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Implementation and Enforcement in a Federal System

*Mogens Moe*

The proper aim of all environmental regulation is the improvement of environmental quality. If we are to achieve this aim, however, we must focus on the organizational aspects of implementing environmental laws. Merely adding new laws because they look good on paper is an inadequate and ultimately ineffective approach to modern regulation.

The following observations are based upon my experience with European Community (EC) and Danish legislation and its enforcement in Danish society. There is reason to believe, however, that my analysis is also valid for other societies which seek to manage environmental problems through legislation.1

I

THE ROLE OF RULES IN ENVIRONMENTAL PROTECTION

In the EC and in Denmark, as in most other countries, rules are the main instrument for environmental management. The EC has adopted approximately 200 directives to protect the environment, and Denmark itself has adopted a similar number of national regulations. Reading all of these rules could leave one with the impression that almost no pollution is possible, and that government2 is capable of handling virtually every pollution problem. As the number of EC directives and national regulations grows, one expects that the environment is becoming cleaner and cleaner—but is it?

Politicians at all levels are competing to write the most beautiful environmental laws. Of course, Danish politicians think that they have adopted the world's best environmental laws. They have believed this since they adopted the first Danish law on the subject in 1974.3

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1. For a description of the components of a successful enforcement program, see Cheryl Wasserman, Principles of Environmental Enforcement, in 1 PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON ENVIRONMENTAL ENFORCEMENT 36 (Budapest, Hung., Sept. 22-25, 1992) [hereinafter 1992 PROCEEDINGS].

2. In the Danish context, “government” means the national government, regional councils, and local councils.

3. Environmental Protection Act, No. 372 (1973) (Den.) (entered into force in 1974). The original act has now been replaced by Environmental Protection Act, No. 358 (1991)
cians in most other countries have a similar view of their own environmental legislation.

Thinking this way does not enhance the state of the environment, however. Laws are just words on paper, and it is a long way from words on paper to actual impact in the physical environment. The distance from drafting to implementation is not unknown in other sectors of society, but the environmental field is teaching us some new lessons about this concept.

II

THE TRADITIONAL LAW MODEL OF ENVIRONMENTAL ENFORCEMENT

Most laws have been modeled on an outdated organizational theory. Under the traditional law model, lawmakers expect a direct series of events to occur. First, a rule is promulgated by the governing body, for example the EC or the appropriate national legislature. Next, the rule and any appropriate regulations are published in the Official Gazette.4 At this point, at least theoretically, the affected industries read the rules and actively seek to comply. Finally, the state takes legal action against the remaining facilities that have not complied.

The use of this model as a framework for environmental enforcement originates from a time when new rules were scarce, and the prevailing attitude was "a law is a law, and it must be obeyed because it is a law." This model and mind-set is what we learned in school, and this is the way most politicians and legal professionals still think.

Based on my own experience, however, this model does not work—at least not in the environmental field. Reality is much more complicated than the traditional law model recognizes. There are many, not few, laws; and it is difficult for even the most conscientious of industries to keep track of the myriad regulations being promulgated in the environmental arena—let alone the additional rules in other fields. Compliance is therefore rarely complete, making implementation ineffective. If the traditional model of enforcing laws remains the standard, then as the number of regulations increases, the prospects are that the problems of non-compliance will only worsen.

(Den.). The new act has not changed the fundamental principles of the first one.

4. EC regulations are directly binding upon EC citizens when they are published in the Official Journal of the EC. But 95% of EC environmental law appears in the form of directives, binding upon the Member States. By mid-1992, the EC had issued 217 directives and 12 regulations regarding the environment. Danish EPA, Internal Records (1992).

Within a prescribed time limit a directive must be transformed into national law. When the corresponding Danish regulation is published in the Danish Official Gazette, it is binding upon Danish citizens.
A. Denmark's Experience Under the Traditional Law Model of Environmental Enforcement

During the first ten years of Danish environmental law, people acted as if the traditional model were an accurate reflection of reality. This meant that most of the results in combating pollution were rather meager: some facilities complied with the environmental requirements on their own accord, but others did not—and they faced no consequences. Many smaller facilities did not even note that the environmental laws were relevant to them.

