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# **The Evolution of Municipal Waste Management in Europe: how Different are National Regimes<sup>1</sup>**

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## **Abstract :**

The 1994 European directive on packaging waste let a diversity of conceptions of waste management to be developed and tested by reality in various countries. Such a diversity may raise drawbacks related to the achievement of the single market and the European law of competition. The paper describes the main differences in the regimes in five countries: France, Germany, the Netherlands, Italy and Greece. This comparative approach allows to identify four main variables in order to characterise policy regimes, which explain the degree of orientation of waste regimes to cost-effectiveness. A second result is to show that, in each country, implementation has resulted in learning, correction and self-regulation, which have reduced the initial divergences between national regimes. So an efficient harmonisation may be unexpectedly achieved by such a soft way without passing stringent European directives. Moreover, by playing the option of experimenting competing organisational and policy concepts, this approach of the European harmonisation would allow to reveal in 2004 the cost-effectiveness of alternative solutions at a moment when the European policy has to be reconsidered.

**Key-Words :** waste management, European harmonisation, economic instruments

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## Introduction

Municipal waste management has been submitted to radical changes from the beginning of the seventies in European countries. The legitimacy of illegal dumping and plain incineration drastically decreased to the profit of incineration with energy recovery, reduction at the source, sorting and recycling. With the severe increase of the costs involved by household waste management for the twenty past years, a general concern about the introduction of new and more effective instruments can also be underlined (Turner R., Pearce D. 1993, 1994). Economic instruments (taxes) and organisations based on voluntary agreements (DSD, Eco-Emballages) have been put into practice in almost every national waste management policies. However, municipal waste policies differ from one country to another to a remarkable degree. Within the European Union, a need of harmonisation amongst each national policies is stressed, because of the externalities that household waste management creates among member States (obstacles to free-trade, but also "waste tourism"). Rules introduced in Denmark or in Germany in favour of the multiple-use systems at the end of the eighties, or the *ecotaxes* adopted later by Belgium are the emblematic examples of such obstacles. They also are at the origin of the reflection on the need of an harmonisation on the topic, started in 1988-1989 and which gave birth to the "packaging directive" adopted in December 1994 by the European Union. Nevertheless, it seems that the directive still allows the member States to develop their own trajectory, without a serious technological or organisational coherence (Buclet N., Godard O., 1997). The risk in the future is therefore to have an increasing amount of externalities weighing on free-trade, but also on environmental protection. The objective of this paper is to analyse the key variables involved in national waste management policies, in order to understand what is really at stake regarding the European harmonisation. The interesting questions regarding the impact of national measures such as the Danish deposit-refund system, are not here developed<sup>2</sup>. They represent measures taken by some European countries, when the authors are interested in the identification of structural key variables influencing policy styles in Europe.

The paper identifies four main key variables: the nature of objectives; the technical options; the role of dialogue between public authorities and industry; the share of the responsibility between actors. This analysis will provide a rationale to identify the key-elements which ought to be taken into account at the European level to re-negotiate the "packaging directive" in a more effective manner. Our paper will study five European countries : France, Germany, Greece, Italy and the Netherlands<sup>3</sup>. Germany and the Netherlands represent the category of environmentally aware countries, while Italy and Greece are, partially or as a whole, in a situation known at the beginning of the seventies in other parts of Europe. France is an

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<sup>2</sup> See for this Buclet, Godard (eds.) (2001).

<sup>3</sup> A more in-depth analysis of those five national regimes, is developed in Buclet, Godard (eds.) (2000).

intermediary case. From one side the modernisation of municipal waste management started in the seventies. From the other side most of the opinion and economic actors do not consider environment as important as it is considered in northern Europe. These five countries put together therefore give a good panorama of the diversity it is possible to meet within the EU.

# 1. A common starting point : substitute or complete policies orientated towards elimination

The evolution of municipal waste management in Europe does not follow exactly the same timing. Nevertheless the five analysed countries – and above, the majority of European countries have faced a same problem. How to define a new municipal waste management policy which substitute or complete a regime essentially orientated towards elimination, which have been largely disqualified in its pertinence and interest ? For a long span of time, waste management policies favoured technical solutions which allowed the minimisation of the financial cost of waste disposal (landfilling, incineration without energy recovery). These policies were based on the assumption that treatment plants and landfilling were able to absorb and solve the waste management problem in a definite way. In the late eighties, different elements bring these orientations into question. A general protest movement arises against the technical choice based on elimination. In addition to the growing public concern relative to the noxiousness of landfilling, the population is increasingly hostile to the building of landfill sites. This phenomenon also concerns incinerators, which are accused of emitting diverse atmospheric pollutants (heavy metals, hydrochloric acid, dioxins). At the same time, the household waste systems have to cope with an increasing volume of waste produced which presses on treatment capacities. This leads to reconsider the techniques in use and to open the scope of waste management schemes to new or neglected options.

