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**German packaging waste management:
a successful voluntary agreement with less successful environmental effects**

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ABSTRACT

The Duales System Deutschland (DSD) is an association of the German packaging industry to collect, sort and recycle packaging waste from consumers. While it can be called a 'voluntary agreement', it was established in response to the regulatory threat of the German Packaging Ordinance to impose individual collection and recycling duties for every packaging producer and distributor. The DSD fulfils most of the conditions for a successful voluntary agreement. German packaging waste management is less successful in its environmental effects, however, as it prioritises recycling over waste avoidance. Whereas avoidance can save the full resource and energy content of economised packages, recycling leads to a partial recovery of the natural resources and energy embodied in waste packages only. The EU Packaging Waste Directive follows the basic principle of the German Packaging Ordinance and similar systems as DSD have been established in other European countries. There is the danger that a specific form of packaging waste management becomes locked in which sets free an innovative potential for recycling technologies, but neglects a similar potential for waste avoidance.

INTRODUCTION

If Voluntary Agreements (VAs) were really ‘unforced by law and unpersuaded by financial incentives’, as an often quoted definition would have it (Jacobs 1991, p. 134), then few agreements could really be called voluntary. Instead, VAs often come about as the response of the private sector to the threat by public authorities to introduce binding, i.e. non-voluntary, regulation. In other words: the private sector swallows the bitter pill of self-regulation in order to fight off the even more dreadful medicine of binding public regulation. In reality, therefore, one can observe a plethora of VAs with a varying degree of impact of public authorities (Sinclair 1997).

A prime example of a VA that is voluntary in nothing but its name is the Duales System Deutschland AG (DSD), an association of the German packaging industry set up for the purpose of collecting, sorting and recycling packaging waste. Formally, the DSD is a voluntary association: it originated in the private sector and no packaging company can be forced to join it. In substance, however, its installation was the only chance for the industry to escape the *individual* duty of every producer and distributor of packages to collect used consumption good packages from the consumer and recycle them. According to §6 section 3 of the initial German Packaging Ordinance (*Verpackungsverordnung*) from 1991, this individual duty could only be waived if from 1st of January 1993 onwards the industry as a whole provided a system in its own responsibility that would guarantee the collection of packaging waste from all consumers and would fulfil certain quotas of collection, sorting and recycling.

In its first and major part, this article provides a critical assessment of the DSD. In its second part it discusses the wider European Union policy context with regard to packaging waste. To do so is imperative as the European Union Packaging Waste Directive 94/62/EC follows the same basic idea as the German Ordinance. In short, the article argues that while the DSD fulfils most of the conditions for a successful voluntary agreement, it has been much less successful in its environmental effects. This is because it prioritises recycling of packaging waste over waste avoidance. Neither the DSD nor the underlying Packaging Ordinance has set up any significant provisions for the avoidance of packaging waste.

In addition to publicly available documents, the article is based on non-standardised interviews undertaken with representatives from DSD, the German federal environment ministry and the Bund für Umwelt- und Naturschutz, which has a specifically national focus and is the biggest German environmental pressure group apart from Greenpeace. These interviews were merely undertaken to gain information and insights, which were not readily accessible otherwise, and no pretence of representativity is made here.

DUALES SYSTEM DEUTSCHLAND: A SUCCESSFUL VA

While VAs usually are the instrument for environmental management preferred by the private sector¹, environmentalists are often less enthusiastic about them (Jenkins 1995; European Environment Agency 1997, p. 50). Their major concern is that VAs might lead to a watering down of environmental protection standards. Game theoretic analysis by Segerson and Miceli (1998) and Schmelzer (1999) shows that under certain conditions the environmental standard negotiated in a VA will always be less than the standard that would be imposed via binding public regulation. Additionally, Bizer (1999) argues that VAs are often agreed upon by the private sector to buy time and to delay more substantial environmental protection measures into the distant future.. On the other hand, there do exist VAs that seem to function quite successfully and do not appear to come about at the expense of environmental standards (Bizer and Jülich 1999).

