Indicators for the prevention of household waste in Flanders

OVAM, your policy partner on waste and soil

(*The indicators we use in Flanders are the following:*

**** the total amount of MSW produced per inhabitant***
**** the amount of waste per consumption unit***
**** the number of stickers against free publicity, that are used***
**** the amount of re-used goods sold***
**** the number of people who compost at home***
**** the number of one way beverages calculated per liter***
**** the amount of packages per consumed unit***
**** the number of free publicity folders, printed in one year***

The Flemish administration tries to calculate every year the results of their policy on the basis of these indicators.)

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10. Summary

OVAM, the Public Waste Agency of Flanders, developed indicators to demonstrate the effects of waste prevention in Flanders. The set of eight indicators enables the progression of the quantities of individual fractions of household waste to be monitored. This is done by collecting and discussing the figures for each indicator, but equally by providing an overall picture using scores for each indicator. It is found that the indicators in general suggest that prevention has gained increasing acceptance in Flanders since 1997.

11. Supervisory group

Lydia Pytseys (OVAM), Geert De Roover (OVAM), Herman Gobel (OVAM), Jan Buysse (VLACO)

12. Contact(s)

Herman Gobel (OVAM)

13. Other titles on this subject

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The title of the publication should be mentioned. For further information, contact the Verkoop- en uitleendienst (Sales and Loans Department) of OVAM, Stationsstraat 110, B-2800 Mechelen Tel. 015/ 284 145 Fax 015/ 20 32 75.

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1 Waste prevention in the Flemish region

1.1 Definitions

1.1.1 Household waste

The term “household waste” is defined in the Waste Decree (Decree of 2 July 1981 concerning the prevention and management of waste). Vlarea (Decision of the Flemish Government of 7 December 1997 to lay down Flemish regulations in relation to waste prevention and management) supplements the definition:
“Art. 2.1.1. Household waste shall be understood to mean:
1. in accordance with Article 3, Section 2(1) of the Waste Decree, waste which has arisen through the normal operation of a private household;
2. the following types of waste which are equated to household waste:
a. street and road-sweeping refuse originating from maintenance by municipal services;
b. market waste;
c. beach waste;
d. paper waste, as defined in Article 3.2.2. “
“Art. 3.2.2. § 1. The provisions of this section are applicable to paper waste, arising from the use or consumption of the following publications:
1. daily newspapers;
2. weekly and monthly magazines;
3. journals and periodicals;
4. free regional press and free publications;
5. telephone directories and fax directories;
6. printed advertising material and other printed material

Section 2. Paper waste arising from the use or consumption of the following publications does not fall under the application of Part 3.2:
1. publications in which no trade advertisements, advertising or publicity texts are included;
2. publications of paper producers and/or importers who bring less than 3 tonnes of paper per year into consumption in the Flemish Region.”

1.1.2 Waste prevention

The Waste Decree defines a waste material as (Article 2): “ 1) any material or object the holder disposes of, intends to dispose of or has to dispose of;”

The Decree does not provide any definition of waste prevention. The definition in the Household Waste Implementation Plan 1997-2001 reads as follows: “The prevention or reduction of the production of waste materials and the harmfulness thereof by reduction at source and re-use. We understand

waste prevention to mean, for instance, home composting and the re-use activity of a used-goods depot."

Waste prevention thus broadly comes down to a combination of prevention at source and the re-use of materials or objects at the level of private households (see also def. OECD[1]). The principle that re-use must lead to comparable application which is clearly in the sphere of use (and not in the sphere of processing) applies in re-use. Waste prevention thus comprises:
- the use of returnable-deposit packaging;
- the handing-over of materials or objects to a used-goods depot;
- the sale of materials or objects as second-hand.

Home composting comes under prevention, because biowaste and green waste is recycled at source and is not presented for collection and central handling[2]. It is almost always only the quantitative aspect which is discussed in the development of the indicators. This is a temporary situation: at a later stage consideration can be given to including qualitative indicators such as the presence of harmful substances.

1.2 Objectives

Specific objectives for the prevention of household waste are contained in the Household Waste Implementation Plan.
For the 1997-2—1 Implementation Plan these are[3]:

	2001	*2006*
Fraction	*%*	*%*
Biowaste and green waste	8	10
Recyclable paper	11	15
Packaging	13	19
Nappies		3
Small hazardous waste	13	25
Others	13	19
Total	6	10

Task of prevention per fraction in 2001 and 2006 in relation to 1995 according to the Policy Scenario (in tonnes).

For the 2003-2007 Draft Implementation Plan these are[4]

Fraction	*Domestic refuse %*	*Bulky refuse %*
Organic waste (total)	19	13
Paper and Cardboard waste*	11	11
Glass waste*	11	11
Metal waste*	11	11
Plastic waste*	11	11
Textiles*	11	11
Drinks cartons*	11	-
Hygiene articles*	11	-
Wood*	-	11
End-of-life electrical and electronic products*	-	28
Other domestic refuse fractions*	11	
Inert waste: construction and demolition waste*	11	11
Small hazardous waste*	11	-

Fraction	*Domestic refuse %*	*Bulky refuse %*
Total	14	13

*with respect to 2000

Tasks of prevention and re-use for domestic refuse and bulky refuse according to the Sustainability Scenario in 2007.

2 Types of indicators

A working definition of indicator is: “unit of measurement which directly provides an approximation of a particular quantity”[5]. Waste prevention is not measurable as a quantity, and indicators are therefore appropriate.

The indicators follow the Pressure-State-Response (PSR) model which the OECD uses as a framework in the development of indicators[6]. This model allows a set of indicators to be put together in a broad manner which, in their totality, establish a relationship with both environmental *pressure* and the environmental effects *(state)* and with the responses of policy or the target groups (*response*).

Pressure indicators with regard to waste have already been in use for some time. The quantities of produced and processed waste are used for this purpose, with the type of processing. They can be divided into two categories:
- *direct pressure*: the causal connection between waste production and environmental pressure is taken as a basis, and quantitative and qualitative data on the waste production are used as an indicator of environmental pressure;
- *indirect pressure*: the causal connection between waste production and environmental pressure is taken as a basis, but underlying variables are used to indicate waste production, such as GDP, private consumption and demographics.

Behind *pressure* are what are known as *driving forces*. In the OECD approach, they are both regarded as “*pressure*”, albeit divided into “direct” (actual pressure) and “indirect” (in fact the driving forces). In the more extensive *Driving forces-Pressure-State-Impact-Response* (DPSIR) model[7], on the other hand, a distinction is made between these “*driving forces*” and the “*pressure*”.

The *pressure* indicators for waste are at the same time indicators for waste prevention: reduced waste production or processing points to waste prevention.

State indicators represent reduced environmental effects as a result of waste prevention. They always reflect reduced emission or immission, reduced risks or energy intensity for specific waste streams, or the handling associated with the avoided waste streams. To simplify, it can be said that an indicator of waste prevention, whether it is a pressure or response indicator, is at the same time automatically a state indicator. A causal connection can always be assumed between waste on the one hand and environmental effects on the other.

Response indicators for waste prevention point to efforts by both the government and target groups to mitigate effects through waste prevention.

They can be put together from data on instrument development and use, behavioural changes and changes in products and processes.

3 Indicators for prevention and household waste

3.1 General approach

In order to analyse the results of waste prevention policy, a decision has been taken to develop a set of indicators. This comprises both "*pressure* indicators" (how great is the production of waste) and "*response* indicators" (what actions have producers, distributors and consumers taken). The whole must provide an indication of the prevention of household waste in the Flemish Region. At the same time, the indicators separately can clarify or qualify the overall picture.

The set comprises indicators which are linked to specific objectives of Flemish waste policy. The set in itself does not fall within the framework of a larger concept. But the policy objectives used are in each case derived, in the policy plans concerned, from objectives which come within the framework of the concepts of "integrated approach" and "sustainable development".

A conscious decision has been made in favour of fractions for which Flemish policy formulates clear objectives, and consequently draws up action within the existing Flemish policy framework. The set does not contain indicators for all (sub-)fractions. It is important to note with regard to the "validity" of conclusions that the total picture is distorted and gives greater weight to the selected fractions than their proportion in the actual production of waste warrants.