**Table 1. Share of landfill in some European countries (1990)**

Country	% of landfilling
Greece	100%
Ireland	100%
United Kingdom	90%
Italy	80-85%
Finland	78%
Spain	74%
Germany	70%
France	52%
The Netherlands	52%
Belgium	49%
Austria	48%
Sweden	35%
Denmark	15%

Sources : Leppänen A. (1994) ; Royal Commission on Environmental Pollution (1993) ; Department of the Environment (1992) ; DSD (1995), other

A common feature was to re-orient the national policies in order to insure the development of sorting and recycling options, which was neglected (and nearly abandoned) since the 70ies in almost every country. This is the reason why the emphasis have been put on household packaging waste. Packaging waste is the fraction of waste with the highest increase rate in industrialised countries. It represented between 25% and 30% of the total amount of household waste in weight and nearly 50% in volume. It is also the type of household waste which constitute the primer source of secondary raw materials.

A second common point regards the use of organisations close to “voluntary agreements” in order to reach the defined objectives regarding packaging waste (DSD in Germany, Eco-Emballages in France, material consortia in Italy, packaging covenant in the Netherlands) (Whiston T., Glachant M. 1996). Voluntary agreements are considered as a "third generation" of policy instruments (Dente B. 1995). The choice of voluntary agreements expresses the clear will of national regulators to involve and make responsible the implied actors in the regulatory process. By this way, national regulators intend to take advantage of decentralised choices (for technical choices, financing support, timing of the implementation) and of the co-operation between actors. The idea is indeed that the objectives could be reached to the best economic conditions, with well-fitted techniques and to the least cost. Organisation costs and the negative effects of asymmetries of information should indeed be minimised, thanks to the implication of the industry. Yet such gain may be expected only if the decentralisation of choices is counterbalanced by incentives strong enough to orient actors towards the achievement of defined objectives (Godard O., Beaumais O., 1994 ; Godard 1997). The right economic signals must be given to decentralised actors.

## **2. Differences in objectives and organisational solutions**

### **2.1. Objectives**

The nature of objectives, their ambition regarding the introduction of upstream solutions, represent the first key variable characterising municipal waste management policies in Europe. Despite a common concern about the replacement of elimination techniques as the cornerstone of the national policies, public authorities did not adopt the same objectives. They are different by their implementation field (concerned type of waste) and the requirements they set. Italy was the first European country to adopt quantitative objectives dealing with packaging waste for very specific products (beverage packaging), while France focused on domestic packaging waste and Germany and the Netherlands on the whole packaging field. In

Greece the tendency should be to follow the French solution. Besides this heterogeneity in targeted waste categories, there is also the diversity of the level of objectives and of the time table left to the actors to compel them.

Each country points out the necessity of developing recycling and energy recovery. Besides, there are some countries emphasising on reduction at the source and refilling, while others do not mention any measure in this sense. Germany and the Netherlands have set regulatory arrangements specifically dedicated to preventing packaging waste production. Furthermore, Germany tries to have an influence on the production and composition of household packaging waste flows via the setting of incentive and differentiated taxes on packaging materials. Germany has not defined any clear objective regarding the production of packaging waste, while the Netherlands has set a limit : packaging waste volume generated in 2000 should not be more than in 1986. In Greece, France and Italy, reduction at the source is not an objective by itself. France and Italy favour valorisation without measures on prevention, while Greece main concern still regards the organisation of controlled elimination schemes.