For a VA to be successful, it has to fulfil a number of conditions, however. The most common ones to be found in the relevant literature can be summarised as follows (see, for example, Preimesberger 1997; European Environment Agency 1997; Rennings et al. 1996; SRU 1998; Bizer and Jülich 1999):

¹ But see Eden (1997) for the notable exception of the UK packaging industry.

- the targets need to be clear and transparent and in a quantitative form. The targets must cover the long-term, but intermediate goals need to be set up as well.
- the targets themselves must not be the object of the VA. Otherwise easily achieved targets are set up that are often nothing more but the codification of future business as usual projections.²
- compliance with the agreement as a whole needs to be ensured via backdrop regulatory threats.
- external and internal free-riding needs to be deterred: no relevant companies may stay outside the agreement and companies that sign up to the agreement must also follow its obligations.
- the agreement needs to be monitored, supervised and verified and the evaluation made public.

The DSD fulfils most, if not all, of these conditions for a successful VA:

- First, the German Packaging Ordinance and its amendments lay down quantitative targets for how much of a given type of packaging has to be recovered, that is, recycled (only in the case of plastics up to 40% of the collected packaging waste can be incinerated instead of recycled). See table 1 for an overview.

² As examples for this, see the German industry's 'Declaration on Global Warming Prevention' (Kristof and Ramesohl 1999) and many of the VAs in Denmark (Neale 1997).

< INSERT TABLE 1 HERE >

- Second, the targets are set exogenous to the DSD. They are set by the federal government (*Bundesregierung*) with the approval of the federal parliament (*Bundestag*) and the chamber of state governments (*Bundesrat*). Of course, lobbying takes place for 'soft' targets. Intensive lobbying achieved, for example, that the targets set in the original Packaging Ordinance from 1991 and as amended in 1993 were lowered *in retrospect* for 1996 in the 1998 amendment, as the targets had not been achieved. Whereas with respect to paper/cardboard, glass and aluminium these targets might not have been much stricter than what the industry would have found profitable to achieve in any case (SRU 1998, p. 211), at least with respect to plastics the German packaging industry had to engage in substantial investments to provide the infrastructure for packaging waste collection and recovery – see table 2 for an overview of costs. At least with respect to plastics, but to some extent for other packaging types as well, the DSD cannot therefore be denounced as undertaking something under the guise of VA, which the packaging industry would have done anyway. Further evidence for this stems from the fact that several earlier attempts in the 1970s and 1980s to persuade the packaging sector to increase recycling rates failed because no alternative binding regulation was threatened (BUND 1988, p. 6; Rennings et al. 1996, p. 248).

< INSERT TABLE 2 HERE >

- Third, the Packaging Ordinance and its amendments ensure compliance via backdrop regulatory threats. §6 section 4 of the Ordinance threatens to recall the exemption from individual collection and recycling duties if the collective system, i.e. the DSD, fails to ensure collection from all consumers and recycling of packages according to the collective quotas in table 1. A special rule applies to beverage packages. According to §8 section 2 of the Ordinance the share of re-usable beverage packages must not drop below 72%. If it does and continues to do so for a period of 12 months after the official announcement of the failure to reach the target, then the federal government threatens to introduce a compulsory deposit-refund system for those beverages for which the target was missed. While these mechanisms appear to be cumbersome, a clear regulatory threat for non-compliance is existent at least.³ As such, the DSD is different from many other VAs in Germany

³ Possibly there will soon be a test whether the threat of a compulsory deposit-refund system is credible: for the first time the 72% target was not reached in 1997. This failure is mainly due to the strongly increasing use of non-reusable beer cans at the expense of reusable glass bottles. Between February 1999 and January 2000 fulfilment of the target is re-examined. Federal environment minister Jürgen Trittin has threatened to introduce a compulsory deposit-refund system for beer and mineral water in case of renewed failure to reach the target (Trittin 1999).

which are of an informal nature and do not include sanctions for non-compliance (European Environment Agency 1997, p. 29).

