

European Commission, Brussels



**THE ORGANISATION OF AWARENESS-RAISING EVENTS ON THE APPLICATION OF
COMMUNITY LEGISLATION ON SHIPMENTS OF WASTE, ON LANDFILLS; ON WASTE
MANAGEMENT PLANS
AND ON WASTE PREVENTION PROGRAMMES**

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MINUTES

BELGIUM – LANDFILL OF WASTE AND WASTE PREVENTION

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BiPRO

Beratungsgesellschaft für integrierte Problemlösungen

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1 Outcome of events

1.1 Workshop on landfill of waste in Belgium

Brussels	14 and 15 May 2009	<p>National Cooperation partner: Association of Cities and Regions for Recycling and sustainable Resource management (ACR+), Ministry of Environment, Nature and Energy Flanders (LNE), OVAM Flanders, IBGE Bruxelles and SPW Wallonie</p> <p>Venue: ACR+ c/o Brussels-Europe Liaison Office</p> <p>Participants: 16</p> <p>Agenda: 10 presentations (including EC and BiPRO)</p>
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Table 1-1: Overview on workshop on landfill of waste in Belgium

The information exchange and awareness raising event on landfill of waste and on waste prevention in Belgium took place the 14 and 15 May in Brussels. The event was organised with support of the Ministry of Environment, Nature and Energy Flanders (LNE), Public Waste Agency of Flanders (OVAM), Bruxelles Environnement (IBGE/BIM) and Service Public de Wallonie (SPW). The workshop was held at premises of the Association of Cities and Regions for Recycling and sustainable Resource management (ACR+), which also supported the preparation of the workshop. On proposal of the national authorities the event was covering beside the topic of landfill of waste, issues on waste prevention.

The 16 participants comprised representatives of the LNE, OVAM, IBGE /BIM Bruxelles and SPW Wallonie, ACR+ and some companies (see Table 2-2 participation list).

The workshop was held generally in English with simultaneous French translation. In total 10 presentations were held.

Note: The workshop comprised an informative excursion to Hallembaye Landfill.

1.1.1 Summaries of presentations held in Belgium

Apart from the presentations from BiPRO and the Commission Services, the following presentations were held during the workshop in Belgium:

(1) Landfills - Actual problems and new regulations in the Walloon Region (Ministère de la Région Wallonne)

The presentation provided an overview on the development of waste management legislation in the Walloon Region. In this context it provided information on landfill classification and implementation of the WAC decision. It also highlighted remaining deficits and priorities for the near future.

(2) Environmental Permits for Landfills in Flanders - Implementation of the Landfill Directive (LNE)

The presentation gave an overview of environmental legislation in Flanders (VLAREM I and VLAREM II) and related classification and permitting procedures for landfill sites. It comprised a short overview on the contents of VLAREM I and II, and provided details of the procedure a landfill owner has to go through to obtain an environmental permit. This included the information to be provided in the license application form, the consultation procedures and the conditions fixed in the permits (i.e. waste acceptance procedures and criteria, technical requirements, operational plan, closure procedures and aftercare, monitoring plan, financial guarantee and record keeping periods, sampling and analysis methods to apply, etc.) in accordance with EU requirements. It also specified criteria for landfilling of waste set in Flemish legislation in addition to EU requirements.

(3) Sustainable management of biowaste (OVAM)

The OVAM presentation focused on prevention of biowaste landfilling. This comprised a short overview on relevant EU legislation and a more detailed description of the historical development of waste management policy in Flanders from the beginning of the nineteen-eighties. Priorities of the different planning periods and policy instruments used for enforcement (bans, smart taxes) were highlighted and explained. Information was illustrated by current treatment and infrastructural data. The specific management of biowaste was illustrated by providing facts about separate collection rates, management regions and treatment infrastructure, quality assurance system, ecological and economical values, home-composting and information initiatives. The presentation finished with a discussion of future challenges.

(4) Analysis and problems encountered with the Waste Acceptance Criteria Decision (CARAH ASBL Laboratories)

After a general introduction to the company the presentation focused on current practice and difficulties with chemical analysis. Explanation was given for the laboratory parameters generally analysed in waste. In this context lack of clear guidance and requirements (e.g. mineral oil analysis, pesticides screening) and the various diverging limit systems and requested values (reference, threshold, intervention, reference values) set in concurrent regional and EU legislation was highlighted as important difficulty both for customers and for laboratory personnel).

(5) The WAC Decision – Experiences of a Flemish landfill operator (INDAVER Benelux)

After short information on INDAVER, the waste treatment and transfer stations in the Benelux managed by the company are described and illustrated in detail. This included capacity figures, waste types accepted as well as construction features and acceptance criteria to be respected according to Flemish legislation. In this context practical contradiction in regulation for different landfill categories due to a combination of old Flemish limit values and WAC criteria and principal deficits and problems arising from current WAC requirements concerning leachate, composition and monolithic waste were shown.

(6) The new Waste Framework Directive and its implications for prevention and recycling (IBGE)

The presentation focussed on consequences and open questions arising from the entry into force of the new WFD. For this purpose it started with a short overview of the structure of Directive 2008/98/EC, the scope of application, the exclusions, new definitions, provisions related to prevention and recycling, the waste hierarchy, end-of-waste status, reuse, separate collection, used oil, biowaste, calculation of recycling rates and extended producer responsibility. The presentation critically assessed the wording of the directive and highlighted expected potential escape route or possibilities for divergent interpretations.

(7) A best technology tool for environmentally sound final treatment of residual waste (Intradel presentation at Hallembaye)

In the introductory presentation to the site visit, the history, technical features, and management procedures as well as operational figures were explained and illustrated in detail.

Site visit to Hallembaye landfill

Hallembaye is a class 2 (non-hazardous waste) landfill situated north of Liege in an old chalk quarry, which provided favourable geological conditions. The landfill was constructed in 1999 according to Landfill Directive requirements aside of a first landfill in operation from 1990-1999.

The active site is divided into two zones with a total capacity of 4,500,000 m³. Up to 2008 about 200,000 tonnes of waste (the majority of which is biodegradable) were deposited annually. This amount has declined considerably due to the entry into operation of the new MSWI in Liege and will further be reduced with the entry into force of the landfilling ban for MSW in January 2010.

The active site is equipped with a modern compliant bottom sealing layer, a leachate collection and treatment system (reverse osmosis) and a gas collection and recovery system. Currently gas is used for electric energy production. Waste heat is used on site but not yet sold externally.

Odour control is effectively managed by daily coverage with compost and by vaporisation of essential oils. In addition early gas collection and recovery is another important measure to control and reduce emissions.