**Table 2. Objectives in the five analysed countries**

<b>Country</b>	<b>Objectives</b>	<b>Time table</b>
<b>France</b>	Domestic packaging: 75% of valorisation <sup>4</sup> Municipal waste: 100% of valorisation except for ultimate waste <sup>5</sup>	1992-2002
<b>Germany</b>	Packaging: between 60 and 70% of recycling <sup>6</sup> Deposit refund scheme and quota of 72% of rebottling for beverage	1991-1998
<b>Greece</b>	Packaging recycling specific <sup>7</sup> objectives of the 62/94/CE directive: 25% of recycling	1994-2000
<b>Italy</b>	Beverage packaging: 50% (glass, metal) or 40% (plastic, composites) of recovering Since decree of 1997, between 50% and 65% of recovering for the whole packaging waste (between 25 and 45% of recycling)	1988-1992 (regularly postponed) 2002 for 1997 objectives
<b>Netherlands</b>	Packaging waste volume generated in 2000 should not be more than in 1986. No more landfilling. Minimum of 60% of packaging waste recycling	2000

<sup>4</sup> Valorisation is a generic term including recycling, composting, incineration with energy recovery and any other form of energy recovery (methanisation, co-generation, etc.). In April 1998, an indicative objective of 50% of recycling for household waste has been announced by the Ministry of the Environment. No time delay has been fixed.

<sup>5</sup> Ultimate waste includes any waste, resulting or not from former treatment, which is not likely to be valorised, given the technical and economical conditions of the moment.

<sup>6</sup> For plastics, recycling quotas have been lowered. 60% have to be recovered as a whole and at least 36% have to be recycled (material recycling). Chemical recycling is therefore limited to 24%.

<sup>7</sup> Greece, Ireland and Portugal benefit of specific and less stringent measures.

The distinction in objectives (prevention plus valorisation in the first case, only valorisation in the second one, mainly elimination in the third one) has important consequences on the type of instrument used in different countries.

## **2.2. Responsibility and levels of co-ordination**

As in any field, the structural organisation of municipal waste management is a crucial point to make objectives effective. It is therefore the second key variable interesting this paper. In most countries, municipalities (or equivalent local authorities) are responsible of the management of household waste. It is the case in France, in Greece, in the Netherlands. In Germany the regulator has limited their field of competencies and has given to DSD the responsibility to manage and finance the packaging waste valorisation schemes. The German choice is an exception in Europe. The industry has to bear the whole management cost for packaging waste, while in France the industry is in charge of only part of it, the over-cost due to the sorting and to the separate collection. There is many organisation models of waste flows management and of sharing responsibilities and charges between public and private actors. Germany chose to divide waste flows (packaging waste from one side, other waste from the other) and to associate to each flow a total operational and financial responsibility, even if such a choice create potential over-costs due to the multiplication of organisational schemes. The other countries took the option to not divide flows, to link only partially organisational with financial responsibilities, in order to rationalise collecting and recovery schemes organisation. This option is even reinforced by the existence of departmental (in France) provincial (in the Netherlands) or regional (in Italy) plans. Those plans aims at giving coherence between local decentralised initiatives, and at rationalising schemes in order to fit with the national regulatory objectives. In the Netherlands, a waste management deliberation body (the AOO) contributes to this waste planning. It plays the role of a deliberation platform for the main concerned actors (the Ministry of the Environment, the Association of Municipalities, the Association of Provinces, Environmental and Consumers organisations). Therefore, while in the other countries the co-ordination is made at the level of municipalities and local authorities of a higher range, in the Netherlands co-ordination regards both local and national levels, with the advantage to give more coherence to local initiatives within the national framework. There is for instance a strong co-ordination between the waste stream capacities of the provinces and an agreement between them on the allocation of waste.

## **2.3. Technical and economical choices**

The important point, regarding the third and fourth key variables here presented, is linked to the existence, or non-existence, of a belief in the capacity of the actors implied to find by their



own the best way to reach objectives. The more is such a belief, the more intense are dialogue between public authorities and industry on the rules to be adopted, and the more flexibility is left to the actors regarding the choice of techniques.

### **2.3.1. Hierarchy of techniques**

Some countries (Germany, the Netherlands) have decided to strictly hierarchy the technical options which can be used to prevent and to valorise household waste. Others have let actors free to choice between several techniques, without any clear mention of preference. This is the case of France, Italy and Greece. In France, if the orientations defined by the law of July 1992 put a limit on landfilling in order to favour valorisation, there is no hierarchy among the techniques of valorisation. For packaging waste management, recycling, composting and incineration with energy recovery are put on the same level. Germany and the Netherlands, at the contrary, give many importance to the hierarchy between techniques. Their priority order is the following : prevention, material re-use, material recycling, incineration with energy recovery, disposal other than landfill, landfilling. The private and local public actors have to respect it. For example in Germany for packaging waste, the DSD has to reach the valorisation objectives only with recycling. The use of incineration with energy recovery is available once the recycling objectives have been already reached (DSD, 1995). The creation of an technical hierarchy is a structuring choice for the whole concerned actors and may be the starting point of the development of a specific technological trajectory, based on a technique or a range of existing or future techniques. The fact that several countries have opted for one type of hierarchy – while others did not – favouring the recycling, leads to predict that contrasted technical and industrial trajectories will develop in Europe.