- Fourth, free-riding has been successfully deterred by now. The DSD had enormous problems in the beginning with companies who did not join the DSD, did not pay the fees for packaging waste collection and recycling, but nevertheless used the so-called Green Dot, a special mark printed on packages with which packagers signalled their membership of DSD. Rennings et al. (1996, p. 261) estimate that up to 40% of packages with the Green Dot originated from free-riders. This problem has now been successfully tackled by more stringent controls through DSD. Another free-riding problem was that some companies refused to use the Green Dot and thereby refused to join the collective system, declaring that they would collect and recycle their packaging waste individually. In reality, however, consumers did not check whether packaging waste carried the Green Dot or not and disposed all waste into the facilities provided by DSD without discrimination. As a consequence, companies that refused to join the collective system could in effect get away without providing an alternative individual system. This prompted DSD to call for binding public regulation to deter this kind of free-riding. In August 1998 a new Packaging Ordinance came into force that requires companies which do not license their packaging with DSD to meet by 2000 the same recycling targets as DSD and demands detailed documentation and proof for this. As a consequence, free-riding has all but vanished.

- Fifth, monitoring, supervision and verification is minutely regulated. According to Annex 2 of the Ordinance, the DSD has to document for each type of packaging waste how much packaging has been produced, how much has been taken back from consumers and how much of it has been recycled. This documentation needs to be verified by an independent expert or environmental assessor and is made public.

LESS SUCCESSFUL ENVIRONMENTAL IMPROVEMENTS

Given that the DSD fulfils most, if not all, conditions for a successful VA, it might be tempting to presume that it has also been successful in achieving significant environmental improvements in the packaging waste sector. Such a presumption would be overhasty, however. To start with, the system of packaging waste collection and recycling is very expensive. As can be seen from table 2, it costs the German economy around 4 billion DM per year (approximately £1.3 billion). This represents a very high cost indeed, even if costs (expressed as licence fees paid by members of DSD) in 1999 were reduced by 9.5% and DSD promises further reductions in the future (Brück 1999).⁴ These high costs are problematic for two reasons: first, in a world of scarce resources and therefore limited willingness and ability to pay for environmental improvements, money that is spent on one purpose is lost for another. Given that packaging waste

⁴ The licence fee reduction led to a decrease of costs in per capita terms from about £17 to £15.

represents merely about 24% of all household waste which in turn represents only about 13% of all waste in Germany, about 4 billion DM are spent on handling a mere 3% of overall waste (Statistisches Bundesamt 1996). Indeed, as the majority of costs accrue with respect to the recycling of but one fraction of packaging waste, namely plastics, the cost efficiency of achieving environmental benefits is rather dubious. Second, there is widespread uncertainty about the actual environmental improvements the DSD has brought about. Any environmentally benign effect from packaging waste collection and recycling must stem from either savings in landfill space and incineration capacities or in reductions in energy and natural resource use for the otherwise 'necessary' production of new packages.⁵ With respect to the first aspect, DSD collects around 5 million tonnes of packaging waste each year, which reduces pressures on landfill and incineration facilities (DSD various years). On the other hand, the severe shortages in these facilities from the late 1980s and early 1990s have now given way to over-capacities, especially as concerns waste incineration, so that this aspect does not play such an important role any longer (SRU 1998). With respect to the second aspect, some of the natural resources and the energy embodied in the packages can be recovered via recycling, even if energy and

⁵ In the case of plastic, part of the positive environmental effects can stem from a recovery of its energy content via incineration.

natural resources are needed for the collection, sorting and recycling of packaging waste.⁶