Coverage: The site is covered by a superficial mineral coverage but not impermeable membrane in order to allow sufficient precipitation to enter the installation in order to speed up degradation of the organic compounds.

Leachate: Annual leachate production is at 46,000 m³ and gas production is roughly 6,700,000 Nm³ of which 70% is recovered energetically to produce an annual electric output of 7,800,000 kWh.

Monitoring: Air and water monitoring is performed.

Box 1-1: Site visit to Hallembaye landfill

The presentations from Belgium, including the standard presentations from the EC and BiPRO are available for download at: www.biopro.de/waste-events/landfill/events09/be.htm

1.1.2 *Legal background and national enforcement structure in Belgium*

Each of the three Belgian regions (Wallonia, Flanders, Brussels) has its own environmental legislation in place and is responsible for its own waste policy including management planning on its own territory

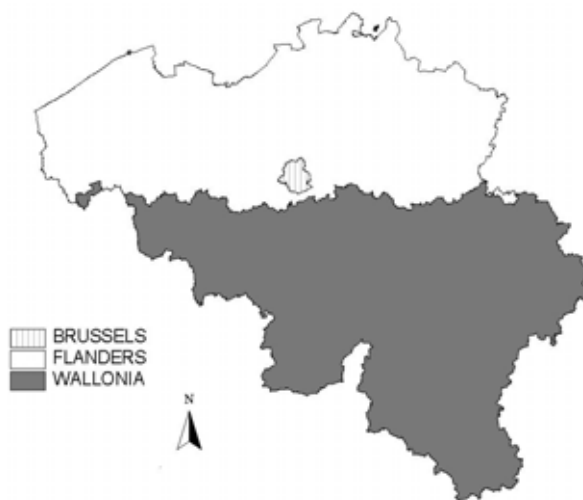


Figure 1-1: The three Belgian regions independently responsible for their waste management

Walloon region

The Walloon region consists of five provinces – Walloon Brabant, Hainaut, Liège, Luxembourg and Namur – covering a total surface area of 16,844 km². It has a total population of 3.3 Mio inhabitants giving a population density of close to 200/km².

In 1987 the Walloon Government adopted a specific decree regulating the siting and operation of sanitary landfills. This decree (Arrêté de l'Exécutif régional Wallon du 23 juillet 1987 relatif aux décharges contrôlées) since then has been amended several times.

Long before the **EU Landfill Directive** came into force, the Regional decree of 1996 banned landfill of waste from January 2010 and requested a planning of landfill construction on the territory. The decree of 1998 adopted the Walloon WMP. In the decree of 1999 most of the aspects of Directive 1999/31/EC have in adopted by establishing environmental permitting procedure.

In the 2003 decree (Arrêté du Gouvernement Wallon AGW) also the technical requirements of the Landfill Directive have been transposed into regional legislation except of the exclusion of certain waste streams, which due to the structure of the regional law had to be addressed in a separate AGW in 2004.

Since 2004 only “ultimate” MSW waste it is allowed for landfilling. The definition of ultimate waste is not yet set in the Regional legislation so that it currently remains within the responsibility of the

competent waste management organisation as is the selection of the appropriate pre-treatment method.

In order to eliminate this situation an amendment of AGW 2004 has been proposed. According to this proposal, waste will be regarded as ultimate if, under current technical and economic conditions it can not be further treated (e.g. residue from separation operation, not appropriate for thermal treatment).

For a number of clearly defined wastes to be listed in a new annex to AGW 2004, the ultimate character will be accepted if the waste is the non combustible residue of a plastic waste separation operation corresponding to less than 3% of the separated wastes. For wastes not covered in the new annex the ultimate character will have to be proved in a case by case procedure.

From January 2010 the landfilling of organic biodegradable waste will be completely banned.

In addition a new landfill tax of 60 € will be introduced in the Walloon Region from 2010 in order to further divert waste from landfills and shift treatment towards recycling and recovery.

The **Waste Acceptance Criteria Decision** (Decision 2003/33/EC) has not yet been officially transposed into regional law, but a proposal has been elaborated which might enter into force by end of this year. Acceptance procedures and sampling methods request a modification of the AGW from 27 February 2003. The acceptance criteria request a modification of AGW from 18 march 2004 (ban of landfill for certain waste types) and of AGW from 10 July 1997 (waste catalogue).

The current version provides for four classes of sanitary landfills as follows:

- Class 1: Sanitary landfills for hazardous but non-toxic waste
- Class 2: Sanitary landfills for domestic and similar waste (Class 2a) or non-hazardous, non-toxic industrial waste (Class 2b)
- Class 3: Sanitary landfills for inert waste
- Class 5: Sanitary landfills set aside for the exclusive use of a waste generator

A more recent decree (30 November 1995) has created a specific class of sanitary landfills for the disposal of certain wastes resulting from the cleaning and dredging of waterways and bodies of water.

Waste according to Walloon legislation is classified in the three categories:

- B: Biodegradable
- NB: Non biodegradable
- C: Not biodegradable but compatible with category B
- A mixed disposal of categories B and NB is prohibited

As concerns sampling and testing methods for determination of acceptability the European norm EN12457, with a L/S ratio of 10 l/kg has been considered as appropriate. As concerns criteria and analysis for monolithic waste the French norm XP-X31-212 is used until the European Norm EN-12457-4 will have been developed.

As concerns limit values and additional acceptance criteria Walloon legislation contains aspects in addition to the EU WAC decision. For PAHs limit values as illustrated Table 1-2 have been set for inert waste.

Parameters	mg/kg dm
PAH	
Benzo(a)anthracene	35
Benzo(a)pyrene	8,5
Benzo(ghi)perylene	35
Benzo(b)fluoranthene	55
Benzo(k)fluoranthene	55
Chrysene	400
Phenanthrene	30
Fluoranthene	40
Indeno(123cd)pyrene	35
Naphtalene	20

Table 1-2: PAH limit values in Walloon legislation / Belgium (source: presentation Pascal Vanderwegen)

In addition limit values for Phenols have been set for all waste categories:

- Inert wastes: 1 mg/kg ms
- Hazardous wastes: 1000 mg/kg ms
- Non-hazardous wastes: 1000 mg/kg ms – (classes 2.1.a, 2.1.b and 2.2)

As concerns asbestos wastes, it has to be noted that only bound asbestos waste is acceptable in the Walloon region. This waste has to be delivered in big packs in class 2 landfills in accordance with the EU decision requirements.

An overall **waste management plan** in the Walloon Region “Horizon 2010” was adopted in 1998. However, this plan does not consider in detail all of the sanitary landfill related issues that the Walloon Region wanted to specify. The Region thus decided to create a special plan called the “Plan des CET” or Sanitary Landfill Plan.