Around 1985, in light of these poor results, regular inspections became generally accepted as necessary to environmental administration. The courts indirectly helped the environmental authorities reach this insight, as now and again a few cases concerning violations of environmental laws went to court. The environmental authorities sought harsh punishments, but the courts only imposed small fines on the violators. The courts explained that the authorities themselves had handled the
cases too leniently. As a result, enforcers saw a need to encourage compliance prior to bringing cases against violators.

In November 1986, the Danish Parliament went so far as to issue a resolution that all illegal emissions should cease within a half year. This was the first resolution of its kind for the Danish Parliament. Although it was not complied with because regulatory systems cannot be constructed that quickly, it gave an impetus to the building of inspection systems.

### B. The EC—Trapped in the Traditional Law Model of Environmental Enforcement

The traditional law model is predominant throughout the world, and the EC is no exception. While the European Commission knows that the traditional model does not work, the EC is constrained to act within its framework in the environmental field. In other fields, the Commission has the right to inspect private firms in the Member States or to inspect the inspection systems of the Member States. Such direct enforcement by the EC is politically impossible in the environmental arena, however, due to the current system of decentralized enforcement and the Member States' desire to maintain that state of affairs. As a result, the effectiveness of EC environmental legislation depends completely upon the national organizations of environmental administration.

### III NEW LEGAL ORDER: ENVIRONMENTAL ENFORCEMENT FROM AN ORGANIZATIONAL APPROACH

#### A. An Overview

Experience has revealed that to achieve results in the physical environment there must be coordination among all aspects of the regulatory

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6. Dagsorden [Resolution] of Nov. 18, 1986 (Den.).

7. Commission Regulation 17/62, 1962 O.J. (13) 204 is an example of this type of inspection in the field of competition.

8. An example of this type of inspection system regarding the fishing industry is Commission Regulation 2241/87, 1987 O.J. (L 207) 1.

9. The Commission hopes to move into a better position when the European Environmental Agency is established. The Agency's main task will be to collect information on the state of the environment in the EC. Council Regulation 1210/90, 1990 O.J. (L 120) 1. But the Member States have not been able to agree upon the seat of that Agency, and thus no Agency currently exists.

10. The environmental administrations of the EC Member States vary tremendously in size and effectiveness across the Community.
system. Adequate laws are one—but only one—of many elements that must work together. Thus, a better legal model than the traditional one is built on an understanding of the entire administrative organization. Such a model emphasizes the interaction between regulated industries and the agencies that implement and enforce the laws.

Figure 2 illustrates some of the elements in a simplified version of an organizational model of environmental enforcement.

The most important element in this model is its focus on environmental quality. The goal of the organizational model is to achieve empirical results, not just to put another law on the books. To maintain this
focus on results, one must include feedback loops. Awareness of one's place within the organizational structure is ensured by these loops, which show how each participant in the chain must monitor and gather data from the next participant, rather than assume that the appropriate behavior is occurring. Absent adequate feedback loops, the system could go on for years without any consistent direction.

Industrial facilities remain an important element in the organizational approach. Unlike the view taken under the traditional model, however, no one using the organizational approach expects the facilities to learn of and react to new regulations without the benefit of external forces. Sometimes the facilities learn of environmental requirements through colleagues and sometimes through inspectors. Some facilities comply with the requirements on their own because it is beneficial to the firm's image. For example, when Danish firms market products in Germany (Denmark's most important customer), an important selling point is that the products are produced as cleanly as possible. However, in general, the real pressure to meet environmental requirements is a result of regular visits by inspectors.

B. Danish Experience With the Organizational Model

If the attitude of regulated facilities toward environmental requirements is positive, as it is among Danish industry, it is possible to achieve significant results. The Danish experience is that facilities will observe rules—if they are aware of them and if they consider them to be reasonable.

