Stockholm Convention
on Persistent Organic Pollutants (POPs)

Belgian National Implementation Plan

To be submitted to the

Conference of the Parties to the Stockholm Convention



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ACRONYM LIST

CCIEP: Coordination Committee for International Environmental Policy
DDD: dichlorodiphenyldichloroethane
DDE: dichlorodiphenyldichloroethylene
DDT: dichlorodiphenyltrichloroethane
DGARNE: Directorate General for Agriculture, Natural Resources and the Environment

DGATLPE : Directorate General for Land-Use Planning, Accommodation, Heritage and Energy
DGEER : Directorate General for Economy, Work and Research
ESSENCIA: Federation of Belgian Chemical Manufacturers
FASFC: Federal Agency for the Safety of the Food Chain
FPS: Federal Public Service

GDP: gross domestic product
GNP: gross national product
HCB: hexachlorobenzene
HCH: hexachlorocyclohexane
IBGE-BIM : Brussels Institute for Management of the Environment

INBO: (Institute for research into nature and forests
IRCEL-CELINE: Belgian Interregional Environment Agency
ISSeP: Public Service Scientific Institute
Kg: kilogram
LNE: Environment, Nature and Energy

mg: milligram
ml: millilitre
OVAM : (Flemish public waste company)
PAH: Polycyclic aromatic hydrocarbon
PBDE : polybromodiphenylether

PCB : polychlorobiphenyl
PCDD : polychlorodibenzo-para-dioxins
PCDF: polychlorodibenzofurans
PCT: polychloroterphenyl
PIC: prior informed consent

PFOS: perfluorooctane sulfonate
pg: picogram
POP: persistent organic pollutant
PTDI: provisional tolerable daily intake
PTMI: provisional tolerable monthly intake

RASFF: Rapid Alert System for Food and Feed
SPAQuE: Walloon Ground Sanitising Company
SPGE: Public Water Management Company
SPW: Walloon Public Service
SWDE: Walloon Water Company

TEQ-WHO: toxic equivalent according to the World Health Organization
TDI: tolerable daily intake
VLAREM: Flemish regulations governing environmental licenses
VMM: Flemish environmental company

1 Introduction

1.1 The Stockholm POPs Convention

The Stockholm Convention on persistent organic pollutants, of 22-23 May 2001, focuses on the elimination or restriction of production and use of intentionally produced POPs (chemicals listed in Annex A and B of the Convention). It also seeks the continuing minimisation and, where feasible, ultimate elimination of releases of unintentionally produced POPs (chemicals listed in Annex C of the Convention).

According to Article 7, paragraph 1 (a) and (b) of the Convention, each Party must develop and endeavour to implement a plan for the implementation of its obligations under the Convention, each Party will also transmit its implementation plan to the Conference of the Parties within two years of the date on which this Convention enters into force for it.

Belgium ratified the Convention in May 2006, and then the implementation plan was drawn up by the Federal Public Service Health, Food Chain Safety and Environment and by the competent authorities of the Regions.

The plan will be reviewed and updated on a regular basis and in a manner to be specified by a decision of the Conference of the Parties; in the meantime it will serve as guideline for the management of all that is mentioned within.

1.2 POPs

1.2.1 Definition

Persistent organic pollutants (POPs) are organic compounds that have one or more toxic effects on humans and wildlife. They are characterised by a low biodegradability and persistence in the environment, they can be bioaccumulated in human and animal tissue, biomagnified in food chains, and are capable of long-range transport.

Due to their resistance to degradation through chemical, biological, and photolytic processes in the environment, POPs have long half-lives.

Some of their chemical characteristics are low water solubility, high lipid solubility, semi-volatility, and high molecular mass. High lipid solubility allows the bioconcentration of these products from the natural environment in the organisms. Joined to the persistence in the environment and to biodegradability resistance, lipid solubility is also a source of biomagnification in food chains.

Furthermore, these compounds are semi-volatile, they can exist as vapour or be adsorbed on atmosphere's particles. This property gives them a sufficient degree of mobility to reach high concentrations in the atmosphere, which allows their long-range transport via marine or atmospheric circulation. They end up thereby on the entire planet, including

places where they were never used. Typically they move from a warmer (with many Human activities) to a colder environment.

1.2.2 POPs selected by the Convention

The Convention has clearly identified 12 chemicals to eliminate or reduce, 9 are organochlorine pesticides (aldrin, chlordane, dieldrin, endrin, heptachlor, hexachlorobenzene (HCB), mirex, toxaphene and DDT), one is use in industrial applications (polychlorinated biphenyls (PCBs)), and two are byproducts which are unintentionally released during thermal processes implicating organic matter and chlorine (dioxins, furans). They were all listed according to some criteria in three different annexes: A when subject to elimination, B when subject to restriction, and C when it is a byproduct.

This list is not definitive; other POPs should be added later following the proposal of one of the Parties. In order to add a new chemical, the proposal will contain the information specified in the Annex D of the Convention. It concerns:

- its chemical identity,
- its persistence,
- its bio-accumulation,
- its potential for long-range environmental transport,
- its adverse effects.

If the proposal contains the required information, it is forwarded to the Persistent Organic Pollutants Review Committee. On the basis of article 8 of the Convention, this Committee examines the proposal and decides if it complies with it. In the case of a positive answer, the Committee recommends that the Conference of Parties decides for or against the addition of the chemical in Annex A, B and/or C.

2 Country Baseline

2.1 National descriptive:

2.1.1 Geography and Population

Country Profile

Belgium is located on the *south-east shore of the North Sea* and shares borders with the Netherlands, Germany, Luxembourg and France. It spans 2 degrees in latitude, from 51 degrees 30 minutes N to 49 degrees 30 minutes N; in longitude, it spans less than 4 degrees, from 2 degrees 33 minutes E to 6 degrees 24 minutes E. The country covers a total area of 30 528 km², of which 13 522 km² is in Flanders, 16 844 km² in Wallonia and 162 km² in the Brussels-Capital Region. Most of Belgium (30 278 km²) is land. Almost the entire country lies in the basins of the two main rivers, the Scheldt and the Meuse, which enter at the French border and then flow towards the Dutch border. Belgium has 66 kilometers of coastline.

Belgium has a relatively *narrow topographical range*. Three main parts can be distinguished: lower Belgium (up to 100 meters above sea level) includes the flat and fertile polders in the west; central Belgium (100-200 m above sea level) includes densely urbanized Brabant; and the Ardennes or upper Belgium is the most sparsely populated and densely wooded part of the country. The Signal de Botrange (694 m above sea level) is the country's highest point.

Belgium enjoys a *moderate maritime climate* with generally mild temperatures, predominantly westerly winds and an average annual precipitation of less than 800 mm. With the two main rivers adding about 8 billion m^3 of water to the 12 billion m^3 net rainfall (i.e. precipitation minus evapotranspiration), Belgium is relatively poor in freshwater resources. Partly owing to the high population density, Belgium's intensity of use of freshwater resources is one of the highest among OECD countries.

Concerning *land cover*, farmland occupies 46% of the total land area (with 28% in arable and permanent crops and 18% in permanent grassland) and forest 22%. The remaining 32% of the territory is mainly built-up and open land. Belgium is criss-crossed by very dense networks of roads (total length 151 000 km²), railways (3 500km) and navigation canals (over 1 500 km), which link the major rivers and Antwerp, the world's fourth largest port (in terms of cargo traffic).

Notwithstanding the country's small size, its climatic and geological conditions have created *diverse ecosystems*. These include Atlantic ecosystems (marine, dunes, heaths, marshes, bogs, grasslands, deciduous forests), meridional systems (chalky grasslands, shrubs and forests) and septentrional ecosystems (peatbogs, deciduous forests). Urbanisation and fragmentation place heavy pressure on habitats.

Belgium has *few mineral and energy resources*. Its deposits of iron ore, lead and zinc have been exhausted. The mineral-processing industry, in particular steel production and copper, zinc and lead refining, nevertheless remains a significant contributor to the Belgian economy. The country has indigenous coal resources, but coal mining ceased in 1992 owing to high production costs. Belgium relies on imports of fossil fuels.(oil, natural gas and coal) for more than three-quarters of its primary energy supply; renewable energy source account for less than 2%. In 2003, the Belgian Parliament passed a law to phase out nuclear energy between 2015 and 2025 (nuclear power currently provides 57% of Belgium's electricity).

Dutch, French and German are the 3 official languages of the country, which involves 3 recognised lingual communities. All of them have their own cultural identity.

The following points characterise the geography and the population of Belgium[1] :

Table 1 : geographic, political and social data which characterise Belgium

Country's area:	33,900 km² of which 30,528 km² of land area
Use of the soil (km²) (2005) :	17,434 of farmland 6,064 of forests and other wooded land 5,868 of built-up land 912 of heath, fens, marshlands, terres vaines et vagues, rock, beach, dunes 250 of wetland
Total population (inhabitants) (2006) Brussels-Capital Region Flanders Wallonia	10,511,382 1,018,804 6,078,600 3,413,978
Population density (2006)	342 inhabitants per km²
Average age of population (2001)	39.8 years
Working people (20-64 years)	6,232,311 (2005)
Birth rate for 1000 inhabitants : Brussels	 15.39

y Data available on : http://statbel.fgov.be

Flanders Wallonia	10.57 11.37
Life expectancy at birth (2001)	75.42 years for the men 81.67 years for the women
Education level (2005)	22.9% first school 21.1% junior high 32.4% high school 15.9% higher education (not-university) 7.7% university education
Unemployment rate	8.5% (M 7.7 et W 9.6)

The country counts 15 agglomerations of more than 80,000 inhabitants, they bring 53% of the population and 63 % of the employment together. It characterises itself by a quasi-urban habitat's wide dispersion on rural land. The five biggest cities are Brussels, Antwerp, Ghent, Liege and Charleroi; they are part of bigger conurbations of at least 1 million people. The growth of urban areas arise, for a part, from the strong need of accommodations resulting from combinated effects of demographic growth, decrease of family's size and increase of life-level.

2.1.2 Political and Economic Profile

The Kingdom of Belgium is a constitutional monarchy. The reform of 1993 of the Belgian Constitution is the latest one of a series of revisions of the Constitution (1970, 1980, 1988) which transformed the country into a federal State made of three communities and three regions. The three communities are the French Community, the Flemish Community and the German Community. The three regions are Wallonia (5 provinces), Flanders (5 provinces) and Brussels-Capital Region. The decision power is divided between those entities equal under ordinary law, which exercise their responsibilities independently in different fields.

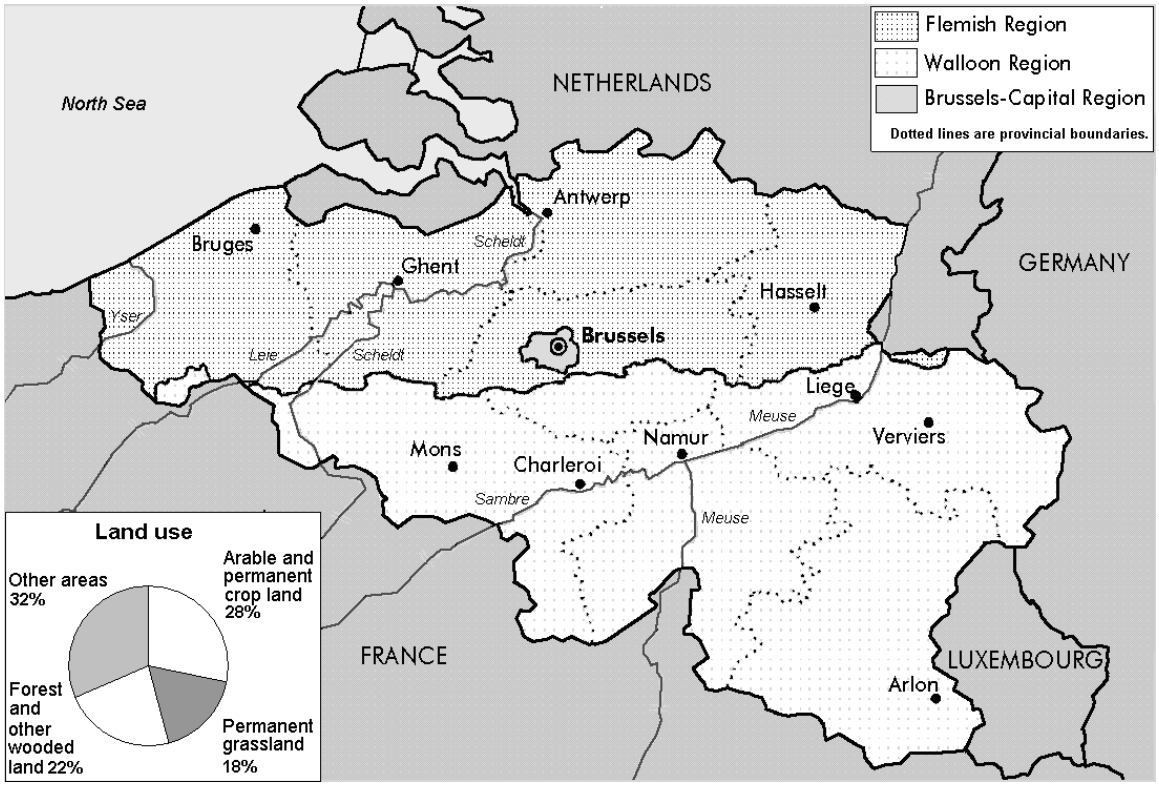

Figure 1: Belgium's map

The Federal State, communities and regions have each their own Parliament and government, except for both Flanders and the Flemish Community which are the same. This means a total of six distinct governments and Parliaments. Several structural relations between Parliaments allow connections between different decision levels.

The country's economy, which depends on private enterprises, benefits from the geographically central location, a very developed transport network and a diversified industrial and commercial basis. It is one of the most open of the OECD areas; the total of the exportations and importations of goods and services represents about 70% of the GDP. Industry is mainly present in the North of the country. The Belgian industrial sector can be compared to a complex processing machine: it imports raw materials and semi-finished products that are further processed and re-exported. About three quarters of the commercial trade is with other European countries. Except for its coal, which is no longer economical to exploit, Belgium has virtually no natural resources. With exports equivalent to over two-thirds of its GNP, Belgium depends heavily on world trade. Nonetheless, most traditional industrial sectors are represented in the economy, including steel, textiles, refining, chemicals, food processing, pharmaceuticals, automobiles, electronics, and machinery fabrication. Belgium's trade advantages are derived from its central geographical location, transport infrastructures and a highly skilled, multilingual, and productive work force.[2]

[2] https://www.cia.gov/cia/publications/factbook/geos/be.html#top

The Belgian GDP was €297,301 million in 2005 and the capita income was €282,853. Despite the heavy industrial component, services account for 71.8% of GDP, 26.3% for the secondary sector. Agriculture accounts for only 1.9% of the GDP (2004).

2.1.3 Profiles of Economic Sectors

The following economic data come from the OECD Environmental Data Compendium.[4]

GROSS DOMESTIC PRODUCT	
GDP, 2004 (billion USD at 2000 prices and PPPs)	285
% change (1990-2004)	31.0
Per capita, 2004 (1000 USD/cap.)	27.4
Exports, 2004 (% of GDP)	83.5
INDUSTRY	
Value added in industry (% of GDP)	27
Industrial production: % change (1990-2003)	17.6
AGRICULTURE	
Value added in agriculture (% of GDP)	1
Agricultural production:% change (1990-2005)	13.0
Livestock population, 2005 (million head of sheep eq.)	25
ENERGY	
Total supply, 2004 (Mtoe)	58
% change (1990-2004)	17.5
Energy intensity, 2004 (toe/1000 USD GDP)	0.20
% change (1990-2004)	-10.3
Structure of energy supply, 2004 (%)	
Solid fuel	10.2
Oil	40.4
Gas	25.5
Nuclear	21.6
Hydro, etc.	2.3
ROAD TRANSPORT	
Road traffic volumes per capita, 2002 (1000 veh.-km/cap.)	8.8
Road vehicle stock, 2003 (10 000 vehicles)	544

[3] Banque Nationale de Belgique
[4] OECD Environmental Performance Reviews: Belgium, 2007

% change (1990-2003)	27.7
Per capita (veh./100 inh.)	52

2.1.4 Environmental Overview

In a country as densely populated and economically developed as Belgium, pressures on the environment are strong. As much as one-fourth of the territory is built-up or covered with dense networks of roads, railways and navigation canals. Industry, heavy freight and passenger traffic, and intensive livestock production and crop cultivation also put pressure on the air, soil, water resources and nature. In this context, making development economically, environmentally and socially sustainable is a challenge. Because of Belgium's very open economy (exports reaching 83% of GDP and imports 81%), and its location, there are many physical and economic interdependencies among Belgium, its European partners and beyond. This explains the very proactive attitude of Belgium concerning international environmental issues.[5]

Issues which are more specific to each of the Regions may be defined on the basis of their activities and/or their geographical locations. These specific features are summarised below:

2.1.4.1 Flemish Region

In Flanders, the issues of energy, water and underground water, as well as fine particles, are at the top of the list for the environment.

a) Energy use in Flanders: effects on the environment

Between 1990 and 2000, energy use for transport increased by 26%. Over the past 5 years, this rise remained contained to 1%. Electric modes of transport (tram, underground, train) are the most effective from an energy-based perspective, but in fact the less effective modes operating on the road network are the most widely used. Private motorised transport (cars and motorbikes) thus account for 88.7% of mileage covered. The average energy use of new privately owned cars has decreased, but this trend has slowed over the past few years, with the popularity of bigger cars. In most sectors, the intensity of greenhouse gases is falling (amount of greenhouse gas emitted per activity unit). All industrial sub-sectors show a decrease per production unit (more pronounced in the chemical, metal, and food industries). Emissions per household have only diminished slightly, while household emissions per inhabitant have again slightly increased, since there has been a fall in the number of inhabitants per household. In most sectors, the improvement in greenhouse gas intensity is not sufficient to fully offset the effects of the increase of activities as regards said greenhouse gases. Since this reduction in the

[5] Environmental performance review of Belgium, Conclusions and recommendations, approved by the Working Party on Environmental Performance at its meeting on 25 September 2006.

greenhouse gas intensity is not enough to completely offset the increase in activities, Flanders was still 3.2% above the Kyoto objectives in 2006.

Last year, over 84% of greenhouse gas emissions in Flanders came directly from the use of fossil fuels (coal, petroleum products and natural gas). The share taken by renewable energies (green energy, green heat and biofuels) in our primary energy use remains at 1.2%. The first crucial step towards reducing our greenhouse gas emissions is therefore a rational use of energy.

b) An increase in rainfall intensity has also been observed in Flanders

Current greenhouse gas concentrations in our atmosphere are leading to climate change. The consequences of this are ever more visible in Flanders. In addition to a temperature increase, we have observed more and more wet rather than dry years in our country. The number of days of heavy rainfall is also on the increase. The sea-level on the Flemish coast rises by 2-3 mm per year, and this trend is more notable at high tide than at low tide. More intense rainy periods and the increase in sea-level will continue to heighten the risk of flooding in Flanders, a densely populated region.

c) Water, what's left to be done

Major pressure is applied on the amount and quality of underground water.

Underground water is probably the largest reserve of drinking water in Flanders (for drinks and by industry, among other uses). In 45% of the measurements carried out over the period 2003-2006, a slight drop in the underground water level was recorded (the aim of achieving status quo was therefore not fulfilled). This drop is due in large part to climate variations. Turing the spring of 2006, the number of times the nitrate threshold was exceeded in water tables dropped, hitting 38%. This is a long way from the 2007 objective, which aimed for no more threshold excesses. The presence of heavy metals is also a problem. A threshold excess in the maximum acceptable concentration of nickel was revealed in 11% of measurements carried out in water tables. Threshold excesses for pesticides were also observed in around a quarter of the spot-measurements made.

d) Surface water: biological quality is still too low

Measurements taken in Flemish rivers show that a very good biological quality is constantly increasing. However, in 2006, only 30% of measurements achieved the standard. There are more measurement points where the fish stock quality is improving than places where it is deteriorating. However, only 4% achieve a good score (2002-2007 period). The PCB (polychlorinated biphenyl) consumption threshold in eel was exceeded for 76% of measurement points (2006). In order to achieve the objectives set by the European guidelines and by the Decree relating to the integrated water policy, significant efforts are required of the Flemish Community as regards household and corporate wastewater disposal, eutrophication and physical repair measures.

e) Dredging spoils and clearing sludge: an integrated approach is required

Flemish rivers show a significant overload of (highly) polluted sediment. A substantial part of this sediment comes from field erosion, waste and other wastewater discharges.

According to an approximate estimate, our rivers contain around 24 million tonnes of sediment. To this must be added an average of 1.8 million tonnes each year, whereas the amounts dredged or cleared do not exceed 1 million tonnes. In some cases, this increase in sediment can compromise navigability or cause local flooding. In addition, the beds of polluted rivers have a negative impact on ecosystems in and beside these rivers, and can in some cases hinder any increase in the surface water quality. This issue requires an integral approach. On the one hand, the depositing of sediment and polluting substances on riverbeds must be reduced. On the other hand, the pace of dredging and clearing activities must be sped up significantly and new (profitable) solutions must be found for the disposal of sediment.

f) Fine particles: both a Flemish and an international issue

Flanders imports and exports fine particles. Since 1 January 2005, new more stringent standards have applied to fine particles (PM10). In Flanders, there are threshold excesses over the daily average in various places. Most of these threshold excesses are observed in urban and industrial areas. The annual average threshold has been reached.

Cross-border transport of air pollution is the most significant source of fine particles in Flanders. According to various models, 29% of PM10 concentrations in Flanders come from its own emissions, 43% of emissions from other countries and 28% come from natural sources and cannot be allocated. Regarding 2.5 PMs, Flemish emissions stand at 26%, foreign emissions at 55% and natural, non-allocated sources at 19%. Flanders also exports its air pollution to neighbouring countries.

Since Flemish emissions have an impact on an area including over 500 million inhabitants (right up into the Scandinavian countries and Baltic states), the export of fine particles outside Flanders causes twice as much damage to health abroad than that caused in Flanders by foreign emissions. The impact of a reduction in fine particles in Flanders must therefore be assessed taking into account not only the effects on health in Flanders but also abroad.

2.1.4.2 Walloon region

Extract from the analytical report on the state of the Walloon Environment 2006-2007

The reality of environmental deterioration and its consequences on quality of life and the future of the planet has led to a general raising of awareness and to the development of environmental policies. Since the 1990s, the concept of sustainable development has underpinned reflection. This involves searching for a balance between economic, social and environmental interests. Problems must be looked at from an overall perspective,

with a long-term vision, taking their impacts into account, and with a view to improving the effectiveness of resources implemented.

A positive evolution in environmental policies

Environmental policies are developed on various scales: international, European, national, regional and local. The required consistency in decisions made at these various levels imposes dialogue, which is both a source of wealth and of difficulties. Gradually, therefore, increasingly successful environmental policies are being developed, in particular with support from international bodies. Evolution is clearly noticeable in European directives. Problems are increasingly looked at using the appropriate geographical scale: drainage basins, water masses, atmospheric pollutant dispersal areas, rural area units, etc. Analysis is becoming multi-functional and is leading to targets being set. In this respect, the water framework directive aims to reach a satisfactory chemical, quantitative and ecological status for water, while the objective of the Natura 2000 directive is to create a cross-border network guaranteeing the sustainability of habitats and the support of species populations of community interest. The integration of environmental protection into other policies is also making progress. Conditionality of subsidies in agriculture is an example of this.

Emphasis is also placed on planning associated with impact assessment while the involvement of players and citizens is stimulated by the obligation to inform and to consult.

The Walloon region is a geopolitical entity located on an intermediary scale between national and international on the one hand, and local authorities represented by the districts (communes) on the other. Its environmental policies are highly conditioned by European directives. Implementing them remains dependant on the fact being taken into account that certain levers remain within the federal remit (taxation, product standards), and that policy application is partly within the remit of the communes (environmental licences, building licences, waste collection, etc.)

Planning in order to achieve objectives

Results-oriented pressures alongside multi-functional / multi-player approaches involve reflection and planning. Planning of targets and resources is the essential forerunner to a responsible and effective policy. With regard to the environment, an initial Environmental Plan for Sustainable Development was drafted in 1995, three years following the Rio conference. It brought together the main principles of policies to undertake in the various environmental domains, and generally, is still relevant now. More detailed plans were drawn up for waste, air, waste water sanitising and energy. Standards or general objectives, which in most cases are set on a relatively long-term basis by European environmental policies or international recommendations, are used as a guide in other areas. Planning is not a simple task. A balance must be found between the statement of broad principles, which are too general, and planning, which is too in-depth.

Planning requires sound knowledge of the initial status, negotiations with players, setting of targets, and the mobilisation of resources so as to achieve the objectives and the final assessment of results achieved.

Status report and performance assessment

The data needed to carry out an environmental assessment are drawn from several sources: water and air quality measurement networks, economic data, administrative forms, specific studies, surveys, modelling, etc. Each of these information sources meets its own objectives. Their use in order to create an environmental assessment and the matching to be done between various parameters requires continuous adaptation and improvement work depending on the issues to cover, the objectives pursued and the way the situation evolves. In some new or complex areas (noise, micro-pollutants, waves, GMO, environment - health, etc.), expertise and measurement networks must continue to be developed. In addition, the analysis of the policies followed in terms of environmental effectiveness in relation to the human and financial resources invested is a key element in terms of improving performance. It is important to include this analysis as soon as policies and plans begin to be drafted.

Prevention

Prevention is a high-priority issue in the long term. It must be thought about at the design and production stage. New projects and plans are now subject to an environmental impact assessment. This implies a thought process which did not exist previously, allowing some negative impacts to be avoided or reduced. In terms of the production line, prevention depends in particular on corporate strategy, technological development, the modernisation of production lines, the nature and packaging of intermediate and end products as well as their sustainability and their potential for recycling and re-use. The market introduction of more eco-efficient products (with less impact in terms of their use) is a fundamental element as regards reducing consumer impacts. Consumer buying behaviour is often presented as a factor which could influence producers of goods and services. Yet corporate advertising strategy is also a factor which determines consumer behaviour. In this influence-based context, environmental messages must be sufficiently persuasive to have the upper hand when faced with advertising messages of which one of the objectives is increased consumption. The main tools used in prevention are research, awareness-raising / education, dissuasive taxation, incentive-based grants and the setting of gradual pollution reduction objectives. The extension of producer liability in terms of their products is also a lever (mandatory collection, for example).

Reducing polluting loads

The reduction of pollution linked to human activities is the second working line. Substantial progress has been made, both by the public authorities and by economic players. A significant reduction in polluting loads (waste water, atmospheric emissions, etc.) has been witnessed for a number of environmental parameters. This is the result of

structural changes in industry, investments made in production lines, increased waste sanitising, etc.