There is also a problem of interpretation for fractions which occur both in household waste and in commercial waste. Shifts can take place which do not make any difference to the total waste mountain but do make a difference to the household fraction. A specific example is increased weight of consumer packaging because of the elimination of outer packaging (commercial waste). The net balance may even be positive, and yet the indicator for household waste provides a negative picture. Questions can also be raised about Flemish indicators for particular fractions for which a Belgian approach has been drawn up. An example of this is packaging. But as Flemish policy for these fractions formulates its own objectives, it remains sensible to use indicators for these fractions.

Finally it should be emphasised that the proposed set exclusively contains indicators of quantities. The indications consequently only relate to the "quantitative" part of waste prevention. No indicators are included with regard to the "qualitative" part ("reduction of harmfulness"). This is the consequence of the observation that only quantitative tasks have been included in the Household Waste Implementation Plans. The lack of both specific tasks and available data (to date no actions have been drawn up to monitor the

qualitative aspects) makes it impossible to devise meaningful indicators for qualitative aspects.

3.2 Justification of the choice

A list of possible indicators, based on an understanding of factors, events and actions, was tested against the following criteria:

- Do the data exist for the calculation?
- Can time series be created and is continuation guaranteed?
- Is the indicator "valid", in other words is the relationship between what we measure and the preventive effect aimed for sufficiently stable and are possible errors acceptable?
- Are the possible "interfering factors" known so that the interpretation be adjusted?

The result is a set which consists of three component parts.

1. A series of "*pressure* indicators" which indicates how waste production progressed and from which it is possible to deduce how this waste production is influenced by waste prevention.
2. A series of "*response* indicators" which indicates how consumers, distributors and producers taken particular actions.

The pressure indicators are based on data on the collection of household waste. A first indicator gives the total quantity of household waste per head of population. This indicator takes account of the external factor of demographics, but not of economic factors (economic climate, income growth and so on). A second indicator has therefore been developed: waste production is linked to the spending of families. A view of the progression of this must allow an assumption to made as to whether more or less waste arises over the years per unit of consumed product (by families). This indicator allows it to be examined whether there is a "disconnection" between economic growth and the growth of the waste mountain.

Other possible pressure indicators have not been looked at. Although the first (total quantity of household waste per Flemish person) must be the most significant indicator to analyse the effect of a policy on waste prevention, the second (waste per consumption unit) offers the possibility of qualifying: total waste production can increase despite clear prevention results.

The series of response indicators can provide a picture of the actions of the local councils, consumers, distributors or producers as a result of the policy. Possible indicators – selected because of the assumed availability of data – are:
- Consumption: Waste prevention, general: number of private individuals who request waste-prevention information;

- Consumption: Waste prevention, general: participation in ecoteams;
- Consumption: Reduction in free printed advertising material; number of no-advertising stickers in use;
- Consumption: Reduction in addressed printed advertising material: number of members on Robinson List;
- Consumption: Home composting: number of distributed compost bins;
- Consumption: Home composting: number of contacts with master composters;
- Distribution/Production: sale of disposable packaging;
- Distribution: sale of cotton nappies;
- Distribution: used goods (sold at used-goods depots);
- Distribution/Production: sale of beverages in deposit-scheme bottles;
- Distribution/Production: sale of refillable detergents;
- Distribution/Production: print run for printed advertising material.

The following proposals were rejected after being tested.

Number of contacts of private individuals with master composters

The justification for using this indicator for the extent of home composting is the assumption that a fixed number of contacts with compost masters take place for each group of home composters. In other words, if the number of contacts rises, home composting increases and vice-versa. Various corrections are, however, necessary if it is to be possible for this assumption to be accepted: the sample must be reduced to those areas where master composters are active, accessibility must be the same, the subject of the contacts must be similar, the contact must actually lead to composting etc. The margins of error due to these corrections is greater than the expected fluctuations in the progression of home composting itself. There is therefore no justification for using such an indicator.

Number of private individuals requesting waste-prevention information

Flemish people request information on waste prevention at various places (from local authorities, intermunicipal bodies, OVAM etc.). Although OVAM has a view of the number of prevention brochures distributed to the intermediaries, it has no idea of the proportion eventually made available to private individuals. In addition, the information in many cases is mixed, and is not solely concerned with waste prevention. There are also many steps between the requesting of information by intermediaries and the extent to which families actually engage in waste prevention. The margin of error is consequently unjustifiably large in comparison with the possible expected fluctuations in waste prevention in the field.

Participation in ecoteams

The work of the ecoteams is highly diverse and covers the whole environmental field. The waste-prevention parts of this is limited. The use of these data as an indicator must be capable of being based on the assumption that for each participant in an ecoteam an equally large “back-up” applies a specific form of waste prevention. This is unlikely: participation in ecoteams is the consequence of targeted communication and promotion rather than of the spontaneous response of the whole population. For this reason it has been decided not to use this indicator for the time being.

Flemish people on the Robinson List

This indicator analyses waste prevention fairly directly: those who are on the list receive less waste in their letterboxes. There is no picture of the actual quantity reduced (how many kg less waste paper per address). There are problems with the required data. The list is based on names, not addresses. If spelling mistakes are made, including in the mail services, post nevertheless arrives at the address. If a person moves house or dies, the necessary adjustments are not always made. No distinction is made between Flemish people in the Flemish Region and the Brussels Region. In addition, it is found that a list of possible corrections is only available for 2001. For these reasons, this indicator is not used for the time being.

Used goods sold at used-goods depots

The intention is to examine to what extent a shift is taking place from the purchase of new to second-hand goods. On closer examination, various assumptions would have to be made to compare the sale of second-hand goods in a meaningful way with the sale of new products. In addition, there are no tasks for this anywhere, and ultimately it is the same question as is also tackled by the other indicator “re-use through used-goods depots”. For these reasons, this indicator was omitted.

Sale of cotton nappies

This is a fairly direct indicator. However, no data are yet available.

Sale of beverages in deposit-scheme containers
This is based on data on the quantities of litres of beverages in deposit-scheme containers on the one hand and disposable containers on the other. The progression of the mutual ratio may be an indication of less or ore re-use. The required data are found not to be available from the distribution and production sector, however. For this reason, this indicator is not used for the time being.

Sale of refillable detergents

The progression of the ratio between quantities of detergent in refill packaging versus original packaging would provide a fine picture of the degree to which purchasing behaviour changes as a result of a certain awareness among buyers and sellers. Separate sales figures are not yet found to be available.

The remaining indicators meet the basic requirements well. They are:
- Paper waste: number of no-advertising stickers in use (consumer side);
- Paper waste: print run of printed advertising material (producer side);
- Re-use: purchasing in used-goods depots (consumer side);
- Home composting: number of compost bins used (consumer side);
- Packaging: sale of disposable containers (producer side).

Two sub-indicators have eventually been developed for disposable containers: disposable containers (weight) per unit of spending, and disposable beverage containers (weight) per litre of beverage sold.

It is clear that an indicator cannot be separately developed for all household waste fractions (e.g. metal waste, textiles etc.). The set of indicators for this reason is certainly not to be regarded as a reflection of the composition of household wastes. Certain fractions have two indicators (paper, containers), while others, as mentioned, as yet do not have any. This does not pose a problem provided it is borne in mind that these are indications, and not a representation of the actual total waste prevention attained.

To obtain a better idea of the indicators selected, their content, how they are calculated, their possible errors and problems in interpreting them, see the technical data sheets.

3.3 Overview

Indicator	*Contents*	1995	1996	1997	1998	1999	2000	2001
waste per head of population	quantity of household waste/Flemish population	x	x	x	x	x	x	x
waste per consumption unit	quantity of household waste/total (Flemish Region) household expenditure on purchase of goods		x	x	x	x	x	
no-advertising stickers	number of families with sticker / total number of Flemish families		x	x	x	x	x	x
use of used goods	kg re-used (recycled) goods per head of Flemish population served	x	x	x	x	x	x	x
compost bins	number of families with compost bin / total number of Flemish families		x	x	x	x	x	x
disposable beverage containers per litre of contents	quantity by weight of disposable household packaging placed on the market / volume of beverages placed on the market			x	x	x	x	
packaging per consumption unit	quantity by weight of disposable household packaging placed on the market / household expenditure on purchase of goods			x	x	x	x	
print run of printed advertising material	quantity by weight of the print run				x	x	x	

Table: Overview of the indicators selected

3.4 The overall picture

3.4.1 Approach

It would be interesting to develop one indicator for the prevention of household waste on the basis of the set of indicators presented above.