In Denmark, it has been possible to cooperate with all sectors of big industry. The various sectors are organized in the Federation of Danish Industries, and all laws are carefully negotiated with that Federation. In most cases a consensus is reached. As a result of this process, an individual facility attempting to avoid the consensus-based legislation has little chance of getting help or sympathy from other industrial actors.

The most important environmental requirements are directly issued to each facility through individual permits or orders, and they are based on best available technology (BAT). The result of this direct imposition of consensus-based standards has been declining discharges of pollu-

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11. The official publication plays no significant role, and I have therefore omitted it from Figure 2. The spread of knowledge of laws is complicated, but there exists some research on that topic. Vilhelm Aubert was the pioneer in the field. See, e.g., VILHELM AUBERT ET AL., EN LOV I SØKLYSET [A LAW IN THE SEARCH LIGHT] (1952). This work is briefly summarized in Vilhelm Aubert, Some Social Functions of Legislation, in SOCIOLOGY OF LAW 116 (Vilhelm Aubert ed., 1969), and VILHELM AUBERT, RETTENS SOSIALE FUNKSJON [THE SOCIAL FUNCTION OF LAW] (1976).

12. In Denmark, "big" is a facility with more than 100 employees.

13. See infra note 28 and accompanying text.
tants to the aquatic environment. The same method is used with respect to air pollution, but attention has been directed to this issue only recently. Similarly, energy production causes significant problems (SO$_2$ and NO$_x$). It, too, is regulated by consensus-based quota rules, and emissions are now diminishing.

The point of these examples is that government and inspectors can convince industries that environmental requirements are reasonable and just, and the overwhelming majority of facilities will comply with the most important requirements on their own. An underlying consensus is reached on major environmental goals and requirements. The remaining few facilities that refuse to comply are left to the police and the courts.

This state of affairs offers a sharp contrast to the traditional law model of enforcement. Under the traditional model, the police and courts are the primary enforcers when facilities refuse to read and react to new regulations. In Denmark's experience with an organizational approach to enforcement, the police and courts still have a role; but it is mainly to reinforce the work of inspectors. The police force only takes over when the inspectors have to give up.

In Denmark—as in any other country—one does not simply close a big facility merely for environmental reasons: jobs are too scarce. But the police, the courts, and a fine may have an effect on a firm's image; and firms have often changed management following troubles with the environmental authorities. A company may also be stigmatized by involvement with the police, but that depends upon what reaches the public through newspapers and television.

C. Capacity Limits on the Enforcement System

There are some inherent problems in environmental enforcement that place limits on the entire system. The most significant problem is one of capacity. It is difficult for both inspectors and facilities to cope with the flow of a large number of new rules.

It is impossible to redraft the enormous bulk of rules, however, or even to abolish any rules in an attempt to reconstruct a coherent set of environmental regulations. Such retrenchment would be received by the regulated community as signaling an era of decreased environmental pro-

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14. Discharges of pollutants, such as organic material, nitrogen, and phosphorous, as well as hazardous substances, such as heavy metals, phenols, and chlorinated compounds, have been declining since 1985. See infra Table 2 and accompanying text.

A clear contrast is offered by the small sector of aquaculture. Aquaculture is using—and polluting—the watercourses of Jutland. No dialogue exists with the aquaculture sector, and it has neglected the applicable environmental requirements. It may take 5 or 10 more years—with much litigation—before a reasonable degree of compliance is reached.

15. An SO$_2$ quota was originally established by Regulation 251 (1984) (Den.). Currently, the regulations concerning SO$_2$ and NO$_x$ are Council Directive 88/609, 1988 O.J. (L 336) 1 and Regulation 885 (1991) (Den.).
tection. In addition, the costs of preparing and negotiating an EC directive are so great that renegotiation is not an attractive option. Two methods people turn to in order to cope with capacity problems are prioritization and citizen complaints.