The second important consequence of the hierarchy, or of its absence, regards the level of the costs of household waste management. The countries which choose to opt for a sort of “technological interventionism” (by adopting a hierarchy) have, at least in a first phase, to support much higher management costs than the others. Two elements are responsible of this : firstly a country which asks the actors to adopt mainly or exclusively one technique, loses the expected benefits of a complementary use of other solutions better adapted to some fractions of the waste flow (Bertolini G., 1994). Secondly, this country has to accept to pay the over-costs due to the R&D investments, and to the efforts necessary to adjust, adapt and diffuse at an industrial level the technique. For instance, it seems that 40% of the overall cost of DSD in Germany have been used to support and develop the separate collection, sorting and recycling of plastics in 1995 (Coopers & Lybrand, 1995). These two types of factors explain in part the differences of costs observed for instance between France and Germany in the field of packaging waste management (Defeuilley C., Quirion P., 1995).

### **2.3.2. Economic instruments**

Besides the direct regulatory measures (quotas, eventual ban of some techniques), most countries, with the exception of the Netherlands, which focus exclusively on voluntary agreements, use some kind of financial mechanisms in order to have the necessary means for reaching the objectives. However, the nature and the level of financial mechanisms are slightly different from one country to another. Many types of instruments are used : landfilling levies are used in France and in Italy (but also in other countries not being analysed here, like Denmark and the United Kingdom); contributions on packaging are introduced on the market (France, Germany); levies are put on some products (like the levy on plastic bags in Italy, introduced at the beginning of the 90 and suppressed after a few years). These instruments combine in a variable proportion an incentive purpose and a financing one. Landfilling levies are used in order to finance the development of valorisation techniques and partly fill the existing price gap between these techniques and landfilling. The contributions on packaging aims at financing selective collection and sorting and may also have a structural effect on the use of packaging (choice of the materials, type of filling technique, nature of the flow to be treated). There are also more precise instruments. For example Eco-Emballages adopted in June 1996 a progressive scale of contributions to the local authorities (for plastic), which should incite them to reach a higher productivity for selective collection and sorting.

Those instruments (taxes, contributions, contribution scale) really incite the actors (firms, household, local authorities) only when they contribute to modify their behaviour. In this sense the instruments adopted are slightly different. Some instruments mostly have a financial dimension and only a scarce influence on behaviours. These are accompanying instruments. The level of the instrument is crucial : a reduced levy on landfilling will generate a signal too weak to weigh on the choice of actors. It will really incite actors only if it modifies the relative prices between two techniques (landfilling and valorisation techniques), two materials (glass and plastic for instance) or two types of packaging. The case of the Netherlands appears as an exception in this panorama. Since the early eighties the use of voluntary agreements have been favoured by the trend towards deregulation and the disappointing evaluations of command-and control evaluations. “By deliberation directly with the affected interest groups in society, support for a more powerful implementation was expected to increase” (Neumann F., 1997). Goals have been defined for the sectors of activity through agreements which take the form of common intention of declaration between the government and the industry (covenants) which are unforceable under civil law. The packaging covenant is one of the many covenants adopted in the Netherlands, as an alternative to the use of

economic instruments. The only compulsive instrument used in order to incite actors to change their behaviour is the landfilling tax effective since 1996. Its level, 15 Ecu per ton in 1996 is by far more inciting than the level adopted for instance in France.