According to a 1996 decision, each selected site other than those for class 3 landfills would have to undergo an EIA by a certified firm. The assessment of the likely class 3 sites would involve a simplified methodology.

Municipalities with areas located close to the landfill's boundaries were also considered to be affected by the project. In this specific case, the distances of 500 m for class 3 landfills, 1,000 m for landfills for dredging sludges and silt, and 2,000 m for class 2 landfills were chosen.

In 1999 the Walloon Government adopted the final Sanitary Landfill Plan (Arrêté du Gouvernement wallon du 1er avril 1999 adoptant le plan des centres d'enfouissement technique). In addition it decided to grant the localities concerned a sort of compensation for the creation of a sanitary landfill on their own or adjacent territories. This compensation, which is calculated according to objective criteria, must be used to improve the quality of life of the people who live near the landfill.

Flanders region

The legal background for **waste management** in the Flemish Region is formed by:

- Decree of the Flemish Council of 28 June 1985 concerning Environmental Licences ("Decreten – Leefmilieu – Decreet milieuvergunning")
- Order of the Flemish Government of 6 February 1991 concerning Environmental Licences (VLAREM I) ("Besluiten van de Vlaamse Regering – Leefmilieu – Titel I van het Vlarem" with Appendix (VLAREM I))
- Order of the Flemish Government of 1 June 1995 concerning General and Sectoral provisions relating to Environmental Safety (VLAREM II) ("Besluiten van de Vlaamse Regering – Leefmilieu – Titel II van het Vlarem" with Appendix (VLAREM II))

Documents are available for download in Flemish and English at <http://navigator.emis.vito.be>

In the Flemish region landfill permits are given in the framework of environmental permitting as specified in the VLAREM system with:

- VLAREM I: Information on procedures and environmental classification
- VLAREM II: Permit conditions (implementation WAC decision)

Landfills in accordance with EU legislation are classified in inert (cat. 3), non-hazardous (cat. 2) and hazardous landfills (cat. 1). In addition there is an landfill category for dredging sludges (see also Walloon region). Environmental classification is always class 1 (polluting activity; activity with important environmental impact).

The license application forms for landfills have to include the following data:

- General information (site plan scale 1/1000, execution plans scale 1/200, administrative data, technical characteristics, additional data like information on preventive measures, BAT, schemes)

- Specific information for landfill site (geological and hydro-geological characteristics, general description of the site and the environment, information on the stability of the site and its environment)
- Plans and surveys (proposal for a work plan, survey plan for the pits, depressions and banks also informing of the ground level and the calculation of the useful volume, proposal for a layout plan; the closure procedures and aftercare of the landfill, undertaking to provide a financial security)
- EIA (Environmental Impact Assessment) for category 1 & 2 landfill sites and IPPC for some installations

When the permit application was submitted it undergoes an evaluation procedure where all involved stakeholders, e.g. Department Environmental Permits, city council, OVAM, Waste Water and Air emission (VMM), Health Inspection (TOVO) can comment. As foreseen in EU legislation permits contain criteria for waste acceptance, sampling and test methods to apply, the workplan for construction, monitoring and control, operational practice and aftercare.

According to Flemish legislation technical requirements for environmental protection are as follows:

	Bottom	Top
Cat 1 & 2	Geological barrier Leak detection system Artificial bottom liner Leachate drainage system	Top liner – final cover - grass
Cat 3	Geological barrier	Final cover - grass

Table 1-3: Technical requirements for landfills in the region of Flanders / Belgium (source: presentation Pascal Vanderwegen)

According to VLAREM II the following targets, methods and deadlines are set for **waste acceptance**:

- Records of basic characterisation & compliance testing: to be kept for 10 years
- Samples taken upon delivery: to be kept for 1 month
- Leaching limit values to be determined with $L/S = 10 \text{ l/kg}$

Additional wastes that may not be accepted according to Flemish legislation are:

- Waste materials for which a landfill prohibition applies
- Wastes containing toxic organic or inorganic substances
- Wastes of which the leachate might affect the liner or the leachate drainage system

Additional criteria for waste acceptance set in Flemish legislation are:

- Limit values for individual BTEX and PAH's for acceptance at cat. 3 landfills (inert waste)
- Limit values for inorganic non-hazardous wastes with a low level of organic/biodegradable substances acceptable at cat. 2 landfill
- Limit values for metals and criteria for stability and non-reactivity in monolithic waste for acceptance at cat. 2 and 1 landfills
- Limit values for Cr VI and total cyanide for hazardous waste acceptable at cat. 2 and 1 landfills
- In the good practice guideline for waste acceptance procedures issued by Flemish authorities, responsibility for compliance testing is allocated to the waste producer, but there is ongoing discussion about this issue.

The management of **biowaste** evolved during the years and different waste management plans were elaborated and put in practice :

1. In Flanders structured waste management started in the early eighties with a first Waste Management Plan (period 1986-1990): focussing on producing order, closing or improving many of the local landfills, cleaning up incineration.
2. The second Waste Management Plan (1991-1995) focussed on MSW with a priority on waste prevention and recycling of waste what was translated via subsidies for composting bins and composting installations. It also introduced the instrument of the the 'Environmental agreements' between the Flemish authorities and the municipalities.
3. At the same time a Masterplan for kitchen waste and green waste was started with the foundation of Vlaco npo (organisation to promote the production and use of quality compost in Flanders), separate collection of greenwaste and organic kitchen waste (vfg -vegetable fruit and garden -waste).
4. In the period 1995-1997 biowaste management was further implemented, proceeding to the three pillar policy: separate collection of kitchen waste and green waste and home composting.
5. The third WMP on MSW (1997-2002) put a focus on the three pillar biowaste policy with focus on home composting and the reduction of residual waste with the goal of no new incineration capacity needs.
6. The current plan for organic-biological waste (2000-...) has a focus on improved quality of the treatment products and on further sensibilisation of the general public for good practice home composting and cycling gardening. In addition goals for collection and treatment of organic-biological waste of enterprises has been added.

7. Similar objectives have been set in the implementation plan for MSW (2003-2007) with cycling gardening and structural embedding of compost masters is one of the targets set.
8. The latest development in MSW management in Flanders (2008-2015) is the balancing of recycling and energy recovery which should go hand in hand, and even more ambitious objectives for prevention, home composting and compost masters.

Major policy instruments used in Flanders are: WMP's, separate collection, Vlaco npo, levies, sensibilisation, information, landfill ban, regulation for secondary raw materials, certificates, environmental agreements, collective composting, compost masters

Information to enforcement infrastructure in Flanders region

OVAM is the responsible authority for waste **policy making**, whereas the municipalities are responsible for the **collection and treatment** of household waste.