Depending on the reduction effort, polluting loads which have already built up in the environment and pollutant-specific mechanisms, these drops can be reflected in most cases, by improvements in the quality of the environment. Generally speaking, efforts must be continuous in order to achieve set targets.

A more environmental management strategy

In forestry and agriculture, new methods of operation which are more effective at taking account of natural balances are gradually being developed and benefit from technical public assistance (research, best practice guides, etc.) and/or financial assistance (agro-environmental measures, specific forestry practices, etc.). On the whole, these actions receive support from professional and trade-union organisations and owners' groups. The European year of nature conservation in 1995, focusing on taking nature into account outside protected areas, also saw a turning-point. The desire to encourage biodiversity is effectively increasingly present in the methods used to manage public areas (military camps, roadsides, streams, Crown forests and those under state control, etc.). The Natura 2000 concept, under development, adds a new dimension by giving priority to an integrated approach whereby human activities can remain as they are, as long as they do not jeopardise the heritage to be protected. Improved results in terms of household waste reclamation have been made possible in particular thanks to high-performance organisation of selective collections (door-to-door collections, high density of container parks, mandatory collections, etc.).

Difficult situations

Managing past loads

For decades, human activities developed unchecked, never taking into account their environmental impacts in neither the short or long term, with two major consequences: the presence of pollution needing to be eliminated and situations which complicate current management. The industrial past in Wallonia was marked by heavy industry (steelmaking, coal mining, etc.) which witnessed a sharp decline over the second half of the 20th century. This left in its wake several disused sites, some of which are highly polluted. These sites require active management: permanent water drainage from areas affected by mine collapses, sanitising of polluted sites which present a danger to the environment and health, landscaping of abandoned sites. This is one of the main pillars of the Marshall plan. The funds needed for such measures are generally very substantial. The fact that despite its decline, heavy industry is still a major element in the current industrial structure explains the high rate of energy consumption and materials in the Walloon region. Intensified farming methods and planting in less productive land has brought about a substantial erosion of biodiversity and a conversion in landscapes. The

insufficiently monitored use of fertilisers and pesticides has led to earth and water contamination which has delayed the expected effects of currently implemented measures by several years. The role given to streams and rivers as recipients and evacuators of waste water and hydraulic systems have meant that the gap between the current situation in terms of water quality and the satisfactory status set by a framework directive on water is still significant for several water masses, in particular for stream located north of the Sambre-et-Meuse furrow. Urban areas - which currently cover 13% of the surface area of Wallonia - are characterised by a strong distribution of habitat. This dispersion brings about eco-landscape deterioration, significant car use, and it complicates the network management (public transport, water and energy distribution, waste and waste water collection, etc.). The weight of history is therefore significant and represents a stumbling block in terms of environmental performance.

The difficulty of fighting disparate sources

Generally speaking, improvements are clearer in areas where there are strong legal restrictions which fall within the remit either of the public authorities or a small number of players. The more spread the sources of pollution, the larger the number of players, and without a mobilising structure, the more problems are difficult to solve. Trends show that citizens remain, on the whole, rather indisposed to make substantial efforts. Mobility is continuing to increase and cars remain the principal mode of transport, representing over 80%. The quantity of household waste is not falling; though results in terms of waste sorting are impressive, this has been at the expense of high-performance organisation making many aspects easier as well as dissuasive taxation, which furthermore has been a source of civic disobedience (secret dumping, home incineration, etc.); in addition, the unclean nature of urbanised areas and roadsides remains an unsolved issue. A third of all pesticides sold are packaged for domestic use (biocides, gardening, etc.). Electricity consumption in dwellings continues to grow. If we look at the facts, the environmental crisis has not, as yet, aroused vigorous mobilisation of all citizens. The energy crisis and climate change which are looming in the relatively short term will probably contribute to a change in behaviour.

Challenges for the future, the need to anticipate

The objectives laid down by international agreements, and, more specifically, by European directives, imply substantial efforts to be made in relatively short timeframes. Since it was unable to mobilise the appropriate resources quickly enough, the Walloon region began to lag behind in some areas (household waste water purification, Natura 2000, polluted sites, for example). It is therefore important for the future to anticipate and plan more, in such a way that the set objectives can be met within the required timeframes.

The necessity of making sufficient human and financial resources available

No policy can be effective if it is not backed by the appropriate resources for its implementation. In terms of the environment, it is often a matter of new policies, and thus this point is crucial. The "polluter pays" and "cost-truth" principles are gaining more and more ground. Over and above their impact in terms of awareness-raising, they allow additional financial resources to be released. In particular, they allowed the waste water purification to be sped up, and waste management to be improved.

In its recent report on the assessment of Belgium's environmental performance, the OECD indeed recommends further development of environmental taxation. In effect, this is a significant lever for the development of a more sustainable economy. Human resources allocated to the management of environmental matters are also essential, in particular for essential tasks such as planning, coordination, execution of measures, training, monitoring and suppression. Without these links, actions lack effectiveness.

Mobilising active forces

In the Wallonia region, there is a high level of associative activity, which represents both wealth and drive, but also a dispersion factor. Generally an essential link is missing in these activities which are often financed by the public authorities: solid overall coordination. In many areas, activities are disparate and sometimes they even compete with one another. In addition, the financing mechanisms are such that projects function generally on an annual basis and have varying budgets. This situation often harms the overall effectiveness of the resources invested. It would doubtless be more effective to better define needs in terms of social management, and on this basis, to pool strengths in terms of presence into common projects spanning several years. Furthermore, economic players (industry players, farmers, foresters, etc.) are favourable to the development of voluntary actions (industry-wide agreements, agro-environmental measures, certification, etc.) This represents a substantial potential for action which merits the full attention of the public authorities, taking account of objectives, resources and sanctions.

Improving governance

The implementation of several bodies (Walloon Water Company (SWDE), Walloon Ground Sanitising Company (SPAQuE), Public Water Management Company (SPGE), inter-district, etc.) has allowed specialisation in management terms. However, this must not lead to a dispersion of resources, actions and information. That is why it is essential to guarantee transparency of operation and to ensure centralising of information. The size and acute nature of environmental problems requires crisis mobilisation. It is important to dedicate the resources but also to assess progress and difficulties, to integrate foreign experiences and to develop research so as to work with the maximum level of effectiveness. The stakes and prospects developed for each of the issues raised in this Report offer several avenues.

For the full report (733 pages, in French):

http://environnement.wallonie.be/eew/tablematiere.aspx

2.2 Institutional, Policy and Regulatory Framework. Assessment of Belgium's situation in relation to POPs.

2.2.1 Policy in terms of environment / sustainable development and legislative framework for the whole.

The right to the protection of a healthy environment is mentioned in article 23 of the Belgian Constitution. The environmental competencies are split between the different authorities. Federal State stills competent in some domains, namely garbage transit, products norms, nuclear, importation, exportation and transit of exotic species and European and international coordination. The other fields are under the responsibility of the Regions. The regional governments are in charge of the international agreements application too, and are closely associated with the preparation of international Belgian politics, its point of view and its positions.

Many fields of the environmental cooperation are shared competencies between federal and regional authorities. In such cases, agreements are signed by both federal and regional representatives, or by the federal minister of environment or by a representative of the foreign minister who's mandated to sign in the name of both two levels of government. The Federal Parliament and the Regional Parliament (of all concerned regions) must give their consent for the ratification. Laws and decrees application must be enacted both at the federal and regional level. This procedure leads to a strong implication of all concerned parts.

The complex institutional frame of Belgium in matter of environment involves many coordination mechanisms, such as the Inter-Ministerial Conference on Environment, which bring the federal and regional ministers competent in environment in Belgium together, the Coordinating Committee for International Environmental Policy (CCIEP), formed by federal and regional authorities representatives in the matter of environment (minister's offices and administrations) and mostly in charge of preparation of the Belgian positions in the frame of international negotiations, the Interregional Cell for the Environment (IRCEL-CELINE) which monitors the atmospheric emissions and catalogues the air data, and the Steering Group "North Sea and Oceans". The federal Council of sustainable development brings representatives of federal and regional ministers together. Representatives of Regional Ministers-President also participate in the works of the Council, as well as NGO's representatives (of environment, development cooperation and consumer rights), syndicate, employer, business environment and scientist community.

INSTITUTIONAL FEDERAL FRAMEWORK

At the federal level, the "Directorate General Animals, Plants and Food Safety (DG IV)" of the Federal Public Service Health, Safety of the Food Chain and Environment is competent for the implementation of rules and norms in the quality and health aspects of

all products that enter into the food-chain. The "Foodstuffs, Animal Feeding, and other Goods" Section is responsible for the norms related to contaminants in foodstuff and undesirable substances in animal feeding. The "Pesticides and Fertilizers" Section of this DG is in charge of the management of files concerning the aggregation of pesticides used in farming that are put on the Belgian market. The aggregation is given by the Public health Minister on an Aggregation Committee's advice. This Aggregation Committee is composed of administrative experts and experts coming from scientific institutions. Following the regionalisation of Agriculture decided in 2001, the composition of this Committee was revised (Royal Decree of 09/01/2007 modifying the Royal Decree of 28/02/1994). The Regions are from now on represented in the Aggregation Committee.

The "Risk Management" Section of the "DG Environment" of the FPS Health, Safety of the Food Chain and Environment is notably responsible for environmental damage prevention, intoxications and other risks to the health that can be caused by dangerous products and substances. The « Biocides» cell which is part of it is in charge of the management of aggregation files of biocides put on the market. The Environment Minister gives the aggregations based on the advices of the "Conseil Supérieur d'Hygiène Publique". A reformation of this system is in preparation in order to harmonize procedures concerning biocides and pesticides.

Within the FPS Health, Safety of the Food Chain and Environment, there is also an Inspection Service which controls for any breaches of the biocides regulations and of which the missions are extended to some controls by marketers and users of farming pesticides.

Regarding the food safety, the FPS is in charge of food safety policy while the Federal Agency for the Safety of the Food Chain (FASFC) checks its application.

The Agency is in charge of:

- control, analysis and expertises of the foodstuffs and their raw materials in all stages of the food chain (production, transformation, storage, transport, trade, importation and exportation);
- the issue of consents, authorisations and licences allowing the practise of some activities in the food chain;
- the development of traceability and identification systems allowing the follow-up of the foodstuffs and their raw materials in all stages of production and transformation.

The FASFC collects, notably in the official control frame, samples of foodstuff and of animal feeding to control the content of persistent organic pollutants like dioxins, PCB and organochlorine pesticides residues. It also performs inspections by the mongers and users of phytopharmaceutical products in order to verify good agriculture practices: aggregated products, usual dosage, cultures, ...

INSTITUTIONAL REGIONAL FRAMEWORK

The Regional competencies regarding the environment matter are now very large. The Region have become competent in the following areas:

- Forests, nature, green spaces, hunting, fishing;
- Protection of the environment, notably for the ground, under-ground, air and water against pollution and aggressions;
- Struggle against noise;
- Garbage policy (with exception for the transit of garbage and radioactive garbage);
- Protection of the water distribution, including technical regulation regarding the equality of drinking water, purification of wastewater and sewage;
- Policy of dangerous establishment, unhealthy and inconvenient, except internal police measure regarding work protection;
- Town-planning and land settlement;
- Agriculture.

Institutional framework of the Walloon region:

Within the Walloon region, it is the Walloon Public Service (SPW), and more specifically the Directorate General for Agriculture, Natural Resources and the Environment (DGARNE) which mainly administer remits relating to the environment.

In addition to the numerous European directives and international commitments, missions are underpinned by environmental planning, the Environment Plan for Sustainable Development (1995), broken down into sector-based plans (cf. Walloon waste plan, drainage basin management plans, etc.).

The Directorate General for Land-Use Planning, Accommodation, Heritage and Energy (DGATLPE) is responsible for organising the development of public and private activities in the country, ensuring that these co-exist harmoniously. This mission has significant environmental implications (conservation of undeveloped and natural areas, environmental pressures due to urbanisation and authorised activities, etc.).

Due to the close links between their remits and the environment, some administrations are more inclined to take the environment into account than others. As an example, the energy policy led by the Directorate General for Economy, Work and Research (DGEER) influences emissions of atmospheric pollutants. The Directorate General for Agriculture, Natural Resources and the Environment (DGARNE) also develops and implements measures designed to reduce the impact of agriculture on the environment.

The SPW specifically manages roads and waterways, infrastructure integration takes into account some aspects linked to the environment (installation of fish ladders on dams,

roadside grass cutting and tree-planting, winter road gritting, storm water basin usage, etc.).

The Walloon Government has set up several bodies responsible for achieving specific missions, some of which concern the environment. These bodies already existed at a national level or were set up after regionalisation. Of note:

- The Public Service Scientific Institute (ISSeP), a research and technological assessment institution;
- The Public Company for Environmental Quality Assistance (SPAQuE) with which the Walloon region agreed a service contract whose activity is heavily centred on polluted lands;
- The Public Water Management Company (SPGE), a limited public law company who was given the mission of protecting water intakes for potential drinking water and public sanitising of waste water;
- The Walloon Water Company (SWDE) which carries out production and distribution of pipe-fed water for most of the area, and monitors the water's drinkability.

Institutional framework for the Flemish Region

Figure 2 shows the organisational structure of the Environment, Nature and Energy policy domain in the Flemish Region. The role and responsibilities of the various entities are then commented upon.

'Leefmilieu, Natuur en Energie' (LNE) Department

The 'Leefmilieu, Natuur en Energie' (Environment, Nature and Energy) Department takes care of the preparation, monitoring and assessment of the policy. Sustainability, integration and consistency are the foremost concerns in this situation. The department supports and leads awareness-raising actions, monitors the implementation of environmental policy and processes environmental license files and agreements.

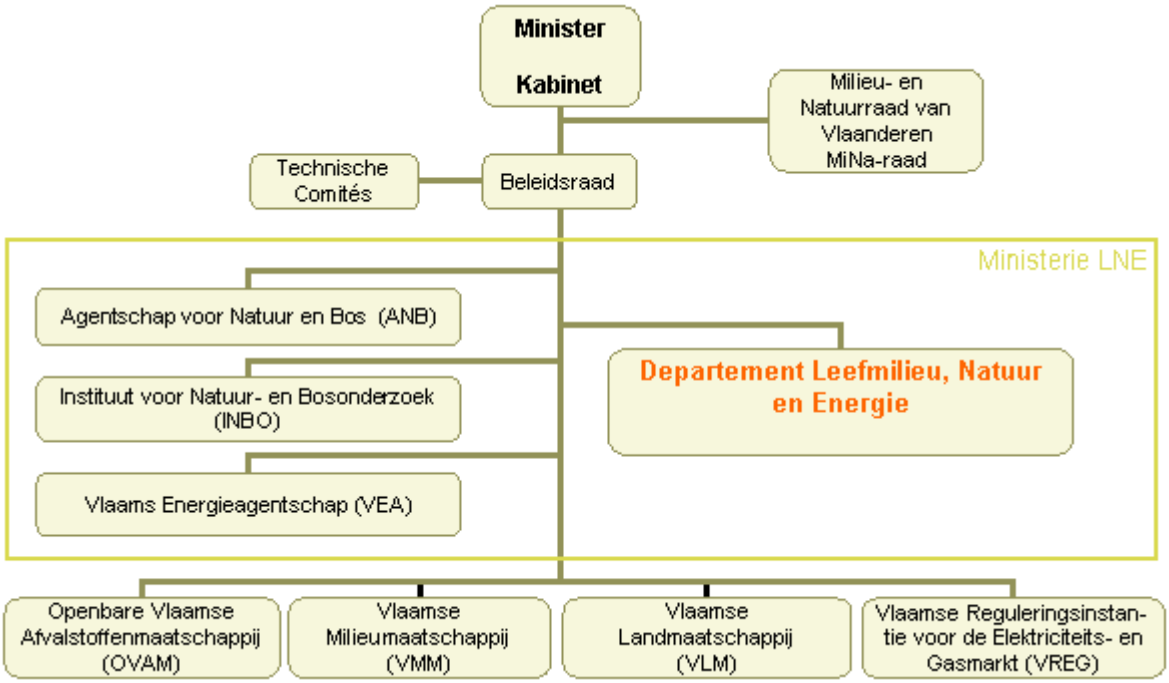

Figure 2: Organisational structure of the "Environment, Nature and Energy" policy domain in the Flemish Region.

Agencies.

Agencies implement policy and provide input for the policy relating to the environment, nature and energy. Agencies and the department work together in a structured way and ensure there is a systematic exchange of information.

The Environment, Nature and Energy policy domain has several agencies:

- 'Agentschap voor Natuur en Bos' (ANB) (agency for nature and forests)
    - supports sustainable management, the strengthening of natural and forestry infrastructures and the landscaping of green areas;
    - manages the "green" domains of the Flemish Region and its partners.
- Instituut voor Natuur- en Bosonderzoek (INBO) (Institute for research into nature and forests)
    - carries out scientific research dealing with the development and sustainable use of nature;
    - drafts annual reports giving an overview of nature.
- Vlaams Energieagentschap (VEA) (Flemish Energy Agency)
    - implements an energy policy targeting sustainability via the promotion of rational energy use and ecological energy production.

- Vlaamse Milieumaatschappij (VMM) (Flemish environmental company)

    - supports the protection and restoration of air and water quality;
    - assesses the situation regarding atmosphere and water;
    - drafts a report each year (every two years) via the intermediary of MIRA on the state of the environment;
    - regulates and pursues integration of the water policy.

- Openbare Vlaamse Afvalstoffenmaatschappij (OVAM) (Flemish public waste company)

    - is in charge of sustainability of waste and materials flow;
    - is responsible for soil rehabilitation and the strategy led in terms of fighting soil pollution.

- Vlaamse Landmaatschappij (VLM) (Flemish land company)

    - its scope of activity is the qualitative layout of open spaces;
    - is in charge of monitoring liquid manure excesses.

- Vlaamse Reguleringsinstantie voor de Elektriciteits- en Gasmarkt (VREG) (Flemish regulatory board for the gas and electricity market)

    - is responsible for regulations, monitoring and the promotion of market transparency on the gas and electricity markets in the Flemish Region.

Together these entities constitute the Environment, Nature and Energy policy domain.

Mina-Raad

- formulates opinions on environmental policy and the environmental aspect of sustainable development;
- contributes to environmental policy and vision and the environmental aspect of sustainable development;
- follows societal developments associated with the environment and the environmental aspect of sustainable development;
- formulates thought on policy memos dedicated to the environment and about the environmental aspects of sustainable development;

Institutional framework of the Brussels-Capital Region

Brussels Environment - Brussels Institute for Management of the Environment (IBGE / BIM) which little by little pooled all remits in terms of the environment, was created by royal decree on 8 March 1989 (Moniteur belge official bulletin, 24/03/89).

(for 2008 organisation chart, see:

http://www.ibgebim.be/uploadedFiles/Site_Info/Accueil/Qui_sommes-nous/orgSynth2008_frinternet_jui.pdf?langtype=2060)

The initial missions of Brussels Environment-IBGE/BIM, as specified in the Order, are in particular:

- the study of the application and transposition of European Union rules in terms of the environment;
- assisting local governments in terms of the environment (guidelines, audits, opinions, etc.);
- the issuing of opinions in terms of operating authorisation licences;
- management, monitoring and fighting against air pollution, water pollution and soil pollution, noise pollution and waste removal;
- the creation, monitoring and organisation of a waste plan;
- the promotion of recycling and the re-use of waste;
- the protection and conservation of nature, monitoring of flora, fauna and natural resources;
- management of green spaces;
- management of natural and semi-natural sites.

With the evolution of administrative structures in the Brussels-Capital Region, and regulation, the missions of Brussels Environment-IBGE/BIM have broadly evolved and today include:

- the biennial drafting of the report concerning the State of the Environment in the Brussels-Capital Region;
- de jure participation in all consensus-building commissions within the scope of environmental licences and urban planning procedures;
- issue of IA and IB category environmental licences, as well as class II licences in the case of a public law originator for a public utility request;
- drawing up of draft specifications relating to impact studies and presidency of support committees responsible for monitoring studies;
- ensuring that legislation is respected in terms of the environment (environmental policy) and, in particular, that relating to environmental licences;
- ensuring that legislation is respected in terms of the environment (environmental policy) and, in particular, that relating to environmental licences;

- management of an Environmental Research Laboratory (LRE) whose main activity is the monitoring and management of air quality measurement networks in Brussels, and the execution of ad hoc awareness-raising campaigns;
- the creation of a "noise" laboratory within the LRE;
- takeover of management activities on over 340 hectares of green space and 1640 hectares of the Sonian Forest;
- management of a taxation department covering waste water discharges within the industrial sector;
- ...

New remits were added to the responsibilities of Brussels Environment-IBGE/BIM in the energy area, comprising (order dated 20 January 2004 - Moniteur belge official bulletin 21/04/94):

- distribution and local transport of electricity via networks whose nominal voltage is less than or equal to 70,000 volts;
- public distribution of gas;
- remote heat distribution networks;
- new energy sources (with the exception of those relating to nuclear energy);
- energy recovery;
- rational use of energy;
- gas and electricity market regulation.

But Brussels Environment-IBGE/BIM does not pool all environmental remits in terms of management. Effectively, Bruxelles Propreté (Brussels-Cleanliness), the Regional Agency for Cleanliness (order dated 19 July 1990 - Moniteur belge official bulletin 25/09/1990) is responsible for the following missions:

- execution of urban area skills in terms of waste removal and processing;
- participation in the establishment, by the Brussels Institute for Management of the Environment, of Planning for Brussels Waste Elimination;
- total or partial execution on request by the Waste Policy Executive;
- road system cleaning which the Urban Area Committee accepts to exercise, on request by one or more communes in the Region;
- road system cleaning and sweeping;

The Agency may carry out the following missions:

- remove waste from a company on request and at its expense;
- handle cleaning of public road systems and their surroundings, on request by and at the expense of the public authorities concerned;
- ensure sweeping, cleaning and removal of waste on sites operated by the Brussels Intercommunal Transport Company (STIB/MIVB) in the conditions determined in agreement with the Ministry which handles Transport and Regional Road Systems.

2.2.2 Relevant International Commitments and Obligations

Table 2 : Relevant international commitments and obligations for the POPs elimination policy

Agreements, programmes or organisations	Comments	Date of ratification
EU membership	Since 1957, at that time still EEC (European Economic Community) founded by the Treaty of Rome.	
OECD membership	Organisation for Economic Cooperation and Development. Participation since 1948, at that time still OEEC, i.e . Organisation for European Economic Cooperation.	Ratification of the Convention relative to OCDE on 13th September 1961
Stockholm POPs Convention		Ratified on 25th May 2006
Rotterdam PICs Convention	On Prior Informed Consent Procedure for Certain Chemicals and Pesticides in International trades.	Ratified on 23rd October 2002
OSPAR Convention	Protection of the Marine Environment of the North Sea and the North-East Atlantic, signed in 1998.	Ratified on 20th January 1999
Aarhus Convention	Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters was adopted on 25th June 1998 at the Fourth Ministerial Conference in the 'Environment for Europe' process.	Ratified on 21st January 2003 in effect on the Belgian territory since 21st April 2003.

Basel Convention	On the transbondary movement of wastes containing hazardous chemicals and their elimination signed in 1989	Ratified on 1st November 1993
Kiev Protocol	Addressing PRTRs (pollutant release and transfer registrers) signed on 21 May 2003 in a follow-up to the Aarhus Convention.	Approved by European Community on 21st February 2006
Montreal Protocol	Regulate the consummation and production of chlorinated and brominated chemicals that harm the ozone layer. Signed on 16.9.1987	Ratified on 30th December 1988
LRTAP Convention	to limit and as far as possible, reduce and prevent long-range transboundary air pollution.	Ratified on 15th July 1982. In effect since 1983.
Aarhus Protocol on POPs	Protocol to the 1979 Convention on long-range transboundary pollution on persistent organic pollutants (1998)	Ratified on 21st January 2003, in effect since 21st April 2003

At the European Union level, many kind of legislation are to take into consideration: the regulations which are directly applicable, the directives which have first to be translate in federal and/or regional law. The table below resumes the European texts useful for the POPs management.

Table 3 : European legislation related to POPs

Legislation	**Title**	**POPs concerned by the Convention or by the Protocol**
Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006	Concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and	all

Legislation	Title	POPs concerned by the Convention or by the Protocol
	Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.	
Regulation (EC) No 1013/2006 of the European Parliament and of the council of 14 June 2006 (abrogating regulation 259/93/EC)	on shipments of waste	all
Regulation (EC) No 166/2006 of the European Parliament and of the Council of 18 January 2006 (abrogeant la Décision 2000/479 EPER)	Concerning the establishment of a European Pollutant Release and Transfer Register and amending Council Directives 91/689/EEC and 96/61/EC	all
Commission Regulation (EC) No 1881/2006 of 19 December 2006	setting maximum levels for certain contaminants in foodstuffs.	PCBs, dioxins/furans, benzo[a]pyrene as HAP markers
Commission Regulation (EC) No 1883/2006 of 19 December 2006	Laying down methods of sampling and analysis for the official control of levels of dioxins and dioxin-like PCBs in certain foodstuffs	PCBs, dioxins/furans
Regulation (EC) NO 396/2005 of the European Parliament and of the Council of 23 February 2005	on maximum residue levels of pesticides in or on food and feed of plant and animal origin and amending Council Directive 91/414/EEC	all
Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004	On persistent organic pollutants and amending Directive 79/117/EEC. Transposes the Stockholm Convention and the UNECE Protocol.	all
Regulation (EC) No 304/2003 of the European Parliament and of the Council of 28 January 2003	Concerning the export and import of dangerous chemicals (Rotterdam Convention obligations transcription)	Aldrin, Chlordane, DDT, Dieldrin, heptachlor, HCB, Mirex, PCB, PCT, Lindane, HCH, Endrin,
Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006	On shipments of waste	all

Legislation	Title	POPs concerned by the Convention or by the Protocol
Directive 2006/12/EC of the European Parliament and of the Council of 5 April 2006 and abrogating Directive 75/442/EC	On waste	all
Directive 2005/69/EC of the European Parliament and of the Council of 16 November 2005 amending for the 27th time Council Directive 76/769/EEC on the approximation of the laws, regulations and administrative provisions of the Member States	Relating to restrictions on the marketing and use of certain dangerous substances and preparations (polycyclic aromatic hydrocarbons in extender oils and tyres)	HAPs
Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004	relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air	benzo[a]pyrene as HAPs markers
Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003	On waste electrical and electronic equipment (WEEE)	PCBs, PCTs
Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003	On the restriction of the use of certain hazardous substances in electrical and electronic equipment	PCBs, Polybromobiphenyles (PBB), polybromodiphenylethers (PBDE)
Directive 2002/32/EC of the European Parliament and of the Council of 7 May 2002	On undesirable substances in animal feed	Aldrin, dieldrin, toxaphene, chlordane, DDT, endosulfan, endrin, heptachlor, HCB, HCH, dioxin
Directive 2001/80/EC of the European Parliament and of the Council of 23 October 2001	On the limitation of emissions of certain pollutants into the air from large combustion plants	by-products
Directive 2000/76/EC of the European Parliament and of the Council of 4 December 2000	On the incineration of waste	by-products

Legislation	Title	POPs concerned by the Convention or by the Protocol
Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000	Establishing a framework for Community action in the field of water policy	all
Directive 2000/53/ECof the European Parliament and of the Council of 18 September 2000	On end-of life vehicles	by-products
Directive 1999/45/EC of the European Parliament and of the Council of 31 May 1999	Concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations.	all
Directive 98/8/EC of the European Parliament and of the Council of 16 February 1998	concerning the placing of biocidal products on the market	all
Council Directive 96/82/EC of 9 December 1996	On the control of major-accident hazards involving dangerous substances	all
Council Directive 96/61/EC of 24 September 1996 (IPPC Directive)	Concerning integrated pollution prevention and control	all
Council Directive 96/59/EC of 16 September 1996	On the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT).	PCB/PCT
Council Directive 91/689/EEC of 12 December 1991	On hazardous waste	all
Council Directive 91/414/EEC of 15 July 1991	Concerning the placing of plant protection products on the market.	all
Council Directive 79/117/EEC of 21 December 1978	prohibiting the placing on the market and use of plant protection products containing certain active substances	aldrin, chlordane, dieldrin, DDT, endrin, HCH, heptachlor, hexachlorobenzene
Council Directive 76/769/EEC of 27 July 1976	on the approximation of the laws, regulations and administrative provisions of the Member States	all chemicals put on the market

Legislation	Title	POPs concerned by the Convention or by the Protocol
	relating to restrictions on the marketing and use of certain dangerous substances and preparations.	
Council Directive 76/464/EEC of 4 May 1976 + Directive 2006/11/EC of the European Parliament and of the Council of 15 February 2006	on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community	all
Council Directive 67/548/EEC of 27 June 1967	on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances	all

Other dispositions are taken into account at federal level:

Legislation	Title	POPs concerned by the Convention
Commission Recommendation 2006/88/EC and 2006/794/EC of 16 November 2006	on the monitoring of background levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in foodstuffs	dioxins, PCBs
Commission Recommendation of 16 November 2006	on the monitoring of background levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in foodstuffs	dioxins, PCBs
Commission Recommendation 2004/704/EC of 11 October 2004	on the monitoring of background levels of dioxins and dioxin-like PCBs in feedingstuffs	dioxins, PCBs

2.2.3 Presentation of legislation and regulation in force covering POPs (manufacture, production and unintentional contamination of POPs).

