

Rennings, Klaus; Brockmann, Karl Ludwig; Bergmann, Heidi

Working Paper — Digitized Version

Voluntary Agreements in Environmental Protection - Experiences in Germany and Future Perspectives

ZEW Discussion Papers, No. 97-04

Provided in Cooperation with:

ZEW - Leibniz Centre for European Economic Research

Suggested Citation: Rennings, Klaus; Brockmann, Karl Ludwig; Bergmann, Heidi (1997) : Voluntary Agreements in Environmental Protection - Experiences in Germany and Future Perspectives, ZEW Discussion Papers, No. 97-04, Zentrum für Europäische Wirtschaftsforschung (ZEW), Mannheim

This Version is available at:

<https://hdl.handle.net/10419/29409>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Discussion Paper

Discussion Paper No. 97-04 E

Voluntary Agreements in Environmental Protection – Experiences in Germany and Future Perspectives

Klaus Rennings
Karl Ludwig Brockmann
Heidi Bergmann

W 636 (97.04)



30. APR 1997 Weltwirtschaft
Kiel

W 636 (97.04) *mu br sig sla*

ZEW

Zentrum für Europäische
Wirtschaftsforschung GmbH

Environmental Economics
and Logistics Series

Voluntary Agreements in Environmental Protection - Experiences in Germany and Future Perspectives¹

von

Klaus Rennings, Karl Ludwig Brockmann, Heidi Bergmann

Zentrum für Europäische Wirtschaftsforschung (ZEW)

March 1997

Correspondence to:

Zentrum für Europäische Wirtschaftsforschung (ZEW)

P.O.Box 10 34 43

D-68034 Mannheim

Germany

Phone: ++49-(0)621/1235-131

Faxnumber ++49-(0)621/1235-226

e-mail: rennings@zew.de

¹ forthcoming: Business Strategy and the Environment

Abstract

A trend towards „softer“ regulation, especially in the form of negotiated environmental agreements, is observable in national and international environmental policies. Such agreements are controversial, because there are fears that government will relinquish its responsibility for environmental protection. This paper analyses recent experiences with voluntary agreements in Germany. Topical German examples that have prompted public debates include the takeback agreement for cars, the voluntary agreement made by a number of industries on a CO₂ reduction by the year 2005 and the voluntary agreement made by the automobile industry on the development of energy-efficient cars.

Proponents of voluntary agreements argue that this instrument provides incentives to the business sector for the development of efficient, innovative and environmentally-friendly solutions. Analysing the examples mentioned above, we conclude that it is hard to detect solutions deserving such attributes. These agreements are unlikely to produce results that go beyond what industry would have done in any case and they avoid using economic incentives. The agreements are non-binding and unenforceable, with the negotiating process leading to a watering down of the environmental goals government had originally aimed at. A preference for negotiated solutions on principle, as currently espoused by the Federal Government in Germany, seems to be „counterproductive“. If the government clearly signals its willingness to refrain from using regulatory or economic instruments in favour of industry agreements, it weakens its negotiating position. The government also limits its options should the implementation of the agreement prove unsatisfactory. Government needs to be „in control“ in order to leave its choice of policy instruments open and to be flexible. In a last step, we derive some general conclusions concerning reasonable strategies and applications of voluntary agreements within the European Union.

Key words: negotiated agreements, climate protection, circular economy, economic instruments of environmental policy

Acknowledgement

We would like to thank our colleague Henrike Koschel for valuable discussions on former versions of this paper. Thanks also to two anonymous referees for helpful comments. This work was supported with a grant from the German Federal Ministry of Economics.

1 Introduction

By reverting to common command and control measures preventive environmental protection can entail a considerable extension of government intervention. The German Federal Government believes that this should be increasingly counteracted through cooperation between government and the business community, amongst other things through voluntary environmental protection measures. However, these „soft“ instruments involve the risk of government relinquishing its responsibility for the environment. Negotiated agreements made by the business community, like the pledges to develop so-called 3-litre cars, to take back old cars or to reduce carbon dioxide emissions, are therefore controversial from an ecological and economic point of view.

The economic perspective is specified here from a neo-liberal perspective. In a liberal approach, markets should coordinate the allocation of goods as far as no market failure can be observed. But when external effects, information deficiencies or inflexibilities exist, the state is responsible for correcting these kinds of market failure. However, the state has to choose the option which minimises market distortions. In other words: Market-based instruments like taxes or tradeable emission permits are generally preferable. Nevertheless, other types of instruments like voluntary agreements can be used alternatively or additionally when they have advantages with regard to certain criteria (e.g. efficiency, institutional controllability, minimisation of unwanted side-effects).

Especially the German Ordo-Liberal-School in the tradition of Eucken argues in favour of a government correcting market failure, and against an interventionist state. Principles and criteria of the ordo-liberal school will be specified in chapter 3 where we in general develop an analytical framework for the valuation of environmental policy measures with special interest in the application to voluntary agreements. Since ordoliberalism is mainly a German economic school, it should be mentioned that similar ideas have been established in other countries. For example, the so-called Oxford-Liberals have created the guideline „as much competition as possible, as much planning as necessary“ (GROSSEKETTLER 1991:106).²

² However, the ordoliberal school focuses more on the responsibility of the state to establish basic rules for a regulatory framework within long-term oriented economic policy, while the Oxford-Liberals give higher weight to policy measures in the short run.

2 Attributes of voluntary agreements in Germany

2.1 Negotiated agreements: soft, non-voluntary and out of keeping with a market economy

Negotiated agreements made by the business community are generally called voluntary. However, what government does is more like showing the instruments of torture to the victim as a first step of torture. Comparable to what, in former times, torturers would do with their instruments, nowadays the Minister for the Environment presents a draft for an ordinance so as to achieve „voluntary“ concessions (MURSWIEK 1988:985). Hence, in principle such cooperative solutions can be interpreted as barter transactions in which the business community imposes an obligation on itself to act in a certain manner, and government in return refrains from enforcing the desired conduct.

In the debate on environmental policy, voluntary agreements are sometimes pictured as „a free-market instrument“. This description is only justified in the case of instruments that use the price mechanism. There are, however, only a few exceptional voluntary agreements which fall back on this fundamental free-market principle. These include the „Grüne Punkt“ („Green Dot“), which in economic terms can be characterized as a levy helping to charge the costs relating to the disposal of packaging in accordance with the polluter pays principle. Yet, as a rule negotiated agreements shy away from such „tough“ economic instruments and do not touch the structure of relative prices; after all, negotiated agreements do not spring from the market system, but rather from political negotiations between government and trade associations. However, an approach that is essentially based on negotiated solutions should not be characterized as market-based, but as a corporatist approach (HOLZHEY/TEGNER 1996:426-427). The main difference is that consumers have commonly no possibility to participate in the negotiation process, although the consumer surplus is highly influenced by the result of the negotiations (improvement of environmental quality).

2.2 Sovereign versus corporatist approach in environmental policy

Voluntary agreements can contain all kinds of instruments. Goals or technical instructions for a specific industry, but also scales of charges and information systems are conceivable. That is why the agreements do not have any working mechanism in their own right, rather the latter depends on the instruments provided in each specific case. Having said this, there are typical characteristics of negotiated agreements concerning

- political decision-making and
- enforcement of agreements.

2.2.1 Political decision-making

Voluntary environmental protection measures differ markedly from the classic model of a rule-issuing government trying to achieve its environmental policy goals through commands and prohibitions. Government refrains from using any instruments of formal power, i.e. from enacting legal norms, and instead enters into negotiations on the realization of the environmental goals with the groups affected. In doing so, government uses the „threat“ of enacting restrictive legal norms as a starting point for negotiating a voluntary agreement and thus exerts a guiding influence on the business community's conduct (HOFFMANN-RIEM 1990:400, 426; BROHM 1992:1025, 1027). In contrast to traditional sovereign actions, government seeks a solution via consensus-building. However, this bargaining process holds dangers. Unlike any cooperation in the form of the right to be heard, the right of participation or of involvement, agreements are based on a system of service-and-service-in-return. For the government side the price for an agreement often consists in reducing the announced level of environmental protection. In order to attain a consensus, government accepts „a downward correction of goals“. This „lowering of the regulatory level“ can turn out to be more or less marked. However, as the case studies examined in connection with this study bear out, a „decrease in the stringency of regulations“ is always observable (BAUER 1987:241, 254). With regard to the demands made in terms of environmental policy, the upshot is that there is a tendency for agreements to fall short of the opportunities arising from the implementation in the form of laws and ordinances (MÜGGENBORG 1990:909, 915). The reasons for this danger of relativizing the level of environmental protection in connection with cooperative solutions are complex. The mode of action „agreement“ by itself suggests a shift away from maximum demands, since a joint solution can only be found in the intersection of possible regulations that is deemed acceptable to both sides. Government should realize that the readiness to negotiate expressed by the business community inevitably only goes as far as the latter's economic self-interest. Protecting the environment is not a value in its own right to the companies concerned. Instead it has to coincide with their own (economic) interests. Finally, what may also be relevant is the fact that it is not individual businesses that negotiate with government, instead as a rule they are represented by their associations, which, experience shows, tend to take a more rigid stand.

It is also significant that voluntary agreements do not only affect the interests of the two negotiating parties, but also to a variable extent the positions of third-parties. Agreements are always associated with the danger of consensus-building at the expense of non-involved parties, which have little opportunity to integrate their interests into the agreements being negotiated. Furthermore, consideration has to be given to the powers of participation that would have to be taken into account in

connection with a legislative procedure or the issuing of an ordinance, but that never features in informal negotiations on voluntary agreements. The mere right to be heard should not be completely excluded from the negotiation procedure.

