

**Voluntary agreements:  
cost-effective or just flexible to fail?**

Kilian Bizer

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### ***Abstract***

Voluntary environmental agreements are widely considered as an alternative instrument to command-and-control policies or economic incentives and are frequently labeled as "efficient" or "cost-effective" . In this article it is argued that voluntary agreements are much more limited in scope. It is shown that agreements are cost-effective only under restrictive conditions hardly ever observed, and that flexibility of non-binding agreements often results in failing the environmental objectives altogether. Empirical evidence of an interdisciplinary analysis of eight case studies suggests that voluntary agreements should be applied as additional instruments rather than alternatives either where small and homogenous groups can be motivated to adhere to voluntary standards or where government agencies carry "big sticks" , i.e. threats of regulatory standards.

# 1

## Introduction<sup>1</sup>

While voluntary agreements are fairly new in environmental policy making, they have been used for a long time in other policy areas. Voluntary agreements are here defined as “self-regulation which is voluntary in character, that involves stakeholders of which at least one is the state, that is either a substitute or that is a device for implementing or going beyond environmental law and policy, and that is aimed at sustainable development.” (Gebbers/Biekart/Bizer et al. 1998, 10). Agreements vary significantly between Europe and, for example, the USA. In the United States there existed a national program to which individual firms and sites can sign up, while in Europe predominantly industrial associations reach agreements with the government, and single firms become a member somewhat automatically through their association. Regardless of the relative merits of one approach over the other, both appear to work in the sense that an increasing number of agreements are actually reached.

The empirical basis of this article is formed by eight case studies, which analyze existing agreements in the context of a broader research project funded by the European Commission’s Environmental Research Program. The case studies were not selected at random but rather with regard to information on the cases available. Therefore the selection could be biased towards more successful agreements. However, at least two of the eight agreements did not even partly achieve their objectives, and none of them were entirely successful.

The main focus of this paper lies on the cost-effectiveness of voluntary agreements. It will be shown that voluntary agreements can only be cost-effective under very restrictive conditions. It will be examined whether the case studies suggest that any of these conditions might hold. A major point of this paper is that policy makers preferred environmental agreements with virtually no knowledge of cost data.

# 2

## Assumed advantages of agreements

Environmental agreements are sometimes praised for being more efficient or cost effective than environmental policy instruments.<sup>2</sup> For example, the Confederation of British Industry believes voluntary agreements can provide

<sup>1</sup> This paper is drawn from a research project funded by European Comissions Environmental Research Programme (Gebbers/Biekart/Bizer et al. 1998). I received valuable comments from Paul Eikins of Keele University, UK, my colleague Martin Führ of SOFIA, and Ralf Jülich, Institute for Applied Ecology (Öko-Institut), both Germany, and two anonymous referees. I am also indebted to Kristina Quattek, Johannesburg, South Africa for editing the text. For all remaining errors I alone am responsible.

<sup>2</sup> European Commission (com 96 0561 Final, November 1996).

an integrated strategy for identifying win-win opportunities<sup>3</sup>, as does the Union des Industries de la Communauté Européenne<sup>4</sup> which argues that agreements can “stimulate the development of cost effective and clean production methods” because of the use of proactive discussions with government and their long term nature.

To state that agreements have the advantage of being more cost-effective than other environmental policy instruments is quite different from saying that individual companies can, and in fact will, choose the least cost option of prevention measures if they were free to select it.<sup>5</sup> While the former statement refers to the overall amount of resources spent to achieve the given overall objective, the latter statement refers only to those firms which take measures and which will select the least-cost option for the individual firm's objective.

Voluntary agreements are also praised for their flexibility. In fact, they potentially leave more choice for individual firms than the outright regulatory route where a regulating agency has power to restrict environmentally harmful action. At the same time, voluntary agreements may fail because its individual members have no legal obligation to abide by their association's commitment. The advantage of giving greater flexibility, therefore, might turn into a disadvantage.

A further advantage is claimed to be the great innovative potential of agreements: industry is supposed to be motivated by discussions with government agencies to develop new approaches to environmental problems. A cooperative strategy might induce sectors to come forward with investments and develop new technologies as they are less bound by bureaucratic procedures and highly motivated to show their commitment to environmental issues. But it is also possible that industry might simply buy time and postpone new regulation without ever intending to stick to the agreement's obligations. Then, of course, innovative potentials will not be utilized.

Finally, literature on agreements in Europe occasionally suggests that voluntary agreements may hinder competition.<sup>6</sup> As certain industries get together to discuss solutions to environmental problems, they have the opportunity to collusion. Under the guise of an environmental agreement firms could, for example, form a common price policy. However, it is also possible that firms engage in greater competition as there might be an incentive to outperform each other not only on products but also to bolster the company or brand through environmental performance.

<sup>3</sup> CBI 1994.

<sup>4</sup> UNICE, Position Paper about the Communication on Environmental Agreements 18 March 1997.

<sup>5</sup> Hansjürgens (1994) 35

<sup>6</sup> Rennings et al. (1997) 160

### 3 Environmental objectives

An instrument is environmentally effective if it meets its objective. The determination of objectives in environmental policy is rarely specific enough to judge whether a measure failed. This also holds for voluntary agreements.