EUROPEAN LEVEL

Relevant European regulations and directives for the POPs issue are resumed in the table 3 of the present document.

FEDERAL LEVEL

- Royal decree dated 28 February 1994 relating to the conservation, market introduction and use of farming pesticides (Moniteur belge Official bulletin 11-05-1994), last amended by royal decree dated 09-01-2007.
- Law dated 21 December 1998 relating to standards for products whose goal is the promotion of modes of production and sustainable consumption and protection of the environment and health (basic law), (Moniteur belge Official bulletin 11-02-99, last amended by law dated 11-05-2007.
- Royal decree dated 13 March 2000, amended by royal decree dated 14 June 2007, setting down the maximum content levels for pesticide residues authorised on and in foodstuffs (Moniteur belge Official bulletin 10-05-2000)
- Royal decree dated 22 February 2005 relating to the initial farming pesticide and biocide reduction programme (Moniteur belge Official bulletin 11-03-2005)
- Royal decree dated 7 October 2005 relating to the content reduction in volatile organic components in some varnishes and paints and in vehicle repainting products (Moniteur belge Official bulletin 19-10-2005).
- Royal decree dated 19 May 2000 setting down the maximum content allowed in terms of [...] polychlorinated biphenyl in some foodstuffs, last amended by royal decree dated 27-09-2006
- Royal decree dated 8 February 1999 concerning natural mineral waters and spring waters, last amended by the royal decree dated 15-12-2003
- Royal decree dated 14 January 2002 relating to the quality of water destined for human consumption which is packaged or used in food establishments for the manufacture and/or introduction to market of foodstuffs. This re-transcribes directive 98/83/EC.
- Royal decree dated 18 February 1991 relating to foodstuffs destined for specific diets, last amended by the royal decree dated 27-09-2006. Being is a re-transcription of the directives 2003/13/EC and 2003/14/EC
- Ministerial decree dated 12 February 1999 relating to the trade and use of [products destined for animal feed, amended by ministerial decree dated 23-04-2007, which re-transcribes directive 2002/32/EC
- Royal decree dated 9 July 1986 which regulates substances and preparations containing polychlorobiphenyls and polychloroterphenyls

- Royal decree dated 12 October 2004 relating to the prevention of dangerous substances in electrical and electronic equipment, amended by royal decree dated 14-06-2006

REGIONAL LEVEL

WALLOON REGION

- Decree dated 27 June 1996 relating to waste and its applicative decrees
- Walloon Governmental Decree dated 10/07/97 drawing up a waste catalogue
- Walloon Governmental Decree dated 25/03/99 relating to the elimination of PCBs/PCTs
- Decree dated 11/03/99 relating to the environmental plan and its application decrees including those setting down sector-based conditions
- Decree dated 27/05/04 relating to book II of the Environmental Code, representing the Water Code
- Walloon Governmental Decree dated 23/06/00 relating to the assessment and management of ambient air quality (introduction of HAPs into the monitoring programme)

FLEMISH REGION

The legal framework within which Flanders positions its environmental policy in general and the fight against POPs in particular includes a series of decrees and their executive orders. The most significant are outlined below. In addition to the execution of decrees, the Flemish Region is also a participant in the execution of European Directives.

The most significant directives linked to regional policy concerning POPs are also highlighted.

- Decree of 5 April 1995 containing general provisions concerning the environmental policy (DABM)

This decree stipulates that Flemish environmental policy is shaped by environmental planning whose cornerstones are the environmental report, the environmental orientation plan and annual environmental programmes.

The environmental report (MIRA) is the scientific foundation of environmental policy. A Nature Report (NARA) was published in May 2005 and deals specifically with the 'nature' aspect.

Flemish environmental report

MIRA, the Flemish environmental report, works towards three objectives:

* MIRA describes, analyses and assesses the state of the environment
* MIRA assesses the environmental policy led
* MIRA describes expected environmental developments based on a series of scenarios deemed relevant, drafted on the assumption both of a continuation in the policy and developments in environmental policy.

There are three MIRA reports:
The MIRA-T annual report (T = themes), a detailed scientific study which gives an overview of the current state of the environment in Flanders based on a series of indicators; the MIRA-BE bi-annual report (BE = "*beleidsevalutie*" or policy assessment), an assessment of the existing environmental policy; and the five-year MIRA-S report (S = scenarios), a description of the expected evolution of the environment in Flanders depending on different (policy) variants.

Further information about this policy instrument can be seen at the following site: www.milieurapport.be.

The environmental orientation plan determines the strong points of the policy which is to be rolled out in terms of the environment by the Flemish Region but also by provinces and districts, in the domains which fall under regional control. On the one hand, the plan targets environmental management and protection and on the other, the promotion of efficiency, yield and internal consistency of the environmental policy, at all power levels.

The current 2003-2007 Plan was determined by the Flemish Government on 19 September 2003. A modification to the DABM decree allowed the extension of the Plan's validity until 2010, in exchange for a series of updates and adaptations, particularly in terms of objectives.

Annual environmental programmes are the executive and operational instruments of the environmental orientation plan. Emphasis is placed in this respect on the organisation, scheduling and priorities associated with the various measures.

- Environmental license decree

The environmental license decree was approved by the Flemish Parliament on 28 June 1985. This decree represents the basis of the VLAREM ('*Vlaams reglement betreffende de milieuvergunning*' or Flemish regulations governing environmental licenses), which enables execution of the environmental license decree.

VLAREM I
The first executive order, VLAREM I, came into effect on 1 September 1991. VLAREM I determines who must request an environmental license, which is

the appropriate body to this end, which procedures are to be respected and who will control the allocation conditions.
Companies are split into three categories, depending on the burden they are supposed to place on man and his environment; these categories are listed as an appendix to VLAREM I.

VLAREM II

The second executive decree, VLAREM II came into effect on 1 August 1995. VLAREM II determines the general and sector-based standards which a company must meet in order to obtain an environmental license and thus to be able to carry out industrial activities.
In its role as a general standard, Vlarem II schedules that the operator must always apply the best techniques available with a view to protecting man and his environment, both in the choice of processing methods regarding emissions, and in the selection of source pollution limitation measures (adapted techniques and production methods, raw materials management, etc.)

- Waste decree

The objectives of the Flemish waste policy are to protect man's health and that of the environment against the harmful effects of waste and to fight against energy and raw materials wastage. This objective is featured in the decree dated 2 July 1981 relating to waste management and prevention, also know as the waste decree. This decree lays the foundations of a coordinated, permanent waste policy at an administrative level; it has been modified several times, with a change in focus as regards priorities, in the sense that although at the outset the permanent elimination of waste was targeted, the pursued objective quickly evolved into the prevention of waste formation and its useful application.

VLAREA

The Flemish Regulations governing the prevention and management of waste, shortened to VLAREA (17 December 1997) brings together a series of executive orders into a cohesive whole.

- Decree relating to soil rehabilitation

The decree containing general provisions regarding environmental policy dated 5 April 1995 formulates the objectives and principles of Flemish environmental policy. It also lays the legal foundation of a long-term policy which talks about the environment in a sustainable way.

To avoid all new pollution and to rehabilitate existing pollution: these are the main objectives of the Decree relating to the rehabilitation of polluted soil and soil protection dated 27 October 2006. This new decree relating to soil rehabilitation follows on from the 1995 decree.

VLAREBO

Vlarebo executes the provisions of the decree relating to soil rehabilitation. In the meantime, the decree has already been modified several times. A significant adaption deals with regulations covering excavated land. A new version of Vlarebo comes into effect on 1 June 2008.

- Decree relating to the reduction in use of pesticides by public services in the Flemish Region.

The Decree relating to the reduction in use of pesticides by public services in the Flemish Region bans the use of pesticides in public governmental bodies from 2004 onwards, unless a reduction programme has been introduced.

BRUSSELS-CAPITAL REGION

Since 1989, the Brussels-Capital Region has had access to a legal arsenal allowing it to effectively, directly and indirectly limit and remove the presence, use and dispersion of POPs in the various sectors of the environment.

The Brussels-Capital Region has given its consent to the Stockholm Convention and the Aarhus POP LRTAP Protocol:

- Order dated 20 April 2006 giving consent to the Commission in terms of persistent organic pollutants, drafted in Stockholm on 22 May 2001 (Moniteur belge official bulletin 09/05/2006).
- Order dated 20 April 2006 giving consent to the Protocol on the Convention regarding long-distance cross-border atmospheric pollution dated 1979, relating to persistent organic pollutants, with its appendices, drafted in Aarhus on 24 June 1998 (Moniteur belge official bulletin 09/05/2006).

The basis for implementation of the obligations of the Stockholm Convention remains those limitations of action regarding the specific operating conditions for every categorised establishment which include provisions for each environmental sector (air, water, waste, soil, noise) and management and monitoring the respect of said conditions.

From the obligation to eliminate PCBs/PCTs present in condenser and transformer oils to the obligation to clean polluted soil, not forgetting the obligation to purify smoke from waste incineration and waste water establishments, water discharge standards, the compliant elimination of waste and operating conditions for environmental licences, the Brussels-Capital Region includes over 250 environmental legislative items which contribute to the reduction of POPs.

2.2.4 Key approaches and procedures for POPs Chemical and Pesticide management including enforcement and monitoring requirements.

Most the measures taken at the regional and/or federal level come from the transposition and implementation of European legislation, mainly via regulation 850/2004 concerning persistent organic pollutants. This European legislation also covers the obligations derived from international conventions in the environmental field in which Belgium is part, as well as their additional protocols.

The use of the nine POPs mentioned in the annex A has been forbidden in farming and non farming fields for more than 20 years, the most recent ban concerns PCB and dates back to 1986. For this last one, only the utilisations in close places or with research study purposes provided that they are not harmful to the environment are tolerated. None of these substances are produced on the Belgian soil. Concerning exports and imports, the European regulation 304/2003/CE and the Rotterdam Convention on prior informed consent procedure for certain chemicals and pesticides in international trades (PIC Convention) are in enforcement for the totality of those substances.

The POPs mentioned in the second part of Annex A are regulated at the federal level by the Royal decree of the 9th July 1986 which defines the directives 76/769/CEE and 85/467/CEE relating to the limitation on the market approval and the use of some dangerous substances and preparations. It regulates substances and preparations containing PCB and PCT. It forbids its fabrication, import, export, sale, free transfer or for commercial or industrial purposes of PCB/PCT of products, equipment, installations or liquids which contain it except for the operations realised in the regulation of garbage management frame (collect, elimination …). The use of those products, equipment… still authorised until their elimination or the end of their life cycle.

The specific politics of the Flemish Region are described below:

a. POP Policy in Flanders: General Approach

In the matter of hazardous substances, the Flanders region follows the approach described in the Environmental Policy Plan 2003-2007. This approach is inspired by the zero-emission goal formulated at the Third North Sea Conference. The Policy Plan also includes all aspects of timing and allocation of financial and human resources.

The Policy Plan lists the measures by substance (or substance group): there are measure packages for metals, pesticides, dioxins, fine particles and PAHs. Those measures are aimed at: improving the inventory of emissions and their monitoring, mapping out and quantifying the different sources (point and diffused), raising public awareness through campaigns (mainly about pesticides and dioxins), cooperating with federal authorities…

The Flanders region follows the European and international policy as regards hazardous substances and complies with commitments in this respect.

b. Pesticide Policy: Decree Implementation

The "Decree on reducing the use of pesticides by public services in the Flanders Region" forbids the use of pesticides by public administration since 2004, except when a reduction plan has been submitted.

As a consequence, many communes and other public services make efforts in order to reduce the use of pesticides. This already led to significant environment benefit. Research has shown that public administration already has achieved a 57,4% environment benefit compared to 2002. The main reason is that the products with the most risk (e.g. Diuron) have been replaced by less harmful products (e.g. Glyphosate).

Significant environment benefit has thus been achieved as regards reducing the use of pesticides. But as long as the purpose of the Decree has not been reached, we should continue with our efforts.

The measuring results in surface and groundwaters show that we have to pay attention to the possible effect of substitution products when forbidding specific plant protection products. The solution is, on the one hand, to substitute non-chemical alternatives for pesticides and, on the other hand, to sustainably transform the public domain with a reduced pesticide use in view.

c. Emission Reduction Policy for Waste Water

Pursuant to the European Directive 76/464/EC, the Flemish Region has drawn up a Hazardous Substances Reduction Programme, which was updated in 2005. The programme contains the main axes underpinning advices on authorisations. The programme imposes prevention and ending as basic principles for PBT substances.

As measuring results for surface water however indicate that very few POPs falling under the Treaty still come directly in surface water through dumping, the Reduction Programme will mainly matter as regards the prevention of new POPs.

d. PCB's in Devices: Disposal Plan

Devices containing PCB's have been tackled – transposing the European directive on the matter and pursuant to the Waste Product Decree – through the Decree of the Flemish Government of 17 March 2000 settling the disposal plan for devices containing PCB's and the PCB's they contain.

That disposal plan for devices containing PCB's regulates the phased and controlled removal of devices containing PCB's, like transformers and condensers.

Besides, the Decree of the Flemish Government of 17 March 2000 limits in time the use of devices containing PCB's, the limit being 2005 (2010 as an exception). In the coming years, the efforts will concentrate on the systematic removing for destruction of the last devices containing PCB's.

The Royal Decree of 9 July 1986 regulating substances and preparations containing polychlorinated biphenyls and polychlorinated terphenyls forbids the production, import and export, sale, free of charge transfer or transfer for commercial or industrial purposes, of products, devices, installations or liquids containing those substances, except for

operations performed within the framework of regulations on waste management (collection, transformation, …). Using these products, devices, … remains allowed until they are removed or until they reach the end of their lifecycle.

e. Waste Materials containing POPs

Materials and articles containing POPs may no longer be used and, as a consequence, they must be considered waste materials. We indeed have to get rid of them. Besides, these materials and articles have to be considered as hazardous waste materials.

The provisions from the Waste Materials Decree relevant in this context are the following:

- It is forbidden to leave behind or manage waste materials contrary to the requirements of this Decree or its implementing orders.
- When being collected, transported and temporarily stored, hazardous waste materials must be thoroughly packed and/or stored and marked in accordance with the international and European requirements that are applicable. Natural persons or legal persons who process hazardous waste materials must keep the different kinds of waste materials separate from each other and keep hazardous waste materials separate from non-hazardous waste materials.

The Vlarem Decree lays down the following conditions as regards processing hazardous waste materials:

- Using appropriate means particular to the responsible operation of the establishment, the operator prevents and controls dust, gas, aerosols, smoke or unpleasant odours. The operator takes all possible measures to minimise polluting emissions.
- Waste materials may not be stored outside the treatment or storage space intended for this purpose. The quantity of waste materials stored at the establishment may not exceed that permitted in the environmental licence.
- Locations at the site where liquids that are harmful to the environment may be spilled are to be provided with an impervious floor in such a way that spilled liquids cannot contaminate the ground itself, groundwater or surface water. This floor is equipped with a leakproof drainage system.
- The drainage of the buildings, the installation and the land is performed in such way that pollution of the rainwater is prevented to the extent possible and that uncontaminated rainwater can run off or is pumped out. Non-contaminated rainwater may in no case be mixed with waste water that requires treatment. Polluted rainwater has to be collected and treated like the remaining waste water of the establishment.
- Hazardous waste must be stored in a compartmentalised storage site, possibly complemented by fixed containers or tanks for liquid wastes. The waste materials may only be stored in the compartments, containers or tanks designated for the

purpose, in accordance with the approved work plan. Hidden pipes and/or connecting ducts between tanks or containers are prohibited.

- The spaces where liquid waste is treated and/or stored must be constructed in such a way that any liquids leaked from the receptacles or spilled accidentally are collected. The floors, receiving drains, sumps and bund are impermeable and chemically inert with respect to the liquids they may come into contact with. Unless specified otherwise in the environmental licence, the capacity of the sumps or the bund must at least be equal to the quantity of liquids stored in the compartment concerned.
- Exceptionally hazardous waste materials, in particular compressed gases and substances that may ignite spontaneously are to be stored in a separate building, spatially separated from other buildings, storage spaces and plants. Minimum distances for this spatial separation may be imposed in the environmental licence.
- Containers, drums, tanks and receptacles containing waste materials that should be stored spatially separated because of their nature and characteristics, may not be located together in one bund.
- To be able to take prompt action with leaks, defective or faulty packing, spillages, and other incidents with a view to limiting any harmful consequences as much as possible, the necessary emergency materials must be available at the establishment. These include absorbing material, outsized drums and protective equipment.
- The operator disposes of a sufficiently equipped water treatment plant to purify the waste water in order to be able in all conditions to meet the effluent limits for discharges to surface water Waste water that cannot be treated in the waste water treatment plant has to be drained away to an adequate treatment plant.

The processing of non-reusable discarded electrical or electronic equipment must take place as follows:

- the various harmful constituents are removed from the appliances, in particular those containing hazardous substances or components;
- the following substances, preparations and parts are selectively disassembled and collected for recycling or disposal at an establishment licensed to this end:
- PCB/PCT-containing and electrolytic capacitors;
- The operator or his authorised representative must have an adequate command of chemistry and must have sufficient knowledge of the characteristics and dangers of the chemicals that may be accepted and of the relevant safety regulations.
- Upon delivery, the hazardous waste is stored and treated by the operator or his authorised representative in such a way that risks are avoided as much as possible.
- The hazardous waste is subdivided and sorted according to its chemical composition, nature or characteristics.

- The operator takes the measures necessary to prevent waste materials that may react with each other from causing uncontrolled reactions or from generating harmful or dangerous gases or vapours.
- If it is found that a receptacle containing hazardous waste is leaking, the receptacle or its contents are transferred to another suitable receptacle immediately and any spilled liquid is cleared.
- The sumps and the separate collection facilities of the compartmentalised storage are to be emptied regularly and at least after each incident. The waste material flow obtained is to be processed in an appropriate fashion.
- Empty contaminated receptacles and contaminated absorbing material are stored and treated according to the nature of the substances with which they have been contaminated. Non-reusable receptacles are processed according to an adapted method.

A study that was completed beginning July 2008 puts side by side the current Flemish environmental regulations – concerning e.g. waste products management and soil management – with the provisions of Regulation n°850/2004 and brings to light the action points and the problems. It also lists all possible products and materials in general that become POP-containing waste streams within the framework of Regulation n°850/2004, allowing assessing the Regulation's impact.

The inventory shows that the number of waste streams containing significant quantities of POPs is limited. Risk streams are construction and demolition waste, isolating materials, electric devices, discarded vehicles and waste oil (PCB's), and fly ash and waste from gas treatment in metallurgy and waste incineration (dioxins en furans). Significant PAHs quantities are to be found in waste oil, tar sludge, asphalt containing tar and roof covering, destruction and demolition waste (granulated rubble) and rubber waste. Flanders does not produce POPs "intentionally" anymore, as the use of most POPs has been prohibited for a long period of time. The POPs that end up in the waste phase come from a past use in building applications (paint, sealing, isolation materials,…), wood preservation (creosote, carbolineum) and cables (flame retardants), from (illegal) use in non-European countries (e.g. contamination of imported textile and timber), or from involuntary generating of POPs resulting from thermal processes or chemical production (incineration residue or unwanted by-products). The inventory also shows that the content of POPs is unknown in some materials. Research mainly focussed on dioxins and furans contamination. Besides, fragmented research exists as regards PCBs, but the presence of POP-pesticides in e.g. wood waste and textile waste is not/has not been analysed. There is not much data either concerning the content of PAHs in waste products.

The compatibility analyses did not allow inferring serious problems making it impossible to implement the POP Regulation.

f. Policy

- Limit and Guidance Values for Dioxin Emissions

Introducing limit values and guidance values for dioxin emissions as specifically mentioned in the appendix, as well as clean-up efforts from the Environmental Inspection Department, led to significant emission reduction in the 90's (see also Monitoring).

Based on a Flemish literature review entitled "Best available techniques, the limitation of dioxin emissions and possible emission limit values for industrial treatment plants", limit and guidance values for dioxin emissions have been included in Vlarem II concerning a number of industrial sectors (the ferrous and non-ferrous sectors, refineries, waste incineration plants and crematoria). As far as the other sectors are concerned, attention mainly goes to the permanent monitoring of the limit values applicable to dioxin emissions.

During the coming years, the Flemish dioxin policy will mainly focus on the "population" sector, with a relative share of 73% in the total emission inventory. In order to realize additional dioxin reductions, attention is fixed on emissions resulting from solid-fuel heating in buildings and waste incineration in open fireplaces and burn barrels. By raising public awareness and introducing emission norms for new solid-fuel stoves, we can realize a small reduction potential by 2010.

- Iron and Steel Production

As regards plants classified in the first category, subsection 20.2 (table 1), sectoral dioxin-emission requirements apply, as described in art. 5.2.0.6. of Vlarem II (table 2 and table 3).

Plants must strive to achieve guidance values through applying the best techniques available in the following fields: raw and secondary materials used, modifying or optimizing processing and using efficient systems for the treatment of combustion gases.

The BREF on the Production of Iron and Steel6 mentions the best available – process-integrated as well as end-of-pipe – techniques.

- Waste Incineration Plants

A far as waste incineration plants (table 4) are concerned, the sectoral dioxin-emission limit values apply, as described in art. 5.2.3. of Vlarem II (table 5). The same dioxin-emission limit values apply to co-incineration plants. Besides, on 1 January 2000, a continuous dioxin sampling has been coupled to an analysis that is mandatory for those plants every two weeks.

[6] Integrated Pollution Prevention and Control (2001), Best Available Techniques Reference Document on the Production of Iron and Steel, http://ec.europa.eu/comm/environment/ippc/brefs/isp_bref_1201.pdf

At EU level, those emission limit values are also provided for in Directive 2000/76/EC on the incineration of waste. BAT (Best Available Techniques)-measures for dioxins are contained in the BREF on waste incineration7.

- Production of Non-Ferrous Metals

As regards non-ferrous metal plants classified in the first category, subsection 20.2 (table 6), sectoral dioxin-emission requirements apply, as described in art. 5.29.0.6. of Vlarem II (table 2).

Plants must strive to achieve guidance values through applying the best techniques available in the following fields: raw and secondary materials used, modifying or optimizing processing and using efficient systems for the treatment of combustion gases.

Those BAT's are contained in a Flemish BAT-study for the non-ferrous industry8 based on the European BREF in the non ferrous industry9. The conclusions of the BREF were taken over and tested with regard to the specific Flemish situation.

- Refineries

Refineries are classified in subsections 20.1.2. and 1.1 of Vlarem I, as shown in table 28 (Annex III).

As far as those plants are concerned, sectoral dioxin-emission requirements apply, as described in art. 5.20.2.2. of Vlarem II (table 4).

Table 4: emission limit and guidance values for refineries

New measures			Existing measures		
Emission limit values (ng TEQ/Nm3)	Emission guidance values (ng TEQ/Nm3)	from	Emission limit values (ng TEQ/Nm3)	Emission guidance values (ng TEQ/Nm3)	from
0,5	0,1	1/5/1999	2,5	0,4	1/1/2002

Plants must strive to achieve guidance values through applying the best techniques available in the following fields: raw and secondary materials used, modifying or optimizing processing and using efficient systems for the treatment of combustion gases.

BAT-measures for dioxins are contained in the BREF on mineral oil and refineries[10].

- Illegal Open-Air Incineration of Waste

[7] Integrated Pollution Prevention and Control (2006), Best Available Techniques Reference Document for Waste Incineration, http://ec.europa.eu/comm/environment/ippc/brefs/wi_bref_0806.pdf

[8] P. Vercaemst en R. Dijkmans, Best Available Techniques for Non-ferrous metals processes (2002), http://www.emis.vito.be/EMIS/Media/BAT_abstract_non_ferrous_metals.pdf

[9] Integrated Pollution Prevention and Control (2001), Best Available Techniques Reference Document in the non ferrous metals industries (2001), http://ec.europa.eu/comm/environment/ippc/brefs/nfm_bref_1201.pdf

[10] Integrated Pollution Prevention and Control (2003), Best Available Techniques Reference Document for Mineral Oil and Gas Refineries, http://ec.europa.eu/comm/environment/ippc/brefs/ref_bref_0203.pdf

Article 4.4.1.1 of Vlarem II lays down severe restrictions as regards open-air incineration of waste. Only vegetable waste coming from the maintenance of gardens, the deforestation or cultivation of grounds or agricultural works of the company may be incinerated, and only at a distance of 100m from buildings or vegetation.