2.2.2 Enforcing the agreement

Concerning the enforcement of an agreement, what has to be stressed is that a mere promise still fails to guarantee its actual implementation. Companies not complying with the pledges (given by their association) do not risk any fines, penalties or other coercive measures (cf. HOFFMANN-RIEM 1990:400, 438; MURSWIEK 1988:985, 988). There is no claim to performance in the case of a voluntary agreement; indeed, what characterizes agreements is the lack of any binding force and of enforceability. In contrast to a contractual relationship, the party pledging voluntary measures never enters into any legal obligations. Contracts and agreements are similar in that both have an exchange of services in common. The relationship „do ut des“, in other words a mutual give-and-take, is typical of contractual relations and agreements alike. However, the binding force of a contract - „pacta sunt servanda“ - is completely foreign to negotiated agreements. Agreements are more likely to be categorized as a gentlemen's agreement, which does not entail any legal consequences. Even if in connection with an agreement the government side was granted the right to monitor compliance of the agreement, this does not constitute a claim to performance. In fact, the point is that the businesses underpinning the agreement do not want to be bound the way they are in contracts. The companies (or rather their associations) make a voluntary agreement without the so-called intention of legal consequences. The agreement solely consists of a declaration of the companies' willingness to act in a certain way, tolerate something or refrain from doing something; the government side is not granted any claim to performance. Consequently, any legal action founded on the agreement brought against the declarant would be doomed to failure. Whether or not compliance with the agreement is monitored makes no difference from a legal point of view, since violation of the agreement does not entail any legal consequences (cf. BEYER 1986:277ff.; 282; HENNEKE 1991:267, 271ff.; BROHM 1994:1025, 1034).

3 Analytical raster for assessing voluntary agreements

The Freiburg ordoliberal school holds that the absence of markets, and any functional defects of existing markets, will result in corrective requirements which cannot be covered solely by an evolutionary competition of institutions - a view which will be pursued here below. This school regards as inadequate the process of natural selection emerging from international competition between institutions evolving as a quasi-random process, but not specified by the state, and the resultant elimination of inefficient institutional bodies. On the contrary, the Freiburg neo-liberals' concept of a free-enterprise economy presupposes that the state must selectively create institutions for countering existing defects and challenges

(GROSSEKETTLER 1991:104-106). The efficiency of such institutions must be measured in terms of how far the principles of free enterprise are respected.

Seen from the perspective of ordoliberalism voluntary agreements are regarded with scepticism. Government no longer - as postulated in the ordoliberal model - stakes out the regulatory framework within which entrepreneurs can dedicate themselves to profit-making. Instead government delegates this responsibility to the businesses themselves. However, in the opinion of ordoliberals a laissez-faire policy with a market economy left to its own devices tends to destroy itself. Failure to protect and promote competition may lead to closed-off markets, cartels, price fixing and ultimately to a distorted price structure. A lack of competition and the wrong price signals in turn may entail a spate of government interventions, e.g. measures to monitor prices and regulatory requirements concerning the application of given environmental technologies (due to a lack of price incentives). That is why those economists who consider government to be a powerful custodian of the system in the tradition of Eucken's ordoliberal school view the trend in environmental policy towards voluntary agreements with great concern (MAIER-RIGAUD 1995).

However, the following assessment will test these hypotheses by applying the ordoliberal principles to concrete case studies of voluntary agreements. The generalized analytical raster in table 1 comprises a catalogue of check criteria applying to the selection of instruments for eliminating deficits in a free-enterprise economy (cf. RENNINGS et al., 1996 for a detailed explanation of the criteria involved).

Table 1: Systematized check criteria for evaluating economic policy measures in terms of regulatory efficacy

Step 1: Goal formulation and operationalization:

- Formulating the targeted goal system
- Indicators
- Assignment of goals, means and implementing agencies

Step 2: Legitimization of the action's goal in terms of contract theory:

- Hypothetical justification (Rawls)
- Reference to conclusive action

Step 3: Selection of the decision-making level/process:

- Subsidiarity principle
- Congruence principle:
 - Equivalence: the user group must coincide with the payer group for a collective good
 - Democratic monitoring: the group of the decision-impacted must coincide with the group of entitled monitors

Step 4: Economic legitimization of actions formulated:

- Choice of instruments: selection of conceivable instruments for goal implementation
- Effectiveness (goal-conformity):

- Degree of goal attainment (direction and dosage)
- Speed of goal attainment
- Invariance against changes in the macro-economic boundary conditions
- **Necessity (system-conformity):**
 - Market-conformity:
 - Instrumental subsidiarity: designing measures with minimized impact on individuals' powers of decision-making (centralized/decentralized)
 - creation of fully functional markets (free price formation, fully functional competition)
 - Minimizing intervention into the functioning of existing markets
 - Priority of regulatory before process policy: formulation of a long-term orientation framework, and avoidance of stop-and-go measures
 - Minimization of detectable unwanted side-effects:
 - Stability-policy goals (economic compatibility)
 - Distribution-policy goals (social compatibility)
- Economic efficiency:
 - Static economic efficiency (cost-efficiency):
 - Purpose/avoidance costs
 - Transaction costs
 - Dynamic economic efficiency (innovation efficiency)
- **Institutional controllability:** implementability in the political process and allowance for the possibilities for abuse in the political/administrative apparatus

Source: In broad conformity with GROSSEKETTLER (1991: p. 114).

With regard to voluntary agreements, these criteria can be interpreted and applied by the following questions:

Step 1 and 2: Goal operationalisation and justification

- What environmental goal does the measure examined in a given case study refer to?
- How can the targets be measured?
- Can this goal be justified hypothetically (Rawls theory of justice) or empirically (democratic decisions, conclusive action)?
- Was the goal originally pursued watered down as early as during the negotiation process or were there any delays?

Step 3: Selection of the decision-making level/process

- Are decisions taken at an appropriate level with regard to the principles of subsidiarity and congruence?
- Is any environmental responsibility delegated and, if so, how is the delegation to be assessed?

Step 4: Economic legitimization of actions formulated

- Choice of instruments: what are the relevant instruments agreements have to be compared with?
- Goal conformity: Is it possible to achieve the specific underlying environmental policy goal with the help of the given agreement?
- System conformity: Is the measure in keeping with the system of a social market economy? Is the system strengthened, does it remain unchanged or is it weakened? Are detectable unwanted side-effects minimized?
- Economic efficiency: Are the costs higher or lower than when using other instruments? What incentives are provided to achieve technological progress?
- Institutional controllability: How immune are voluntary agreements to political influences that can dilute their desired effect? How do the associations deal with the problem of free riders?

4 Choice of Case Studies

The assessment scheme to evaluate environmental policy measures is applied to topical examples taken from the fields of climate protection and circular economy. The problem area of the promotion of clean technology is cross-sectional in nature because it is relevant for both fields of environmental policy.

4.1 Climate protection

The Chlorofluorocarbon (CFC)-phase-out and the reduction in carbon dioxide emissions will serve as case studies from the area of climate protection. The CFC-case study derives its relevance from the fact that the progress made in phasing out CFCs is often cited as a case for the economic and ecological advantageousness of using voluntary agreements. Voluntary agreements, the argument goes, result in the ecological goal being attained more quickly, trigger off an innovation drive in industry and safeguard industry's export capability. The carbon dioxide case study is the obvious choice, not only because of its particularly prominent role in the global warming problem. Accounting for 60% of the damage, anthropogenic carbon dioxide emissions are the largest cause of the greenhouse effect. Moreover, with regard to the carbon dioxide problem the German business community presented an updated voluntary agreement in March 1996. This German negotiated agreement has come to be considered a model for the European Union's climate policy.

4.2 Circular economy

Particularly in the field of German waste disposal policy, voluntary agreements dominate other measures. The significance of negotiated agreements in the area of waste disposal policy is explicitly stressed by the Federal Government. In order to place greater emphasis on waste avoidance, Germany created the Kreislaufwirtschafts- und Abfallgesetz (Act on a Circular Economy and Waste), which has come into force since October 1996. Producers of, say, electronic goods and batteries can pre-empt industry-specific ordinances through negotiated agreements and can voluntarily comply with the legal obligations. The voluntary agreement on the disposal of old cars made by the automobile industry, which is being used as a case study, also has to be seen against this background. In addition, an analysis of the Duales System Deutschland (DSD, Dual System Germany) will be carried out.

4.3 Clean technology

A further case study to be examined is the so-called 3-litre car, which serves as an example of clean technologies. Although there is overlap between that case study and others - for clean technology is used in climate protection as well as in strategies of material flow management aiming at establishing a circular economy -

this area is to be dealt with separately. It seems likely that in the future clean technologies will be of great importance on the road to a sustainable economy, and the question arises how such a development can be encouraged without repeating the mistakes made in the past (regulatory enactment of best available technologies) and what part voluntary environmental protection measures can play in this.

5 Goal operationalisation and legitimation

5.1 Climate protection

To start off with, one has to examine whether in individual environmental policy areas operational goals have been defined which could serve as a yardstick for the evaluation of voluntary agreements. As for the case study taken from climate protection, there are specific national and international reduction goals for greenhouse gases and ozone-depleting substances to which one can revert without any reservations. The goals are operational and can be justified by theoretical reasoning and conclusive actions.

5.2 Circular economy

It is much harder to answer the question how goals relating to the establishment of a circular economy can be described in concrete terms and in a manner being compatible with a liberal market system. On the whole the disposal crisis in the German waste disposal industry has eased, thus no bottlenecks concerning dump or incineration capacities are foreseen for the future. Regional crises can primarily be put down to compulsory (regional) disposal self-sufficiency. Nationally solid waste production has stabilized or is even falling. Recycling capacities are being built, numerous plants are in the planning stage and there are reserve capacities (cf. BRENNCK et al. 1996:2-4).

