nuisance in particular air and noise pollution. Hence the primary aim was not the safeguarding of the environment but the protection of public health and well-being. The next article went further; suggesting that society should be protected but than in order to achieve this, so must the environment.

The Federal Law for the protection of the environment rested on the following guidelines:

- prevention;
- causality (PPP);

- collaboration between public authorities, associations and the economy;
- execution of the law to be carried out by regional authorities;
- the main targets were air, soil and biotopes as well as noise;
- right to appeal (given in particular to environmental protection agencies);
- environmental impact assessments (EIA) compulsory;
- legislative methods;
- limits on emissions;
- the creation of a specialist office.

This law constituted a set of “police rules” with bans and compulsory orders as well as other methods of control and administrative surveillance. The use of economic instruments was not part of the law.

After research and analysis on the effectiveness of the law, revisions were made in 1995. These revisions included the idea of taking into account economic and ecological arguments as well as progress made in the area of technology. New instruments were introduced and the scope of the law widened:

- extensions to dangerous substances and organisms;
- improvements in waste and soil legislation;
- new instruments such as ecological labels, subsidies for abatement technologies, environmental audits, taxes, extended civil liability for polluters.

SUMMARY

This lecture has aimed to outline various instruments that can be used towards environmental protection. The range of standards available to public authorities to aid in the shift towards better environmental amenities and better quality amenities was outlined. Finally, the case of Switzerland, which moved from command and control regulation to a more market-based approach, was summarized. The next lecture will take a closer look at market-based instruments — ecological taxes and charges.

ADDITIONAL REFERENCE

PETITPIERRE, G. (1996), *De l'article constitutionnel sur l'environnement au développement durable: juin 1971 – juin 1996*, Fribourg, SPE.