**Table 3. Degree of incitement of the instruments**

<b>Country</b>	<b>Instruments</b>	<b>Degree of incitement</b>
<i>France</i>	Levy on landfilling: 6.15 Ecu/t (1998) Average contribution on packaging: 0.0015 Ecu	Weak Weak
<i>Germany</i>	Contribution per kg of packaging: between 1.53 Ecu and 0.07 Ecu. Differentiation of 1 to 19 between glass and plastic	Strong
<i>Greece</i>	No instruments. Projects of adaptation of Eco-Emballages to the Greek regime	Null
<i>Italy</i>	Contribution on plastic bags: 0.07Ecu per unit Levy for packaging unit from 0.01 to 0.05 Ecu per packaging	Strong Weak
<i>The Netherlands</i>	Levy on landfilling: 15 Ecu/t (1996) Covenant	Medium Non measurable ex-ante

The countries with the most inciting fiscal instruments generally have objectives needing a modification of the behaviour of actors regarding technical choices or production processes. This is the case of Germany, of Italy (for non-biodegradable plastic bags). This should be the case of the Netherlands if they had not chosen voluntary agreements. Italy has introduced a tax on non-biodegradable plastic bags in order to dissuade their consumption and encourage the use of substitutes. Through the DSD, Germany took inciting measures with high contributions differentiated between materials. This was necessary to reach in time the objectives. The definition of objectives (recycling plus prevention) and the technological interventionism for packaging waste management, explain the high level of the DSD taxes. The expected effects of high and differentiated contributions – viability of the recycling sector, reduction of packaging introduced on the market, substitution effect between materials – should help to reach very constraining objectives.

The constraints introduced by the Dutch case are slightly different. The change in the behaviour of the actors, and most of all of the industry, is not incited by any financial item. The involvement of all parties is expected to permit the fulfilment of the objectives in the most efficient way, thanks to a co-operation favourable to the creativeness in finding low-cost

solutions. Of course the enforceability of the covenant, if not respected by the actors, is under question. However until now, and even if the objectives are not precisely reached, there is no case of clear failures. For the specific case of the packaging covenant, however, firms not willing to follow the covenant prescriptions' place themselves automatically under the jurisdiction of the Dutch transcription of the European Directive. In the eyes of industry this mechanism prevents from a free-riding strategy of firms.

In France and Italy, the levies on landfilling are low and do not fill up the gap of relative prices between recycling and elimination. The main political impulsion does not rely on them. They aim at facilitating the adoption of technical and organisational schemes for valorisation (in France, the driving force of valorisation is the obligation to valorise in 2002 any waste, at the exception of ultimate waste). The same reasoning may be used for packaging waste. The instruments used in France are not inciting the actors to modify their behaviour. Eco-Emballages sustains municipalities by financing part of the selective collection and of sorting. Its action does not have any effect upstream. Yet, the choice of a non-hierarchy between techniques of valorisation, the incineration with energy recovery being at the same level of recycling, and the absence of intermediary valorisation objectives for each type of technique, should have call for stronger inciting instruments. This did not happen (Defeuilley C., Lupton S., Serret Y., 1997).

### **3. The obstacles to implementation**

Whatever are the objectives fixed, the organisation or the instruments adopted, each national policy have been submitted to revisions of the chosen procedure to reach objectives. Yet, the interesting point is to see to which extent a decentralised procedure is able to facilitate the evolution of the regime through the required corrections.

In the Netherlands, in 1996 the goal to reduce packaging introduced in the market in 1994 were already attained for aluminium, tinplates, glass and paper-cardboard. Not surprisingly, this is not the case for plastics<sup>8</sup>. This led the actors implied in the packaging covenant to elaborate various co-covenants, one for each material. This new subdivision gives more responsibility to the producers of specific materials, avoiding the whole covenant to fail because of the lack of efforts of some material producers, which could penalise other

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<sup>8</sup> It is indeed the case in any country. Reasons are roughly the following ones: plastic recycling is only developed for industrial waste, where it is easy to get big quantities of homogeneous materials. It is indeed crucial to recycle flows of plastic strictly homogeneous. Regarding household waste, plastics are heterogeneous, each category having to be sorted with extremely expensive processes. The required economies of scale are hardly reached by sorting units. This leads to new potential solutions, such as the conception of more homogeneous -speaking of plastic composition- packaging, easier to sort. Industry now "tends" to conceive packaging in such a way.

producers having done the necessary efforts. The Dutch regime also encounters financial problems, because of problems of incineration over-capacities, while much of the waste is still landfilled. The income of landfills does not compensate by far the financial losses due to the incinerators being under-used.

In Italy the system of Obligatory Syndicates grouping for each material the producers, has not brought to the expected results. In the case of glass and of paper-cardboard, they have been useful to consolidate the already good recycling results obtained but did not succeed in reaching the objective within the established delay. The progression in plastics, though insufficient to comply with the objective of 40% of recycling, is impressive with 31% of recycling in 1996. This figure however masks the fact that most of the plastic recycled does not belong to the domestic packaging waste category. Another problem relies on the weak participation of the municipalities to the functioning of the system. The Obligatory Syndicates had the responsibility to manage the recycling of materials but not the separate collection schemes, still at the hands of the municipalities. Many municipalities did not make any effort until recent times, and no sanction were foreseen for municipalities.