- Solid-Fuel Heating in Buildings

According to an exception in subsection 2.3.4 a) of Vlarem I, incinerating non-treated logs in wood-burning stoves for the heating of a residence or a workplace, in attractive fires and similar devices with a maximum nominal thermal power of 300 kW, is not a waste treatment plant and, as a consequence, is allowed. So it is strictly forbidden, as an individual, to use different forms of treated wood waste.

- Solid-fuel heating in buildings and illegal open-air incineration of waste

    - Emission Inventory

In 2000 researchers completed a study on a reliable inventory of dioxins–emissions resulting from solid-fuel heating in buildings and possible policy actions, like a standard testing, a regulation on use and public awareness campaigns.

A survey carried out among individual users of stoves and open fireplaces and emission factors found in the literature made it possible to make an updated inventory of dioxin emissions and PAHs resulting from solid-fuel heating in buildings. Within the framework of a supplementary measuring programme, other measures were taken during the incineration of (garden) waste in burn barrels and open fireplaces and when heating a building with open fireplaces and solid-fuel stoves. Based on these additional data, the emission inventory has been optimized.

    - Protocol

In 2001 the Flemish Minister of the Environment signed a protocol with a number of industrial confederations and the VVSG (Association of Flemish Cities and Municipalities) concerning building heating and waste incineration in the open air. Within the context of that protocol, these organisations actively collaborated to the public awareness campaign and a dialogue was launched on environmental quality requirements for solid-fuel heating devices.

    - Product Standardization

The European Committee for Standardization (CEN) worked out harmonized European norms for domestic solid-fuel heating devices: EN 13229:2001/A2:2004 and EN 13240:2001/A2:2004. The norms contain a threshold value for CO-emissions and the efficiency of these devices.

In 2004 the Federal Authorities started working out a Belgian Royal Decree in consultation with the sector and the Regions concerning the efficiency, the CO emission and the particles emission, as well as the quality of solid fuels, based on European norms.

As a result of the (draft) Royal Decree, stricter performance requirements will be introduced gradually in the period 2007-2010. A number of international developments as regards fine particles will be taken into account.

The improved performance of these new devices will also indirectly result in positive effects as regards dioxin-emission.

- Public awareness

The first large-scale campaign, titled "25% of dioxin-emission results from small garden fires", took place during the summer of 2002. The campaign pointed out that small garden fires damage health and the environment and, as a result, illicit incineration is forbidden. The campaign also pointed out the many alternatives to incineration: preventing, sorting or composting waste. The campaign was made in cooperation with the distribution sector confederation and the VVSG. The campaign brochure will also be distributed during the coming years, after an update in 2007. The campaign was also supported by the website www.vlaanderen.be/sluikverbranden.

In 2003 confederations of producers, the distribution sector and the VVSG cooperated to launch a public-awareness campaign titled "heating smarter with stoves and open fireplaces", using a brochure containing practical tips to keep heating safer and more environment-friendly. The campaign will be continued in the coming years.

- Municipal Police Regulations

The Flemish authorities and the Flemish municipalities will work out consistent municipal regulations concerning that issue within the framework of a cooperation agreement. Those regulations allow establishing further-reaching rules in addition to the existing legislation, in particular concerning the moment and weather conditions of incineration.

- Vinyl Chloride Production

The OSPAR-decision 98/4 includes a dioxin-emission limit value of 0,1 ng TEQ/Nm3 for the manufacture of vinyl chloride monomer and 1,2-dichloroethane. It also mentions a monitoring through annual measuring. The OSPAR-decision applies to new installations as from 9 February 1999 and to existing installations as from 1 January 2006.

As a party to the OSPAR convention, Belgium must implement this decision. That OSPAR decision will be transposed in the Flemish Environment Regulation in 2007-2008.

- Improving Shredders

Strongly increased dioxin and PCB-126 deposition was recorded in 2002 around a scrap processing plant in the Flemish Region. On the basis of the recorded data, deposition measuring was carried out in 2005 around 9 Flemish scrap processing plants with a shredder. The measuring results of 2005 show that increased dioxin (and PCB-126)

deposition can regularly be measured in the immediate vicinity of scrap processing plants. The improvement measures imposed by the Flemish Environment Inspection to the scrap processing sector mainly focus on dust control. The future measuring results will show if those measures are sufficient to reduce the presence of dioxins en PCB's outside the plant.

2.3 Assessment of the POPs issue in Belgium

Given the specific situation of Belgian policy in terms of the environment, different approaches must be taken into consideration. Indeed, human monitoring and quality control for food fall under federal control, while the monitoring of emissions in the environment fall under regional control. The rest of this chapter is therefore sub-divided according to these criteria.

2.3.1 Assessment of the POPs issue at a federal level

2.3.1.1 History

If pesticides mentioned in Annex A were commonly used until the years 1960, market approval has been denied for those products since the beginning of the years 1970. Moreover, none of those pesticides is being produced currently on the Belgian territory, and all of them are forbidden for farming use and non farming use fields (the most recent ban dates back to 1988 and concerns non farming use of chlordane). Since the European regulation 2455/92/CEE entered into force, abrogated by the regulation 304/2003/CE, there has been no notification for those substances nor import and export.

The same is true for the specific case of DDT (dichloro-diphenyl-trichloroethane). Its use has been banned in Belgium since 1974 in the farming sector and since 1976 for all other sectors (avis officiel 22/11/74 and AR 01/11/76). No production exists on the territory or is scheduled for the future, and neither export nor import is planned. An inventory was made based on declarations of individuals and no stock of this product was declared. It was concluded that there was no longer any stock present on the territory. Belgium will not be an exception to the Stockholm Convention of POPs.

Moreover, since 1997, the ASBL Phyotfar-Recover, coming from the Belgian federation of chemical industries, is in charge of collecting and processing empty packages that had contained phytopharmaceutical products as well as expired products. Campaigns are regularly led close to farmers, big companies of pulverisation and in the concerned industrial sites. The rates of collecting and treatments exceed 90%.

Regarding PCB and PCB equipment, the directive 96/69/CE necessitates their elimination by the 31st of December 2010 the latest.

The inventory for PCB equipment was created in 1999 based on owner and inspector declarations[11]. Normally, this equipment should have been decontaminated and/or eliminated according to when they were made, by the 31st of December 2005. However, an exemption can be given, delaying the deadline until 31st of December 2010. The treatment of this kind of equipment is under the responsibility of the Regions.

Diffuse PCBs are not part of an inventory. The total quantity introduced onto the Belgian market has been estimated at 4500 tons of which 80% is for open applications (rubber, painting) and 20% for close applications (little transformers of washing machines, fluorescent tubes). About 400 tons introduced as production impurities in bulk chemicals must be added. The estimation of PCB quantities still on the market in 1999 was based on the shelf life of the products. For example, the life of domestic paint is estimated at 20 years. Diffuse PCBs used in close applications come mainly from small capacitors in fluorescent tubes. Although quantities of diffuse PCBs used in open applications were representative for about 80% of diffuse PCBs introduced in Belgium, they only account for about 40% of diffuse PCBs still present in 1999. This is notably due to limited longevity of open applications and the fact that PCBs have not been used in this kind of application since 1973[12].

Polychlorodibenzodioxins (PCDDs) and polychlorodibenzofurans (PCDFs) are also known as dioxins. PCBs show a similar structure and are called "dioxin-like". Dioxins, as well as hexachlorobenzene (HCB) are unintentionally produced following an incomplete combustion and during the fabrication of pesticides and other chlorinated substances. Technological developments of the 20th century have contributed to the increase of dioxins in the environment. Some sources that have left traces but are no longer used today:

- Use of 2,4,5-T pesticide
- Processing of wood with pentachlorophenol
- Industrial utilisation of PCBs
- Utilisation of oil fuel and fuel (leaded)

Actual sources are:

- Incineration of waste (including medical and dangerous)
- Steel industry
- Combustion of peat, coal and wood (industrial and household)
- Fumes (especially diesel vehicles)
- Controlled, uncontrolled and accidental fires

11 source : IBGE : http://www.ibgebim.be/FRANCAIS/contenu/content_fiche2.asp?SelectPage=3884&Langue=fr&Prefixe=dec&ref=399&base=

12 Source : *IBGE*, Gisement des Polychlorobiphényles (PCB) sur http://www.ibgebim.be/FRANCAIS/contenu/content_fiche2.asp?SelectPage=3884&Langue=fr&Prefixe=dec&ref=399&base=

- Waste water sludge
- Reservoir of old pollution (e.g. contaminated sites)
- Production of paper pulp using chlorine as whitener.

Furans are also produced this way, but they are a sub-product of PCB fabrication too.

In January 1999 in Belgium, recycled fat destined for animal feeding was accidentally contaminated by 100 liters of PCBs. This accident caused the "crisis of dioxin". The time elapsed and the range of exposure during the incident were too small to significantly increase the PCB body burden of the general population. Only the farmers who regularly ate their own products should have, in the worst case, duplicated their body burden (but no higher than the values observed in the 80s) (Bernard 2000)[13]. Nevertheless, it has allowed the awareness of the dangers of those products in our country. Following this incident, a series of analyses were conducted to verify the exposure risk of the population from those kinds of products. Belgium is similar to other European countries: food exposition for dioxins in European countries is between 1 and 4 pg/kg of weight, which are acceptable values of ADI proposed by WHO (Van Leeuwen et al., 2000)[14].

2.3.1.2 Human Monitoring

Blood concentrations

- *Pesticide POPs*

Several studies conducted at a national level showed human blood concentrations of several organochlorine pesticides. A growth of those concentrations is linked with age. The results for the whole of Belgium are resumed in the following table. DDE (dichloro-diphenyl-dichoroethylene) and DDD (dichloro-diphenyl-dichloroethane) are both degradation products of DDT which can be found in commercial preparations of DDT. DDT metabolises into DDE in the human body; this is why DDE is found in a major quantity during evaluations. Half-life in the human body is 4 years for DDT and about 9 to 10 years for DDE (Noren & Meironyté, 2000). The ratio of DDT/DDE gives an indication of elapsed time since exposure.

13 Bernard A. Bulletin et mémoires de l'Académie royale de médecine de Belgique. 2000;155(3-4):195-201; discussion 201-4. [Food contamination by PCBs/dioxins in Belgium: analysis of an accident with improbable health consequences.

14 Van Leeuwen F.X.R., Feeley M., Schrenk D., Larsen J.C., Farland W., Younes M. Dioxins: WHO's tolerable daily intake (TDI) revisited. Chemosphere, 2000, 40, 1095-1101.

Table 5 : Human blood concentrations of organochlorine pesticides and their metabolites collected in different age-group.

Year	age	sex	N	Pollutant	mean	SD	min.	median	Max.	unit	ref.
'98-'00	19-63	v	20	HCB	32.0	19.6	7.3	27.2	66.9	ng/g lipids	Van Wouwe et al., 2004 [15]
2001	20-24	M+v	18	HCB	21.8	9.1	9.6	18.1	39.7	ng/g lipids	Voorspoels et al.,2002 [16]
2001	25-29	M+v	4	HCB	17	2.3	14.5	16.6	20		
2001	30-34	M+v	9	HCB	19.9	4.4	15.2	19.8	26.2		
2001	35-39	M+v	13	HCB	25.3	10.7	11.3	22.9	42.7		
2001	40-44	M+v	42	HCB	29.5	18.2	9.8	26.3	89.5		
2001	45-49	M+v	30	HCB	30.6	20.4	8.5	26.3	113.3		
2001	50-54	M+v	16	HCB	35.1	19	11.1	34.3	89.2		
'98-'00	19-63	v	20	β-HCH	23.1	14.7	5.6	16.7	53.2	ng/g lipids	Van Wouwe et al., 2004
'98-'00	19-63	v	20	γ-HCH	5.4	2.7	3.1	4.5	14.6	ng/g lipids	Van Wouwe et al. 2004
'98-'00	19-63	V	20	Oxy-chlordane*	22.3	19.9	4.0	15.8	67.4	ng/g lipids	Van Wouwe et al., 2004
'98-'00	19-63	v	20	Trans-nanochlor	8.4.	4.7	2.5	7.6	16.7		
'98-'00	19-63	v	20	p,p'-DDE	365.0	313.2	37.4	344.2	1390.3	ng/g lipids	Van Wouwe et al., 2004
2001	20-24	M+v	18	p,p'-DDE	96	56.4	40.9	74.4	256.1	ng/g lipids	Voorspoels et al.,2002
2001	25-29	M+v	4	p,p'-DDE	87.1	55	39.4	71.6	166		
2001	30-34	M+v	9	p,p'-DDE	171.9	135.2	37.2	147.2	417.1		
2001	35-39	M+v	13	p,p'-DDE	194.5	121.5	66.4	145.3	498.3		
2001	40-44	M+v	42	p,p'-DDE	190.4	88.8	53.8	183.2	424.8		
2001	45-49	M+v	30	p,p'-DDE	217.4	146.4	56	182.2	641.9		
2001	50-54	M+v	16	p,p'-DDE	254	140.5	90.1	245.2	689.2		
'98-'00	19-63	v	20	p,p'-DDT	9.1	2.5	6.0	8.3	13.5	ng/g lipids	Van Wouwe et. al., 2004

**trans-chlordane and cis-chlordane were under the limit of detection*

[15] Van Wouwe N, Covaci A, Kannan K, Gordon J, Chu A, Eppe G, de Pauw E., Goeyens L (2004) Levels of contamination for various pollutants present in Belgian human plasma, *Organohalogen Compounds*, 66, 2818-2824.

[16] Voorspoels S., Covaci, A., Maervoet, J. & P. Schepens (2002) Relationship Between age and levels of Organochlorine Contaminants in Human Serum of a Belgian Population, *Bulletin of Environmental Contamination and Toxicology*, 69: 22-29.

- *POPs from unintentional production*

Different kinds of studies are in progress to determine with much precision as possible the contamination levels and the risks for human beings. Their purposes are to measure blood contents of contaminants as well as human milk concentrations.

Incinerators are a well known source of dioxins. More chronicle exposures have been observed in incinerator neighbourhoods compared to the average population. They are mostly due to the presence of low chlorinated congeners, whose profile is characteristic of the ones of contaminated cows present on these side sites. Mean blood values of 26.5 pg TEQ-WHO/g fat (TEQ-WHO: Toxic Equivalent Quantities according to the WHO) have been measured in the control population while values of 35.5 pg TEQ-WHO/g fat have been recorded in the incinerator neighbourhood population, although with the condition that these neighbours had eaten local products in a regular way (Bernard et al., 2001)[17].

Analysis of human milk

Following joint query from the World Health Organization and the PNUE, a study about the concentrations of different POPs in human milk has been conducted in 2006 on a large scale and is representative of all parts of the country. It is the 4th campaign of this type coordinated by the WHO, the three previous only took into account dioxins, furans, products of combustion and industrial waste as well as PCBs. The purpose of this study is to verify to which extent environmental pollutants are now found in the human body. Human milk was chosen because it is easily collectable and contains enough fat to measure the accumulation of these pollutants in Human beings. The project was conducted under the authority and with subsidisation from the Joint Interministerial Conference on Environment and Health, which brings together all federal, community and regional Belgian authorities that are competent in the fields of environment and health. 191 mothers from Flanders, Wallonia and Brussels spread over 2 maternity clinics per province (in both rural and urban area) have agreed to participate in this project. The selection criteria were:

- Breastfeeders,
- Adults under 30,
- Born in Belgium and domiciled in the collect area for minimum 5 years,
- HIV negatives,
- Giving birth to a 1st child (twin childbirth are not taken into account in the study),
- Normal pregnancy,

[17] Bernard A., Fierens S., Mairesse H., Hermans C., Broeckaert F., Focant J.-F., De Pauw E. Incinérateurs, crise dioxine et risques sanitaires pour la population belge. *Bulletin de la Classe des Sciences*, 2001, **1-6**, 103-117. http://www.facmv.ulg.ac.be/amv/articles/2002_146_6_01.pdf

- Until term childbirth (gestation > 36 weeks),
- Healthy babies.

The samples were individually analysed by the "Institut de santé publique" for the presence of PCB markers and organochlorine pesticides. This concerns in particular the following substances: aldrin, chlordane, dieldrin, DDT -which also included DDE-, endrin, heptachlore, hexachlorobenzène, hexachlorocyclohexane (alpha-, beta- and gamma-HCH, the latter is also called lindane), PCB 28, PCB52, PCB101, PCB118, PCB138, PCB153, PCB180.

A mix of the collected samples has also been analysed by a laboratory designated by the WHO. This laboratory, located in Fribourg, has done tests on the samples of all the involved countries. In this mix, the substances that have already been analysed in Belgium in the individual samples were analysed again as well as a series of other substances: the toxaphene organochlorine pesticide, the dioxin group (polychlorinated dibenzodioxins & polychlorinated dibenzofurans), the dioxin-like PCB group, brominated flame retardants PBDEs and combustion products of flame retardants namely polybrominated dibenzodioxins and dibenzofurans, and mixes of brominated and chlorinated dibenzodioxins and dibenzofurans. The quantities of PFOS and PFOA have also been measured in the sample mix at the Antwerp University.

This study allows to verify the content of POPs in the population in order to examine the effectiveness of reduction measures that have been taken until now. The collected data will help to satisfy the eventual gaps present in the current political struggle against POPs.

The results of analyses performed in Belgium are detailed in the following table:

Table 6 : Concentrations of several organochlorine pesticides (ng/g lipids) present in 200 human milk samples collected in 2006 in Belgium. The only detectable substances were dieldrin in 15 samples of which 3 were under the limit of quantification (LOQ) ; oxychlordane in 4 samples of which 2 were under the LOQ, HCB in 172 samples of which 9 were under the LOQ and PCB were present and quantifiable in all the samples. Regarding DDT and its metabolites, all the samples showed values under the limit of detection (LOD) for the p,p'-DDD, the o,p'-DDD and o,p'-DDE, the o,p'-DDT was only detectable in one sample, and p,p'-DDT in 13 samples of which 3 were under the limit of quantification (LOQ).

	N	**Mean**	**Geometric Mean**	**Median**	**Minimum**	**Maximum**	**P25**	**P75**	**P10**	**P90**	**Std.Dev.**	**< LOD**	**< LOQ**
Aldrin	190	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	190	0
Dieldrin	190	1.0		0.0	0.0	19.3	0.0	0.0	0.0	0.0	3.8	**175**	**3**
Endrin	190	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	190	0
Heptachlor + epoxide	190	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	190	0
Chlordane's metabolites :													
α-Chlordane	190	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	190	0
γ-Chlordane	190	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	190	0
Oxychlordane	190	0.2		0.0	0.0	10.8	0.0	0.0	0.0	0.0	1.2	**186**	**2**
Trans-nonachlore	190	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	190	0
HCB	190	15.2		15.5	0.0	40.6	12.2	19.1	5.0	23.3	7.6	**18**	**9**

	N	Mean	Geometric Mean	Median	Minimum	Maximum	P25	P75	P10	P90	Std.Dev.	< LOD	< LOQ
PCB's Markers													
Sum of PCB's markers	196	131.9	121.9	122.7	47.1	496.6	91.4	160.2	72.0	192.3	56.4	**0**	**0**
PCB 28	196	7.4		5.0	0.0	63.6	0.0	11.5	0.0	17.2	9.0	56	83
PCB 52	196	6.7		5.0	0.0	57.4	0.0	7.5	0.0	16.0	8.1	56	91
PCB101	196	4.3		5.0	0.0	36.9	0.0	5.0	0.0	11.0	5.7	84	86
PCB118	196	11.4		11.8	0.0	43.8	5.0	14.9	5.0	19.0	6.5	8	60
PCB138	196	33.3		32.0	0.0	127.1	24.3	39.7	20.4	48.3	13.8	2	0
PCB153	196	46.1	43.0	43.7	17.4	153.8	33.2	54.9	27.0	68.6	17.9	0	0
PCB180	196	23.3		22.7	0.0	63.1	16.6	29.7	13.0	35.4	10.1	3	6
DDT et métabolites:													
p,p'-DDE	190	121.6	101.3	95.9	26.1	724.5	70.7	140.5	49.8	211.4	93.3	**0**	**0**
p,p'-DDT	190	1.5		0.0	0.0	80.2	0.0	0.0	0.0	0.0	7.7	**177**	**3**
o,p'-DDT	190	0.1		0.0	0.0	17.3	0.0	0.0	0.0	0.0	1.3	**189**	**0**
p,p'-DDD	190	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**190**	**0**
o,p'-DDD	190	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**190**	**0**
o,p'-DDE	190	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**190**	**0**

Out of all the substances tested for -see table above- only 4 kinds were detected: dieldrin, HCB, PCB markers and DDT metabolites. For those latest, only p,p'-DDE was detectable and quantifiable in all the samples, the median-value being 95.9 ng/g of lipids. We must insist that dieldrin was under the limit of quantification.

A monitoring in the time of dioxins and furans concentration is possible because these products were targeted from the 1st maternal milk campaign organized by the WHO. Human milk analyses that had been done in the past have allowed bringing to light a bigger PCDD/PCDF concentration in Belgian women –16.9 pg TEQ/g fat– than in the other European countries, except the Netherlands (Van leeuwen & Malish, 2002)[18].

In the first WHO human milk campaign in '87-'88, Belgium had the highest values of dioxins/furans within the 19 participating countries (40.2 pg TEQ/g fat). During the second and the third campaigns, Belgium was, with other industrialised countries, in the first ones too. However, Belgian values have followed the decreasing international trend. For this fourth campaign, Belgian concentrations were decreased (10.3 pg TEQ/g fat) compared to five years ago (15 and 19 pg TEQ/g fat).

[18] Van Leeuwen FXR, Malisch R (2002) Results of the third round of the WHO-coordinated exposure study on the levels of PCBs, PCDDs and PCDFs in human milk, *Organohalogen Compounds*, 56, 311-315.

Table 7 : Statements of Belgian measured values in the mix samples of the successive WHO campaigns. Values for dioxins/furans formulated in pg TEQ/g fat. TEQ value of successive campaigns is based on TEF values modified during process of time for individual congeners [19].

	WHO[a] '88-'89	WHO[b] '91-'92	WHO[c] '01-'02	WHO[c] '05-'07
Belgium				
All the regions				10.3 (N=178)
Walloon Brabant (rural)	33.7 (N=in)	20.8 (N=8)	14.8	
Liege (industrial)	40,2 (N=in)	27.1 (N=20)		
Liege (rural)				
Liege (urbane)			19.1	
Brussels (urbane)	38,8 (N=in)	26.6 (N=6)		
Countries set				
Number of countries	18	19	20	*
Mean	21.8	14.5	9.8	*
Standard deviation	9.6	5.6	4.7	*
Minimum	4.9	3.8	3.9	*
Maximum	40.2	27.1	22.8	*
P10	9.3	8.1	6.1	*
P25	16.4	10.9	6.8	*
Median	19.5	14.4	8.9	
P75	29.4	17.6	10.5	*
P90	36.7	22.0	17.1	*

N= number of milk samples in the mix sample, un=unknown, total of 64 individuals (Van Cleuvenbergen and al.,1994).

** Result of the 4th campaign is not yet available.*

[a] calculated with N-TEF (toxic Equivalency Factors), by : *Van Cleuvenbergen and al. (1994), Tarkowsk and Yrjänheikki (1989), Liem and al. (1996).*

[b] calculated with I-TEF of NATO, by : *Liem and al. (1996), OMS (1996)*

[c] calculated with WHO_{1998}-TEF, by *Van Leeuwen and Malish (2002), Malish (pers. Comm.)*

The following graph shows the evolution in time of dioxin and furan concentrations in Belgian human milk. We can note a regular decrease of those concentrations in time.

[19] There are several « calculation schemes » with different toxic equivalency factors (TEF) for individual congeners, during the calculation of a common TEQ (toxic equivalency factor) for the group. In the **N-TEQ** scheme (Nordic), dibenzofuran 1,2,3,7,8-Pentachlorinated has a TEF of 0.01, while in the **I-TEQ** scheme (NATO) it is 0.05. This conducts to insignificant differences of less than 1% between results expressed in N-TEQ or I-TEQ. The **WHO_{1998}-TEQ** for dioxins/furans could nevertheless overtake the I-TEQ value of 10%. This comes mainly from the higher TEF value of dibenzondioxin 1,2,3,7,8-pentachlorinated, which is 1 instead of 0.5 according to I-TEQ system.

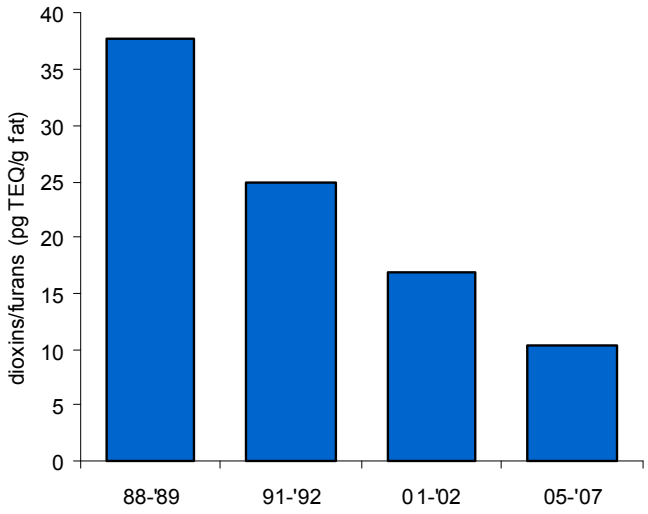

Figure 3: Dioxin + furan concentrations in Belgian human milk analysed in the four successive WHO campaigns. In the first 3 ones, there was no mix samples coming from milk collected in the all of Belgium. Per campaign, 2 to 3 mix samples were composed of human milk coming from mothers from 2 to 3 regions. The values on this graph for the first 3 campaigns thus represent an approximate Belgian mean value, calculated on the basis of available Belgian mix samples.

Monitoring of the food chain

- *Pesticide POPs*

In 2006, a total number of 1539 samples of fruits, vegetables, cereals and processed plant products (including baby food) were taken by the Belgian Federal Agency For the Safety of Food Chain (FASFC) off the Belgian market and analysed for the presence of pesticide residues (see annex I).[20]

Four officially recognised laboratories were involved in the 2006 monitoring programme. They are all ISO 17025 accredited for the most important analytical methods and commodities.

Within the tested residuals, the pesticides mentioned in the Stockholm Convention as well as chlordecone and lindane have been searched. Only 2 substances have been found in fruits and vegetables: DDT and heptachlor, both of them were present in only one sample. No pesticide has been found in cereals.

The results are resumed in Annex I.