Although the situation has been defused, a goal has to be formulated for a future-oriented waste disposal policy which is oriented towards controlling solid waste production and towards an adjustment of the latter to existing dump capacities. For the case studies chosen from the sphere of waste disposal policy, goals appropriate to the problem have to be specified. The case studies were chosen to illustrate two different aspects of the waste disposal problem. Whereas packaging waste primarily constitutes a quantitative problem, the problem relating to the disposal of old cars is primarily qualitative in nature.

The disposal of old cars creates a need for environmental policy measures, especially because of the large volume of shredder waste that has accumulated after the disposal of some 2.6 million old cars each year. This waste is a mixture of plastics, glass, textiles and wood fibre substances, which cannot be recycled and can only be put on a dump. Its volume amounts to about 1.5% of the domestic waste

volume in Germany and is therefore fairly small, but owing to its explosive make-up, this waste is classified as hazardous waste.

Packaging waste, on the other hand, primarily poses a quantitative problem that in terms of quality is not explosive in nature. With regard to weight, packaging waste accounts for roughly 30 per cent of domestic waste, twenty times the annual shredder volume from the disposal of old cars.

The voluntary agreement on environmentally-sound recycling of old cars made by the automotive industry aims at improving the recycling of old cars as well as of old car components, and especially at reducing the amount of shredder waste, processing old cars in keeping with the needs of the environment and at going easy on dump capacities and raw materials.

The catalogue of measures included in the voluntary agreement distinguishes between the processing of old cars that were registered before the voluntary agreement came into force („existing car fleet“) and the processing of old cars registered after the coming into force of the voluntary agreement („future car fleet“). This distinction makes sense, since the producers' scope for reducing resource consumption as well as solid waste production differs. With respect to the future car fleet, additional options present themselves due to changes in design, construction, materials chosen etc.

The most important measures mentioned in the voluntary agreement to attain the goals that were set are:

- Establishment of a nation-wide take-back system of certified businesses for the taking back and recycling of old cars within two years after the regulation takes effect.
- Old cars from the existing fleet of cars are taken back at generally accepted market terms.
- Old cars from the future car fleet that meet certain criteria (for instance, the initial registration must not date back more than twelve years) are taken back free of charge.

5.3 Clean technology

Finally, regarding the last case study the question has to be answered whether supporting clean technology should be a goal of environmental policy and how such a goal can be formulated in operational terms. Although supporting clean technology is a sensible environmental policy goal provided that the increased application of this technology promises improvements in solving environmental

problems, from an economic point of view environmental goals should not be formulated in the form of technological standards, because this restricts the available freedom for adjustment unnecessarily. Instead there should be an orientation towards long-term environmental quality goals that leaves the decision on the technology applied open for the time being. Such an orientation towards long-term environmental goals which ideally should be formulated in such a way that they cover various pollutants also constitutes an important stimulus for the application of clean technology.

Against this background an environmental policy goal like the „development of a 3-litre car“, to which representatives of the German automotive industry pledged themselves at a meeting with the premiers of their respective German states, has to be viewed critically, as it largely determines the choice of technology. Similar in nature is the voluntary pledge given by the Verband der Automobilindustrie (VDA, Association of the Automotive Industry) of March 1995 of a 25 per cent reduction, based on the 1990 figure, by the year 2005 in the average fuel consumption of the cars/estate cars it produces and sells in Germany (ZIMMERMEYER 1995:2; VDA 1995). It is planned to upgrade the pledge by the year 2000 to over 30 per cent.

These pledges are part of the efforts made in the past few years to reduce the fleet consumption of motor vehicles (BMV 1995; SRU 1994).³

It has to be stressed that goals aiming at supporting clean technology - for example, fuel-efficient vehicles - are only justifiable if they form part of a broader overall plan. The latter should be oriented towards the attainment of certain environmental quality standards (e.g. climate stability). If such an overall plan exists, promoting the development of fuel-efficient motor vehicles, for example, can certainly be one of several „action-oriented goals“ to pursue a higher environmental quality goal.⁴

³ The European Commission is also backing the goal of reducing fuel consumption. An essential instrument of this strategy is the reduction in the average consumption to 5 litres per 100 kilometres for new vehicles with a petrol engine and 4.5 litres per 100 kilometres for new diesel vehicles. In this context the Commission regards the deadline for implementation that the European Parliament has in mind, the year 2005, as very ambitious (ÖKOLOGISCHE BRIEFE 1996 (5)). On account of the different carbon dioxide content in fuels like petrol, diesel and natural gas, a standard limit of 120 milligramme of carbon dioxide per kilometre is to be fixed (SZ of 6 March 1996).

⁴ According to a definition given by the ENQUETE-KOMMISSION „SCHUTZ DES MENSCHEN UND DER UMWELT“ („Protection of Humans and of the Environment“ Commission of Inquiry) (1995:4), environmental action-oriented goals „indicate the steps necessary to achieve the characteristics of the environment or the states described in environmental quality goals.“

6 Choosing the decision-making level and process

6.1 International free riders push negotiated agreements in climate policy

According to the principle of congruence included in the theory of public goods, the club deciding on the provision and funding of a good should ideally be identical to the club benefiting from the good. A stable global climate benefits the entire world population, consequently, a global institution would have to be founded to decide on the provision and funding of the good „climate protection“ in an economically optimal manner. However, as long as there is neither an „Environment Security Council“ nor a comparable institution, the road via international agreements that has been used so far, has to be followed further. In that connection one has to keep in mind that any solution below the global level entails serious additional problems of free rider-behaviour.⁵ Amongst other things, the implications of this free rider-behaviour have so far been seen in the fact that none of the leading industrialized nations is willing to play a pioneering role in introducing climate taxes (MULLER 1995). This national wait-and-see attitude in the follow-up process to Rio has led to an environmental policy standstill in the field of global climate protection. Precisely in view of this standstill in international climate policies, voluntary agreements seem to be an instrument politicians and business representatives are taking up readily, because it allows a certain degree of national activities without businesses having to accept serious cost disadvantages in international competition. Voluntary agreements in the field of climate protection have become common all over the world.

6.2 Negotiated agreements in climate policy arise from a „no regrets“ approach

Originally, the policy of voluntary climate protection measures was pushed by the US administration in particular, which had committed itself at a very early stage to a „no regrets“ strategy concerning climate protection (KRAUSE/KOOMEY/OLIVIER 1994; RENNINGS 1994:83-86). Unsure about possible climatic damage, the administration concluded that to be on the safe side, it would only order measures to reduce greenhouse gases that even from a managerial point of view were at least cost covering. To date the „no regrets“ strategy has contrasted with the „insurance buying“ policy of some Western European states like Germany. According to the latter policy, the climate protection standards that are fixed are arrived at on the basis of a global warming deemed just about acceptable

⁵ which, admittedly, a global club does not necessarily abolish either, if, say, decisions relating to the funding of climate protection programmes and to the allocation of these funds to the beneficiaries are taken independently of one another.

and on the basis of reduction goals derived from the latter. In order to reduce the risk of climatic damage, the costs involved in achieving the standards are accepted as a quasi-insurance premium. While most industrial countries have so far merely formulated the stabilization of climate-relevant emissions as a climate protection goal, the Federal Government is pursuing a relatively ambitious goal with an absolute reduction of 25 % by the year 2005 compared with the 1990 level.

Now the question is whether this national reduction goal can be attained with „no regrets“ measures - and one can hardly expect more on the basis of voluntary agreements. An optimistic answer to this question is fed by estimates in the latest report submitted by the Intergovernmental Panel on Climate Change (IPCC 1995b:20), according to which „no regrets“ measures have a reduction potential of 10 to 30 per cent in the next 20 to 30 years. The enormous potential of „no regrets“ measures, which microeconomic studies have also identified in the OECD-countries including Germany, is attributed to the fact that profitable investments in improved energy efficiency have so far never materialized due to substantive market failure and to shortcomings in the coordination between institutions. Examples of these impediments are a lack of information and of economic incentives to conserve energy in the case of public utilities. The possibilities to overcome the impediments that are mentioned include deregulation measures, provision of advice and training and upgraded financial support programmes. In addition, cooperative solutions, for instance in the form of voluntary environmental protection measures, are seen as a way of overcoming institutional impediments. Seen against this background, voluntary agreements on a reduction in carbon dioxide emissions definitely have a potential.

In contrast, initial experience gained in the US with the Climate Change Action Plan (CCAP) of 1993, which essentially contains voluntary measures on the part of public utilities and companies, is not promising. It seems as if current measures are not sufficient to attain the US stabilization goal by the year 2000. Only individual states - such as New York, which is able to replace decommissioned oil- and coal-fired power plants with gas-fired ones in a cost-effective way - are expected to achieve the stabilization goal. Yet, wherever costly adjustments would be necessary that go beyond „no regrets“ measures, the voluntary agreements do not appear to be working (SANGHI 1995).

Once the goal in climate policy is in danger of being missed, the real Achilles heel of voluntary agreements is revealed. For now it becomes evident whether the tough stance in environmental policy that was threatened in this case will really be taken up. The Federal Government knows full well that the success of negotiated agreements greatly depends on how credible the threat looming in the background is. That is why it explicitly emphasized (BMU 1995:3) it would „remain in control“ and not hesitate to „use regulatory and fiscal instruments once it emerges that the

pledge given by the business community amounts to little more than 'business as usual' or fails to be complied with."

6.3 Takeback of cars: watering down and postponement of goals

The voluntary agreement on the disposal of old cars resulted from years of negotiations between the German Ministry for the Environment and associations of the automotive industry. The desired goal, reducing the production of solid waste from the disposal of old cars, is meant to help to provide a public good, namely scarce dump capacities. The beneficiaries of this public good are the business sector and the consumers. The business sector along with the buyers of new cars and the last owners of old cars also has to meet the costs arising from the creation of the network of take-back businesses as well as from the development of new types of construction, new materials and new forms of recycling. Only the business sector, i.e. the automotive industry, was involved in the negotiating process. Since there was no parliamentary debate either, an essential group of beneficiaries and payers of the public good, the car buyers, was excluded even from ways of exerting indirect influence on the decision-making process. This group does not have any supervisory powers either. Thus, the principle of congruence has only partly been met.