In Germany, the problems are not directly bounded to the attainment of the objectives. They mostly regards the externalities caused by the functioning of the DSD. The sorting objective has been reached even more easily than it was initially scheduled. If the financial crisis of 1993-1994 may be called a “growth crisis”, the problem of lacking capacities to recycle sorted materials has been solving by exporting the materials abroad. This phenomenon has created distortions on secondary markets abroad, because the German DSD financially supports the whole collection and sorting operations, while this financial supports in other countries are only partial (like in France) or even non-existent (like in the Netherlands). Sorted material could therefore be sold in other countries at a lower price than the one including sorting and collecting costs. Furthermore, many times the materials collected and sold by the DSD has disappeared as “waste” and no more as a “secondary” commodity. Yet, the main problem for is the excessive cost of the DSD. Many actors have denounced the lack of mechanism controls against the rent-seeking strategy developed by the waste management operators. This, added to the dual system of the management, leads to many inefficiencies.

In France the objectives fixed in 1992 were not as ambitious as they were in Germany or in the Netherlands. Yet, some difficulties went out. The number of municipalities that have not yet made the appropriate investments to attain the expected valorisation rates is still very important. Their financial constraints are very important, they are often confronted with real budgetary difficulties and are reluctant to increase local taxes. Besides, the investment costs of the national waste management legislation have been largely underestimated (by 10 times).

Furthermore, according to the departmental plans elaborated in the last years, incineration with energy recovery would treat between 65% and 70% of the total amount of household waste (27% in 1989). The place of other valorisation techniques would be relatively limited. Composting (8%) and recycling (19%) represent together 27% of valorisation, versus 8% for landfilling and incineration without energy recovery (Denby-Wilkes V., 1996). The results of Eco-Emballages are also far from being very optimistic on its capacity to reach the objectives in time (Eco-Emballages, 1998). In 1997 Eco-Emballages has reached a valorisation level of 1.8 million tons of packaging waste (72% recycling, 28% energy valorisation). The overall valorisation rate (recycling and incineration) of household packaging waste reaches to 31% (22% for recycling alone).

In Greece the problem are radically different. Illegal landfilling is still the “standard” of municipal waste management. An attempt of the Greek industry, in agreement with the public authorities, is to promote a system of separate collection close to the French Eco-Emballages. The limited scale of the experience does not allow any comment on the results obtained.

#### **4. A correcting evolution**

Except for Greece, which is still in the first stage of the elaboration of its regime, the four other countries analysed, enlightened by the feed-back of the first years of functioning of their regimes, decided to improve them.

In Germany, because of the excessive cost of the recycling of plastic, a debate has focused on the quantitative level to fix for it. After many negotiations, it has been decided to lowered the quota for plastic : 60% have to be recovered in total and at least 36% have to be recycled. Such distinction is new and gives more legitimacy to many techniques, like the “gasification” in steel mill as a substitute for fuel. Besides, measures have been taken in order to avoid the DSD to be too expensive. The operators are no more paid on the input “waste” they receive, but on the outputs of sorting and supports are progressively increasing in function of cost-efficiency. This should reduce the cost of the German regime. Besides, measures have been taken in order to limit the export of secondary material, which has been strongly criticised by other countries and by NGOs. There is a clear tendency to correct the most important problem of the regime, which is not by far to reach the fixed objectives, but to reduce the costs of its functioning and to suppress the subsidies to the export. The DKR, responsible of the recycling of plastics intends to stabilise the exportation to 10% and to stop financing plastic recycling in 2003.