[20] Pesticide Residue Monitoring in Food of Plant Origin, Belgium 2006, Report of Monitoring Results Concerning Directives 90/642/EEC, 76/895/EEC and 86/362/EEC and Commission Recommendation 2006/26/EC

- *POPs from unintentional production*

To verify the content of products in food, samples are collected in the frame of self-checking systems in application in Belgian industries. Moreover, every animal fat lot bound to animal feeding must systematically be tested for PCBs by the producer before it is put on the market. It means more than 1000 tests on animal fat and more than 700 tests on animal proteins must be conducted. Concerning dioxins, they are searched by screening. The number of annual analyses is 1270 for livestock feed and 1390 for the rest of the food chain. Experience tells us that contamination by dioxins is often attended by PCB contamination. Furthermore, PCBs are more easily detected; therefore they are used as markers and their analysis is systematic[21].

Estimation of dioxins consumer exposition[22]

Dioxins and PCBs controls realised by FASFC in 2006 in animal feeding

In 2006, 1564 PCBs analyses, 1186 dioxins analyses and 91 dioxin-like PCB analyses have been conducted in animal feeding. Only three results did not conform and contained additives (sepiolite, manganese, zinc oxide).

	2006		2005
	Number of analysis	% conformity	% conformity
Raw materials	2.500	97,6%	99,1%
Additives et premixes	443	99,3%	99,5%
Mixed feed	7.708	99,6%	99,4%
Total	10.662	99,1%	99,3%

Dioxins incident in the production sector of gelatine

Early in 2006, the Dutch authorities discovered a dioxin contamination in pig fat from a Belgian producer use in animal feed. The source of this contamination was likely a failure in the process used to transform bones for gelatine production. The fat (a secondary product) was intended for feeding animals. Many food samples were taken at this occasion in Belgium, leading to surveillance measures by animal feeding producers as well as by breeders. Considering dioxin contamination risks inherent in the use of animal fat for producing animal feed, the FASFC, in consultation with the sector, reinforced control measures of these raw materials by a systematic analysis of batches put on the market. These regulatory prescriptions have entered into force during 2007.

21 Source : AFSCA. 2006.Contamination des aliments pour animaux par la dioxine : quelques FAQ.
22 Rapport annuel 2006 de l'AFSCA

Following this incident, the scientist Committee of FASFC has, on hand, determined the pig an poultry contamination level from contaminated foodstuff and, on the other hand, conducted a risk assessment to estimate consumer dioxins exposure via the consumption of animals products – pigs and poultry - and via gelatine consumption.

For adult consumers – on a mean diet – the additional exposure due to contaminated foodstuff stays limited (below the weekly acceptable dose). For high-risk consumers, a temporary excess may occur, but the "body burden" increase stays very limited.

Health-risks represented by dioxins depend mainly on the base exposure and, in all likelihood, has remained little or unchanged from this incident. This incident is nevertheless a backward step in the exposition decrease observed during the last years via food.

Dioxins and PCBs controls realised by FASFC in 2006 in foodstuff

In 2006, 3 out of 857 analyses conducted in the meat sector showed contamination. None of the 77 milk samples taken in dairies showed contamination. As a reminder, in cases of unconformity of dioxin contents or excess, intervention levels are set in regulation of the 6 February 2006 which requires the competent authority to lead an inquest regarding the origin of contamination with an eye to its identification, its suppression if possible or its maximum reduction.

In 2006, 427 dioxin analyses, 47 dioxin-like PCB analyses and 176 PCB indicator analyses were done in the transformation and distribution sectors. They concerned milk and milk product samples, eggs coming from free-range or battery farming, animal oils and fats, meat and fish-based baby food and food supplements. A norm exceed at 3.7 pg WHO-TEQ/g fat was observed in food supplement made of fish oil. This sample was in unconformity for dioxin-like PCBs and PCB indicators as well. A statement and a notification via the RASFF were drawn up and the concerned products was taken off the market and destroyed. In 2005, 2 food supplements samples were in unconformity. In 2004, only one unconformity was observed for eggs coming from free-range farming.

Table 8: Dioxins, dioxin-like PCBs and PCB indicators in foodstuff

	Dioxins		dioxins-like PCBs		PCB indicators	
	Number of samples	% conformity	Number of samples	% conformity	Number of samples	% conformity
Baby food	15	100 %	10	100 %	15	100 %
Fruits, vegetables and vegetable oils	59	100 %	40	100 %	33	100 %
Eggs and ovoproducts	32	100 %	12	100 %	12	100 %
Fishing and aquaculture	150	100 %	47	100 %	55	100 %
Milk products	98	100 %	69	100 %	39	100 %
Meat and derived products	50	100 %	17	100 %	22	100 %
Food supplements and fish oil	23	95,7 %	11	90,9 %	10	90,0 %
Total	427	99,8 %	206	99,5 %	176	99,4 %

2.3.2 Assessment of the POPs issue at the Walloon region level

In terms of the Walloon Region, a Walloon Governmental order dated 29 June 2000 relating to the protection of surface water against pollution caused by certain dangerous substances included in the Water Code, and in partial transposition of Directive 2006/11 (formerly 76/464) identified 81 relevant substances from the 99 featured on list II of the Directive's appendix, on the basis of prior measurement campaigns carried out on surface water.

A substance is deemed to be relevant if, over a minimum period of one year, at least one measurement of the concentration exceeds the previously defined determination threshold. This list was drafted for the first time in 2000, reviewed in 2002 and updated every 3 years.

For each relevant substance a quality objective is set, alongside the implementation of measurement campaigns, which include 13 annual samples over 7 monitoring sites. In the event that the threshold is exceeded over a one-year period, a reduction programme is adopted, aimed at reaching this objective within 5 years. Relevant substances include DDT, heptachlor, PCBs, hexachlorobenzene and HAPs (hazardous air pollutants). At this time, only HAPs have been subject to a reduction programme, ongoing since 2002.

Within the scope of the underground water table monitoring programme, none of the pesticides featured in Appendix A of the Agreement cause a problem. See also an overview of water-based PCB, dioxin and furan monitoring in the Walloon Region in 2006 and 2007 featured in Appendix II

Dioxin emissions in the Walloon Region have been brought down sharply over the past few years, thanks to the modernising of waste incinerators and the strengthening of emission standards for these establishments. Since 2001, continuous monitoring of these emissions has been in place, and the results are accessible by the public and regularly updated via the Internet (http://environnement.wallonie.be/data/air/dioxines/index.htm).

In the same way, a multi-year programme to monitor the emissions of a dozen waste reclamation establishments covering HAPs, PCBs and dioxins in particular, has been set up. The results are also available on the Internet (http: //environnement.wallonie.be/data/air/valorisation/).

At this time, only HAPs have been subject to a reduction programme, ongoing since 2002. In 2005 for the surface water quality measurement network, 65% of the sites monitored experienced HAP concentrations which were still above the threshold of 0.1 µg/l. This contamination has many causes, such as historical soil pollution, in particular for deserted economic activity areas, road system runoff, atmospheric deposits. Account must also be taken of the low biodegradability and their frequent presence in sediments and suspended particulates.

In terms of the surface water quality measurement network, 33% of the sites monitored in 2005 experienced PCB concentrations above the threshold of 0.007 µg/l. See also an

overview of water-based PCB, dioxin and furan monitoring in the Walloon Region in 2006 and 2007 featured in Appendix II

As regards air quality, within the scope of implementing Directive 2004/107, a HAP measurement programme has been integrated into the air quality measurement network since 2004. Initial results for 2004 and 2005 are available on the Internet.

However, the data available has shown a constant decrease in industrial HAP emissions since 1990.

Finally, the implementation of pollutant transfer and emission registers via Regulation E-PRTR 166/2006 and the PRTR Protocol to the UN/EC Aarhus Convention will allow the widening of the data already available via the EPER register for Hexachlorobenzene and HAPs to include all POP substances covered by the Convention.

Initial results will be made available to the public via the Internet by the end of 2009.

As regards PCB equipment, the Walloon Governmental Order of 25 March 1999 laid down the obligation for PCB/PCT (content > 50ppm) holders or devices containing more than one dm^3 of PCB/PCT to declare this before 21 November 2000 and either have them eliminated or decontaminated before 31 December 2005, unless an extension was granted until 31 December 2010 at the latest and subject to certain conditions by the Ministry responsible for the environment.

Devices containing less than one dm^3 of PCB/PCT must be eliminated before 31 December 2010. At 1 March 2007, 8696 items of equipment in question had been counted, of which 6740 have already been eliminated, in compliance with the provisions laid out within the scope of waste legislation.

2.3.3 Assessment of the POPs issue at the Flemish region level

2.3.3.1 Monitoring in the environment

Summary

Much monitoring exists in Flanders with relation to POPs. They are measured in aqueous soil, surface water and the air. In addition to the survey of emissions into the water and air, some POPs are also looked for in waste.

The table below shows for each of the POPs falling under the Convention if they are included in the surface water and aqueous soil networks, in water and air emission records and/or in deposit monitoring networks.

This overview shows that all the substances in Annex A, with the exception of mirex and toxaphene, are measured in surface water and aqueous soil. In addition, they are also part of the survey of air and water emissions.

Substances resulting from unintentional production are summarised in annual obligations and deposits of dioxins, furans and PCB 126 are measured. DDT deposits are not measured.

Substances in Appendices A, B and C	Surface water	aqueous soil	Emission recording (water and air)		Deposits
Aldrin	x	x	x	x	-
Chlordane	x (cis, trans)	x	x	x	-
Dieldrin	x	x	x	x	-
Endrin	x	x	x	x	-
Heptachlor	x	x	x	x	-
Mirex	-	-	x	x	-
PCB	x	x	x	x	PCB 126
Toxaphene	-	-	x	x	-
DDT	x	x	x	x	-
Dioxins	-	-	x	x	x
Furans	-	-	x	x	x
benzene hexachloride	x	x	x	x	-

In Flanders, there is also an operational "pesticide monitoring network" which observes some 70 pesticides in surface water. These substances are not measured in groundwater.

Analysis method

In order to analyse POPs in the various types of environment, a wide range of techniques are used. A non-exhaustive list of the various methods and techniques used is given below.

- the determination method of a series of aromatic and / or halogenated volatile compounds (boiling point between -30 °C and 218 °C; see compound list in line with EPA 502, 524.4 and 624) in surface-, waste- and underground water includes a "purge and trap" or "headspace" pre-concentration followed by thermal desorption and a gaseous chromatography analysis linked to a mass spectrometer (GC-MS); the analysis of this group of compounds in ambient air via thermal desorption and GC-MS analysis;
- thermally stable pesticides such as organophosphorous pesticides (OPPs) and triazine-type herbicides present in surface water and waste water are determined quantitatively using respectively, gaseous phase chromatography with flame-based photometric detection and high-performance liquid chromatography linked to a mass spectrometer (LC-MS);
- the determination method for a series of organochlorine pesticides (OCPs) and polychlorinated biphenyl (PCB) (PCB 31, 49, 169 and 170) in surface-, waste-

and underground water includes a pre-processing stage (solvent-based extraction and desulfurisation) followed by GC-MS analysis;

- the analysis of a broad group of phenols in surface- and waste water is based on prior derivatisation, followed by quantitative determination via GC-MS;
- the determination method of a series of organonitrogen pesticides (ONPs) is based on membrane filtration followed by solid phase extraction linked to LC-MS analysis;
- regarding water, the application of the combination of HPLC-SM-TOF (Time Of Flight) techniques has recently been implemented. Using rapid chromatography at a high separation resolution, this new analysis technique allows unequivocal identification of polar compounds present in water samples covering a wide range of organic micro-pollutants (including pesticides). In addition, this analysis technique also enables targeted analyses (search and quantification of known pollutants such as glyphosate / AMPA for example) to be carried out, the execution of non-targeted compound screening (identification of unknown micro-pollutants in the water compartment: unknown / new pesticides);
- New developments in chromatography, such as two-dimensional gaseous chromatography (2D GC) offer significant prospects in terms of detecting toxic substances which were hitherto unknown, a highly automated sample purification process during analysis (without the use of solvents), highly specific, sensitive detection via the use of mass spectrometry (MS) and a high analysis capacity. In combination with thermal desorption, this enables a rapid analysis technique which respects the environment as regards organic micro-pollutants such as polycyclic or nitro-polycyclic aromatic hydrocarbons (HA(N)Ps), PCBs, phthalates, brominated flame retardants, which have been hitherto difficult to determine, in particular in ambient air.
- The provision of dioxins and PCB 126 in steel deposits occurs via high-resolution GC/MS (external analyses).

Recording of emissions in air and water

For water emissions, all substances are summarised in the obligation in terms of the integrated annual environmental report. For industrial sectors, dioxin and furan emissions into the air are obtained partly from individual reports from companies, and partly from an additional collective estimate.

In the 'air' form of the integrated annual environmental report, dioxin and furan emissions are reported as a group under the name PCDD/F, and expressed in mgTEQ/year. In contrast to all other pollutants, no threshold has been set for the reporting of PCDD/F.

If emission measurements are imposed for PCDD/F in an operating license, the results of said measurements must be the subject of a report and appended.

- **'Water' Results**

Since 1996, all substances (with the exception of toxaphene, mirex, dioxins and furans) are requested in the integrated annual environmental report, 'Water' part. No company has ever reported these substances at levels which exceed their respective thresholds.

In the 2007 reports (2006 data), toxaphene, mirex, dioxins and furans were integrated for the first time in the integrated annual environmental report in line with the E-PRTR regulations. Given that most of the aforesaid substances are no longer relevant for Flanders, we expect to receive only limited, if any, information.

- **'Air' Results**

The number of operations which measure and report dioxins and furans has increased sharply over the years. While in 1996 only 2% of the 340 operations obliged to complete reports reported PCDD/Fs, this proportion had increased by 2006 to 13% out of a total of 420.

In addition to these individual emissions, an additional assessment is carried out for industrial sectors using emission factors and activity data.

Emissions generated by building heating (population sector and trade and services sector) are estimated using energy consumption and emission factors. Emissions resulting from open fire combustion and domestic incinerators are calculated externally.

Hexachlorobenzene is a substance which must imperatively be mentioned ('Air' emission inventory). However, no operations in Flanders have transmitted any emission figures for this substance, which would presuppose that no companies have exceeded the reporting threshold for hexachlorobenzene (0.010 tonnes). Since we expect hexachlorobenzene emissions to be paltry in other sectors, no estimation of this has been made.

In the 2007 reports (2006 data), the other substances were integrated for the first time in the integrated annual environmental report (IAER) in line with the E-PRTR regulations. Given that most of these substances are no longer relevant for Flanders, we expect to receive only limited, if any, information.

<u>Overview of air-bound dioxin emissions</u>

Dioxin emission sources for which we have sufficient information to be able to create an inventory are as follows:

- Population (domestic heating mainly via open fires and ranges + waste combustion in open fires and domestic incinerators);
- Trade and services (inter alia, crematoria, building heating systems, waste combustion);
- Traffic and transport (road traffic);

- Industry (inter alia, ferrous and non-ferrous metals industry);
- Energy (inter alia, electricity production).

Temporarily, there are no estimates for those sectors for which we have insufficient information. This is particularly the case for the manufacture of food products, luxury commodities and cable combustion.

Tables 9 and 10 show the evolution of dioxin emissions by the various sectors in Flanders over the period 1990-2006.

Table 9: Evolution of dioxins emitted (g TEQ/year) by various sectors in Flanders (1990-1997)

	1990		1991		1992		1993		1994		1995		1996		1997	
	g TEQ	%	g TEQ	%	g TEQ	%	g TEQ	%	g TEQ	%	g TEQ	%	g TEQ	%	g TEQ	%
population	**32**	**6**	**32**	**7**	**32**	**7**	**32**	**8**	**32**	**8**	**33**	**9**	**35**	**13**	**33**	**12**
domestic heating	9		9		9		9		9		10		12		10	
domestic incinerators, open fires	**23**		**23**		**23**		**23**		**23**		**23**		**23**		**23**	
industry	**202**	**41**	**202**	**44**	**202**	**46**	**202**	**49**	**201**	**52**	**201**	**55**	**201**	**73**	**201**	**76**
chemicals	0.225		0.185		0.145		0.105		0.065		0.025		0.025		0.026	
ferrous	**127**		**127**		**127**		**127**		**127**		**127**		**127**		**127**	
non-ferrous	68		68		68		68		68		67		67		67	
wood, - protection	**6**		**6**		**6**		**6**		**6**		**6**		**6**		**6**	
building, asphalt, rubber	**-**		**-**		**-**		**-**		**-**		**-**		**-**		**-**	
transport	**1**	**0.1**	**1**	**0.1**	**1**	**0.2**	**1**	**0.1**	**1**	**0.1**	**0.476**	**0.1**	**0.415**	**0.2**	**0.369**	**0.1**
road transport	**1**		**1**		**1**		**1**		**1**		**0.476**		**0.415**		**0.369**	
energy	**2**	**0.3**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0.4**	**2**	**0.4**	**2**	**1**	**1**	**1**
refineries	**-**		**-**		**-**		**-**		**-**		**-**		**-**		**-**	
gas and electricity	**2**		**-**		**-**		**-**		**2**		**2**		**2**		**1**	
trade & services	**257**	**52**	**229**	**49**	**205**	**47**	**180**	**43**	**155**	**40**	**131**	**36**	**38**	**14**	**30**	**11**
household waste incineration	**180**		**x**		**x**		**x**		**x**		**x**		**x**		**x**	
industrial waste incineration	**6**		**x**		**x**		**x**		**x**		**x**		**x**		**x**	
hazardous waste	**68**		**x**		**x**		**x**		**x**		**x**		**x**		**x**	
domestic heating	**0.170**		**x**		**x**		**x**		**x**		**x**		**x**		**x**	
crematoria	0.039		**x**		**x**		**x**		**x**		**x**		**x**		**x**	
mud incineration etc.	**3**		**x**		**x**		**x**		**x**		**x**		**x**		**x**	
TOTAL	**493**	**100**	**464**	**94**	**439**	**89**	**414**	**84**	**391**	**79**	**367**	**74**	**276**	**56**	**266**	**54**

Table 10: Evolution of dioxins emitted (g TEQ/year) by various sectors in Flanders (1998-2006); reference year 1990)

	1998		1999		2000		2001		2002		2003		2004		2005		2006	
	g TEQ	%	g TEQ	%	g TEQ	%	g TEQ	%	g TEQ	%	g TEQ	%	g TEQ	%	g TEQ	%	g TEQ	%
population	**33**	**16**	**33**	**42**	**33**	**55**	**33**	**57**	**31**	**70**	**32**	**73**	**32**	**74**	**32**	**69**	**31**	**68**
domestic heating	**10**		**10**		**10**		**10**		**8**		**9**		**9**		**9**		**8.36**	
domestic incinerators, open fires	**23**		**23**		**23**		**23**		**23**		**23**		**23**		**23**		**22.92**	
industry	**154**	**73**	**31**	**40**	**11**	**19**	**8**	**14**	**7**	**17**	**7**	**15**	**7**	**16**	**10**	**22**	**7**	**14**
chemicals	**0.025**		**0.006**		**-**		**-**		**0.001**		**0**		**0.001**		**0.001**		**0.000**	
ferrous	**81**		**21**		**8**		**5**		**6**		**5**		**6**		**9**		**6**	
non-ferrous	**67**		**10**		**2**		**2**		**1**		**0**		**0**		**0.285**		**0.130**	
wood, - protection	**6**		**0.285**		**0.179**		**0.451**		**0.457**		**0.374**		**0.210**		**0.111**		**0.200**	
building, asphalt, rubber	**-**		**-**		**1**		**1**		**1**		**1**		**0.153**		**0.197**		**0.080**	
transport	**0.326**	**0.2**	**0.289**	**0.4**	**0.249**	**0.4**	**0.221**	**0.4**	**0.201**	**0.5**	**0.198**	**0.5**	**0.183**	**0.4**	**0.169**	**0.4**	**0.160**	**0.3**
road transport	0.326		0.289		0.249		0.221		0.201		0.198		0.183		0.169		0.160	
energy	**2**	**1**	**1**	**1**	**1**	**2**	**2**	**3**	**1**	**3**	**0.497**	**1**	**0.346**	**1**	**0.250**	**1**	**0.040**	**0**
refineries	0.030		-		0.240		1		1		0.182		0.060		0.250		0.040	
gas and electricity	**1**		**1**		**1**		**1**		0.328		0.315		0.286		0.000		0.000	
trade & services	**21**	**10**	**12**	**16**	**14**	**24**	**15**	**25**	**4**	**9**	**4**	**10**	**4**	**9**	**4**	**9**	**4**	**8**
household waste incineration	**x**		0.386		1		1		0.138		0.133		0.080		0.114		0.050	
industrial waste incineration	**x**		**8**		**10**		**11**		**3**		**4**		**3**		**3**		**3**	
hazardous waste	**x**		0.480		0.080		0.080		0.099		0.101		0.094		0.094		0.094	
domestic heating	x		0.265		0.268		0.272		0.273		0.261		0.232		0.213		0.215	
crematoria	**x**		0.085		0.093		0.094		0.103		0.001		0.001		0.001		0.001	
mud incineration etc.	x		3		3		3		0.070		0.070		0.070		0.070		0.070	
TOTAL	**211**	**43**	**78**	**16**	**59**	**12**	**58**	**12**	**44**	**9**	**44**	**9**	**43**	**9**	**46**	**9**	**42**	**8**

These tables show that dioxin emissions fell from 493 g in 1990 to 42 g TEQ/year in 2006, which represents a decrease of 92%.

The proportion of emissions generated by the population stood at 6% in 1990.

In 2006, this proportion increased markedly (68%), due to the effect of sharp drops in other sectors.

Open fire and domestic incinerator emissions in 2006 represented over half of overall dioxin emissions. In drums and related apparatus used to incinerate waste, it may be that the temperature is not sufficient or that oxygenation is deficient at certain parts of the fire pit. Since combustion may not be complete, there is the risk of dioxin emissions. It is not just by burning plastic, paper and other similar materials that this occurs, but also during the combustion of waste which may at first glance seem harmless, such as garden waste.

The proportion of emissions generated by industrial sectors fell sharply between 1997 and 2000 due to an upsurge in the metallurgical sector. The metallurgical sector reduced its emissions thanks to a rehabilitation programme and the implementation of an exhaust gas purification system.

For the non-ferrous metals industry, emission figures are taken from the official annual environmental reports. The proportion that emissions generated by industrial sectors represent compared to emissions as a whole has more than halved over the period as a whole 1990-2006.

In the trade and services sector, the largest share of emissions in 1990 came from household waste incineration systems. Over the 1991-1998 period, an overall assessment was carried out for the trade and services sector.

From 1996, the waste incineration sector sharply reduced its emissions through the practice of purification. The proportion represented by the trade and services sector for dioxin emissions as a whole consequently fell from 52% in 1990 to 8% in 2006.

Measuring depositions: dioxins and PCBs

Depositions of dioxins have been measured in Flanders since 1995. These measuring operations are carried out twice a year (standard measuring campaigns) and stretch over a month.

One measuring campaign is carried out in the spring and another in the autumn, and the purpose of this latter is to provide a more accurate reflection of depositions over the winter (heating of buildings, less favourable dissemination conditions) in the measurements. The dioxin deposition measuring network has been extended over the years, going from 10 measuring stations in 1995 to seventy or so in 2000. Because of the improvement in the situation, the number of measuring stations has fallen over the last few years. Depositions of dioxins were measured in fifty or so locations in 2007.

Depositions of PCB 126, the most toxic congener, have been measured since 2002. This measuring operation was carried out at each dioxin deposit measuring station up until 2004. As depositions of PCB 126 turned out to be low in many places, the decision was taken only to measure depositions of PCB 126 in a certain number of relevant locations. In 2007, these measurements were carried out at thirty or so stations where deposits of dioxins are also measured.

The measurement sites are mainly chosen close to potential sources (incinerators, ferrous and non-ferrous metal industries, crematoria, airports, urban areas, etc.) and so they are not representative of the average depositions for Flanders. The substantial efforts made firstly by the waste incineration sector and secondly by the ferrous and non-ferrous metals industry have led to an increase in the relative importance of these so-called diffuse sources. In addition to industry, the heating of buildings, open fires and long distance air travel are also sources of depositions. The results of the measuring operations

carried out in 2002 show in the end that significant depositions of dioxins and PCB 126 have been detected in the areas immediately around scrap metal processing companies which have a shredder.

The sites are reviewed every year depending upon the depositions measured over the course of the previous year. Additional measuring operations are scheduled in places where large depositions have been measured, in order to keep closer tabs on the situation in the area in question. Measuring operations are being halted on sites where small depositions have been measured on several occasions.

The analysis is carried out by HRGC/MS. The results in relation to depositions are sent to the Inspectorate for the Environment, which can lead to in-depth inspections carried out in the field on the company and the cleaning up of any polluting facilities. The deposition values are also sent to the Federal Agency for the Safety of the Food Chain which, if necessary, carries out food analyses and withdraws any contaminated foodstuffs from the market.

PCB-Dioxin Depositions: results and trends

Flanders applies a threshold of 26 pg TEQ/m²/day for depositions of dioxins.

A comparison of the results since the start of the measuring operations seems to show a downward trend up until 2003. From 2004 onwards, we again see larger depositions of dioxins. However making an exhaustive comparison with previous years is no easy matter, given that the measurement programme changes each year and there are attempts to detect unknown sources by installing a certain number of new measuring stations.

The measurements of depositions of dioxins may be influenced by various different nearby sources. Any increase in depositions must always lead to checks being carried out on the company, so that the source can be more accurately determined.

When the measurement of depositions of dioxins in Flanders began, it was found that there were significant depositions of dioxins around waste incinerators. After 1993-1994, a sharp drop was recorded not only for medium-sized depositions of dioxins, but also for the maximum-sized depositions. These sharp reductions are due to the cleaning up steps insisted upon by the Inspectorate of the Environment belonging to the Department of "Environment, Nature and Energy" and the ministers involved. From 1993 onwards, a number of household waste incinerators were closed and the others were fitted with purification systems.

The current situation is that waste incineration systems must comply with a very strict emission standard of 0.1 ng TEQ/Nm³ and so it is doubtful that they are still producing significant depositions of dioxins.

The depositions of dioxins currently being measured near household waste incinerators are small.

The non-ferrous metals sector is also a source of pollution by dioxins. The clean-up steps which have been imposed and are helping both to avoid emissions through chimneys by means of the installation of filters and to prevent diffuse emissions by means of the covering and aspersion of the land, have led to a sharp fall in depositions near non-ferrous metal facilities. Peaks in depositions of up to 50 pg TEQ/m²/day were recorded regularly during the period from 1998 to 2001. The annual average for depositions of dioxins near to a non-ferrous metals company reached 7.8 pg TEQ/m²/day in 2005 and 6.6 pg TEQ/m²/day in 2006.