1. *Prioritization*

The enforcement system may cope with the overwhelming number of regulations by giving different priorities to different rules. Thus, some rules are considered important environmental requirements; others are regarded as just another rule. The best to hope for is that the enforcing organization establishes reasonable priorities; i.e., it prioritizes based on the state of the environment and the amount and nature of the discharges.

How much enforcement can actually be accomplished then depends upon the make-up of the regulated community (e.g., the number and character of facilities) and the efficiency of the inspection organization. It is possible to anticipate the cost of administering different rules (in terms of inspections, paperwork, and related factors) and to estimate how much one will get out of the rule. The rational enforcement choice is then to allocate your administrative resources where you get the best environmental results.

Even when prioritization is attempted, however, it often happens that a new set of rules drowns in the flood. In 1984, for example, the European Community adopted a directive on the transboundary shipment of dangerous waste.\(^6\) The Directive was transformed into a Danish regulation in 1987, which was duly reported in the *Official Gazette*.\(^7\) However, only three or four people in the Danish Environmental Protection Agency (EPA) knew of the regulation, and it was generally unobserved. In 1989, a Danish steelworks sold a cargo of filter dust to an English firm, which in turn sent it to South America. These actions violated the transboundary shipment regulations. Greenpeace detected the situation, and the cargo was forced to return to Europe.\(^8\) After this embarrassing event, the regulation was “revived,” and it is now well known by all of the relevant facilities. But such “revival” of unnoted regulations does not happen very often.

An example of a regulation that is completely impossible to enforce is the Danish “nickelous button” regulation.\(^9\) The idea itself is sound: many people have an allergic reaction when their skin comes in contact

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\(^{18}\) This case of the Danish Steelworks of Frederiksvaerk is discussed in *II PROCEEDINGS OF THE INTERNATIONAL ENFORCEMENT WORKSHOP* 216 (Utrecht, Neth., May 8-10, 1990).
\(^{19}\) Regulation 854 (1991) (Den.).
with nickel. Given this situation, all objects containing nickel that may come in contact with the skin, such as buttons and earrings, have been forbidden. No one knows, however, who produces or imports these items. No inspections are carried out, and no citizens file complaints about buttons that break the rules. Under these circumstances, who is the regulated community? Nobody knows, and the regulation is not enforced.

2. Citizen Complaints

Many Americans believe that citizen suits can save the world by empowering a large group of enforcers. Denmark and some other countries in the northern part of the EC have had enlightening experiences with citizen complaints. In Denmark, in 1974, environmental law was seen as an extension of older nuisance law. It was seen as natural that neighbors of a facility had the right to make complaints, forcing the local environmental authorities (either municipal or regional) to take action regarding the situation. The parties could then appeal the local authority's decision to the EPA and obtain further review from the Environmental Appeal Board.\(^{20}\)

But what do neighbors of a facility most easily notice? Noise and smell. This meant that environmental authorities devoted much of their time to cases involving noise and smell, which may have little correlation to health hazards. Other kinds of pollution, such as water, soil, and other types of air pollution, were not addressed by citizen complaints.

In 1982, Parliament tried to rectify this state of affairs by giving the right to file complaints to major environmental organizations.\(^{21}\) This right is limited to the more important cases in which the complaining organization has a stated interest. This change resulted in a greater number of cases, but a better balance of issues is now presented to the environmental authorities. An appropriate balance between large and small cases has only been achieved since 1985, however, when the authorities started to make inspections on their own initiative.\(^{22}\) Danish experience thus shows that while private enforcement of environmental laws can play a useful role, it is only efficient in conjunction with public enforcement.

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20. Neighbors' rights to appeal are based on the Environmental Protection Act, No. 358, § 98 (1991) (Den.) (§ 74 of the original act). They exercise the appeal rights frequently because no expense is involved. Indeed, the whole administrative complaint process is extremely informal. The initial complaint may be oral or written, and an appeal may be as simple as a letter stating, "I appeal." Lawyers are rarely used in this process. The neighbors may also sue in court, but that occurs only infrequently (perhaps once per year).