Cooperation with and between Flemish municipalities is organised by means of, for example:

- Environmental agreements between municipalities and the Flemish authorities to stimulate for example home composting and separate collection
- Subsidies for composting bins, composting installations
- Brochures about separate collection of vfg waste and green waste

Smart' taxes are used to steer waste management. Taxes:

- Make landfilling more expensive than incineration
- Make (co)incineration more expensive than recycling
- Steer the market towards the treatment option with the lowest environmental impact

In addition restrictive permitting policy for landfills increases landfilling costs.

1.1.3 *Facts and figures related to landfilling of waste and waste prevention activities in Belgium*

Information to waste management infrastructure in Walloon region

Current waste treatment shares in the Walloon region are 45% recycling, 15-40% waste incineration and 11% landfill. The treatment infrastructure as regards landfill is as follows:

- 7 non-hazardous waste landfills (class 2)
- 11-12 landfills for inert waste (class 3)
- 3 industrial hazardous waste landfills (on production sites)

During the development of the regional landfill plan in 1996, 331 site proposals spread over the entire territory of Walloon were examined as regards their appropriateness for waste management. In January 1997 the Walloon Government decided upon the following shortlist of sites to undergo more thorough examination. In 1998 the Walloon Government drew up a list of sites for public hearings.

This list consisted of:

- 33 Class 3 sites
- 10 Class 2 sites
- 14 sites for dredging sludge and silt

According to a political consensus class 1 landfills intended exclusively for hazardous waste will not be constructed in the region.

Public waste management in Walloon region is organised in so-called “intermunicipal areas”. Eight associations of municipalities are the responsible key players for domestic waste management in particular the management of class 2 landfills and MSWI (see Figure 1-2). Each area hence should have at least one class 2 landfill, aside from the possibility of synergy between two or more intermunicipal associations. At the time of the plan’s adoption the total residual capacity of the existing sites was estimated to be 10 Mio m³, while the needs around 2020 were put at some 15 Mio m³. Consequently only one new site (Silly-Enghien in the IPALLE area) was planned, since the forecast needs were covered by the existing sites and their extensions in all other areas. With this planning the region’s class 2 landfill needs are well covered, with a safety margin of the order of 20% to cover contingencies.

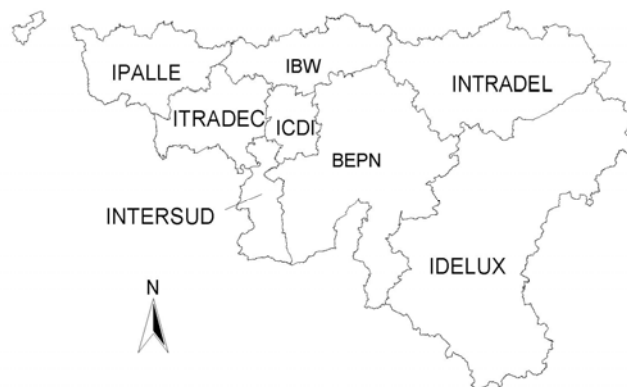


Figure 1-2: MSW management areas in the Walloon Region/Belgium (source: presentation of Alain Houtain, Waste Management Conference Sardinia 2009)

Landfills for the dredging sludges and silt from waterways and open water bodies are situated on the water's edge, right next to the sites to dredge, so as to be able to meet navigability and flood control needs. The overall unfavourable environmental impact assessments of the dredging sludge landfills led the Walloon Government to choose only two of the proposed sites. This will not be enough for its needs. Other technologies to recover or dispose of these sludges are consequently being studied.

The cost of transport is a major element for class 3 landfills. To define an "economic and spatial mesh" criterion, the Walloon Government decided that the sites' locations must guarantee all professional users of an inert waste landfill access to a site by road within 30 minutes (or 35 minutes for densely populated areas), regardless of the user's location. The authorised class 3 landfill network, thus, has a huge overcapacity.

Information related to waste acceptance criteria in Walloon region

Related to waste acceptance criteria, in the Walloon Region the following parameters are usually applied for waste analysis: PAHs, BTEX, PCB, Hydrocarbons (C10-C40), Mineral oils, Pesticide (screening) and Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn).

Samples that are analysed comprise dredging and WWTP sludges, soil samples from accidental contamination and soil samples of private lands.

Information related to waste prevention in Walloon region

For the Liege region, where waste management is in the hand of INTRADEL, valuable information on waste prevention activities and awareness raising has been provided in the context of the site visit to Hallembaye.

Similar to the situation in Flanders, various activities are established in the Liege region in order to increase reuse and repair, home composting, low waste gardening, waste prevention at home in the office and in school, and to reduce food waste. To this end various informative brochures have been

published that are available at treatment installations and civic amenity sites and are actively distributed to citizens. Brochures also contain links to local reuse initiatives¹ (e.g. online bourses for exchange of goods or support in all questions related to repair and reuse possibilities) and contact data to repair companies. These brochures are accompanied by reusable bags, cooling bags, small litter boxes for cigarettes, non-pub stickers, etc that are disseminated to citizens during various occasions such as days of the open door etc.

Information to waste management infrastructure in Flanders region

In Flanders the waste management infrastructure in terms of landfills is the following:

- Cat. 1 hazardous waste: 4
- Cat. 2 household waste: 5
- Cat. 2 non-hazardous waste with low organic content: 5
- Cat. 3 inert waste: 6

An overview of the proportion between the different treatments in Flanders is illustrated in Figure 1-3.

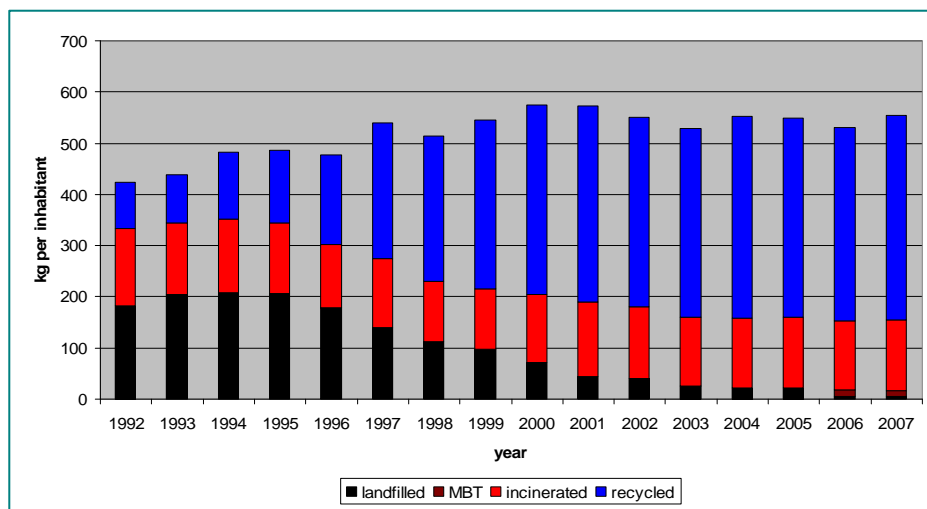


Figure 1-3: Change in MSW treatment from 1992 to 2007 in Flanders/Belgium (source: presentation Mieke De Schoenmakere)