The question remains, however, whether an alternative packaging waste management policy could not lead to a higher reduction of natural resource and energy use at the same or even at lower cost. From an environmental perspective, the greatest reduction potential lies in the avoidance of waste rather than in waste collection and recycling (Kopytziok 1992). Recycling can only partially recover the resources and the energy embodied in the recycled packages. Resources and energy are consumed in the process of collecting, transporting, processing, marketing and using the recycled materials. Given that ecologically committed scholars and environmental activists usually postulate reductions in resource and energy use by a factor of 4 as a target over the next 50 years or so (Ayres and Simonis 1994; Weizsäcker et al. 1996; Friends of the Earth 1999), it seems impossible to contribute substantially to reaching such an ambitious goal with an emphasis on recycling rather than avoidance of waste. Furthermore, pollution is produced at various stages of the recycling process. For example, the recycling of aluminium produces substantial amounts of slag, which is contaminated with toxic metals and dioxines. The so-called de-inking of recycled paper causes contaminated sewage mud. Lastly, materials cannot be endlessly

⁶ Unfortunately, there does not exist any comprehensive study quantifying the savings in energy and natural resources due to DSD. For the Bund für Umwelt und Naturschutz Deutschland, it is one of its major critiques that DSD does not have to document the environmental effects of its system of collecting, sorting and recycling.

recycled. For example, the fibre length of paper is reduced in each cycle of recycling such that the fibres become too short and new cellulose has to be added.

In terms of avoidance the DSD's performance is rather poor, however. Admittedly, it is not completely lacking incentives for avoidance. First, as every package carries a licence fee, the DSD leads to an implicit price rise for packaging, which decreases its consumption. Second, the licence fees are not only differentiated according to the weight and either the volume or the surface of a package, but also according to the type of package in that the respective recycling cost has some impact on the licence fee. Because of the differentiated licence fee structure there is a relative price incentive to substitute easily recyclable packages for ones that are more difficult to recycle.⁷ According to Wolfgang Brück, president of DSD, consumption of packages in Germany decreased by 13 percent between 1991 and 1998 (Brück 1999). How much of this reduction can be attributed to DSD is unclear, however, for two reasons. First, the amount of waste more generally has stagnated or slightly decreased in Germany from 1990 onwards (Statistisches Bundesamt 1996; Ewers et al. 1997). Second, according to DSD figures the major reductions in packaging consumption have occurred early on in the period between 1991 and 1998, so that DSD, which came into effect in 1993, cannot be credited with achieving the full reduction.

⁷ Critics argue, however, that in order to become environmentally more effective, the licence fees would need to reflect more strongly the relative differences in difficulty to recycle certain packaging types. On this, see the federal environment minister's proposal that licence fees should better reflect ecological aspects, which is discussed further below.

What is beyond doubt is that the packaging waste collection and recycling system as represented by DSD does not give the same weight to waste avoidance as it gives to recycling, let alone prioritises avoidance.⁸ In many respects it rather encourages the consumption of packaging, which is contrary to the solemn declarations by both the packaging industry and former federal environment minister Angela Merkel that the Packaging Ordinance and DSD put emphasis on waste avoidance (AG Verpackung und Umwelt 1990; Merkel 1998). The 'Green Dot', its characteristic feature, suggests to consumers that in their consumption they need not worry about the accompanying packaging waste, as it will be recycled rather than disposed of.⁹ It might thus in the first place lead to a decrease in environmental concern of consumers about the overall amount of packaging production and therefore, *ceteris paribus*, to an increase in its consumption. Already in 1990, the German Council of Environmental Advisors (*Sachverständigenrat für Umweltfragen*) foresaw in a special report on waste management the danger that the DSD would not contribute to the desired avoidance of waste at the point of origin (SRU 1990, p. 4). The DSD might thus well be in conflict with the fundamental norm in §4 of the German Product Recycling and Waste Management Act from 1994 (*Kreislaufwirtschafts- und Abfallge-*

⁸ Partly, this is because the German electricity supply industry took over substantial parts of the packaging and other waste management infrastructure in the late 1980s and early 1990s (Anonymous 1989a, 1989b). These pressure groups supported prioritising recycling as this would guarantee profits to their investments.

⁹ The colour green was selected on purpose, of course.

setz) which gives priority to waste avoidance over recycling and incineration (or energetic utilisation (*energetische Verwertung*) as incineration is called somewhat euphemistically in the Act).

