
THE ENFORCEMENT OF ENVIRONMENTAL CHARGES IN THE NETHERLANDS

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SUMMARY

It is often claimed that charges are easier to enforce than direct regulations. Unfortunately, no regulatory charges are being used in Dutch environmental policy, so it is not possible to compare the enforcement-burden of these two instruments in practice. Experience, however, has been gained with financing charges. The examples presented in this paper illustrate that there is a trade-off between the regulatory effectiveness and the enforceability of these charges. For reasons of feasibility and enforceability, concessions are made on the correspondence between the charge-base and the environmental problem, thus limiting the regulatory potential of the charge. The decisions made on the specifications of the charge-base indicate that enforcement problems would rise if a charge is aimed at the regulation of behavior of a specific firm or household. From the point of view of enforcement, the relative advantages of charges compared to direct regulation seem therefore to be limited. Charges can, however, improve the enforceability of other instruments by correcting prices that cause environmentally unfriendly behavior.

1 INTRODUCTION

Current environmental policy is to a large extent based on bans, regulations and licenses. Though direct regulation in principle is a suitable instrument to reach environmental targets, its effectiveness is highly dependent on a successful enforcement. In the context of an expanding environmental policy, the administrative and enforcement requirements of regulation, however, cause an overload of tasks and responsibilities for the government. It is more and more realized that the theoretical advantages of direct regulation do not necessarily materialize in practice because of implementation problems.

In the Netherlands, The Scientific Council for Government Policy, one of the main advisory bodies to the government, drew attention to the drawbacks of direct regulation as the dominant instrument of environmental policy (1). The Council warned that the failings of direct regulation come at the expense of the credibility and legitimacy of environmental policy. As an answer to this problem, the Council proposed the government use less coercion and make more use of the mechanisms of transaction (market forces, economic instruments) and persuasion (covenants, education, information).

This increased stress on self-regulation and on the use of transaction (market processes) as a coordinating mechanism in environmental policy, concurs with the argument of economists that charges should be used more widely in environmental policy (2). Before we discuss these arguments, for reasons of clarity, it is good to make a distinction between three different kinds of charges.

2 FINANCING CHARGES, REGULATORY CHARGES AND ENVIRONMENTAL TAXES

Discussions on environmental charges often end in a lot of confusion because the concepts and their meanings are jumbled. In this paper we want to use the distinction made by the Scientific Council for Government Policy (1), which is according to the primary aim of the charge (table 1). But before doing this, we have to warn that the distinctions made are quite academic. In actual policy-making, similarities may be greater than the differences.

Firstly, the Council distinguishes earmarked charges. The primary aim of these charges is to collect revenue to pay for certain environmental activities or investments, such as water-treatment installations or waste-collection. The rate of the charge is determined by the funding needed and the volume of the tax base. Though the primary aim is the revenue, financing charges can have a regulatory impact, as is the case with the Dutch water pollution charge discussed below.

The primary aim of regulatory charges is to give price-incentives in order to change economic behavior, irrespective of any funding which might be required for countermeasures. They aim at substituting environmentally sound production processes, products and patterns of consumption for bad ones. This means that the basis for the charge may gradually diminish, or even disappear. The rate is in principle determined by the environmental objectives related to the base of the charge. The primacy of the regulatory aim can best be guaranteed by not using the income these charges generate for a specific aim or for the Treasury, in order to ensure that spending requirements do not determine the rate. The revenues can therefore best be returned to the charge-payers. If the charge-base is not eroded fully by the charge, as would be the fact in case of a regulatory energy charge, revenues would become a structural part of government income, and the charge would become similar to an environmental tax.

Environmental taxes combine funding and regulation by introducing environmental considerations into the tax system. Environmental value, then, is added as a basis to the traditional system of taxing income, capital and consumption. Since the primary aim is funding, this also determines the rate. The regulatory effect is a side-effect, albeit a desirable one. To prevent the overall tax base from being eroded, environmental taxes can best be levied on environmental resources for which demand is fairly constant (low price elasticity of demand).

Table 1. Distinction of Taxes and Charges.

	Aim	Revenue spent on
Earmarked charge	Funding	Environmental measures
Regulatory charge	Behavioral change	Feedback into economy
Environmental tax	Reform of tax system	Substitution for other taxes

2.1 Rationale for the use of environmental charges

In market economies, individual consumers as well as companies normally make their economic decisions on the basis of market prices. According to standard economic theory, the market mechanism generates an efficient outcome of all these private decisions. One of the conditions for this efficient outcome, however, is that market-prices are correctly reflecting scarcity. This means, among other things, that prices should reflect all social and environmental costs.

