MIRA-T

Flanders Environment Report

Indicator Report

'07

VLAAMSE MILIEUMAATSCHAPPIJ

Flanders Environment Report **MIRA-T** **2007** **Indicator Report**

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Flanders Environment Report

MIRA-T 2007 Indicator Report

Presented on 14 December 2007 to Hilde Crevits,
Flemish minister for Public Works, Energy, the Environment and Nature

Marleen Van Steertegem, final editing

VLAAMSE MILIEUMAATSCHAPPIJ

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Preface

In this new MIRA-T 2007 Indicator Report, we have selected key facts and figures on the environment in Flanders and combined them into a convenient work of reference. Together, the more than 100 indicators deal with the whole environmental area. As a result, the Indicator Report at hand is complementary to the new edition of the MIRA-T 2007 Focus Report with a critical analysis of present-day bottlenecks or challenges for environmental policy.

Good environmental policy requires good figures. We regard it as our mission to offer policy makers, environmental experts and interested citizens up-to-date and reliable environmental information. In this way, we hope to make a useful contribution to the environmental debate in Flanders.

For more figures and background information, we refer to our website www.environmentflanders.be.

We hope you will enjoy this new VMM publication.

The MIRA team
November 2007

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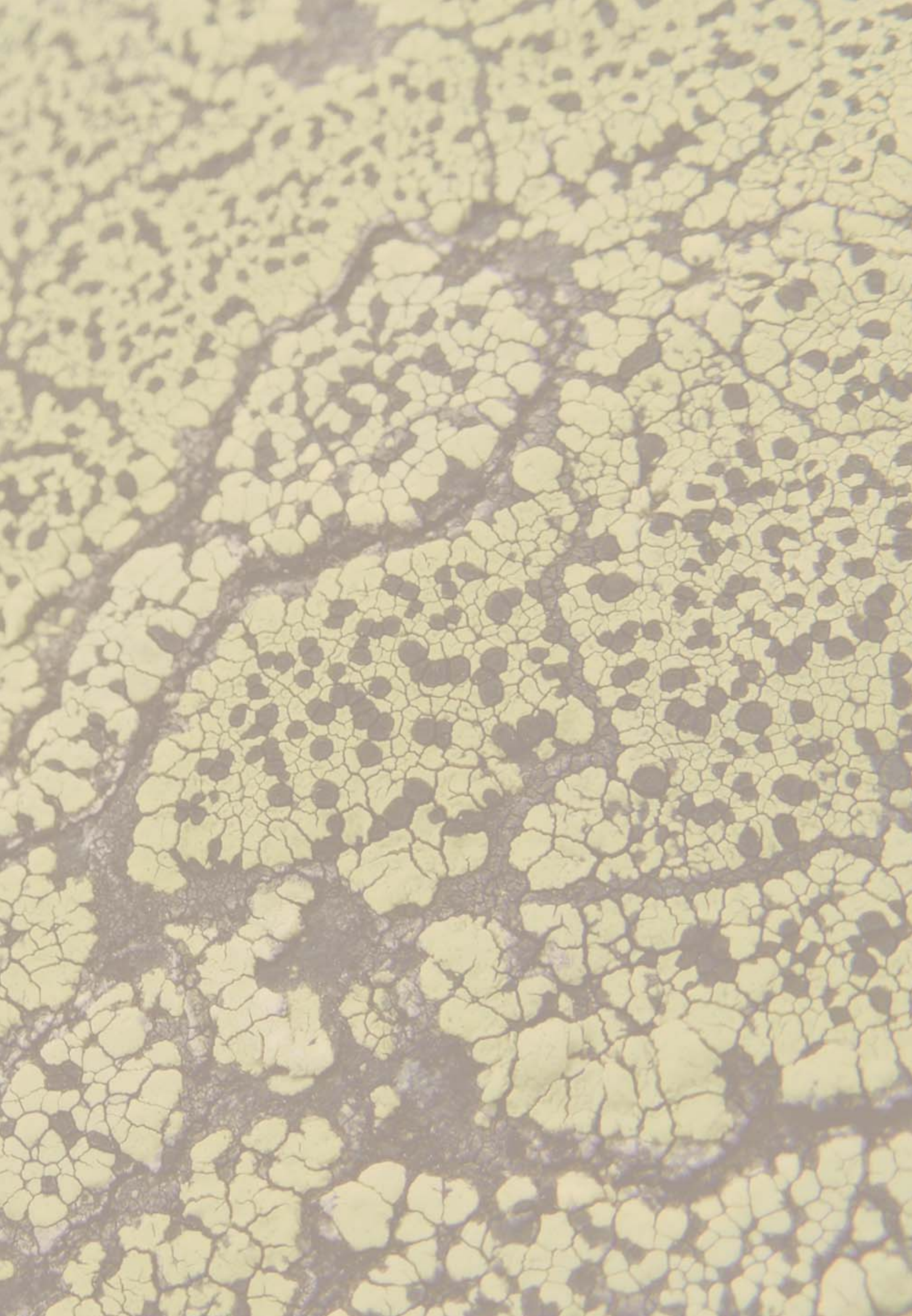


Table of contents

Introduction

Marleen Van Steertegem, MIRA, VMM project leader

Annual reporting on the quality of the environment in Flanders should allow us to detect changes in due time, so that the (environmental) policy level can respond appropriately. The MIRA-T 2007 Indicator Report offers a concise but complete overview of the state of the environment using carefully selected indicators and the most recent data.

Where content is concerned, the Indicator Report at hand is very similar to the previous 'Environmental indicators in pocket size', but the larger format leaves a bit more room for figures and analysis. Whereas the MIRA-T Focus Report offers an in-depth study of specific environmental problems, the Indicator Report is intended mainly as a convenient reference work for both environmental professionals and interested citizens.

Threefold task for the Flanders Environment Report

The task of the *Flanders Environment Report (MIRA)*, determined by decree, is threefold:

- a description, analysis and evaluation of the current state of the environment;
- an evaluation of the environmental policy conducted to date;
- a description of expected environmental developments in case of unchanged policy as well as in case of a change in policy according to a number of scenarios that are thought relevant.

Furthermore, the report must be well publicised.

MIRA provides the scientific foundation for environmental policy planning in Flanders. The study of the situation is reflected in the annual MIRA-T reports, in which policy makers and citizens find answers to questions regarding the state of the environment, what the underlying causes are and how the environmental situation can be improved. The first scenario report, MIRA-S 2000, was published in 2000; the next edition is planned for 2009. The first policy evaluation report (MIRA-PE) appeared in June 2003, the third edition in the autumn of 2007.

A choice of environmental indicators

A good environmental indicator is policy-relevant, scientifically based and measurable. In the MIRA-T 2007 Indicator Report, you will find a selection of key indicators which span the whole environmental area. For the selection of the indicators the first criterion was continuity; as a result, a large number of indicators can be found in previous indicator reports as well, especially in the 2005 and 2006 editions of 'Environmental indicators in pocket size'.

One characteristic of environmental information is that the underlying figures are continuously being improved (and expanded), thus increasing their reliability. In order to guarantee the transparency of the MIRA reports, the underlying data regarding resource use and emissions are contained in the core set of environmental data. Previously, this core set was part of the Focus Report, but it has now been included in the Indicator Report. The core set of environmental data, in its extended version, can be consulted at www.environmentflanders.be.

Environmental disruption chain as a familiar framework

The environmental disruption chain (DPSIR, *driving forces, pressure, state, impact, response)* has proved its added value for the description and analysis of environmental problems by now. In this Indicator Report as well, the DPSIR chain is used as a framework for analysis. This has the additional advantage that users are presented with a familiar structure which should allow them to find the required information quickly.

The Indicator Report consists of 4 parts, ordered according to the environmental disruption chain:

1. *Environment map* of Flanders*:* a short chapter discussing the so-called environmental profiles of the sectors (the sector's part in the different environmental themes) and eco-efficiency in Flanders. This first part can be read as a general summary of the state of the environment in Flanders;
2. *Sectors:* with a description of the activities and the environmental pressure of six sectors (households, industry, energy, agriculture, transport and trade & services);
3. *Environmental themes:* with a description of 21 environmental disruption processes (ranging from dispersion issues and eutrophication to climate change and the use of GMOs and coast & sea);
4. *Impacts:* with a description of the impact of this environmental disruption on humans, nature and the economy.

Each (environmental) theme is described concisely using carefully selected indicators for the main links in the disruption process. The indicators are ordered according to the different links; by way of information, the link is always indicated next to the title of the indicator.

Indicators as a reporting tool for (Flemish) environmental reporting

An indicator in MIRA indicates, refers to and/or informs about activities, situations, phenomena and so on in the environment. The indicator is given meaning via the presentation of the context by means of (historical or natural) reference values and/or objectives. The origin of the objectives is always indicated and at least the objectives of MINA plan 3 (2003-2007) are evaluated.

In order to ensure the policy-relevance of the (environmental) information, the discussion of the MIRA indicators aims to provide the best possible answers to the following questions:

- *What does the indicator show?:* with a description of the historical evolution of the indicator, the objectives and the distance to the target, and the share of the target groups;
- *How can the evolution be explained?:* with a critical evaluation of the evolution of the indicator based on measures taken by the government and target groups, and independent developments;
- *How can this be improved?:* with a description of possible measures required in order to make the distance to the target smaller or eliminate it.

Indicators with a human face

Environmental indicators tell us how the environment is faring and whether we are on the right track. In order to allow the reader to make a quick judgement, the indicators of the environmental themes and the impacts have been given a score using the so-called smileys. The evaluation always refers to the change in the indicator over the indicated period:

☺ Positive evolution with achievable target

😐 Unclear or limited positive evolution, but insufficient to meet target

☹ Negative evolution, moving away from target

? (Still) insufficient data available to judge evolution

The 'earmarking' of indicators undeniably involves a danger of too much simplification. Hence, the main aim of the smiley is to urge the reader to read the corresponding indicator description.

The indicators have at least been tested against the objectives of the 2003-2007 Environment Policy Plan (MINA plan 3, www.milieubeleidsplan.be). For some indicators, (policy) objectives are still missing or the historical dataset is still too limited, so that no evaluation is possible. The inclusion of these indicators is a plea for further attention to data collection and evaluation, both from the world of research and from policy makers.

More indicators and information at www.environmentflanders.be

There seems to be quite a strong culture of indicator-oriented environmental reporting in Flanders nowadays. Besides a selection of key indicators in the printed Indicator Report, an extensive set of (environmental) indicators can be consulted at www.environmentflanders.be.

An extensive set of nature indicators can be found on the website of the Nature Report (NARA) of the Research Institute for Nature and Forest:
www.natuurindicatoren.be or via www.nara.be.

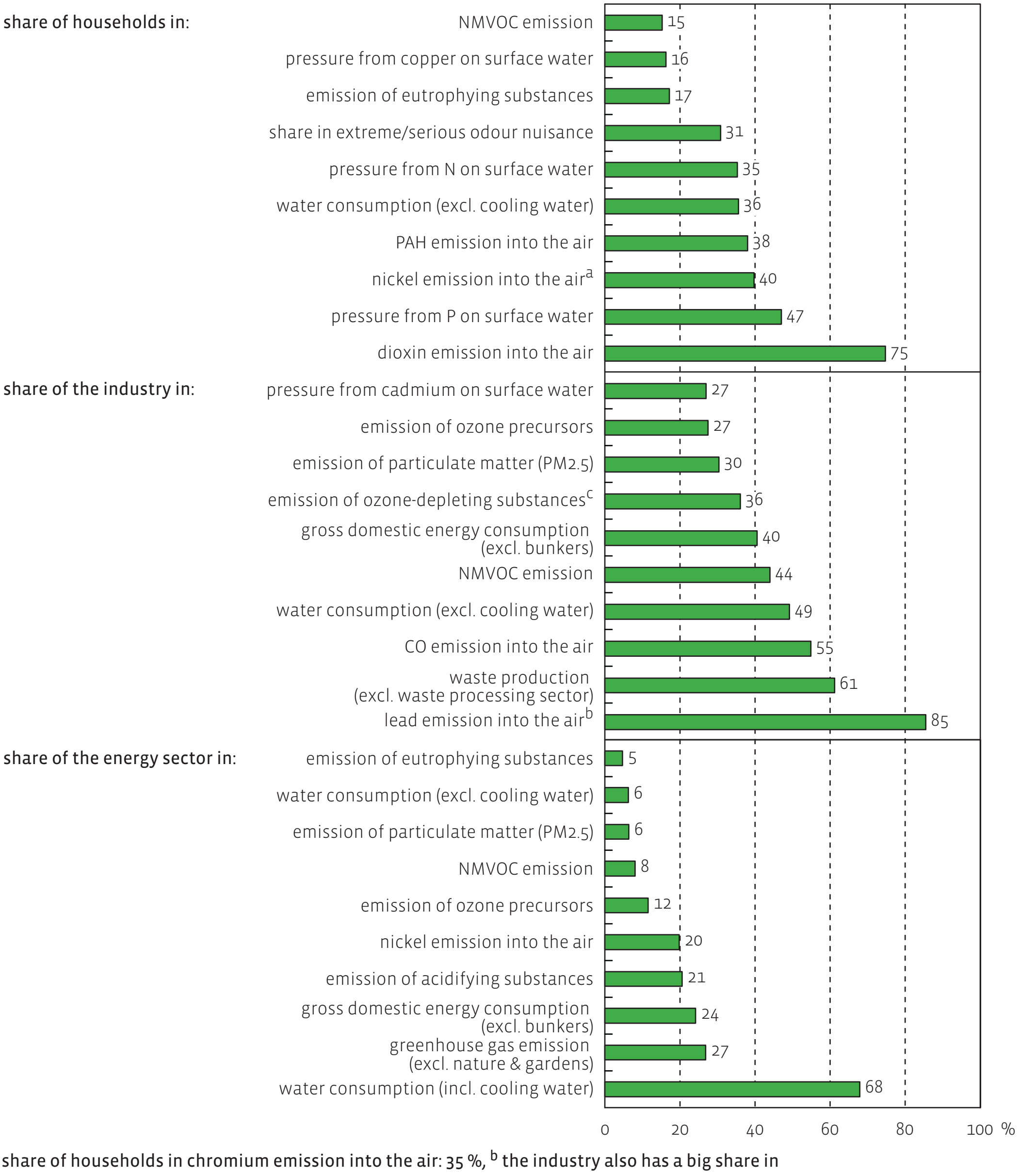
Indicators are really only the tip of the iceberg and are supported by extensive data collection and a solid scientific basis. The available information and knowledge of the sectors, environmental themes and impacts described in the framework of MIRA are brought together in background documents. With each new edition of the printed MIRA-T report most of these background documents are updated as well, and made available at www.environmentflanders.be.

1

Environment map of Flanders

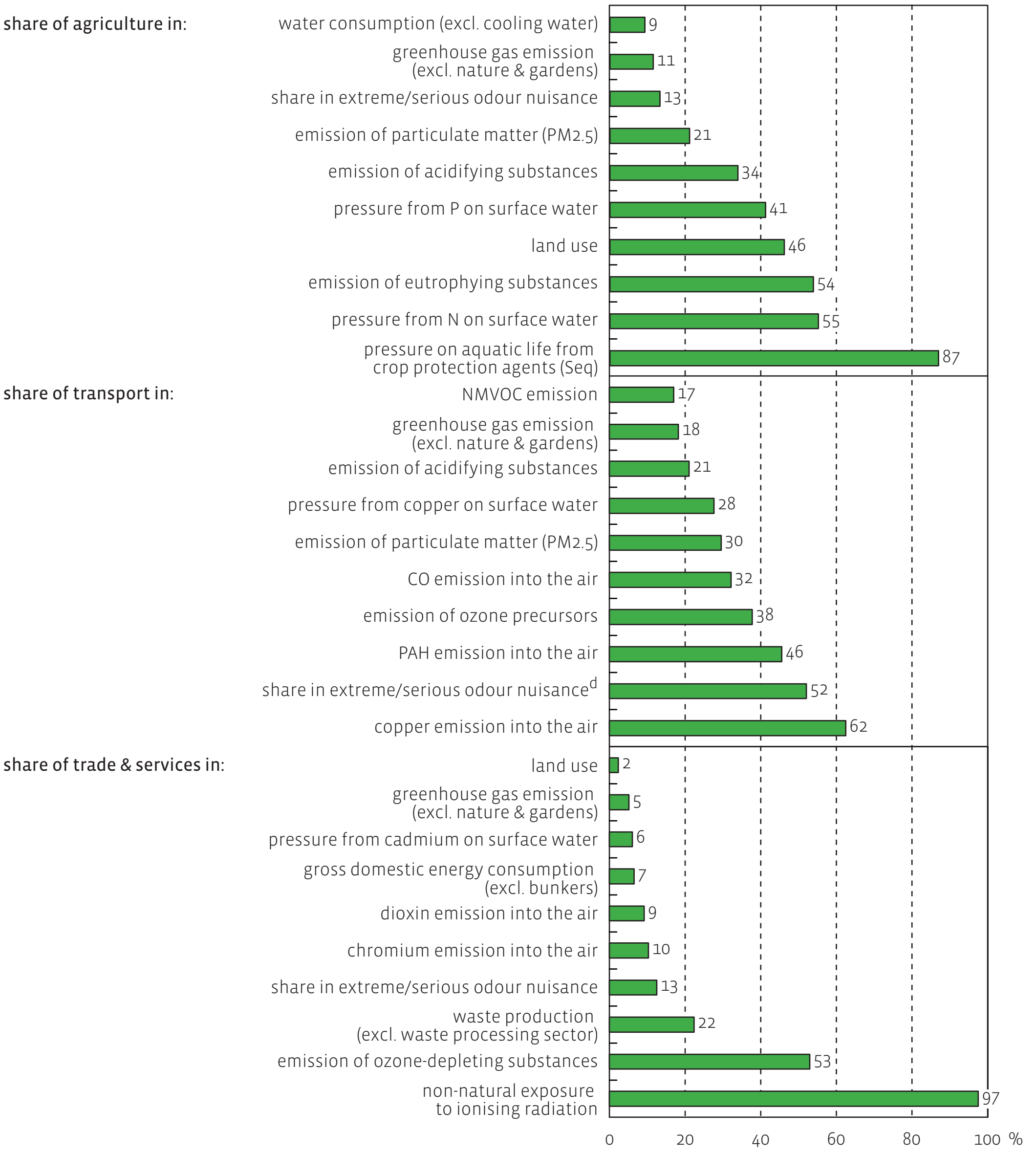
Environmental profile of the sectors

The environmental profiles show the contribution of the different sectors to the environmental pressure in Flanders. For each sector, the ten biggest shares in use of natural resources and emissions are shown.



[a] share of households in chromium emission into the air: 35 %, [b] the industry also has a big share in emissions of other heavy metals into the air, [c] including the energy sector
data for 2006, excluding pressure on aquatic life from crop protection agents (2005), pressure on surface water from heavy metals (2005), waste production (2005), nuisance (2004) and water consumption (2003)

Environmental profile of the sectors

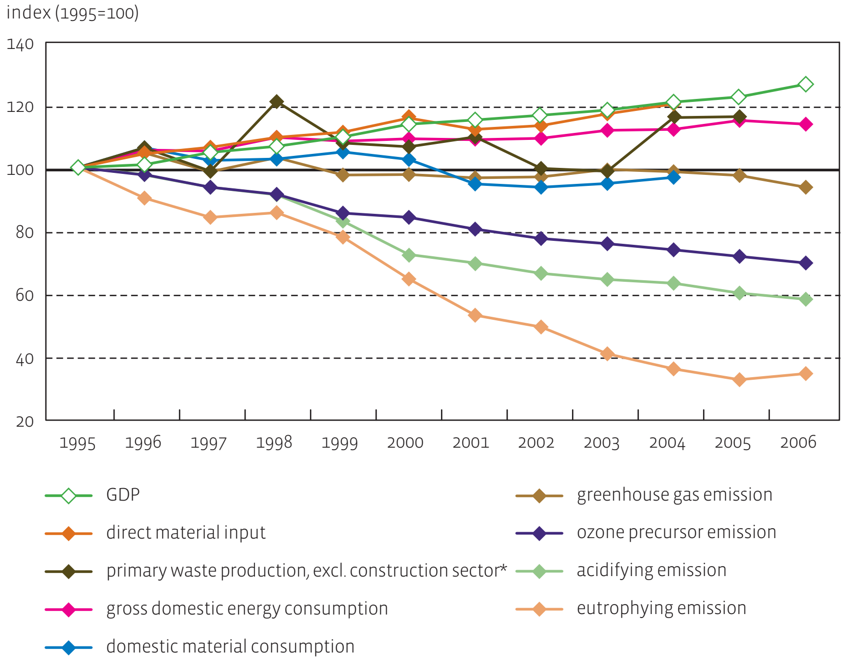


[d] share of transport in serious/extreme light nuisance: 41 %, in serious/extreme odour nuisance: 27 %, data for 2006, excluding pressure on aquatic life from crop protection agents (2005), pressure on surface water from heavy metals (2005), waste production (2005), nuisance (2004) and water consumption (2003)

Source: MIRA, VMM

Eco-efficiency in Flanders

DPSIR



* from households and companies, excluding subsectors for which data have only been available since 2000, and excluding the construction sector. Waste production by the construction sector accounts for more than a quarter of the primary waste and is subject to strong fluctuations.
The direct material input includes imports and own exploitation, excluding hidden flows. Domestic material consumption is the direct material input less the exports.

Source: NBB, calculations of CDO-UGent, OVAM, Flanders Energy Balance VITO, VMM

Environmental pressure largely uncoupled from economic growth

One of the objectives contained in the Flemish Coalition Agreement and the Flemish Policy Document on the Environment and Nature 2004-2009 is to uncouple environmental impact and material and energy consumption from the economic growth in Flanders, i.e. to increase the eco-efficiency of the Flemish economy. This goal has been partly achieved. All emissions have been uncoupled from the gross domestic product (GDP), albeit to a different extent: emissions of ozone precursors and acidifying and eutrophying substances have fallen sharply, emission of greenhouse gases remained fairly stable at first but have decreased slightly since 2003. The amount of primary waste (excluding waste from the construction sector) fluctuates, but it does seem to have increased less than the GDP during the period 1995-2005. A relative uncoupling can also be seen in the domestic material consumption and the gross domestic energy consumption: domestic material consumption has remained more or less constant, and energy consumption has increased globally, but at a slower pace than the GDP. However, direct material input has clearly risen at the same pace as the GDP. This rise is the result of the growing material demand for exports.

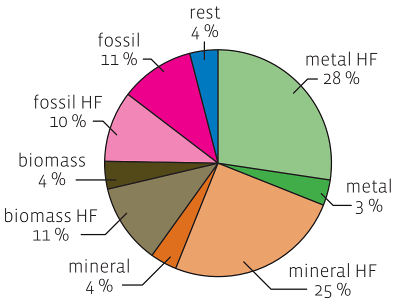
Eco-efficiency does not take into account environmental pressure abroad

Flanders strongly depends on imports. The waste and emissions resulting from exploitation abroad and from the production of imported goods are not included in the Flemish environmental statistics. The real eco-efficiency of Flanders can only be determined if that foreign environmental pressure is taken into account as well.

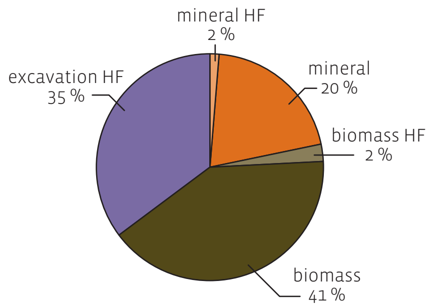
Hidden flows

DPSIR

imports and hidden flows



own exploitation and hidden flows



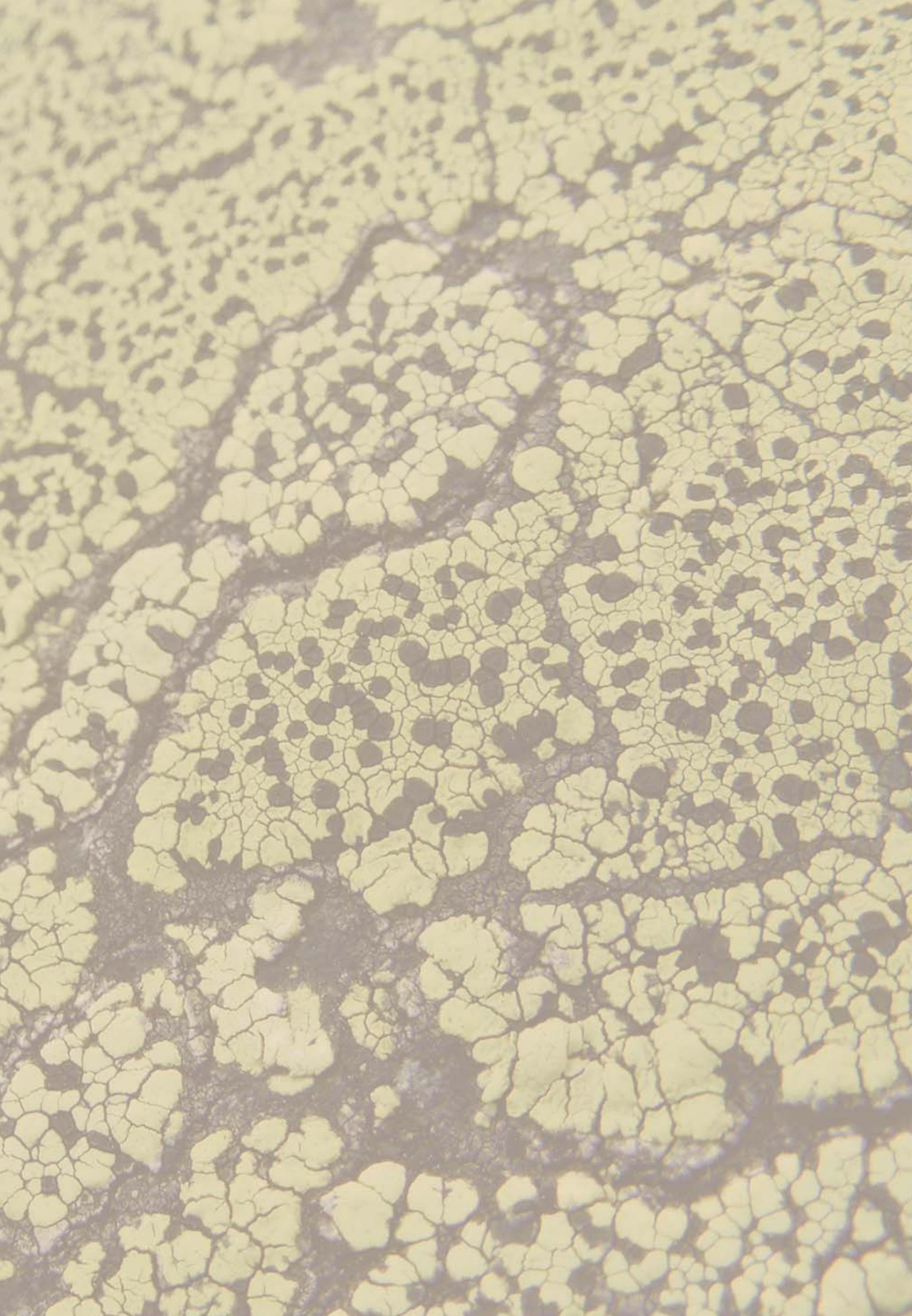
data for 2004
HF = hidden flows

Source: NBB and calculations of CDO, UGent

Attention to hidden flows
In order to keep its economy going, Flanders extracts raw materials from the environment all over the world. Through this exploitation hidden flows are generated: raw material flows that have no economic purpose, but do damage the environment. Examples are erosion by agriculture or layers of soil excavated during mining.

Very large hidden flows linked to import
Considerably more hidden flows are linked to import than to own exploitation: 74 % of the total material requirement from import are hidden flows, compared to 39 % for own exploitation.

The large hidden flows linked to import are partly characteristic of the exploited raw material (e.g. diamonds). Additionally, the often low efficiency of exploitation and production also plays a role. Imported agricultural products, for instance, often come with a considerable load of hidden flows (73 % of hidden flows compared to a 27 % yield) as a result of the high amount of erosion in crops such as coffee, cacao and soy beans. By way of comparison: for Flemish agricultural products the hidden flows amount to 5 %. Thus, the exploitation of imported raw materials probably generates more environmental pressure than exploitation within Flanders.