A ferrous metals facility was also subjected to an in-depth clean-up in order to curb emissions of dioxins. Even so, depositions of dioxins vary in the area near the site. The yearly average for depositions of dioxins has never fallen below 11 pg TEQ/m²/day since 2001, and peaks of depositions of 40 pg TEQ/m²/day are regularly recorded.

At present an increase in depositions of dioxins is regularly measured near various factories producing particle boards (more than 100 pg TEQ/m²/day) and this situation calls for very careful monitoring.

Significant depositions of PCB 126 are regularly measured in the areas around companies involved in the shredding of metals. The average depositions of PCB 126 near various metal shredding companies varied between 45 and 137 pg TEQ/m²/day in 2003. Monthly peaks of more than 100 pg TEQ/m²/day were regularly recorded at all of the measuring stations. These values lead the 'Inspection de l'Environnement' to insist upon various clean-up measures designed to contain the particles, and the impact of these measures is already partly being seen in the average values of the depositions measured in 2006: the yearly average near various shredding companies varied from 11 to 72 pg TEQ/m²/day. Even so, other clean-up measures are still required if we want to achieve acceptable figures.

Depositions of dioxins and PCB 126 are also measured in urban and rural areas. In addition to the sources disseminated at large distances, domestic heating and traffic can also play a role in the depositions. The difference between the values measured in rural areas and in urban environments is minimal. On these types of site, average depositions of dioxins and PCB 126 are 4 and 3 pg TEQ/m²/day respectively.

Measurements in surface waters

POPs have been measured in surface waters since 1991. The table below shows the number of measurement sites where searches for the substance in question have been carried out, broken down by each pollutant. Even so, this does not necessarily mean that the substance was actually detected on all of these measurement sites.

The number of measurement sites went up from around 80 in 1991 to roughly 150 in 2004, and then fell back to forty or so in 2007. The reason for this is that the substances

have either only rarely been detected or have not been detected at all over the last few years in the huge pesticide measurement network. So, since 2006, the number of measurement sites has been reduced to forty or so strategic locations, spread across the whole of Flanders (including sites at the edges of basins, entry and exit points).

Results for surface waters

Table 11 shows the positive detection rate, over a number of years, compared to the total number of analyses. Whereas the detection rate for certain UNEP substances was at around 20% in the early 1990s, there were hardly any positive analyses by 2005. In this case the changes are for the better.

Table 11: Overview of positive detections in surface waters, shown as a percentage of the total number of measurements

Year	PCB'	Aldrin	Chlordane**	Dieldrin	Endrin	Heptachlor	Hexachlorobenzene	DDT
1991	5 – 37	18		21	16	12	19	10
1992	1 - 40	13		17	11	5	20	19
1994	0 – 20	3		0	3	0		5
1995	4 – 22	2		4	2	2	4	4
1996	2 – 20	1		6	7	0	9	0
1997	1 -10	0	1 – 5	1	3	3	12	1
1998	1 – 3	3	1 – 7	14	7	6	9	2
1999	0 – 1	2	1 – 2	19	2	1	2	0
2000	0 – 2	1	0 – 1	4	1	1	1	1
2001	0 – 1	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0
2003	0 – 1	0	0	0	0	0	1	0
2004	0 - 1	0	0	0	0	0	0	0
2005	0 - 1	0	0	1	0	0	0	0

* PCB 170; PCB 180; PCB 138; PCB 153; PCB 101; PCB 49; PCB 52; PCB 118; PCB 28; PCB 31; PCB 169
** chlordane (cis, trans)

Measurements in aquatic soils

The Flemish network carrying out systematic measurements in aquatic soils was launched in March 2000 and its purpose is to map out and monitor the quality of Flemish aquatic soils. 600 measurement sites were designated for this purpose. Given the heterogeneity of the aquatic soils, we can thus map out the ecological quality of these aquatic soils.

As the quality of aquatic soils changes slowly, unless substantial clean-up or purification work is carried out, and given the complexity of the study, 150 measurement sites are being sampled each year.

In the end the aquatic soil measurement network comprises 600 measurement sites, which are sampled every 4 years. This means that the average concentrations of the various substances can be compared as follows: 2000 compared to 2004, 2001 compared to 2005 and 2002 compared to 2006.

Results

Table 12 shows the detection rate, over a number of years, for aldrin, chlordane, dieldrin, endrin and PCBs measured in aquatic soils (shown as µg/kg of dry matter).

Table 12: Overview of positive detections in aquatic soils, shown as a percentage of the total number of measurements

Year	Aldrin	cCdane	tCdane	Dieldrin	PCB 101	PCB 118	PCB 138	PCB 153	PCB 169	PCB 170	PCB 180	PCB 28	PCB 31	PCB 49	PCB 52	PCB t
1995	0			17	39	37	48	46			46	20	23	43	29	48
1996	0			12	37	34	44	44			43	8	10	37	21	45
1997	6			21	40	36	52	56			49	10	2	22	23	57
1998	1			30	37	30	47	49			45	14	13	33	24	52
1999	4			13	45	44	57	60			52	25	0	20	32	63
2000	17	26	26	27	59	52	63	64			56	22	50	32	40	67
2001	0	1	1	3	37	35	44	44	0	25	40	13	12	13	18	44
2002	1	0	3	1	67	67	74	72	4	60	71	55	41	57	61	78
2003	0	1	2	4	62	60	65	69	2	43	62	42	28	42	45	73
2004	0	5	3	5	60	57	69	69	1	45	68	15	10	20	27	69
2005	0	0	2	2	54	54	63	63	0	50	61	19	18	23	20	65
2006	0	2	3	4	66	69	75	79	0	64	75	44	35	44	48	86

Unlike the situation inside the water column, the various PCB congeners (with the exception of PCB 169) are still regularly found in aquatic soil (table 13).

Devices containing PCBs

Owners of devices containing PCBs have been obliged to declare their devices since 1986. Since the order made by the Flemish Government dated 17th March 2000 setting out the plan for the elimination of devices containing PCBs and for the PCBs contained therein (M.B. – the Belgian Official Gazette - 17.05.00) came into force, this list of declared devices has been kept up-to-date by the OVAM on behalf of the Flemish Region, so we have a good outline of the presence of the PCBs contained in devices.

Results

More than 20,000 devices containing PCBs have been declared in Flanders, more than 92% of which have now already been eliminated in the meantime. It is mainly in the energy distribution sector that devices are still to be found in service. These must have been taken out of service by the end of 2010.

POPs in waste

As far as the stocks present in pesticides and other POPs are concerned, studies on which sectors, flows and quantities need to be tackled as a priority are currently being carried out.

Results: PCBs in waste

Searches for PCBs were carried out in certain kinds of waste during the course of 2004. In waste flows such as construction and demolition waste, the fine part of the waste from hewn processed wood and paper pulp, the concentrations of PCBs measured are lower (a few tens of µg/kg). This slight pollution is probably due to the presence of applications (which are banned nowadays) such as paint, mastic and sealer for concrete.

In the opinion of specialists in this field, there is a very low risk during the phase when the products containing wood in question (particle boards) are being used, since PCBs tend to behave in an immobile way and are only found in very low concentrations in any case.

Even so, we must take the pollution found into account when it comes to carrying out the final treatment.

Authorised incinerators are fitted with the systems required in order to handle the purification of the flue gasses and the prevention of emissions. The incineration or the heating of usual products by consumers is obviously far less easy to monitor. The awareness-raising which needs to be carried out in this respect could draw inspiration from that already performed as far as dioxins, etc. are concerned. These latter are formed during incineration in domestic combustion installations or clandestine incineration.

Polluted soil register

A list of all polluted plots of land is kept up-to-date in order to map out pollution in Flanders, to clean up the soil systematically and to offer owners legal protection when purchasing land. This databank collects detailed documentation showing all of the known data on a piece of land, its pollution and the phases involved in cleaning it up.

2.3.3.2 Human biomonitoring

Background

At least up until 2006 the "Steunpunt Milieu en Gezondheid" was running a biomonitoring project on behalf of and funded by subsidies from the Flemish authorities.

It carries out a general screening of individuals belonging to three age groups: newborn babies, teenagers and adults.

The first cycle of the Flemish human biomonitoring programme ended at the end of 2006 and the results for the aforementioned three age groups were published.

There was systematic recruitment in 8 priority areas: 1196 mothers and their newborn babies, 1679 teenagers aged 14 and 15 and 1583 adults aged between 50 and 65. There were approximately 200 participants per area and they had been living in the areas in question for at least 5 years. Mixed pollution was found in the priority areas, which covered rural communes, the Antwerp and Ghent urban areas, industrial areas polluted by petrochemicals and metals, the fruit-growing region around Saint Trond and also areas located in the immediate vicinity of household waste incinerators.

The biomarkers for exposure and effects were measured in the babies' umbilical cords and in blood and urine samples provided by the teenagers and adults. Additional health data was obtained from maternity registers and pupil supervisory centres. The participants filled in detailed questionnaires about their general states of health, any allergy and asthma problems, fertility, diet, smoking, education, the make-ups of their households and certain social and economic data.

They were also asked to give information about their estimates of environmental pressure, any health problems relating to it and whether they would be prepared to take part in the debate on health and the environment.

The participants all gave their written consent to taking part and the programme was approved by an ethics committee and submitted to the Data Protection Commission, for information.

Measuring exposure

Generally speaking the pollutant contents measured in the blood and urine samples were below current standards or indicative values. Even so, there were large variations in the contents measured. For more in-depth comparisons of the data, both the reference average and the P90 value were used. A comparison with data from both previous studies and studies carried out abroad failed to show that there was anywhere where the average values measured in Flanders were particularly high.

The pollutant contents were always lower in the adults than in the teenagers. This result was expected for substances which are more difficult to destroy such as dioxins, PCBs, HCBs and p,p'-DDEs, as they build up in the body as it ages.

It was found that living in various priority areas had a measurable impact on the content in terms of PCBs, dioxins and persistent pesticides such as hexachlorobenzene and p,p'-DDEs (a degradation product of DDT).

The clear trend which emerges for the three age groups shows an increase in the contents of chlorinated hydrocarbons (PCB, dioxins, HCBs and p,p'-DDE) in rural areas. The fruit-growing area shows lower values, except for the adults, in whom we still find increased rates of p,p'-DDEs and HCBs, probably due to a more intensive use of these pesticides in this region in the past. The Canal Albert area showed an increase p,p'-DDE content in all three age groups.

The other priority areas show a different method of exposure for each age group.

Measuring the effects

The parameters relating to the effects which were either measured or about which questions were raised related to asthma and allergy problems, the babies' birth weights, sizes and cranial circumferences, the development of puberty among the teenagers, fertility, gestation time and miscarriage problems among the young mothers, miscarriage problems among adults, along with the occurrence of effects likely to lead to an increased risk of cancer.

Asthma problems were more common among the teenagers than among the young mothers and older adults. They stated, in 9%, 4.3% and 5.5% of cases respectively, that their doctors had diagnosed asthma.

A larger number of mothers from urban areas said that they had asthma problems. This trend was comparable, although not statistically significant, among the teenagers and adults. It appears that chlorinated hydrocarbons suppress asthma: among the adults, the risk of suffering from asthma was lower when there were larger PCB, p,p'-DDE and HCB contents in the serum, the risk of suffering from hay fever fell among the teenagers who had a higher PCB content. Observations made as part of previous studies were thus confirmed.

The development of puberty among the teenagers was slightly slowed down in the Antwerp urban area and in the Antwerp harbour region (only in girls). In the fruit-growing region, average gestation time was shorter by comparison with the reference average. Even so, the differences are minimal and have no significance in hygiene terms, even if they can be demonstrated statistically. By gathering data from all of the areas, we can see that boys with higher PCB, HCB and p,p'-DDE contents have a higher rate of testosterone and their puberty begins slightly sooner. Mothers with high contents of PCBs, dioxin type substances and HCBs tend to be more likely to use fertility treatments. Adult diabetics show slightly higher PCB and HCB contents.

The trends are not very clearly defined and can only be statistically observed on a group scale, although they do still match the possibility of causing the hormonal disorders which are mentioned as far as chlorinated hydrocarbons are concerned.

Strategic interpretation

Unlike the environmental data measured, the data on human biomonitoring is difficult to translate directly into specific measurements, because of the incorporation of external environmental factors and characteristics linked to the individuals such as lifestyle, hobbies, housing conditions, etc. The use of the human biomonitoring results as a strategic tool thus requires us to know far more about this subject and for there to be a wider discussion of it. This was the background against which the "step-by-step" plan was drawn up in order to provide a sustained way of coping with the mass and complexity of the data provided as part of the biomonitoring. This plan is also designed to enable the assessment of the signals detected from the point of view of seriousness in health terms, finding the causes and, if necessary, coming up with a strategic proposal.

The step-by-step plan was applied as a pilot project to the increased DDE rates which were found for all three age groups in rural areas and in the Canal Albert industrial area. Specific strategic measuring operations will be put together based upon the DDE step-by-step plan. Amongst other things, in this respect we are thinking about the continuation of the study of the current and historic route of absorption of DDT in Flanders, as well as a gathering and awareness-raising initiative with regard to pesticides.

The step-by-step plan integrated for other increasing pollutants began in January 2007. In consultation with the authorities, experts in the field and a panel of judges made up of social groups, amongst others, will decide for which pollutants the step-by-step plan will be implemented. In any case, rural areas will be a point requiring special attention in this respect. Also in the future, the step-by-step plan will continue to be based upon the involvement of the full range of participants. Open communication will be implemented in this respect, thus making it possible to come up with specific strategic measures for the selected areas and pollutants.

2.3.3.3 Biomonitoring of the biota

Measuring of pollutants found in the European eel

The Flemish measurement network for pollutants found in the eel is a measurement network covering the whole of Flanders and it aims to monitor bioaccumulable substances which are found in the eel. This network was launched in 1994 and comprises 350 measurement sites located on waterways, canals, polder channels and in stagnant waters. More than 3000 eels have so far been analysed in order to check for the presence of 10 PCB congeners, 9 pesticides and 9 heavy metals. Certain places were selected for the purposes of analysing other substances (brominated flame retardants, volatile organic solvents, dioxins, fluorinated organic compounds, endocrine disruptors, polyaromatic hydrocarbons and metallothioneins).

Results: pollutants in eels

All of the substances above are found in variable quantities in freshwater fish, depending upon the measurement site. So for the majority of the measurements, the results were above the detection limit and this also covers a number of substances which have been banned for years.

A noticeable reduction in all of the PCB congeners measured (see table 13), of almost all pesticides and of four heavy metals (arsenic, nickel, lead and chrome) has been seen over the last 14 years. There has been a remarkable reduction in α-HCH and lindane due to the ban on using these substances which came into force in 2002 and a reduction in concentrations of HCB, dieldrin and endrin has also been seen.

Table 13: Results of the pollution measurement analyses in eels in the Flemish Region

Pollutant	Min	Max	Average	# places	Period	# analysis	% >DL
Aldrin	0.5	109.36	7.44	121	1994-2007	548	45.99
TNONA	0.2	305.66	12.33	371	1994-2007	2739	58.34
DIELDR	0.27	1860.9	97.99	363	1994-	2638	200793.14
ENDRIN	0.5	1983.3	8.59	352	1994-2007	2447	19.94
CB 28	0.34	2205.48	43.5	375	1994-2007	2808	94.62
CB 31	0.06	1086	20.52	367	1994-2007	2665	92.31
CB 52	0.17	4207.7	221.27	375	1994-2007	2821	97.87
CB 101	0.14	10986.6	423.64	375	1994-2007	2823	99.93
CB 105	0.5	6302.4	162.39	375	1994-2007	2826	99.29
CB 118	1.29	14196.7	506.46	375	1994-2007	2826	100
CB 138	1.53	65625.3	1398.16	375	1994-2007	2829	100
CB 153	8.23	93853.3	1992.93	375	1994-2007	2829	100
CB 156	0.11	4978.4	137.27	375	1994-2007	2820	99.47
CB 180	0.5	41365.2	902.55	375	1994-2007	2827	99.96
TDE	0.07	3420.5	202.35	374	1994-2007	2776	96.58
DDTPP	0.18	4271.99	30.96	374	1994-2007	2760	56.16
pp DDE	0.5	12959.6	538.74	375	1994-2007	2829	99.96
Dioxins*	1.7	141.9	35.8	8	2001-2005	8	100

* Sum of dioxins, furans and dioxin type PCBs, as pg/g of fresh mass

Generally speaking, concentrations of DDT and its derivatives are down, but in certain places the figures do emphasise recent cases of pollution.

2.3.4 Assessment of the POPs issue at the Brussels-Capital region level

The POPs in the Bruxelles-Capitale Region are managed through the imposing of increasingly strict operating conditions in terms of waste disposal, discharges and emissions of chemical substances into the environment.

These impositions derive mainly from European and international obligations (OSPAR).

They essentially cover direct action on PCBs / PCTs and dioxins/furans.

The other POPs, such as HCBs and HAPs, have benefited from a reduction or increased surveillance either as a result of these impositions or also through the imposition of stricter surveillance and self-monitoring conditions

Because of its urban structure, the question of POP pesticides does not arise to any great extent in the Bruxelles-Capitale Region. Even so, constant vigilance needs to be maintained in order to monitor and eliminate any old stocks.

The self-monitoring measures and the drawing up of a list (BiPRO 2008) now mean that we can take stock of the situation as described below.

Discharges in waste, rates, trends and major sources

HCB

HCB discharges appear to have been stable since 1990 (0.05kg/year) and in total they are below the PRTR threshold. According to the available data, the sectors which are the main sources of HCB discharges in waste are the incineration of household waste (~95%) and secondary lead production (5%).

PAH

Likewise **PAH** discharges appear to have been stable throughout the period (0.003 t/year) and in total they are below the PRTR threshold. Here once again the main sources appear to be the incineration of household waste (~92%) and secondary lead production (8%) sectors. Even so it should be noted that the estimate had to be carried out on the basis of a measurement below the detection limit for the SIOMAB and with an emission factor (European average) for secondary lead production. As a result, the estimates can only be an initial assessment of the scale of the possible discharges

PCDD / PCDF

According to the data, **PCDD/PCDF** discharges have been cut by 98% (from 102 gTEQ/year to 2.33 gTEQ/year) over the last seventeen years (1990-2007), but in total

they are still a long way above the PRTR threshold. In individual facility terms, the highest thresholds can be attributed to the STEP Nord and to the SIOMAB (incineration of household waste).

Whereas the incineration of household and hospital waste was the dominant source in 1990, we can see a sharp reduction which is due to the halting of the incineration of hospital waste in the whole of the Region, and the reduction in discharges by the SIOMAB, whereas the STEP Sud now appears as a new minor source. The STEP Nord became the main source of discharges in waste in 2007.

Discharges in the form of waste from secondary lead production and cremation are still more or less stable and now contribute 60% to the total discharges.

In order to supplement the assessment of potential discharges, we need to take the dumping of waste in the Bruxelles-Capitale Region into consideration. Although they have now been out of service for several decades they amount to a potential reservoir of emissions and it is recommended that they should be included in the lists of emissions. A total reservoir of 3-40 gTEQ (maximised 90 g TEQ) could be expected from this sector.

PCBs / PCTs

Unintentional discharges of PCBs appear to have increased by 196% between 1990 and 2007 (from 4.9 kg/year to 14.5 kg/year) which is above the PRTR threshold.

The sectors which are the main sources are the incineration of household waste, followed by the non-thermal treatment of sewage sludge and secondary lead production. The increase in discharges can be explained by the entry into operation of the STEP Nord. Within this context the facts that the discharges were estimated based upon the data available for the STEP Sud and that a wastewater purification plant is not a primary source need to be taken into consideration.

In order to round off the assessment of potential discharges we need to take the quantities of PCBs in decommissioned electrical equipment into account. As the PCB part of the waste statement can better be extrapolated on the basis of the quantity destroyed each year, we can estimate that discharges in waste from equipment containing PCBs have fell from almost 400 tonnes in 2001 to 160 tonnes in 2006. In spite of everything, the expected discharges exceed all the discharges from other source sectors by a factor of 10,000.

PCBs/PCTs have been made subject to the implementation of European legislation including the obligation to dispose of oils (dielectric) from transformers, condensers, hydraulic devices, electrical resistors and self-induction coils. A list of the facilities affected was begun in 1999, on the basis of the declarations, and it was completed as findings were made when the operators applied for new environmental permits or there was an alteration to the current permit.

The IBGE inspection department checked whether the disposal of the products in question had been properly carried out and whether this disposal had been carried out by an accredited "disposer". The inspectors visited 733 facilities in 2006 and, as a result of these checks, 447 warnings and 636 formal notices were issued, with 9 reports being drawn up.

As transformers are the main source of PCBs/PCTs, askarel, pyralene and chlophene, they were thus the priority target of the ministerial order of 20th December 1999 drawing up a regional PCB/PCT disposal and decontamination plan (MB dated 31/12/1999).

The disposal of oils containing PCBs/PCTs, askarel, pyralene or chlophene, or the disposal or decontamination of certain elements was carried out according to a schedule linked to the ages of the equipment. The disposal schedule was as follows:

Disposal by:	**All devices manufactured before:**
31.12.2000	1970 or date unknown
30.06.2001	Before 1971
30.06.2002	Before 1972
30.06.2003	Before 1973
30.06.2004	Before 1974
30.06.2005	Before 1975
31.12.2005	Other devices

A few exceptions were made on the grounds of the manufacturers' delivery deadlines. These exceptions could not go beyond 31.12.2008.

In April 2007 the report on PCB action in terms of the number of pieces of electrical equipment stood as follows:

	Dielectr type				
equipment type	***Askarel***	***Clophene***	***PCB***	***Pyralene***	
hydraulic device	4				*4*
self-induction coil			6		*6*
condenser	82	7	556	1	*646*
recipient for contaminated materials			1		*1*
electrical resistor	3				*3*
transformer	2035	95	1581	116	*3827*
	2124	*102*	*2144*	*117*	***4487***

Estimated weights:

Estimate using CLEEN report methodology					
number	***weight***	***dielec. weight***	***total weight***	***total dielec. weight***	
3	500	150	1500	450	kg
535	30	10	16050	5350	kg
1	500	150	500	150	kg
3	500	150	1500	450	kg
3230	1500.0	500.0	4845000.0	1615000.0	kg
			4864550.0	***1621400.0***	kg
			4864.6	**1621.4**	T

Discharges into the air and into water

A list of unintentional emissions into the air and discharges into water of POP products was drawn up and the reduction in them shows the effectiveness of the environmental measures imposed in the environmental permits such as the DeNOx systems and the effective surveillance of the facilities.

New facilities, such as a sludge incinerator, are a new source requiring increased surveillance.

An overview of the development of POP discharges into water in the Bruxelles-Capitale Region on the basis of the available data is shown in the following table.

Table 14: Trend in POP discharges into water in the Bruxelles-Capitale Region

Substance		annual totals 1990	annual totals 1995	annual totals 2000	annual totals 2003	annual totals 2004	annual totals 2005	annual totals 2006	annual totals 2007	difference compared to 1990
PCDD/F [g TEQ/year]		0.037	0	0.0050	0.0139	0.0139	0.0139	0.0518	0.0637	72%
PCB [kg/year]		0	0	0.0046	0.0046	0.0046	0.0046	0.0046	0.0046	1%
HCB [kg/year]		0	0	0.00066	0.00066	0.00066	0.00066	0.00066	0.00066	0%
PAH [t/year]		0.042	0.042	0.042	0.042	0.001	0.001	0.001	0.001	-97%
PAH	B[a]P [g/year]	0.063	0.063	0.069	0.054	0.068	0.055	0.064	0.066	6%
	Indeno Pyren [g/year]	0.063	0.063	0.069	0.054	0.068	0.055	0.064	0.066	6%
	B[k]F [g/year]	0.063	0.063	0.069	0.054	0.068	0.055	0.064	0.066	6%
	Fluoranthene [g/year]	1.75	1.75	1.93	1.52	1.89	1.54	1.79	1.85	6%
	B[b]F [g/year]	0.069	0.069	0.076	0.060	0.074	0.061	0.070	0.073	6%
	B[ghi]P [g/year]	0.063	0.063	0.069	0.054	0.068	0.055	0.064	0.066	6%
PAH 16 EPA [kg/year]		0.014	0.014	0.016	0.013	0.016	0.013	0.015	0.015	0.014
PAH 10 VROk [kg/year]		0.019	0.019	0.021	0.016	0.020	0.017	0.019	0.020	0.020

In this context it should be noted that the sectors which are relevant sources for discharges into water the eau are limited to waste incineration, coke production, the non-thermal treatment of sewage sludge, creosoting and the dumping of enclosed municipal waste. For the other source sectors, discharges into water are only to be expected for technical reasons (type of process).

Surface waters

In the Bruxelles-Capitale Region, the quality of surface waters is subjected to regular checking over the course of the year. Since 2001, the measurements have been carried out

a rate of 5 times per year for the parameters which do not pose any problems and 12 times per year for all others. The measurements are taken at the entrances and exits to the various waterways, i.e. the Senne, the Woluwe and the Canal de Bruxelles-Charleroi.

The POPs or potential POPs analysed are PAHs (6 Borneff), pentachlorophenol, DDT, Aldrin, Dieldrin, Endrin, hexachlorobenzene (HCB), hexachlorobutadiene (HCBD) and hexachlorocyclohexane (HCH).

Of all these substances, only PAHs (not yet included in the Stockholm Convention) show a worrying concentration and require appropriate measures.

The results of the analyses are shown in the table above.

Discharges of industrial wastewater

PCDD / PCDF

Over the last seventeen years (1990-2007), total PCDD/PCDF discharges have risen by 72% (from 0.037 gTEQ/year to 0.064 gTEQ/year), but in total they are still below the PRTR threshold.

The only source in 1990 was coking plants, which explains the initial reduction. From 2000 onwards, there were two factors responsible for the increase in discharges. These were the installation of a wet gas purification plant at SIOMAB (incineration of household waste) and the commissioning of the STEP Sud. Due to its large capacity, the entry into operation of the STEP Nord in 2007 explains the sharp growth in discharges in 2007. The STEP Nord now contributes 79% of the total known discharges.

Within this context it should be noted that the purification plants are not primary POP sources, but they only channel discharges from the domestic and/or industrial sectors. So this is an increase in actual discharges.

The potential dumping of waste in the Bruxelles-Capitale Region does not exceed 0.14 mgTEQ/year. This leads to the hypothesis that the dumping of non dangerous waste, even if it is still in the process of decomposition (but not exploitation) accounts for negligible sources.

As shown in table 15, PCDD/PCDF discharges appear to have risen by 72%. Although there was a reduction between 1990 and 1995, discharges slowly increased up until 2005 and are showing an accentuated rise up until today. Even so, it should be noted that the discharges are still at a very low level. Even the total emissions on the basis of the available data are well below the PRTR threshold.