In reality, the latter is not the case. Because environmental goods are not traded on the market, they get no price. The production factor—environment—is therefore priced too low, which causes over-use of the environment. Economists point out that the fact that the market mechanism will not tend to an optimum as long as prices do not reflect all costs is a major cause of our environmental problems

In the introduction, it was indicated that a standard reaction to this market-failure was government regulation. This is of course not the only possible reaction. Economists stress that because the market mechanism is such a strong allocative instrument, it should be used in environmental policy. If economic actors make their decisions on the basis of prices, it is the trick to get the prices right. In an economy with "correct" prices, economic agents will behave within the limits of sustainability, without much government interference.

A standard example which illustrates the advantages of economic instruments is a regulatory energy charge. Such a charge is quite easy to impose and collect, especially in case there already are other taxes on energy (like excise duties on mineral oils). The number of tax payers is small, because it is only necessary to make the energy producers, importers and/or distributors liable for taxation. This, together with a well organized market where the trade in the basis of the charge is well administered, makes enforcement easy. All users of energy (companies and households) are effected via the price of energy, and can optimize energy-efficiency according to their respective situation. Economic actors with the lowest cost of energy saving will save most energy, which causes an efficient distribution of energy-saving efforts. Since energy-saving investments become more profitable, market forces create an incentive to develop energy saving technology.

Compare the effects of such a tax with a system of regulation trying to accomplish the same. Energy-use standards for products should be formulated, for example, or energy efficiency requirements should be incorporated in the environmental licenses. Besides the fact that government needs lots of information about the available technology it also should enforce these regulations (does the product match the norms? Is the firm in compliance with the licence?).

It is because of these advantages (effectiveness, total abatement against least costs, dynamic influence on technological development, usage of information on a decentral level) that charges have enthusiastic supporters. Incorporate environmental costs into prices by introducing charges, they say, and the market mechanism will do the rest, thus lowering the enforcement burden for the government.

2.2 Enforcement issues with charges

Notwithstanding these advantages of charges, it should not be forgotten that the problem of enforcement is not solved by introducing charges but shifted. Instead of regulating behavior, government now needs to regulate prices. It is in fact a similarity between charges and direct regulation that both instruments need enforcement. This implies effective monitoring activity on the charge base, and clear criteria for identifying violations. And just like direct regulations, charges need a framework of administrative and legal processes to take appropriate action to ensure compliance. It is remarkable that the enforcement of economic instruments gets so little attention in literature. The massive literature on economic instruments mainly stresses all their theoretical advantages. The literature on enforcement, on the other hand, concentrates on direct regulation.

To fill the gap between the abundance of theoretical claims and the lack of empirical support, in this paper, we want to give an indication to what extent Dutch experience with economic instruments supports the claim that economic instruments are superior to direct regulation from the point of view of enforcement. A complication we encountered from the start, however, is that the experience with charges is in fact almost totally restricted to the ones with financing as their primary objective. Therefore, we will have to derive our conclusions on the enforceability of charges as a regulatory instrument on the basis of observations on the design of financing charges. We will find out that considerations of practicability and enforceability led in a number of cases to the choice of a charge-base which is different from the one that would have been chosen if regulation had been the primary aim. Though the examples below do not cover all charges used in Dutch environmental policy, the most important ones are discussed.

3 FINANCING ENVIRONMENTAL POLICY OF CENTRAL GOVERNMENT: ENFORCEMENT ISSUES

A first instructive example on the role of considerations of enforcement is the history of the financing instrument of Dutch central government. In the seventies, Dutch environmental policy was characterized by sectoral laws, concerning for example air, water, soil, waste and noise. In each of these laws, corresponding to the polluter pays principle, possibilities were created to introduce charges to finance the costs made for that particulate field of environmental policy. In course of time, only a limited number of charges came into effect.

3.1 Air pollution and traffic noise tax experience

In the case of air-pollution and traffic-noise, charging emissions was judged as impractical since it would have meant metering a huge amount of, partly mobile, sources. Since there is a relation between air pollution and noise production on the one hand, and the use of fuels on the other, for practical reasons the latter was chosen as the charge-base. The existence of excise duties on mineral oils facilitated this solution. The environmental charges for these fuels were simply added to the excise duties and collected by the existing charging infrastructure.