Therefore, the evaluation of environmental performance of voluntary agreements is very much open to debate: Strictly speaking one could conclude that almost all agreements did not reach their objective as they suffered delays in implementation. Even the one positive exception among the case studies, a neighborhood agreement in the US, did not fully reach its objective, as not all potential emission sources could be closed for the future.

Generally, policy objectives are stated frequently in broad terms with no specific time scale. The voluntary agreements under review here differ from this significantly as they were explicitly chosen on the criterion of defined objectives. As all of the agreements failed by strict standards, we broaden the definition of environmental effectiveness to include also those instruments as a success which led to a partly fulfillment of the objective. Even under such a broad definition, two of the reviewed cases fail to meet the criterion of environmental effectiveness, the Cement Agreement and the EDTA Agreement.

Table 1: Environmental objectives and effectiveness of eight case studies

	<i>Country</i>	<i>Objective</i>	<i>Objective clearly reached</i>	<i>Objective partly reached or delay</i>
Cement Agreement	Belgium, Walloon Region	- energy recovery of waste - incineration of regional waste	no	no
River Meuse Agreement	Belgium	- improved monitoring and dialogue - protect fauna and flora - etc.	no	yes
Battery Agreement	Germany	reduction of mercury below 0.1% in 1993	no	yes
EDTA <sup>7</sup> Agreement	Germany	reduction of EDTA (chelating agent) emissions by 50 % in 1996	no	no
Fine Ceramic Agreement	Netherlands	20 % energy efficiency improvement by 2000	no	yes
SUBAT Agreement <sup>8</sup>	Netherlands	Clean up and remediation of contaminated soil of voluntarily closed petrol stations by 2000	no	yes
33/50-Program	USA	Reduce releases and transfers of 17 targeted substances by 33 % in 1991 and 50 % in 1995	no	yes
Alcoa Agreement	USA	Zero discharge of wastewater	no	yes

Source: Gebers/Biekart/Bizer et al. (1998) 81.

<sup>7</sup> Ethylenediaminetetraacetic acid (EDTA) is a synthetic chelating agent in cleaning compounds used in household detergents as well as in film developing, electroplating and textile production.

<sup>8</sup> SUBAT means roughly translated Contaminated Soil Cleanup and Removal from Petrol Stations (Stichting Uitvoering Bodemsanering Amovering Tankstations).

The criterion of environmental effectiveness might not entirely cover all environmental effects the agreement might have. Frequently it is emphasized that voluntary approaches mobilize potentials which can get lost otherwise. Frey (1997) argues that soft regulation such as voluntary approaches might even “crowd in” intrinsic motivation of regulated agents and thereby change their attitudes and behavior. A similar argument is made by Ayres and Braithwaite (1992) who observed in various sectors that cooperative (“responsive”) regulation can evoke individual support far beyond what is legally binding.<sup>9</sup> All this is not regarded in this paper: The criteria for evaluating agreements environmentally is whether they reached the explicit goal or were about to reach it with little delay. Side effects as a general increase of intrinsic motivation on environmental issues are left aside.

## 4 Cost-effectiveness

### 4.1 General conditions

In order to examine cost-effectiveness we will ask whether environmental agreements can bring about minimum cost solutions and under what conditions this might be the case. In this context, agreements compete with economic instruments which give a uniform incentive and require no further informational exchange between the parties concerned. In addition to economic instruments command-and-control policies also compete with agreements. Therefore it is crucial whether and under what conditions agreements can be superior to a command-and-control policy.

Cost-effectiveness is defined in the static sense as the minimum cost solution of a given environmental quality standard. The minimum cost solution includes abatement costs as well as transaction costs such as informational, contractual, monitoring and administrative costs. Environmental agreements are cost-effective if they reach a given target at least costs. In addition to this static definition there is also a dynamic aspect of efficiency. An instrument is regarded as dynamically efficient, if long-term incentives are given to engage in innovative technologies with less environmental impacts.

The classic set of instruments in environmental policy consists of statutory law with mandatory restrictions, charges, tradable permits and various derivations as well as combinations of these.<sup>10</sup> Charges and tradable permits are considered efficient in the static as well as in the dynamic sense. Subsidies are efficient statically but not dynamically. Statutory law is neither statically nor

<sup>9</sup> The positive effects of different policy options are discussed in greater detail especially with regard to democratic aspects and public participation in Gebers/Bierkart/Bizer et al. (1998). For a detailed discussion of responsive regulation see Bizer (1998).

<sup>10</sup> Also, liability rules should be mentioned which are efficient in the static and the dynamic sense.

dynamically efficient, and it remains to be shown whether environmental agreements achieve static or dynamic efficiency.<sup>11</sup>

There is some indication that environmental agreements can be efficient under specific circumstances. Assume, for instance, a small group of industrial firms, which are non-competitors in product and factor markets and differ greatly in production technology and abatement costs. Assume further, that regulation would be costly as each technology would require specific regulation. This rather strict assumption actually reflects administrative and legislative practice as uniform regulatory standards are still an exception. An environmental agreement could save administrative costs on behalf of the state, and it could possibly achieve cost-effectiveness, if emission sources with lower abatement costs would discharge less and those with higher abatement costs would maintain their emission loads. Under these circumstances, legislative and administrative costs would be saved by an agreement rather than mandatory regulation, and a cost-effective outcome would be secured.