22. See supra part II.A.
Although the array of problems confronting environmental authorities and the difficulties of enforcing a large number of regulations is daunting, we can reduce pollution through a combination of adequate rules and adequate organization. Danish industry provides an example of such success, as can be seen from Tables 1 and 2, below.

The statistics we have kept in Denmark do not make it possible to follow total emissions since 1974—that is a weakness in the feedback system. But the two tables taken together give a relevant impression of the pollution trends since the first Environmental Protection Act.

**TABLE 1: WASTE WATER POLLUTANTS FROM THE CHEMICAL INDUSTRY IN DENMARK: 1975-1985**

<table>
<thead>
<tr>
<th></th>
<th>1975</th>
<th>1980</th>
<th>1985</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOD</td>
<td>23,249</td>
<td>35,186</td>
<td>36,629</td>
</tr>
<tr>
<td>Tot-N</td>
<td>1,691</td>
<td>2,603</td>
<td>2,614</td>
</tr>
<tr>
<td>Tot-P</td>
<td>2,257</td>
<td>3,461</td>
<td>2,428</td>
</tr>
</tbody>
</table>

These figures can be interpreted as follows. In the first years of the new regulation, a policy of using longer pipes was predominant. It was believed that the sea could work as a natural sewage system and treat ever rising emissions from industry. Thus, emissions continued to rise with production. But in the early 1980's it was recognized that it would be necessary to clean the waste water, and all new industrial facilities were required to build sewage treatment installations.

23. CARL TH. PEDERSEN, DEN KEMISKE INDUSTRIS MILJØEFORHOLD [THE ENVIRONMENTAL SITUATION IN THE CHEMICAL INDUSTRY] 12 (1987). Please note that the pollutants are measured in metric tonnes. The pollutants are biological oxygen demand, total nitrogen, and total phosphorous.

24. The case of the chemical company NOVO in Kalundborg provides an illustration of this policy change. NOVO emits its sewage through a long pipe into the sea. On November 18, 1982, the Environmental Appeal Board permitted NOVO to emit virtually untreated sewage water, resulting in pollution of 3,600 metric tons BOD (biological oxygen demand) per year. This decision was heavily criticized by the Danish press. In 1985, the Vestsjaelland regional council extended the allowance to 18,000 metric tons BOD per year. Criticism of the permit led to an appeal of the case. In 1986, the Danish seas suffered from extended oxygen depletion. The EPA decided the NOVO case in 1987 and the Environmental Appeal Board on August 4, 1988. The new permit allowed only 5,000 metric tons BOD and ordered NOVO to start building a sewage treatment plant. With the treatment plant now in operation, emissions are under 1,000 metric tons BOD per year.
Table 2: Waste Water Pollutants from 57 Big Enterprises in Denmark, 1985-1995, Comprising 60% of the Total Industrial Sewage

<table>
<thead>
<tr>
<th></th>
<th>1985</th>
<th>1989</th>
<th>1995 (forecast)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>tonnes/year</td>
<td>tonnes/year</td>
<td>tonnes/year</td>
</tr>
<tr>
<td>BOD</td>
<td>41,300</td>
<td>36,000</td>
<td>(much lower)</td>
</tr>
<tr>
<td>Tot-N</td>
<td>4,300</td>
<td>4,100</td>
<td>1,600</td>
</tr>
<tr>
<td>Tot-P</td>
<td>3,200</td>
<td>1,000</td>
<td>100</td>
</tr>
<tr>
<td>Heavy metals</td>
<td>19</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>Phenols</td>
<td>528</td>
<td>86</td>
<td>14</td>
</tr>
<tr>
<td>Non-chlorinated aliphatic compounds</td>
<td>6,200</td>
<td>4,063</td>
<td>332</td>
</tr>
<tr>
<td>Chlorinated aromatic compounds</td>
<td>80</td>
<td>40</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 2 shows that from 1985 to 1989, there was a small reduction in waste water pollutants as regulations began to be accompanied by enforcement. For example, the significant reduction in phosphorous resulted from a direct order imposed on the single largest polluter. The remarkable reductions expected in the next period (1995 forecast) are due to the Aquatic Environment Plan of 1987, which is directed at all large polluters—both new and old—and gives rise to strict follow-up measures by environmental authorities. As of this date (end of 1992) industry has been able to comply with the Plan.