There is, however, the problem of the addability of data according to the various approaches (e.g. counting the response rate of stickers together with packaging percentages). One solution might be to split the indicators per fraction, weigh them and then count them. The additional value of combining sub-indicators by weighing is, however, slight to non-existent in view of the many assumptions.

In addition, as already said, the set is not a reflection of the totality of household waste. Consequently not all the factions are reproduced by an indicator according to their proportion in the totality. For this reason too, adding together would not provide any added value.

Added value can only be achieved through the manner of presenting. This can be done using a “radar diagram”. On this diagram, each indicator has an axis with a scale. The maximum (100 on the axis scale) agrees with the objectives included in the Household Waste Draft Implementation Plan 2003-2007. The reference year is 1998 (0 on the axis scale). For each year, the value of the indicator is plotted on this axis scale. This value expresses what portion (in %) of the distance to the objectives has been covered since 1998. In this way it is possible to follow progress in the direction of targets, and the gap still remaining (“distance to target”) between the present situation and the target to be reached for 2007 is made visible.

The line connecting the plotted values forms an area for each year. The increase or decrease in this area from year to year gives an indication of how waste prevention is progressing in Flanders.

The choice of 1998 is primarily entirely pragmatic. This is the year from which the required data are available for the indicators used. An additional argument is that 1998 was the year in which the previous Household Waste Implementation Plan 1997-2001 began fully to produce effects. In addition, the period 1998-2007 occupies exactly ten years.

The interpretation given to this radar-diagram presentation is: “*in view of the situation which the Sustainability Scenario of the (Draft) Household Waste Implementation Plan envisages for 2007, what progress in waste prevention do the figures since 1998 show?”*

3.4.2 Characteristic features

The significance of the various indicators differs: there are “total indicators” (waste per head of population) and “fraction indicators” (used goods). In view of the aim of the exercise – to draw up an instrument that allows waste prevention to be made visible – more attention must be given to the development of a “total indicator” which is as correct as possible. The other indicators are related to specific topics and are illustrative of specific policy measures.

No weighting has nevertheless been attributed to the various indicators. A shift in an indicator such as no-advertising stickers has just as great an impact on the area of the radar patch as a shift in the indicator of waste per head of population.

The set consists of dependent variables. All the “response indicators” are in a certain relationship to the “pressure indicators”. The degree to which no-advertising stickers, for example, are used affects the eventual quantity of waste per head of Flemish population.

All this means that the radar patch must not be looked at in a metrological manner. The area of the patch must not be expressed as a % of the total area. The growth of the area of the patch in year x compared with year x-1 expressed in % must not be used as an indicator for the increase in waste prevention. Growth of the radar patch merely indicates that the Flemish population have come somewhat closer to the various targets. This perhaps only applies to particular fractions (to de deduced for each axis).

It should be remembered once again that these are “only” indicators. In addition, it is a selection. Even if the patch were to fill the whole radar screen, no statement can be made on the question of whether prevention has been attained. There are, however, indications that the tasks have been attained for the fractions looked at in the Flemish Region..

3.4.3 Result for the years 1997 to 2001 inclusive

afval / inwoner = waste per head of population
afval / consumptie – waste per consumption unit
anti-reclamestickers = no-advertising stickers
kringloopgoederen = used goods
compostvaten = compost bins
eenmalige drankverpakkingen / liter = disposable beverage containers
eenmalige verpakkingen /consumptie = disposable containers/consumption unit
oplage reclamedrukwerk = print run of printed advertising material

Graph: variation in value of the indicators on a scale with the value 0 for the situation in 1998 and value 100 for the target of the Household Waste Draft Implementation Plan 2003-2007

3.4.4 Conclusions

There is found to be a positive trend towards waste prevention for most of the indicators, except for the indicators of “printed advertising material” and “waste per head of population”. The negative trend in “waste per head of population” is qualified by the clear positive trend in the indicator of “waste per consumption unit”. There is therefore reason to assume that there is a disconnection (less and less waste per unit of consumption), but that the waste mountain is nevertheless continuing to grow. This is chiefly the consequence of the growth of specific fractions (such as green waste, construction and demolition waste and wood waste), growth which is perhaps attributable to more collection facilities rather than greater production of waste as such.

Among the packaging indicators account must be taken of the fact that they are Belgian indicators, and it is not yet clear to what extent they differ from the Flemish ones. It may nevertheless be assumed that this trend also arises in Flanders. For disposable beverage containers there is a status quo to slight decline (returnable bottles are at risk of losing further ground), while for disposable containers per consumed unit the trend is more positive (the weight of disposable packaging per euro spent is falling). What is represented by the indicator of “no-advertising stickers” is an overestimate as dropouts are not taken into account, but it may be assumed that there is a positive trend.

Overall it can be said that there is evidence that the Flemish population have in general been making increasing prevention efforts since 1977. For the totality of household waste, the results of these efforts (quantities) are, however, offset by the increase in specific fractions. The question should be

asked whether this increase is not a shift (from own processing or from commercial waste to household waste) rather than real growth.

3.5 The various indicators

3.5.1 Waste per head of population

Since 1991, OVAM has been systematically collecting inventoried quantities of collected household waste per head of population in the Flemish Region.

Under Article 5.1.6.3 of Vlarea, the municipalities and intermunicipal bodies have to make the data available to OVAM annually. Thanks to correct fulfilment of this obligation by the 308 Flemish municipalities, OVAM has very complete data on the total amount of household waste collected by or on behalf of the municipalities.
The data are divided into the various fractions. The four large groups are: selectively collected household waste, domestic refuse, bulky refuse and municipal refuse. Within the selectively collected wastes there are the various sub-fractions (including glass, metal, paper and cardboard, construction and demolition waste, green waste etc.).
The data on the size of the Flemish population come from Statistics Belgium (Nationaal Instituut voor de Statistiek).

This indicator provides the following picture.

Kg per head of population
Lineair (Kg per head of population)

Graph: Progression in quantity of household waste per head of Flemish population

A clear rising trend has been noticeable since 1991. There is no real explanation for the fluctuations between 1994 and 1998. The sharp rise in

1997 may possibly be partly explained by the fact that - as a result of the Implementation Plan - numerous municipalities organised additional selective collection, so that the fraction of “selectively collected wastes” rose sharply (suction effect). This increase was still adequately offset in 1997 by shrinkage in the fraction of domestic refuse (the residual waste bag), as actions such public awareness campaigns and a policy of encouragement (higher reimbursements with longer decision-making procedure) did not follow until later. Balance was restored from 1998.

In interpreting, account must be taken of the characteristic features of the data. Firstly fluctuations may be attributable to tightened municipal policy which no longer allows waste from retailing, the services sector and hotels, restaurants and catering to enter the municipal collection circuit from a certain time. Such a fluctuation has nothing to do with any preventive actions. A correction is possible if it becomes clear what proportion these fractions account for in the total. Unfortunately this correction factor is not available for past years.

Another significant factor which causes fluctuations in the data is the improved registration by municipalities over time. For this reason too, great care must be taken with fluctuations in this indicator for waste prevention.