In some sense, of course, one could argue that the DSD, whose major purpose is recycling, is the wrong target for blame with respect to the failure of substantial packaging waste avoidance. Following this argument, it is the Packaging Ordinance itself or even the wider German policy with respect to packaging waste management that is fundamentally flawed. In my view, such an argument suggests a deceptive separateness of issues, however, as DSD is the major component of the Packaging Ordinance and the cornerstone of German packaging waste management. Nevertheless, this argument has merit in putting emphasis on analysing the wider context in which DSD operates. As a next step, it is therefore appropriate to look at the future of packaging waste management in Germany.

THE FUTURE OF PACKAGING WASTE MANAGEMENT IN GERMANY

There are basically four possible options. One is to keep the system basically as it is now with small amendments. For example, Germany's federal environment minister Jürgen Trittin has proposed that the structure of licence fees that DSD charges to the producers of packages should reflect ecological aspects more strongly (Trittin 1999). In other words, the relative price for packages that are difficult to recycle or are intensive in resource and energy consumption should

increase. For example, at the moment all plastic carries the same fee, but some types of plastic are easier to recycle than others. Such a strategy is likely to make DSD somewhat more environmentally friendly, but will not lead to any substantial avoidance of packaging waste. For the special case of beverage containers, it is unclear whether the deposit-refund system, that is threatened to come into effect if the quota of reusable packages persistently falls short of 72%, will be environmentally beneficial. Instead, it might even further increase the use of non-reusable cans and thereby defeat its original purpose. This is because a mandatory deposit-refund system on cans suggests environmental friendliness to consumers who might no longer be able to distinguish between the different environmental effects of non-reusable and reusable systems and might prefer the lighter and more easily transportable cans to the heavier glass bottles. The mandatory deposit-refund system might thus very well defeat its own purpose of encouraging the use of reusable packages. This is a fundamental flaw symptomatic of a system that is hostile towards levying taxes on or banning non-reusable packages where alternatives exist.

The second option also keeps the system basically as it is now, but tries to reduce its costs in taking small and difficult to recycle packaging waste, especially plastics, out of the system's coverage. These types of packaging wastes would be labelled with a Red Dot instead of the Green Dot in order to signal to consumers that these should be disposed of with the normal household waste and should not be put into the facilities provided by DSD. This proposal has been around for some time already (SRU 1998, p. 211). Because consumers have in

the past not distinguished between packaging waste that carried or did not carry the Green Dot, it seems unrealistic to expect that consumers would distinguish between packaging that carries the Green or the Red Dot, however. Apart from the practical feasibility of this option, its environmental soundness is open to question as well. It would cancel out the ongoing progress that is being achieved with automatic sorting technology and innovative recycling techniques for these types of packaging waste. DSD (1999b) expects that 'fully automatic sorting technology will be the norm in the German waste disposal industry by the middle of the next decade' and that the 'problem of packaging that is "difficult to recycle" or small will therefore resolve itself from a technical point of view'.

The third option is to keep the system of recycling, but to introduce alongside strong fiscal or regulatory incentives for waste avoidance. This could be achieved via a general tax on packages, via especially high taxes on non-reusable packages where reusable alternatives exist as in the case of beverages or even via an outright ban of certain environmentally unfriendly packages. Eco-balances undertaken by the German Federal Environmental Agency (*Umweltbundesamt*) show that reusable packaging for beverages is in general ecologically superior to non-reusable packaging, especially if the packaging is standardised and the beverages come from regional production (Umweltbundesamt 1996). This third policy option would be explicitly directed at waste avoidance and is likely to lead to the strongest reductions in packaging waste and in the consumption of resources and energy. It is doubtful, however, whether such a

strategy would be consistent with European Union law. The EU and its Commission have so far been rather hostile towards the banning of certain packages (see the next section below).