The corporatist approach in environmental policy is being criticized, amongst other things, because of the danger of environmental policy goals being watered down. For example, the willingness to make more far-reaching concessions to the recycling of old cars is greater on the part of individual car producers than on the part of the industry's associations.

The negotiating process concerning the disposal of old cars reveals that as early as 1992 there was a complete draft for an ordinance including all essential elements of the voluntary agreement made in 1996. However, due to the cooperative principle, on which the waste disposal law is based and to which the Federal Government attaches great importance in waste disposal policy, a negotiating process that lasted several years followed between the government and the business sector. Therefore, there was no noticeable acceleration of the decision-making process, on the contrary, a delay occurred.

One comes to realize that once the government commits itself to a corporatist style of environmental policy, the other negotiating partner is granted a potential to delay and water down goals that should not be underestimated. The example shows that one has to urge politicians to keep their options open. A binding commitment giving priority to cooperative solutions can deprive the instrument of voluntary agreements of the basis for effective environmental policy improvements. For example, there is some noticeable watering down of goals in the negotiated

agreement on the disposal of old cars with regard to the quotas fixed and the period scheduled during which cars are taken back free of charge.

6.4 Clean technology: negotiated agreements as an accompanying instrument

At what level should the decisions on the application and promotion of clean technology be taken? According to the principle of subsidiarity, one has to check whether the decision on the application of the technology can also be taken at the lowest level, i.e. in the markets. In principle, there are no objections to this when it is a case of applying clean technology. Having said this, a decisive prerequisite for a coordination via the price mechanism is that:

- first, there is an ecological framework that does not in general discriminate against the application of environmental technology.⁶
- second, this ecological framework is designed in such a way that it does not especially impede the application of end-of-pipe technologies to the detriment of clean technology. Disadvantages clean technologies suffer from compared with end-of-pipe solutions that can be put down to existing regulations, e.g. to an orientation towards individual environmental media and pollutants, should be reduced (HOHMEYER/KOSCHEL 1995).

Under the aforementioned conditions, markets offer a suitable coordination mechanism for decisions on technology application. On this basis voluntary agreements can fulfill an accompanying function and be used wherever rules remain incomplete and have to be supplemented.

7 Evaluating the instrument

7.1 Goal conformity

7.1.1 CFC-negotiated agreement: in certain applications in conformity with the goals

So far voluntary agreements to reduce ozone-depleting substances have definitely been successful in ecological terms. The goals were exceeded, although there were

⁶ Empirical studies on inducing environmental innovations (GREEN et al. 1994:1051; HEMMELSKAMP et al. 1995:19) show that vast numbers of environmental innovations are caused through the existence and anticipation of environmentally-relevant regulations. Apart from that, costs and revenue aspects play a role, with product innovations primarily aiming at increasing sales and process innovations, on the other hand, at cutting costs.

some critics who argued the phase-out could have been achieved even faster (KOHLHAAS/PRAETORIUS 1994:89). As a rule the monitoring of the negotiated agreements is done by someone who is neutral. Negotiated agreements governing the reduction of CFCs enjoyed special advantages (compared with the case study on the reduction of carbon dioxide), since substitutes had already been discovered which when applied did not lead to costs soaring and since additional pressure was exerted by the demand side (slump in sales of sprays containing CFCs). Thus, in an entrepreneur's cost-benefit calculations, opting for a reduction in CFCs involved little risk. On the other hand, continuing to manufacture products containing CFCs would have been much riskier from a managerial point of view. This is also borne out by the fact that although CFCs were speedily replaced in products, CFC-substitution in production processes was slow to materialize, because the switch was costlier and there was less pressure by the demand side.

7.1.2 No impetus for absolute CO₂-emission reductions

The business community's voluntary agreements on a reduction in carbon dioxide of 1991 and 1995 came in for a lot of criticism, because they did not contain any noticeable initiatives that clearly went beyond „business as usual“. Criticism was levelled in particular at the fact that it was hard to check whether the goal was being achieved. The following minimum requirements for information (listed by the German Federal Environmental Protection Agency) that should be included in a negotiated agreement on carbon dioxide reduction (ÖKOLOGISCHE BRIEFE 1996 (2)) were not met:

- reference and target year as well as a reduction path in the form of a timetable with detailed information on partial goals,
- exact fixing of emission or energy conservation goals,
- absolute energy consumption listed according to fuel,
- development of primary consumption,
- development of specific consumption per technical unit,
- reductions achieved,
- in-depth comment on and analysis of the figures provided (e.g. information on whether reductions are attributable to additional climate protection activities, an economic slowdown or to modernization investments that would have been made anyhow) as well as
- detailed list of the „special efforts“ promised.

The updated version of the negotiated agreement of March 1996 meets these minimum requirements. The plan on carbon dioxide monitoring presented by the BDI (Federation of German Industries) provides for associations to record their reductions in a total of eight tables (BDI 1996). Total fossil fuel input, net power supplied externally, energy input as well as specific carbon dioxide emissions calculated from this and specific energy input are to be stated for the base year, the previous year and the year under review. The demanded comment on and analysis of the figures and the list of special efforts are also included. The reports are checked by a neutral expert.

What is particularly striking is that no fewer than 12 out of 19 associations pledge to reduce absolute carbon dioxide emissions. According to the Federal Government (BUNDESREGIERUNG 1996a:3), the pledges correspond to a 20 per cent reduction in emissions in these sectors. However, when one takes a closer look it is precisely the achievement of absolute reduction goals that turns out to be the agreement's real Achilles heel, something the statement made by the Vereinigung Deutscher Elektrizitätswerke (VDEW, Association of German Electric Power Stations) (VDEW 1996) illustrates.

According to the VDEW, the absolute reduction potential in the electricity industry until the year 2015 amounts to 25 per cent compared with the base year of 1987. However, compared with the base year of 1990, which the Federal Government is now taking as a basis, estimates merely put the potential at 12 per cent. The figures are even more off target if the target year of the Federal Government is taken as a basis: The potential for the period up until the year 2005 is, compared with the reference year of 1990, down to 8 to 10 per cent. Compliance with these pledges is even conditional on ambitious prerequisites such as:

- a consensus in society on the exploitation of nuclear energy on the basis of existing law,
- an increase in the service life and capacity of existing nuclear power stations,
- the Mülheim-Kärlich nuclear power station going into operation,
- the undisturbed operation of existing nuclear power stations and
- unrestricted choice of fuels for the power stations on the part of the companies.

On the whole with regard to goal conformity, one can stress that shortcomings of the instrument of voluntary agreements have been identified and in part abolished. Still, when a comparison with the Federal Government's climate protection goals is

made, one has to question the goal conformity of this instrument, in particular if all other measures are discontinued due to the agreement that was made. To date the development of absolute carbon dioxide emissions is by no means following a path that makes this goal seem feasible (KOHLHAAS/PRAETORIUS 1995:278). Nor does the updated declaration issued by the German business sector indicate a new trend concerning this path. Additional need for action can be deduced, in particular for the German states that made up the FRG prior to unification. If the VDEW puts the absolute carbon dioxide reduction potential of German electric power stations, which are responsible for about a third of all German carbon dioxide emissions, at a mere 8 to 10 per cent compared with the target year of 2005 (VDEW 1996:5), the question arises as to who is to contribute the above-average reductions needed to offset the expected increases in carbon dioxide emissions in areas like transport.

7.1.3 Takeback of cars: business as usual

The assessment of goal conformity in the case of voluntary agreements on the disposal of old cars is oriented towards the question whether the instruments chosen are suited to achieve the top goal, the reduction in solid waste production and, in particular, in shredder waste. First of all, one has to examine what the substantive contribution is in the automobile industry's agreement compared with the way in which old cars have been disposed of so far. If some substance can be established, the next question is whether the measures planned constitute an effective contribution towards the solution to the problem.

Seen against the background of the conditions in the existing car-disposing industry, the measures have to be considered out of keeping with the goals, since they do not represent any change vis-à-vis the status quo. There already is a nationwide take-back network made up of independent businesses. Besides, even today the last owner is able to have his or her old car disposed of at generally accepted market terms. These terms can mean that the last owner still manages to get a positive market price for the old car.

The pledge to take back old cars from the future car fleet free of charge, provided they are no older than 12 years, does not constitute a substantive measure either. Firstly, most of the cars needing to be disposed of, do not come under this category. According to the ADAC (the main association of motorists in Germany), the mean age of a car whose registration has been cancelled is 13.2 years. If one takes data provided by the manufacturers as a basis, no fewer than 8 out of 23 producers say that the average life of the vehicles exceeds 15 years. Secondly, the pledge of taking cars back free of charge is obsolete, because according to the Arbeitsgemeinschaft Deutscher Autorecyclingbetriebe GmbH (ada, Association of German Car Recycling Businesses Ltd.) all old cars fitting the definition still fetch a positive market price (AUTORECYCLING, issue 1/96).

So far the bottom line of the study is that essential components of the take-back-agreement are „business as usual“ measures. More specifically, they do not constitute new measures, as they will not lead to a substantive change in the way things have been regulated so far. It is alarming that the negotiated agreement encourages manufacturers and importers to assume control of the car-disposing industry. Here there is a danger of the paradox that due to the voluntary agreement not only will polluters - i.e. the producers with whom product responsibility lies - not be charged costs in line with the polluter pays principle, but the polluters are even provided with a framework for the opening-up of a novel and lucrative business segment.