The rising trend is at odds with the policy targets. The 1997-2001 Implementation Plan envisaged that by 2001 6% had to be prevented in comparison with the situation in 1995. The graph shows how large this gap is:

Kg per head of population Target UHA 1997 Lineair (Kg per head of population)

Graph: Progression in the quantity of household waste per head of Flemish population and target according to the Household Waste Implementation Plan 1997-2001

A correction has been applied in the Draft Household Waste Implementation Plan 2003-2007: a new target with respect to a new reference year has been formulated, namely 13% waste prevention in comparison with the situation in 2000 (Sustainability Scenario). On the graph this gives:

Kg per head of population Target UHA 1997
Target UHA 2003 Lineair (Target UHA 1997)

Graph: Progression in quantity of household waste per head of Flemish population and targets according to the Household Waste Implementation Plan (UHA) 1997-2001 and the Draft Household Waste Implementation Plan 2003-2007

Conclusions

The progression in the quantity of waste presented by the public to the municipal collection systems, calculated per head of Flemish population in the year concerned, indicates that the targets for waste prevention in the present Implementation Plan are not being met. As an indicator of waste prevention it tells us little. A slight decrease in growth can only be observed from 1998 on. This is not marked, and in view of the factors outlined above which may cause fluctuations, this conclusion must be treated with great caution.

All this does not mean that this indicator demonstrates that overall there is no waste prevention: growth may be smaller as a result of prevention efforts. The following indicators are used to demonstrate this to some extent.

3.5.2 Waste per consumption unit

The total quantity of household waste is an indicator to represent the effect of waste prevention. However, this quantity includes a few waste fractions for which no specific prevention policy has been conducted, or which are influenced by external factors which have a greater impact. One example of an external factor is obviously economic growth.

In order to eliminate the latter, the waste production per head of Flemish population is related to a unit of economic activity. The gross domestic product (GDP) is usually used for this purpose. GDP is an indicator of prosperity in general, and of production and consumption in particular. Depending on the point of view adopted, GDP gives the extent of added value, domestic income or total domestic spending. The drawback, however, is that GDP is not just an indicator of the level of family spending but also takes into account the expenditure of government and businesses (investments).

It is recommended that an indicator should be used which demonstrates family spending even more correctly. In the National Accounts, GDP is split and the category of "private consumption spending" can be used separately if appropriate. The drawback is that all spending is included, including spending on activities which engender waste at the consumer (for instance purchasing of services, non-profit association activities). Statistics Belgium collects such data through the household budget surveys[8]. In this way it is possible to take account only of those product categories which will actually have an effect on waste production in families. All the services are consequently filtered out. What remains are products which the consumer acquires and through waste logically arises at home.

A correction for changed patterns of consumption is, however, possible. As a result, it may happen that the total spending is unchanged but that there is, for example, relatively more spending on luxury items and less on small maintenance works in the home. If waste production were to decrease as a result of this - which is logical - the indicator will show a positive progression (less waste per unit of consumption than previously) which, however, does not have anything to do with more or less waste prevention as a result of measures and actions.

The numerator in our approach (quantities of waste) has also been filtered out. Only those waste fractions which are normally associated with regular consumption have thus been taken into account. The intention is to eliminate these fractions where this a high likelihood that the extent of the fraction is mainly determined by factors other than the pattern of consumption of the consumer (e.g. green waste, construction and demolition waste). The technical data sheets show which fractions were or were not adopted. With regard to

these data, the same remarks and warnings with regard to interpretation naturally apply as for the indicator of waste per head of population.

The Statistics Belgium statistics are usable from 1996. The indicator shows the following progression:

consumption waste (index) product purchases (index)
indicator Lineair (indicator)

Graph: Progression of the indicator for waste per consumption unit

Firstly the same break in trend in 1996 and 1997 is visible among the waste fractions taken into account ("consumption waste") as for the total quantities of household waste. However, in contrast to the indicator of "waste per head of population", the general trend for this selection of trends is downward. The increase in the total quantity of household waste is influenced by the increase in (large) fractions such as green waste, construction and demolition waste and wood waste, while the other fractions remain fairly stable. The quantities engendered by household consumption appear even to decrease over the years, albeit to a very small extent. In view of the warnings on interpretation which are applicable, it is difficult to view this as significant.

There is an upward trend with regard to consumption itself ("product purchases"). This is not surprising in view of economic developments in general. Remarkably there is a dip in 1997 which is in contrast to the peak in waste production. There is no explanation for this. Relating the quantities to spending provides an indicator which indicates how much waste arises per

unit of consumption. As the denominator ("product purchases") shows an upward trend, and the numerator ("consumption waste") a downward trend, the result sharply downward, with a distinct dip for 1997.

This appears, however, to be an indication of a certain degree of waste prevention: with similar spending over several years (unit of consumption) less waste also arises. This does not say anything about the causes: these may be both on the consumption side (but note the waste in purchases) and on the production side (less input of materials per unit of packaging, but in return …). The producers in particular have been working on material reduction in the last few years, and as waste is expressed in kg, this may, for example, have an impact.

Conclusions

The indicator of "waste/consumption" focuses on the relationship between consumption and the waste that arises in it in individual families. Filtering out both waste fractions and purchasing categories which do not fit in with this relationship provides an indicator which reveals the progression of this relationship.

The indicator indicates that there is what is known as a "disconnection", i.e. the waste production is not proportional to the economic activities. A downward trend can be recognised per unit of consumption. Even bearing in mind the errors of margin and warnings on interpretation, it is justifiable to regard this as accomplished waste prevention.

3.5.3 No-advertising stickers

The municipalities have been offering their population no-advertising stickers since the mid-nineties. If a family affixes one of these stickers to its letterbox, this family makes it known that it no longer wishes to receive unaddressed advertising and/ore regional newspapers. This has the result that publishers can reduce their print run for unaddressed advertising and/or regional newspapers on the basis of the number of stickers. As a result, less paper waste is eventually produced.

Since the mid-nineties, municipalities have provided OVAM with figures on numbers of stickers handed out through a survey. The data on the number of Flemish families come from Statistics Belgium.

The total numbers of stickers handed out in Flanders (taking account of the corrects made as described in the technical data sheets – cf. annex) provides the following picture for the period 1997-2001:

number of stickers handed out

Graph: number of no-advertising stickers distributed in Flanders (cumulative)

The number of stickers handed out rises from 1997 to 2001, and this trend appears to be continuing into the future.

It is assumed that each sticker handed out corresponds to one family. Taking account of the task from the Household Waste Draft Implementation Plan 2003-2007, a drop of 16% in print run should be achieved by the end of 2003 in comparison with 1999. If this target is to be achieved, the number of

families already using an no-advertising sticker in 1999 will have to rise further.

A study (survey 2001[9]) shows that 17.4% of the Flemish population prevent paper waste by affixing a no-advertising sticker to their letterboxes. 87.1% of these families were already doing so in 1999. The number of families with a no-advertising ticker in 1999 was consequently 15.2%. The whole print run in 1999 is therefore distributed between 84.8% of letterboxes (families). In order to reduce the amount printed by a further 16% by the end of 2003 (Household Waste Draft Implementation Plan 2003-2007 Sustainability Scenario), the number of letterboxes delivered to must decrease to 71%. Consequently, 29% of families must affix a sticker at the end of 2003.

The indicator of "number of families with a no-advertising sticker in relation to the total number of families in Flanders" (expressed in %) provides the following picture:

% families with sticker

Graph: Estimated number of Flemish families with a no-advertising sticker

It can be seen from this graph that in 2001 a maximum of 25.5% of Flemish families already received a no-advertising sticker. The difference between the stickers handed out and stickers actually used is very important. Stickers may no longer be in use after a certain time, and stickers are not only acquired through the local authority. The two differences (over-estimate and under-estimate) will probably not cancel each other out. An estimate of necessary corrections is not possible at present on the basis of available data.

Conclusions

The indicator of “proportion of Flemish families using a no-advertising sticker” provides an indication of the reduction in the print run of unaddressed printed materials and regional newspapers, and consequently of the prevention of part of paper waste.

It can be seen from the evaluation from 1997 to 2001 that the indicator used is progressing on an upward slope.

A correction for stickers handed out but not or no longer used is, however, necessary. As there are no opportunities for making corrections, the indicator used provides an over-estimate. It is not known how large this is. Nor will an increase in the number of stickers used result 100% in an equally large reduction in the print run. On the other hand, it appears justified to assume that this trend is in any case positive.

3.5.4 Used goods

Recycling activities, more specifically the re-use of goods by offering them for sale and buying them at used-goods depots, prevent waste.