The fourth option is to abandon all recycling targets and to abolish the DSD as a collective system. Such a position is held by some economists who call for a clearly market-oriented approach towards packaging waste management and regard the DSD as a major hindrance towards achieving free markets in the waste sector.¹⁰ According to Ewers and Tegner (1998, p. 3) the government should not determine how much waste is produced, avoided or recycled. The only thing it should do is to ensure that all externalities of waste disposal are internalised. The presumption is that the price signals following from internalisation will work their way backwards through all markets and will lead to the efficient level of waste production, avoidance and recycling via the invisible hand of the market. Such a position ignores, however, that very often a full internalisation of externalities is impossible because of uncertainty and ignorance about the complex effects of pollutants on ecosystems (Neumayer 1999, pp. 98-102). The identification and monitoring of environmental hazards and their assignment to specific pollutants is often impossible. Furthermore, such a position ignores the fact that the major problems of packaging waste are not environ-

¹⁰It is also a position shared by the German Council of Environmental Advisors (*Sachverständigenrat für Umweltfragen*) (SRU 1998), which is not surprising as its member responsible for the waste sector (Prof. Hans-Jürgen Ewers) is one of the major proponents of the market-oriented approach (Ewers et al. 1997).

mental hazards in disposal, which are rather small, but the waste of scarce energy and natural resources in the process of packaging production, recycling or disposal. As this fourth option is not likely to lead to substantial waste avoidance and potentially leads to lower recycling rates, it is the least preferred option from an environmental point of view.

The first option is likely to characterise the future of packaging waste management. The second and the fourth option are unlikely because there is currently no political party in Germany that wants to go this way. Also, such an option would clash with Germany's obligation to implement the European Union Packaging Waste Directive 94/62/EC, which prescribes the basic idea of the German Packaging Ordinance for all EU countries in setting minimum targets for packaging waste recovery (see below).

The third option is also not likely to become reality. Any further fiscal or regulatory interventions in the packaging sector would face furious hostility by the packaging sector. After all, it has originally agreed on the DSD merely to fight off more far-reaching regulation. While environmentalists and possibly minority factions of the ruling Social Democratic and Green parties could support this option, it is unlikely that they could gain a majority within their party, let alone convince the federal government to engage in a new conflict with the industry.

THE EUROPEAN UNION CONTEXT

Turning to the wider European Union context, the most important policy initiative has been the EU Packaging Waste Directive 94/62/EC. Similar to the basic idea of the German Packaging Ordinance, Article 6 of the Directive requires member countries to achieve a minimum target of 50% of packaging waste materials to be recovered from the waste stream no later than five years after implementation of the Directive. An exemption to this general rule applies to Greece, Ireland and Portugal, which are required to recover merely 25% initially and 50% only from 2006 onwards. Article 7 encourages the 'participation of the economic operators of the sectors concerned' and thus effectively encourages the establishing of VAs for packaging waste treatment in the European Union member states. In Austria, Belgium, France, Ireland, Luxembourg, Spain and Portugal the packaging sector has set up associations similar to the DSD. The DSD has played an active role in encouraging this process in transferring its copyright for the 'Green Dot' to the Packaging Recovery Organisation Europe (PRO EUROPE) in Brussels in December 1996, which in turn grants user rights to the mentioned associations outside Germany. According to DSD (1999a) around 212 million people in the European Union now consume goods that carry the 'Green Dot'. To some extent, therefore, the German Packaging Ordinance and DSD functioned as a role model for the EU Directive and the developments in European packaging waste management.

As with the German Ordinance, the Directive does not contain any substantial incentives for packaging waste avoidance. Caps on the overall amount of

packaging waste were originally envisaged in a pre-draft of the Directive, but had to be cancelled due to opposition from member states and lobbying pressure by the packaging sector (Golub 1996, p. 7 and 9). What remained in the Directive are non-binding statements such as 'the best means of preventing the creation of packaging waste is to reduce the overall volume of packaging' and the allowance for member states to 'encourage reuse systems of packaging (...) in conformity with the Treaty' in Article 5. That these provisions can hardly be considered more than vague phrases, can be inferred from the fact that the Commission regularly quarrels with member states, which actually try to encourage reuse systems of packaging. For example, the Commission has sent so-called reasoned opinions to Germany regarding its Packaging Ordinance regulations 'which continue to promote the re-use of packaging materials' and to Denmark 'as metal cans for drinks and other types of non-reusable packaging are banned there' (European Commission 1999, p. 32).¹¹

In many other respects, the Directive is even less environmentally friendly than the German Ordinance. The reason is that the Directive does not simply follow the German role model, but represents a compromise resulting from the differing policy concepts with respect to packaging waste management and the ensuing regulatory competition among member states.