In France, with the renewal of the Eco-Emballages agreement in 1996, a first correction has been brought to the regime, with changes in the method of calculation of the direct payments to local authorities, in order to favour more recycling and give a smaller incentive to incineration. After this, an official note from the *Ministry of the Environment* went on the 28<sup>th</sup> of April to modify the orientations of the French regime. The note insists on the higher place to give to the recycling (including composting) with a long-term indicative goal of at least 50%. It also clarifies the notion of *ultimate waste* which, until now, was assimilated by many actors to the output of incineration. The official note specifies that they are “the non-recoverable fraction of waste and not only the output of incineration”. This point is important as it gives less the impression to local authorities that incineration cannot be avoided and that in some cases, landfilling may be an acceptable solution for waste being discarded from sorting or composting activities. Finally, it tries to give a more operational interpretation of the principle of proximity. Mainly because of the lack of flexibility of the capacities of incineration, and of the required economies of scale which would incite departments to maintain a large room for this technique, the geographical limits of departments are often felt as too restricted. The note calls for co-operation between departments on this point in order to obtain environmental and economical benefits. These points put together, the modification of payments of Eco-Emballages to municipalities and the correction of departmental plans in order to orient their objective as a whole, towards at least 50% of recycling, could give a new impulsion to the national policy of household waste management in the years to come.

In Italy, the regime has been deeply changed in 1997. The responsibility for the achievements of the objectives is assigned to a new private compulsory consortium, CONAI. This new organism joins two new categories to the already involved packaging producers : the fillers and the distributors. Its scope is to overcome the main difficulty of the previous Obligatory Syndicates : the lack of involvement of packaging users, while this category is very sensitive to environmental pressure. Packaging producers and fillers, since October 1998, have to pay a fixed entree fee and a contribution depending on the packaging volumes they introduce onto the market. The returns of this fee are used to finance collection and sorting operations of packaging waste. However, the exact role of CONAI, and the articulation of packaging producers and fillers responsibilities, are not yet well-defined and are subject to many criticisms from the Ministry of the Environment. There are no guarantees that the management system will be coherent with the legislation and the co-operation between the industry and the municipalities is still difficult to organise, mainly in the south of the country.

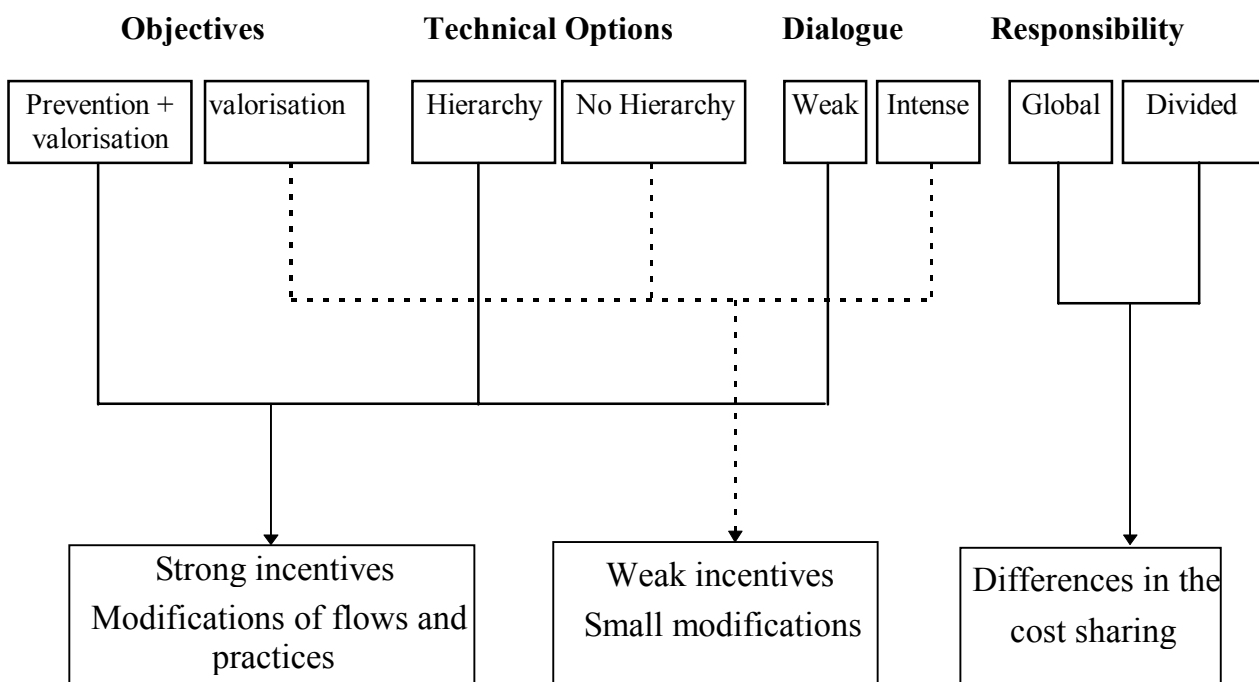
In the Netherlands, we already stated that the packaging covenant has been shifted in many co-covenants in order to better identify the responsibilities of the various materials. Besides this, the proximity principle is progressively left out, so that demand and supply of waste

management fit better on a national level. Yet, as the results are globally satisfying and the quantitative objectives are to be reached in 2000, it is too early to have a judgement on the whole capacity of the regime to reach the fixed goals.