On the whole the voluntary agreement on the recycling of old cars made by the German automotive industry and decisive components supplying industries, the car component distribution sector and the car disposal industry, can be characterized as a „business as usual“ measure. The degree to which the environmental policy goal is met is small.

7.1.4 Clean technology: policy mix including economic instruments makes sense

Efficient measures to promote clean technology should take into account a company's investment cycles and adjustment deadlines. In principle, voluntary agreements can support this process, but by themselves they are often unsatisfactory with regard to desired targets.

Agreements presupposing a commitment to refrain from introducing accompanying economic instruments in return, have to be considered inappropriate to the goal. A case in point seems to be the meeting of three German premiers with representatives from the automotive industry of March 1995 at which moderation was pledged concerning additional government measures such as an increase in mineral oil tax. However, it is precisely the pledge to refrain from adopting these accompanying measures that undermines the prospects of also marketing an energy-efficient car successfully.⁷

With respect to the standards of vehicle fleets, even at a company level it is not sure whether the goals will be achieved, since compliance with the standards depends on the demand for individual models, which is something the company concerned finds hard to anticipate. Moreover, so far all fuel-conserving models have been vehicles

⁷ The European Commission, which wants to see negotiated agreements on a reduction in the consumption of the motor vehicle fleet, also seems to have realized this. The Commission's estimation is that such an agreement would entail the risk of the newly-developed vehicle models failing in the market. That is why the Commission believes such a measure has to be combined with fiscal incentives for the consumers.

with diesel engines and even modern diesel engines fitted with soot filters emit three times as many carcinogenic substances as petrol engines. Consequently, the German Council of Environmental Advisers warns of a one-sided policy on the reduction of greenhouse gases and demands a greater reduction in carcinogenic substances instead.

7.2 System conformity

7.2.1 Non binding agreements: no sanctions against unfair players

Voluntary agreements can constitute solutions in keeping with the system, if they establish binding standards for the parties involved and if free-rider behaviour can be prevented. However, since associations normally do not possess any effective mechanisms to punish their members, and hence no binding rules of the game can be agreed, the approach to problem-solving shifts to the moves of the game, that is to say to the wrong level in the system. As KREUZBERG (1993:308) writes, voluntary agreements hinge on „a disproportionately high participation of ‘honest companies’ in environmental protection activities and therefore lead to a redistribution of burdens to the detriment of ‘honest’ players.“

7.2.2 CFC-phase out: „soft“ instruments appropriate for preventive strategies

Prohibitions are definitely measures to avert concrete and acute damage to the environment that are in keeping with the system. In such situations the liberal principle of maximising freedom cannot be used as a yardstick for policy design on constitutional grounds (BROCKMANN et al. 1995:70). That means that instruments with low intervention intensity and a high degree of freedom, such as negotiated agreements, can only take precedence as long as it is safeguarded that acute environmental damage will be averted. If this is not the case, „tough“ instruments will be applied. This is also evident in the CFC-example: The realistic alternative to a voluntary reduction in the production of CFCs and ozone-depleting substitutes would have been a quick ban on these substances. In order to bring about a complete phase-out of CFC-application in products, finally the complementary CFC-halon-prohibition ordinance was issued in Germany. The aerosol industry did not agree to a voluntary phase-out desired by the Ministry for the Environment (KOHLHAAS/PRAETORIUS 1994:89).⁸

⁸ The way to protect the ozone layer that is more in keeping with the system than anything else would be to apply „tough“ instruments presenting economic incentives, as was done in the US. There politicians successfully opted for the application of a mix of instruments comprising levies and permits (COOK 1996:4).

7.2.3 Climate policy: long-term danger of intervention spiral

A characteristic of voluntary environmental protection measures in the field of climate protection frequently cited as being particularly in keeping with the system, is that these measures, compared with energy and carbon taxes, cause fewer side-effects on goals relating to stability and distribution policies. The „double dividend“ of an ecological tax reform is often overrated, the argument goes, i.e. the simultaneous achievement of ecological (reduction in greenhouse gases) and economic goals (e.g. job creation) due to the revenue-neutral compensation of ecological taxes (KOSCHEL/WEINREICH: 1995).

However, if emitters are charged the adjustment costs caused by a climatically-sound restructuring of capital assets, this has to be regarded as being in keeping with the market, irrespective of the compensation question. A „policy of little steps“, which the German Council of Environmental Advisers advocates, would primarily send the necessary price signals to consumers for a more economical use of energy. This would be the crucial advantage over voluntary agreements. Secondly, a policy of little steps would minimise the side-effects on goals in the fields of stability and distribution policies. For voluntary agreements are primarily not in keeping with the market and the system, because such price signals usually are not included in the instruments they are provided with. A climate policy based on voluntary agreements is thus always associated with the danger that even a high „no regrets“ potential that could be siphoned off is overcompensated by increasing energy consumption - not only in the sphere of transport.

In the long run failure to attain the goals leads to new government intervention in the form of limits, technical instruction and rules of conduct. As long as there are no permanent and effective incentives to buy and use energy-efficient technologies or to practise energy-conserving behaviour, failure to attain goals has to be abolished with the help of such new regulations. Regulations on driving behaviour, the purchase of energy-efficient motor vehicles or on using state-of-the-art technologies for heat insulation purposes are examples of such a catalogue of measures. Unless in the long run plans for voluntary climate protection measures are accompanied by price instruments which are in keeping with the market, there is a risk of setting a spiral of intervention in motion that should have been stopped through this instrument in the first place.

7.2.4 Circular economy: effects of negotiated agreement on competition

Cooperation between individual trade associations and government can lead to informal marketing agreements, to markets being shielded and to barriers to market entry for third parties being erected. That these fears cannot be dismissed is shown by the case studies taken from the problem area circular economy. From the point of view of competition policy, buzz words in environmental policy like „product

responsibility from cradle to grave“ involve the danger of encouraging trends towards concentration and vertical integration.

As for the impacts negotiated agreements on the disposal of old cars have on the structure of the disposal industry, it is the effects on the number of receiving points and on the number of businesses doing the recycling that are decisive. In general, trends towards concentration in the industry are expected on account of more stringent disposal standards.

In principle all specialized businesses meeting the criteria for recognition or certification enjoy unrestricted access to the system. However, there are dangers involved in the formulation of the criteria licensed businesses have to meet. Here unnecessary barriers to access could be erected favouring financially-strong companies, for example, because large investments prove necessary. The Association of German Car Recycling Businesses (ada) is talking of an existential threat to the small and mid-size structure of its industry (AUTORECYCLING, issue 1/96). Besides, if vehicle manufacturers largely control the disposal industry, one also has to fear that the option of recycling becomes less attractive to disposers, for manufacturers will probably prefer to sell new parts.

Competition in the recycling industry is indeed in danger of being harmed to the detriment of small to medium-sized businesses owing to cooperation between large manufacturers and suppliers. This can happen at the expense of the hitherto dominating small to medium-sized businesses; a pattern already familiar from the development of the Dual System Germany.

Irrespective of the question of licensing criteria for businesses, a network could, once it has been set up, be subject to the abuse of power. In analogy to the relationship between large motor vehicle manufacturers and suppliers, ominous structures can develop between manufacturers and recyclers (BENZLER/LÖBBE 1995:157). The take-back network can also lead to a monopolization of the spare parts market and of shredder activities. For example, the Association of the Automotive Industry (VDA) had originally planned to couple the free take-back with brand commitment concerning spare parts, but this point was dropped in the course of the negotiations (HOMBURGER 1996).

7.2.5 Enhancing cleaner production: fair rules instead of voluntariness

It is obvious that end-of-pipe technologies will not automatically start to be superseded by cleaner production (SRU 1994:Tz 262). According to the German Council of Environmental Advisors, the prospects for clean technology greatly depend on progress being made in environmental policy with respect to the correction of the structure of relative prices, which still encourage an overexploitation of the natural life-sustaining systems.

On the other hand, voluntary agreements, by virtue of their approach, are not up to the job if instead of accompanying a correction of relative prices, they are used as a substitute thereof and made without giving due consideration to the market.⁹ Even if, for example, fuel consumption in motor vehicles is successfully cut, unless additional price incentives are provided to use energy economically and to buy these vehicles, these innovations will turn into part of the decoration at motor shows, without large numbers of them being sold to the public.

As long as the wrong rules apply, it seems unlikely that a player is voluntarily going to behave in the ecological manner desired. However, whenever a desired form of behaviour fails to materialize voluntarily, government can respond in two ways. Either it puts up with failures in environmental policy and thereby shows that it leaves the design of the political framework to influential pressure groups, or sooner or later it helps things along with coercive measures. In this way voluntary measures, despite their own low intervention intensity, can in the long term entail a spiral-of intervention with unacceptably high intervention intensity.

7.2.6 Green dot: Market-oriented approach with some market imperfections

As for cooperative solutions, it is in principle also possible to develop environmental policy instruments that take free-market principles into account. Due to the problems of charging social costs relating to the dumping of waste with the help of dump charges, the ordinance governing packaging, for instance, and the Dual System it spawned represent two variants of instruments of control that make sense in economic terms and are in keeping with the market. Although juridically speaking take-back duties are commands, these commands are less questionable from an ordoliberal point of view, since they provide the standard addressee with scope for individual adjustment (SPIES 1994:309).