But why would those firms with lower abatement costs be willing to cooperate? There can be several reasons which depend more on the specific market the firms find themselves in than on the environmental agreement itself. However, one reason for pro-active abatement efforts endogenous to the agreement could be a financial compensation by those with higher abatement costs.

Depending on the kind of compensation rule, and assuming that the rule is functioning well, the environmental agreement can even be dynamically efficient if it gives incentives for further technological improvements.<sup>12</sup> This would require a time-path for environmental objectives in the agreement. Keeping in mind the restrictive assumptions, it can be concluded that there is a theoretical possibility of environmental agreements reaching cost-effective results within a given group.<sup>13</sup> But in order to show favorable circumstances for efficiency of actual environmental agreements, a catalogue of requirements must be checked which will be derived from looking at the steps of the bargaining process involved in reaching agreements.

In the ongoing public discourse, agreements are often deemed cost-effective solely on the basis of assumptions made on the process in which agreements are reached and the underlying behavior of industry's decision makers. The argument runs as follows: Industry agrees on an action scheme in order to avoid regulation by the state. A formal agreement can only be reached, if

<sup>11</sup> It is surprising how many sources accept environmental agreements as cost-effective for those making reductions (for example Arora/Cason 1996, 414). This, indeed, might not be the case as pressure can be higher on those firms with closer contact to consumer markets but higher abatement costs.

<sup>12</sup> For a different opinion see Rennings et al. 1996, p. 101.

<sup>13</sup> The incentive for further improvements holds also for non-members of the agreement, which could calculate membership on the basis of compensations and abatement costs. Therefore dynamic efficiency can be achieved for more than just the group members, if the group's statutes are open for new members.

total costs for each participating firm are lower or at least equal to total costs under the instrument otherwise implemented by the state. If the costs are higher for the agreement, a firm would not consent. Consequently, the agreement must be cost-effective.

As agreements in Europe are usually not reached at the level of individual firms, this condition should be softened by saying that the relevant association and its most influential members should have the impression that an agreement is less costly. At the same time, this implies that agreements can be reached also in cases where individual firms face higher costs than with alternative instruments. As industrial associations tend to be dominated by the biggest firms, small and medium sized companies may be disadvantaged. If they, as a consequence, stay out of the agreement, their potential contribution to reaching the target can not be activated. As it is likely that small-and-medium sized firms differ substantially in abatement costs as well, the agreement is leaving out cost saving potentials other instruments with uniform incentives include.

Voluntary agreements, therefore, can be cost-effective if various practical conditions hold:

- First, the agreement is reached by a small group of firms which emit the same substances or produce the same hazardous or harmful products.
- Secondly, the firms reveal all information about abatement costs and future investments.<sup>14</sup>
- Thirdly, they agree upon choosing the minimum cost solution for the entire group regardless of the costs which might accrue to one member.

If all three conditions hold, the agreement will be cost-effective in a static way, i.e. at a single point of time abatement costs or environmental protection costs will represent a minimum cost solution.

It is obvious, that these conditions are restrictive. First of all, only few environmental problems can be addressed by small groups. However, some of the case studies show that examples exist. The Battery Agreement (Germany) included about eight producers, the SUBAT Agreement (Netherlands) was reached by a few firms which totally dominate the country's gas stations, and the EDTA Agreement (Germany) includes one major producer and the parent association of most firms which apply the substance. But even in these cases, there was no evidence that the industrial members of agreements compare the firm's individual abatement costs. Despite the fact that such a comparison would make only sense in the EDTA and the Battery Agreement, there is no evidence, either that firms would not act strategically in the end. Both case studies at least reveal the potential for industry to act strategically within the agreement wherever the state is involved. Additionally, an agreement on implementing the minimum cost solution without compensation between the members would be against the individual interests of the firm with smallest abatement costs. Why should this firm solve the problem for all the others?

<sup>14</sup> This is basically saying that firms do not act strategically. If they don't reveal all relevant information a mechanism like charges or tradeable permits must be implemented. As this leads us back to the original policy choice, this case can be omitted here.

Without some compensation by the other members of the agreement this outcome is unlikely. None of the agreements showed such mechanisms.

An instrument is dynamically cost-effective, if it gives incentives to invest in research and development activities and thereby lower abatement or environmental protection costs over time. Under the restrictive conditions listed above it is possible that incentives may even be destroyed in a dynamic process. Again, the assumption is that firms share all relevant information and will act if they face lower reductions costs than others. However, such a situation is not stable, because one firm can gain by withholding information about actual abatement costs from others. It is further assumed, that firms will take advantage of the asymmetric distribution of information. Then the firm which is most successful in the search for new technology and still open about its cost situation might be punished by having to make investments because those with lower abatement costs hide and wait. Voluntary agreements will bring about minimum cost solutions only, if firms behave systematically against their own interests.