Things were not so easy for two other charges. The industrial noise charge was charged on noise emissions. To restrict the number of tax-payers, the charge was based on metered emissions only for large polluters. For small companies a flat fee was introduced, dependent on the branch of industry and the size of the specific company. The charge for an individual company was calculated with the help of a table with coefficients reflecting standard noise production of installations of distinguished branches of industry. Implementation of the charge was hindered, however, by ongoing discussions about the coefficients. Companies were claiming to produce different noise levels than the ones following from the tables. In combination with the administrative costs of the monitoring of the noise emission of the large firms, the perception costs of the industrial noise charge were judged to be high in comparison to the revenue of the charge.

3.2 Chemical waste charge experience

The chemical waste charge was imposed on the amount of chemical waste produced by firms. This charge gave, as an unfavorable by-product of the revenue, an incentive to illegally dispose of chemical waste. This illegal disposal is very difficult to trace, which made the charge difficult to enforce. Since the environmental consequences of illegal disposal can be serious, the chemical waste charge was judged to be an unsuitable instrument to finance environmental policy.

3.3 Shift to a fuel charge

The inflexibility of a sectoral financing system, in combination with the problems of the industrial noise charge and the chemical waste charge led to a change in the financing of Dutch environmental policy. Since 1988, all direct environmental expenditure of central government were paid out of a general fuel charge, thus making fully use of the practicability of the existing fuel charges. In 1992 this charge was changed into an environmental tax. The revenues of this tax are directed towards the public funds, out of which also the environmental expenditures of the government are paid.

4 WATER POLLUTION CHARGE

The water pollution charge was introduced in the Pollution of Surface Waters Act as an instrument to finance the costs of water quality management. The most expensive part of this water

quality management is the building and operation of collective water treatment plants. In accordance with the polluter pays principle, everybody discharging waste water into the sewer system or into surface waters should contribute to these costs. Since precise implementation of the polluter pays principle would imply the measuring of emissions for millions of sources, a more practicable system was designed (3).

As a standard measure of water pollution, the oxygen demand of waste water produced by one person (one inhabitant equivalent, or i.e.) was defined as the entity for the charge-base. To keep the system simple, a household is charged a standard number of i.e., dependent of the average family size in the specific region (in most cases 3 i.e.). Households with one person, however, can ask to be charged for 1 i.e. Consequently, all households pay a flat fee, irrespective of the pollution emitted.

For companies, a system is used comparable to the one of the former industrial noise charge described above. Large firms are obliged to measure the oxygen demand of their waste water themselves. They have to store the samples which can be controlled by the government. For the much larger number of smaller firms this procedure was judged to be impracticable. For them a table of coefficients was created, dependent on the characteristics of processes in the branches of industry. As a measure for the size of the activities the amount of water used is taken as an indicator, though the relationship with total pollution will at best be vague. If companies think they emit less than is implied by the usage of the coefficient they can ask for a measurement of the real pollution. In all other cases, small companies pay a flat fee, irrespective of the real amount of pollution in their waste water. Very small polluters (those emitting less than 5 i.e. according to the coefficient table) are charged the same as households (a standard 3 i.e.).

Besides oxygen binding substances, the water pollution law also has heavy metals and phosphates as a base. It is only imposed on companies that have to meter their emissions. It is assumed that companies falling under the coefficient table will have negligible emissions of these substances.

As was indicated above, the water pollution charge has financing as its primary aim. The main instrument of pollution control in the Pollution of Surface Waters Act is direct regulation by means of permits and decrees. The Act recognizes, however, that a regulatory impact may be a positive side-effect of the charge. From empirical research, it is known that this regulatory effect did indeed materialize, in fact a lot more than expected. Especially the rate for oxygen binding substances is high enough to give companies an incentive to reduce the pollution in the waste water, mainly by building their own water treatment plant. Though it took quite a long time before this effect became visible, the water pollution charge is often cited as an example of the potential of regulatory charges. Of special interest is the positive effect on technological development. Because of the charge-induced market demand for water purification technology, new installations and techniques were developed. This had, among other things, the result that water purification technology is now a main export article for the Dutch environmental production sector.