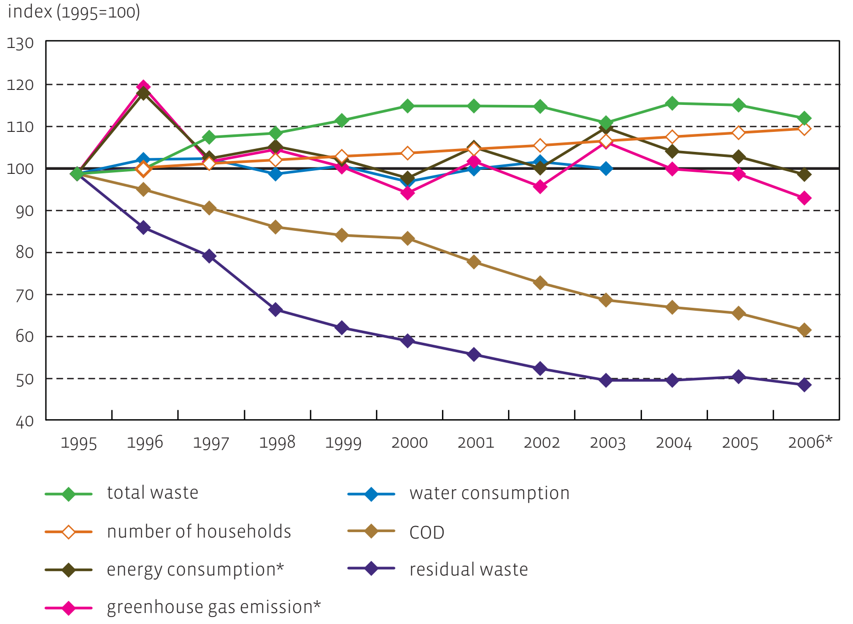
2

Sectors

2.1 Households

Eco-efficiency of households

DPSIR



* provisional figures for energy consumption and greenhouse gas emissions in 2006

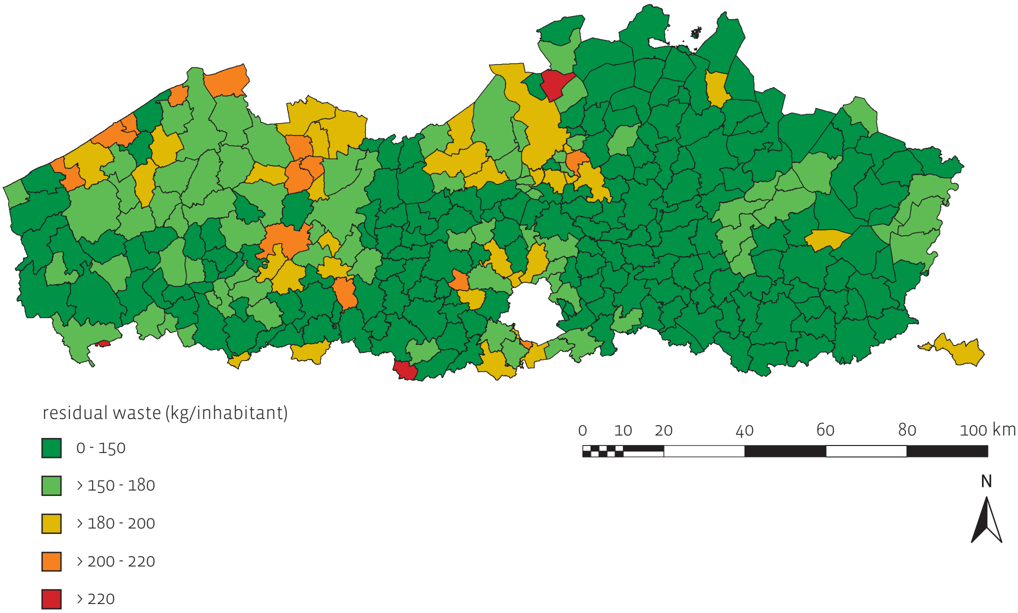
Source: NIS, OVAM, Flanders Energy Balance VITO, VMM

Households are slowly becoming more environmentally friendly
The number of households increased by 10 % in the period 1995-2006. The total amount of waste (+12.5 %) rose faster than the number of households. By contrast, the volume of residual waste decreased by 51 % in the same period as a result of successful separate collection (absolute decoupling). Energy consumption fell slightly (-1 %), whereas there was a more pronounced decrease in the corresponding greenhouse gas emission (-6.5 %) between 1995 and 2006. Thanks to the development of waste water treatment, an absolute decoupling can be observed in the chemical oxygen demand (COD) as well (-38 %). Water consumption does not show a clear trend, but has remained fairly constant in recent years.

	1995	2000	2005	2006*
number of households (1 000)	2 296	2 392	2 502	2 526
energy consumption (PJ)	233.4	229.4	241.1	231.2
greenhouse gas emission (ktonnes CO_2-eq)	13 612	12 895	13 501	12 727
water consumption (10^6 m^3)	264	258	270 (2002)	266 (2003)
total household waste (ktonnes)	2 888	3 331	3 337	3 249
COD (ktonnes)	116	97	76	72
residual waste (ktonnes)	1 911	1 183	977	939

Amount of residual waste per municipality

DPSIR



data for 2006
In the Household Waste Implementation Plan for 2003-2007 a correction factor was applied to 17 municipalities because of their specific function (core city, tourism, university city).

Source: OVAM

The amount of residual waste is decreasing
In 2006 3 249 ktonnes of household waste was collected in Flanders; this accounts for approx. 11 % of the total amount of primary waste. 71 % of all household waste is collected separately; the remaining 29 % is residual waste. In 2006 each citizen put out approx. 154 kg of residual waste, 7 kg less than in 2005.

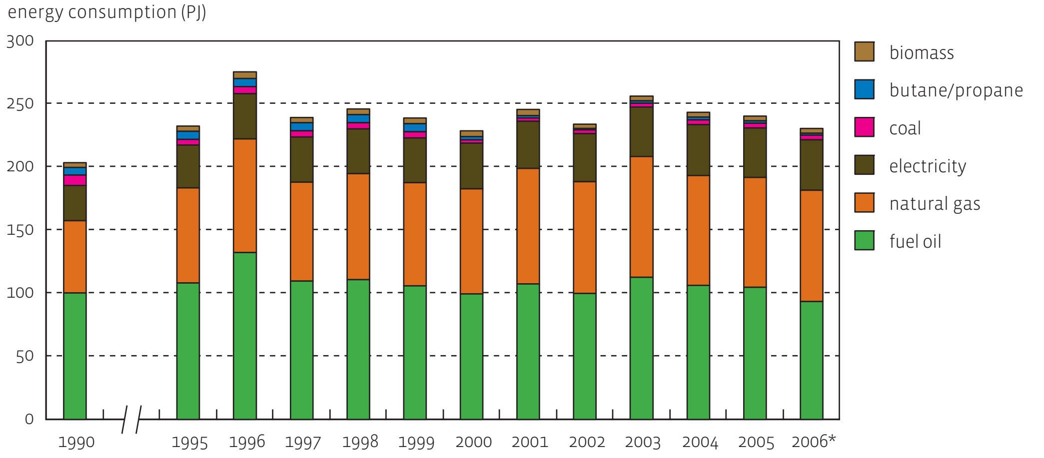
Big differences between municipalities
At the level of the individual municipalities, there are big differences. In 2006 59 % of municipalities already collected less than 150 kg of residual waste per inhabitant. On the other hand, 5 % of municipalities still collected more than 200 kg of residual waste per inhabitant, which means that the objective from the Household Waste Implementation Plan 2003-2007 (maximum 200 kg residual waste per inhabitant by 2005) was not achieved. Six of those municipalities are in the province of West Flanders, five in East Flanders, four in Flemish Brabant and one in Antwerp. On average, West Flanders is the province where most residual waste is collected per inhabitant. The main cause of this is coastal tourism.

amount of residual waste (kg/inhabitant)	1991	1995	2000	2001	2002	2003	2004	2005	2006	2007
average Flanders	331	325	191	180	169	160	159	161	154	
target individual municipalities						220		200		
target Flanders						180		165		150

Households

Energy consumption in private homes by fuel type

DPSIR



* provisional figures

Source: Flanders Energy Balance VITO

Start of a falling trend in domestic energy consumption

24 Energy consumption by households has increased from 204.4 PJ in 1990 to 231.2 PJ in 2006 (+13.1 %). However, since 2003 we can see that domestic energy consumption is falling. This is the result of the improved energetic quality of houses (insulation and more efficient heating installations), the trend to build smaller houses, and a slight shift towards flats. Even so, the energetic quality of Flemish private homes remains rather poor.

Energy consumption for heating very dependent on outside temperature

Households use fuels (fuel oil, natural gas ...) mainly for heating. As a result, the consumption of those energy carriers varies a lot in function of the average outside temperature.

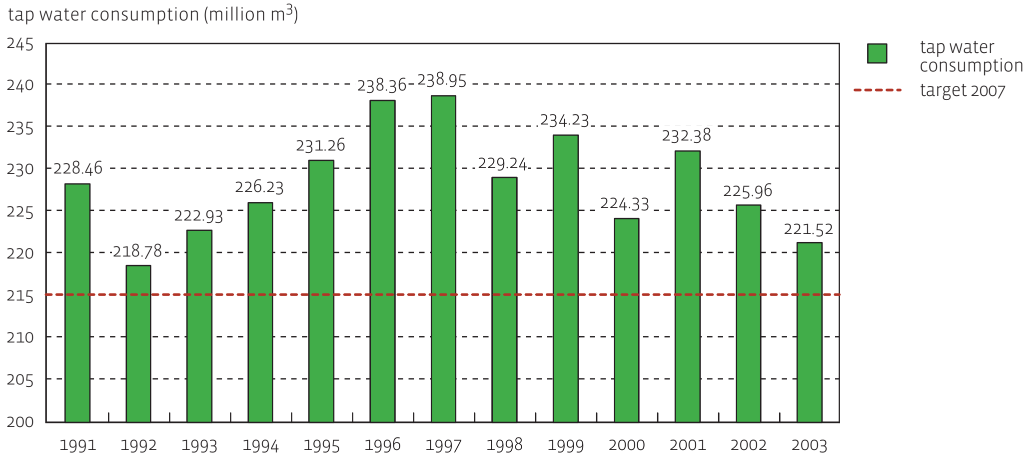
Domestic electricity consumption has risen

Between 1990 and 2006 electricity consumption increased almost constantly (+44.0 %) and much more than the consumption of fuels (+8.2 %). The average electricity consumption per household also continues to rise. Causes of this are the rising number of appliances, the longer use of those appliances (e.g. we watch more hours of TV), and the introduction of new appliances. These developments completely undo the energy savings that result from the greater efficiency of the appliances.

energy consumption (PJ)	1990	1996	2000	2002	2003	2004	2005	2006*
fuel oil	100.9	132.9	100.3	100.5	113.4	107.1	105.6	94.4
natural gas	57.4	90.1	83.1	88.6	95.9	87.0	87.0	87.9
electricity	27.9	35.9	36.1	38.3	39.2	40.3	39.2	40.1
coal	8.5	5.7	2.6	2.7	3.0	3.8	3.6	3.6
butane/propane	6.0	6.5	2.8	1.2	1.8	2.1	1.9	1.5
biomass	3.8	5.1	4.4	3.5	3.9	3.9	3.8	3.7
total	*204.4*	*276.2*	*229.4*	*234.8*	*257.2*	*244.2*	*241.1*	*231.3*

Tap water consumption

DPSIR



A uniform dataset could only be compiled up to 2003.

Source: VMM

Need for implementation of sustainable domestic water consumption policy
Since 2001 the tap water consumption by households has fallen. Based on new figures provided to VMM by the drinking water companies in 2007 the domestic tap water consumption in 2006 can be estimated at 189 million m^3. However, it is impossible to compare these figures to those for 1991-2003 because since January 2005 the drinking water companies have not been reporting to VMM in the same way as before as a result of a modification in the water bill. For this reason, it is not possible either to test the figures against the MINA plan 3 (2003-2007) objective (215 million m^3 in 2007).

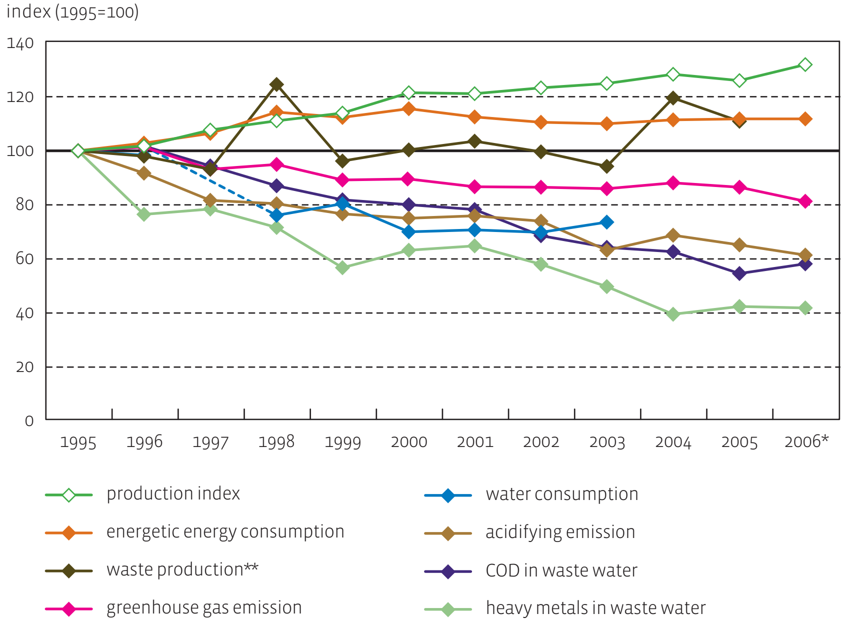
Since January 2005 the water bill for households has a different structure. The drinking water companies now do not only charge for the water used, but they also include a remediation contribution for the collection and treatment of the waste water in the bill. Consumers now know that the price of water is made up of several components, not just the production and delivery of drinking water. However, this measure can only be efficient if domestic water consumption is also measured correctly, and reduced water consumption results in lower costs. Not all Flemish homes are currently equipped with an individual water meter.

Awareness campaigns as well as other policy instruments, such as the subsidising of rainwater tanks, have to stimulate responsible water consumption by households.

2.2 Industry

Eco-efficiency of the industry

DPSIR



* provisional figures, ** waste production by the industry excluding the construction sector
COD = chemical oxygen demand, Aeq = acid equivalents

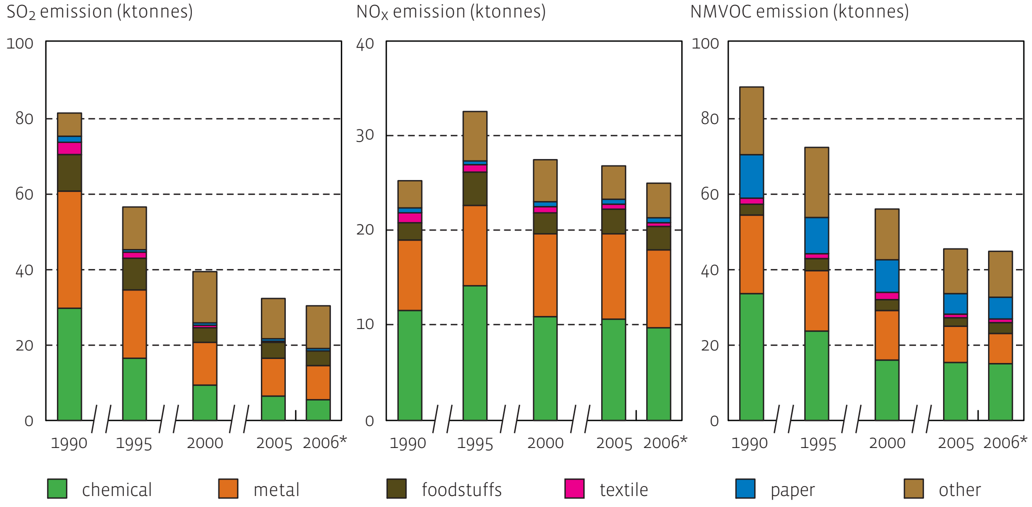
Source: NIS, OVAM, Flanders Energy Balance VITO, VMM

Increasing eco-efficiency, except for energy consumption and waste production
The industry in Flanders has succeeded in completely decoupling the environmental pressure of various parameters from the economic development through technological improvements and the use of more environmentally friendly products.
Between 1995 and 2006 the production index (an economic indicator representing industrial production) rose by 31 %. The emission of acidifying substances and the discharge of COD and heavy metals into waste water have decreased by respectively 39 %, 43 % and 59 % since 1990 (or 1992). The emission of greenhouse gases decreased by 20 %, industrial water consumption decreased by 27 % (2003 compared to 1995). For these parameters the decoupling is complete. The most important measures which have contributed to this are, amongst others, process-integrated measures, the use of DeNOx and DeSOx installations, changeover to low-sulphur fuel, the use of solvents with a lower NMVOC content and higher efficiency of waste water treatment techniques ... When it comes to energetic energy consumption and waste, there is no complete decoupling yet. In recent years, energetic energy consumption has been running more or less parallel to industrial activity, while waste production by the industry (excluding the construction sector) has fluctuated.

	1995	2000	2005	2006
production index	100	120	125	131
waste production (ktonnes)	7 859	7 822	9 446 (2004)	9 178 (2005)
energetic energy consumption (PJ)	353	406	392	392
acidifying emission (10^6 Aeq)	2 524	1 872	1 620	1 529
COD in waste water (tonnes)	63 088	49 931	33 869	36 128

Emission of SO_2, NO_X and NMVOCs into the air

DPSIR



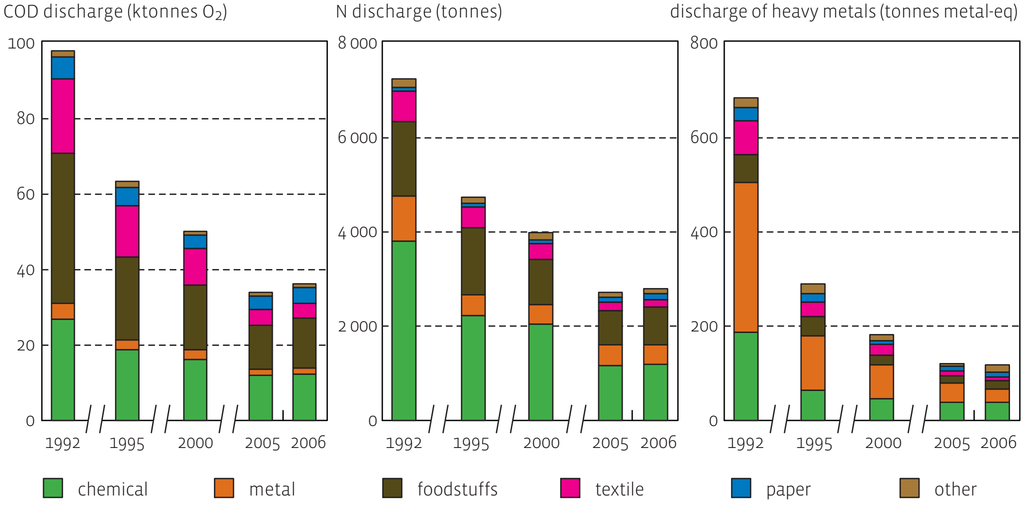
* provisional figures

Source: VMM

Sharp decrease for SO_2 and NMVOC emissions, status quo for NO_X emission
Industrial NMVOC emissions fell by 49 % during the period 1990-2006 thanks to efforts in several subsectors such as the *chemical industry*, *metal degreasing* and *automobile assembly*. The measures mainly focus on product optimisation, vapour recovery, the use of low solvent content products, water-based paints and inks, etc. The European Solvent Emissions Directive imposes limit values for direct and diffuse emissions for different industrial installations and its phased implementation will lead to a further decline in NMVOC emissions in the future.

SO_2 emissions dropped by 63 % during the period 1990-2006, particularly thanks to the efforts of the *chemical* and *metal* subsectors during the first half of the 1990s. However, in 2006 the total industrial NO_X emission was approximately at the same level as in 1990. SO_2 and NO_X emissions can be reduced by switching from solid or liquid fossil fuels to low-sulphur fuels (natural gas), by process measures or by DeSOx and DeNOx installations, and a higher energy efficiency.

Discharges of COD, N and heavy metals in industrial waste water DPSIR



COD = chemical oxygen demand, BOD = biochemical oxygen demand, N = nitrogen

Source: VMM

28

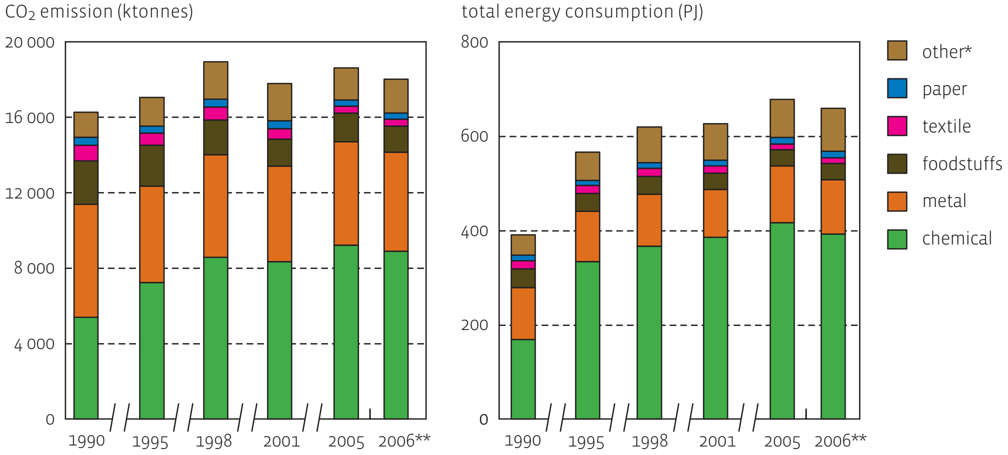
Decreasing discharge for all pollutants

Industrial discharges of nitrogen and phosphorus decreased continuously in the period 1992-2006 and were significantly lower in 2006 than in 1992 (-62 % and -78 % respectively). The total emission of heavy metals (in metal equivalents) dropped by 83 % between 1992 and 2006, mainly in the period up to and including 1995. The greatest reductions were recorded for the metal (-90 %) and chemical (-80 %) sectors. Nevertheless, these two subsectors continue to be the most important dischargers of heavy metals.

In the period 1992-2006 the industrial discharge of BOD and COD dropped markedly, by 65 % and 63 % respectively. The most important reductions occurred in the chemical, the food and the textile industries. The declining discharge figures can be attributed to more efficient purification techniques and improved production processes.

The total amount of industrial waste water discharged in 2006 was 213 million m^3. Up to 2003 a decrease in the discharged volume could be observed, among other things due to higher levies on groundwater abstraction and waste water discharges, which lead companies to use water more sparingly. Since 2003 there is again a slight increase in the amount of discharged waste water.

Energy consumption and CO_2 emissions



* including the relatively insignificant consumption for low tension and heat which cannot be attributed to the various subsectors
** provisional figures

Source: Flanders Energy Balance VITO

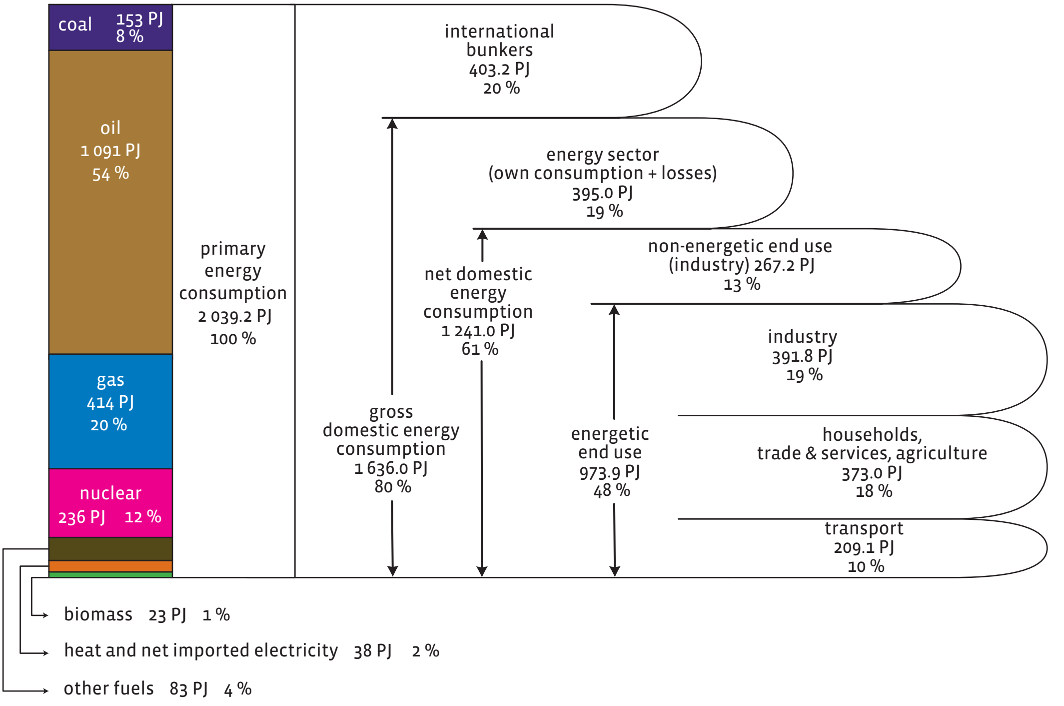
Total energy consumption and greenhouse gas emissions do not go down
The industry discharged 18.02 Mtonnes of CO_2 in 2006 – 10.7 % more than in 1990.
An important part of this rise can be attributed to the tenfold increase of non-energetic energy consumption in the chemical industry (use of energy carriers such as e.g. petroleum as raw materials for various synthetics, or natural gas for the production of ammonia).
The CO_2 emission caused by energetic energy consumption fell sharply between 1990 and 2006 in the textile (-54 %), food (-40 %), nonferrous (-22 %) and paper (-19 %) industries. However, it rose in the chemical (+30 %) and in other industries (+32 %). Globally, CO_2 emissions from energetic energy consumption fell by 2.5 %.

Since 1990 the total industrial energy consumption in Flanders has risen by 68.8 %. In 2006 it had a share of 40.3 % in the gross domestic energy consumption. 64 % of the increase can be attributed to the drastic increase in ‘non-energetic energy consumption’ in the chemical industry. Energetic energy consumption fell between 1990 and 2006 in the textile (-36 %) and the food sector (-9 %), and rose in the paper (+23 %), metal processing (+11 %), chemical (+52 %) and various other industries (+152 %).