## 4.2

### Case Studies

The cases under review reveal an enormous lack of data with regard to abatement costs as well as transaction costs. In virtually no country and for no choice of instruments were alternative instruments considered and these considerations backed up with cost data. Quite to the contrary: the choice of voluntary agreements appears to be based rather on a political fashion or else on the expectation of minimum resistance by industry. This might not be surprising to the regular observer of environmental policy. But as the theoretical basis for cost-effectiveness is weak, it would appear that justification is at least based on empirical evidence. The aim of this section is to show how poorly substantiated this is empirically.

Costs associated with specific instruments accrue in various ways. Assuming that social external costs with regard to the specific goal can be neglected under different policy instruments, private costs as well as internal social costs may differ among instruments with regard to industry and state authorities. For a strict comparison of alternative instruments the following costs would have to be estimated.

Studies on economic instruments usually stress the importance of *abatement costs*<sup>15</sup> which include, firstly, investment costs for buildings and technology. Investment costs are fixed costs in the sense that they can not be altered by reducing or increasing production activity. Secondly, they include variable costs such as labor costs and other resource costs for running abatement technology (i.e. energy costs, chemicals, filters, etc.)

While in the case of end-of-pipe technologies costs for abatement can be easily distinguished from other costs of production, this is not the case with

<sup>15</sup> The case studies under review are not restricted only to the abatement of pollution, but more generally to the protection of environment. In these cases environmental protection costs could be used instead of abatement costs.

clean technologies. Clean technologies consist of a change in production processes with lower resource inputs or lower emissions. Conventionally, abatement costs are evaluated by taking cost data from producers of abatement technologies as well as from firms which run the technology.<sup>16</sup> As many costs accrue because of the specific application in production processes, these vary substantially.

A different category of costs are *transaction costs*. While abatement costs are relevant almost exclusively for firms, transactions costs can be quite high also for state authorities and industrial or other organizations. Transactions costs include costs for collecting information on available technology, relevant legal standards and actual emission levels as well as implementation costs for the state in case of taxes and command-and-control policies. Aside from information costs, firms also face contractual costs. With regard to voluntary agreements these costs can be especially relevant to industrial associations. Contractual costs include costs for lobbying. After an agreement is reached, industrial associations might offer to monitor actual emission levels, changes in products etc. Such monitoring costs might accrue to individual firms or to industrial organizations. Finally, there will be enforcement costs in those cases, where monitoring shows non-compliance with mandatory standards or agreements.

Currently applied technologies for reducing emissions can be characterized as mostly clean technologies, which reduce overall resource inputs in production. Consequently, estimations of abatement costs become increasingly difficult.

The case studies attempted to collect all available cost data on the agreements and possible alternatives. In many cases, additional calculations could be made to complete the data. However, the research showed that in none of the cases sufficient cost data were available or could be generated independently. In neither country the introduction of voluntary agreements was based on a thorough comparison of costs under alternative instruments. The cost data which were available concentrated exclusively on either overall investment costs of entire sectors or on administrative costs on behalf of the state or industrial associations.

In the case of the Fine Ceramic Industry Agreement (Netherlands) total investment costs of the sector related to the agreement were estimated at between ECU 250 and 550 million annually.<sup>17</sup> But as this figure includes all investments related to the agreement, it overstates the actual investment required to meet the environmental goal. Major investments, for example the replacement of kilns, serve many more purposes than just energy efficiency. As replacement costs of entire kilns are quite substantial, at roughly between ECU 250,000 and 1,000,000, one of the major motive for replacement is the ability to switch to cheaper fuels in order to reduce pay-back-periods of the investment. Nonetheless, energy efficiency plays a major part as well: better

<sup>16</sup>

See for evaluations of abatement cost data ERL (1991); Dopfer et al. (1991).

<sup>17</sup> See van Dril (1996).

insulation, computerized control of the kiln and the opportunity to use cheaper off-peak rates and heat reuse systems allow efficiency savings of between 25 and 50%.

Transaction costs of the fine ceramic industry is estimated at ECU 33 million. This includes administrative costs associated with the organization of the agreement as well as with the attendance of meetings by firm representatives. Estimates of enforcement costs were unavailable. Despite these estimated figures, the fundamental question, whether the agreement is reaching a given objective with lower costs than alternative instruments. In addition, it should be mentioned that the fine ceramic industry in the Netherlands has not met the environmental target yet.

The same is true for the German agreement on the reduction of water pollution by EDTA, a chelating agent: The environmental objective was not reached. This was partly due to the higher resource prices of alternative substances, e. g. ADA in the photo industry. As substitutes like ADA cost about 30% more than EDTA there is only a small market niche for them. In other segments alternative substances such as PDTA have chemical shortcomings. Comparative cost data are not available. As EDTA is a substance which is also contained in some cleaning detergents, alternative instruments with greater effectiveness may be difficult to apply on a national level. The available data are not sufficient to draw conclusions on cost-effectiveness.

One example for an agreement which did not fully reach the target is that related to the collection and recovery of mercury in batteries in Germany. The agreement was concluded by the Trade Association Batteries and the Federal Association of German Retail Trade. Despite a pending, and in March 1998 finally adopted regulation which threatened to regulate collection and recovery of all batteries, the agreement did not result in a reduction of emission of toxic heavy metals in domestic waste. Although industry covers the cost of collecting and recycling as well as disposing of used batteries, which reached roughly ECU 1.6 million in 1996, the weak links in the product life cycle is between households and retailers as well as retailers and producers. As the pending regulation was estimated to impose total costs of ECU 30 to 60 million for collection, recycling and disposal, industry was willing to enhance the system. As consumers were unwilling to separate batteries which contain mercury, lead and cadmium from other batteries the attempt failed. Lack of information or resistance exists also on the level of retailers. Information to customers was given only on request, and boxes for recycling batteries were hidden behind counters rather than being made easily accessible.