Since 1994, the used-goods depots have themselves kept a record of the “number of kilograms of goods sold per head of population served”. The number of kilograms sold is limited to the quantities actually sold in the shops. Other destinations are sale to third parties, sale of recyclable materials and removal for further processing or disposal[10].

This indicator consequently provides a very good picture of the extent to which more or less waste prevention is done in the Flemish Region by re-using goods through used-goods depots.

The progression is as follows:

kg/head of population served

Graph: Progression of recycled goods sold per head of population served in Flanders

The indicator provides a fine upward trend. The annual rise is decreasing in relative terms, which according to the experts was to be expected[11].

The target of 5 kg per head of population served as contained in the Household Waste Draft Implementation Plan 2003-200712 is probably attainable according to the present trend, provided current efforts are maintained (or slightly strengthened).

3.5.5 Compost bins

Public awareness creation among the Flemish population on the home composting of biowaste was started in the early nineties. This resulted in the purchase of compost bins being subsidised by the Flemish Government. The municipalities and intermunicipal bodies were then able to sell them on to their populations at a subsidised price. As a complement to this, a network of master composters was also built up.

The municipalities and intermunicipal bodies have notified OVAM of the number of compost bins sold since the mid-nineties through a questionnaire-based survey. The data on the number of Flemish families come from Statistics Belgium.

The total numbers of compost bins sold in Flanders (taking account of the corrects made as described in the technical data sheets – cf. annex) provide the following picture for the period 1997-2001:

Numbers in use (estimate)

Graph: Progression of the number of compost bins in use by Flemish families (estimate)

The numbers of compost bins sold were corrected for “dropouts”. Research (study 200113) shows that on average 10% of home composters drop out, but that at least 10% are also thinking about starting. The numbers of compost bins were therefore reduced by 10% to take account of the dropouts.

It can be seen from the graph that the rapid rise since 1996 has eased off slightly in recent years. It can be concluded from this that the potential of home composters with a compost bin is gradually being reached. The population can meanwhile use other means of composting, such as wormeries, compost containers, compost heaps and so on.

The Household Waste Draft Implementation Plan 2003-2007 anticipates that by 2007 40% of the Flemish population will be actively involved in preventing organic waste. Research (survey 2001) shows that around 34% of Flemish families are involved in home composting in one way or another. On the assumption that the number of home composters with a compost bin does not change (in relation to the total number of home composters), by the end of 2007 11% of Flemish families will have to have a compost bin at their disposal.

The indicator of “proportion of Flemish families with a compost bin” provides the following picture:

% families who use a compost bin

Graph: Progression in the proportion of Flemish families (%) which use a compost bin

It can be deduced from this graph that at the end of 2001 approximately 8% of Flemish families had a compost bin and presumably were also using it (in view of the fact that the figures were corrected for the number of dropouts).

Conclusions

The progression in the number of families engaged in home compositing using a compost bin indicates that home composting is more than likely on the increase, although less rapidly in recent years than in the early years. On the basis of the figures up to 2001, the task for the end of 2007 appears attainable with regard to the home composting of biowaste.

3.5.6 Disposable beverage containers per litre of contents

This indicator provides a picture of the shift in supply of beverage containers: a drop in the indicator may, among other things, be a consequence of rise in the use of re-usable containers and/or a drop in the eight of the disposable containers used.

The graph below shows the progression for disposable containers of spirits, beer, wine, soft drinks and waters converted to the total number of litres of contents put on the market (disposable and re-usable). This indicator for disposable containers for beer, soft drinks and waters is falling slightly. The reasons for this rise and fall need to be examined more closely.

Spirits (index) Beer (index)
Wine (index) Soft drinks and juices (index)
Waters (index) Total (index)

Graph: Progression of the weights of containers (indexed) on the Belgian market per category of beverage

In the total (sum of all container weights/sum of all beverages), the rises and falls in the various product groups in the last few years are found to offset each other. The conclusion is therefore that on the basis of this indicator there is no evidence that in absolute terms substantial prevention (more usable or less material for disposable containers) has been achieved.

It is important to note, however, that in a market of increasing 'proportioning' (increasing supply of smaller containers) status quo may nevertheless point to efforts that have been made.

As this is a Belgian indicator (exclusion of data for the whole of Belgium), the conclusions must always be treated with due caution.

3.5.7 Containers for consumption unit

An active policy in relation to packaging waste has been conducted in recent years. Under the cooperation agreement on the prevention and management of packaging waste, the duty to take back packaging was introduced and some businesses had to set up prevention plans for packaging waste.

Data from Fost Plus show that the total quantity of packaging put on the market is still rising. An increase in the quantity of packaging used may have various causes. In order to eliminate the factor of economic growth as much as possible, the total quantity of packaging is related to a unit of economic activity, namely the unit of consumption spending for families (for further explanation see the indicator of waste per consumption unit). In drawing up the indicator, account was only taken for spending (denominator) of the product categories which lead to the use of packaging.

For the numerator (= quantity of packaging put on the market), use was made of the data from the members which are notified annually. These are data at the Belgian level. For this reason, a decision was taken to work with figures for Belgium for the denominator, that is to say the spending of households. The indicator progresses as follows.

Total spending (index)
Quantities by weight of packaging (index)
non-corrected indicator

Graph: Progression of the non-corrected indicator for disposable packaging per unit of consumption in Belgium

As far as consumption is concerned, there is a rising trend. The quantity of packaging put on the market is also rising. Juxtaposing the two variables provides an indicator which indicates whether the Flemish population is using more or less packaging per unit of consumption. The rise in the quantity of packaging in the above graph is, however, also a consequence of an increase in the number of businesses joining Fost Plus. In order to exclude this as far as possible, the estimated quantity of packaging put on the market is worked with in the graph below. The total quantity of packaging has been corrected annually for non-affiliated businesses.

Total spending (index)
Quantities of packaging by weight (corrected) (index)
indicator
Lineair (indicator)

Graph: Progression of the quantities of disposable packaging per unit of consumption in Belgium.

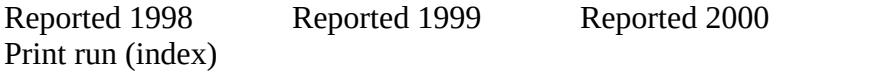
The indicator shows a downward trend. In other words, the quantity of packaging per consumption unit is falling. The same observation also applies to the quantity of packaging compared with GDP. The fall in this indicator does not say anything about the causes: these may be both on the consumer side (the implementation of the prevention plans in the context of the cooperation agreement relating to the prevention and maintenance of packaging waste). The fall in the indicator may also be a consequence of change in the pattern of spending (more expenditure on expensive goods with relatively less packaging).

It is important to note that this is a Belgian indicator. There may perhaps be a difference compared with the Flemish situation. Expenditure by the Flemish population is found to have grown more sharply in recent years than that of the other Belgians. But in view of the fact that the proportion of packaging for the Flemish market cannot be distinguished there is no clarity on the progression of weights of packaging in Flanders.

It is perhaps justified to assume that the difference between Belgian and Flemish progression does not have an impact on the visible trend.

3.5.8 Amount of advertising material printed

The environmental policy agreements on paper included targets on the reduction of actually distributed print runs of the newspapers of the free regional press and printed advertising material. The Household Waste Draft Implementation Plan 2003-2007 states that by the end of 2003 the producer/importer of free regional newspapers, non-addressed free publications and/or non-addressed printed advertising material must achieve a reduction in the actual print run of 16% in weight in comparison with the print run in 1999[14]. Agreements with distributors, awareness campaigns among the population, monitoring and the use of stickers on letterboxes must reduce the paper mountain.
The graph shows the progression in distributed print runs. The data are notified under environmental policy agreements.



Graph: Progression of print runs of free printed advertising material in Flanders

The print runs notified under the environmental policy agreement on printed advertising material are still rising. This rise in 2000 in comparison with 1999 was, however, limited. The results should also be qualified as not all business which put printed advertising material on the market are included in the graph below. The resulting underestimate is, however, limited. Only the data from businesses which are members of a federation which has signed the environmental policy objective were used.

