ADOPTION OF STANDARDS

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Summary

The target of the environmental control options is to assure that the concentrations of pollutants in an environmental medium do not exceed a certain level. In general, this may be achieved in practice mainly through legislation but also through voluntary cooperation between industry and government combined with public information and education. The selection of methods and strategies for pollution regulation depends to a large extent on the existing legal and social structure in each country. Legislation is particularly advantageous in countries where the national constitution has requirements which give priority to environmental protection measures as well as to the obligations of the citizens regarding the environment. The development of a legal framework contains two regulatory steps. The first is the endorsement of a formal legal instrument, such as an act, ordinance or decree. The second is the development of regulations, by-laws, rules and orders, which may incorporate supplementary legal changes by the authority designated in the formal legal instrument.

1. General legislative procedures in environmental control

Environmental control policies do not only underline the responsibilities of polluting factors like industry, but they also incorporate the limits of power for a state authority to intervene. The decision for the creation of a regulation depends in the first place on the

outcome of a risk evaluating procedure, which could eventually justify intervention. In practice, that means that whenever there is a substantial hazard to human health or the environment, the competent authority may order a regulatory action. But in most cases a wider approach is adopted which requires the regulating agency to balance economical and social considerations together with public health aspects in reaching a final decision concerning environmental regulation.

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These two contrasting approaches towards improving the environmental quality and protecting the health of the population can be found in the environmental control methods adopted in two major industrial countries, the USA and the United Kingdom. In general, environmental regulation in the UK is relatively informal and flexible while regulations in the USA tend to be more formal and rigid. The UK makes extensive use of self-regulation and encourages close cooperation between government officials and representatives of industry while in the USA legislation plays a more active role in making and enforcing environmental policy.

The advantages of the cooperative approach adopted by the United Kingdom include efficient collaboration among all parties involved and a joint commitment to improve environmental quality on a solid basis. A disadvantage of this process is the lack of clear responsibility among the parties. In this case, the success of the regulating procedure depends on the sincerity that a process is conducted and also on the availability of independent investigations. If this alternative is followed, both parties, the regulators and the regulated, must combine their committed efforts to achieve socially accepted levels of protection against environmental risks.

The selection of methods and strategies for pollution regulation depends to a large extent on the existing legal and social structure in each country. In countries with tradition of close cooperation between the administrative authorities and the industry and of industrial compliance with government proposals combined with a positive public attitude towards environmental quality, standards tend to be applied through voluntary agreements. On the other hand, countries with a history of state control of polluting activities and a well-organized administration for supervising such activities, are expected to use regulatory options fitting into the existing system.

Legislation is particularly advantageous in countries where the national constitution has requirements which give priority to environmental protection measures as well as to the obligations of the citizens regarding the environment. In this context, environmental law is not considered as a supplementary legal system but it is rather viewed as part of a comprehensive process of resource management, supported by scientific assessments and integrated with the general planning of economic development.

While the ratification of legislation is a political process, in many countries are often drafted at an initial stage by technical and legal experts within environmental departments. In many countries or states, where several regulations dealing with a particular environmental issue have been already adopted, the development of more comprehensive laws can be observed together with an increasingly creative and forward looking role of government in environmental management. For example, pollution control in these countries or states has evolved from common law, dealing with nuisances into legislative control of emissions of particular pollutants at specific locations on a case-by-case basis. Current environmental legislation in many countries often attempts to anticipate and prevent potential environmental problems through environmental impact assessment.

The legislative framework has moved during the years from an initial responsive role to face particular environmental problems, towards a guiding role that places environmental control decisions within a wider context of social and economic development. Environmental legislation in many countries usually covers:

- Protection and conservation of natural resources essential for living organisms
- National and international rules and regulations controlling the emission and distribution of pollutants into the environment
- The establishment of competent organizations to evaluate and quantify risks but also in relation to the associated benefits.