It must be kept in mind, however, that the development of technology is the most important factor in pollution reduction. Thus, the continuing and increasing pressure on enterprises to produce according to best available technology standards should not be neglected. Since 1974, all new industrial sources in high-pollution sectors have had to ask for permits, which set out environmental requirements according to BAT. In addition, some of the old facilities that pollute the most have been forced to ask for new permits. Currently, all old facilities are obliged to request new permits. Furthermore, permits that are more than eight

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25. Denmark Ministry of the Environment, The State of the Environment in Denmark 97-98 (1991). The 57 enterprises include non-chemical industries. Table 1 includes only the chemical industry, which was one of the first sectors to come under the scrutiny of environmental authorities. There may be a time lag before other industries achieve similar results.

26. Prior to 1988, the Cheminova company emitted more than 1,000 metric tons of phosphorous per year. The regional council of Ringkøbing heard the case in 1988, and the Danish EPA decided the case on April 9, 1990. As a result of this decision, phosphorous emissions have been gradually reduced, and they will be held under 15 metric tons per year by 1995.

27. The Aquatic Plan is a report of the Environmental Committee of the Parliament (Apr. 30, 1987). Several regulations followed this report, including Regulation 784 (1987) (Den.). Regulation 784 demands that big industrial plants ask for new permission to emit sewage water, and that the new emission permits be based on best available technology.

28. Regulation 794 (1991) (Den.). This law was originally Regulation 176 (1974) (Den.).

29. Regulation 532 (1992) (Den.).
years old may be revised, meaning that newer and stricter requirements are possible.\textsuperscript{30}

\section*{V \hspace{1em} OVERALL ENVIRONMENTAL QUALITY}

The results of the Danish battle against pollution have been good over the last two decades. We are seeing lower industrial emissions, and production from the regulated industry has increased 52\% from 1974 to 1991.\textsuperscript{31} It would be better to have figures demonstrating an improvement in overall environmental quality, instead of settling for statistics about reductions in industrial emissions alone. There are, however, other contributors to environmental degradation which must be dealt with before positive overall results will be obtained.

\textit{A. Agriculture}

When the EC and Denmark focused on industry as the big environmental problem in the 1970's, everyone overlooked agriculture. Agriculture is a major contributor to water pollution, and our next task lies in that sector.\textsuperscript{32}

Reducing agricultural pollution will pose a new set of problems. Unlike the difficulties encountered in the industrial sector, the organizational problem with agriculture is not that there are too few inspectors, but that the regulations only scratch the surface.\textsuperscript{33} The environmental problems associated with agriculture are generally common to all north-western EC Member States, and the solutions would be much simpler if the EC could coordinate its agricultural and environmental policies.

\begin{flushleft}
\begin{footnotesize}
\textsuperscript{30} Environmental Protection Act, No. 358, § 41 (1991) (Den.).
\textsuperscript{32} A description of agricultural pollution problems can be found in ENVIRONMENTAL PROTECTION AGENCY OF DENMARK, ENVIRONMENTAL IMPACTS OF NUTRIENT EMISSIONS IN DENMARK (1991).
\textsuperscript{33} One reason for believing this is that the degree to which the law is observed in Denmark is relatively high, even in the agricultural sector. However, the different nature of the agricultural pollution problem can be highlighted by referring back to the organizational approach to environmental enforcement. For the system depicted in Figure 2 to be effective, there must be a reasonable number of inspectors in relation to the number of facilities, and this does not appear currently to be a problem in Denmark. In Denmark, there are now about 2,000 local inspectors and approximately 20,000 relevant facilities in industry and 50,000 in agriculture. ENVIRONMENTAL MINISTRY OF DENMARK, MILJOETILSYN 1991 [ENVIRONMENTAL INSPECTION], at 11, 25 (1992). The total area at issue is 44,000 km\textsuperscript{2} and there are 5,100,000 inhabitants.