In Belgium, the Cement Industry reached an agreement with the Wallonian Government. This agreement is not yet effectively in force as implementation is delayed to await the new waste management plan for Walloon. In the agreement, industry is induced to accept waste from the region for incineration in kilns at reasonable prices. Apart from the disputed environmental consequences of such an agreement, cost saving will probably take place at the local level, where expensive depositing or waste incineration

can be avoided. Actual cost data for a comparison was not available. Prices paid to the producers of cement are confidential.

An agreement which was at least partially effective in reaching the target, was concluded between the Dutch Government, specifically the Ministries of Environment, of Economic Affairs and Finance, and industry, specifically the National Association of Integrated Oil Companies, the Association of Petroleum Product Resellers and the Automotive Association (SUBAT Agreement). The agreement is designed to finance clean-ups and remediation of contaminated soil and water at voluntarily closed petrol stations. For the Dutch Government the agreement was attractive, because there was some threat of substantial closures of gas stations with contaminated soil. In this case the authorities would have to bear the costs. Instead, the agreement puts in place a voluntary levy on petrol sales. Revenues are collected together with taxes but paid separately into a remediation fund. The implementation of the levy, which is formally equivalent to an excise duty, was voluntary for the major oil companies. Although no cases of resistance by gas stations are reported, it can be concluded that costs have been passed on to them. The available cost data consist of a comparison of remediation costs under different subsidy schemes. The SUBAT Agreement covers average costs per outlet of 63,000 ECU. But as remediation under the agreement takes place only on sites which have been abandoned, the figure cannot be compared with the average cost of the subsidy scheme for occupied sites, where business is continued while remediation takes place. However, the agreement succeeded to lower licensing costs by a uniform 25%.

One of the best-known voluntary agreements is the 33/50-Program of the United States' Environmental Protection Agency (EPA). The agreement targeted 17 substances. Emissions of 1988 were to be reduced by 33% in 1992, and by 50% in 1995. The disclosure of data was required by law under the Emergency Planning and Community Right to Know Act. However, adherence to targets was voluntary. No cost data were collected by government or otherwise compiled.

Industry supporters of the program emphasized the voluntary character as well as the importance of the EPA setting an agenda by naming 17 substances and reduction goals. Some companies that volunteered to participate in the program reported to interviewers that they undertook unusual environmental investments – i.e. with pay back periods longer than the anticipated pay back period of two years typically required. The program's high visibility may have helped to encourage internal decision-makers to overcome financial hurdles;<sup>18</sup> however, it is difficult to ascertain whether this openness to greater spending was the cause or effect of participation in the agreement.

Another success story is the neighbourhood agreement of the Calhoun County Resource Watch, a local environmental group, and the Alcoa Aluminium Corporation. This agreement is quite different in character, as two parties are involved directly, the environmental problem is rather limited in

<sup>18</sup> For a detailed analysis see also Arora/Cason (1996) and Arora/Gangopadhyay (1995) with a formal exposition.

scope, and the only alternative instrument is a command-and-control approach. The neighborhood agreement was overall successful in reaching the environmental target. Total expenditure on abatement technology reached \$ 3.1 million with additional costs for a professional engineering study (\$ 135,000) and a technical advisor to the community group (\$ 15,000). The most obvious pressure on Alcoa came from the public pressure and pending litigation costs if no agreement could be reached.

Another agreement, which is not focused on industrial sectors, is the River Agreement (Belgium). The agreement covers 115 actions in 1996. 50% of the actions were completed, 30% were partially implemented and 20% were postponed to 1997. Aside from initial costs accrued to the promoters of the agreement and aside from the general management costs of the contract itself, information on actual cost data are not available.

In conclusion it should be noted that in neither agreement the choice of instrument was based on actual cost data. Nor was the decision in favor of voluntary agreements taken by comparing different instruments and their cost scenarios. Total costs of an instrument appear to be of little relevance to policy makers in this context, and even the favorability of minimum cost solutions to a given environmental problem was not sufficient to induce a rational process of identifying the best instrument.

Taking into account the apparent lack of data it can be concluded that empirically there is no evidence at all which supports the idea of cost-effective voluntary agreements.

### 4.3

#### **Cost-effectiveness of agreements compared to command-and-control**

In this section the issue of cost-effectiveness is not raised in the broader context of all possible instruments, but only with regard to command-and-control policy and only with respect to abatement cost. We neglect two aspects: Firstly, we do not consider the state's motive which could be to forego implementation costs by shifting responsibility to industry. Secondly, we treat the alternatives as equal in implementation costs no matter who initially bears the costs.

Again, let us assume a small number of firms which form an association. The association is confronted with pending regulation which will require its members to make large-scale investments in abatement technology. The central question is, under what conditions will the firms reach an agreement in order to postpone regulation?