¹ E.g. www.troctoo.com, www.2ememain.be/echange; www.xchange.be; www.quefaire.be; www.eco-lable.com; www.liguesdesfamilles.citoyenparent.be; www.res-sources.be, electrosocie.eu, www.brocantroc.com, etc

Similar to the development in treatment infrastructure and treatment shares over time the composition of the residual MSW waste bag changed considerably, with especially the biowaste content having reduced dramatically. Besides this paper-cardboard, glass and metals showed the strongest decline, whereas plastics remained nearly unchanged (see Figure 1-4)

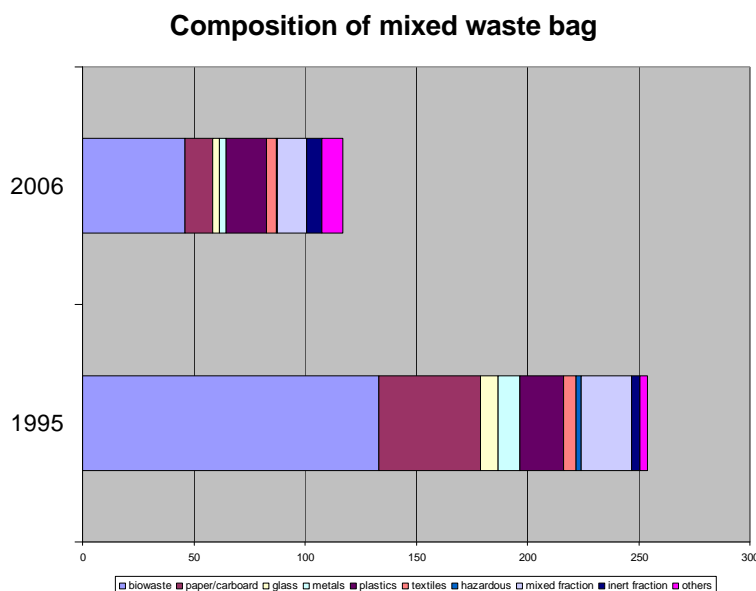


Figure 1-4: Change in MSW treatment from 1992 to 2007 in Flanders/Belgium (source: presentation Mieke De Schoenmakere)

Information related to biowaste collection and treatment in Flanders

This observation is a consequence of the obligations of the intermunicipal organisations.. Waste management associations (inter-municipalities) have to choose a type of separate collection and treatment for biowaste which depending to its infrastructure and population density can either focus on kitchen residues (vfg: vegetable fruit and garden waste) or on green waste from gardening. The choice made in the different regions is illustrated in Figure 1-5.

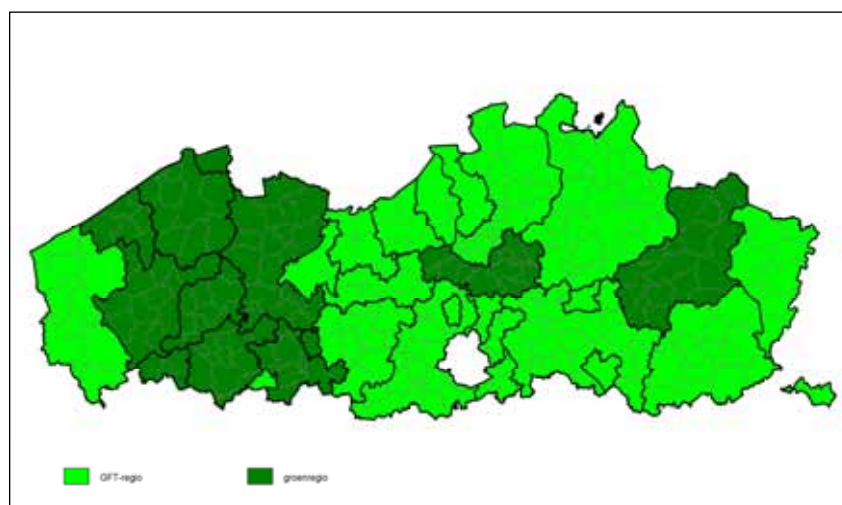


Figure 1-5: Kitchen residues (vfg waste) and green waste region in Flanders / Belgium (source: presentation Mieke De Schoenmakere)

The development of separate biowaste collection and treatment is demonstrated in Figure 1-6.

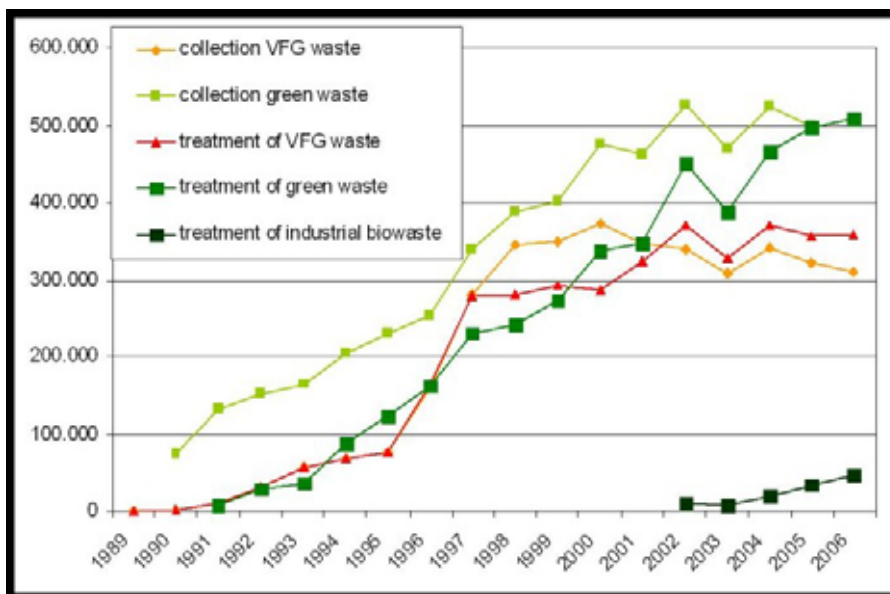


Figure 1-6: Trend of biowaste collection and recovery in Flanders /Belgium (source: presentation Mieke De Schoenmakere)

The distribution and diversification of the treatment infrastructure for biodegradable waste in Flanders is illustrated in Figure 1-7. Infrastructure comprises composting and anaerobic digestion/bio-gasification plants.