In the field of packaging, too, reservations from the point of view of competition policy have to be expressed. German disposal markets are highly cartelized and oligopolized. The Dual System is a demand cartel legitimated by the ordinance on

⁹ Economically speaking, for companies the application of clean technology is in the short term linked with increasing costs and financial risks. Disadvantages of integrated technologies from the point of view of an entrepreneurs' investment calculations, are higher access and information costs, adjustment and changeover costs, funding bottlenecks, long decision-making horizons and greater economic risk. Here negotiated agreements may be able to provide an additional impetus for adjustment and changeover, but an adjustment to ecological requirements in a way that minimises the costs for the overall economy is not to be expected with voluntary agreements in view of the restriction to certain technologies and the expected free rider-behaviour on the part of the companies.

packaging. There is always just one disposer per territorial division who is given the tasks of collecting and sorting.¹⁰

However, the Dual System also shows that non-uniform action in different countries can lead to distorted competition in foreign trade. Negative impacts of the Dual System on the European disposal industry become apparent in the case of waste paper, for example. German recyclers get their waste paper free of charge, whereas other European recyclers have to bear the collecting and sorting costs themselves. This cost advantage not only de facto represents an import impediment, but also leads to increasing German exports of waste paper. For example, in France this has the ecologically-ridiculous consequence that growing amounts of waste paper have to be incinerated or put on dumps for lack of demand (WUPPERMAN 1993:453).

7.3 Economic efficiency

7.3.1 CO₂-agreement is not cost-efficient

Solutions to the problem of reducing emissions are economically cost-effective if each emitter fixes his contribution to the reduction in such a manner that the overall economic avoidance costs are minimised. Individual emitters neither know the avoidance costs nor are they interested in including them in their decision-making, hence, these signals have to be sent through environmental policy. Levies and permits in particular are classic textbook instruments meeting the economic efficiency criteria, because they send out these signals in the form of a correction of relative prices. On the other hand, a reduction in emissions with minimal costs for the overall economy is unlikely to be achieved via a voluntary agreement on carbon dioxide or eco-efficient cars, for instance, due to the restriction to certain sectors and the free-rider behaviour to be expected on the part of the members of the associations.

Moreover, voluntary agreements are not convincing when it comes to their dynamic efficiency, i.e. their effect on technological progress. Here it is possible to compare voluntary agreements to regulations. Once the goal has been achieved, there are no further incentives to reduce emissions. Compared with regulations, there does not even inevitably have to be an incentive to maintain the standard once it has been attained (KREUZBERG 1993:309).

¹⁰ The Federal Ministry for the Environment justifies the formation of cartels saying that new environmental technologies will be developed. In a diametrically opposed view the Federal Cartel Authority in Berlin regards functioning competition as the essential driving force for the development of new environmental technologies (WELT of 15 April 1996). The amendment of the ordinance on packaging, which is to take effect soon, is to promote competition by stipulating that disposal activities (collecting, sorting, recycling) linked to dual systems have to be put out to tender (UMWELT, 4/1996).

7.3.2 Cost-efficient CFC phase-out

When assessing the economic efficiency of German agreements on reducing ozone-damaging substances, consideration has to be given to three unusual features in particular that accelerated the substitution on managerial grounds alone:

- the ban on CFCs as propellants for most aerosol products in the US as early as 1978,
- the declining demand for products containing CFCs (e.g. aerosols) and
- the availability of low-cost substitutes.

The economic cost efficiency of negotiated agreements on CFCs has to be regarded as positive. Each agreement covered the main polluters, which were enabled to implement the reduction at the lowest possible cost.

Concerning dynamic efficiency, here, too, one has to repeat: Once the goal has been achieved, there are no further incentives for progress in terms of environmental technology. However, with respect to the development of environmentally-friendly CFC substitutes, the bottom line is that owing to the aforementioned unusual features there had already been sufficient incentives for technological progress.¹¹

7.3.3 Fundamental distortions of waste markets

Although the distribution of scarce environmental resources takes place in an allocation-efficient fashion via a change in relative prices, waste disposal in Germany is confronted with fundamental market distortions. The capacity problem regarding dumps would theoretically best be solved by charging dump users in line with the polluter pays principle all internal and social costs that arise, that is to say by increasing dump charges. Among the costs not included fully today, the costs relating to dump-scarcity, dump operation and dump emissions feature prominently. So far costs relating to the environment have been externalized as much as possible. However, on account of an inflexible scale of charges, dump operators are not able to charge users all their operational costs (BRENCK et al. 1996:1). Inefficient forms

¹¹ What has turned out to be a particularly efficient instrument in the US to protect the ozone layer is the simultaneous application of permits and a tax for the protection of the ozone layer. The American environmental agency EPA estimates that the administrative costs amounted to only 10 per cent of the administrative work a regulation would have entailed. Furthermore, it was possible to quickly adjust the licenses issued to the modifications of the Montreal Protocol. Whereas in 1988 the cost of halving CFC consumption was put at \$ 3.50 per kilogramm, only two years later it was possible to lower these estimates to \$ 2.20 per kilogramm (COOK 1996:4f.).

of organisation in turn lead to price increases; on the whole serious distortions in the cost structures ensue.¹²

In view of the increase pledged in recycling quotas, the establishment of the disposal system for old cars involves considerable costs. As the establishment and maintenance of the disposal system represent sunk costs, there is a growing incentive for businesses to partially recycle the old cars that were taken back, or to recycle the raw materials they contain. Yet, it still depends on the relative price for newly purchased raw materials or for newly produced car parts whether there will in fact be a drop in the volume of waste to be dumped or in net resource input.

The fact that cars are taken back free of charge does justice to the polluter pays principle, since the producer bearing product responsibility is charged the disposal costs. Thus, the solution is dynamically efficient, for the producer is provided with incentives to look for technological innovations in competition with other producers (SACKSOFSKY 1996:103). However, the question arises whether the disposal costs are high enough in relation to other production costs to initiate recycling-oriented research and development.

7.3.4 Green Dot economically efficient

In the packaging sector, founded on the ordinance on packaging, an economically-efficient system was created on a voluntary basis by introducing the Green Dot system. A graduated system of royalties paid by packing material producers and distributors to the Dual System Germany Ltd. shows a tendency of charging costs in accordance with the polluter pays principle and thus results in the marginal avoidance costs being compensated for.

However, reservations result from the changed conditions in the disposal and recycling of packaging following the establishment of the Dual System. Strong concentration effects in the disposal and recycling markets make monopoly and oligopoly profits possible, and sometimes transaction costs have risen considerably compared with the status quo ante. The financial crisis experienced by the DSD in 1993 halfway through the year illustrates the level of transaction costs associated with this system. On the expenditure side, collecting and sorting costs had soared on account of higher-than-expected volumes. As for the disposal of the remnants, the problem that emerged was that disposal businesses owned by private persons or

¹² When shredder residues were classified as hazardous waste in 1990, this was a measure that aimed at containing shredder residues from the disposal of old cars and that had a great impact on prices. Dumping costs rose from around DM 70 per ton to between DM 500 and DM 1,000 per ton (1992) (WEILAND 1995:58). However, it is still too early to comment on the measure's directive effect. According to the Association of German Car Recycling Business (ada) the share of waste from the disposal of old cars - in particular plastics - is still increasing.

local authorities are able to charge monopoly prices. With respect to the revenue side, the Green Dot was frequently used without making the corresponding royalty payments to the DSD. By September 1993 a deficit amounting to DM 710 million had accumulated (WUPPERMAN 1993:450).

7.4 Institutional controllability

7.4.1 Enforceability depends on induced costs and external pressure

In principle the enforceability of voluntary agreements in associations depends on three factors:

- the costs of the agreement made,
- the costs of the government ordinance looming in the case of non-performance of the agreement and
- the effectiveness of possible punishment meted out by the associations themselves (e.g. expulsion from the association).

Whereas „no regrets“ measures are unlikely to meet with much opposition in an association, pledges going beyond them involve the danger of an internal allocation struggle, which can let a withdrawal from the commitment seem worthwhile. In such cases certain passages in the declaration providing scope for interpretation, or preconditions for the agreement that were never met can provide a welcome opportunity to terminate cooperation.

Problems regarding enforceability are not expected to emerge in the case of the automotive industry's fairly undemanding voluntary agreement on reducing fuel consumption. According to the German Council of Environmental Advisers latest annual report (1996:Tz. 166, translated by the authors) „it is widely believed that the goal of cutting fuel consumption by 25 per cent over 15 years, based on a relatively high average consumption, is in line with the expected technological development already. The pledge to launch car models by the year 2000 with diesel engines consuming three to four litres per 100 km cannot claim to be a special feat of engineering, either“.

On the other hand, problems relating to the enforcement of voluntary agreements on carbon dioxide reduction in associations have been revealed, e.g. in talks conducted by the Federal Environmental Protection Agency (UBA) with representatives from the associations in connection with the climate protection initiative launched by the German business community. For example, UBA's annual report reads (1993:167, translated by the authors): „The talks revealed fundamental difficulties whenever negotiated agreements made by associations are to contain binding requirements

that are usually laid down in a statutory basis. Many individual businesses refuse to recognize declarations made by their associations as binding. It is virtually impossible to impose sanctions following non-compliance of the agreements“. Thus, the instrument of negotiated agreements reaches limits which result from its voluntary nature.

7.4.2 Redistribution at the expense of third parties

Since the instrument of voluntary agreements per se does not send out any price signals that lead to automatic adjustments on the part of the players, decisions have to be made on a case-by-case basis on how the overall reduction targeted is to be divided up between individual groups. This, some people say, involves the danger that groups that are inferior in terms of the way they are organized, like households, ultimately have to bear the largest adjustment burden. This has to be qualified by saying that this argument can also be used against economic instruments. In real life the political representation of interests also plays an important part with economic instruments, for instance when exceptional areas are stipulated that will be exempted from energy taxes. Even Denmark, a country usually regarded as exemplary when it comes to introducing ecological taxes, has special arrangements for particularly energy-intensive businesses, and the burden of levies is mainly borne by private households (MEZ 1995:109 and 126). As the example shows, the uniform price signals economic instruments want to bring about are frequently watered down in the political process.