For greater simplicity let us further assume that the state is not willing to accept a different level of environmental protection. In other words, the outcome of the agreement must be the same as that of regulation measured in overall units such as tons of emissions etc. as under direct regulation.

The first condition is that firms must have different marginal abatement costs. If they have equal marginal abatement costs they cannot succeed in finding a solution less costly than the solution under regulation. Secondly, they must reveal their actual abatement costs in absence of economic incentives equal to charges or tradable permits. Thirdly, for those firms which do more than they

would have to do under regulation some compensation must be paid - otherwise they have no incentive to offer more.

Again, there is no indication that the agreements under consideration were based on such an extensive exchange of information. Quite to the contrary: In those cases, in which nothing else than the postponement of regulation was offered to a group of firms, agreements failed to work. In those which did not fail the environmental objective, subsidies in various forms were offered additionally.

From a purist point of view, agreements based on subsidies are less voluntary than those which are based on a concerted action. But even when viewed from moderate perspective, it should be questioned whether such agreements deserve to be called voluntary. If actual abatement is based on the incentive given by the subsidy and not by the agreement, the instrument bears little resemblance with voluntary agreements which industry terms directly without being paid for abatement.

Closer review of the Fine Ceramic Agreement, for example, shows that it functions primarily on the basis of subsidies. The Cement Agreement is somewhat different in character: It seems to be simply a market transaction where cement kilns are paid for incinerating waste.

The SUBAT Agreement on soil remediation of closed gas stations in the Netherlands reveals features of a charge-subsidy-scheme imposed by the oil companies on gas stations with assistance of the state. The charge was agreed upon by the major oil companies and has been most likely passed on to gas stations and, at least partially, to consumers. The charge, in this case the excise duty on each cubic meter sold in the Netherlands, is not voluntarily paid by gas stations. The remaining voluntary element is that gas stations are free to accept subsidies for soil remediation when they close shop. It can be shown generally that charge-subsidy-schemes can be cost-effective in reaching targets.<sup>19</sup> Whether this is true for the SUBAT Agreement is impossible to say, as it depends on the extent to which subsidies are taken for measures which were planned anyway.

But there were also other cases: Agreements such as the EPA 33/50 (USA), the Battery Agreement (Germany) and the EDTA-Agreement (Germany) did not include subsidies. Except for the EPA 33/50, the incentive to act according to a given target was set by the authorities' threat to impose regulation more stringent and costly than the agreement. Again, it can be asked, whether such agreements are voluntary in character. Contrary to subsidies offered by the state, this latter approach to inducing abatement by industry is at least somewhat new in environmental policy: it offers some flexibility to industry while the state bears only monitoring costs. Unfortunately, both agreements clearly failed to reach their objectives.

This leaves EPA 33/50 as an example for a voluntary agreement which is neither based on subsidies nor directly connected to a threat of further regulation. In the 33/50 program the threat of regulation as an alternative to the voluntary program was an implicit one – an understanding that the

<sup>19</sup> See Pezzey (1992).

program would attempt to show that a voluntary approach could work, and that if it failed additional command and control regulations would be likely to ensue. While 33/50 covers a wide range of firms and might be considered a success with regard to its environmental objectives, this is speculative. It is unclear to what degree emission reductions reported by participants were due to the program being in place.

In addition, there is no indication that the agreement was cost-effective in the sense that the objective was reached at minimum costs. The agreement operated on the basis of public attention to the companies which volunteered to comply with the goal. It is, therefore, not surprising that research showed that companies which produce products for consumer markets were more likely than the average firm to join the program. Such firms could expect to receive a premium for their environmental efforts.<sup>20</sup>

At the same time, firms could hope that attendance and adherence to the agreement would serve as a proof of goodwill towards the EPA. Even though there was no legally binding relaxation of regulations for companies reaching the objectives, they expected that this would improve their status with the agency.

For the case studies under review one additional aspect was relevant: Agreements can be less costly for industry if the scope of the instrument is reduced compared to the regulation otherwise imposed. This is the case with the Battery Agreement (Germany), where the agreement covers only a small portion of the market, i.e. household batteries containing cadmium, mercury and lead. The regulation will cover all batteries regardless of the substances contained. This shows that agreements can have a cost-saving effect for industry, if the state's instrumental design is covering more than the agreement. But cost-saving should not be mistaken for cost-effectiveness: The alternative instruments attempt to reach different objectives.

In conclusion, of eight agreements three operate on the basis of subsidies (Fine Ceramic, SUBAT<sup>21</sup>, Cement<sup>22</sup>). Of the remaining five agreements, two had pending legislative (batteries) or regulative (Alcoa) threats, although in the latter case public pressure by local groups was of greater importance. EPA 33/50, EDTA and Upper River<sup>23</sup> consisted neither of subsidies nor of immediate regulative threats. EPA 33/50 achieved the environmental goal by a broad

<sup>20</sup> See Arora and Cason (1996) with a detailed analysis.

<sup>21</sup> Again it should be noted that SUBAT's funds are financed by a levy paid by oil companies but shifted to gas stations. Formally the spending of such funds can be taken as an equivalent to subsidies.