Figure 1-7: Biowaste recycling and recovery infrastructure in Flanders/Belgium (source: presentation Mieke De Schoenmakere)

The principal treatment possibilities for biowaste in Flanders are illustrated in Fig. 1-8.



Figure 1-8: Organic waste cycles in Flanders (source: presentation Mieke De Schoenmakere)

For quality assurance the obligation for a certification scheme has been introduced in Flanders via VLAREA (Flemish regulation on waste prevention and management) for treatment products from biowaste, including:

- Secondary raw material: User certificate (1998)
- Obligation for integral chain management testing certificate (2004)
- Certification commission (2009)

With the help of this policy the EU target for 2016 to reduce the amount of biodegradable municipal waste going to landfill to **35%** of the total amount of biodegradable municipal waste that was produced in 1995 (3,397,080 t), was achieved already in 2002.

	2003	2004	2005	2006	2007
Biodegradable municipal waste going to landfills	584,115 t	39,576 t	27,024 t	7,202 t	0 t

Table 1-4: Trend of annual biowaste quantities landfilled in Flanders

The separate collection and treatment of biowaste has various benefits on ecological and economical side. OVAM estimated those benefits based on figures for the year 2007 (see Box 1-2).

Benefits and ecological value composting – An example from the Flemish region/Belgium

The Flemish region of Belgium achieved the targets for diverting biodegradable waste from landfill by a composition of various instruments. One of them is the separate collection of kitchen waste (vfg waste) and green waste collected. The ecological value for the biowaste collected in 2007 was counted as:

- 500,000 ton CO₂ saved, which is comparable with 240,000 cars driving for 1 year (15 000 km/year) or 200,000 households electricity use for 1 year (3 500 kWh/year)
- Vfg-digestion with post composting: electricity for 5,500 households + 15% sieve overflow for biomass: electricity for 12,000 households
- 100,000 m³ water saving a year, which is comparable to the water use of 2,400 persons (45m³/person/year)
- 3,200 to 3,800 t less soil erosion

The economic value sums up to:

- 55 €/t composted green waste
- 65 €/t composted kitchen waste (vfg-waste)

Box 1-2: Ecological and Economic benefits of biowaste treatment in Flanders (source: presentation Mieke De Schoenmakere)

34% of the population in Flanders is home composting (mainly in rural areas). Such achievements have only been possible by the introduction of a system of compost masters. The system was started by Comité Jean Pain in 1994. In 1998 Vlaco npo takes over. In 2008 about 2,500 compost masters (5 per 10,000 inhabitants) are active in Flanders, raising awareness and providing knowledge on training on best practice. Information is distributed via websites (www.ovam.be, www.vlaco.be, www.compost.be; www.tuingrond.be; www.compostmeester.be; www.thuiscomposterren.be) and brochures.

Information related to waste acceptance criteria in Flanders

Limit values for waste composition and leaching in Flanders are the results of pre-existing regional legislation and the EU WAC decision requirements. Some landfill categories not covered within the WAC keep the existing Flemish criteria. The Flemish authorities decided to introduce the new WAC parameters for all landfill categories to avoid potential switch between hazardous and non-hazardous landfill and to introduce criteria for monolithic waste. An overview on current acceptance limits for non-hazardous and hazardous are illustrated in Tab. 1-5)

		Leachate limit values (VLAREM II, afd 5.2.4)	
		Hazardous waste landfill	Non-hazardous waste landfill
As	mg/l	2.5	1.0
Ba	mg/l	30.0	90**
Cd	mg/l	0.5	0.5
Cr	mg/l	7.0	
Cr6+	mg/l	0.5	0.5
Cu	mg/l	10.0	10.0
Hg	mg/l	0.2	0.1
Mo	mg/l	3.0	9.0**
Ni	mg/l	4.0	2.0
Pb	mg/l	5.0	2.0
Sb	mg/l	0.5	1.5**
Se	mg/l	0.7	2.1**
Zn	g/l	20.0	10.0
Ammonium	mg/l	none	1.0
F	mg/l	50.0	50.0
Cl	mg/l	2,500.0	none
Nitrite	mg/l	none	30.0
SO4	mg/l	5,000.0	none
CN-	mg/l	1.0	1.0
DOC	mg/l	100.0	80.0**
Phenol-index	mg/l	none	100.0
TDS (WOG)	% DS	10.0	10.0*
Hydrocarbons	% DS	5.0	5.0
EOX	mg/kg DS	1,000.0	1,000.0
TOCv		6 %	6 % DS
LOI / ignition loss		10 %	10 % DS
Solvents	% DS	3.0	3.0
Physical stability and bearing capacity	kN/m2	10.0	10.0
	new parameter		

*in salt cell conditions

**approximate value of #BBT (valid to 16/07/2009)

Table 1-5: Leaching limit values for waste landfills in Flanders/Belgium (source: presentation Alain Konings)

Information related to environmental taxes in Flanders

In order to guide waste management further towards prevention and recycling graded environmental taxes have been introduced for conventional waste treatment methods (Tab. 1-6). For specific and detailed figures see: <http://www.ovam.be/jahia/Jahia/pid/2020?lang=null> (Tarieven milieuheffingen 2009)

Treatment prices	Tariff	Tax	Total
Landfilling MSW	60€	79€	139€
Incineration MSW	70-130€	7€	77-137€

Table 1-6: Increased treatment prices for landfill as instrument to guide waste management in Flanders/Belgium (source: presentation Mieke De Schoenmakere)

Information related to waste prevention in Flanders

Waste prevention in Flanders is an issue since 1991. Different instruments are being used (see Box 1-3).

The PRESTI Programme in Flanders - An example for regional waste prevention programmes in Belgium

Waste prevention in Flanders is an issue since 1991. Major activities are coordinated in the regional PRESTI (PREvention STImulation) programme.

Objective: The programme aims to fulfil the objectives set by the prevention policies of the Region of Flanders by especially addressing industry, companies and SMEs and organisations.