Conclusions

This indicator does not point to achieved waste prevention. Furthermore, it points to increased waste production through free printed advertising materials.

Annex: Technical data sheets

Indicator of waste per head of population

Goal

To deduce waste prevention from the shifts in quantities of waste of private families on the basis of the registered quantities of collected waste by or for municipalities.

Formula

The quantity of household waste (tonnes)/number of heads of Flemish population.

Distance-to-target

Tasks have been included in the Household Waste Draft Implementation Plan 2003-2007 (version of July 2002): Sustainability Scenario: in 2007 13% reduction in comparison with 2000. The same target is used for the ratio of waste to heads of population.

In order to demonstrate the distance-to-target, 1998 is the reference year, and the results of the year concerned are positioned in relation to the target.

Dataset

1. Quantities of waste
Annual inventory by OVAM on the basis of data submitted by municipalities (Vlarea obligation). Published in the series: “Huishoudelijke afvalstoffen: Inventarisatie” (Household waste: inventory”); absolute figures in tonnes for Flanders, for the various fractions. Figures available from 1991.

2. Size of population
The population figures from Statistics Belgium are used for this purpose (in the series Actual population on 1 January *n*”).

Errors and corrections

The figures include some waste which does not come from the operation of households, but from (mainly) retailing, hotels, restaurants and catering and services. A change in municipal policy in this regard may bring about shifts which have nothing to do with waste prevention.

correction: use of a correction factor (not yet used in 2002). This is a combination of extrapolation of data from municipalities and of an estimate on the basis of previous studies.

Municipal refuse: as a result of the inclusion of market waste this is no longer exclusively associated with household consumption and household waste behaviour.

correction: none: "municipal refuse" is recorded with varying correctness and completeness by municipalities, in fact this must always be looked at together with domestic refuse and bulky refuse (to be finally disposed of, non-selective waste streams)

By including biowaste: as a result of the "suction effect" (a waste stream which previously was processed is selectively collected as soon as the collection is there), the supply of biowaste increases, so that the impression is incorrectly given that more waste per consumed unit would arise.

correction: none: as the "suction effect" is the sucking-away of the biowaste fraction of home composting (or equivalent form of prevention), the "incorrect impression" remains a correct indicator of (in this case reduced) waste prevention

Calculation

For the years **1995, 1996, 1997, 1998, 1999** and **2000**: waste presented (all fractions), expressed in kg/head of population.

Interpretation (problems)

Fluctuations in the time may be attributable to factors other than waste prevention, such as improved registration by municipalities, change in regulations so that non-household waste (schools, small businesses from self-employed and services sector and so on) is collected less.

Presentation on the radar diagram:

The results are presented as a percentage on an axis where 0% is the result in 1998 (reference year for the radar diagram) and 100% is the target for 2007.

Indicator of waste per consumption unit

Goal

To deduce waste prevention from the shifts in quantities of waste of individuals lined to individual spending.

Formula

Quantity of household waste (tonnes) / spending (€).

Distance-to-target

Targets have been included in the Household Waste Draft Implementation Plan 2003-2007 (version of July 2002): Sustainability Scenario 2007: 13% reduction in relation to 2000. We adopt the same target for the ratio of waste/consumption unit.

In order to analyse the distance-to-target, 1998 is the reference year, and the results of the year concerned are positioned in relation to the task.

Dataset

1. Selectively collected waste fractions: data from 1991.

Basis: see "waste quantities" in Dataset of the technical data sheet on "Indicator of waste per head of population"

Selected set: glass (clear glass, coloured glass, mixed glass); paper and cardboard (paper, cardboard, paper and cardboard mixed); metals (metals mixed, crown caps, metal containers); plastics (plastics mixed, expanded polystyrene; biowaste; beverage cartons; textiles; white and brown goods; non-reusable used goods (*); small hazardous waste; medicines (collected via household waste streams, collected via pharmacies)
(*) To be calculated from annual reports of the used-goods depots

Excluded from the totality of data on selectively collected waste fractions:
- used goods: form part of prevention
- animal waste
- green waste (tree trimmings, garden waste, mixed): mixing of commercial and green waste
- construction and demolition waste (construction and demolition waste, waste wood, flat glass): quantity presented per consumption unit depends to a greater extent on particular factors (whether or not taken back by contractor, own sale, type of construction activity) than on the factor of waste prevention
- automotive tyres: figures on consumption of consumption units not available

- agricultural sheets: not linked to private households

2. Domestic refuse: see basis, data from 1991.
3. Bulky refuse: see basis, data from 1991.
4. Municipal refuse: see basis, data from 1993.
5. Spending

Statistics Belgium lists in the "standard of living" series:
Household budget study 1995/1996 – family expenditure
Household budget study 1996/1997 – family expenditure
Household budget study 1997/1998 – family expenditure
Household budget study 1999 – expenditure and income
Household budget study 2000 – expenditure and income

Data in each case per product category up to 6 figures; figures per household in the Flemish Region. From these lists we select a **sub-list** of only "goods", and therefore excluding all services.

6. Number of households (figures from Statistics Belgium, household budget study department)

To obtain the figures per household, Statistics Belgium divides the totals per region by the number of households.

7. Index figures

The data in the household budget studies are in actual prices. In order to obtain constant prices, we use the figures from the Ministry of Economic Affairs ("Consumer price index" series). As the data for the first three lists in each case relate to two years, an average of the indices for the months concerned is taken

Errors and corrections

The figures include some waste which does not come from the operation of households, but from (mainly) retailing, hotels, restaurants and catering and services. A change in municipal policy in this regard may bring about shifts which have nothing to do with waste prevention.

correction: use of a correction factor (not yet used in 2002). This is a combination of extrapolation of data from municipalities and of an estimate on the basis of previous studies.

Municipal refuse: as a result of the inclusion of market waste this is no longer exclusively associated with household consumption and household waste behaviour.

correction: none: "municipal refuse" is recorded with varying correctness and completeness by municipalities, in fact this must always be looked at together with domestic refuse and bulky refuse (to be finally disposed of, non-selective waste streams)

By including biowaste: as a result of the “suction effect” (a waste stream which previously was processed is selectively collected as soon as the collection is there), the supply of biowaste increases, so that the impression is incorrectly given that more waste per consumed unit would arise.

correction: none: as the “suction effect” is the sucking-away of the biowaste fraction of home composting (or equivalent form of prevention), the “incorrect impression” remains a correct indicator of (in this case reduced) waste prevention

The spending figures for the first three periods (1995-1996, 1996-1997 and 1997-1998) in each case relate to two years (in each case from 1 June to 31 May), while the waste date relate to calendar years.

correction: impossible. It is assumed that the shift in time has very limited consequences.

Calculation

For the years **1995**, **1996**, **1997**, **1998**, **1999** and **2000**: per unit of consumption: absolute quantities of waste divided by the product of figures from datasets 5, 6 and 7.

On the radar limited to period 1998 – 2000.

Interpretation (problems)

Fluctuations in the time may be attributable to factors other than waste prevention, such as improved registration by municipalities, change in regulations so that non-household waste (schools, small businesses from self-employed and services sector and so on) is collected less.

The shift between the period of the numerator and that of the denominator for the first three years (1996, 1997 and 1998) is an additional argument not to use the results per year as an absolute given, and to focus on the indication of progression.

Presentation on the radar diagram

The results are presented as a percentage on an axis where 0% is the result in 1998 (reference year for the radar diagram) and 100% is the target for 2007.

Indicator of no-advertising stickers

Goal

To deduce waste prevention from the number of no-advertising stickers distributed through the municipalities.

In this case, the quantity of unaddressed advertising is reduced and the print run of these publications will be reduced.

Formula

Numbers of families with sticker / total number of Flemish families expressed in %.

Distance-to-target

The Household Waste Draft Implementation Plan 2003-2007 species a reduction by the end of 2003 in the print run for the regional press of 16% in comparison with 1999, to be achieved through a sticker campaign. This 16% has consequently been adopted as a target. This means that by the end of 2003 at least 16% of families must be using a no-advertising sticker.