7.4.3 Relinquishment of political scope

The updated declaration presented by the German business community on the prevention of damage to the climate once again clearly indicates the limits of voluntary agreements. If the environmental goal obviously runs counter to the individual economic interests of the associations, people - like some representatives of the VDEW recently - suddenly talk of the „fetish year 2005“ in connection with the Federal Government's timetable. Although, for example, the VDEW's agreement already is a scaled-down version (providing for a reduction of merely 8 to 10 per cent by the year 2005), undesired political measures (e.g. in nuclear energy policy) may prompt termination of the agreement. In any case, a government has to expect being asked whether it is possible for a pledge with little substance to be worth so much that the government in return, for decades to come, puts up with being deprived of a great number of potential courses of action relating to climate and energy policies.

8 General conclusions and future perspectives

8.1 General Conclusions

The examples analyzed here have offered weaknesses of voluntary agreements with regard to goal-conformity, system-conformity, cost-efficiency and institutional controllability. However, it can be argued that hardly any instrument will meet all these criteria. If it does theoretically, it may be watered down in the political process (or perhaps will not be implemented at all). Thus, it should be mentioned that there may be reasonable applications for voluntary agreements, but the instrument should be used very carefully. Against this background, we want to draw some general lessons from the German experience and give some recommendations for the international discussion of using voluntary agreements within the European Union.

Opportunities for the application of voluntary agreements that are welcome from an ordoliberal point of view especially exist if they are used within a mix of policy-instruments. If economic incentives are introduced on a voluntary basis (example: Green Dot) or if agreements are used to accompany economic instruments (example: combination of carbon taxes and voluntary agreements), agreements would really deserve the attribute of being market-based. If economic instruments cannot be employed, for instance when substances have been completely banned, negotiated agreements as „soft“ instruments of environmental policy can certainly serve to accompany „tough“ regulatory measures or - provided it is not a matter of warding off acute dangers - to replace them (example: CFC-phase out). Except for these areas, however, from an ordoliberal point other instruments are preferable.

By combining negotiated agreements and economic instruments, it is possible to avoid a lack of incentives, which is one of the worst flaws of most voluntary agreements in terms of design. To date a lack of incentives has led to voluntary agreements either being undemanding with regard to the contents and being phrased accordingly, or, in the case of more ambitious pledges, to them being associated with a great amount of time and effort needed for enforcement and monitoring. It is also due to a lack of incentives that as a rule, only specific and no absolute reductions are achieved. Without any signals in favour of a way of using environmental resources that is generally less harmful, even with demanding specific reduction goals there is the risk that an overall increasing consumption of environmental resources will overcompensate for these goals.

The increasing significance of voluntary agreements in current environmental policies may have to do with them being labelled „market based instruments“ and the fact that their increased use is associated with hopes of thus strengthening the market system. However, a more in-depth analysis reveals that although in principle it is possible to design voluntary agreements in a manner that is in keeping with a market economy, in most cases people avoid doing it. As the examples that were

studied showed, such a free market-oriented design does not come about voluntarily and spontaneously, rather it requires standards and a framework set by government. However, once such a framework is set, agreements may be used as a tool for implementation within an environmental policy-mix.

For this reason one has to strongly advise the government against making a commitment to the effect that in return for voluntary declarations on environmental protection, the government will not make use of any other instruments. This imposes disproportionately severe restrictions on the politicians' latitude in how they act in the future and thus on their capacity for problem-solving. Such a policy tends to neglect other solutions that may be more appropriate to the problem, such as the application of a mixture of environmental policy instruments.

If a decision to give preference to voluntary solutions in general is made or if a decision in favour of such solutions is taken at an early stage, this too is counterproductive, because the substance of negotiated solutions - the governmental „potential for threats“ - is weakened and delays in the form of a stamina contest are provoked. The examples that were examined confirmed that without considerable governmental pressure, voluntary agreements do not yield any pledges that go beyond „business as usual“ or „no regrets“ measures. In order to make it absolutely clear that the government really „is in control“, the scope for design in environmental policy has to be kept unrestricted and flexible. On the other hand, giving priority to voluntary solutions on principle imposes disproportionately severe restrictions on government when it comes to quickly reverting to „tough“ environmental policy instruments following unsatisfactory negotiation results or delayed implementation.

8.2 European Perspectives

Although our case studies represent only German experiences, some lessons can be drawn for the use of voluntary agreements on a European level. As it seems, the European Commission is aware of several potential shortcomings of agreements being stated here.

In November 1996 the European Commission issued a communication examining the use of environmental agreements as an instrument of EU environment policy (Com (96) 561). The (non-binding) paper deals with the instrument in general, presents guidelines on „environmental agreements“ and provides a survey over the use of voluntary (environmental) agreements in the Member States.

The guidelines given by the Commission point out seven topics that should be taken into account when public authorities design environmental agreements on national or local level:

- consultation,
- contractual form,
- quantified objectives,
- monitoring of results,
- public information and transparency,
- independent verification of results and
- additional guarantees.

Before an environmental agreement is concluded, the paper says, all interested parties (companies, business associations, environment groups and public authorities) should have the opportunity to comment on the draft. Their opinions should be taken into account.

The legal status of an agreement plays an important role for the success of an agreement. According to the Commission, binding agreements provide in general better safeguards in terms of achieving environmental objectives. Contracts (binding on both parties) offer a well-defined framework that may include sanctions for noncompliance and is enforceable through the courts.

The weakness and bad reputation of certain past agreements partly derive from the lack of quantified objectives, leaving room for the perception that agreements were used to avoid or delay effective action, the Commission states. Objectives have to be quantified in figures as opposed to „best efforts“ clauses. Also intermediate objectives should be set to show the effectiveness of an agreement.

According to the Commission's findings, results of agreements have to be monitored, the agreement itself should define „how“.

The failure of agreements, the paper goes on, is often connected with a lack of public information and transparency. Transparency is crucial to assure third parties that non-regulatory obligations are kept. Agreements should be published in the national Official Journal or an equally public document. Even a public register of agreements should be considered.

In some cases it may be appropriate to set up a committee or independent body to collect, evaluate, or verify results. This is particularly important in cases where the measuring methods differ or where the disclosure of business secrets has to be avoided.

As an additional guarantee that the agreement will be fulfilled, dissuasive sanctions such as fines and penalties could be foreseen for case of noncompliance, the Commission concludes.

Measuring the German way of using environmental agreements at the standard set by the Commission's guidelines, one will find that the national agreements fall behind in nearly every respect. Apart from the fact, that all the German agreements are non-binding, the procedure while negotiating an agreement and the structure of the final commitment show a whole lot of deficiencies.

Thus, fundamental flaws of the negotiations may be overcome when the guideline will be followed. From our point of view it is important to mention that, according to the communication of the Commission:

1. A cost-effective use of agreements will be made as a part of policy mix together with, for example, regulatory or economic instruments and
2. agreements may be under certain circumstances an efficient tool for implementing of environmental policy, but they are not appropriate for environmental target setting. General targets should be set through legislation.

These basic conclusions go along with the findings of our study. The politician's „art of the possible“ may now be to look carefully for reasonable applications of agreements without falling back to traditional command-and-control measures. As experiences in Belgium (Seyad et al.:1996) and the United Kingdom (Eden:1996) show, neither a strategy of strong regulation of voluntary agreements (which makes the agreements obsolete) nor a strategy of far-reaching deregulation (or self-regulation) of environmental target-setting seems to be promising. If not driven to one of these extremes, there may be several applications for more flexible ways of environmental policy.

References:

- Autorecycling 1996 (1): Herausgegeben von der Arbeitsgemeinschaft Deutscher Autorecyclingbetriebe GmbH. Köln.
- Bauer, Hartmut (1987): Informelles Verwaltungshandeln im öffentlichen Wirtschaftsrecht, VerwArch 1987, S. 241 - 268.
- BDI - Bundesverband der Deutschen Industrie e.V. (1996): Aktualisierte Erklärung der deutschen Wirtschaft zur Klimavorsorge. Köln.
- Benzler, Guido, Klaus Löbke (1995): Rücknahme von Altautos - Eine kritische Würdigung des Konzepte. In: RWI-Mitteilungen, Jg. 45, 1995-2, S. 141-162.

- Beyer, Wolfgang (1986): Der öffentlich-rechtliche Vertrag, informales Handeln der Behörden und Selbstverpflichtungen Privater als Instrument des Umweltschutzes, Dissertation Universität Köln.
- BGW - Bundesverband der deutschen Gas- und Wasserwirtschaft (1996): 1. Zwischenbericht zur Klimaschutzklärung der deutschen Gaswirtschaft vom März 1995 bis zum Jahr 2005. In: BDI - Bundesverband der Deutschen Industrie e.V.: Aktualisierte Erklärung der deutschen Wirtschaft zur Klimavorsorge. Köln.
- BMU - Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (1995): Staatssekretär Jauck fordert mehr Kooperation von Staat und Wirtschaft im Umweltschutz. BMU-Pressemitteilung 117/95, Bonn.
- BMV - Bundesminister für Verkehr (1995): Statement des Bundesministers für Verkehr anlässlich der Präsentation des Opel Corsa Eco 3 am 7.9.1996 in Bonn. Fs. Nr.: 0340 070995 1430.sch
- Brenck, A. et al. (1996): Zwischen Entsorgungsnotstand und Überkapazitäten - Wege zur effizienten Organisation einer umweltverträglichen Abfallwirtschaft. Schlußbericht zur Studie "Optimierung des Verbrauchs knapper Deponiekapazitäten" für den Bundesminister für Wirtschaft, Zusammenfassung der Ergebnisse. Berlin.
- Brockmann, Karl Ludwig, Henrike Koschel, Isabel Kühn, Klaus Rennings (1995): Ordnungspolitische Grundfragen einer Politik für eine nachhaltige, zukunftsverträgliche Entwicklung. Expertise im Auftrag des Bundesministeriums für Wirtschaft. Zentrum für Europäische Wirtschaftsforschung, Mannheim.
- Brohm, Winfried (1992): Rechtsgrundsätze für normersetzende Absprachen - Zur Situation von Rechtsverordnungen, Satzungen und Gesetzen durch kooperatives Verwaltungshandeln, DÖV, S. 1025 - 1035.
- Brohm, Winfried (1994): Rechtsstaatliche Vorgaben für informelles Verwaltungshandeln, DVBl., S. 133 - 139.
- Bundesregierung (1996a): Erklärung der deutschen Wirtschaft zur Klimavorsorge. Pressemitteilung Nr. 118/96, Bonn.
- Cook, Elizabeth (1996): Marking a Milestone in Ozone Protection: Learning from the CFC Phase-out. In: World Resources Institute. Issues and Ideas, January 1996. Washington.
- DIW (1996): Energieverbrauch und CO₂-Emissionen in Deutschland in der ersten Hälfte der neunziger Jahre. In: DIW-Wochenbericht 4/96, S. 73 - 79.
- Eden, Sally (1996): Problems of Environmental Consensus: Packaging Regulation and Self-Regulation in the UK. Paper presented on the Sixth Annual Greening of Industry Network Conference, Heidelberg, November 1996.