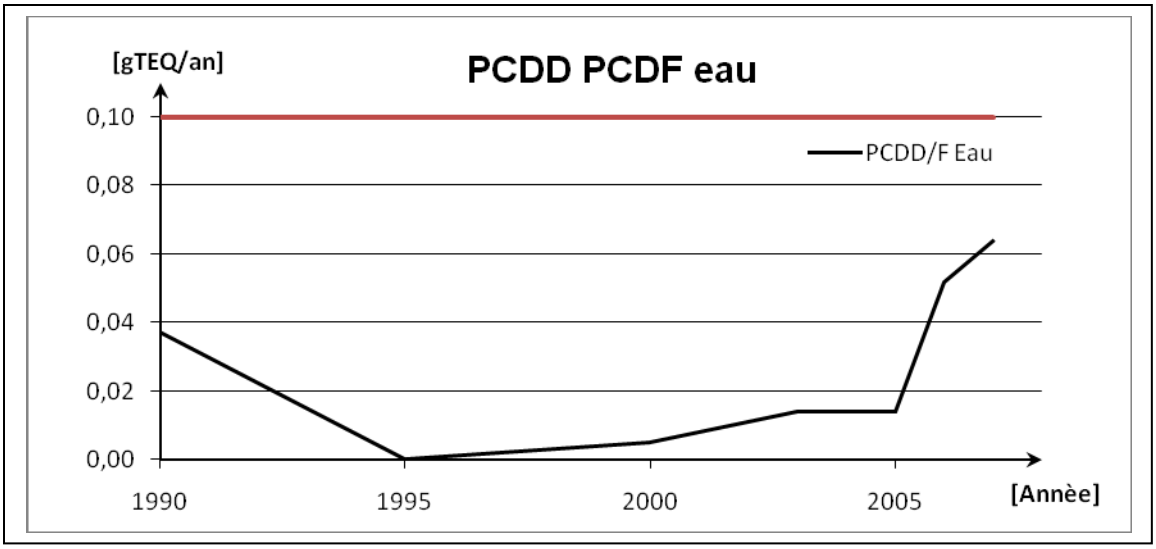

Figure 4: Trend in aqueous discharges with PCDD/PCDF in the Bruxelles-Capitale Region (red line = PRTR threshold)

As illustrated in the next table, the main sources of PCDD/PCDF aqueous discharges were very different between 1990 and 2007.

Table 15: Trend and sector-specific contribution of PCDD/PCDF aqueous discharges in the Bruxelles-Capitale Region

PCDD/F µgTEQ/year	1990	1995	2000	2003	2004	2005	2006	2007	Difference compared to 1990	Total pro rata rate (2007)	Pro rata rate PRTR threshold
Waste incineration [µgTEQ/year]	0	0	2,000	2,000	2,000	2,000	2,255	1,636	-18%	3%	2%
Coking plants [µgTEQ/year]	37,080	0	0	0	0	0	0	0	-100%	0%	0%
Incineration of sewage sludge [µgTEQ/year]	0	0	2,973	11,892	11,892	11,892	11,892	11,892	300%	19%	12%
Treatment of sewage sludge [µgTEQ/year]	0	0	0.0	0.0	0.0	0.0	37,640.6	50,187.5	33%	79%	50%
Total [g/year]	0.037	0	0.005	0.014	0.014	0.014	0.052	0.064	72%	100%	64%

Even so, the estimates do suffer from a lack of data and from the immanent weakness of the emission factor which must be categorised into class E.

As far as PCDD/PCDF discharges are concerned, we also need to take the potential dumping of waste in the Bruxelles-Capitale Region into consideration. As shown above, the maximum expected discharges do not exceed 0.14 mgTEQ/year (2% of the total). This supports the hypothesis that the dumping of non-dangerous waste, even if it is still active, amounts to negligible sources.

PCB

Discharges of PCBs are hardly increasing at all (from 0 kg/year to 0.0046 kg/year) over time and in total they are still a long way below the PRTR threshold. These discharges are solely due to SIOMAB waste incineration activities since the installation of the wet gas purification equipment in 2000.

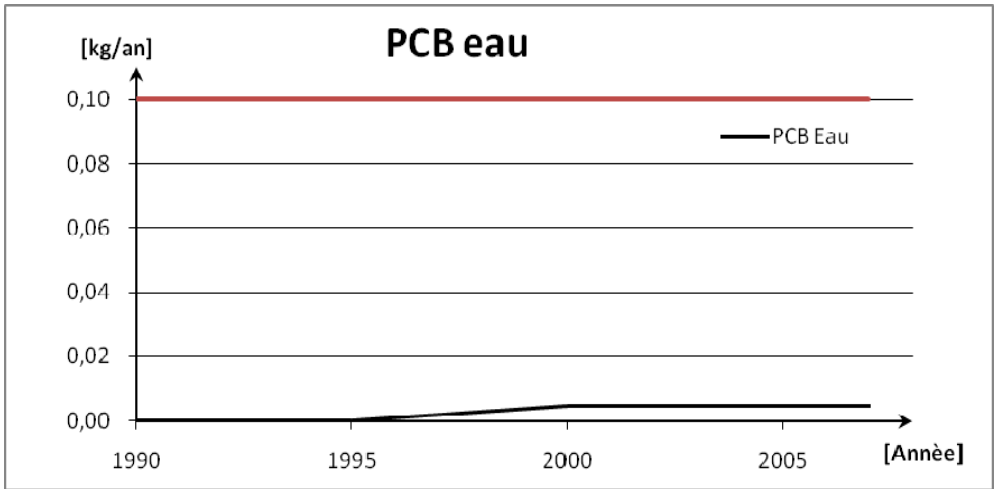

Figure 5: Trend in PCB aqueous discharges in the Bruxelles-Capitale Region (red line = PRTR threshold)

Due to a lack of data (measurements are available only for 2007), there are no clear trends to be found. We also need to take into account the fact that, as the concentrations in water were below the detection limit, the data presented is for estimated maximum emissions and the calculation was carried out using half of the detection limit. As shown in table 16, PCB discharges only began in 2000 and appear to have remained stable since this time. The discharges based on the available data are a long way below the PRTR threshold

Table 16: Trend and sector-specific contribution of PCB aqueous discharges in the Bruxelles-Capitale Region

PCB mg/year	1990	1995	2000	2003	2004	2005	2006	2007	Difference compared to 1990	Total pro rata rate (2007) (2007)	Pro rata rate PRTR threshold
SIOMAB incineration of household waste [mg/year]	0	0	4,600	4,600	4,600	4,600	4,600	4,629	1%	100%	5%
Total [kg/year]	0.	0.	0.0046	0.0046	0.0046	0.0046	0.0046	0.0046	1%		5%

HCB

The HCB discharges appear to be stable since 2000 (0.0006 kg/year) at a level a long way below the PRTR threshold. As for PCBs, the discharges are solely due to waste incineration activities at the SIOMAB since the installation of the wet gas purification equipment in 2000. These are also estimated maximum emissions, as the concentrations in water are below the detection limit.

As for PCBs, HCB discharges only began in 2000 and appear to have remained stable since this time. The discharges based on the available data are a long way below the PRTR threshold.

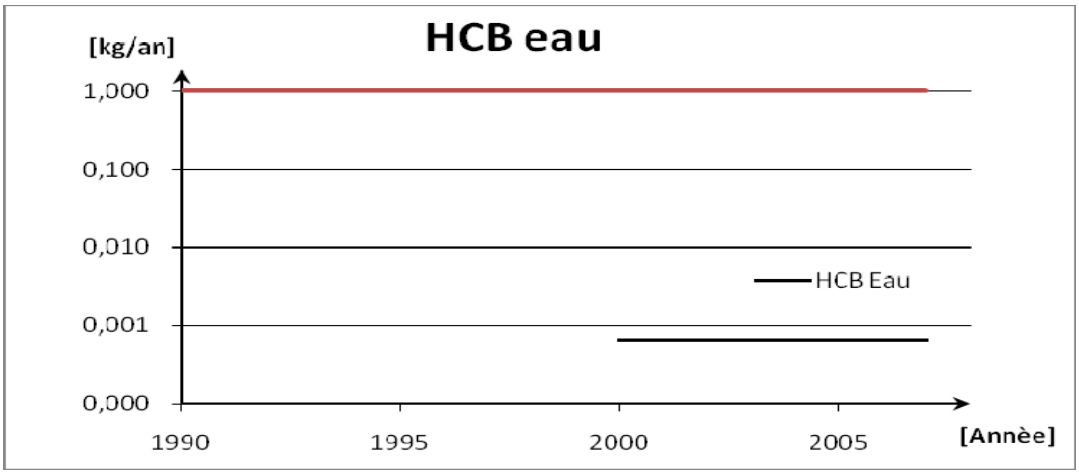

Figure 6: Trend in HCB aqueous discharges in the Bruxelles-Capitale Region (red line = PRTR threshold)

Due to a lack of data (measurements are available only for 2007), there are no clear trends to be found. We also need to take into account the fact that, as the concentrations in water were below the detection limit, the data presented is for estimated maximum emissions and the calculation was carried out using half of the detection limit.

Table 17: Trend and sector-specific contribution of HCB aqueous discharges in the Bruxelles-Capitale Region

HCB mg/year	1990	1995	2000	2003	2004	2005	2006	2007	Difference compared to 1990	Total pro rata rate (2007)	Pro rata rate PRTR threshold
Waste incineration [mg/year]	0	0	660	660	660	660	660	661	0%	100%	0%
Total [kg/year]	0	0	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0%		0%

Atmospheric emissions, rates, trends and major sources

Table 18: Trend and sector-specific contribution of atmospheric emissions in the Bruxelles-Capitale Region

PCDD/F [µgTEQ/Year]	1990	1995	2000	2003	2004	2005	2006	2007	Difference compared to 1990	Total pro rata rate (2007)	% of PRTR threshold
Industrial boilers [µgTEQ/year]	1,015	1,209	1,015	881	848	800	739	930	-8%	1%	1%
Service industry boilers [µgTEQ/year]	7,120	7,917	7,349	7,905	7,732	7,537	7,388	7,564	6%	11%	8%
Waste incineration [µgTEQ/year]	82,200	82,200	85,844	85,844	73,339	74,615	39,237	7,169	-91%	10%	7%
Incineration of sewage sludge [µgTEQ/year]	0	0	1,118	4,470	5,005	5,038	3,790	4,776	327%	7%	5%
Incineration of hospital waste [µgTEQ/year]	1,676,293	1,676,293	0	0	0	0	0	0	-100%	0%	0%
Crematoria [µgTEQ/year]	43,397	32,934	32,850	37,005	19,278	36,235	36,777	36,121	-17%	52%	36%
Incineration of carcasses [µgTEQ/year]	1,115	0	0	0	0	0	0	0	-100%	0%	0%
Production and melting of metals [µgTEQ/year]	10,000	10,000	10,000	12,600	9,582	2,549	3,103	13,236	32%	19%	13%
Coking plants [µgTEQ/year]	1,854,000	0	0	0	0	0	0	0	-100%	0%	0%
Treatment of residual oils [µgTEQ/year]	3,241	3,241	3,241	3,241	0	0	0	0	-100%	0%	0%
Total [g/year]	3.68	1.81	0.14	0.15	0.12	0.13	0.09	0.07	-98%	100%	102%

PCDD / PCDF

Over the last seventeen years (1990-2007), according to the data, **PCDD/PCDF** emissions have been cut by 97% (from 3.68 gTEQ/year to 0.07 gTEQ/year), and in total they are now below the PRTR threshold.

As far as the contributions of individual sources are concerned we can reach the following conclusions:

- In 1990, most of the emissions were as a result of the production of coke (~51%) and the incineration of hospital waste (~49%)
- As coke production had been halted since 1993, hospital incinerators contributed around 90% of the total emissions in 1995.
- After the closure of the hospital incinerators, the municipal waste incinerator became the largest remaining source in 2000. In addition to this, the incineration of sewage sludge appears as a new source.
- Emissions fell in 2004 as a result of the ban on the combustion of used oils.
- Emissions from the incineration as main source fell by almost 50% in 2005 following the installation of a DeNOx system which had a direct effect on discharges of PCDD/PCDF.
- Emissions from the incineration sector saw a further remarkable fall as a result of the permanent closure of the incinerator at the Van Roy workshop on 15.01.2007.
- The dominant source now appears to be cremation (~ 50%). Secondary lead production (~19%), combustion in the service sector (~11%), waste incineration and sewage sludge (10% and 7%) are other sources of emissions.
- Combustion in the industrial sector appears to be a minor source.

According to the data the sectors which are the main sources for emissions were or are coking plants, waste incineration, cremation and secondary lead production. The two sectors which are the main sources and two additional sources were eliminated during this period. The contributions of different source sectors and the changes which have taken place over the last fifteen years are illustrated in Table 8.

As is illustrated in figure 7, there was a sharp reduction between 1990 and 1995, followed by a more gradual reduction up until 2007. The total PCDD/PCDF emissions in the Bruxelles-Capitale Region currently do not exceed the PRTR threshold for an individual installation.

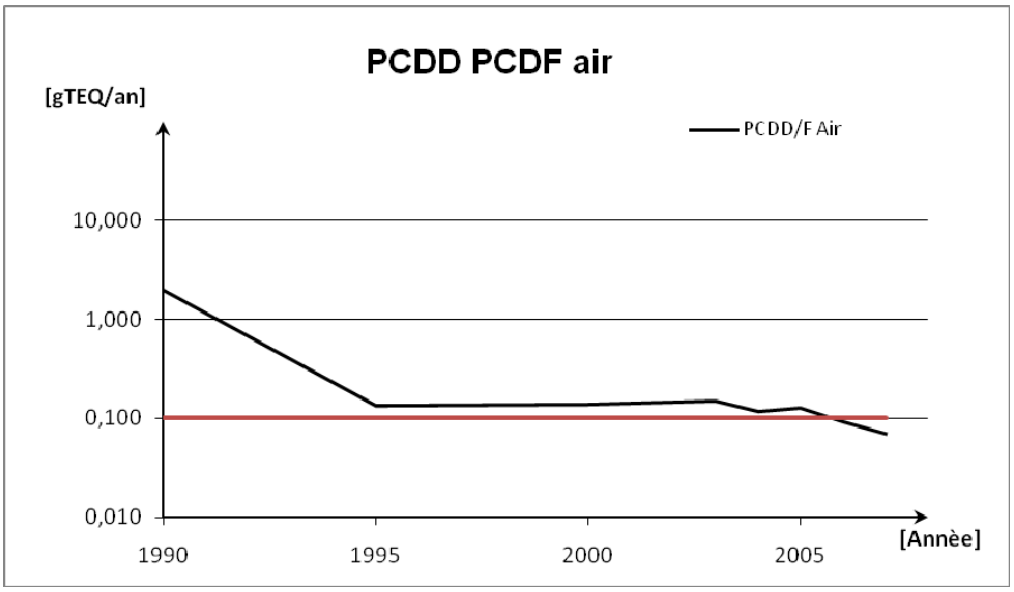

Figure 7: Trend in PCDD/PCDF atmospheric emissions in the Bruxelles-Capitale Region (red line = PRTR threshold)

PCB

Emissions of **PCBs** fell by 41% (from 5.2 kg/year to 3 kg/year) but in total they are still above the PRTR threshold.

As far as the contributions of individual sources are concerned we can reach the following conclusions: Back in 1990 the majority of PCB emissions were as a result of the incineration of household waste, followed by coking plants and secondary lead production. A reduction which took place between 1990 and 1995 can be explained by the halting of coke production and another small reduction between 1995 and 2000 by the closing of the hospital incinerators. The incineration of sewage sludge appears as a new source in 2000.

According to the data, waste incineration must have contributed 97% of total emissions, but the results must be interpreted very carefully given that the measurements for PCBs are missing and the emissions have had to be estimated using emission factors which do not take any of the effects of changes to the technical standard into account. As this factor corresponds to no more than the BAT (see BREF document), we can be sure that the actual emissions were higher until the installation of the DeNOx system, and that the reduction in emissions is actually more pronounced.

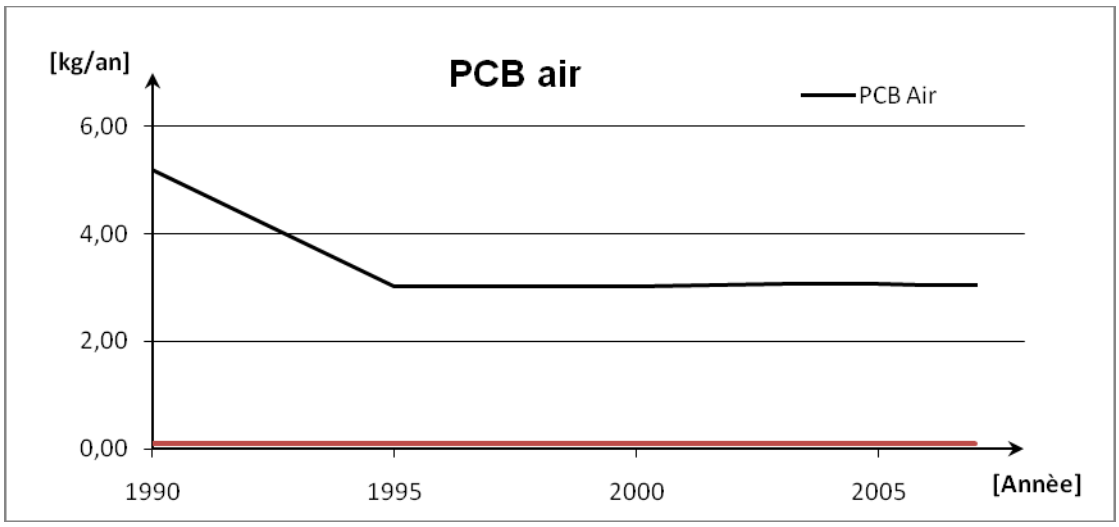

Figure 8: Trend in PCB atmospheric emissions in the Bruxelles-Capitale Region (red line = PRTR threshold)

As shown in Table 19, PCB emissions have fallen by 41% to 3 kg/year over the last fifteen years. As is illustrated in figure 8 above, there was a sharp reduction between 1990 and 1995, although emissions have been more or less stable since then. Nowadays the total emissions on the basis of the available data are still higher than the PRTR threshold.

The data shows that the source sectors for PCB emissions were waste incineration, coking plants, secondary lead production and the incineration of hospital waste. The contributions of different source sectors and the changes which have taken place over the last fifteen years are illustrated in the table below.

Table 19: Trend and sector-specific contribution of PCB atmospheric emissions in the Bruxelles-Capitale Region

PCB mg/year	1990	1995	2000	2003	2004	2005	2006	2007	Difference compared to 1990	Total pro rata rate (2007)	% of PRTR threshold
Industrial boilers [mg/year]	2,030	2,000	2,030	1,762	1,695	1,599	1,655	0	-18%	0%	0%
Service industry boilers [mg/year]	14,241	15,529	14,697	15,811	15,463	15,074	13,843	0	-3%	0%	0%
Waste incineration [mg/year]	2,900,460	2,900,460	2,900,460	2,900,460	2,900,460	2,900,460	2,900,000	2,900,460	0%	97%	2900%
Incineration of hospital waste [mg/year]	20,319	20,319	0	0	0	0	0	0	-100%	0%	0%
Production and melting of metals [mg/year]	90,145	90,145	90,145	96,280	99,390	80,243	88,102	86,710	-4%	3%	87%
Crematoria [mg/year]	2,887	2,191	2,185	2,462	1,282	2,410	2,446	2,403	-17%	0%	2%
Coking plants [mg/year]	2,163,000	0	0	0	0	0	0	0	-100%	0%	0%
Total [kg/year]	5.19	3.03	3.01	3.02	3.02	3.00	3.01	2.99	-42%	100%	2990%

HCB

HCB emissions appear to have increased by 1017% between 1990 and 2007 (from 0.5 kg/year to 6 kg/year) but in total they are a long way below the PRTR threshold.

As far as the contributions of individual sources are concerned we can reach the following conclusions: waste incineration was the dominant source of HCB emissions up until 2000 although since then almost all estimated HCB emissions appear to be due to the incineration of sewage sludge at STEP Sud. However the results do need to be interpreted very carefully. The explanation for the dominant HCB emissions from the STEP Sud is the emission factor of 500 mg/t from the EMEP/CORINAIR guide. It should be noted, that the not yet official proposals for the revision of the EMEP/CORINAIR Guide contain an emission factor for the incineration of sewage sludge of 1 mg/t, which would reduce the emissions from the STEP Sud to 12g/year, in other words a long way below the PRTR threshold. So verifying the actual emissions seems both important and necessary in this case.

As is illustrated in figure 9 below, the increase took place mainly between 2000 and 2007. To date, the total emissions on the basis of the available data are a long way below the PRTR threshold set.

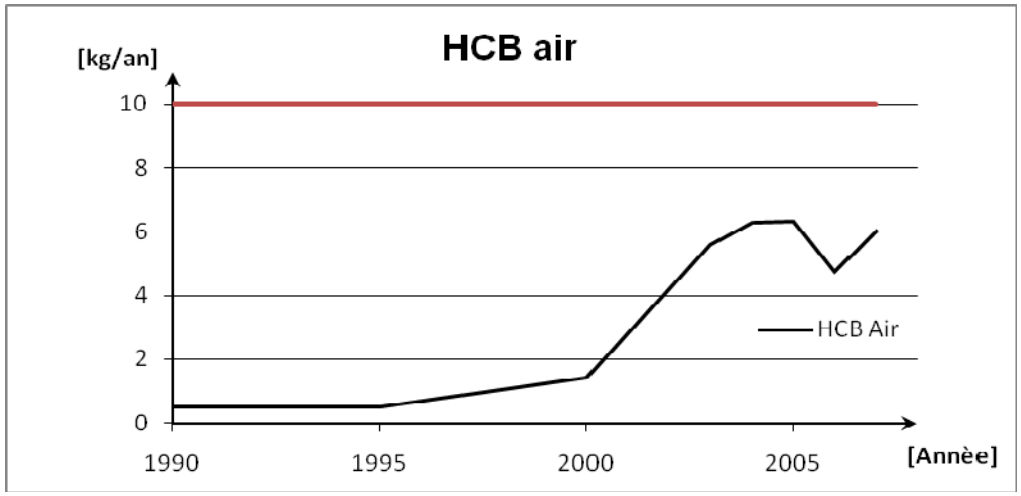

Figure 9: Trend in HCB atmospheric emissions in the Bruxelles-Capitale Region (red line = PRTR threshold)

2.3.5 Summary regarding production, uses and future release of POPs- required conditions to the purposes of exemptions.

No POP is currently or will be produced or intentionally released in the future. The end of PCB use in equipment is foreseen for December 2010. The only notable release in the environment is the one of dioxins and furans.

For dioxins, furans, hexachlorobenzene, HAPs and PCBs, the majority of the interventions will have to be executed at a regional level. On the federal side, Belgian refineries have already organised the disassembly of tetra-ethyl lead adjunction units, which caused dioxins and furans emissions during the combustion of leaded oils (purpose of the European directive 99/32/CE). During the transposition of the European directive 99/32/CE related to the reduction of sulphur content of certain liquid fuels (AR 7/03/01 – MB 23/03/01), a maximal content of PCBs has also been fixed while it doesn't stand in this directive. Regional authorities follow rigorously these by-products emissions *via* monitoring and regular supervision. An objective for those emissions decreases is also fixed.

3 Strategy and Action Plan Elements of the National Implementation Plan

3.1 Implementation strategy

The plan, which takes place within a European Framework, is largely inspired by the implementation plan of the European Communities, while adhering to Belgian guidelines/specifications.
Indeed, most of the existing measures at a regional/federal level are a result of the transposition and implementation of European legislation, notably the 850/2004/EC Regulation which concerns organic pollutants. This legislation also respects obligations of international environmental conventions in which Belgium has taken part, and their additional protocols.

3.2 Activities

1st activity:

To facilitate participation between the Parties of the Convention, and the exchange of information (article 9).

Objective:

Competent authorities implement the exchange of relevant information for the purpose of reducing or limiting to a minimum or eliminating (when feasible) the production, use or release of persistent organic pollutants. It also aims to use the information exchange as a means to finding alternative solutions, highlighting risks and the economical and social costs inherent to those solutions.

Measures:

A national focal point (person or group) will centralise relevant information to make available to the Parties as well as gather information from its European counterparts working within the other Parties.

Implementation:

A correspondent is designated at a national level to centrally control the information exchanges.

2nd activity:

Public information, awareness and education (article 10)

Objective:

Provision of advice on consumption is to be considered, especially in the case of products that don't originate from traditional commercial production and are thus not subject to standardization ie fish from sportive fishing, eggs from farming and so on.

Measures:

a) Information available on the websites of the competent authorities could provide information on POPs and alternatives.

b) Regular consultation between the different levels involved at POPs meetings.

Implementation:

An ad hoc POPs sub-group of the "product politic" group of the CCIEP will uphold points addressed in the above paragraph with a regular follow-up.

Collaboration with the "Directorate General Animals, Plants and Food Safety", the FASFC and the communities, regions and federal environmental figures in charge would also be responsible for establishing the foremost recommendations regarding food.

3rd activity:

Technical and financial assistance (articles 12 and 13)

Objective:

Competent authorities provide timely and appropriate technical assistance to developing Parties and Parties with transitional economies. The Competent authorities cooperate in assisting them, taking into account their particular needs. This is done with an aim to carry out their obligations regarding European POPs regulations.

Measures:

a) The provision of technical assistance according to a specific timetable for countries in need of such assistance.

b) The websites of the competent authorities should provide a section with information on POPs and alternative solutions.

Implementation:

The "development cooperation" section of the "FPS Foreign Affairs" should bear in mind point a) above when considering annual contributions to the Global Environment Facility (GEF).

An ad hoc POPs sub-group of the "product politic" group of the CCIEP should consider point b) of this activity with a regular follow-up.

4th activity:

Inspection at all levels

Objective:

Respect the different legislations and prevent any import or export of POPs listed in the Stockholm Convention, along with those which are to be added to one of the annexes, and those similar to the previously mentioned substances. Keep controls related to the presence of contaminants in the food chain. This can be done with preventing food chain contaminations via strict standards and controls of food and animal feeding.

Measures:

Follow-up of regular inspection programs of concerned products and foodstuff.

For the follow up of identified problems, the contamination origin could be researched jointly by the different departments, for instance as part of recommendation 2006/88/EC[23]..

Implementation:

Collaboration will be set up with customs services for imports. The inspection will be followed at regional level for the control of emissions, and at federal level for the place on the market.

An *ad hoc* POPs sub-group of the "product politic" group of the CCIEP will consider points of this activity with a regular follow-up.

5th activity:

Follow-up of monitoring at regional and federal levels

Objective:

Measure the evolution of POPs residues in environment, food chain and human body.