2.3 Energy

Energy flows in Flanders

DPSIR



provisional figures for the year 2006

Source: Flanders Energy Balance VITO

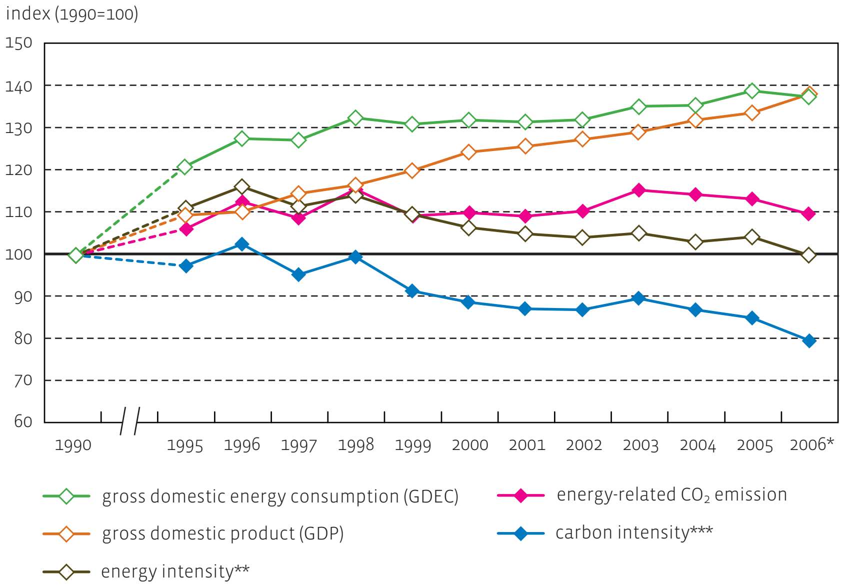
Fossil fuels continue to dominate the energy mix

Nuclear energy accounts for 12 % of primary energy consumption in Flanders. Despite a significant growth in recent years, the contribution of renewable sources of energy remains limited: 1.1 % for biomass and 0.04 % for primary electricity production from water, wind & solar energy. As a result, Flanders continued to be dependent on fossil fuels for most of its energy consumption in 2006.

gross domestic energy consumption (PJ)	1990	1995	2000	2005	2006*
households	204	233	229	241	231
industry (energetic + non-energetic)	390	566	651	679	659
energy	343	342	366	384	395
agriculture	36	37	33	33	32
transport	166	185	204	209	209
trade & services	54	76	86	104	107
total	*1 193*	*1 439*	*1 571*	*1 653*	*1 636*

* provisional figures

Energy and carbon intensity in Flanders



* provisional figures
** energy intensity = amount of Gross Domestic Energy Consumption (GDEC) per unit of Gross Domestic Product (GDP) in constant prices
*** carbon intensity = amount of CO_2 emitted as a result of energy consumption (incl. process emissions in the chemical industry and emissions as a result of the non-energetic consumption of fuels) per unit of Gross Domestic Product (GDP) in constant prices

Source: VITO, VMM

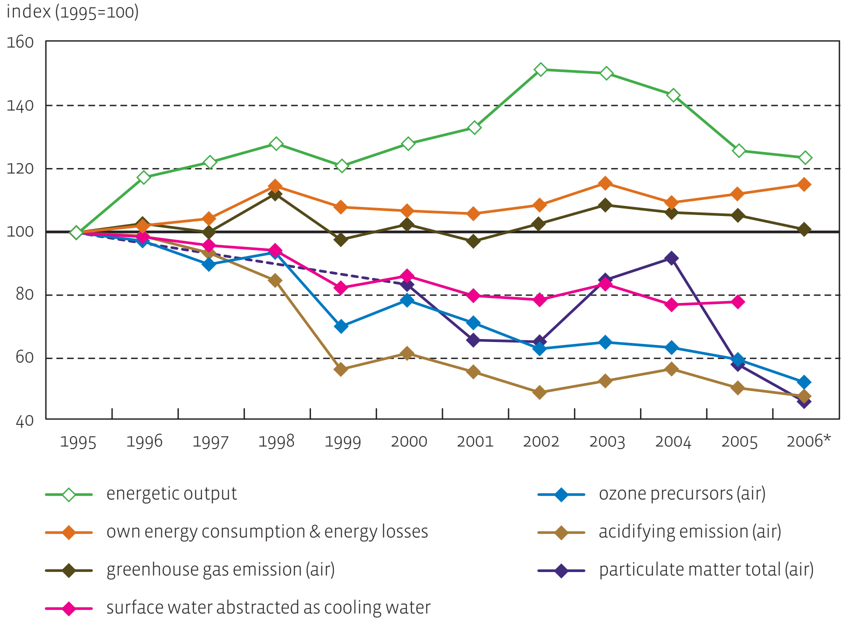
Energy intensity in Flanders plunges below the 1990 level

The *energy intensity* of the Flemish economy decreased by 0.5 % between 1990 and 2006 (compared to a 3.9 % increase in 2005 with respect to 1990). The energy intensity increased by 13.7 % between 1990 and 1998, and decreased almost continuously after that. The 'jump' between 1990 and 1995 is mainly the result of the increase in non-energetic energy consumption in the industry. A change in the energy intensity can be the result of either a structural effect (shifts in the importance of sectors within the Flemish economy) or changes in the energy efficiency (e.g. a change in energy consumption per unit, product or service).

Whereas the decrease in *energy intensity* remains fairly modest, *carbon intensity* decreased by 20.6 % in the period 1990-2006. Although both curves show a similar course, the carbon intensity curve ends lower as a result of the switch to lower-carbon fuels in Flanders: solid fuels with a high CO_2 emission factor have been replaced mainly by natural gas with a lower CO_2 emission factor.

Eco-efficiency of the energy sector

DPSIR



* provisional figures

Source: MIRA based on VITO and VMM

Improved output of energy production

The energetic output of the energy sector – i.e. the total energy content of the finished products – increased by 24 % in the period 1995-2006. The energy used by the sector itself and the energy that is lost during transformation, transport and distribution increased at a slower pace (+15 %). This relative decoupling points to improved efficiency.

Slower decrease in the energy sector's greenhouse gas emissions

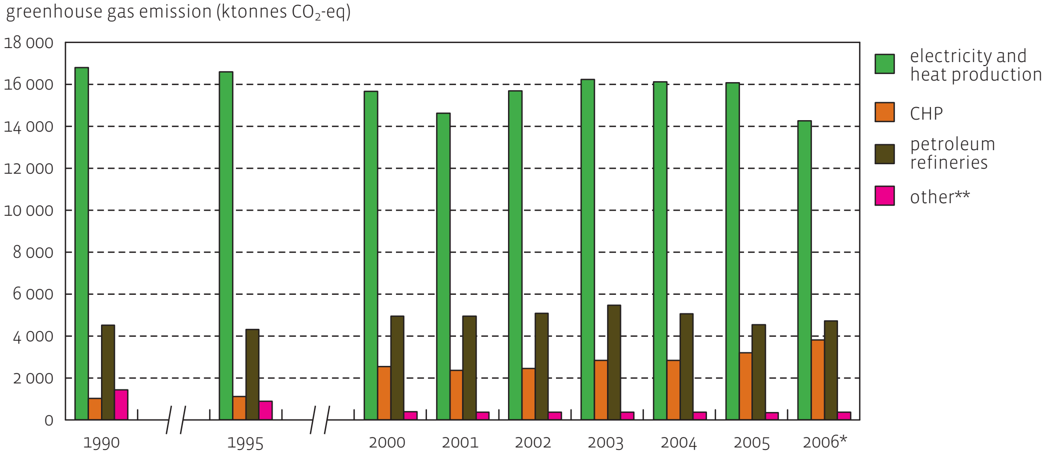
The emission of particulate matter, acidifying substances and ozone precursors is approximately 50 % lower in 2006 than in 1995 (absolute decoupling), but remains strongly dependent on the use of coal in power plants (e.g. change after 2002). Despite the positive evolution since 2003, there is no absolute decoupling for greenhouse gases yet. The decreasing trend in the consumption of cooling water in the 1990s has not continued. As a result, the energy sector remains by far the biggest water consumer in Flanders.

	1995	2000	2005	2006*
energetic output (PJ)	1 403	1 803	1 772	1 741
own energy consumption & energy losses (PJ)	342	366	384	395
greenhouse gas emission (ktonnes CO_2-eq)	22 958	23 573	24 217	23 209
surface water abstracted as cooling water (million m^3)	3 280	2 832	2 560	..
emission of ozone precursors (tonnes TOFP)	80 026	62 844	47 789	42 068
acidifying emission (million Aeq)	4 102	2 531	2 081	1 971
particulate matter total (tonnes particulate matter)	4 673	3 902	2 718	2 171

TOFP = tropospheric ozone forming potential, Aeq = acid equivalents

Emission of greenhouse gases by the energy sector

DPSIR



* provisional figures
** mainly transport & distribution of natural gas, coal mines and coking plants

Source: VMM

Use of fossil fuels dominates emissions from the energy sector
In 2006 the emission of greenhouse gases by the energy sector dropped below the level of 1990 for the first time. The closure of the coal mines and the only independent coking plant resulted in the biggest net decrease. Decreasing emissions from traditional thermal power plants (e.g. as a result of the switch from coal to natural gas) were undone by the increasing emissions from CHP installations (CHP = combined heat and power). However, the primary energy saving in CHP installations allowed for emission reductions[1] in other sectors. Between 2002 and 2005 an increased use of coal and blast furnace gas – which already contains 25 % CO_2 – in electricity production caused a temporary increase. The emissions from petroleum refineries fluctuate due to variations in their own energy consumption and in the losses during transformation.

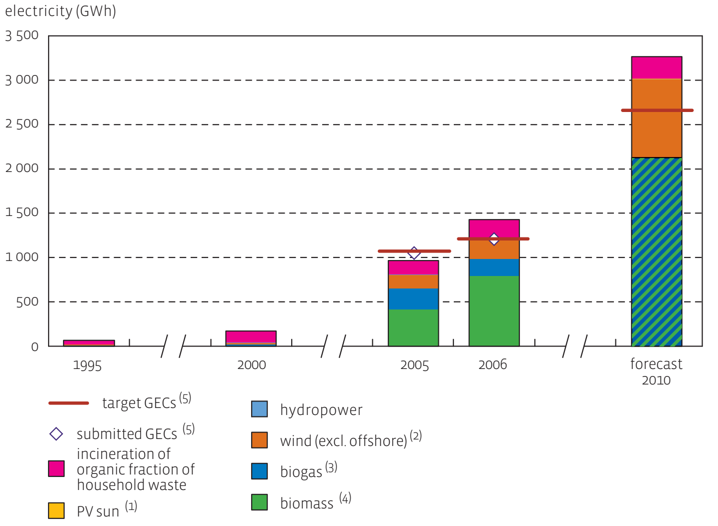
Even more than in other sectors, greenhouse gas emissions from the energy sector in 2006 consisted mainly of CO_2: 98.5 %, mainly as a result of the burning of fossil fuels. The rest of the emissions were CH_4 (1.1 %, mainly losses due to leakage during the distribution of natural gas), N_2O (0.42 %, incomplete combustion) and SF_6 (0.03 %, losses due to leakage during the insulation of equipment in high-voltage substations.

greenhouse gas emission (ktonnes CO_2-eq)	1990	1995	2000	2005	2006*
electricity & heat production	16 832	16 647	15 700	16 112	14 286
CHP	1 018	1 111	2 539	3 211	3 821
petroleum refineries	4 519	4 309	4 946	4 548	4 728
other**	1 437	891	388	346	374
total	*23 806*	*22 958*	*23 573*	*24 217*	*23 209*

[1] *Whereas emissions for separate heat production are usually counted with the other sectors, emissions in CHP installations for combined heat and power generation are usually classified under the energy sector as a whole.*

Electricity production from renewable energy sources (green power)

DPSIR



(1) installations under subsidy regulation since 1998
(2) Offshore wind energy cannot be taken into account for the certificate obligation.
(3) organic waste fermentation, gasification of wood; in 2010 including biomass
(4) co-burning of wood, sludge and/or olive stones. Green power from biomass is classified under 'biogas' in 2010.
(5) It concerns respectively the target and the actual number of certificates submitted before 31 March of the following year. The number of submitted GECs (Green Energy Certificates) may differ from the number of GECs awarded during the year itself.

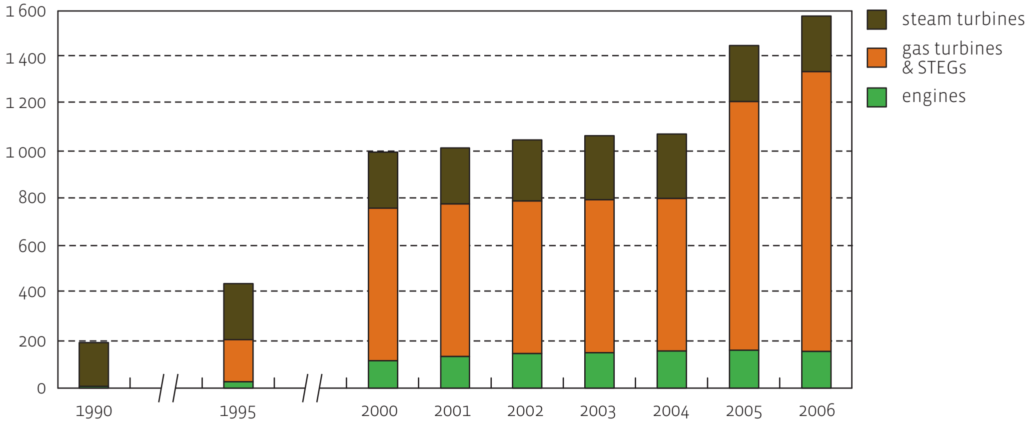
Source: VEA

Despite strong growth, green power remains marginal
Once more, the production of green energy rose sharply in 2006: a 48 % increase compared to 2005. The 1 429 GWh of green energy for 2006 correspond to 2.4 % of the gross electricity *consumption* in Flanders.

Target of green power certificates approached
In 2006 the electricity *suppliers* had to submit green energy certificates (GECs) for 1 270 GWh on 31 March 2007 (GECs; 1 GEC = 1 MWh of green power). GECs were submitted for 1 268 GWh, so 99.8 % of the certificate obligation was complied with. Not all available GECs were submitted on 31 March 2007: in total GECs were available for 1 588 GWh, either granted for power production in the period 1.1.2006-31.3.2007, or accumulated from previous years.

electricity production (GWh)	1995	2000	2005	2006	*forecast 2010*
incineration of organic fraction of household waste	46.3	132.0	160.0	208.1	*253*
PV sun(1)	0	0.1	1.1	1.4	*3*
hydropower	2.0	2.2	2.3	2.1	*3*
wind (excl. offshore)(2)	8.6	15.5	154.0	237.5	*885*
biogas(3)	8.6	20.6	235.5	188.1	*2 123*
biomass(4)	0	0	413.0	792.1	
total	*65.5*	*170.4*	*965.9*	*1 429.3*	*3 267*

Production of electricity and heat via cogeneration (combined heat and power, CHP)



Source: VITO

CHP advance resumed
Cogeneration (combined heat and power, CHP) is the simultaneous generation of heat and power from primary energy sources (e.g. natural gas or biomass). The power is usually used to generate electricity. By the end of 2006, a total *capacity* of 1 582 MW_e of CHP installations was operative in Flanders. 859 MW_e of these were quality CHP installations which generated a primary energy saving with respect to the reference installations for separate *electricity and heat production*. All CHP installations together produced 8 452 GWh of electricity in 2006, which corresponds to 14 % of the gross electricity consumption. This means an 11 % increase with respect to 2005 in quality CHP capacity and a 21 % increase in electricity production in all CHP installations together.

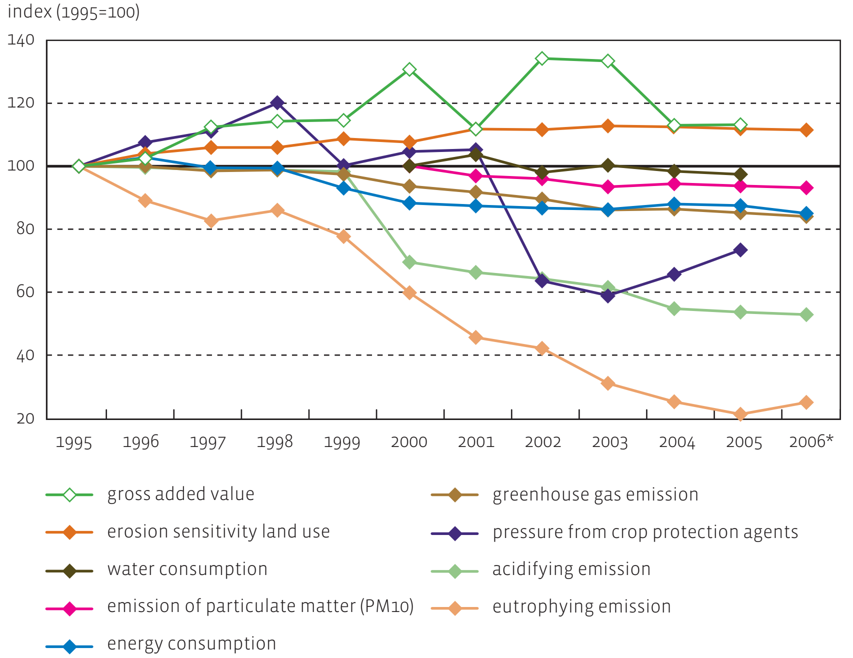
On 31 March 2007 electricity suppliers had to submit *combined heat and power certificates* (CHPCs) corresponding to a primary energy saving of 1 032 GWh. Only quality CHP installations receive CHPCs degressively. Based on the power production in the period between 1 January 2006 and 31 March 2007 and the certificates accumulated from the previous years, theoretically 58 % of the CHPCs needed to achieve the quota were present in the market. Certificates were only submitted for 566 GWh of primary energy saving (54.9 % of the quota).

operational electrical capacity (MW_e)	1990	1995	2000	2005	2006
engines	8	27	116	161	155
gas turbines & STEGs	-	179	649	1 057	1 190
steam turbines	187	238	238	239	237
total	*194*	*444*	*1 003*	*1 457*	*1 582*

2.4 Agriculture

Eco-efficiency of agriculture

DPSIR



* provisional figures

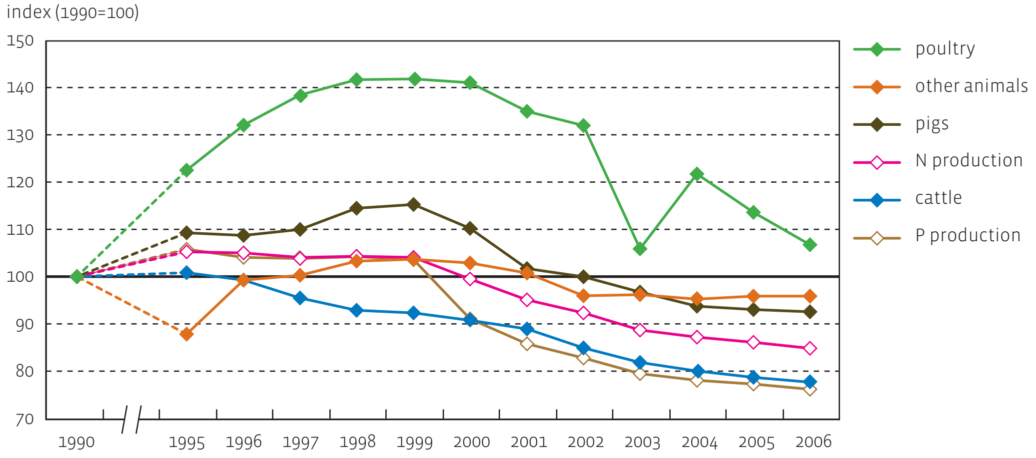
Source: Aquafin, FOD Economie, ILVO, VITO, Vlaco, VMM

Agriculture is doing better in the environmental area

Environmental pressure from agriculture has decreased, while the volume of activity, expressed as gross added value, has stagnated. The eco-efficiency of agriculture is growing, except for erosion sensitivity. Increase of scale and a reduced livestock since 2000 have intensified the falling trend in emissions and resource use. Acidifying and eutrophying emissions have fallen sharply by more than 53 % and 25 % respectively since 1995. Driving forces behind the decline are the reduction of livestock numbers, the reduced use of chemical fertiliser, the application of low-emission techniques and the lower levels of nutrient content in animal feeds. The rise for eutrophication in 2006 was a result of the poor harvest. The decrease in livestock numbers and the switch to natural gas explain the decreasing greenhouse gas emissions. The pressure on aquatic life from crop protection agents reached the target for 2005 in 2003: a 50 % reduction with respect to 1990. Since then, however, a slight increase has been registered.

	1995	2000	2005	2006
gross added value (10^6 euro)	2 254	2 943	2 594	..
energy consumption (PJ)	34.4	30.4	30.1	29.2
crop protection agents (10^9 Seq)	32	33.5	23.5	..
eutrophying emission (Eeq)	37.5	22.4	8.0	9.6
acidifying emission (10^6 Aeq)	5 978	4 165	3 215	3 168
greenhouse gas emission (ktonnes CO_2-eq)	11 490	10 764	9 798	9 678
erosion sensitivity (index)	100	107.55	111.79	111.45
water consumption (10^6 m^3)	..	68.8	66.9	..
emission of particulate matter (PM10) (tonnes)	7 190	7 195	6 740	6 698

Livestock and animal manure production



Source: 15 May count FOD Economie, ILVO

Less animals in agriculture ...

The size of the Flemish cattle stock has been decreasing since 1996 due to improved efficiency (dairy stock) and the worsened economic situation (meat stock). In comparison with 1990 the number of cattle in 2006 dropped by 24 %. The reduction of the pig stock started after 1999 as a result of the drop in prices (since 1998), the dioxin crisis (1999), the purchase agreement (2001-2004) and the stricter manure policy. The poultry stock underwent a great expansion up to 1998, which was followed by 3 stable years, but went down from 2001 onwards as a result of the manure policy, the dioxin crisis and the fowl plague. The latter, in combination with low prices, are also the cause of a strong temporary fall in 2003. After that, the figures continue on the previous decreasing trend. Rising raw material prices are presenting the poultry and pig industries with new challenges.

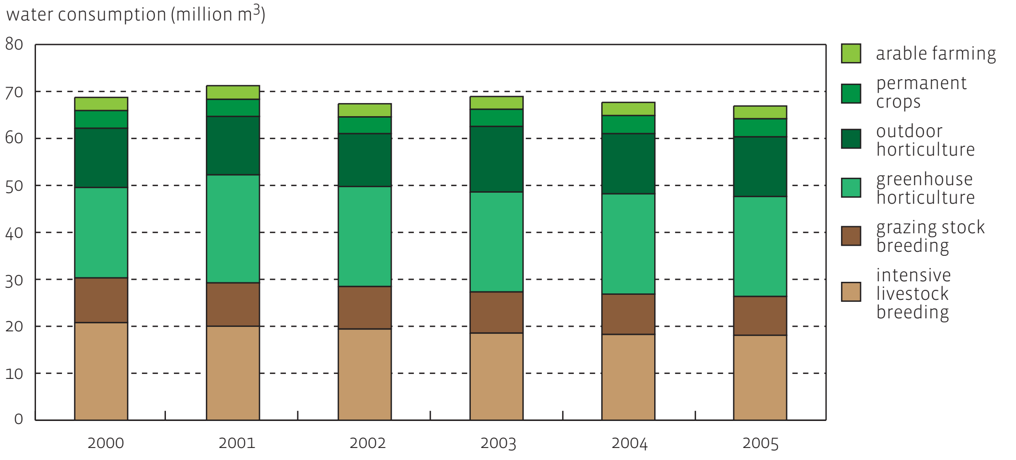
... and less manure

The production of animal manure has been continuously decreasing since 1999, a peak year for livestock. The decrease is stronger for phosphorus because the poultry stock decreased the most. Poultry manure contains relatively more phosphorus. The main driving force behind the decrease is the decreasing livestock, but also the use of lower nutrient content feed in the pig and poultry industries and the increased efficiency of dairy cows. The animal manure used on agricultural land, with 49 million kg of phosphate in 2006, already dropped below the objective of MINA plan 3 (2003-2007) of 55 million kg by 2007.

	1990	1995	2000	2005	2006
cattle	1 715 772	1 731 113	1 558 075	1 350 304	1 332 923
pigs	6 395 797	6 990 977	7 051 094	5 952 518	5 924 171
poultry	25 998 165	31 860 249	36 663 318	30 385 744	28 144 820
other animals	165 380	151 154	192 488	158 715	158 622
animal manure production (ktonnes N)	181.7	191.3	180.8	156.6	154.2
animal manure production (ktonnes P)	34.7	36.7	31.6	26.8	26.4

Water consumption in agriculture

DPSIR



Source: ILVO

Arable farming and horticulture consume more water than stockbreeding

Agriculture used 67 million m³ of water in 2005. The subsectors greenhouse horticulture, intensive stockbreeding and outdoor horticulture are the biggest water consumers with 37 %, 27 % and 19 % of the total water consumption by agriculture in 2005. The container fields which belong to outdoor horticulture and greenhouse horticulture hardly make use (if any) of natural precipitation; crops are always irrigated. The high water consumption by intensive stockbreeding is mainly due to the large amounts of drinking water for the animals. In addition, the stockbreeding sector also uses a lot of water for the cleaning of stables and milking machines. Cattle use 51 % of the water within the stockbreeding sector, followed by pigs with 38 %.

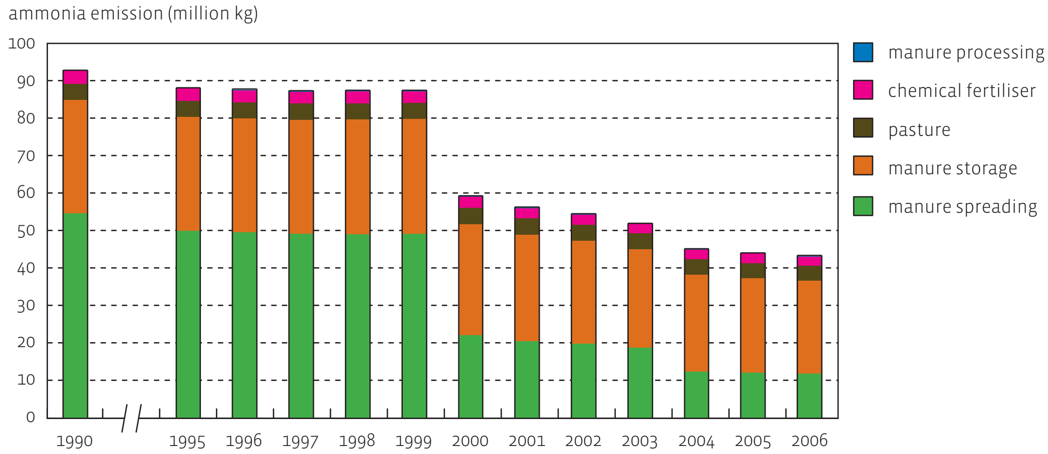
Falling water consumption in stockbreeding

Water consumption in agriculture fell by 3 % between 2000 and 2005. This fall is completely due to a 3.9 million m³ (or 13 %) *decrease in water consumption by stockbreeding* as a result of the reduction in livestock numbers. In reality, water consumption by stockbreeding will have dropped even more. The index numbers were maintained constant over the examined period, which means that a reduction in the water consumption as a result of water savings e.g. during the cleaning of the milking machines or due to a reduction of the amount of water which is spilt, was not taken into account between 2000 and 2005. Water consumption in arable farming and horticulture has fluctuated over the years. This is the result of shifting between different crops, especially in greenhouse horticulture and outdoor horticulture.

water consumption (million m³/y)	2000	2001	2002	2003	2004	2005
intensive livestock breeding	20.8	20.0	19.4	18.6	18.3	18.1
grazing stock breeding	9.5	9.2	9.1	8.7	8.6	8.3
outdoor horticulture	12.6	12.4	11.3	13.9	12.8	12.7
greenhouse horticulture	19.3	23.1	21.3	21.3	21.4	21.3
permanent crops	3.8	3.6	3.6	3.7	3.8	3.8
arable farming	2.8	2.9	2.7	2.6	2.8	2.7
total	*69*	*71*	*67*	*69*	*68*	*67*

Ammonia emissions in agriculture

DPSIR



Source: VMM

Falling emissions

Agriculture is responsible for 93 % of ammonia emissions in Flanders. Ammonia (NH_3) is an important component of potentially acidifying emissions. During the period 1990-2006 there was a remarkable drop in ammonia emissions (53 %). The biggest drop in ammonia emissions occurred in 2000 (-32 % in comparison with 1999) with the coming into effect of manure decree MAP 2 bis, which made the low emission application of fertiliser obligatory. The downward trend continued after 2000, also as a result of the livestock reduction, which accounts for about one third of the fall. Due to a declining use of chemical fertiliser the corresponding NH_3 emission has also decreased.