There are no comparable figures for other EC countries, but relevant data may be found. See 1 1992 PROCEEDINGS, supra note 1, at 307 (regarding the Netherlands); \textit{id.} at 319 (regarding Norway); \textit{id.} at 339 (regarding the U.K.). Denmark, the Netherlands, and Germany are known within the EC for their environmental policy and expansive environmental administration. LUDWIG KRÄMER, FOCUS ON EUROPEAN ENVIRONMENTAL LAW 52 (1992).
\end{footnotesize}
\end{flushleft}
Solving problems concerning nitrogen and pesticides in groundwater and sea water requires harsh measures, however. Such measures are politically impossible in Europe at the present time because the EC's current agricultural policy has led the EC into a dead-end. High prices for agricultural products based on subsidies (not on the market) have slowed the migration from agriculture to other businesses, but the number of farmers is so high that their average income is lower than in the rest of the population. Thus, policy changes that cost income or jobs are very difficult to enact.

B. Consumer Pollution

Even if one addressed agricultural pollution to the same extent as industrial emissions, there is yet another component of environmental quality to address—individual or "consumer" pollution. Models of environmental regulation based on inspections do not work with respect to pollution caused by consumers. In Denmark, for example, we must use other means in order to make 5 million water consumers save water or to make 2 million car drivers buy more unleaded gasoline. The most important of these means are based on economic incentives.

One example of a successful use of economic incentives for individual behavior is the installation of obligatory water meters in houses and apartments. This has been remarkably successful, saving at least 10 to 15% of the normal annual water consumption of a Danish household. As each cubic meter costs approximately 12 DK (approximately 2 US$) to pump and to treat as sewage, passing that cost to the water user creates an obvious incentive to reduce consumption.

A similar mechanism is used with respect to automobile emissions. All European drivers pay a high tax on gasoline as an incentive to use the public transportation system. The average price for gasoline in Europe is approximately 24 DK (approximately 4 US$) per gallon; but in Denmark, car drivers who buy unleaded gasoline get it 10% cheaper. This price differential has given unleaded gasoline 75% of the market, resulting in a significant drop in lead pollution.

34. The average annual water consumption for a Danish household is 170m$^3$. After installation of the water meters, there was an immediate decrease in consumption by 25%, leveling off at 10-15% over the long run. HENRIK BUHL & CARSTEN HOLM PEDEREN, VANDBESPARELSER I HUSHOLDNINGEN [WATER SAVINGS IN THE HOUSEHOLD] 16 (1988).

35. This average cost was calculated by the Danish EPA.

36. Luxembourg and Greece do not tax gasoline, but the rest of the EC Member States impose a tax at roughly the same level as Denmark. KAROLA TASCHNER, CAR USE AND FINANCIAL INSTRUMENTS IN THE EC: A REPORT FOR THE EUROPEAN ENVIRONMENTAL BUREAU 7-8 (1992).

37. Regulation 726 (1991) (Den.).

In order to implement new environmental requirements and standards, one must first define the target group. The current focus in Denmark is on industry, but we are beginning to recognize that a new approach will be required to address agricultural pollution. Yet another approach will be required to deal with consumer pollution.

In general, people involved in the environmental sector (especially politicians) should try to shift the emphasis from production of new rules to the effective implementation and enforcement of the most important environmental requirements. The reliance on the traditional law model, whereby more and more regulations are issued, needs to be re-evaluated and replaced with an organizational understanding of environmental enforcement.

In Denmark, an organizational approach is beginning to yield significant progress in reducing industrial pollution. Problems still persist, however, because the system has limited resources and there is an ever-increasing number of regulations. Nonetheless, we must hope that reasonable prioritization and enlightened rulemaking will continue to contribute to the achievement of the one true aim of environmental regulation: the improvement of environmental quality.