Realisation: The PRESTI programme has been step-wisely developed in so far 5 consecutive periods:

- PRESTI 1 (1994) - Studies per professional sector and dissemination of obtained knowledge to the SME's
- PRESTI 2 and 3 - Pilot companies introducing prevention measures and experiences were spread
- PRESTI 4 (1998) – Addressed to intermediary organisations that set up projects, works with an environmental commitment of the SME and environmental actions during one year; companies can earn a certificate
- PRESTI 5 (2003 - end in 2008) - Besides federations, research bureau's, environmental organisations etc. can submit projects and receive 65% subsidy of the project cost → the evaluation already started

Several instruments were used to raise awareness and knowledge about waste prevention, in particular:

Eco-efficiency scan programme: The program wants to encourage SME's to invest in an eco-efficient policy. In this way they combine environmental profit with economic advantage. Over a period of 3 years the program aims at the participation of 1.000 Flemish SME's. Budget was 2,6 million €. The programme was developed in close contact with the stakeholders. The programme follows a three step method including an audit (by means of the eco-efficiency scan), a follow-up after 6 months and a follow-up after 1 year. The voluntary programme is carried out by (external) consultants free of charge for the SME. Data is strictly confidential.

MAMBO: The less waste programme ("Minder Afval - Meer Bedrijfsopbrengsten") is a tool to calculate total waste costs for Flemish SME's. The result showed that the true waste costs are up to 10 times higher than the visible disposal costs and mean value of total waste costs amounts up to 5% of the production costs.



Ecolizer: Ecolizer is an instrument to promote ecodesign based upon the internationally accepted method “Eco indicator 99 method. The eco-indicators used are based upon Life Cycle Assessments. Step 1 includes the gathering of data on emissions and resource inputs of production processes and step 2 the recalculation to one score. The method foresees an analysis of problems in a reduced life cycle assessment of the product (production, usage and disposal). It is useful for the comparison of materials and production processes and the internal comparison of product proposals and concepts.

Ecodesign Awards: The award makes an inked to the prestigious “Henry Van de Velde” Price for professional designers creating eco efficient products. For students of the field of product development an inspiration database including 250 examples on eco-efficient design was created.

Product test: A web application for local authorities was installed. The authorities can check how well they perform in the field of green procurement and product-use using environmental criteria. The product test is so far available for office supplies and cleaning products and includes an annual update.

Further information at:

PRESTI: <http://www.ovam.be/jahia/Jahia/pid/100?lang=null>

MAMBO: www.mambo.be/

ECOLIZER: www.ecoinvent.ch (Method) ; www.pre.nl/eco-indicator99

Box 1-3: The PREvention STimulation Programme (PRESTI) in Flanders /Belgium (source: Waste Management Presentation of OVAM, Copenhagen 2008; provided as background document from Mieke De Schoenmakere)

Brussels Capital region

Brussels takes part in the ACR+ (www.acrplus.org) the association of cities and regions for recycling and sustainable resource management. Besides conferences, workshops, technical reports and information campaigns, active waste prevention actions are one of the major tools and activities of the organisation. The Figure below give an illustration of the calculated waste and CO2 reduction potential envisaged in the current <-kg campaign.



Figure 1-9: Waste prevention action of ACR+ as example of recent activities in the Brussels Capital Region/Belgium (source: Jean-Pierre Hannequart)

1.1.4 *Major problems and deficits related to landfill of waste identified in Belgium*

- No systematic inventory of closed landfills and dumpsites
- No systematic investigations into gas emissions from closed landfills/dump sites; generally no gas recovery from closed sites
- Financing of monitoring, aftercare and remediation of old closed dump sites; no financial guarantees for this purpose in place
- Determination of range of variability of regularly arising waste deemed difficult
- Strict incineration and landfill bans in place but motivated derogation possible
- Major interferences of organic and “inorganic” carbon in DOC analysis leading to analysis results exceeding limit values set; existing norm needs to be improved
- Leaching limit values in the WAC are expressed as mg/kg DM, whilst the old Flemish limit values were expressed as mg/l
- Very low limit values for new parameters: Ba, Sb, Se, Mo, DOC; in this context it is to question what is (eco-)toxicological relevance?
- Stabilisation/immobilisation of oxy-anions (Sb, Se, Mo) is not successful if metals are present in mixtures, what is often the case
- Composition limit values in the WAC are expressed “as such”, whilst old Flemish limit values, were expressed as “dry matter”
- There is a lack of clarity in definition of monolithic waste
- Regional limit values (expressed as mg/m²), have been based on Flemish legislation for secondary raw materials; there are no limit values on composition
- There is a considerable variation in the approaches taken for analytical verification between Flemish landfill operators
- Lack of clarity when a load and/or a waste stream is to be regarded compliant to the WAC
- Lack of clarity when a stabilised waste should be regarded as compliant after treatment

1.1.5 *Major problems and deficits related to the new WFD identified in Belgium*

- Lack of clarity how to use life-cycle aspects as potential reason to change the waste hierarchy order
- Partial inconsistency and discrepancy with packaging waste directive requirements
- Difficulties with proper interpretation of newly defined treatment operations including the different reuse levels (direct reuse, preparing for reuse, recycling)
- Difficulties with proper calculation of recovery efficiency of waste incineration facilities
- Lack of easy use guidance for end-of waste status determination
- The 2020 recycling targets for separately collected waste fractions leave much room for interpretation so that a clear guidance and calculation standards are urgently needed
- The extended producer responsibility is not sufficiently requested in the new WFD (“MS may...”)
- Technical feasibility may be used as excuse not to promote ambitious recovery operations

1.1.6 *Examples of good practice identified as potential tools to improve implementation and enforcement in Belgium*

- Sustainable waste management, biowaste management and waste prevention started long before EU requirements came into force
- Existing landfills compliant with Landfill Directive requirements
- Additional acceptance criteria (specific waste types, specific combinations) and limit values for landfills set
- Criteria for monolithic waste set in Flemish legislation
- System of environmental permits
- Gas recovery performed on operating landfills
- Leachate treatment generally performed on-site (afterwards direct discharge into open waters possible)
- Use of leachate water for cleaning of waste waters of wet scrubber systems in on-site incinerator plants
- Residual waste is systematically sent to separation plants where organic fraction is sorted out and directed towards energy recovery (incineration)

- Green paper on biodegradable waste, organisation of related conferences at EU level, promotion of Biowaste Directive
- EcoEfficiency Scan and ResouceCities as waste prevention activities for SMEs and public administration in Flanders (OVAM site) and Brussels Capital Region (ACR+ website)
- Focus on quality composting (compost masters, compost quality label)
- A large number of composting plants also in the Walloon region; separate collection of biodegradable waste fractions already started in Namur, Liege, and Luxembourg region
- Green certificates and subsidies for gas recovery from landfills; important raise of energy recovery in landfills (pre-dominantly electricity generation; heat recovery not yet)
- Separate collection of packaging waste is generally established also in the Walloon Region; Paper and plastic fractions are largely incinerated (energy recovery)
- Civic amenity site network established throughout the country
- Local collection/reuse campaigns for toys, bicycles, etc. at civic amenity sites
- Awareness raising and education on waste prevention, reduction of food waste, home composting, sustainable gardening, waste prevention at home in office and at school
- Local exchanges bourses for waste prevention