Emission ceiling for 2010 in view

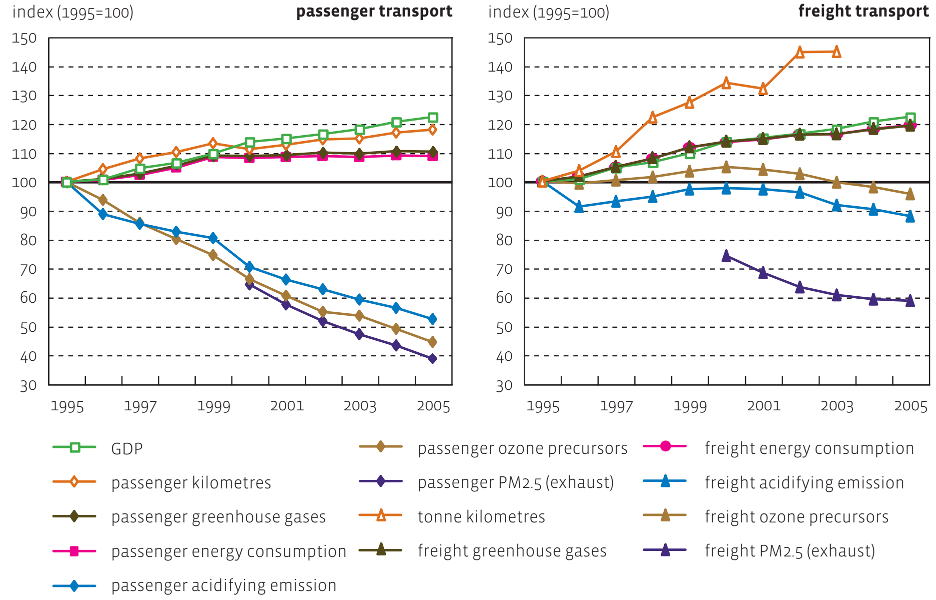
The policy target is a Flemish NH_3 emission of 45 million kg in 2010 for all sectors. This target seems achievable on the condition that further measures are taken. In agriculture, this can be done via low emission storage and a reduced nitrogen content of feed for pigs and poultry.

ammonia emission (million kg)	1990	1995	2000	2005	2006
chemical fertiliser	3.49	3.26	2.86	2.5	2.5
manure spreading	54.68	50.01	22.24	12.3	12.1
manure storage	30.27	30.44	29.64	25.1	24.7
pasture	4.23	4.34	4.32	4.0	4.0
manure processing	-	-	0.1	0.1	0.1
total	*92.67*	*88.04*	*59.06*	*43.9*	*43.2*

2.5 Transport

Eco-efficiency of transport

DPSIR



Due to a change in the calculation of the number of vehicle kilometres in 2006 no emission data for road traffic could be obtained for 2006 which were consistent with the period 1995-2005. Therefore, the discussion of data will be limited to the period 1995-2005 for all parameters. For railway transport, only emissions from diesel trains are included.

Source: De Lijn, Flanders Energy Balance VITO, FOD MV (2006), NIS, NMBS, PBV, SVR, VITO, VMM

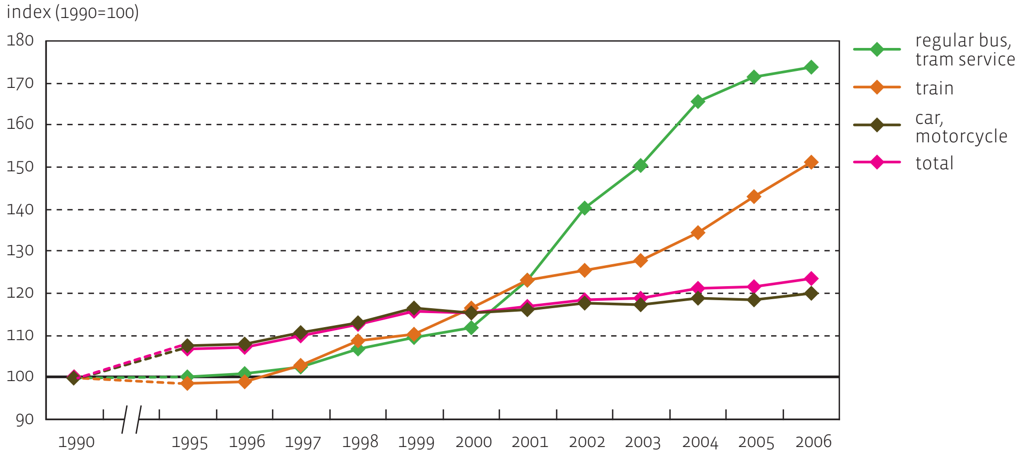
Eco-efficiency of passenger transport better than that of freight transport

In contrast with energy consumption by passenger transport (road and railway), energy consumption by freight transport (road, rail and inland navigation) continued to rise after 2000. CO_2 emissions followed that trend. The evolution was especially determined by road traffic, which represents the bulk of transport flows. The changeover of the vehicle fleet to diesel and an increased availability and purchase of lower consumption vehicles explain the stabilisation in passenger transport. The strong growth in freight transport, on the other hand, resulted in rising greenhouse gas emissions. Both for passenger and freight transport, the emission of ozone precursors, acidifying substances and PM2.5 was lower in 2005 than in 1995. This is the result of the stricter European emission standards for new vehicles and fuels. Due to the strong growth in activity, emissions from freight transport decreased later or less strongly than those from passenger transport. The introduction of Euro 3 engines in 2001 caused a turn in freight transport.

	GDP (10^9 euro)	passenger km or tonne km (10^9)	energy consumption (PJ)	greenhouse gases (ktonnes CO_2-eq)	ozone precursors (tonnes TOFP)	acidifying pollutants (10^6 Aeq)	PM2.5 (tonnes)
passengers 1995	117.9	59.04	111.6	8 142	129 005	1 294	3 508
passengers 2005	144.2	69.67	121.7	8 992	57 834	682	1 372
freight 1995	117.9	34.12	73.2	5 399	76 283	1 353	3 377
freight 2005	144.2	49.42*	87.5	6 438	73 003	1 192	1 981

* 2003

Passenger transport flows



From 2002 onwards school transport is included in regular bus/tram service.

Source: De Lijn, FOD MV (2007), NMBS

Railway grew fastest over the past two years

Passenger transport by *car or motorcycle* increased continuously between 1990 and 1999, and less sharply from 2000 onwards. However, in 2006 there was another 1.3 % increase. Over the past decade, the use of public transport has risen significantly. The growth of *regular bus/tram services* is mainly a consequence of a focused price policy and an extended offer. For *rail travel* there are also reduced prices for certain groups. Furthermore, capacity has been increased by raising the number of train kilometres by 5 % and operating more double deck carriages. Between 1995 and 2001 the growth of regular bus/tram transport flows was comparable to that of railway transport; after that, railway transport underwent a slower growth. During the past two years, the growth of regular service bus/tram transport slowed, while rail transport consolidated its growth. Compared to 2005 there was a 5.8 % increase in rail transport, whereas bus/tram transport only increased by 1.4 %.

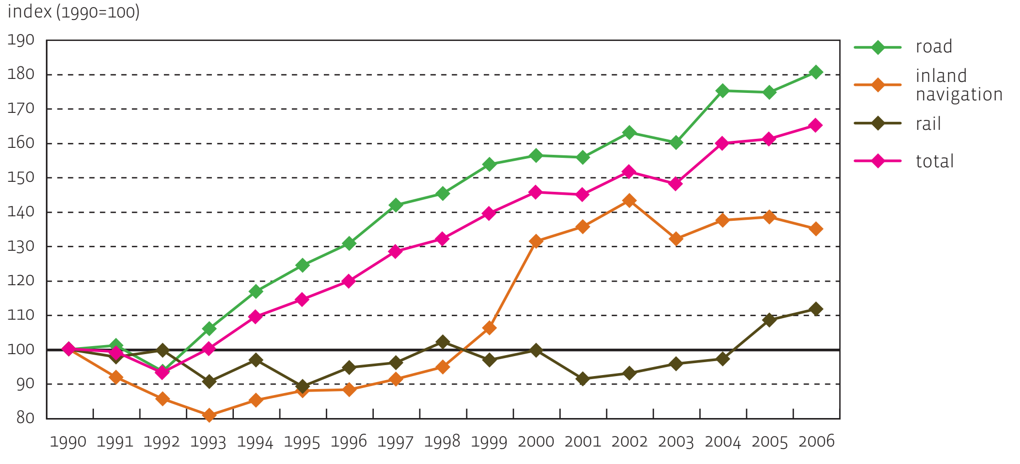
Limited modal shift in passenger transport

In 2006 the total number of passenger kilometres (private as well as public transport) amounted to 70.48 billion, 1.7 % higher than in 2005 and 24 % higher than in 1990. In 2006 private motorised transport still accounted for 88.7 % of transport flows, regular bus/tram services represented 4.0 % and rail transport 7.3 %. In 1990 the shares were 91.2 % (car, motorcycle), 2.9 % (regular service bus/tram) and 5.9 % (rail). Despite the significant growth in public transport, only a limited modal shift has been observed.

passenger transport (billion passenger km)	1990	1995	2000	2006
regular bus, tram service	1.63	1.64	1.83	2.84
train	3.39	3.34	3.94	5.12
car, motorcycle	52.03	55.87	59.98	62.52
total	*57.05*	*60.85*	*65.75*	*70.48*

Freight transport flows

DPSIR



Source: FOD MV (2007), NIS, NMBS, PBV, VITO

Transport by inland navigation stabilised after a period of strong growth

In 2006 the transport flows of *freight transport by road* amounted to 39.45 billion tonne kilometres, an 81 % growth compared to 1990. Globally, freight transport by road has continued to increase over the past few years. *Freight transport by rail* fluctuated a lot in the period 1990-2006. However, over the past five years this freight transport increased continuously and in 2006 it reached 4.06 billion tonne kilometres. This is the highest value since 1990 and means a 12 % growth. In 2006 the number of tonne kilometres of *inland navigation* was 6.63 billion. Compared to 1990 freight transport by water increased by 35 %. Since 1998 inland navigation is stimulated by the embankment programme of the Flemish government, a financial incentive for the construction of loading and unloading facilities. This resulted in a continuous growth of the activity up to 2002. During the past four years, however, this figure has stabilised.

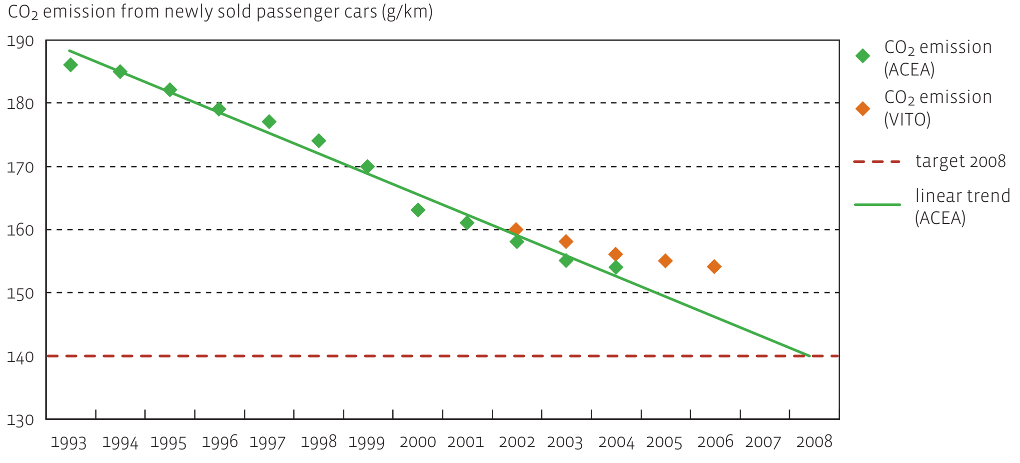
No modal shift in freight transport

In 2006 the total number of tonne kilometres was 50.13 billion, which means a 65 % increase with respect to 1990. Road transport made up 79 % of the total, railway transport 8 % and inland navigation 13 %. In 1990 this was still 72 %, 12 % and 16 %. The target values for 2010 (Flanders Mobility Plan Policy Resolutions, sustainable scenario) are 69 %, 14 % and 17 % respectively. In order to reach those objectives and achieve a modal shift, rail and inland navigation will have to continue to be encouraged.

freight transport (billion tonne km)	1990	1995	2000	2006
rail	3.63	3.24	3.62	4.06
inland navigation	4.91	4.32	6.45	6.63
road	21.84	27.18	34.15	39.45
total	*30.38*	*34.73*	*44.21*	*50.13*

CO_2 emissions from newly sold passenger cars

DPSIR



Source: ACEA, VITO based on DIV (Vehicle Registration Service)

2008 target not achievable

The most important pillar of the initial European strategy to reduce CO_2 emissions from new passenger cars (COM(95)689) is the *voluntary* covenant with the automobile sector. As a result of technological improvements, the average CO_2 emission of new passenger cars should drop by 25 % by 2008 compared to 1995, to an average of 140 g/km. The figure shows, on the one hand, data for Belgium as officially reported by the EC in cooperation with the automobile industry, and, on the other hand, the data calculated by VITO. If we extrapolate ACEA's data linearly, Belgium should reach the objective for 2008. However, from both datasets it is clear that the falling trend has been less pronounced over the last few years. Data from VITO show an annual decrease of 1.2 % between 2002 and 2004, and of only 0.6 % in 2005 and 2006. This lead to a value of 154 g/km in 2006. The increase in the weight and dimensions of passenger cars played an important role in the too limited decrease of CO_2 emissions. When looking at the evolution for petrol vehicles and diesel vehicles separately, one can see that for petrol vehicles there was a continuous decrease between 2002 and 2006, while for diesel vehicles the situation stabilised.

Additional measures required by 2012

Given that the achieved reduction is insufficient in order to reach the target, the EC (COM(2007)19) proposes additional measures with a focus on an *obligatory* reduction of CO_2 emissions to 130 g CO_2/km by 2012 thanks to improvements in engine technology and a further decrease by 10 g CO_2/km as a result of other technological improvements and a bigger share of biofuels.

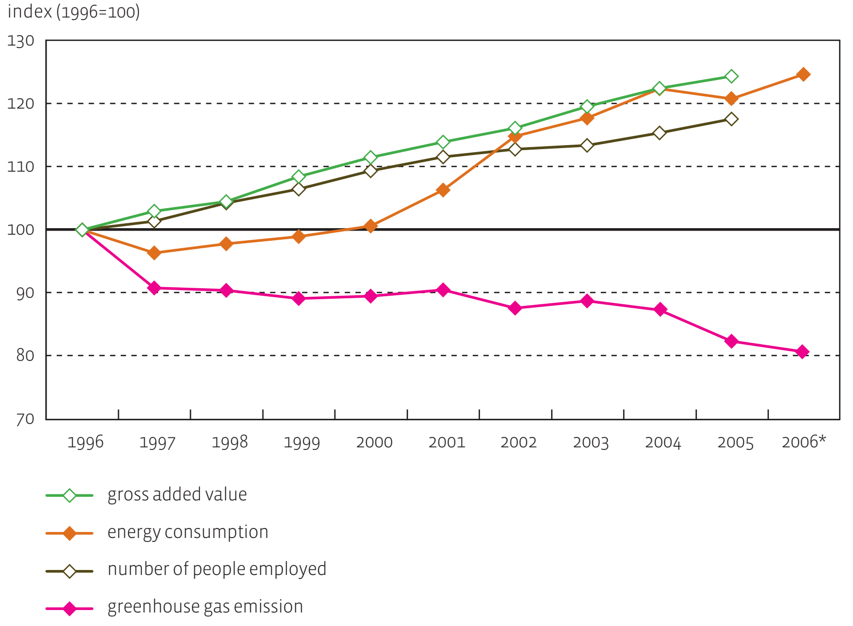
CO_2 emission from newly sold passenger cars (g/km)	2002	2003	2004	2005	2006
petrol	170	168	165	162	158
diesel	155	154	152	152	152
average	*160*	*158*	*156*	*155*	*154*

Source: VITO based on DIV

2.6 Trade & services

Eco-efficiency of trade & services

DPSIR



* provisional figures

Source: NBB, Flanders Energy Balance VITO

Rising energy consumption, falling greenhouse gas emissions
In the period 1996-2005 energy consumption rose less than the gross added value of trade & services. In 2006 approximately 19.5 % less energy was consumed than in 1996 for every unit of gross added value.

After a decrease in 2005 the energy consumption rose again by 3.3 % in 2006. Since 1996 greenhouse gas emissions had been dropping steadily and in 2006 the emissions continued to decrease, by 2.0 % in comparison with 2005. This absolute decoupling can be ascribed to the decrease in CH_4 and CO_2 emissions.

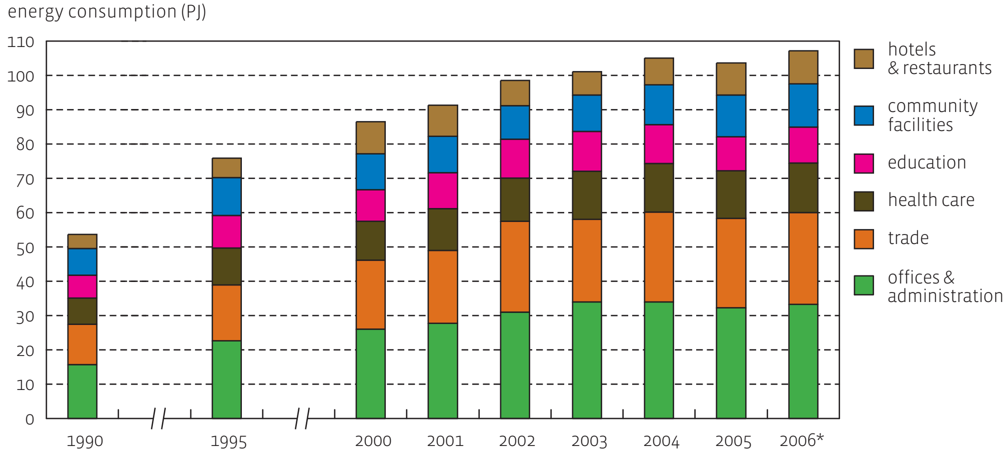
A reduced energy consumption and a further reduction in the emission of greenhouse gases can be obtained via better technologies, such as energy-saving processes, improved combustion technologies for solid and liquid fuels and end-of-pipe techniques.

	1996	2000	2004	2005	2006
gross added value (10^9 euro)***	69 130	84 577	102 865	107 197	107 197**
number of people employed	1 493 222	1 632 356	1 722 076	1 775 028	1 755 028**
energy consumption (PJ)	85.9	86.4	105.1	103.7	107.1*
greenhouse gas emission (ktonnes CO_2-eq)	5 486	4 912	4 792	4 518	4 427*

* provisional figures, ** figures 2005, *** in constant 2000 prices

Energy consumption per subsector

DPSIR



* provisional figures

Source: Flanders Energy Balance VITO

Energy consumption keeps rising

Energy consumption by trade & services increased from 53.7 PJ in 1990 to 107.1 PJ in 2005, which means it almost doubled. In 2006 energy consumption rose by 3.3 % in comparison to 2005. Offices & administration (31 %) and trade (25 %) remained the largest energy consumers in 2006. These are also the two subsectors with the largest increase since 1990 in terms of percentage, respectively 111 % and 129 %.

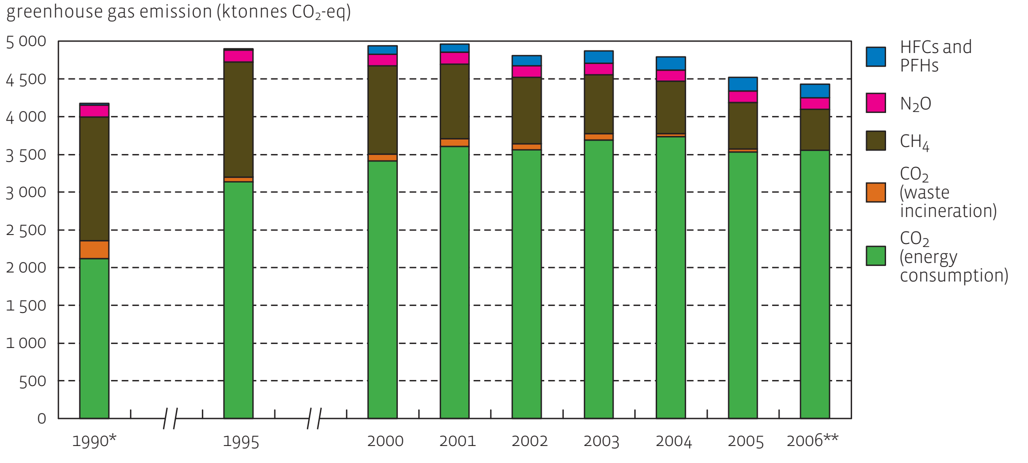
Electricity and natural gas are the most important energy sources in the trade & services sector, with shares in 2006 of respectively 40.8 % and 44.1 %. Petroleum products (mainly domestic fuel oil) account for 12.7 % of the energy consumption.

In order to reduce energy consumption and environmental pressure, energy-saving processes and renewable energy sources can be employed.

increased energy consumption 2006 (PJ)	vs. 1990	vs. 2000
offices & administration	17.5	7.2
trade	15.1	6.6
health care	6.9	3.3
education	3.8	1.2
community facilities	4.9	2.2
hotels & restaurants	5.4	0.3

Greenhouse gas emissions

DPSIR



* HFC emission figures are only available from 1995 onwards. For 1990 the emissions of 1995 were taken.
** provisional figures

Source: VMM, Econotec, Flanders Energy Balance VITO

Falling greenhouse gas emissions
CO_2 emissions from trade & services are the result of energy consumption, on the one hand, and waste incineration, on the other. CH_4 emissions mainly stem from landfills and composting. N_2O is released as a result of medical applications in health care. F-gases are used as a coolant in cooling installations of supermarkets and air-conditioning installations, among others.

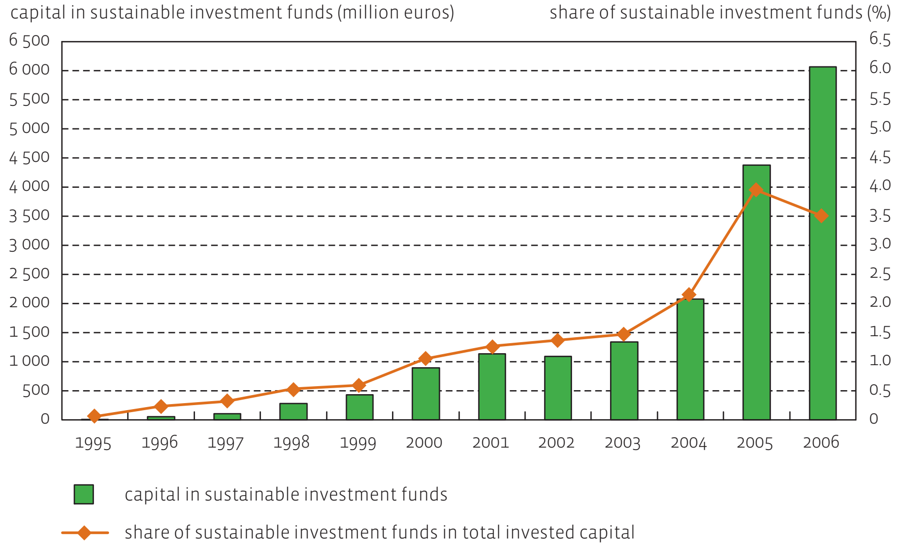
Greenhouse gas emissions from trade & services peaked in 1996 (cold winter) and from then on they have been falling almost continuously to 4 427 ktonnes CO_2-eq in 2006. Even so, this is still 6.1 % higher than in 1990. The target from the Kyoto protocol for Flanders is a general emission reduction of 5.2 % in the period 2008-2012 compared to 1990.

Limited share of trade & services sector in greenhouse gas emissions
The share of the trade & services sector in the total Flemish greenhouse gas emissions is limited and amounted to 5.2 % in 2006. The drop in greenhouse gas emissions since 1996 is partly due to the decrease in CH_4 emissions at landfills. For waste incineration, no CO_2 emissions were registered at all anymore.

greenhouse gas emission (ktonnes CO_2-eq)	1990*	2000	2004	2005	2006
CO_2 (energy consumption)	2 120	3 411	3 733	3 532	3 552
CO_2 (waste incineration)	236	90	41	41	0
CH_4	1 641	1 171	693	615	546
N_2O	157	154	151	151	151
HFCs	19	86	174	179	179
total	*4 173*	*4 912*	*4 792*	*4 518*	*4 427*

Sustainable investment in Belgium

DPSIR



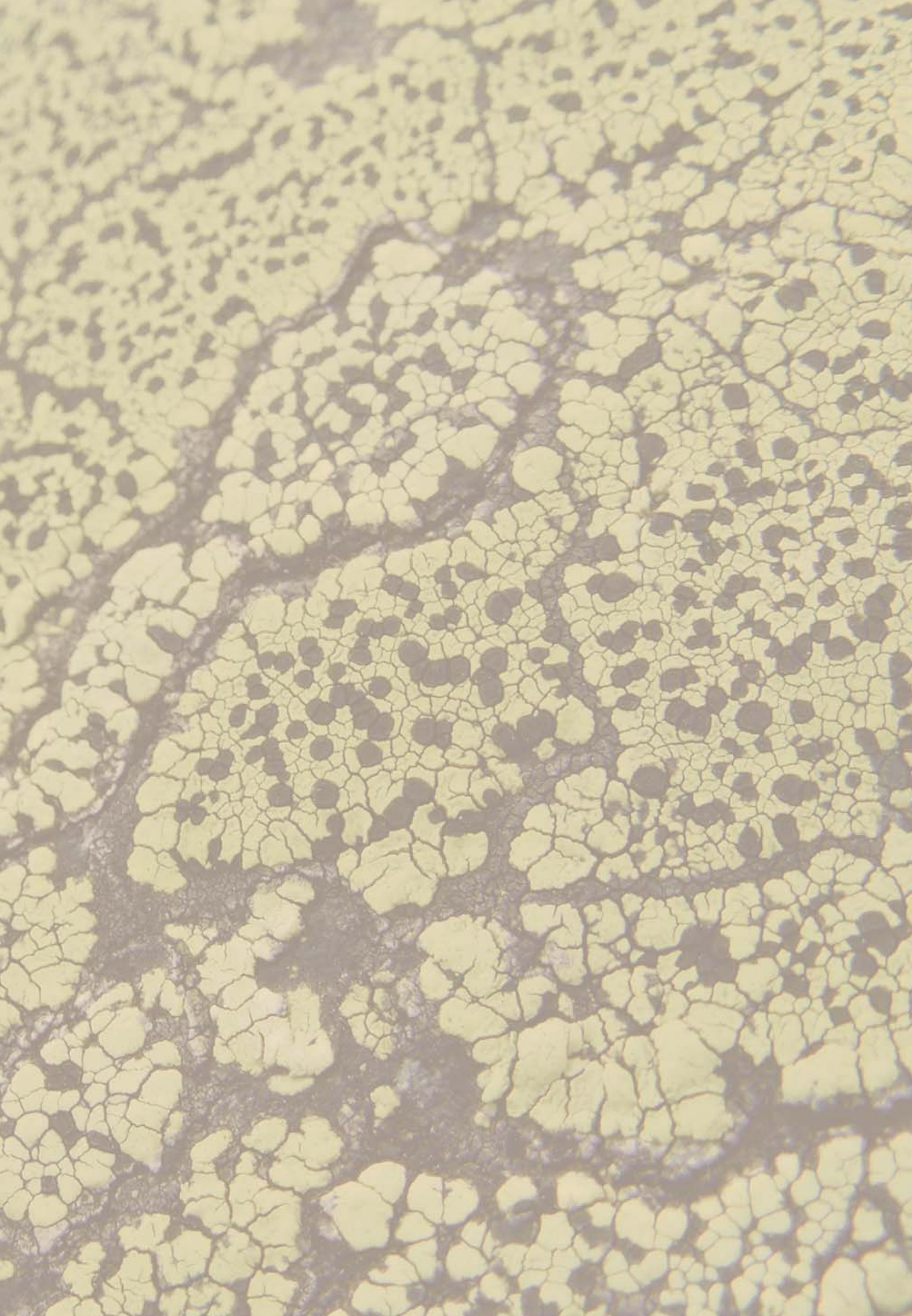
Source: Beama and own research by Forum ETHIBEL

Sustainable investment is on the rise

Investors and financial institutions have a major impact on the economy and society by steering capital flows. One of the ways in which they can contribute to sustainable development is by participating in or offering sustainable investment funds. These investment funds only invest in shares or bonds which meet a number of criteria, e.g. in the areas of environmental policy, social policy and sustainability.