Measures:

A follow-up of human milk analyses must be done every 4 or 5 years in the same conditions as the 2006 study.

Meet the Commission recommendation 2006/794/EC of the 16th November 2006 relating to the control of background levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in foodstuffs.

Implementation:

An *ad hoc* POPs sub-group of the "product politic" group of the CCIEP will consider the 1st measure of this activity with a regular follow-up. The 2nd measure will be followed-up by the FAFCS. Information exchange on results and future plans is considered as useful.

6th activity:

Awareness raising of the chemical sector

Objective:

[23] Recommandation de la Commission du 6 février 2006 sur la réduction de la présence de dioxines, de furannes et de PCB dans les aliments pour animaux et les denrées alimentaires

Chemical sector must be aware regarding the purity of products intended for a use in the food chain (e.g. technological auxiliaries).

Measures:

Following the dioxin incident in gelatine and in order to promote food security, a behaviour code has been established and signed by chemicals producers and distributors on a side (ESSENCIA) and by buyers of those products which are used in food chain on the other side (APFACA and FEVIA). This behaviour code is based on a better communication between stakeholders: traceability and risk evaluation based on the use of the chemical which is done in the food-firm.

This code is in force since 1/01/07. The first appraisal of the realisation of this code was made on the 24/01/2008; a second appraisal has taken place by end-September 2008.

Implementation:

Continuation of the contacts between the FASFC and the different concerned sectors, especially regarding the risk assessment of some technological auxiliaries.

3.3 Additional measures proposed for the Flemish Region

Flemish policy

- Active participation by the Flemish Region in consultation bodies with
    - the federal government
- Updating of the aquatic discharge reduction programme (application of directive 76/464/EEC), this approach will be translated mainly into the framework for the prevention of 'new' POPs
- Implementation of management plans for Meuse and Escaut river basins with a view to achieving a good situation for surface waters by 2015 (application of directive 2000/60/CE)
- Optimising the application of the "pesticides in public services" decree
- Active monitoring by the BBT-BREF
- Searching for "points which are subject to problems in Flemish environmental legislation on waste and soils and relating to European regulation 850/2004, and drawing up of the statement of waste flows potentially contaminated by POPs."
- Surveillance and contribution towards the definition of "new POPs".

Monitoring in the Flemish region

- Development of new measuring methods for the surveillance of new POPs
- Systematic addition of new substances in the surface water, aquatic soils, etc. surveillance networks.
- Optimising of lists of emissions into water and the air
- A second human biomonitoring campaign is being organised as part of the second "Steunpunt Milieu & Gezondheid (2007- 2008)". In addition to conventional POPs (dioxins, PCBs), attention is paid to new POPs such as phthalates and flame retardants.

Communication in the Flemish region

Communication aimed at the target groups

The Flemish Government is communicating with the various target groups involved with persistent organic pollutants through various channels of communication. The communication activities are in line with the political strategy. Explanations of two campaigns relating specifically to pesticides and dioxins are given below.

a) specific communication on pesticides: "zonder is gezonder" campaign, 2007-08

The Vlaamse Milieumaatschappij planned a certain number of initiatives under the title of "zonder is gezonder" in 2007-2008 designed to increase public awareness of the reduction of pesticides both directly and indirectly. The initiatives fall within the framework of the recommendations made by the Flemish Parliament following the Unité 808 resolution. The suggestion of working on a communication plan aimed at citizens has

been made there. These latter must be first of all informed about the obligation to reduce the use of pesticides by public administrative bodies and secondly about the use of pesticides in their own homes and gardens, which should be limited and alternatives used wherever possible. These measures are necessary for the protection of drinking water.

A first wave (September 2007) dealt with raising awareness about the prevention of the use of pesticides. This message was aimed at citizens in general and especially at people who live in protected areas for underground waters, as covered by the decree of 24th January 1984 implementing underground water management measures.

The population was also encouraged to hand in any remaining (banned) pesticides via the KGA circuit. Posters were distributed to the municipalities so that they could create information boards. These boards were preferably to be placed in pesticide-free areas, so that the municipal policy on pesticides could be seen by the population. During the second wave (March 2008), the campaign was repeated in its entirety.

Information on this campaign is available on the website at www.zonderisgezonder.be.

Pesticide collection campaign

A study commissioned last year by the "Steunpunt Milieu & Gezondheid" revealed that traces of pesticides which have been banned for many years were being found in the blood of Flemish people. A campaign managed by the department was run in order to avoid the use of banned pesticides in the environment or the food chain. This campaign followed on from the "Zonder is gesonder" campaign.

b) Campaigns specifically targeting dioxins

The Flemish Region is running awareness-raising campaigns on the illegal open-air incineration of household waste and the proper use of solid combustible stoves. The information is made available through brochures, websites and the Flemish helpline[24].

Flemish policy on dioxins for the next few years focuses mainly on the "population" aspect which accounts for 73% of the list of total emissions. In order to obtain additional reductions in dioxins, the emphasis is placed on emissions from solid fuel domestic heating and waste incineration in open fires or in domestic incinerators. The raising of awareness among the population along with the introduction of standards on emissions for new solid fuel stoves may lead to the making of a further potential reduction by May 2010.

For the other sectors, attention will remain mainly on continued surveillance of the limits on emissions of dioxins.

[24] The Flemish hotline acts as a hub, providing people with information by telephone or e-mail.

The information is provided through brochures, websites and the Flemish hotline.

The results of the survey carried out by the "Leefmilieu, Natuur en Energie' department on dioxins are available to the public online at:

http://www.lne.be/themas/luchtverontreiniging/informatie-studies.

c) Availability of the results

Monitoring in the environment: results of the measuring operations

The results of the measuring operations in the air and in water are available to view on the website at http://www.vmm.be. The Vlaamse Milieumaatschappij is also planning an annual publication on discharges into the air and the quality des surface waters and underground waters.

The results of the measuring operations on deposits of dioxins and PCBs are available to the public online, and are more actively sent to the communes.

Biomonitoring: results of the measuring operations

The results of the Flemish biomonitoring programme established according to the region and the age group are available to the public on the "steunpunt Milieu en Gezondheid" website at (www.milieu-en-gezondheid.be)). The communication is being developed via various channels:

- As part of the biomonitoring, communication has got underway with wide, representative proportion of the population. This contact with the people who were analysed and the individual notification of the results have an awareness-raising effect.
- The basic information and the results of the biomonitoring campaign are shown on the "steunpunt Milieu en Gezondheid" website. In addition to the results, for adults, results by group and the basic information, information is given about the various markers into which research was carried out. Further information about POPs can be found at upon exposure to the markers (including DDTs and HCBs, PCBs and dioxins).
- Open communication is an important basic principle in the plan. The population is told about the way that procedure takes place with the consultation of experts and a tour made by the panel through biomonitoring operations and the department's newsletter.
- After the three campaigns carried out on the basis of age group, communication to the whole of the population has been planned through the press, and communication to the scientific world will take place through a seminar.

Information for the target groups

There are accessible, easy-to-use websites (www.milierapport.be, www.vmm.be, www.ovam.be) where members of the public can find the information they need. The main target groups are citizens, industry and agriculture.

Continued communication aimed at the target groups

- Setting up of the second "Zonder is gezonder" campaign
- Making the results of the measuring operations available
- Continuing with the dioxins campaign aimed at incineration (of waste) by private individuals.

3.4 Additional measures proposed for the Walloon Region

1st activity:

Assessment of POPs and potential inclusions in the appendices to the Convention

Objective:

To improve awareness of the presence of these substances in the environment in the Walloon Region.

Measures:

Select the substances which are relevant to the Walloon Region and incorporate them into the measuring networks and the emission lists.

Implementation:

For the measuring networks, follow the usual selection procedure (assessment of relevant according to factors such as existing restrictions, known uses and the sectors involved, where necessary screening in order to establish whether they are present in the environment).

2nd activity

Using pesticides

Objective:

To reduce the impact of pesticides and biocides on human health and the environment. To make sustainable use of pesticides and biocides.

Measures:

First Programme de Réduction des Pesticides à usage agricole et des Biocides (PRPB - Agricultural Pesticide and Biocide Reduction Programme), adopted in 2005 and updated every two years.

Draft decree regulating the use of pesticides in public places.

Implementation of the PRPB:

Promotion of organic farming and the biological fight against damaging organisms. Promotion of agro-environmental measurements (including grass verges along waterways);

Promotion of good phytosanitary practices and non-chemical alternative techniques;

Promotion of equipment and accessories (rinsing tank, drum rinsing device, anti-drift sprayers, biofilter, etc.);

Splitting of approvals between professional and amateur users

Professional licence;

Training, information and awareness-raising.

3rd activity

Emission of POPs by large industrial facilities

Objective:

Within the framework of the existing legislation, to continue with the reduction of industrial emissions and informing the public.

Measures:

Environmental permit

Emissions register

Implementation:

As part of the implementation of Directive 96/61 IPPC, the setting of maximum emission values for the relevant facilities and substances and, as part of the implementation of Regulation 166/2006 E-PRTR, of the annual reporting of the emissions covered via the application of the decree on the environmental permit.

4th activity

Rehabilitation of disused sites

Objective:

Within the framework of the existing legislation, to redevelop sites of former economic activity and clean up any polluted sites, including those polluted by POP substances, for which the cost of cleaning up the soil > 25% of the total redevelopment cost

Measures:

Priority action for the decree - programme dated 23rd February 2006 relating to priority actions for Walloon the future ("Marshall plan").

Implementation:

Simplification and speeding up of the procedures designed to help strengthen rehabilitation, cleaning up and the renovation of these sites to be redeveloped.

3.5 Additional proposed measures for the Bruxelles-Capitale Region:

1st activity

Emission of POPs by large industrial facilities and minor sources

Objective:

To continue with the efforts on monitoring and surveillance and prevention of emissions from installations which are likely to be or to become the largest emitters of POPs.

Measures:

Surveillance of the new STEP Sud sewage sludge combustion facility in order to have more accurate measurements and to verify its impact on involuntary emissions of POPs (HCHs, PCDDs/PCDFs, PCBs).

Increased surveillance of crematoria which are becoming a major source of emissions of POPs in the Bruxelles-Capitale Region. Examination of the situation with emissions after the installation of a smoke purification system (PCDDs/PCDFs).

Ongoing surveillance of the household waste incinerator in order to confirm the fall in emissions of PCDDs/PCDFs and surveillance of HCHs.

Ongoing surveillance of FMMs.

Implementation:

Inspection and environmental permit departments.

2nd activity

Domestic PAHs as a result of urban heating.

Objective:

To reduce emissions of PAHs from urban and industrial heating.

Measures:

Application of the URE and the PEB and the monitoring of the insulation of buildings.

Continued monitoring of domestic urban heating and monitoring of heating engineers and their continuing training.

Implementation:

Inspection, authorisation and energy department.

3rd activity

Use of clean technologies

Objective:

To promote the use of new technologies or products or processes designed to replace POP-generating processes.

Measure:

Tackle the target sectors such as the degreasing of metals which generate HCHs.

ANNEX I : Monitoring of the POPs present in the food chain

Source: Pesticide Residue Monitoring in Food of Plant Origin Belgium 2006, Report of Monitoring Results Concerning Directives 90/642/EEC, 76/895/EEC and 86/362/EEC and Commission Recommendation 2006/26/EC (Federal Agency for the Safety of the Food Chain, http://www.afsca.be)

Summary table of pesticides sought and found in fruit and vegetables – surveillance sampling only:

Pesticide (listed in alphabetical order of the English name of the pesticide)	Total number of samples analysed for specific pesticide	Number of samples with residues at or above reporting level	% samples with residues at or above reporting level	Reporting level (mg/kg)
aldrin	220		0.0	
chlordane, sum (cis+trans)	220		0.0	
DDT, sum	1239	1	0.1	
dieldrin, sum	220		0.0	
endrin	220		0.0	
HCH, sum (a-/b-/d-/e-)	512		0.0	
heptachlor, sum	220	1	0.5	
hexachlorobenzene	220		0.0	
lindane	1239		0.0	

Summary table of pesticides sought and found in cereals – surveillance sampling only

Pesticide (listed in alphabetical order of the English name of the pesticide)	Total number of samples analysed for specific pesticide	Number of samples with residues at or above reporting level	% samples with residues at or above reporting level	Reporting level (mg/kg)
aldrin	24		0.0	
chlordane, sum (cis+trans)	24		0.0	
DDT, sum	24		0.0	
dieldrin, sum	24		0.0	
endrin	24		0.0	
HCH, sum (a-/b-/d-/e-)	24		0.0	
heptachlor, sum	24		0.0	
hexachlorobenzene	24		0.0	

ANNEXE II : Monitoring des PCB, des dioxines et des furannes dans l'eau en Région wallonne

Méthode d'analyse des PCB

Matrice « eau »

L'échantillon est prélevé dans un flacon en verre et conservé au réfrigérateur entre 2 et 5°C et à l'abri de la lumière jusqu'à son analyse.

La totalité de l'échantillon (≅ 1 litre), tamponné à pH 7, contenant 200g de NaCl, est extrait une fois par 10 ml de toluène. La phase organique est séchée sur sulfate de sodium anhydre. La séparation et la mesure des analytes de l'extrait sont déterminées par chromatographie en phase gazeuse sur colonne capillaire au moyen d'un détecteur à capture d'électrons (ECD). Leur teneur est calibrée au moyen d'une courbe standard (calibration externe).

Chromatographie en phase gazeuse, détecteur ECD (Electron Capture Detector)

Références : **U.S. EPA Method 2005** : Analysis of Organohalide and commercial Polychlorinated Biphenyl (PCB) products in water by microextraction and gas chromatoography et **ISO 6468 (1996)** : Dosage de certains insecticides organochlorés, des polychlorobiphényles et des chlorobenzène – Méthode par chromatographie en phase gazeuse après extraction liquide / liquide.

Limites de quantification : 0,001 à 0,002 µg/l pour chacun des congénères

Matrice « matières en suspension »

Le prélèvement des matières en suspension (MES) est effectué in situ par centrifugation.
Les MES sont conservés au réfrigérateur entre 2 et 5°C jusqu'à l'analyse.
Séchage chimique (sulfates), broyage manuel.
Extraction ASE à l'hexane/acétone, séchage et désulfuration.
Purification sur Florisil, concentration de la phase organique au Turbovap.
Analyse par chromatographie en phase gazeuse avec détection par capture d'électrons (ECD) et confirmation par spectrométrie de masse.

Référence : **ISO 10382 (2002, qualité du sol)** : Dosage des pesticides organochlorés et des biphényles polychlorés – Méthode par chromatographie en phase gazeuse avec détection par capture d'électrons.

Limites de quantification : de 2 à 10 µg/kg MS (µg/kg matières sèches) selon le cogénère

Réseau de surveillance de la qualité des eaux de surface en région wallonne - année 2006

Substances/Paramètres	Sites de contrôle - matrice Eau	Sites de contrôle - matrice MES
Polychlorobiphényles (PCB) (somme n°28, 52, 101, 118, 138, 153, 180)	89 sites	22 sites
Dioxines (PCDD)	-	-
Furannes (PCDF)	-	-

Proposition de réseau de surveillance de la qualité des eaux de surface en région wallonne dans le cadre de la mise en œuvre de la directive cadre sur l'eau (DCE) – année 2007

Substances/Paramètres	Sites de contrôle - matrice Eau	Sites de contrôle - matrice MES
Polychlorobiphényles (PCB)	25 sites (13x/an)	23 sites (4x/an)
Dioxines (PCDD)	-	23 sites (Max 4x/an)
Furannes (PCDF)	-	23 sites (Max 4x/an)

Les polychlorodibenzodioxines (PCDD) et les polychlorodibenzofurannes (PCDF) seront suivis au maximum 4x/an sur 23 sites dont 7 sites de contrôle spécifiques aux substances dangereuses (AGW 12.09.2002) et ce uniquement dans la matrice "matières en suspension".

Parmi les 210 congénères des dioxines et furannes, 17 sont considérés comme toxiques et feront l'objet du suivi.

Congénères suivis au niveau des 7 sites de contrôle spécifiques aux substances dangereuses	
Dioxines	2,3,7,8-tétraCDD
	1,2,3,7,8-pentaCDD
	1,2,3,4,7,8-hexaCDD
	1,2,3,6,7,8-hexaCDD
	1,2,3,7,8,9-hexaCDD
	1,2,3,4,6,7,8-heptaCDD
	OCDD
Furannes	2,3,7,8-TCDF
	1,2,3,7,8-pentaCDF
	2,3,4,7,8-penta-CDF
	1,2,3,4,7,8-hexaCDF
	1,2,3,6,7,8-hexaCDF
	1,2,3,7,8,9-hexaCDF
	2,3,4,6,7,8-hexaCDF
	1,2,3,4,6,7,8-heptaCDF
	1,2,3,4,7,8,9-heptaCDF
	OCDF

ANNEXE III : Monitoring in het Vlaams Gewest

Table 20: Indeling Vlaamse ijzer- en staalproducenten

Indelingslijst Vlarem I	Omschrijving	Klasse
20.2.1.	Installaties voor het roosten, pelletiseren of sinteren van ersten, met inbegrip van zwavelhoudend erts	1
20.2.2.	Installaties voor de productie van ijzer of staal (primaire smelting) met inbegrip van uitrusting voor continugieten	1
20.2.3.	Installaties voor het smelten van ferrometalen	1

Table 21: Grens- en richtwaarden voor dioxine-emissie in ferro smeltinrichtingen

Nieuwe inrichting			Bestaande inrichting		
Emissiegrenswaarde (ng TEQ/Nm3)	Emissierichtwaarde (ng TEQ/Nm3)	vanaf	Emissiegrenswaarde (ng TEQ/Nm3)	Emissierichtwaarde (ng TEQ/Nm3)	vanaf
0,5	0,1	1/5/1999	1	0,4	1/1/2003

Table 22: Grens- en richtwaarden voor dioxine-emissie in sinterinstallaties

Nieuwe inrichting			Bestaande inrichting		
Emissiegrenswaarde (ng TEQ/Nm3)	Emissierichtwaarde (ng TEQ/Nm3)	vanaf	Emissiegrenswaarde (ng TEQ/Nm3)	Emissierichtwaarde (ng TEQ/Nm3)	vanaf
0,5	0,1	1/5/1999	2,5	0,4	1/1/2003

Table 23 : Indeling afvalverbrandingsinstallaties

Indelingslijst Vlarem I	Omschrijving	Klasse
2.3.4.1 a)	1° Biomassa-afval: - plantaardig afval van land- en bosbouw - plantaardig afval van de levensmiddelenindustrie - vezelachtig afval afkomstig van de productie van ruwe pulp en van de productie van papier uit pulp, dat op de plaats van productie wordt meeverbrand en waarvan de vrijgekomen energie wordt teruggewonnen - kurkafval - onbehandeld houtafval,met een nominaal thermisch vermogen van:	
	1) tot en met 5 MW	2
	2) meer dan 5 MW	1
	2° niet verontreinigd behandeld houtafval, met een nominaal thermisch vermogen van	
	1) tot en met 5 MW	2
	2) meer dan 5 MW	1
2.3.4.1 b)	verontreinigd behandeld houtafval	1
2.3.4.1 c)	Afgewerkte olie	1
2.3.4.1 e)	niet-gevaarlijke huishoudelijke afvalstoffen	1
2.3.4.1 f)	niet-gevaarlijke bedrijfsafvalstoffen die vergelijkbaar zijn met huishoudelijke afvalstoffen	1
2.3.4.1 g)	vast niet-risicohoudend medisch afval	1
2.3.4.1 h)	risicohoudend medisch afval en vloeibaar en pasteus niet-risicohoudend medisch afval	1
2.3.4.1 i)	krengen in dierencrematoria	1
2.3.4.1 j)	andere niet-gevaarlijke afvalstoffen	1
2.3.4.1 k)	andere gevaarlijke afvalstoffen	1
2.3.4.1 l)	dierlijk afval met uitzondering van krengen in dierencrematoria	1
2.3.4.1 m)	Waterzuiveringsslib	1
2.3.5.	Opslag en reiniging van metalen recipiënten door uitbranden	1

Table 24 : Emissiegrenswaarden verbrandingsinrichtingen voor afvalstoffen

Inrichting	Emissiegrenswaarde (ng TEQ/Nm3)
Verbrandingsinrichting voor huishoudelijke afvalstoffen (rubriek 2.3.4.1 e, f, g, j, l, m)	0,1
Verbrandingsinrichting voor gevaarlijke afvalstoffen (rubriek 2.3.4.1 k)	0,1
Verbrandingsinrichtingen voor als brandstof te gebruiken afgewerkte olie (rubriek 2.3.4.1 c)	0,1
Verbrandingsinrichtingen voor risicohoudend medisch afval en voor vloeibaar en pasteus niet-risicohoudend medisch afval (rubriek 2.3.4.1 h)	0,1
Dierencrematoria (rubriek 2.3.4.1 i)	0,1
Verbrandingsinstallaties van biomassa-afval, met een nominaal thermisch vermogen tot en met 5 MW (rubriek 2.3.4.1 a)	-
Verbrandingsinstallaties van biomassa-afval, met een nominaal thermisch vermogen van meer dan 5 MW (rubriek 2.3.4.1 a)	0,1
Verbrandingsinstallaties van niet-verontreinigd behandeld houtafval, met een nominaal thermisch vermogen tot en met 5 MW (rubriek 2.3.4.1 a)	0,4
Verbrandingsinstallaties van niet-verontreinigd behandeld houtafval, met een nominaal thermisch vermogen van meer dan 5 MW (rubriek 2.3.4.1 a)	0,1
Verbrandingsinstallaties van verontreinigd behandeld houtafval (rubriek 2.3.4.1 b)	0,1
Opslag en reiniging van metalen recipiënten door uitbranden (rubriek 2.3.5)	0,1

Table 25 : Indeling non-ferro producenten

Indelingslijst Vlarem I	Omschrijving	Klasse
20.2.1.	Installaties voor het roosten, pelletiseren of sinteren van ersten, met inbegrip van zwavelhoudend erts	1
20.2.4.	Installaties voor de productie en het smelten van non-ferrometalen met inbegrip van legeringen, inclusief terugwinningsproducten (affineren, vormgieten) met een capaciteit per dag van : a) voor lood en cadmium : 1° 20 kg tot en met 1 ton 2° meer dan 1 ton tot en met 4 ton 3° meer dan 4 ton b) voor andere metalen : 1° 20 kg tot en met 0.5 ton 2° meer dan 0.5 ton tot en met 20 ton 3° meer dan 20 ton	2 1 1-IPPC 2 1 1-IPPC
20.2.5	Installaties voor de winning van ruwe nonferro metalen uit erts, concentraat of secudaire grondstoffen met metallurgische, chemische of elektrolytische procédés	1

Table 26 : Indeling raffinaderijen

Indelingslijst Vlarem I	Omschrijving	Klasse
1.1.	Niet in rubriek 20.1.2. begrepen inrichtingen voor de raffinage, voor de destillatie, het kraken, het vergassen of enige andere wijze van verwerking van aardolie of aardolieprodukten (Raffinaderij van ruwe aardolie, met uitzondering van deze waarin uitsluitend smeermiddelen uit ruwe olie worden vervaardigd : zie rubriek 20.1.2)	1
20.1.2.	Raffinaderij van ruwe aardolie, met uitzondering van dez waarin uitsluitend smeermiddelen uit ruwe olie worden vervaardigd (zie ook rubriek 1.1.)	1

ANNEXE IV: Evaluation of substances listed in the Protocol to the Convention on long-range transboundary pollution and candidates to the Stockholm Convention: chlordecone, hexabromobiphenyle, lindane, HAP's.

There are some data concerning candidate substances to the Convention. It has been decided to add it as an annex at this plan for information.

Chlordecone: not produced nor used because it is part of chemicals listed in Annex 1 of Aarhus Protocol to the LRTAP Convention of 24 June 1998.

Hexabromobiphenyle: not produced nor used, pointed by the European Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment. This directive is transposed by the A.R. of 12 October 2004 - Arrêté royal relatif à la prévention des substances dangereuses dans les équipements électriques et électroniques.

Lindane: has been used as topic veterinary insecticide (is part of chemicals listed in Annex 2 of Aarhus Protocol to the LRTAP Convention of 24 June 1998 that use must be limit to certain activities). According to regulation 850/2004/EC, its production had to be reduced to the minimum and finally eliminated for the end of 2007 at latest.

Lindane, also known as gamma-hexachlorocyclohexane (γ-HCH), is the only active isomer of HCH which has pesticide properties (on a total of 8 isomers).

Lindane penetrates the organism mostly by the cutaneous and pulmonary tract and for a lower part by a digestive way. Absorption, mostly fast, depends mainly on the used formulation and proper characteristics of the subject (cutaneous state, age). Lindane accumulates in fat tissues, kidneys, thyroid and brain. Its blood half-life is of 20 hours during short expositions, but can get to 8 days during chronic expositions.

Analysis of human milk

A first study drawn up in Belgium by Saunders and al had determined following HCH burdens for 2003:

Table 27: concentration of HCH (ng/g lipids) in 60 samples of human milk collected in Belgium in 2003

Isomer	mean	median	Min	Max	unit	Ref.
α-HCH	3.6	0.9	0.3	36.1	ng/g fat	*Saunders et al., 2005*[25]
β-HCH	24.9	22.3	4.3	71.5		
γ- HCH	1.6	1.2	0.3	14.6		
δ-HCH	1.3	0.9	0.3	23.4		

[25] Saunders M., Palkovicova L., Stoian I., Van Den Heuvel R., Desager K.Plutocracy Project. (2005) *Toxicology Letters*, 158, Suppl 1, S151

Similar tests done in 2006 show a decrease of these values, as on 190 samples only β-HCH was detectable in 38 but it always was under limits of quantification.

Table 28 : concentration of HCH (ng/g lipids) in 200 samples of human milk collected in Belgium in 2006. α-HCH was under the limit of detection (LOD) in all the samples, β-HCH was detectable in 79 samples with 38 under the limit of quantification (LOQ), γ-HCH was detectable and quantifiable in only one sample.

	N	Mean	Geometric Man	Median	Minimum	Maximum	P25	P75	P10	P90	Dev. Std.	< LOD	< LOQ
HCH Metabolites													
α-HCH	190	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**190**	**0**
β-HCH	190	11.0		0.0	0.0	1065.2	0.0	5.0	0.0	15.4	77.7	**111**	**38**
γ-HCH	190	0.1		0.0	0.0	19.8	0.0	0.0	0.0	0.0	1.4	**189**	**0**

HAPS: by-products, OSPAR 96/4 Regulation, Aarhus 1998 (annex III for reduction). HAPs are taken into account by the European Directives about classical pollutants and particles emissions reduction. Cars and commercial vehicles are regulated by the 98/69/EC and non-road mobile machinery by the 97/68/EC.

HAPs are also present as process contaminants when direct contacts with fumes.