5 THE WASTE DISPOSAL CHARGE

Another interesting example of the relationship between enforcement and the design of charges are the recent developments with respect to the waste disposal charge. In the cases presented above, for reasons of simplicity, practicability and enforceability, the base of the charge got removed from the polluting activity. In the case of the waste disposal charge, it's the other way round: for reasons of effectiveness, the charge is increasingly imposed on the polluting activity itself. As a consequence some enforcement problems may rise.

In the Netherlands, the municipalities have the legal obligation to collect the waste of households and to take care of the disposal. In order to finance the costs of these activities, municipalities are allowed to impose a waste disposal charge. One of the ideas behind the introduction of this tax was that the government wanted to create a financing instrument which would

give no incentive to people to get rid of their waste in an illegal way (charge avoidance). Therefore, the charge is to be paid by every household, offering waste or not.

Consumer-organizations, citizens and some municipalities became in course of time unsatisfied with the lump-sum character of the charge. They argued that there is some injustice in the fact that every household has to pay the same amount of money, independent of the amount of waste offered. This feeling got stronger once it became clear that the charges were rising fastly (as they did in the Netherlands with an 18 percent yearly growth-rate during the last years). Because of the flat fee, there is no way citizens can influence this financial burden.

A lot of municipalities (one in three) therefore decided to charge families more than one-person households. However, it is clear that a really just financing of the costs would make the charge more directly dependent of the amount of waste offered by the households. Moreover, such a pay-as-you-discard approach would give households appropriate incentives to recycle, to compost and to adjust their purchasing habits to reduce the amount of waste they generate. Of course, an important prerequisite for a manageable system is that households are given the opportunity to reduce the waste they offer. So, a necessary complement of the pay-as-you-discard systems are curb-side facilities, such as paper-containers and bottle-banks.

Differentiating tariffs is possible by weighing the waste supplied by individual households, the introduction of expensive refuse-bags, or measuring the offering frequency of waste-containers. In the Netherlands, most experience has been gained with the expensive bag system (25 country-side municipalities) (4). In this system, the sanitation department exclusively collects bags in which part of costs of collection and disposal are discounted.

Some municipalities report problems with illegal charge avoidance. Occurrence of this behavior seem to be the greatest during the starting period of the new system. People realize that they can earn money by offering less waste, and some of them use this possibility in a creative manner by taking the waste to other municipalities or their workplace ("waste tourism").

In the town of Barendrecht, for example, the amount of waste offered dropped sensationally after the introduction of an expensive bag costing 2.5 guilders. Observers became less enthusiastic about this environmental success when they heard that the amount of waste offered in the neighboring town grew inexplicably with 23%. Because it is not forbidden to drive around in a car filled with refuse-bags it is quite complicated to take action against this waste tourism. Civil servants of the sanitation department of a neighboring town, however, tried to catch people from Barendrecht disposing their waste on the streets. Caught "tourists" could expect a fine of 80 guilders.

Though waste tourism for a large part is a temporary phenomenon, the example shows that the risks of illegal charge avoidance are real. The amount of the financial incentive seems to be quite critical. Experience shows that problems rise fast if the price of the bags rises above 2 guilders (US\$ 1). It should be noted that all differential systems can be used in combination with a flat fee to cover (part of the) fixed costs of the sanitation department. Disposal costs for households, then, get a constant and a variable part. The share of the variable costs can be used to "fine-tune" the incentive to prevent and separate waste, respectively the incentive to get rid of waste illegally. Some municipalities indeed chose to lower the price of the bag in response to experiences with waste tourism.

6 WASTE TAX

Prices play a role in environmental behavior, whether the government uses economic instruments or not. The relevance of the costs of waste disposal for the chosen kind of waste treatment is an illustration of this point.

The general objective of Dutch waste policy is to reduce the risks from waste disposal for humans and the environment to an acceptable or, where possible, negligible level. Part of the policy to reach this objective is a priority setting for means of waste disposal (prevention - recycling - incineration - landfilling). Incineration is preferred to landfilling because the latter costs space (which

is very scarce in the Netherlands), and creates risks for soil and groundwater. Moreover, by incinerating waste, at least the energy-content of the waste is gained back. This priority-setting is reflected in the environmental targets for waste-disposal, as laid down in the National Environmental Policy Plans.

Unfortunately, actual waste-treatment and its cost-structure is opposite to these policy priorities. The costs of prevention and recycling are in most cases higher than the costs of incineration, which in turn is more expensive than landfilling. As a consequence, almost half of the amount of household-waste, for example, is brought to the landfill.