In 2006 the Belgian sustainable fund market grew by 38.6 % to 6.07 billion euros. During that same period, the total Belgian investment fund market grew by 45 % to 173 billion euros. Thus, the share in the total fund market has decreased for the first time to nearly 3.5 %, still a European record.

On a total of some 100 products which are marketed as ethical or socially justified, there are 77 which deserve the 'sustainable' label (besides funds also new types of investment). This is a significant increase (39 %) with respect to 2005.

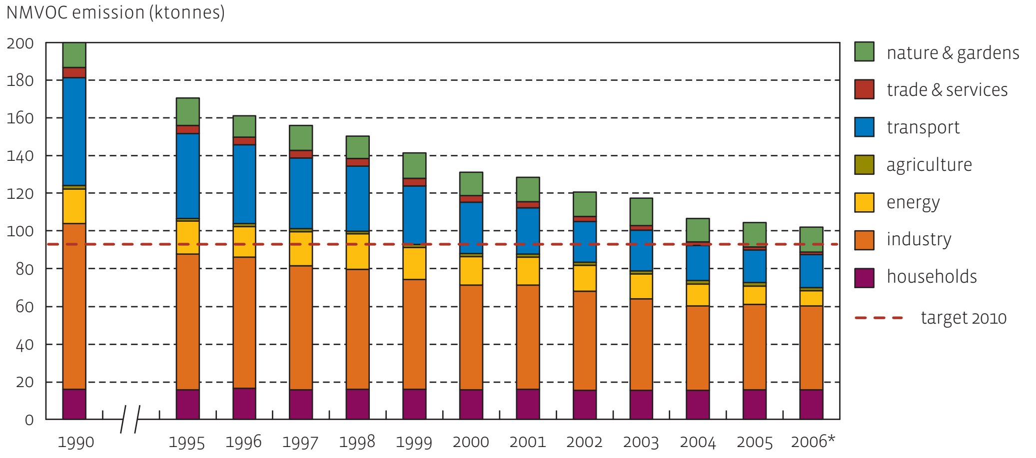


3 Environmental themes

3.1 Dispersion of VOCs

☺ NMVOC emissions into the air

DPSIR



* provisional figures, NMVOCs = non-methane volatile organic compounds

Source: VMM

Target within reach

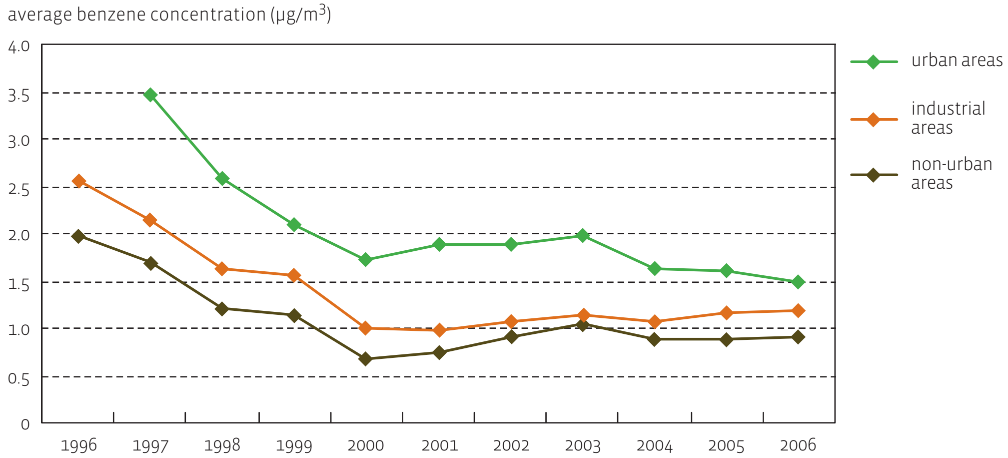
In 2006 NMVOC emissions for Flanders were 49 % lower than in 1990. The NEC target of 91.9 ktonnes by 2010 (binding figure of 70.9 ktonnes for stationary sources and indicative figure of 20.96 ktonnes for transport) is achievable via further implementation of the measures contained in the emission reduction programme of the Flemish Government.

Further efforts required from households

The transport sector registered the biggest emission reduction between 1990 and 2006 (-70 %). This reduction is the result of vehicle standardisation, regulations in respect of the volatility and benzene content of petrol and the vehicle fleet's changeover to diesel (diesel has a lower NMVOC content than petrol). The industry, especially the chemical and metal processing industries, remain the principal source, despite a 49 % reduction in 2006 compared to 1990. Domestic NMVOC emissions as a result of the use of paints, glues, solvents and cleaning products have barely reduced since 1990 (-3 %). The reduced NMVOC content in those products as a result of various regulations is undone by a considerable increase in consumption.

NMVOC emission (tonnes)	households	industry	energy	transport	trade & services	nature & gardens	*total*
1990	15 978	87 984	18 394	57 282	5 308	13 108	*199 894*
1995	15 662	72 104	17 369	45 198	4 331	14 440	*170 578*
2000	15 526	55 668	15 256	27 218	3 445	12 493	*131 220*
2005	15 756	45 247	9 779	17 374	1 656	13 048	*104 555*
2006*	15 602	44 586	8 173	17 369	1 545	13 048	*101 978*

Benzene concentration in the ambient air



Source: VMM

Status quo in benzene concentration in the past few years
Benzene is a carcinogenic volatile organic substance. The average benzene concentration in the ambient air (at 8 measurement points) has decreased by a factor of 2.5 since 1996 and amounted to 1.16 µg/m^3 in 2006. The concentration has remained more or less unchanged since 2000, but is still markedly lower than the 5 µg/m^3 target established for 2010. In urban areas the benzene concentration is always higher than in other areas. The reason for this is the busy city traffic. In recent years, the concentration in industrial areas has also increased slightly.

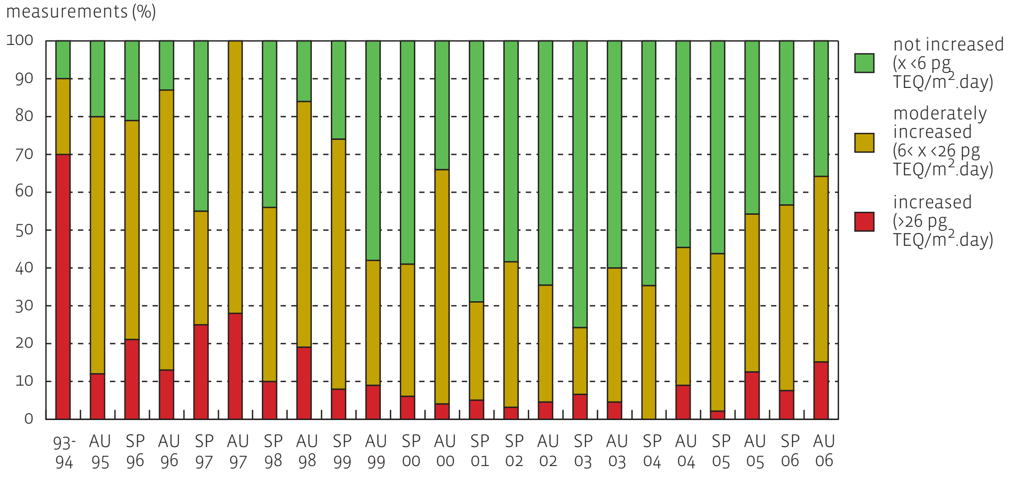
Individual exposure to benzene, on the other hand, is 2 to 3 times higher than the average concentration in the outside air as a result of the exposure to heightened concentrations in traffic (several hundred times more on busy crossroads and roads, in car parks and at petrol stations) and in closed spaces (about double that of the concentration outside).

Transport remains by far the most important source (88 %) of benzene and toluene emissions (petrol contains 1 % benzene and 3.5 % toluene). In future, the further phased implementation of vapour recovery phase II (vapour recovery between car tank and underground storage tank) and the extra measures proposed in the Flanders Mobility Plan Policy Resolutions (extending carpooling, adequately tuning the different kinds of public transport to each other, stimulating freight transport by water and rail, fiscally rewarding vehicles which comply with the future environmental standards) could cause a further decrease in the emissions and consequently also in the concentration of benzene and toluene in the ambient air.

3.2 Dispersion of POPs

☺ Dioxin deposition

DPSIR



TEQ: toxic equivalents, SP: spring, AU: autumn

Source: VMM

Emission reduction visible in deposition measurements

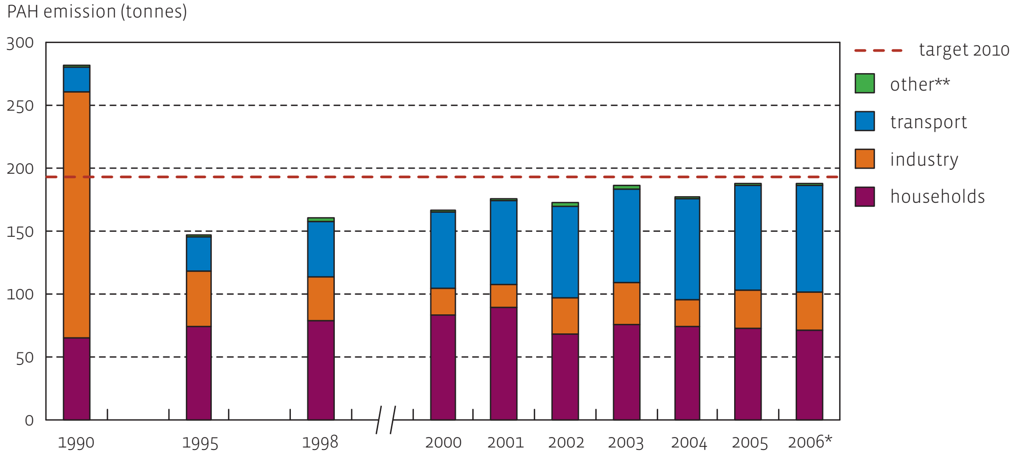
The half-yearly dioxin deposition measurements show a declining trend (monthly average dioxin deposition assessment standards according to VMM proposal). In 1993 there was still an increase in 70 % of the measurements; in 2006 this was down to 7.5 % (spring) and 15.1 % (autumn). This decline is a result of the decreased dioxin emissions, especially due to drastic decontamination and the use of clean technology in waste incineration and sintering installations. The fact that the percentage of locations without an increase has dropped below 60 % again since the autumn of 2004 is mainly due to the choice of measurement points. This is because the measurement programme changes every year, based on both past results and new insights and questions of government bodies. Through the establishment of new measurement points new sources of dioxins are traced. Hence, comparison of the results is not easy.

Dioxin deposition closely follows local problems

Besides the half-yearly deposition measurements, monthly measurements have been carried out as well since April 2001 in order to monitor new sources and the short-term effect of decontamination. Each year, the number of measurement points is increased. The measurement results show that in the immediate vicinity of scrap processing facilities there were regular measurements of increased dioxin depositions, and especially of PCB 126. This was the case in Menen, Ghent, Genk, Gistel, Geel, Kallo and Willebroek. The remediation measures imposed on the scrap processing sector by the Environment Inspection are mainly aimed at particle control. The future measurement results will have to show whether those measures suffice in order to reduce the presence of dioxins and PCBs outside company boundaries.

☹ Emission of PAHs into the air

DPSIR



PAHs: polyaromatic hydrocarbons
* provisional figures, ** others: energy + agriculture + trade & services

Source: VITO

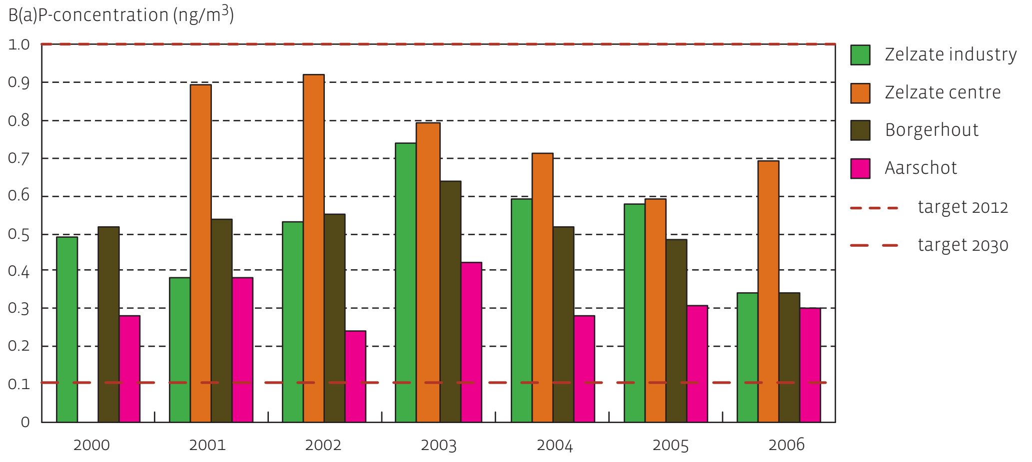
PAH emissions follow trend of rising use of diesel and catalytic converters
In the period 1995-2006 total PAH emissions in Flanders rose by 28 %, to just below the target for 2010 (192 tonnes). In 2006 emissions from transport more than tripled (316 %) compared to 1995 and represented 46 % of the total PAH emissions. The increase in the total PAH emission in that sector is attributable to the increasing use of diesel and the increase in naphthalene content as a result of the use of the catalytic converter. Nonetheless, there is a reduction of harmful PAHs in terms of absolute quantity.

38 % of the total emission of PAHs in 2006 comes from households, the main sources being the heating of buildings with coal and wood and the incineration of waste in small barrels and open fires. The industry managed to reduce the emission of PAHs considerably in the period 1990-2000 by reducing the use of creosote and carbolineum during wood preservation and the banning of tar oil and pitch as binding agents for the construction of asphalt roads. In recent years, however, industrial PAH emissions have increased again.

PAH emission (kg)	1990	1995	2000	2005	2006*
households	65 891	74 924	83 175	72 797	71 472
industry	194 043	43 448	21 154	30 086	29 543
transport	19 884	27 092	61 124	82 921	85 783
total	*281 751*	*147 582*	*167 245*	*187 521*	*188 217*

PAH concentration in the ambient air

DPSIR



B(a)P: benzo(a)pyrene

Source: VMM

Current PAH concentration still not without danger for public health

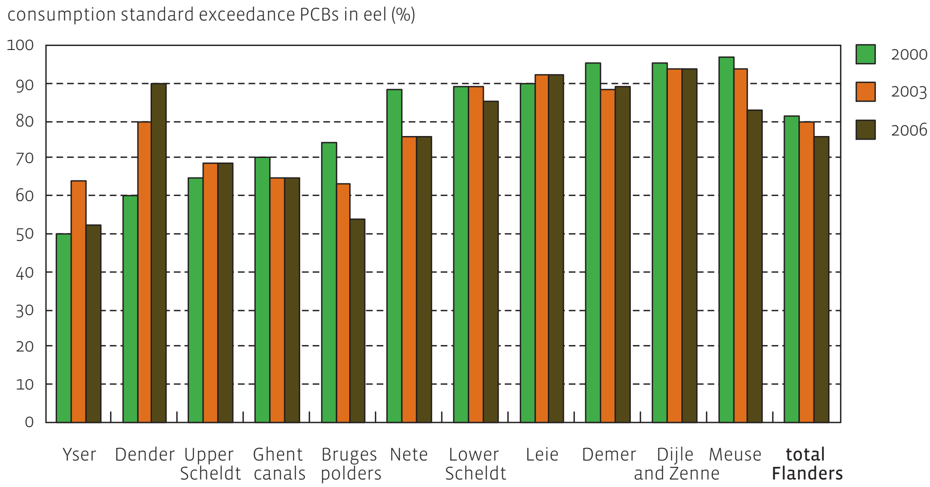
Since 2000 VMM has been measuring PAHs (polyaromatic hydrocarbons) in the ambient air using a high volume sampler. Systematic samples are only taken for a limited number of measurement points. B(a)P (benzo(a)pyrene) is one of the best known PAHs due to its carcinogenic properties; as a result, it is used as an indicator for PAHs.

In comparison with 2001, increases were detected in 2002 in the Zelzate industrial area, Zelzate centre and Borgerhout. On most locations B(a)P values increased in 2003 and dropped slightly again after that. In 2006 all concentrations, except those in Zelzate centre, were lower than in 2005.

The fourth Daughter Directive (2004/107/EC) on air quality uses a target value of 1.0 ng B(a)P/m^3 in PM10 particles as the annual average to be reached in 2012. In its *Air Quality Guidelines*, the World Health Organisation indicates a cancer risk of 1 in 100 000 exposed people in the case of lifelong exposure to 0.1 ng B(a)P/m^3 in the air (which can be established as a target for 2030). The target for 2012 of 1 ng B(a)P/m^3 is achieved everywhere. However, exceeding values have been registered with respect to the target for 2030.

☹ PCB concentration in eel

DPSIR



Source: INBO

More than three quarters of the eel from Flemish surface waters are unsuitable for consumption

In order to systematically follow up the quality of the surface water, INBO measures the PCB concentration (seven marker PCBs) in eels (because of their large area of distribution and high fat content). Testing against the PCB standard for consumption (75 ng/g fresh weight) indicates that in 2006 eels contained too many PCBs in 76 % of the measurement points. In 2000 this was still 81 %. The highest concentrations (more than 2 000 ng/g fresh weight) were recorded in the Congovaart in Mol, the Leyloop in Ravels, the Dessel channel at two locations in Mol and the Meuse in Maasmechelen.

Historical pollution of surface water by PCBs

PCB concentrations in eel can also be tested against the reference concentration for surface water (240 ng/g fat). The measurement results show that the quality of the surface water underwent a positive evolution between 2000 and 2006. However, this evolution is very slow. There is no new PCB pollution, but the historical PCB pollution in surface water will remain problematic for years due to the persistent nature of PCBs.

Exceedance of the reference concentration for surface water

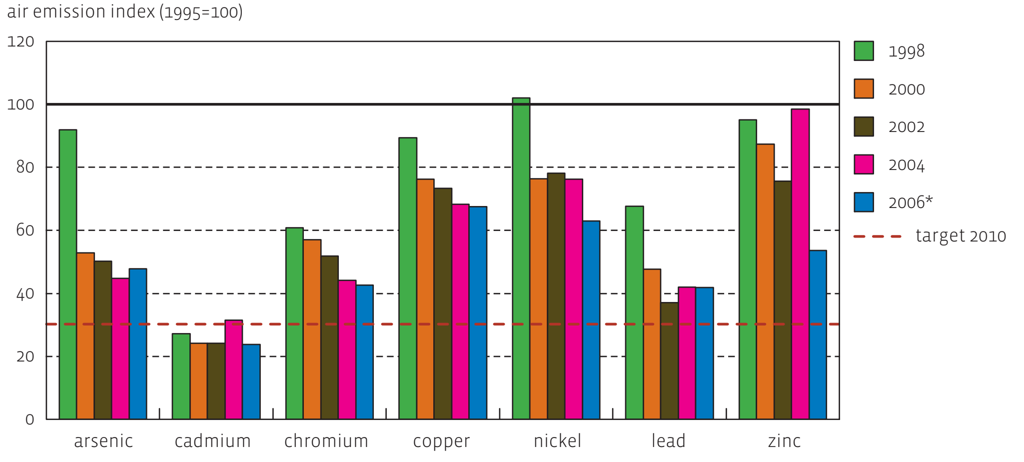
measurement points (%)	2001	2003	2006
no deviation	15	17	19
slight deviation	22	25	25
deviation	30	25	28
strong deviation	33	33	28

Source: INBO

3.3 Dispersion of heavy metals

Emission of heavy metals into the air

DPSIR



* provisional figures

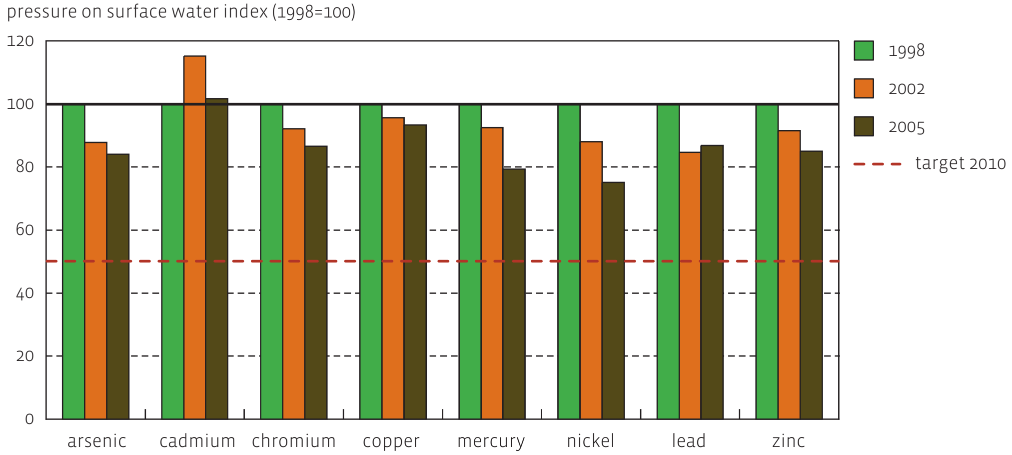
Source: VMM

Target not yet within reach
Emission of heavy metals into the air have shown a falling trend since 1995. For arsenic, cadmium and lead, the situation has stabilised over the past years. In 2006 the metal industry was responsible for more than 75 % of the total emissions of arsenic, lead and zinc. As a result, fluctuations in the emissions of that subsector are largely responsible for the total emissions of these metals. Emissions from the heating of buildings, especially important for chromium and nickel, have decreased in recent years; one of the reasons for this are the mild winters. The main source of copper in the atmosphere is road transport. In that sector emissions have remained more or less stable over the past few years. By reducing the use of leaded petrol, lead emissions from transport have decreased considerably compared to 1995. Only for cadmium the target for 2010 has already been achieved; for the other metals extra efforts are required.

emission into the air	arsenic	cadmium	chromium	copper	nickel	lead	zinc
reduction 2006 vs. 1995 (%)	52.2	76.2	57.4	32.4	37.0	58.1	46.4

Pressure on surface water from heavy metals

DPSIR



Source: VMM

Pressure on surface water not sufficiently reduced yet
Pressure on surface water has decreased for most metals. Pressure on surface water from households has decreased for all metals as a result of the higher percentage of inhabitants whose waste water is treated by an urban waste water treatment plant. For most metals discharges from the industry were markedly lower in 2005 than in 1998. For most metals soil erosion is an important or very important source. Due to a lack of data, the figures for soil erosion have been maintained constant over the whole period. Obviously, this is reflected in the trend results.

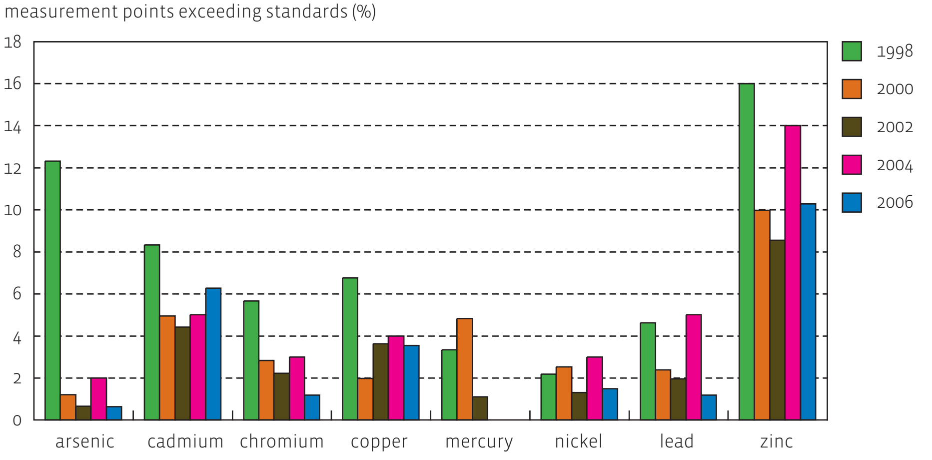
The target of MINA plan 3 (2003-2007) (a 50 % reduction in 2010 compared to 1998) has not yet been reached for any metal. Additional effort is required to meet the target, both for point sources and for diffuse sources.

pressure on surface water	arsenic	cadmium	chromium	copper	mercury	nickel	lead	zinc
reduction in 2005 vs. 1998 (%)	15.9	-1.7	13.4	6.7	20.7	24.9	13.6	15.0

Dispersion of heavy metals

Heavy metals in surface water

DPSIR



Source: VMM

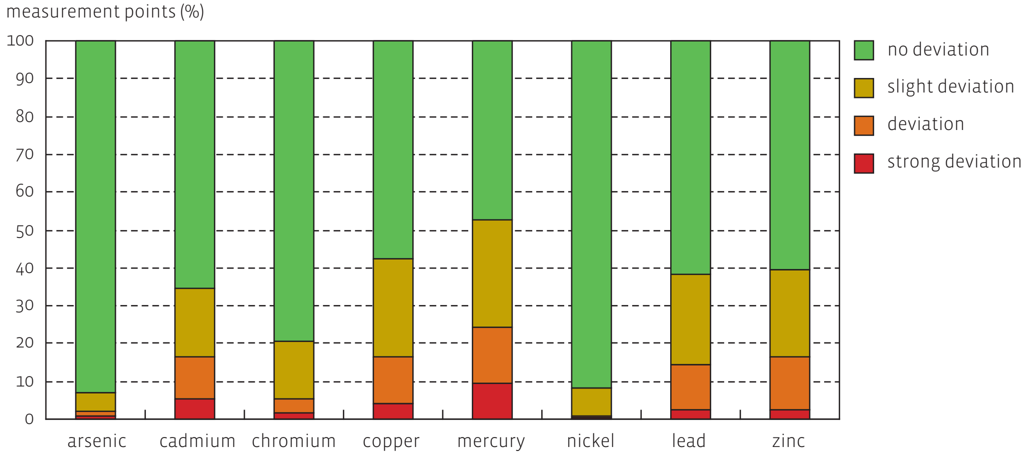
Less standard exceedances

Since 1998 the number of exceedances of the basic quality standards has decreased for all heavy metals. Currently, most exceedances are observed for zinc, cadmium and copper. The increase in the percentage of measurement points which exceed the standard for cadmium can partly be ascribed to the incidental discharge in 2006 of cadmium into the Meuse by a company near Liege. An excessive cadmium concentration, in contrast to the situation for zinc, is a problem which is especially prominent in the Campines as a result of previous activities of the zinc industry. The exceedances for zinc are very spread out across the whole Flemish territory. Households (especially zinc building materials) and diffuse sources (e.g. wear of car tyres and via soil erosion) play an important role in the zinc pollution.

measurement points with standard exceedance (%)	arsenic	cadmium	chromium	copper	mercury	nickel	lead	zinc
2006	0.6	6.3	1.2	3.5	0.0	1.5	1.2	10.3

Heavy metals in watercourse sediments

DPSIR



Source: VMM

Heavy metals can remain in watercourse sediments for a long time
The VMM's watercourse sediment monitoring network consists of 600 locations, 150 of which are sampled each year. The physico-chemical evaluation of the sediment includes, among other things, a study of the presence of heavy metals. The measurement points are grouped into 4 categories based on the deviation they show compared to the reference value.