The constitutional framework of a country determines, to a great extent, the allowable areas of regulation as well as the distribution of the executive and administrative powers and responsibilities to each factor contributing to the environmental control decisions. Even in countries that do not have a constitution, public health and social policy considerations normally provide sufficient background for the formulation of environmental regulatory measures, provided that these come within the acceptable limits concerning for example the question of the division of power. Countries with a federal structure tend to recognize the need for sharing of the jurisdictional and operational power and responsibility between the central government and the local authorities.

The development of a legal framework contains two regulatory steps. The first is the endorsement of a formal legal instrument, such as an act, ordinance or decree. The second is the development of regulations, by-laws, rules and orders, which may incorporate supplementary legal changes by the authority designated in the formal legal instrument. The development of these subsidiary instruments involves the setting of standards, which are describing the pollutant level that is considered acceptable for protection of human health and the environment. In common language the terms “regulation” and “standard” are very frequently interconnected.

There are three possible approaches to realize legal changes:

1. The revision or updating of existing laws by amending legislation
2. The replacement of existing laws by an entirely new piece of legislation

3. The ratification of complete legislation, where none existed previously, by the consolidation and revision of sections from several existing laws, supplemented by new or additional provisions.

The first two approaches are closely interrelated. It is often difficult to decide which of them is preferable in a particular situation. An assessment of the nature and magnitude of the contemplated changes and the facility with which they can be accommodated within the existing legislative framework may provide an indication of which approach is the best for the situation.

2. Legislative procedures concerning ambient air quality standards

There are essentially two legislative approaches to the direct regulation of air quality: ambient air quality standards and performance or emission standards. Ambient air quality standards prescribe the permissible levels of contaminants for the region covered by the standards. One of the first questions to be answered concerning ambient air quality standards is what level or levels of government should be responsible for setting the standards and how extensive a region they should cover. In the USA under the clean air act, the federal government has been assigned the task of establishing both national primary ambient air quality standards, those designed to protect the public health, and national secondary ambient air quality standards, those designed to protect the public welfare. The states, and to some extent local governmental units, are free to establish standards that are stricter than the secondary standards, but they are not permitted to establish less strict standards. Strong arguments can be made that air quality standards adequate to protect the public health ought to exist in every state and locality. That is, it appears reasonable to begin with a minimum base for protecting health such as the national primary standards. The case for national secondary standards, however, appears to be weaker. States and local governmental units may be able, so long as the public health is not endangered, to make the appropriate trade-offs against air quality. This approach would leave to local governments the responsibility for establishing secondary standards, if they decide to do so. The major argument favoring a larger state role in setting standards is that states should have a larger scope of action for obtaining their economic goals and simultaneously preserving the environment. Arguments favoring the federally established national standards emphasize the realities of the national economy, the mobility of the population, the impropriety of permitting industries with relatively high levels of emissions to shop around for the cleanest air or the most permissive jurisdictions, and the likely inability of many states to adopt and enforce adequate standards.

Another area of questioning about air quality standards concerns the methods by which the standards are set—the legal and administrative techniques by which the standards are developed. One possibility is for the legislative body to set the actual standards in the statutes. There are obvious weaknesses in this approach as the scientific information upon which the standards are based is almost certain to change, and economic and social conditions may change. If the standards are locked into a statute, the process of conforming them to these changes may be difficult and time-consuming. On the other hand the important advantage of this method is that it eliminates the possibility of

pressures to the administrative agency to change the standards or to delay their implementation.

The alternative approach, which is the one adopted by the USA Congress in the Clean Air Act is to establish general air quality goals or objectives in the statute and then leave to the competent administrative agency the task of working out the detailed standards necessary to achieve the goals. When this approach is taken, great care must be exercised in stating the goals because the standards may be subject to legal challenge if they cannot be shown to be directly related to the achievement of the air quality goals. Also, the detailed standards must not be based only on the judgment of the administrator but should rely on sound scientific data. If economic and technological considerations are to be emphasized in achieving and maintaining the standards, they must be carefully articulated in the statutes and implemented in the regulations.