<sup>22</sup> The Cement Agreement does not offer formal subsidies but compensation through prices paid for accepting and burning regional or local waste instead of waste from abroad. The effect is the same as with subsidies.

<sup>23</sup> It is possible only for the management of the Upper River Agreement to receive subsidies. The agreement itself does not provide funds for signatories.

campaign with public attention on the companies which complied with the agreement.

None of the case studies indicate that the agreements under review come close to the restrictive conditions under which they could be cost-effective, statically and dynamically. The only exception could be the case of Alcoa, where the agreement covers only one site. It appears that there would be no solution with the same or better results but less abatement costs.<sup>24</sup> As most of the bargaining process costs between the local group and the firm were paid by the latter as well, it could be argued that command-and-control could have saved additional costs of independent technical counseling for the group. However, the process costs in a legal challenge may then have mounted higher, and thus the effective resolution of the dispute by the neighborhood agreements was likely to have been cost-effective from a process costs perspective as well.

## 5

### Flexibility, Innovation and Competition

In this section three more advantages will be checked that are frequently brought up in connection with voluntary agreements. These are the greater flexibility of environmental agreements, which leave more choices to industry, the innovative potential which is seen at least as high with agreements as with other instruments, and, finally, competitive effects, which are regarded as negligible. These advantages will be discussed in the light of the case studies.

#### 5.1

##### Flexibility of agreements

All the case studies suggest that voluntary agreements allow a greater flexibility than the command-and-control approach. Compared to strict emission standards agreements certainly leave more choices to industry. Industry is not bound by best available technologies or other standardized regulation but totally free to choose technical options.

Aside from this, agreements offer another kind of flexibility: the choice to fail the objective. As this flexibility plays a major part in many of the cases, for example the EDTA Agreement, the Battery Agreement or with regard to the time-schedule the SUBAT Agreement, flexibility under voluntary agreements conflicts with environmental effectiveness. The threat of strict regulation only offers an indirect incentive to the individual firm while the obvious advantage to industry is that agreements generally do not include direct sanctions by the group or association. If the agreement allows industry simply to delay regulative action flexibility turns into a disadvantage from the public perspective.

Considering that command-and-control policies are formed in informal and sometimes formal processes attended by authorities as well as industry and

<sup>24</sup> See generally also Lévêque (1997)<sup>10</sup> with the opinion that agreements on the micro-level can be cost-effective while agreements on the level of associations will not. Also Arora/Cason (1996) 414.

independent technical counselors, regulation is not as inflexible as often stated. In addition, the implementation usually takes into account the individual technical possibilities of the firm and its competitive situation. Rarely, command-and-control policies are as stringently implemented as designed.

As it takes rather long periods of time to change regulation, for example, the formal "turnover rate" of regulation on waste water in Germany is between five and ten years agreements can offer an opportunity to authorities to give an incentive, albeit a weak one to industry to take additional action. Such a measure will always have a limited power, which lies within "no regret"-potentials. Reduction potentials labeled as "no regrets" are economically feasible even without adding further incentives. Within this scope agreements can be an effective measure.

In conclusion, voluntary agreements offer a viable policy option for authorities to tackle "no regret" potentials of industry. Although there is substantial danger that industry misinterprets flexibility of agreements as flexibility to fail the objective, this will be of limited consequence as long as agreements are applied only as an additional policy option rather than an alternative option to command-and-control policy or economic instruments.

## 5.2

### **Innovative potential**

In the literature it is occasionally suggested that ambitious agreements lead to an exchange of information on environmental protection technology.<sup>25</sup> However, the case studies do not support this. The only possible exception could be a mild technological progress in soil remediation technology (SUBAT), although it remains debatable, of course, whether it can be ascribed to the agreement.

The innovative potential of voluntary agreements appears to be the mobilization of "no regret" potentials. Compared to charges, certificates or a command-and-control policy, this is a very limited benefit. But within this scope, environmental agreements have the advantage of being a consensual strategy. Industry and state authorities must agree on objectives as well as a time schedule. The process of reaching the agreement can be understood as a bargaining process. On behalf of industry agreements which are not connected to subsidies are usually reached to avoid more stringent regulation. In view of the regulative threat, industry will offer just enough to postpone or to avoid regulation. The case studies suggest that such a bargaining process is unlikely to induce technological improvements.

The innovative potential could be more within the range of institutional arrangements. Some case studies suggest that relations between industry and state authorities could be improved. A closer relation, for instance, is developed in the SUBAT Agreement (Netherlands), where the association agreed with the government to collect a levy and to organize remediation of sites. As the government could collect the levy just as well without industry,

<sup>25</sup> See, for example, Lévêque (1997) 11.

the spending of subsidies must be less costly or more effective than it would be within government authorities. However, there is no evidence to show it. On the other hand, SUBAT certainly deserves to be called a policy innovation as the consortium of oil companies takes over functions of the state.

Other agreements reveal different policy innovations. One of the agreements, the EPA 33/50, works on the basis of aggressive public relation effects. The publication of firms which pledged to achieve the objective as well as the improvement of public relations of firms within their local setting served as a major incentive. At the same time no subsidies were paid within the program. The utilization of the publicity effect of environmental performance by the authorities is an institutional innovation.