Dataset

Data on the number of distributed stickers are available for the majority of municipalities. Origin of the data: annual survey for inventory of household waste. The information on the no-advertising stickers has been requested since the second half of the nineties. Data already available and processed for 1997 to 2001 inclusive.

Errors and corrections

A limited number of municipalities do not maintain a register of distributed stickers.

> *correction*: An estimate of the stickers distributed in these municipalities is possible, on the basis of the number of stickers distributed in municipalities which do maintain a register.

The stickers were distributed in a number of municipalities to all families through a mailing, but the municipalities do not know how many are actually used.

> *correction*: An estimate of the stickers probably used in these municipalities is possible on the basis of the number of stickers distributed in municipalities which do maintain a register.

The register of distributed stickers consists of an annual numerator or a permanent continuous.

correction: The data are to be corrected on the basis of comparison of the data for the same municipality per year.

A difference continues to exist between the distributed stickers and the stickers actually used. Stickers can no longer be used after a certain time because the family wants to receive advertising again. Old stickers may be replaced. Stickers disappear but are not replaced. As a result, the total number of distributed stickers (corrected as described above) will give an over-estimate of the stickers actually used. On the other hand, bodies (such as environmental movements) other than the municipalities also offer no-advertising stickers or home-made stickers may be affixed to the letterbox. Consequently the number of stickers distributed (through the municipalities) is an over-estimate of the number used. The two differences (over-estimate and under-estimate) will probably not cancel each other out.

correction: no estimate of this phenomenon is possible at present on the basis of the available data.

Calculation

Totals (including extrapolation over all municipalities) for 1997, **1998**, **1999, 2000** and **2001.**

Interpretation (problems)

The number of distributed stickers does not provide a true picture of the number of stickers actually affixed to letterboxes.

The distributed stickers over the years will not always remain permanently affixed. Members of the public may decide at a particular time to start receiving advertising again or the sticker may be removed from the letterbox for other reasons; at the same time, a number of families may have replaced their original stickers with a new one.

The no-advertising stickers give an indication of reduced paper waste per letterbox, but caution is advised with regard to the print run (dumping of non-distributed copies in container parks).

Presentation on the radar diagram

The results are presented as a percentage on an axis where 0% is the result in 1998 (reference year for radar presentation) and 100% is the target for 2003.

Indicator of used goods

Goal

To deduce waste prevention from the increase in the quantities of goods not ending up in the waste circuit due to re-use through used-goods depots.

Formula

Quantities of re-used goods (kg) / number of heads of Flemish population served.

Distance-to-target

Targets are include din the Household Waste Draft Implementation Plan 2003-2007 (July 2002): 5 kg per head of population at the end of 2007.

In order to analyse the distance-to-target, 1998 is the reference year, and the results of the year concerned are positioned in relation to the target.

Dataset

Since 1995, those responsible for the used-goods depots in Flanders have compiled an annual follow-up report. From the first year, the indicator "number of kilograms of goods sold per head of population served" has been in use. Account is only taken of the goods which are actual sold through the recycling shops. Sale to third parties for dismantling, recycling of materials or other purposes is therefore not included.

The quantities turned over are related to the heads of population served, these being the numbers of people living in the areas covered by the used-goods depots.

Errors and corrections: None

Calculation
Totals for the years **1995**, **1996**, **1997**, **1998**, **1999**, **2000 and 2001**

Interpretation (problems)

Used-goods depots are not the only place where second-hand products are bought. It is not known whether sales through used-goods depots is not taking the place of other second-hand channels (classified ads, exchanges, private shops etc). Further research may later bring qualifications to this picture.

The available data are expressed in kg per served head of population (and therefore not per Flemish inhabitant). With effect from 2001, the area covered is almost the whole of Flanders, so that the figures “per head of population” and “per Flemish inhabitant” are almost identical.

Presentation on the radar diagram

The results are presented as a percentage on an axis where 0% is the result in 1998 and 100% the target for 2007.

Indicator of compost bins

Goal

To derive waste prevention from the number of compost bins used by families in the Flemish Region.

Formula

Numbers of Flemish families with compost bin / total number of Flemish families expressed as a percentage

Distance-to-target

The targets in the Household Waste Draft Implementation Plan 2001-2007: 36% of the population is engaged in the prevention of biowaste and 46% of the population is engaged in the prevention of green waste. One of the possible forms of prevention of biowaste and/or green waste is to compost it at home.

Dataset

Number of compost bins sold by the municipal administration (or intermunicipal body) to the population of their own municipality. Origin of data: annual survey for inventory of household waste. The information on compost bins has been requested since the second half of the nineties. Data already available for 1996 to 2001 inclusive.

Errors and corrections

Research shows that the number of dropouts is proportional to the number of new composters. The number of distributed bins gives an over-estimate of users.

> *correction:* It can seen from the study "Enquête bij de bevolking in verband met afvalvoorkoming en afvalsortering in Vlaanderen in 2000-2001" ("Survey of the population in connection with prevention and sorting of waste in Flanders in 2000-2001", OVAM, 2001) that of the number of non-home composters (through the various methods) 10% have dropped out and 10% have the intention to start.

The register of sold compost bins consist of annual numerator or a permanent continuous numerator.

> *correction:* The data are to be corrected on the basis of a comparison of the data for the same municipality per year.

Calculation

Totals of the compost bins distributed for the years **1996**, **1997**, **1998**, **1999, 2000** and **2001.**

Interpretation (problems)

Home composting by private individuals is not always done using a compost bin. Other equipment is also used, such as compost containers, compost heaps ... even wormeries.

Nor do private individuals always purchase their compost bins from the municipal authority (or intermunicipal body). They can also be bought in the retail trade.

The register of compost bins sold additionally includes those bins sold or made available to non-individuals, for example schools and clubs.

Consequently the indicator of “number of sold compost bins” will be an under-estimate of the actual number of families who do home composting.

Presentation on the radar diagram

The results are presented as a percentage on an axis where 0% is the result in 1998 (reference year for the radar presentation) and 100% is the target for 2007.

Indicator of beverage packaging per litre of contents

Goal

To deduce waste prevention of beverage containers from a reduction in the weight of packaging of disposable beverage containers per unit of beverages put on the market.

Formula

Quantity by weight of disposable beverage containers which are placed on the market (kg) / the volume of drinks placed on the market (litres).

Distance-to-target

The Household Waste Draft Implementation Plan 2003-2007 envisages in the sustainability scenario that 20% of disposable beverage containers have been replaced by re-usable ones in 2007 in relation to 2000. We can adopt these objectives as a target for this indicator. In order to analyse the distance-to-target, 1998 is the reference year, and the results of the year concerned are positioned with respect to the target.

Dataset

1. Quantity of disposable beverage containers placed on the market (numerator in the above formula)

Basis
Under the cooperation agreement concerning the prevention and management of packaging waste, Fost Plus reports every year on the quantity by weight of disposable packaging placed on the market in the past year by members of Fost Plus. The data for beverage containers are available from 1997. The data relate to the whole of **Belgium.** Data are available for each product group: food, beverages, cleaning and maintenance, hygiene and care, others. The product group of beverages is divided into:

- Lemonades, colas and fruit juices
- Milk
- Waters
- Beers
- Wines and sparkling wines
- Spirits

2. Consumption of beverages expressed per person

Basis: Statistics Belgium publishes data on the annual consumption of beverages in Belgium (data originating from the association of producers of distilled drinks, Belgische Brouwers (Belgian Brewers), Koninklijk Verbond van de industrie van Waters en Frisdranken (Royal Association of the Waters and Soft Drinks Industry). Data were found for the years 1980, 1990, 1993, 1997, 1998, 1999 and 2000. A division is made into:

- Spirits
- Beer
- Wine
- Water
- Soft drinks
- Milk
- Buttermilk
- Chocolate milk
- Yoghurt and drinking yoghurt
- Coffee
- Tea
- Fruit juice and vegetable juice

Consumption in cafés and restaurants is not included for milk, buttermilk and chocolate milk, The data relate to the whole of **Belgium.**

3. Population number

In order to obtain the total consumption, the figures relating to consumption are multiplied by the number of inhabitants. The population figures from Statistics Belgium are used for this purpose (in the series “Change in population”: figures for 1 January of the year concerned.