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Biographical Sketches

Dr. Pavlos Kalabokas obtained his first degree in Physics from the University of Athens, Greece, in 1983, followed by the Masters and Ph.D degrees in Air Pollution Chemistry from the University of Paris VII, France, during 1983-87. The topic of his research was "sampling and analysis of carbonyl compounds in the atmosphere of Paris, France".

He was a visiting scientist to the German Research Center KFA-Julich, Institute of Chemistry of Polluted Atmospheres, during 1987-1988, and to the German Research Center KFA-Julich, Institute of Applied Physical Chemistry, during 1989-1990. During 1991-1993 he was Research Associate at the Laboratory of Meteorology of the University of Athens working on the vertical measurements of tropospheric and stratospheric ozone over Athens. During 1994-1997 he was Research Associate at the Environmental Research Laboratory of the Greek National Center of Scientific Research "Demokritos" working on the analysis of air pollution data in Athens using atmospheric models.

Since 1997 Dr. Kalabokas has been an elected Researcher at the Research Center for Atmospheric Physics and Climatology, Academy of Athens, studying urban air pollution in Athens; rural ozone levels around Athens; atmospheric pollution around refineries; and air quality in the area of the proposed new airport of Athens (the NTU Athens project).

To date Dr. Kalabokas has published over 65 papers on the above research topics. His other scientific activities include review of papers for international scientific journals on environmental pollution, and review of research projects in the European Union. He is a member of the Greek Committee on Environmental Pollution problems.

Dr. Michael Christolis is a Civil Engineer specializing in environmental science and technology. Currently he is working as a research collaborator at the National Technical University of Athens (NTUA), Greece, on the mathematical modeling of environmental problems. He has so far accumulated twenty years of experience in air quality monitoring, pollutant dispersion modeling, assessment of the impacts of industrial accidents, design of emergency systems, and implementation of the Seveso Directive in Greece.

During 1983-1988 he was the Head of the Laboratory for the Air Quality Monitoring Network for the City of Athens. In 1988 he joined the Computational Fluid Dynamics Unit (CFDU) of the Chemical Engineering Department of the NTUA, working on research projects on the computational modeling of various applications focusing on environmental issues and problems.

Professor Nicholas C. Markatos obtained his Diploma in Chemical Engineering from the National Technical University of Athens, Greece, in 1967, followed by M.Sc, DIC and Ph.D degrees from the Imperial College of Science, Technology & Medicine, University of London, UK, during 1970 to 1974.

In 1983 Professor Markatos was appointed Director of the Centre for Mathematical Modeling and Process Analysis at the school of Mathematics and Scientific Computing of the University of Greenwich, London, England. At that time he was also a visiting lecturer to the Computational Fluid Dynamics Unit of Imperial College as well as working for CHAM Ltd, (Concentration Heat and Momentum, Limited), London, England. At CHAM he worked first as leader of the Aerospace Group (1976) and then, from 1977 until 1984, as Manager of the Applications Team working on various Fluid Mechanical, Thermodynamic and Transport problems.

Since 1974 he has served as technical consultant to many Research Centres, state institutions and industries.

In June 1980 he was awarded the "Certificate of Recognition" by the Inventions Council of NASA.

In 1985 Professor Markatos was elected Professor of Chemical Engineering at the National Technical University of Athens, and in 1990 he was elected Head of the Chemical Engineering Department. In 1991 he was elected Rector of that University.

Professor Markatos' main scientific interest is in the mathematical modeling of Transport Phenomena, Fluid Mechanics, Thermodynamics and Physical Processes like Fluid Flow (Laminar and especially Turbulent), Heat and Mass Transfer, Environmental Flows, Combustion, etc.

He is referee of scientific papers, reviewer of new books, as well as member of the Editorial Board of several international Scientific Journals.

He has published over 100 original scientific papers in international journals and participated and organized many international conferences, seminars and meetings all over the world. Author of two books, he has also published many articles in the popular press on Engineering Higher Education.