## 5. The key variables of municipal waste management policies

As introduced, four main variables help to represent the observed differences between the national policies : the nature of the objectives and most of all the presence or lack of reduction at the source (prevention) ; the options taken in the field of techniques (interventionism or no a priori hierarchy) ; the lack or importance of the dialogue between public authorities and the industry ; the organisation of waste flows and of responsibility (global or differentiated between actors).

### The key variables of national policies



These four variables – in their multiple combinations – explain the degree of incentive of the means being employed. For instance, the setting of a preventive policy and of ambitious objectives for valorisation (Germany, the Netherlands) require important financial means and incentive instruments. Indeed, important changes in the behaviour of actors have to be obtained.

An in-depth dialogue favours the acceptability but also leads to neutralise the incentive structure, as in the case of the French policy (Defeuilley C., Godard O., 1997). In France, industrialists played a leading role in the formulation and the implementation of the



packaging waste legislation. Eco-Emballages is the product of a long negotiation process, which was held to incite all the industrialists (with possible conflicting interests) to enter in a collective action to promote household packaging waste valorisation. The stake was in particular to fill the gap between fillers and material producers. This consensus-driven process has led to important drawbacks. Firstly, it has been necessary to avoid any additional cost disturbances between material *filières* (the fees paid by fillers are not differentiated : the charge is equal whatever the material). This allows, on the one hand, to avoid new market distortions between material producers and, on the other hand, to ensure to fillers that they will continue to use the whole range of packaging materials without any restriction. Secondly, industrialists have tried to minimise the financial burden they ought to bear (using the additional cost calculation, and externalising responsibilities, performances, uncertainties and risks towards municipalities). Thirdly, they have tried to gain a maximum control over their involvement in collection actions. As a result the green-dot put on household packaging has lost almost all its incentive properties.

These variables also explain the difference in costs between countries, for example between the German and the French regimes. The organisation of the responsibility and the options taken in the field of techniques are the main variables explaining a cost gap between two regimes. A regime combining ambitious objectives, technical interventionism and the division of waste flow in several fractions, leads to a strong increase of the costs weighing on private and public actors. Those who criticise one system or another<sup>9</sup> often forget that a comparison between regimes have to take differences in objectives and techniques<sup>10</sup> into account.

## Conclusion

The European directive on packaging and packaging waste (1994) set the following objectives : between 50% and 65% of packaging waste (in weight) ought to be valorised, the part given to material recycling in the valorisation techniques must be equal to 25% - 45%. 15% of each packaging material have to be recycled. These objectives will be re-evaluated ten years after their implementation in the member-states, in order to re-negotiate another set of goals for packaging and packaging waste. For almost every European country, these objectives are not severe commitments. In some cases, they are already fulfilled, because of the high recycling rates traditionally obtained for industrial and commercial packaging waste in industrialised countries. The European directive has set non stringent objectives and let each country decide upon its technical and organisational choices. This leads to create a diversity of approaches, each of them based on different principles, institutions and

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<sup>9</sup> Strong rivalries arose for instance between France and Germany during the nineties.

<sup>10</sup> Techniques, but also environmental standards weighing on them.

instruments. A real harmonisation of national policies, enabling to reduce the drawbacks of several institutional and technical trajectories, should be engaged through a negotiation process focusing on the key variables which have been identified above (nature of objectives, technical options, dialogue and responsibility).

The existing mixes between key variables ought to be analysed at the end of the 10 years between the implementation of the European directive in the national laws and the definition of a new set of objectives. The efficiency of each national trajectory not only depend of its capacity to reach initial objectives, but also of its flexibility through time. As it has been shown, with the increasing experience due to feed-backs on results, improvements are introduced. The flexibility undeniably depends on the articulation between key variables. It might therefore be interesting to understand if, for instance, the absence of an a priori technical hierarchy, or of an intense dialogue between public authorities and industry, are elements really favouring such an improvement. In other words, questions are open regarding the long term efficiency of the several combinations between the key variables here presented.

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