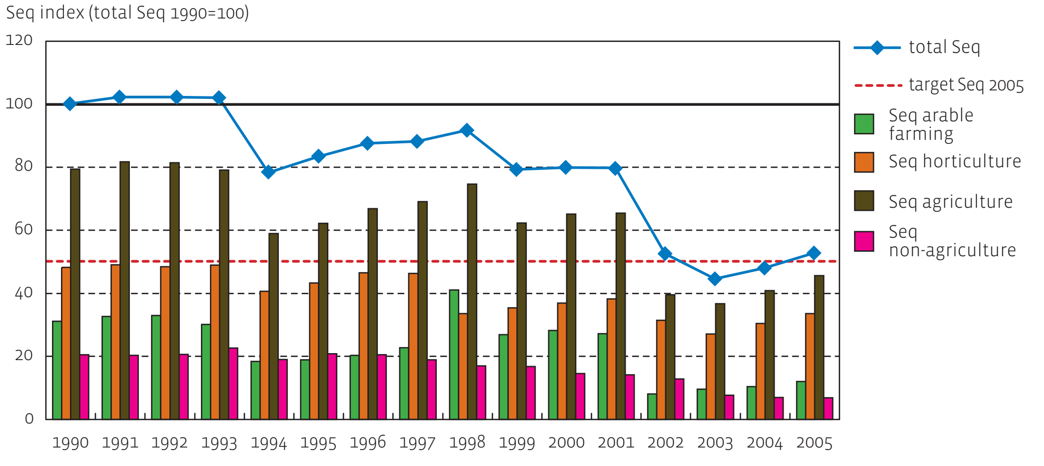
To a greater or lesser extent, heavy metals have a tendency to adsorb to particulate matter and soil material. Once present in the sediment, heavy metals can remain for a long time. Part of the watercourse sediment pollution with heavy metals can therefore be ascribed to historical pollution. Arsenic and nickel concentrations found hardly ever deviate from the reference value. Mercury is most often found in concentrations which deviate from the reference value. This is explained by the strong tendency of mercury to adsorb to particulate matter and soil material.

measurement points (%)	arsenic	cadmium	chromium	copper	mercury	nickel	lead	zinc
no deviation	93.1	65.6	79.5	57.7	47.2	91.8	61.6	60.3
strong deviation	0.7	5.2	1.5	4.3	9.5	0.5	2.5	2.5

3.4 Dispersion of pesticides

Pressure on aquatic life from crop protection agents

DPSIR



Source: UGent

Just short of target

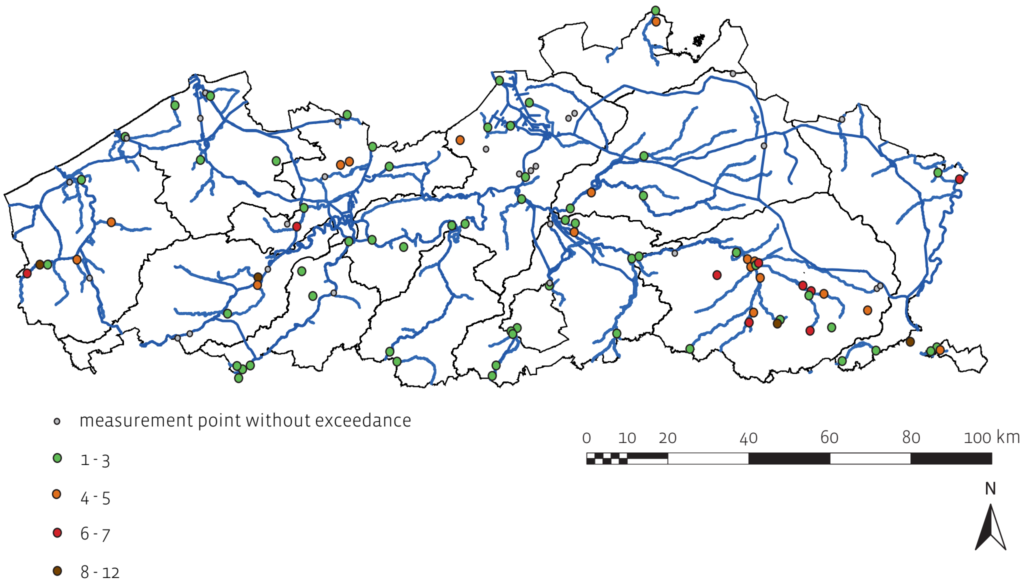
The 'pressure on aquatic life from crop protection agents' indicator weighs the annual sold quantity for each crop protection agent according to toxicity for water organisms and persistence in the environment, and is expressed as the sum of the dispersion equivalents (ΣSeq). In 2005 there was a 47 % reduction with respect to 1990. This means the result remained slightly short of the target. MINA plan 3 (2003-2007) aims for a 50 % reduction in 2005. In 2004 and 2005 the ΣSeq rose slightly, but the cause of this is not easy to determine. In recent years, ΣSeq values have risen for both arable farming and horticulture; the ΣSeq value for non-agriculture, on the other hand, continued to drop. The climate might be a factor which explains this, but there is no absolute certainty in this respect. What is certain is that a slight increase in the sales of certain products can cause a considerable increase in the total Seq.

Seq value	1995	2000	2001	2002	2003	2004	2005
reduction in 2005 vs. 1990 (%)	16.9	20.3	20.3	47.6	55.5	52.1	47.4

Dispersion of pesticides

😐 Pesticides in surface water

DPSIR



Source: VMM

Acute toxicity from pesticides in surface water

VMM has been monitoring the presence of pesticides in the surface water for around ten years now. In 2006 it concerned some 100 substances and 105 measurement points.

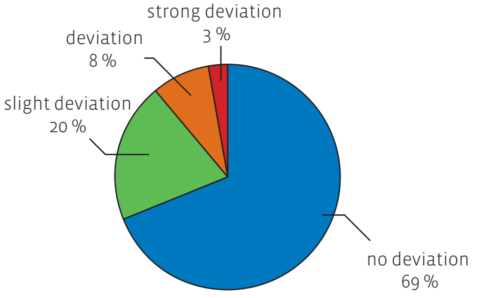
Since there are no legal standards available for all pesticides that are found in the surface water it is interesting to compare measurement values to ecological reference values. The test against the MAC values *(Maximum Admissible Concentration)* gives an idea of the acute toxicity caused by the presence of the substance in question. If the maximum value from the measurement results at a measurement point exceeds the MAC value, this is recorded as an exceedance of the MAC value.

Exceedances of the MAC values can mainly be situated in the Yser basin and the Demer basin/Haspengouw, both agricultural areas. In particular insecticides lead to problems of acute toxicity. Diazinon (insecticide) lead to exceedances of the MAC value at 53 % of the measurement points. Other substances which caused exceedance of the MAC values at more than 10 % of the measurement points are: dichlorvos (42 %, insecticide), isoproturon (28 %, herbicide), dimethoate (16 %, insecticide), α-endosulphan (16 %, insecticide), β-endosulphan (13 %, insecticide) and linuron (12 %, herbicide).

Dispersion of pesticides

Pesticides in watercourse sediments

DPSIR

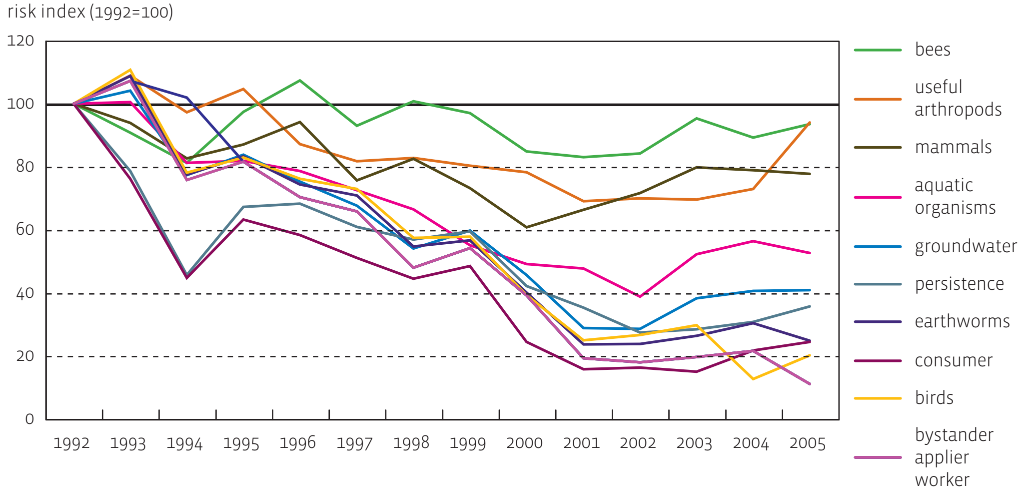


Source: VMM

Persistent pesticides remain in watercourse sediments for a long time
The VMM's watercourse sediment monitoring network contains 600 measurement points, 150 of which are sampled each year. The physico-chemical evaluation includes, among other things, a study of the presence of organochlorine pesticides (e.g. DDT and degradation products, drins, lindane). The measurement points are grouped into 4 categories based on their deviation from the reference value.

69 % of the measurement points, sampled in the period 2003-2006, did not show a deviation with respect to the reference value. At 31 % of the measurement points organochlorine pesticides were detected in slightly to strongly deviating concentrations. What is remarkable is that already long forbidden agents such as DDT (and degradation products, insecticide) are still found in high concentrations (up to more than 400 µg/kg of dry material). Cyclodienes (drins, insecticides), which have been prohibited for decades, also crop up in high quantities at various measurement points. The measurement points which were sampled in 2000-2002 were studied again in 2004-2006. During this period the situation improved slightly.

☹ Multi-risk approach of crop protection agents (POCER) DPSIR



Source: UGent

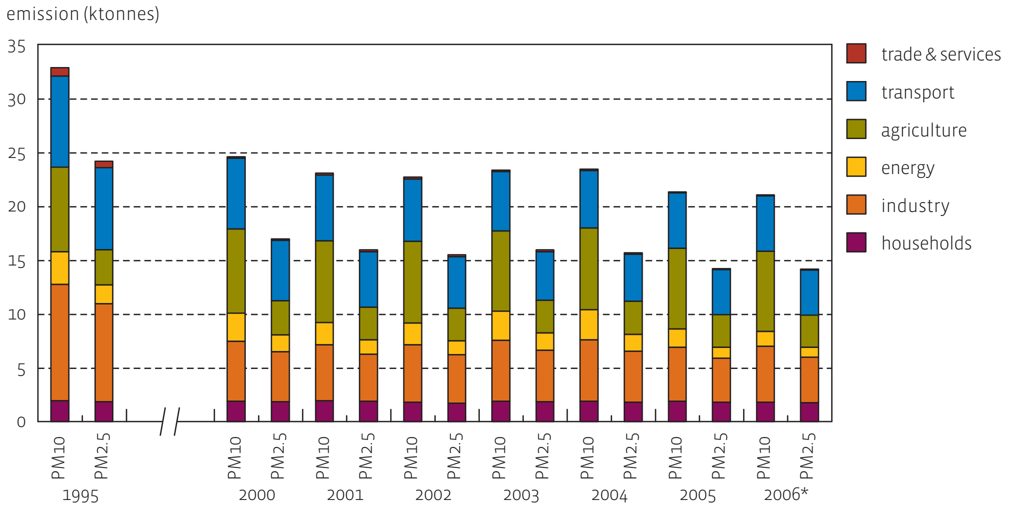
Risks of use of crop protection agents quantified
The POCER *(Pesticide Occupational and Environmental Risk)* indicator tries to assess the impact of different restrictive measures in agriculture on different components: applier, worker (working in a sprayed field), bystander (accidental passer-by during and after spraying), consumer, persistence, groundwater, aquatic organisms, birds, earthworms, bees, useful arthropods and mammals.
The risk per component is described by means of a so-called Risk Index (RI). A RI is the quotient of the estimated human exposure or the estimated concentration in the environment and the (eco)toxicological limit value.

Between 1992 and 2001 significant reductions were realised for different components, but after 2001 the risk started to rise again. The reason for this is to be found especially in the increased sales figures of soil decontamination agents. This group of pesticides has a big influence on the risk indices of all components.

3.5 Dispersion of particulate matter

Emission of PM10 and PM2.5

DPSIR



* provisional figures

Source: VMM

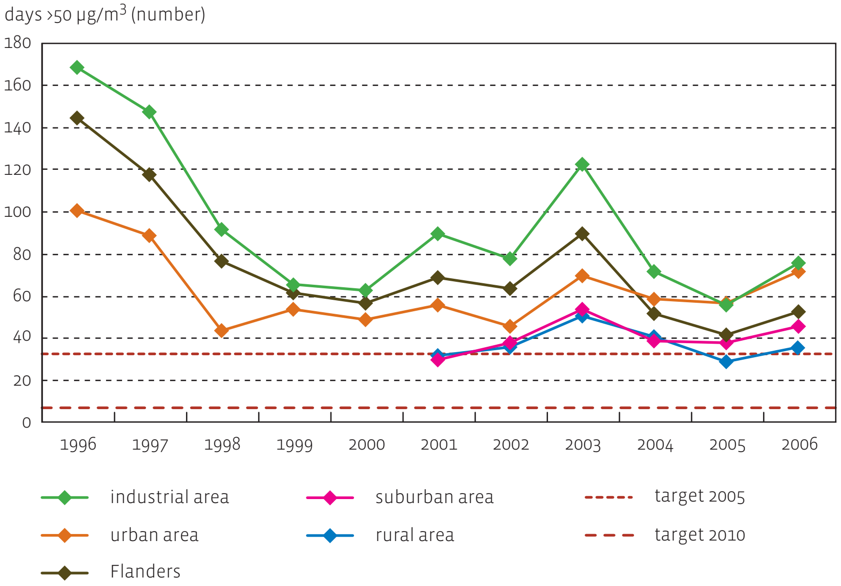
Primary PM10 and PM2.5 emissions stagnate
Both PM10 and PM2.5 can be emitted directly. This primary emission dropped significantly during the period 1995-2000. Since then, no other significant drop has been recorded. Besides the direct emission, PM10 and PM2.5 are also formed by reactions of particle precursors. The NEC (National Emission Ceilings) Directive is to ensure a further reduction in the emission of particle precursors by 2010.

Sources of PM10 and PM2.5 emissions
Despite the adaptation of the calculation method, agriculture remains the largest source of primary PM10 emissions. The proportions of this contribution, however, are uncertain. The source is also thought to be less relevant with respect to health. For PM2.5 industry and transport were the main sources in 2005 and 2006.

emission (ktonnes)	1995		2000		2005		2006*	
	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
households	1.92	1.82	1.91	1.84	1.88	1.80	1.80	1.73
industry	10.79	9.12	5.52	4.65	5.00	4.06	5.18	4.25
energy	3.05	1.74	2.62	1.57	1.70	1.03	1.38	0.91
agriculture	7.88	3.28	7.85	3.15	7.48	3.00	7.44	2.97
transport	8.45	7.61	6.54	5.59	5.15	4.18	5.15	4.18
trade & services	0.76	0.60	0.16	0.15	0.10	0.09	0.10	0.09

☹ Daily average PM10 concentration

DPSIR



Source: based on measurements of the telemetric monitoring network, VMM

Too many exceedances in daily average PM10 concentration

The daily average PM10 concentration in the air shows peak moments and gives an idea of short-term exposure to PM10. In its Daughter Guideline (1999/30/EC), the EU formulated the limit values for PM10 in the ambient air for 2005 and 2010. From 2005 onwards the daily average concentration cannot exceed 50 µg/m³ on more than 35 days; from 2010 onwards the maximum is 7 days.

Until 1999 we can see a decreasing number of exceedances; after that, the number fluctuates. In all areas we can observe an increase in the number of exceedances in 2006. The highest number of exceedances was registered in industrial areas.
The target for 2005 was only reached at 6 out of 31 individual measurement points, namely Dessel, Hasselt, Houtem, Mechelen-Zuid, Steenokkerzeel and Zwijndrecht administrative centre.

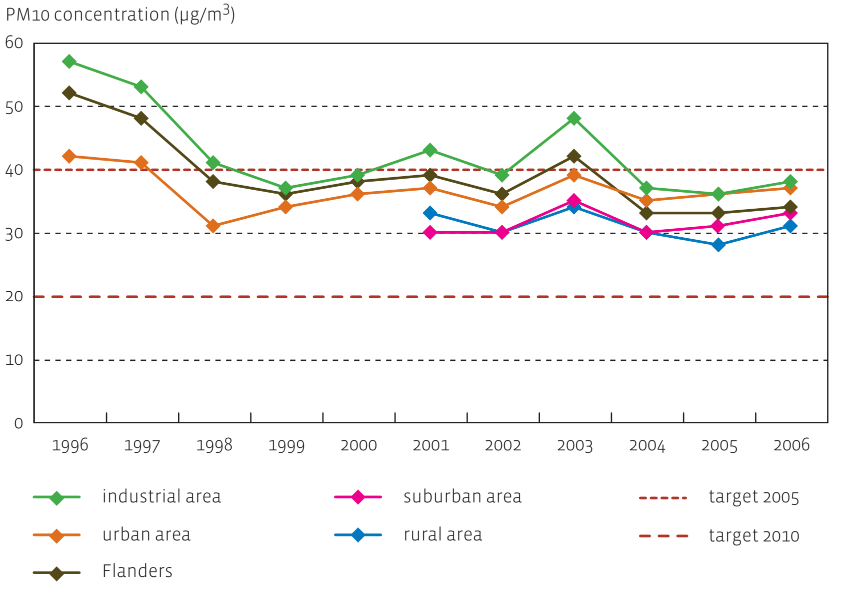
New targets under preparation

In October 2007 there was no agreement yet between the European Council of Environment Ministers and the European Parliament on whether to modify those limit values or not.

number of days >50 µg/m³	1996	1998	2000	2002	2003	2004	2005	2006
industrial area	168	91	62	77	122	71	55	75
suburban area	..	..	..	37	53	38	37	45
urban area	100	43	48	45	69	58	56	71
rural area	..	..	..	35	50	40	28	35
Flanders	*144*	*76*	*56*	*63*	*89*	*51*	*41*	*52*

Annual average PM10 concentration

DPSIR



Source: based on measurements of the telemetric monitoring network, VMM

Annual average PM10 concentration does not drop further

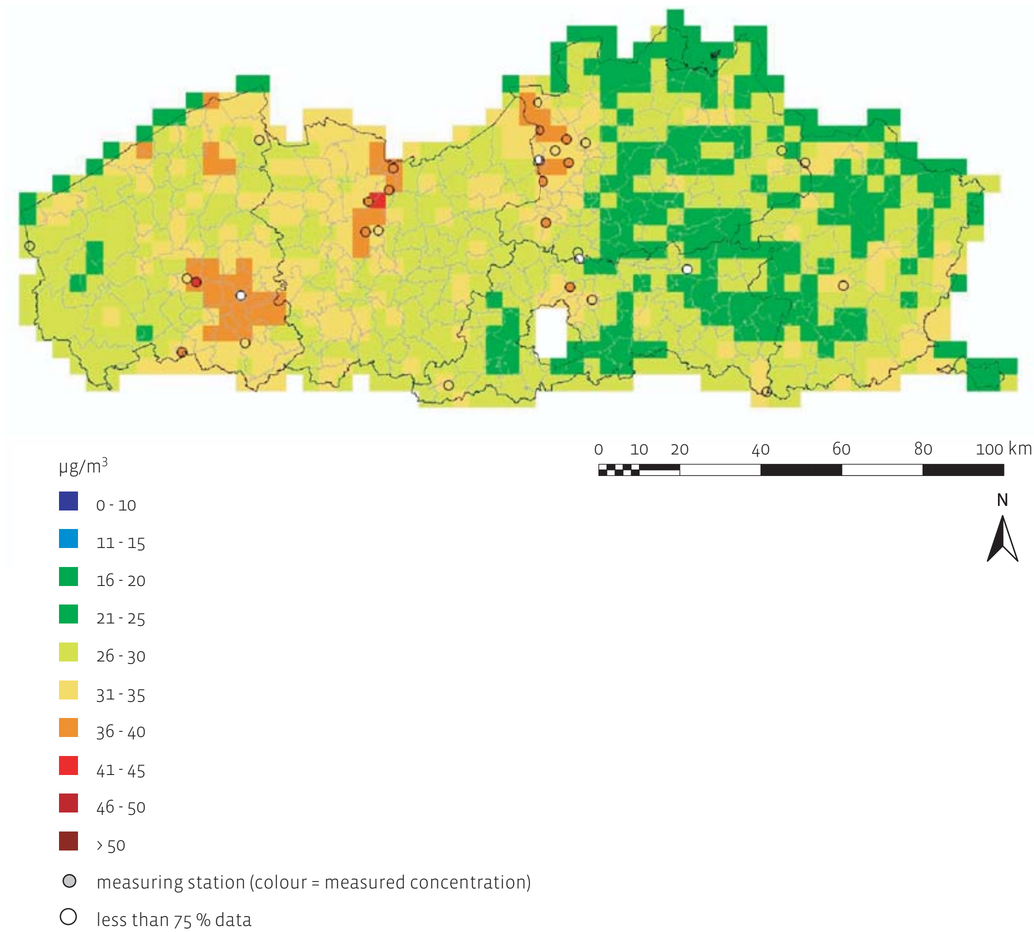
The annual average PM10 concentration reflects long-term exposure. This annual average dropped in the period 1996-2000, but has fluctuated since then, remaining close to the target for 2005 despite decreasing PM10 emissions. This deviation can partly be explained by secondary particles (which originated from particle precursors), the weather and unknown sources. In 2006 the 40 µg/m^3 target for 2005 was reached for Flanders and for urban, suburban, industrial and rural stations. However, exceeding values were recorded at two individual industrial measuring stations, namely in Roeselare Port and Oostrozebeke. The target for 2010 was not reached at any of the measuring stations.

New targets under preparation

In its Daughter Guideline (1999/30/EC) the EU formulated the limit values for PM10 in the ambient air for 2005 and 2010. Those targets for the annual average PM10 concentration are included in MINA plan 3 (2003-2007). The target for 2005 is 40 µg/m^3; that for 2010 is 20 µg/m^3. In October 2007 there was no agreement yet between the European Council of Environment Ministers and the European Parliament on whether to modify those limit values or not.

PM10 concentration (µg/m^3)	1996	1998	2000	2002	2003	2004	2005	2006
industrial area	57	41	39	39	48	37	36	38
suburban area	..	..	..	30	35	30	31	33
urban area	42	31	36	34	39	35	36	37
rural area	..	..	..	30	34	30	28	31
Flanders	*52*	*38*	*38*	*36*	*42*	*33*	*33*	*34*

☹ Annual average PM10 concentration: spatial interpolation DPSIR



Source: IRCEL-VMM

Interpolation technique offers a global spatial overview

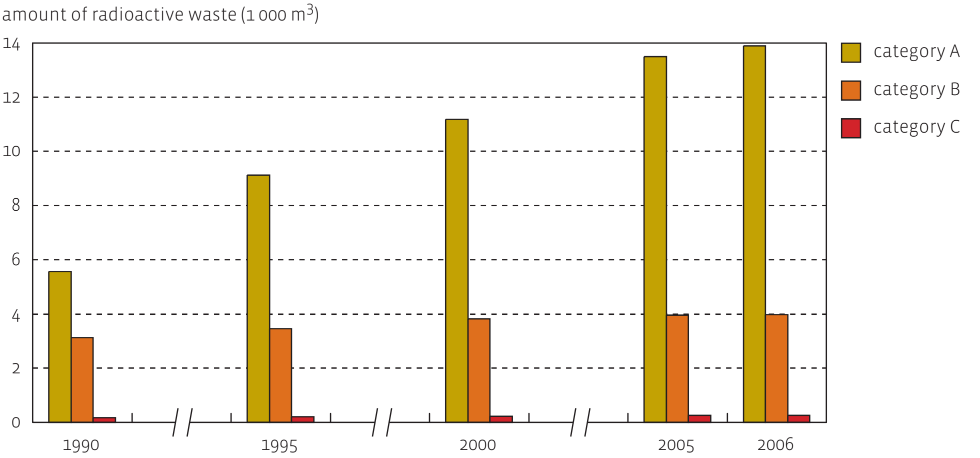
The 32 stationary PM10 measurement points of the VMM's telemetric air monitoring network in Flanders (2006) are a spatial sample of the global spatial PM10 pollution in the whole of Flanders. In order to be able to assess that global spatial situation, the measurement values need to be extended to locations for which no measurements are carried out. This is done by means of a spatial interpolation technique: the RIO-corine model.

PM10 concentrations are highest in the west of Flanders

The highest annual average PM10 concentrations occur in the west of Flanders. PM10 concentrations between 36 and 40 µg/m³ are recorded in the metropolitan areas of Antwerp and Ghent, the port areas and the south of West Flanders. The annual average concentration of 40 µg/m³ (target for 2005) has only been exceeded locally in Flanders since 2004. It should be remarked here though that the interpolated concentrations are representative of areas of 4x4 km. Near busy traffic arteries or local emission sources concentrations can be higher.

3.6 Ionising radiation

☹ Nuclear waste stored in anticipation of final disposal DPSIR



Unprocessed used nuclear fuel and dismantled steam generators are being stored in Doel and Tihange and have not been included in this figure.

Source: NIRAS

Storage in anticipation of final storage increases every year

In the period 1967-1982, Belgium, like many other countries, dumped the conditioned radioactive waste in the sea: in total, 15 765 m^3 of low-level and radium-containing waste was dumped in the North-Atlantic Ocean at 4 000 m depth. Since this was stopped in 1982, the amount provisionally stored at Belgoprocess in anticipation of final disposal increases each year. One reason for this is that research into the best final disposal method is still going on. In mid-2006 the federal government opted for surface storage in Dessel on the border with Mol for category A waste (low- and intermediate-level short-lived waste). The project is in the design phase; construction is planned for 2011-2016. For category B (long-lived) and category C (high-level) waste Belgium is studying final storage in deep clay layers.

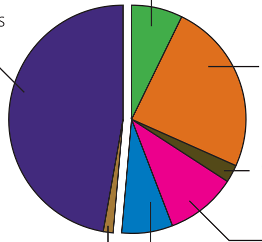
Nuclear research and nuclear plants main sources of radioactive waste

The conditioning of radioactive waste – conversion or transformation, removal or securing of harmful substances in the waste – in Belgium is mostly done at Belgoprocess in Dessel. In 2006, after processing 254 m^3 of low- and intermediate-level conditioned waste was obtained. The origin of that waste was the Belgian Nuclear Research Centre (66.1 %), the nuclear plants (10.4 %), the decommissioning of old installations in Mol-Dessel (2.5 %), hospitals & biomedical laboratories (1.2 %) and other companies (19.9 %). In addition, the nuclear plants processed the largest part of their waste themselves on site and contributed an additional 133.2 m^3 of conditioned waste in 2006. Finally, at the nuclear plants themselves unprocessed used nuclear fuel is stored (~ category C; not included in figure & table): at the end of 2006 at the site of Doel there were already 1 226 tonnes of this material stored, and every year this amount grows by another 60 tonnes.

amount of waste (m^3)	1990	2000	2005	2006	*estimated by 2070*
category A	5 565	11 181	13 495	13 888	*70 500*
category B	3 124	3 818	3 966	3 976	*8 900*
category C	173	226	253	266	*4 900*

Sources of ionising radiation in effective radiation dose for the population

DPSIR



* natural sources

Source: UNSCEAR (2000), calculated for Flanders for 2006

Half of the ionising radiation is of natural origin

Ionising radiation can cause biological damage in living beings, which can lead to hereditary defects and cancer. For Flanders the effective dose of ionising radiation – a measure for biological effects of exposure expressed in sievert (Sv) – is estimated at 4.1 mSv/y. 2.1 mSv/y of this stems from natural sources and 2.0 mSv/y from the application of ionising radiation (especially in medicine). The contribution of nuclear plants and industry during normal operation is minimal.