The same is true for the EDTA-Agreement in Germany and the River Meuse Agreement (Belgium). The latter agreement emphasizes the formation of a common understanding and responsibility for the river and utilizes the agreement as a public forum. Despite the difficulties in evaluating the effectiveness of such a broad agreement, it can be called a policy innovation to get regional support of 74 parties throughout authorities, industry, and other private stakeholders.

With regard to policy innovation, the Alcoa Agreement carries more features of a simple contract between a local group and a firm. The environmental group offers to stop protests and resistance to the emissions, while the company, in return, reduces emissions to a certain level. As the contract is transformed into a new permit with reduced emission levels, the environmental administration plays the role of the referee and checks compliance.

Technological improvements mentioned in some of the case studies are long-term achievements with no connection to the agreements. For example, kiln replacement of the Fine Ceramic Industry (Netherlands) is due to extensive subsidies, and not to voluntary pledges of the industry association. Another example is the EDTA-Agreement (Germany). In this case, the innovative effect should be to change harmful EDTA with relatively harmless ADA which is more expensive. An effective measure is to equalize relative prices to give the less harmful substance a chance to compete. But this is exactly what an agreement cannot do.

### 5.3 Competition

Competition may be hindered by agreements if the signatories receive advantages other firms do not receive or if signatories can protect markets.<sup>26</sup>

The River Agreement (Belgium) and the Alcoa Agreement (USA) have had no such effects. With Alcoa the only possible effect on relative competitiveness could be that the company could be hindered by compliance costs that do not accrue to other companies on the market. But as this is not the case in practice, both agreements have no relevant competitive effects.

<sup>26</sup> This can take place by raising rival's costs. See Salop, Scheffman (1983).

Agreements that may give competitive advantages to firms involved are the Cement Agreement (Belgium), the Fine Ceramic Agreement (Netherlands), and the SUBAT Agreement (Netherlands). In the first two cases, the actual competitive effects appear to be negligible. In the case of the SUBAT Agreement, it could be suspected that the levy collected from all petrol sales could be used to induce gas stations to go out of business by offering financial help in the remediation of their soil. In the end, a substantially smaller number of gas stations will share the market. As the market for petrol is not dominated by individual gas stations, this will not lead to an oligopolistic or even monopolistic situation on the level of retailers. But the example shows that competitive effects are at least possible.

Another possible route to hinder competition could be to make subsidies more accessible to members of the agreement. For instance, the agency which is administrating the Fine Ceramic Agreement also administers subsidies for energy efficiency. Even though there is no empirical evidence that non-members did not receive funds where members did, such an institutional overlap bears some danger.

## 6

### Conclusion

1. Voluntary agreements are not cost-effective measures to reach a given goal. They are not an alternative to economic instruments, because they give neither a uniform incentive to reduce emissions with regard to individual abatement cost functions nor can they effectively prevent free-riding by individual firms or entire sectors. Voluntary agreements may be a policy option for various reasons (e.g. intrinsic motivation), but are not driven by the criterion of cost-effectiveness.
2. There is no evidence that voluntary agreements are more cost-effective than command-and-control policies, because government decisions, although in favor of voluntary approaches, lack adequate data. It is theoretically possible only under very restrictive conditions that voluntary agreements may prove cost-effective for achieving some very specific and limited goals.
3. Voluntary agreements offer more flexibility than a command-and-control approach, but this includes the freedom to fail the agreement's obligations. Examples show that industry utilizes agreements as a means to buy time in order to postpone regulation.
4. Although voluntary agreements can be policy innovations, they can have adverse effects on dynamic efficiency if the agreement is based on revealing all relevant information on marginal abatement costs. Then, incentives to act as a free-rider are strong, and a firm acts against its own interests, if it invests heavily on research and development of reduction technologies and reveals all relevant information on individual abatement costs.
5. Positive effects on competition were not observable, but are possible. Negative effects on competition were negligible in the cases under review. However, agreements have a potential to affect competition, if subsidies in the future are restricted to firms which joined the agreement in the past or

if they are utilized to raise rivals' costs. Then, agreements reduce contestability of markets. Agreements can also be utilised against competitors if subsidies by the state are used for pushing them out of business. However, there was no empirical evidence of such effects in the case studies.

6. Voluntary agreements may succeed in reaching additional environmental protection, if an incentive such as public awareness can be utilised. However, firms with greater distance from consumer markets react less eagerly to such incentives compared with firms that may earn an "environmental premium" from their customers.
7. Voluntary agreements are not an alternative policy option to economic instruments or command-and-control policies but rather a supplementary measure. Their scope is by and large restricted to producing efforts where apparently no other policies will be put into place, so voluntary action can be established with "no regrets". Voluntary agreements can bring greater visibility to such "no regret"-potentials. Considered that command-and-control can take a rather long period of time before standards are renewed, voluntary agreements could serve occasionally as an interim measure.
8. In a framework of responsive regulation with the aim to increase intrinsic motivation of agents, voluntary agreements can serve as a useful tool. But in order to function agreements must be actively communicated between government agencies, industry, and non-governmental organisations. This presupposes relatively small and homogenic groups. Even then, agencies will be in need of additional policy options for intervening if the agreement threatens to fail.

## 7

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