- Enquete-Kommission „Schutz des Menschen und der Umwelt“ des Deutschen Bundestages (Hrsg.) (1994): Die Industriegesellschaft gestalten - Perspektiven für einen nachhaltigen Umgang mit Stoff- und Materialströmen. Bonn.
- Environment WATCH (1995): Commission Plans EU Codes for Green Taxes, Voluntary Agreements. 27.10.1995, S. 13.
- European Commission (1997): Communication to the Council and European Parliament on Environmental Agreements. In: Supplement to Europe Environment Nr. 492 - January 28, 1997.
- Green, Kenneth, Andrew McMeekin, Alan Irwin (1994): Technological Trajectories and R&D for Environmental Innovation in UK Firms. In: Futures 1994, 26 (10), S. 1047 - 1059.
- Grosseckler, Heinz (1991): Zur theoretischen Integration der Finanz- und Wettbewerbspolitik in die Konzeption des ökonomischen Liberalismus. In: Erik Boettcher et al. (Hrsg.): Jahrbuch für Neue Politische Ökonomie, Band 10, Tübingen, S. 103 - 144.
- Hemmelskamp, Jens, Georg Licht, Egbert Oldenboom, Jan Willem Velthuisen (1995): The Impact of Parameters provided by Environmental Policy on the Innovative Behaviour of Companies in selected European Countries. Final Report of a Study commissioned by the European Commission DG XII, Contract Nr. EV5V-CT94-o376, Mannheim, Amsterdam.
- Henneke, Hans-Günter (1991): Informelles Verwaltungshandeln im Wirtschaftsverwaltungsrecht und Umweltrecht, NuR, S. 267 - 275.
- Hoffmann-Riem, Wolfgang (1990): Reform des allgemeinen Verwaltungsrechts als Aufgabe - Ansätze am Beispiel des Umweltschutzes, AöR, S. 400 - 447.
- Hohmeyer, Olav, Henrike Koschel (1995): Umweltpolitische Instrumente zur Förderung des Einsatzes integrierter Umwelttechnik. Gutachten im Auftrag des Büros für Technikfolgenabschätzung beim Deutschen Bundestag, Mannheim.
- Holzhey, Michael, Henning Tegner (1996): Selbstverpflichtungen - ein Ausweg aus der umweltpolitischen Sackgasse? In: Wirtschaftsdienst 1996/VIII, S. 425 - 430.
- Homburger, B. (1996): Altkar - Recycling endlich auf dem Weg. Erklärung der umweltpolitischen Sprecherin der F.D.P.-Bundestagsfraktion vom 21.2.1996.
- IPCC - Intergovernmental Panel on Climate Change (1995a): Second Assessment Synthesis of Scientific-technical Information Relevant to Interpreting Article 2 of the UN Framework Convention on Climate Change. Genf.

- Kohlhaas, Michael, Barbara Praetorius (1994): Selbstverpflichtungen der Industrie zur CO₂-Reduktion. Berlin.
- Krause, Florentin, Jonathan Koomey, David Olivier (1994): Incorporating global warming externalities through environmental least cost planning: a case study of Western Europe. In: O. Hohmeyer, R. L. Ottinger: Social Costs of Energy. Berlin, Heidelberg, New York, S. 287 - 312.
- Kreuzberg, Peter (1993): Zur ökonomischen Rationalität „freiwilliger Kooperationslösungen“ für das Klimaproblem. In: Zeitschrift für Energiewirtschaft (ZfE) 4/93, S. 304 - 309.
- Maier-Rigaud, Gerhard (1995): Für eine ökologische Wirtschaftsordnung. In: Jahrbuch Ökologie 1996. München.
- Mez, Lutz (1995): Erfahrungen mit der ökologischen Steuerreform in Dänemark. In: Olav Hohmeyer (Hrsg.): Ökologische Steuerreform. ZEW-Wirtschaftsanalysen Band 1, Baden-Baden, S. 109 - 128.
- Müggendorf, Hans-Jürgen (1990): Formen des Kooperationsprinzips im Umweltrecht der Bundesrepublik Deutschland, NVwZ, S. 909 - 917.
- Muller, Frank (1995): Energy Taxes, the Climate Change Convention and Economic Competitiveness. Paper Presented to the 3rd International Conference on Social Costs, Ladenburg, Germany, 27 - 30 May.
- Murswiek, Dietrich (1988): Freiheit und Freiwilligkeit im Umweltrecht. In: Juristen Zeitung, 43. Jg., H. 21, S. 985 - 993.
- Ökologische Briefe (1996) (2): „Denkhilfe“ für die Wirtschaft aus dem Umweltbundesamt.
- Ökologische Briefe (1996) (5): Europäische Kommission will das Fünfliterauto.
- Ökologische Briefe (1996) (8): Klimaschutzverhandlungen - Genf wird kaum Ergebnisse bringen.
- Rennings, Klaus (1994): Indikatoren für eine dauerhaft-umweltgerechte Entwicklung. Stuttgart.
- Rennings, Klaus, Karl-Ludwig Brockmann, Henrike Koschel, Heidi Bergmann, Isabel Kühn (1996): Nachhaltigkeit, Ordnungspolitik und freiwillige Selbstverpflichtung. Heidelberg, 1996.
- Sacksofsky, E. (1996): Anmerkungen zu verschiedenen Konzepten einer Neuregelung der Altautoentsorgung. In: Zeitschrift für Umweltpolitik & Umweltrecht, Jg. 19, Heft 1, S. 99-108.
- Sanghi, Ajay K. (1995): Climate for Climate Change Actions in the U.S.: The New York Experience. Paper Presented to the 3rd International Conference on Social Costs, Ladenburg, Germany, 27 - 30 May.

- Schmitt, Dieter, Helmut Dungen (1992): Klimapolitik in der Sackgasse? Einsatzmöglichkeiten für Kompensationen. In: Wirtschaftsdienst, 1992/V, S. 271 -276.
- Seyad, Akim, Marc de Clerq, Filip Senesael (1996): The Use of Voluntary Agreements as Instruments of Environmental Policy in the Energy Sector - the Belgian Electricity Voluntary Agreement Case. Paper presented on the Sixth Annual Greening of Industry Network Conference, Heidelberg, November 1996.
- Spies, R. (1994): Der "Grüne Punkt" als ökonomisches Instrument in der Abfallwirtschaftspolitik. In: Zeitschrift für angewandte Umweltforschung, Jg. 7, Heft 3, S. 309-321.
- SRU - Rat von Sachverständigen für Umweltfragen (1994): Umweltgutachten 1994 - Für eine dauerhaft-umweltgerechte Entwicklung. Wiesbaden.
- SRU - Rat von Sachverständigen für Umweltfragen (1996): Umweltgutachten 1996 - Zur Umsetzung einer dauerhaft-umweltgerechten Entwicklung. Wiesbaden.
- SZ - Süddeutsche Zeitung vom 6.3.1996: Fünf-Liter-Auto gemeinsames Ziel.
- Umwelt (1995a): Workshop „Freiwillige Selbstverpflichtungen zur Klimavorsorge“. In: Umwelt Nr. 12/1995, S. 438.
- Umwelt (1996): Novelle der Verpackungsverordnung. In: Umwelt Nr. 4, S. 158.
- UBA - Umweltbundesamt (1993): Jahresbericht 1993. Berlin.
- VDA - Verband der Automobilindustrie e.V. (1995): Freiwillige Zusage zur Kraftstoffverbrauchsminderung. Frankfurt/Main, 22.3.1995.
- VDEW - Verband Deutscher Elektrizitätswerke (1996): Bericht 1996 zur „Erklärung der VDEW zum Klimaschutz“. In: BDI - Bundesverband der Deutschen Industrie e.V.: Aktualisierte Erklärung der deutschen Wirtschaft zur Klimavorsorge. Köln.
- Weiland, R. (1995): Rücknahme- und Entsorgungspflichten in der Abfallwirtschaft - Eine institutionenökonomische Analyse der Automobilbranche. Wiesbaden.
- Welt vom 15.4.1996: Merkel liebäugelt mit Kartellen.
- Wupperman, B. (1993): Zwei Jahre Verpackungsverordnung: Weitere Machtkonzentration statt Müllvermeidung. In: Zeitschrift für angewandte Umweltforschung, Jg. 6, Heft 4, S. 448-455.
- Zimmermeyer, Gunter (1995): Voluntary Fuel Economy Targets for Motor Vehicles in Germany. Presentation for the IEA/OECD International Workshop on Voluntary Approaches for Mitigating CO₂-Emissions. Bonn.