1.1.7 *Priority activities for waste management in Belgium*

- Further specification and improvement on monitoring requirements for landfills in Walloon legislation
- Modification of Walloon waste catalogue to make it fully compliant with WAC requirements
- Aim to restrict further capacity planned in Flanders: needs must be, as much as possible, covered by improved prevention/recovery

1.1.8 *Priority activities for Member States and EU Commission as identified in Belgium*

- Define End-of-Waste Criteria and elaborate List of Waste
- Elaborate recycling targets and calculation methods as well as prevention indicators
- Elaboration of Waste Prevention Guidelines and exchange of best practice
- Elaborate Energy Efficiency Formula

- Prepare guidance on the application of the waste hierarchy
- Realise an impact assessment on biowaste followed by a proposal, if appropriate
- Prepare an interim report on waste generation and prevention (end 2011)
- Develop eco-design policy and action plan to change consumption patterns (end 2011)

1.1.9 *Proposals, suggestions and needs addressing the EU Commission with respect to landfill of waste*

- Enhance information exchange on best practice for waste prevention, biowaste reduction between EU Member States
- Elaborate guidance on responsibility for “compliance testing” (waste producer or landfill operator?)
- Elaborate harmonised definition of biowaste/biodegradable waste
- Allow re-injection of leachate water into landfilled waste in order to speed up decomposition of the organic fraction (Walloon Region)
- Labelling/certificate for bio-plastics in order to foster consumption and consumers demand
- Revise/improve analysis method for DOC in order to avoid false high results due to “inorganic” carbon
- Revise limit values for Sb, Se, Mo, based on information exchange between Member States, and taking into account BAT
- Allow acceptance of waste streams in “salt cell” technology, for high (inorganic) salt contents pre-treated waste still exceeding LV after applying BAT
- Introduce clear definition and WAC on “monolithic” waste; limit “organic” input fraction before stabilisation
- Cover waste verification/compliance procedures by a code of good practice, or guideline (including for stabilised waste)
- The definition of residual waste/ultimate waste remains a local/regional or national definition as clear guidance on this issue is not set

1.1.10 *Proposals, suggestions and needs addressing the EU Commission with respect to the new WFD and waste prevention*

- Need of clear guidance on interpretation of life-cycle aspects as potential reason to change the waste hierarchy order
- Need for clarification on applicability for packaging waste
- Need for clear definition and guidance for interpretation of newly defined treatment operations including the different reuse levels (direct reuse, preparing for reuse, recycling)
- Need for guidance and clarification of calculation formula for recovery efficiency of waste incineration facilities
- Need for short easy guidance for definition of end-of waste status
- The 2020 recycling targets for separately collected waste fractions leave much room for interpretation so that a clear guidance and calculation standards are urgently needed

2 Annex II: Agendas and participation lists

2.1 Agenda of workshop on landfill of waste and waste prevention in Belgium 2009

14 May 2009

9:30	Registration, Come together, including Coffee
Chair: Representatives of Ministry, BiPRO	
10:00	Anke Joas, BiPRO GmbH, Munich <i>Opening of the Workshop</i>
10:10	Peter Hofbauer, BiPRO GmbH, Munich <i>Introduction to the EU Project</i>
I. RELEVANT LEGISLATION AND STATUS QUO	
10:20	Anke Joas, BiPRO GmbH, Munich <i>Overview on relevant European legislation – The Landfill Directive</i>
10:50	Peter Wessman, European Commission, DG Environment <i>Status and problems with the implementation of European legislation for landfills</i>
11:20	Pascal Vanderwegen, Ministère de la Région Wallonne <i>Décharges: problèmes poses et nouvelles réglementations en Préparation en Région wallonne</i> <i>Landfills – Actual problems and new regulation in Region of Walloon</i>
11:45	Sabine Van Regenmortel, Ministry of Environment, Nature and Energy (LNE) <i>Environmental Permits for Landfills in Flander – Implementation of the Landfill Directive</i>
12:10	Mieke De Schoenmakere, Public Waste Agency of Flanders (OVAM) <i>Sustainable management of biowaste</i>
12:35	Question and Discussion
13:00	LUNCH BREAK
II. PRACTICAL ASPECTS OF WASTE MANAGEMENT PLANNING AND WASTE PREVENTION	
Chair: BiPRO	
14:00	Peter Hofbauer, BiPRO, Munich <i>Legal requirements for acceptance and control during operation of landfills</i>
14:20	Marc Cuignet; CARAH ASBL Laboratories <i>Analysis and Problems encountered with the Waste Acceptance Criteria Decision</i>
14:45	Alain Konings, INDAVER Benelux <i>The WAC Decision – Experience of a Flemish landfill operator</i>
15:10	COFFEE BREAK
15:25	Jean-Pierre Hannequart, ACR+/Bruxelles Environnement (IBGE) <i>The new Waste Framework Directive and its implications for prevention and recycling</i>
15:50	Anke Joas, BiPRO GmbH, Munich <i>Legislation and examples of good practice of waste prevention</i>
16:15	Questions and Discussion
17:00	END OF THE FIRST WORKSHOP DAY

15 May 2009

III. EXCURSION	
8:00	- Excursion to Landfill:
14:00	Hallembaye landfill in Oupeye, Liège
13:00	END OF THE WORKSHOP

Table 2-1: Final agenda for the workshop on landfill of waste and waste prevention in Belgium 2009

2.2 Participation list of workshop on landfill of waste and waste prevention in Belgium

	Name	Institution	Phone/Fax	E-mail	Address
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5	Ms Vicky Demeyer	Ministry of Environment, Nature and Energy (LNE) Department Environmental Permits	+32 32 24 64 76 Fax: +32 32 24 64 51	vicky.demeyer@lne.vlaanderen.be	Lange Kievitstraat 111-113 bus 61, 2018 Antwerpen, Belgium
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19	Ms Nadia Casier	OVMB - Oostvlaams Milieubeheer	+32 9 342.95.67 – 0486	Nadia.casier@ovmb.be	Kennedylaan 50, 9042 Gent
20	Mr Peter Hofbauer	BiPRO GmbH	+49 89 1897 9050	peter.hofbauer@bipro.de	Grauertstr. 12 81545 Munich, Germany
21	Ms Anke Joas	BiPRO GmbH	+49 89 1897 9050	anke.joas@bipro.de	Grauertstr. 12 81545 Munich, Germany

Table 2-2: Final participant list for the workshop on landfill of waste and waste prevention in Belgium 2009

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