Various instruments can be used to prevent waste flowing to the cheapest but least preferred way of disposal. In the Netherlands, landfilling prohibitions are in preparation for specific waste streams. It is clear that such a system of prohibitions needs a comprehensive legal system, with clearly defined waste categories. On the landfill, control is necessary whether the loads of waste offered do contain any of the fractions for which there is a dumping prohibition. Enforcing this system will be quite complicated, especially if there is a continuous financial incentive to bring the waste to the landfill instead of choosing other means of disposal. It is therefore felt that a change in the cost-structure is necessary to create an enforceable system. In the second National Environmental Policy Plan (5), the rise in landfilling tariffs to the incineration level is therefore formulated as a target.

One of the instruments used to change the cost structure of waste disposal is a tax on the end-disposal of waste. The bill for this tax passed the lower house, and is now discussed in the Senate. The waste tax is an example of an environmental tax with the primary aim of collecting funds for the Treasury. The discouraging effect on the landfilling or incineration of waste is a welcome but secondary effect.

The waste tax has to be paid by the owners of the landfill-sites where the waste is dumped. The waste tax is a general means to raise the costs of end-disposal, thus improving the competitiveness of recycling. Because average landfilling costs are much lower than incineration costs, in the bill a higher tariff for the former is proposed. The tariff for landfilling will be 28.50 guilders per ton, while the tariff for incineration will be nil. For comparison: the average tariff for dumping of householdwaste is 73 guilders per ton, while the average tariff for incineration amounts to 121 guilders per ton (in 1995 expected to be about 220 guilders per ton).

In the waste tax, the government chose to introduce only a general tariff for landfilled waste. From an environmental point of view it would be desirable to have higher tariffs for waste streams with relatively high costs of segregated collection, recycling or re-use. In that way, the tariff-structure of the waste tax would give more specific incentives to the best ways of disposal. However, this differentiation of tariffs would have made the waste tax more complex and more difficult to enforce, which was judged by government to be unfavorable. All distinguished waste-streams would have to be defined very carefully and precisely. The tariffs would have to be dependent on the costs of re-use for every waste stream, which can change in course of time. More-over, the enforcement of the tax would become very complicated. At the landfill, where waste is often offered in an unseparated way, every waste stream distinguished in the tariff should be weighted separately. The perception costs that would be the consequence of such a refinement of the tariff were judged as being too high.

7 CONCLUSIONS

In this paper we investigated whether Dutch experiences support the claim that environmental charges are easier to enforce than direct regulation. Because only financing charges are implemented in Dutch environmental policy, we had to use indirect evidence on the enforceability of charges as a regulatory instrument. Since the regulatory effect of a charge is dependent on the extent to which the actor can influence the amount of charge paid by altering behavior, an effective charge requires a base which is as close as possible to the behavior the government wants to regulate. To see whether enforceability is a problem with respect to charges, we therefore investigated the choices made on the design of the charge bases of the major environmental charges.

The experiences with financing charges presented in this paper show that a lot of concessions on the correspondence between the charge-base and the environmental problem are made for reasons of feasibility and enforceability. The widespread use of flat fees for categories of charge-payers is an illustration of this. These concessions can be justified from the primary aim of these charges, which is to raise money. It deserves no lot of phantasy, however, to realize that a lot of enforcement problems would accompany a charge with a base more aimed at regulation. Moreover, the history of the waste disposal charge illustrates that working with charges can cause specific enforcement problems because an (explicit) financial premium is put on undesirable behavior.

Apart from the conclusion that there seems to be a trade off between the effectiveness and the enforceability of charges, the examples also make clear what are the determinants of the feasibility and enforceability of charges. We found, for example, that connecting environmental charges to an existing tax infrastructure has practical advantages. Beneath that, the number of tax-payers and the measurability of the base seem to be of central importance. Since the number of tax payers is much lower, and the tax base is, as a traded good, easier to measure, charges on inputs are often more practicable than emission charges.

A major advantage of charges is that they can be designed to support the working of other, more specifically regulating instruments by changing the existing price-structure in an environmentally friendly way. By carefully selecting a charge-base, a substantial, though global and unpredictable environmental effect can be attained with a relatively low enforcement strain. Selecting instruments for environmental protection, therefore, is no matter of choice for one instrument against the other, but of a careful composition of a mutually enforcing mix of instruments.

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