¹¹ Before the passing of the Packaging Waste Directive, the Commission had already in the 1980s unsuccessfully challenged the Danish bottle recycling system in the European Court of Justice (Case No. 302/86).

First, in addition to the mentioned minimum targets, the Directive also sets a maximum target of 65% of packaging waste recovery. According to Article 6, para. 6, Member States can only set programmes going beyond this maximum target 'on condition that these measures avoid distortions of the internal market and do not hinder compliance by other Member States with the Directive'. The motivation for these provisions stems from the adverse consequences the German Packaging Ordinance initially had on other member states. At the very beginning of its existence, the DSD did not have sufficient national capacities to process the total amount of recycled packages that it was required to recycle according to the Ordinance. As a consequence, large amounts of recycled materials, mainly paper, were dumped in other EU countries and the Far East, causing angry reactions by foreign companies, especially in France and the United Kingdom (Biod, Probert and Jones 1994; Eden 1997, p. 234). The Commission feared that retaliatory measures by other EU member states and counter-measures by Germany could potentially undermine the objective of the Single European Market and the Directive was an attempt to contain trade frictions among the member states with respect to recycled materials. Maybe even more than by environmental motives, the Directive was therefore triggered by concern about the smooth functioning of the internal market. Further evidence for this is that the Directive is explicitly based on Article 100a of the Treaty establishing the European Community, instead of Articles 130r to 130t. Whereas the latter articles encompass the environment chapter of the Treaty, the major ob-

jective of Article 100a is the synchronisation of national legislation in order to remove and avoid internal barriers to trade.

Second, contrary to the German Product Recycling and Waste Management Act, on which the amended Packaging Ordinance is based upon, the EU Directive, while paying lip service to preventing the creation of packaging waste, does not even contain a clear hierarchy of objectives and disposal methods in which the prevention of packaging waste ranks higher than recycling which in turn ranks higher than incineration.

Third, and related to the last point, the Directive positively encourages the incineration of recovered packaging waste as an alternative to material recycling. In this respect, it follows the French model of packaging waste management (see Biod, Probert and Jones 1994). Article 6 of the Directive again sets a maximum target of 45% and a minimum target of 25% by weight of the totality of packaging material and a minimum target of 15% by weight of each packaging material to be recycled. The rest is to be incinerated. As mentioned, the German Packaging Ordinance in contrast allows incineration for up to 40% of plastics only, all other recovered packaging waste needs to be recycled. A recent study by the Öko-Institut and the Deutsche Projekt Union (1999) aspires to demonstrate that material recycling is ecologically superior to incineration.

Fourth, and more generally, the recovery and recycling targets set in the Directive are commonly regarded as relatively lax, hardly exceeding already achieved targets in the member states (Gehring 1996, p. 21). This, together with the setting of maximum targets, was the main reason why countries like Ger-

many, Denmark and the Netherlands, which had already established more stringent national systems and had therefore envisaged more ambitious recovery and recycling targets voted against the Directive, when it came to a qualified majority vote in the European Council of Ministers in December 1994. The Commission's environment directorate (DGXI) has recently put forth a draft with new recycling targets which aim to increase the total target to 75% by 2006 with minimum targets for each packaging material to be increased to 45% (ENDS 1999). Whether these more ambitious targets will become reality, remains to be seen, however.