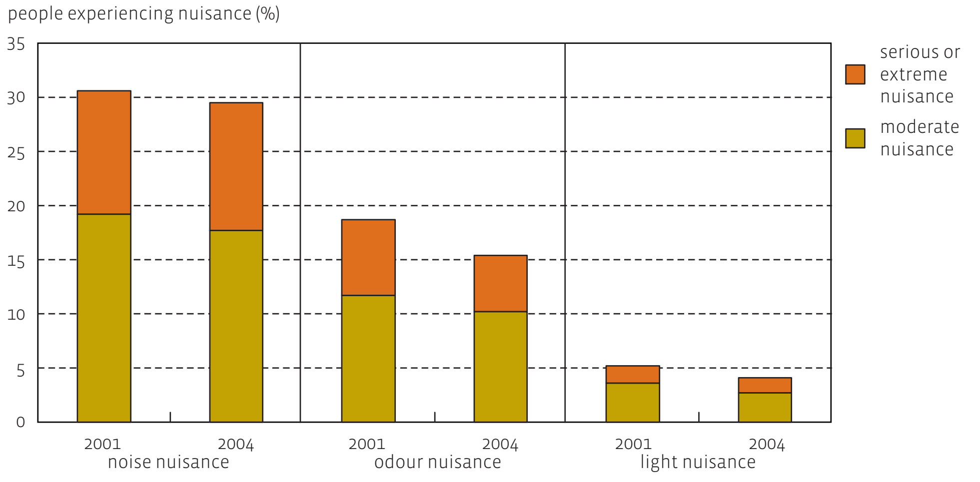
Dose increase almost completely on account of medical applications

The average annual dose has increased during the period 1955-2006 by more than 1 mSv. This is almost completely on account of medical applications. Not only the number of examinations but also the dose for each examination has increased due to the fast evolution of radiological techniques, e.g. the development of new, more powerful CT scanners and the use of medical images during surgical interventions. Approximately 0.1 mSv of the increase is the result of natural radioactivity which has been increased by human activity. Causes are the reduced ventilation in buildings (due to better insulation) and the extended application of construction products which contain phosphogypsum and fly ashes. Those by-products of the phosphate industry and coal combustion contain higher concentrations of natural radioactive substances.

3.7 Nuisance

Reported nuisance from noise, odour and light

DPSIR



Source: AMINABEL (2004)

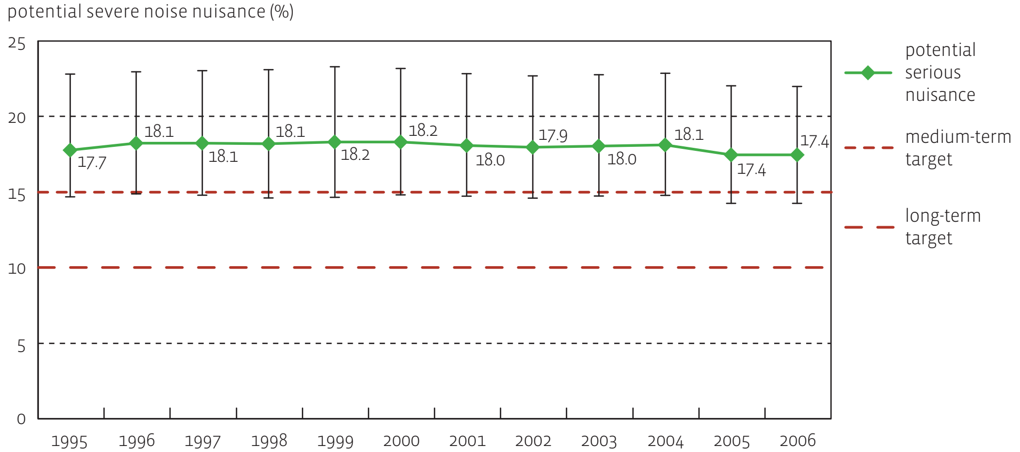
Written Environmental Investigation shows the reported nuisance
The reported nuisance is a reflection of the measure in which the inhabitants of Flanders suffer nuisance from noise, odour and excessive light. These figures are obtained on the basis of the Written Environmental Investigation (SLO). This three-yearly survey had already been conducted in 2001 and 2004. The reported nuisance shows whether nuisance has increased or decreased. Modifications in the sources causing this nuisance can also be traced.

Noise is the main source of nuisance
Noise is the most important source of nuisance with respectively 11.8 % and 17.7 % of people experiencing serious to extreme nuisance and moderate nuisance in 2004. Light nuisance affects the lowest number of people, with 1.4 % suffering serious to extreme nuisance and 2.7 % experiencing moderate nuisance. In 2004, 15.4 % of people experienced odour nuisance. This means that the MINA plan 3 (2003-2007) target for odour nuisance was reached. This target consists of a decrease in the proportion of people suffering serious nuisance to less than 7 % and a status quo or decrease in the proportion of people suffering moderate nuisance compared to 2001, when this was 19 %.

people experiencing nuisance (%)	noise nuisance		odour nuisance		light nuisance	
	2001	2004	2001	2004	2001	2004
moderate nuisance	19.2	17.7	11.7	10.2	3.6	2.7
serious or extreme nuisance	11.4	11.8	7.0	5.2	1.6	1.4

☹ Potential severe noise nuisance from traffic

DPSIR



with indication of the interval within which the exact value with 68 % reliability is situated

Source: Infrastructure Agency, LNE, BIAC, ATF-K.U.Leuven, FOD Economie, General Directorate for Statistics and Economic Information, Aggregatie INTEC-UGent

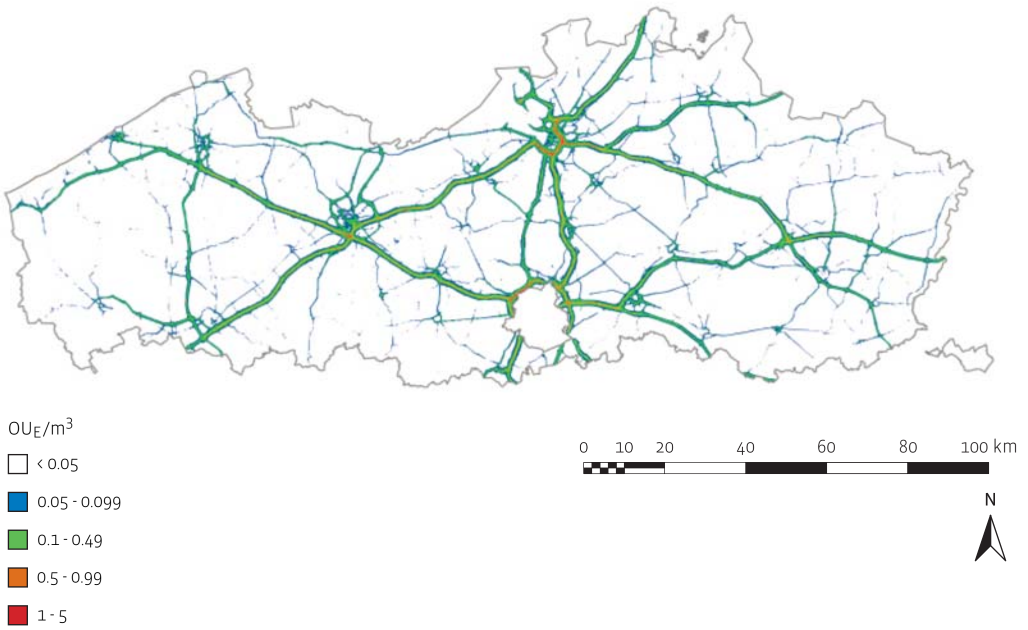
Number of people potentially experiencing noise nuisance does not go down

When calculating potential noise nuisance, the nuisance from sources outside the home is estimated, excluding punctual aspects (such as media attention) and personal aspects (such as sensitivity to noise). As a medium-term goal, MINA plan 3 (2003-2007) determines that the number of people potentially experiencing nuisance in Flanders should drop to less than 15 % of the population in 2007. The level of this indicator has not changed and this goal has not been reached due to the lack of a clear policy on noise from road traffic. However, other sources of noise, e.g. from households (neighbours), industry, trade & services must not be forgotten. They each cause potentially serious nuisance to only a small part of the population, but together they are responsible for around one third of all potential nuisance.

Nuisance

Odour nuisance from road traffic

DPSIR



OU_E: European odour units; the map reflects the situation in 2004

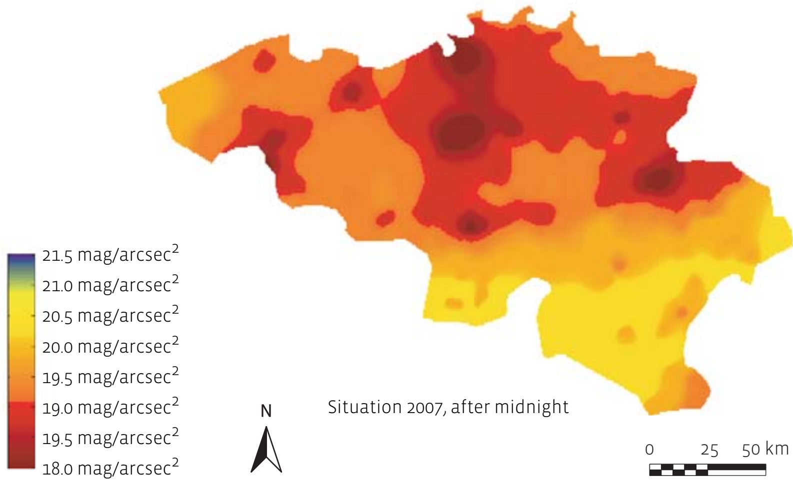
Source: PRG Odournet nv

Traffic as a source of odour nuisance
By means of odour emission indicators for vehicles, a map was created showing the odour nuisance from road traffic in Flanders. On this map, the big cities are clearly visible as a result of the dense road network and the high traffic intensities.
The zero effect level is the minimum odour concentration for the source to produce a significant effect.

Based on the odour nuisance map and the zero effect level the number of people potentially experiencing nuisance and the surface area affected by odour nuisance as a result of road traffic can be determined. In 2006 the proportion of people potentially experiencing nuisance as a result of road traffic in Flanders was 27 %. The surface area affected by odour nuisance is defined as the area within which the zero effect level is exceeded on a yearly basis; for 2006 this was 11 % of the surface area of Flanders.

Currently the odour emission from road traffic is mostly indirectly influenced by international and European legislation which is aimed at the reduction of emissions from other air pollutants.

☹ Artificial sky luminance



mag: magnitude; arcsec: arcseconds

Source: VITO

Light pollution and sky glow

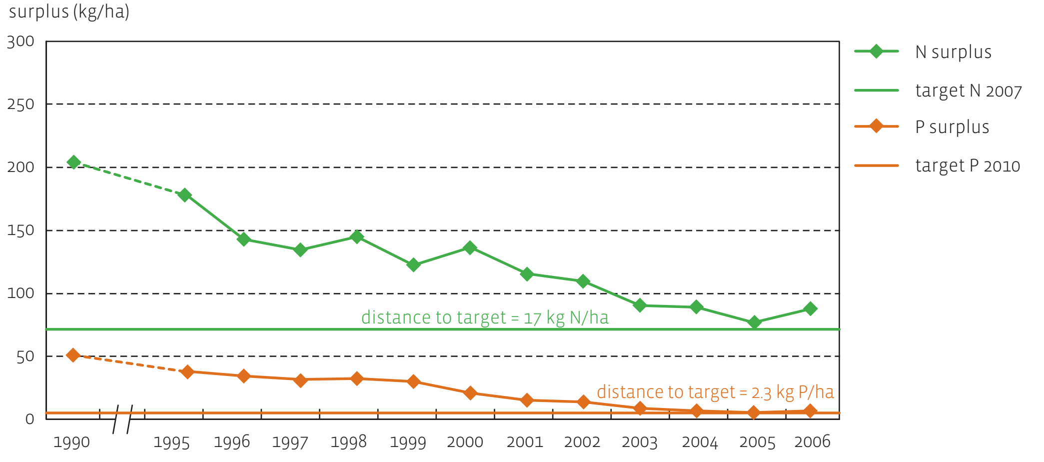
Light pollution is the excessive and wasteful use of artificial light. A form of light pollution is the artificial sky glow or sky luminance which results from the reflection of artificial light on gas molecules such as water vapour and particulate matter in the atmosphere. When the sky is too bright, the stars are no longer visible. Specific intensity is a unit of measurement used by astronomers to indicate the brightness of the starry sky and it can be converted to luminance. It is a logarithmic scale, and an unpolluted night sky receives the highest value, 22.

More than 9 times the natural sky luminance

If we converted the map of Belgium for the period after midnight into percentage of natural sky luminance new moon, we would obtain values of 300 % to over 900 % (in the areas most affected by light pollution) almost everywhere in Flanders. Thus, the target for 2007 contained in MINA plan 3 (2003-2007), namely that artificial sky luminance must not amount to more than 9 times the natural sky luminance (between 0:30 and 5:00 a.m.), was not achieved.

3.8 Eutrophication

☺ **Surplus on the soil surface balance in agriculture** DPSIR



* provisional figures

Source: ILVO

Big reduction in the surplus, target within reach

The surplus on the soil surface balance in agriculture is the difference between, on the one hand, what ends up on the agricultural soil (fertiliser, deposition) and, on the other hand, the removal of crops and ammonia emissions. This surplus eventually ends up in the air and the water or remains in the soil. In 2006 the surplus for nitrogen had dropped by 57 % and for phosphorus by 88 % compared to 1990.

Drop driven by reduced use of fertiliser

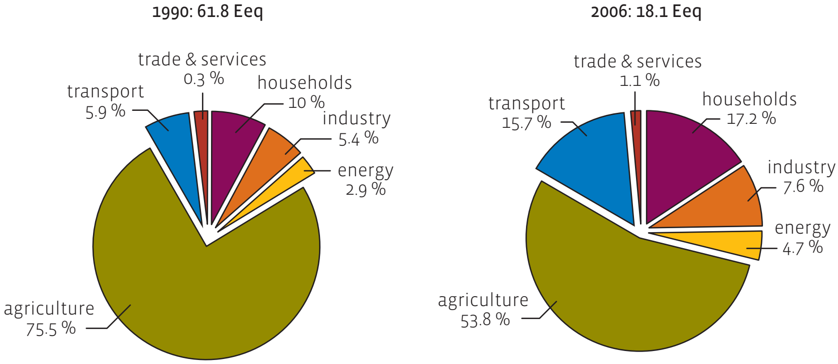
The pronounced decrease in the period 1990-2006 was mainly a result of the reduced use of chemical fertiliser: -40 % for nitrogen and -86 % for phosphorus. In addition, animal manure production decreased (-15 % for N and -24 % for P) due to shrinking livestock numbers and a lower nutrient content of animal feed. The increasing processing and export of manure lower the pressure on the Flemish agricultural soil. The slight increase in 2006 is the result of a poor harvest in that year.

The 2007 nitrogen target is not so much intended to avoid eutrophication, but as a general protection measure for the collection of drinking water. Nevertheless, the decreasing environmental pressure seems to be insufficient to attain an acceptable nitrate concentration in surface water, and the soil surface balance target will need to be adjusted.

surplus	1990	1995	2000	2005	2006	target 2007
nitrogen (kg N/ha)	203	177	136	76	87	70
phosphorus (kg P/ha)	51.0	37.4	20.3	4.6	5.9	3.6

☺ Eutrophying emissions

D P SIR



1 Eeq (eutrophication equivalent) = 10 000 tonnes N = 1 000 tonnes P

Source: Aquafin, ILVO, OVAM, core set of environmental data, MIRA

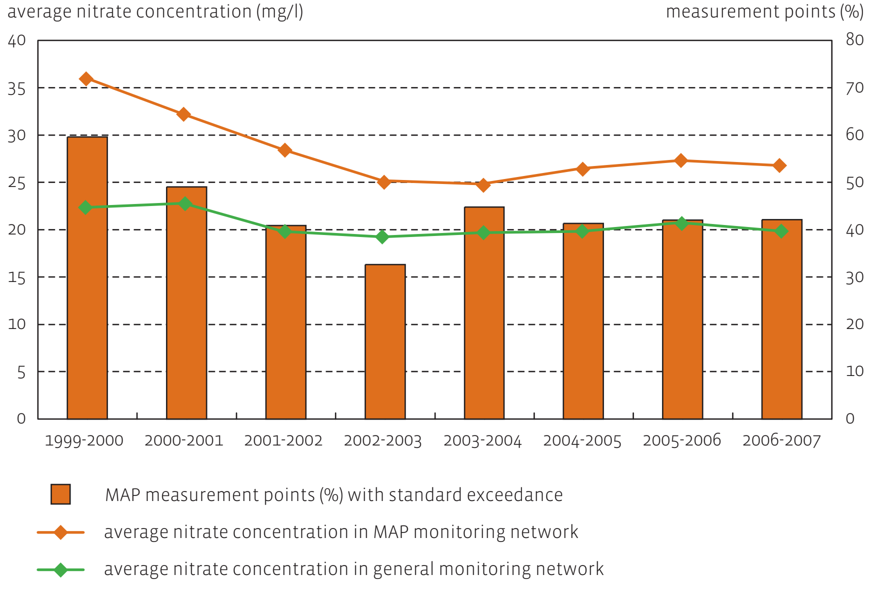
Agriculture, households and transport cause most of the eutrophication
Eutrophying emissions include the emission into air, water and soil of eutrophying nitrogen and phosphorus. Agriculture accounts for the largest share of eutrophying emissions. It is followed by households and transport, which jointly account for 33 % of nutrient pressure in 2006. The share of these 2 sectors has grown since 1990. Agriculture has reduced its share from 75 % to 54 %. As the largest polluter (agriculture) realised the largest emission reduction, the share of all other target groups rose, even if they achieved a reduction in absolute terms. After agriculture, the energy sector, the industry and households achieved the biggest reduction. Trade & services increased its share of emissions both in absolute and relative terms.

Impact on environmental quality remains a sore point
In 16 years' time, eutrophying emissions have dropped by 71 %. Outside agriculture, this is mainly the result of decreasing NO_x emissions in the energy and transport sectors and of the increased treatment of waste water from households and industry. This has had only a limited effect on the improvement of water and air quality up to now because – particularly for nitrogen – different chemical transformations can occur. This results in a delay due to which the effects of measures cannot be determined immediately.

eutrophying emission	1990 (Eeq)	2006 (Eeq)	evolution 1990-2006 (%)
households	6.2	3.1	-50
industry	3.3	1.4	-59
energy	1.8	0.9	-53
agriculture & fisheries	46.6	9.7	-79
transport	3.7	2.8	-22
trade & services	0.16	0.20	+24
total	*61.8*	*18.1*	*-71*

Eutrophication

☹ Nitrate in surface water in agricultural areas DPSIR



Source: VMM

Too much nitrate in surface water

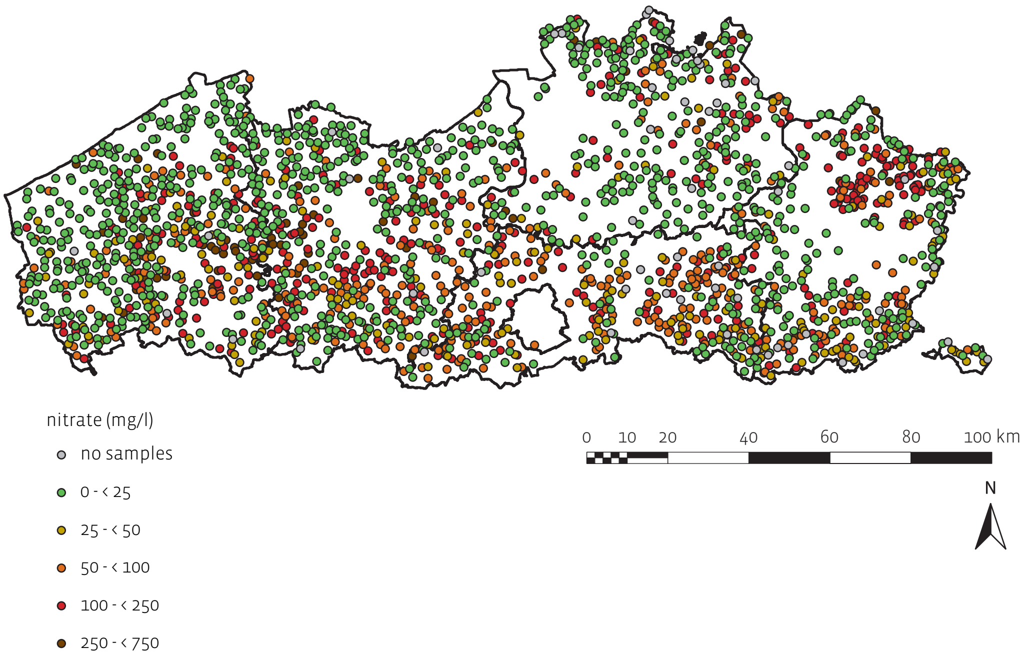
The quality of the surface water in agricultural areas is followed up via the MAP monitoring network, operated by VMM. The general network encompasses both the agricultural areas and the rest of Flanders. In each MAP measurement point the nitrate concentration should remain below 50 mg nitrate/l in 95 % of the measurements. According to MINA plan 3 (2003-2007), each measurement point in surface water has to comply with this 95 % standard in 2007. The results always refer to the period between 1 July and 30 June, including the winter period. From the time series it is clear that the positive trend of the period 1999-2003 has turned. The stagnation is explained by the weather conditions, which favour nitrate discharge, but also by overfertilisation. The average nitrate concentration in agricultural areas is higher than the overall concentration in Flanders. This points to the important role of the agricultural sector in the decontamination of surface water with respect to nitrate.

New manure policy has to bring change

The lack of evolution in the MAP monitoring network over the past three winters illustrates the need for additional measures. A change is needed, stimulated by a renewed manure policy. In order to optimally protect the environment and fight eutrophication, considerably lower values than 25 mg nitrate/l are needed in every measurement point.

	1999-2000	2002-2003	2005-2006	2006-2007
MAP measurement points with exceedance (%)	60	33	42	42
average nitrate concentration in MAP monitoring network (mg nitrate/l)	35.8	24.9	27.1	26.5
average nitrate concentration in general monitoring network (mg nitrate/l)	22.1	19.0	20.5	19.6

☹ Nitrate in groundwater in agricultural areas



results of spring 2006 measurement campaign

Source: VMM, http://dov.vlaanderen.be

Nitrate from manure enters into the soil

The quality of the groundwater table is followed up by VMM in the MAP monitoring network for groundwater. According to MINA plan 3 (2003-2007), each measurement point in groundwater in agricultural areas has to comply with the 50 mg nitrate/l standard. The general increase in the exceedance percentages during the spring campaign of 2005 compared to 2004 can be ascribed in the first place to an increase in the number of sampled measurement locations. In principle, the slight improvement in the average nitrate concentrations in 2006 is positive, but it can also be a result of a temporary weather effect. Both the autumn of 2005 and the spring of 2006 were characterised by a low amount of precipitation or a frozen soil surface, so that the amount of nutrients washed into the groundwater was rather small.

Local manure pressure and vulnerability of the soil play an important role

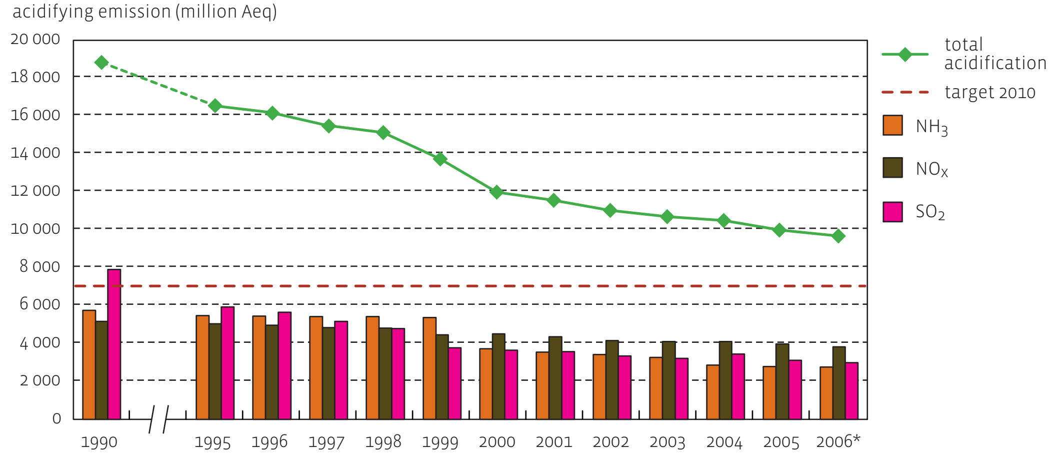
The results for 2006 on the map show that the exceedances at the measurement points are not distributed equally over Flanders. Besides the local manure pressure, the vulnerability of shallow water-carrying layers determine the results as well. Vulnerability is determined by the permeability of the soil when it comes to nitrates. Overground measures have a delayed impact on the groundwater.

measurement points (%)	spring 2004	spring 2005	spring 2006
exceedance of 50 mg nitrate/l	35.7	39.5	37.9
exceedance of 25 mg nitrate/l	47.5	51	48.8

3.9 Acidification

Potentially acidifying emissions

DPSIR



* provisional figures. NO_x emissions from the soil caused by bacterial processes after the use of animal manure and chemical fertiliser are not considered when determining the NEC ceilings but they are taken into account for the emission totals.

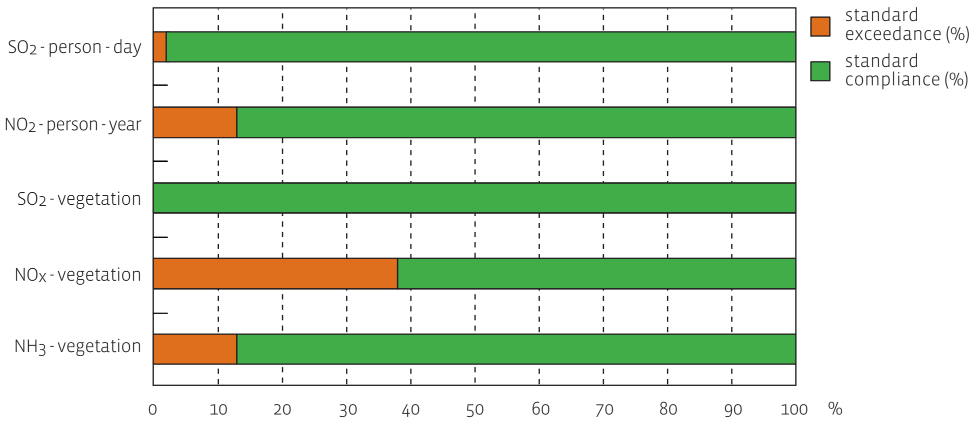
Source: VMM

Acidifying emissions decrease but the target for 2010 becomes difficult to achieve
In 2006 acidifying emissions in Flanders were only 50.8 % of those in 1990. Between 1990 and 2000 SO_2 and NH_3 emissions dropped the most, thanks to the use of various fuels with a lower sulphur content, the low emission application of manure, and the decrease in livestock numbers. NO_x emissions did not decrease that much during the period 1990-2006, in spite of a range of reducing measures in the transport and energy sectors. The target from the EU Directive on National Emission Ceilings (NEC) for 2010 will probably be difficult for Flanders to reach.

Further measures for NO_x emission reduction are necessary
In 1990 NO_x had the smallest part in acidifying emissions; since 2000, however, NO_x is the most important component. In 2006 the transport sector was responsible for 49 % of NO_x emissions and further measures are necessary (mobility policy, encouraging the changeover to low emission vehicles, awareness campaigns, adaptation of the road tax ...). The industry can reduce further by continuing the use of NO_x filters, low NO_x burners, catalytic converters and other measures aimed at process emissions.

acidifying emission (million Aeq)	1990	1995	2000	2005	2006*
SO_2	7 920	5 936	3 660	3 120	2 991
NO_x	5 161	5 052	4 505	3 980	3 832
NH_3	5 762	5 475	3 730	2 788	2 751
total	*18 843*	*16 463*	*11 896*	*9 888*	*9 575*

SO_2, NO_x, NO_2 and NH_3 concentrations in the ambient air DPSIR



Source: VMM

Limited number of exceedances, especially in the Antwerp area
Excessive concentrations of potentially acidifying substances in ambient air are *harmful* for both *humans* and *ecosystems*. The measured concentrations of SO_2, NO_x and NO_2 are tested against the limit values from the 1st European Daughter Directive 1999/30/EC and NH_3 concentrations against the limit value for vegetation of the World Health Organisation (WHO).

SO_2 and NO_2 concentrations are measured at respectively 47 and 55 measurement points. The location of measurement points which are taken into account for testing against the standards is in accordance with the criteria contained in the directive. To test concentrations against the standard for public health, the measuring stations taken into account are those which are located in areas where large groups of the population are exposed to SO_2 and NO_2 concentrations. Due to the dense development, the road network and the spread of the industry, strictly speaking there are no areas in Flanders to which the annual limit values for the protection of ecosystems is applicable. However, testing against these annual limit values can be done indicatively.