Errors and corrections

Not all businesses are yet affiliated to Fost Plus. Consequently more packaging waste is eventually put on the market than is apparent from the Fost Plus figures. However, the effect of this on beverage containers is limited.

Correction: none

Congruence between the numerator and denominator: the data come from different sources. The numerator comes from Fost Plus and the denominator originates from Statistics Belgium. The numerator relates to Belgium.

Correction: no correction for the Flemish Region. It is realistic to assume that the difference between the response at the Belgian and Flemish levels is very limited. With an almost fixed ratio like this, one indicator can be replaced by the other without major problems.

Calculation

For **1997**, **1998**, **1999** and **2000.** The data from dataset 1 are divided by the product of the figures from datasets 2 and 3. This calculation is performed for the following categories:

- Lemonades, colas and soft drinks
- Milk
- Waters
- Beers
- Wines and sparking wines
- Spirits

Interpretation (problems)

The result is even more than an indicator: it gives the measured reduction n waste for the product groups concerned.

A change in the indicator may have various causes: reduction or increase in the weight of the beverage containers (for example shift from disposable glass to disposable plastic containers: reflected in a reduction in weight but is not a measure of prevention; more or less re-use: a measure of prevention), or changing consumption (more preference for light containers (e.g. beverage containers instead of glass): again reduction in weight but not a measure of prevention)

It is a Belgian indicator!

Presentation on the radar diagram

The results are presented as a percentage on an axis where 0% is the result in 1998 (reference year for the radar presentation) and 100% is the 2007 target.

Indicator of packaging per consumption unit

Goal

To deduce waste prevention in packaging from progression in the weight of packaging material with respect to spending on consumption.

Formula

Quantity of disposable household packaging which is placed on the market (kg) / the household spending on the purchase of goods (€)

Distance-to-target

Objectives have been included in the Household Waste Draft Implementation Plan 2003-2007 (version July 2002). This plan envisages in the sustainability scenario that 11% of disposable packaging in 2000 is prevented or replaced by re-usable packaging in 2007. This objective can also be used as a target for this indicator, although relative figures are used (related to consumption spending).
In order to analyse the distance-to-target, 1998 is the reference year, and the results of the year concerned are positioned with respect to the target.

Dataset

1. Quantity of disposable packaging put on the market (numerator in the above formula)

Basis
Under the cooperation agreement relating to the prevention and management of packaging waste, Fost Plus reports every year to the IVC on the quantity by weight of disposable packaging put on the **Belgian market** in the past year by the members of Fost Plus from 1997.

2. Spending

Statistics Belgium lists in the "standard of living" series:
Household budget study 1995/1996 – family expenditure
Household budget study 1996/1997 – family expenditure
Household budget study 1997/1998 – family expenditure
Household budget study 1999 – expenditure and income
Household budget study 2000 – expenditure and income

Data in each case per product category up to 6 figures; figures per household in **Belgium**. From these lists we select a **sub-list** of spending in which the packaging has been subjected to the regulations for household packaging.

3. Number of households (figures from Statistics Belgium, household budget study department)
To obtain the figures per household, Statistics Belgium divides the totals per region by the number of households.

4. Index figures
The data in the household budget studies are in actual prices. In order to obtain constant prices, we use the figures from the Ministry of Economic Affairs ("Consumer price index" series). As the data for the first three lists in each case relate to two years, an average of the indices for the months concerned is taken

Errors and corrections

Not all businesses are affiliated to Fost Plus. Consequently more packaging waste is eventually put on the market than is apparent from the Fost Plus figures. The affiliation rate is, however, estimated at more than 90%.

correction: the quantities of the members are adapted to an estimation of the total market.

With regard to spending, it is not always easy to establish a link between the category of spending and the occurrence of packaging waste of household origin.

correction: A number of categories of spending are not included because no packaging waste of household origin arises through the activity concerned.

Data are only available at the Belgian level for the numerator.

correction: none possible; in order to be correct we also use a Belgian denominator. It is realistic to assume that the difference between the response at the Belgian and Flemish levels is very limited. With an almost fixed ratio like this, one indicator can be replaced by the other without major problems.

Calculation

For the years **1997**, **1998**, **1999** and **2000**. The data from dataset 1 are divided by the product of the figures from datasets 2, 3 and 4.

Interpretation (problems)

A change in the indicator may have various causes:
reduction or increase in the weight of the packaging, more or less re-use, shift in the pattern of consumption.

It is a Belgian indicator!

Presentation on the radar diagram

The results are presented as a percentage on an axis where 0% is the result in 1998 (reference year for the radar presentation) and 100% is the 2007 target.

Indicator of print run for printed advertising material

Goal

To deduce waste prevention from the reduction in the print runs for printed average materials

Formula

Weight of print runs (kg)

Distance-to-target

The Household Waste Draft Implementation Plan 2003-2007 (version July 2002) provides for a reduction by the end of 2003 in the print runs of the regional press and non-addressed printed advertising material of 16% in comparison with 1999, to be attained among other ways by a sticker campaign. We adopt this objective separately as a task for the fraction of non-addressed printed advertising material.

In order to analyse the distance-to-target, 1998 is the reference year, and the results of the year concerned are positioned in relation to the objective.

Dataset

The annual print run is notified under the two environmental policy objectives. Data on printed advertising material are available from 1998.

Errors and corrections

The population of businesses affiliated and reporting differs over the years.

Correction: impossible: no individualised data are available under the obligations of the environmental policy agreements. The net fluctuation due to this changing membership is, however, negligible.

Calculation : For the years **1998**, **1999, 2000**

Interpretation (problems)

An increase or decrease may have various causes: over the years the population of businesses affiliated differs, better reporting.

The target group for acceptance obligations for paper is larger than the group reached through the environmental policy agreements. Although the policy objectives are attuned to this group, due caution should be observed in using

this indicator as a measure of whether the objectives for the whole market for printed advertising material are attained or not.

Presentation on the radar diagram
The results are presented as a percentage on an axis where 0% is the result in 1998 (reference year for radar presentation) and 100% is the 2007 target.

Notes

[1] Draft Synthesis and Discussion Report. OECD Workshop on Waste Prevention: Toward Performance Indicators, 8-10 October 2001, Paris

[2] Taken from Ontwerp Uitvoeringsplan Huishoudelijke Afvalstoffen (Household Waste Draft Implementation Plan), July 2002, p. 97

[3] Taken from Ontwerp Uitvoeringsplan Huishoudelijke Afvalstoffen (Household Waste Draft Implementation Plan), July 2002, p. 97

[4] See Uitvoeringsplan Huishoudelijke Afvalstoffen 1997-2001 (Household Waste Implementation Plan 1997-2001), OVAM, 1997, Table 3.1 p. 128

[5] Prestaties meten in de overheid, Geert Bouckaert, Tom Auwers, Die Keure (in cooperation with Instituut voor de Overheid, KULeuven), Bruges, 1999, 205 pp)

[6] Draft Synthesis and Discussion Report. OECD Workshop on Waste Prevention: Toward Performance Indicators, 8-10 October 2001, Paris

[7] Environmental Indicators: Typology and Overview, Technical report No 25 EEA, E. Smeets, R. Weterings, TNO, 1999

[8] See among the Statistics Belgium (NIS) products "household budget survey" in the"standard of living" series

[9] Enquête bij de bevolking in verband met afvalvoorkoming en afvalsortering in Vlaanderen in 2000-2001, OVAM, January 2002

[10] See the OVAM publication "De kringloopcentra in het Vlaamse gewest: opvolgingsverslag 2001", pp. 21ff

[11] De kringloopcentra in het Vlaamse gewest: opvolgingsverslag 2001, p. 25.

[12] Ontwerp Uitvoeringsplan Huishoudelijke Afvalstoffe (Household Waste Draft Implemetation Plan), OVAM, July 2002, p. 103

[13] Enquête bij de bevolking in verband met afvalvoorkoming en afvalsortering in Vlaanderen in 2000-2001, OVAM, January 2002

14 See Table 33 in the draft plan on p. 102