To sum up, the European Union and many of its member states have followed the German way of prioritising recycling over packaging waste avoidance. Associations similar to DSD were set up in other member states and in this respect DSD really is a prime example for a successful VA. That this success will translate into substantial environmental improvements at the EU level is rather unlikely, however. Significant reductions in the consumption of packages and the accompanying resource and energy savings are not to be expected. Worse still, many provisions in the Directive are hardly stringent and encourage incineration of waste packages at the expense of recycling. Similarly, while associations in other member states resemble the DSD, very often they are faced with much laxer targets for both collection and recycling of packaging waste (for more detail, see Brisson 1994).

CONCLUSION

If DSD fulfils most conditions for a successful VA, why does this success not translate into substantial environmental improvements? The answer is that the very idea of German packaging waste management is misguided. Instead of prioritising waste avoidance as actually demanded by §4 of the Product Recycling and Waste Management Act and in spite of solemn declarations in *Sonntagsreden* (cheap talk on special occasions) to the contrary, the system's focus is on waste recycling where avoidance can at best come about as an indirect effect. The environmental effect is therefore inferior to what a waste management policy with priority on avoidance could achieve: instead of the full resource and energy saving that would follow from waste avoidance, only part of the embodied resources and energy can be recovered with recycling and further resources and energy are consumed in the process of collection, sorting and recovering. There is an important lesson here for the assessment of VAs: even the best VA that fulfils all the conditions for success might achieve inferior environmental effects if its inherent logic is misguided from an environmental perspective. Most conditions for a successful VA one can find in the literature are *procedure-oriented*. They do not pay enough attention to the *contents* of an agreement. It is simply not enough to have monitored, long-term, quantitative, non-negotiable targets if the targets themselves are misguided.

However, the misguided contents might in turn be the consequence of an important procedural flaw of the way the DSD was established as a VA. Bizer and Jülich (1999, p. 62, added emphasis) conclude from an examination of sev-

eral Dutch and German VAs that 'participation of all legitimate and relevant actors in the negotiation and implementation process is likely to be positively related to higher *environmental* effectiveness. An early and adequate discussion of the environmental issues that involves all relevant parties helps to define the environmental problem and eventually the content of the agreement'. If one regards environmental groups as legitimate and relevant actors for packaging waste management, then it was exactly their involvement and impact upon the content of the agreement that was missing. From the beginning, environmental pressure groups and the opposition Social Democratic and Green parties were sceptical towards the DSD's priority of recycling over avoidance, but the then ruling Christian Democrat and Liberal parties together with the packaging industry deliberately ignored calls for greater emphasis on waste avoidance. In the DSD's board of trustees no environmental groups are represented. A consumer interest group left the board early on as it did not see its interests represented (Rennings et al. 1996, p. 231).

The DSD has by now very well established itself in Germany. Many of the initial problems such as insufficient and horrendously expensive facilities for plastics recycling or the already mentioned dumping of German recycled paper in other EU countries or South East Asia have now been solved. They have been what is called children's diseases (*Kinderkrankheiten*) in German: initial problems fading away after a while. The system is now in the process of realising its full innovative potential with automatic sorting technologies and refined recycling methods. However, this will not change its inherent logic which gives priority

to recycling over avoidance. Indeed, the better the DSD establishes itself, the more will this misguided priority lock itself in. The now ruling Social Democratic and Green parties have all but given up on any plans to reverse this priority, which provides a case in point. That many of the EU countries are following the same path is good news for DSD, but bad news for environmentalists who want to see substantial reductions in resource and energy use in the packaging sector that could only come about if the same innovative potential that is now being realised in the recycling sector was available for the avoidance of waste as well.

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Table 1. Recovery quota according to the German Packaging Ordinance.

	1/1/1993	1/7/1995	1/1/1996	1/1/1999
glass	42%	72%	70%	75%
tinplate	26%	72%	70%	75%
aluminium	18%	72%	50%	60%
paper/ cardboard	18%	64%	60%	70%
plastic	9%	64%	50%	60%
other composite	6%	64%	50%	60%

Table 2. Costs of the DSD.

	1993	1994	1995	1996	1997	1998
Total cost (bn DM)	3.1	3.4	4	3.9	4	3.9

Source: DSD (various years).