The SO_2 limit value for health, both hour (350 µg/m^3, max. 24 exceedances per year) and day (125 µg/m^3, max. 3 exceedances per year), was respected everywhere in Flanders in 2006, except at one measuring station in the Antwerp port area. Similarly, the annual SO_2 limit value for vegetation (20 µg/m^3) was not exceeded at any of the rural measuring stations.

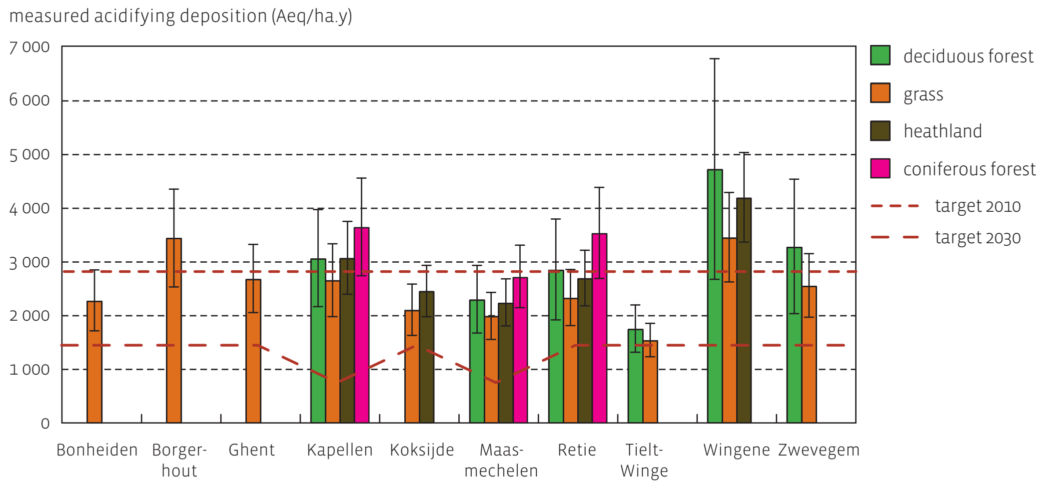
The hourly NO_2 limit value for the protection of human health (200 µg/m^3 not more than 18 times exceeded) was respected. On the other hand, there was a remarkable increase in 2006 in the number of exceedances of the numerical value, concretely at a number of measuring stations in the Antwerp area. The future annual NO_2 limit value for the protection of human health (40 µg/m^3) was exceeded at 7 stations (six in the Antwerp port area, one in Borgerhout).

The annual NO_x limit value for vegetation (30 µg/m^3) was exceeded in 3 out of 8 rural stations in 2006 (Schilde, Dessel and Gellik), while for NH_3 there was one exceedance of the annual limit value for vegetation (8 µg/m^3) in Wingene (West Flanders) with 8.54 µg/m^3.

Acidification

Measured acidifying deposition

DPSIR



* measured acidifying deposition in the year 2006

Source: VMM

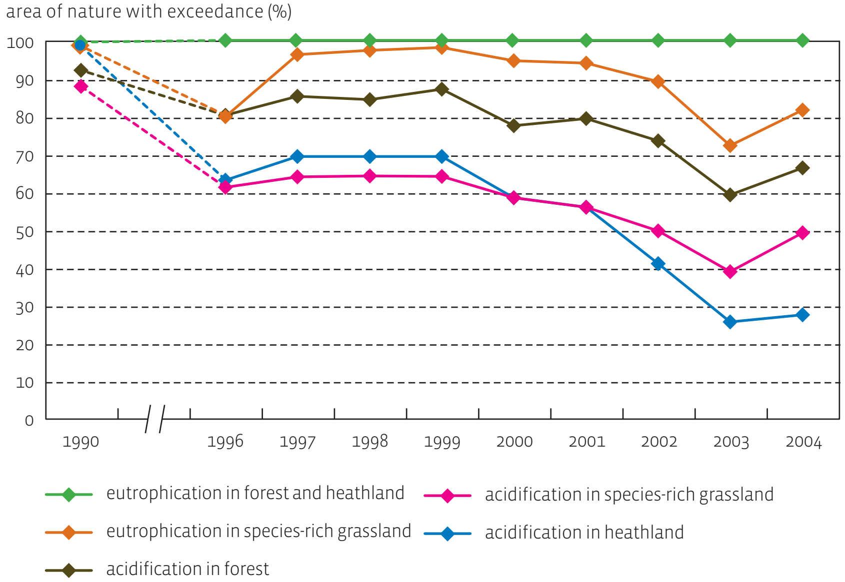
Target for 2010 only significantly exceeded once
In the VMM's acidifying deposition monitoring network, the potential acidifying deposition (wet + dry, excl. aerosols) is measured at 10 locations (although without direct influence from local sources). If we compare the total deposition in 2006 with the target for 2010, there are still *clear exceedances* for the vegetation types forest and heathland in 2006. Statistically speaking, however, only one *significant exceedance* can be observed, namely for heathland vegetation in Wingene. This does not mean that the deposition target at other measurement points and for other components was *not* exceeded, but only that the estimated uncertainty (error flags in the graph) concerning the deposition is too big to be able to draw statistically sound conclusions. For grassland, the standard seems attainable. For 4 of the measurement points the target has already been reached significantly.

Target for 2030 not reached anywhere yet
The long-term target, which implies that no damage occurs to vegetation, is not being reached anywhere yet. Especially in typical heathland areas such as Kapellen and Maasmechelen the depositions are still a long way from the target. But for the other vegetation types as well, measurement values are twice as high as the target values.

Aeq/ha (2006)	grass	deciduous forest	coniferous forest	heathland	target 2010	target 2030
Bonheiden	2 262	-	-	-	2 770	1 400
Borgerhout	3 424	-	-	-	2 770	1 400
Ghent	2 666	-	-	-	2 770	1 400
Kapellen	2 638	3 047	3 628	3 052	2 770	1 400
Koksijde	2 087	-	-	2 435	2 770	1 400
Maasmechelen	1 972	2 282	2 703	2 224	2 770	1 400
Retie	2 314	2 833	3 515	2 674	2 770	1 400
Tielt-Winge	1 522	1 734	-	-	2 770	1 400
Wingene	3 436	4 704	-	4 175	2 770	1 400
Zwevegem	2 538	3 263	-	-	2 770	1 400

☹ Area of nature with exceedance of critical loads for eutrophication and acidification

DPSIR



Source: VMM

Critical load as a standard for eutrophying and acidifying deposition

Due to eutrophication and acidification plant species that need a living environment with a low amount of food deteriorate fast or even die out. The critical load of a certain kind of vegetation is the deposition with which, in the long term, no harmful effects for the vegetation occur. In 95 % of the total area of vulnerable terrestrial ecosystems (forest, heathland and species-rich grassland) the critical load for eutrophication was exceeded; for acidification this is 59 %.

Starting to decrease, but still a long way to go

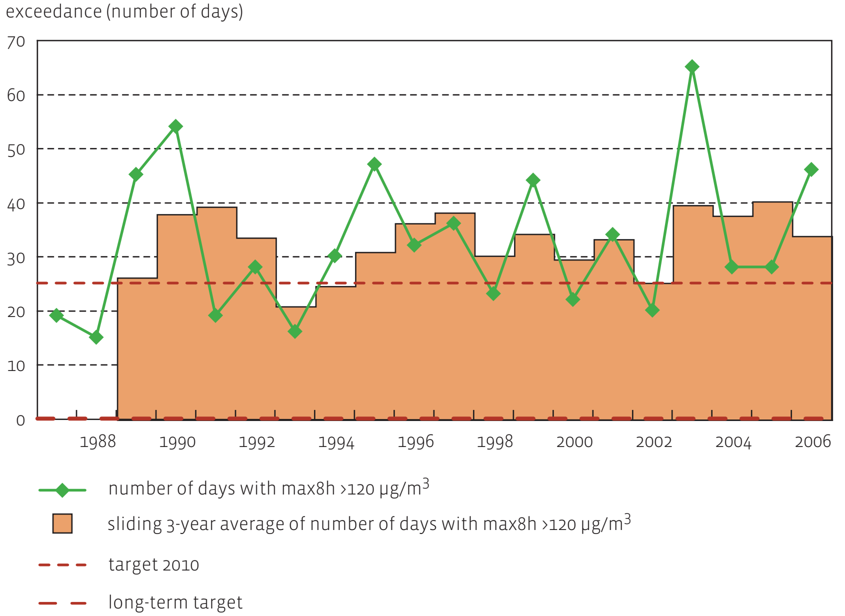
For 2010 no major improvement is expected for forest and heathland. The pressure from acidification is decreasing in forest, heathland and species-rich grassland. This decrease is related to the decrease in acidifying emissions. The increase in 2004 with respect to 2003, however, is remarkable and could be due to a higher acidifying deposition caused by increased precipitation in 2004. We expect the decreasing trend to continue in the coming years. Even so, decreased pressure on vulnerable ecosystems in Flanders is not a guarantee for a proportional restoration of the soil and biodiversity. This restoration is a very slow process and additional efforts continue to be required in order to reduce the emission of eutrophying and acidifying substances into the air, also after 2010.

area of nature with exceedance (%)	1990	1996	2000	2004
eutrophication in forest and heathland	100	100	100	100
eutrophication in species-rich grassland	98	80	95	82
acidification in forest	92	80	77	66
acidification in heathland	99	63	58	27
acidification in species-rich grassland	88	61	58	49

3.10 Photochemical air pollution

Exceedance indicator ($NET60_{ppb}$-max8h)

DPSIR



Source: IRCEL, interregional air database

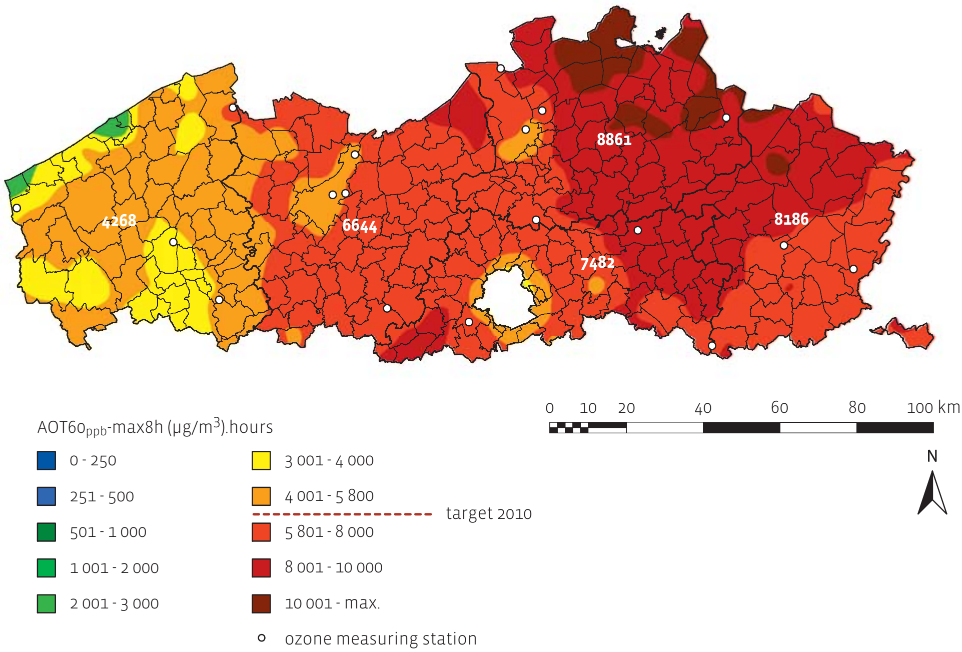
Target for 2010 once more out of reach

In Ozone Directive 2002/3/EC a long-term target for the protection of human health was established for the exceedance indicator: the maximum 8-hour average ozone concentration in ambient air may not exceed 120 µg/m^3 on any given day. The target for 2010 is 25 days per calendar year, averaged over 3 years.The averaging over 3 years is intended to level off variations due to differences in meteorological circumstances somewhat and to better identify the possible influence of the reduction policy.
The number of days with exceedance varies from year to year and depends on the quality of the summer. Due to the very sunny and hot summer of 2003 the exceedance indicator reached a maximum of 65 days. In 2004 and 2005 it dropped again to 28 days, whereas in 2006 the number of days with exceedance rose to 46. In the years 1990, 1995, 2003 and 2006 air pollution by ozone was high and approximately 70 % of the Flemish population was exposed to exceedance on more than 25 days. In 2006, this rose to 73 %, and 11 % of the Flemish population was even exposed to exceedance on more than 35 days.

A reduced emission of ozone precursors in Western Europe has lead to a reduction in the number of days with exceedance – spread over 3 years – since 1998. In 2002 the target for 2010 was reached. Due to the exceptional summer of 2003 the indicator rose again to over 40 in 2005. In 2006 the sliding 3-year average dropped to 34 days, insufficient to reach the 25-day target. Further sustainable reduction measures, like those aimed at reaching the emission standards established in the National Emission Ceilings (NEC) Directive 2001/81/EC, must be implemented in order to reach the target permanently at all locations.

Annual excess indicator (AOT60$_{ppb}$-max8h)

DPSIR



The geographical distribution was calculated using the measurements from all ozone measurement points of the telemetric monitoring networks of the three regions. On the map only VMM measurement points in Flanders are shown.
The figures are the average AOT60$_{ppb}$-max8h values per province.

Source: IRCEL, interregional air database

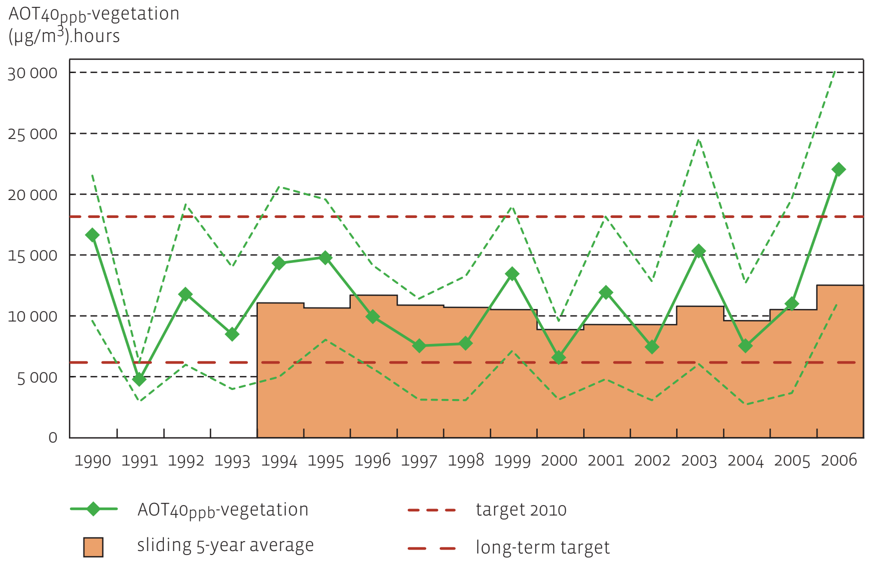
Ozone excess affecting health was high in 2006

The annual excess indicator also gives an indication of ozone levels affecting health. This indicator takes into account the level and the duration of the exceedances. Over one year, it adds up the daily exceedances of the maximum 8-hour average ozone concentration compared to the threshold of 120 µg/m^3. The annual excess fluctuates and is in line with the annual variation in sunshine and temperature.

In 2006 the average annual ozone excess in Flanders once more exceeded the EU target of 5 800 (µg/m^3).hours and amounted to 6 970 (µg/m^3).hours. This is twice the average over the past 10 years, which was 3 420 (µg/m^3).hours. For annual ozone excess 2006 comes in second place and is 10 % below 2003, when very high ozone levels were recorded.

The map shows the distribution of ozone excess affecting health across Flanders in 2006. The highest ozone excess was recorded in Antwerp (8 861 (µg/m^3).hours) and Limburg (8 186 (µg/m^3).hours). Next came Flemish Brabant (7 482 (µg/m^3).hours) and East Flanders (6 644 (µg/m^3).hours). In West Flanders the excess was significantly lower, 4 268 (µg/m^3).hours. In 2006 the EU target for 2010 was exceeded on 72 % of the Flemish territory. This affected 66 % of the population. Only West Flanders stayed below that threshold nearly everywhere. The higher excess in the northeast of Flanders has to do with the higher temperatures and the lack of atmospheric dilution processes such as e.g. a land or sea breeze at the coast.

☹ Seasonal excess for vegetation ($AOT40_{ppb}$-vegetation) DPSIR



The points on the solid line show the average value for field crops and semi-natural vegetation in Flanders for each year. The dotted lines indicate the lowest and the highest annual values.

Source: IRCEL, interregional air database

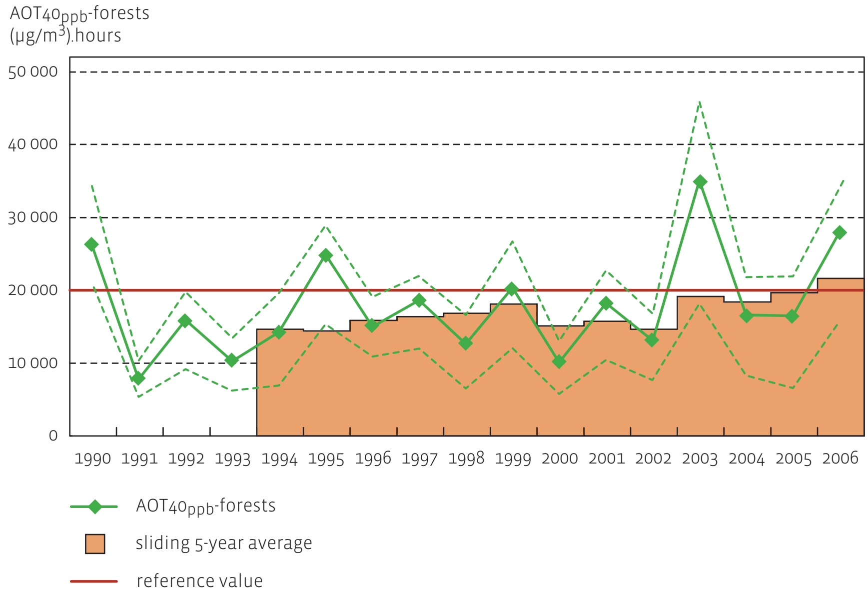
Vegetation also affected by high ozone values in July 2006

In order to protect vegetation a target for seasonal excess for vegetation ($AOT40_{ppb}$-vegetation) was included in the Ozone Directive. Seasonal excess is defined as the surplus above 80 µg/m^3 of all hourly ozone values added up between 8 a.m. and 8 p.m. during the months of May, June and July. The target (2010) is 18 000 (µg/m^3).hours, averaged over 5 years.

In 2006 the average excess for vegetation was 21 910 (µg/m^3).hours. This is more than twice the average over the past 10 years, which was 10 898 (µg/m^3).hours. In the decreasing excess for vegetation classification, 2006 comes at the very top. Far behind in second place comes the year 2003, with an average excess on arable land of 15 203 (µg/m^3).hours. This high value in 2006 is caused by high ozone values mainly concentrated in July, i.e. during the growing season of the crops (May to July). In Flanders, the sliding 5-year average of seasonal excess for crops is below the target of 18 000 (µg/m^3).hours. There is a decreasing trend starting from 1994. In 2006, however, seasonal excess for vegetation has risen in such a way that the 5-year average started rising again as well. Especially in the provinces of West and East Flanders the situation worsened a lot. In 2006 the long-term target of 6 000 (µg/m^3).hours was exceeded on all arable land. Even the 2010 target of 18 000 (µg/m^3).hours was exceeded on 74 % of the land. Only in West Flanders this was not the case; in all other provinces it was.

A further decrease in emissions is needed in all European countries to achieve the long-term target. The revision of the NEC (National Emission Ceilings) Directive, which will lead to adjusted emission ceilings for 2020 in 2008 or 2009, will contribute to that.

☹ Seasonal excess for forests ($AOT40_{ppb}$-forests) DPSIR



The points on the solid line show the average value for forests in Flanders for each year. The dotted lines indicate the lowest and the highest annual values.

Source: IRCEL, interregional air database

Seasonal excess for forests on a rising trend
Seasonal excess for forests is the cumulated surplus above 80 µg/m³ of all hourly ozone values between 8 a.m. and 8 p.m. during the months of April to September. The Ozone Directive only specifies a reference value of 20 000 (µg/m³).hours for the protection of forests. Exceedances of this value must be reported to the European Commission and the population.

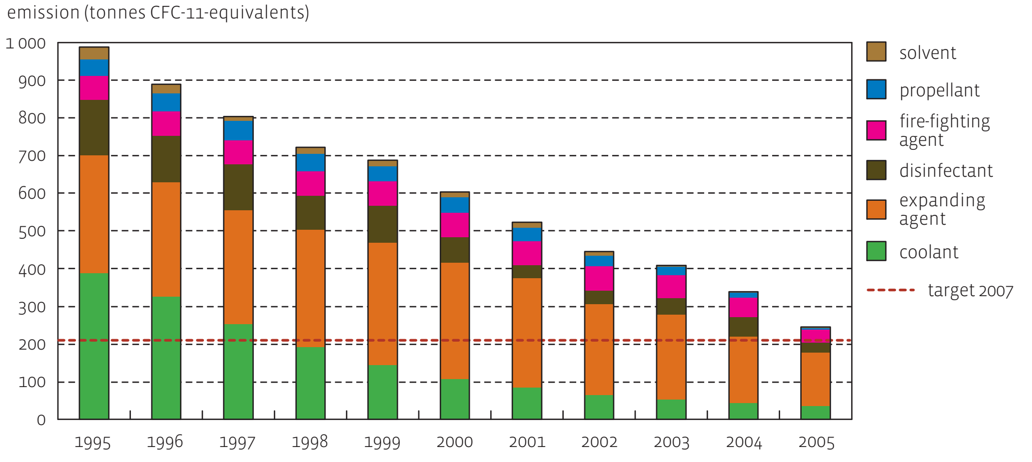
The average excess for forests was very high in 2006: it reached the second highest value since 1990. After having reached a maximum in the ozone-rich year 2003, seasonal excess for forests remained below the EU reference value nearly everywhere in the milder ozone years 2004 and 2005. However, in 2006 the average seasonal excess for forests rose again to 27 761 (µg/m³).hours.

The sliding 5-year average of seasonal excess for forests shows a more pronounced upward trend than the excess for arable land. This is because ozone damage to forests can occur during 6 months (from April to September), while the growing season for field crops is restricted to 3 months (May, June and July). The longer the period, the more the increasing trend of the ozone background values becomes apparent. For the year 2006 , this means that the 5-year average, which amounted to 21 624 (µg/m³).hours, did exceed the EU reference value.

3.11 Depletion of the ozone layer

Emission of ozone-depleting substances

DPSIR



Source: VITO based on Econotec (2007)

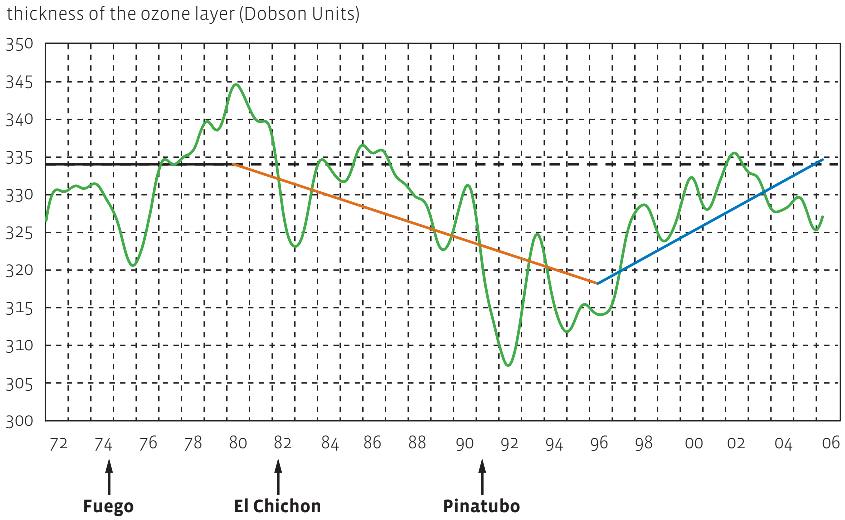
Emissions reduced by three quarters over 10 years; short-term target within reach
To protect the ozone layer the emission of ozone-depleting substances must be reduced. In 2005 the total emission amounted to 245 tonnes CFC-11-eq, or 744 tonnes CFC-11-eq less (-75 %) than in 1995. Expanding agents (used in the manufacture of synthetic foams) remain by far the most important source: 58 % of the emissions in 2005.

MINA plan 3 (2003-2007) intends to push back emission of ozone-depleting substances by at least 70 % by 2007 in comparison with *emissions in 1999*, which means a reduction of 481 tonnes CFC-11-eq. In 2005 the reduction was 443 tonnes CFC-11-eq compared to 1999 (64 %). Thus, emissions still need to be reduced by 39 tonnes CFC-11-eq (16 % of the emissions in 2005) in order to reach the target. It is expected that this target will be reached as the changeover to non-ozone-depleting agents for a number of applications is still taking place. Moreover, measures are being taken to collect ozone-depleting substances which were used in the past as much as possible.

emission (tonnes CFC-11-eq)	coolant	expanding agent	disinfectant	fire-fighting agent	propellant	solvent	*total*
1995	388	314	146	65	43	34	*989*
2000	107	308	69	65	40	15	*603*
2004	44	175	52	51	14	2	*338*
2005	36	141	26	36	5	2	*245*

Thickness of the ozone layer

DPSIR



Source: KMI

Too early for a final conclusion

The figure shows the evolution of the thickness of the ozone layer above Ukkel. The trend can be divided into two periods. Between 1980 and 1996 the thickness of the ozone layer decreased by 0.29 % per annum (red line). Between 1997 and 2006 we can observe an increase of 0.49 % per annum (blue line).

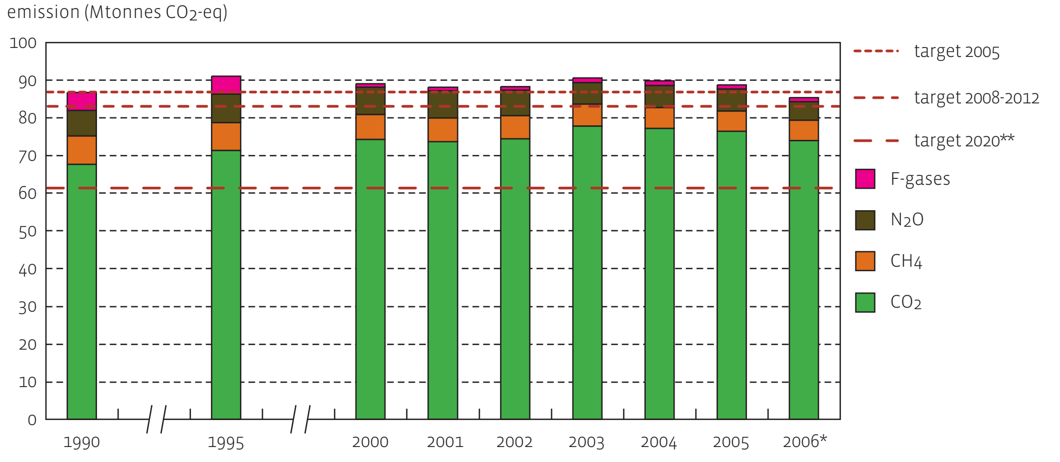
There is great uncertainty about the future evolution of the thickness of the ozone layer. New scientific research shows that there are interactions with climate change. A temperature rise in the troposphere goes hand in hand with a temperature drop in the stratosphere, which would increase the efficiency of ozone-depleting substances. As a result, the recovery of the ozone layer would slow down further (even with decreasing chlorine and bromine concentrations). Furthermore, there are other additional disturbances, such as volcanic eruptions, which (temporarily) affect the ozone layer. In addition, big differences can occur from one year to the next due to the dynamic activity of the atmosphere (air circulation). Therefore, we will only be able to draw definitive conclusions regarding the recovery of the ozone layer in a few decades from now.

Taking into account the abovementioned uncertainties and the big variations which occur from one year to the next, it is still too early to interpret the increase in the thickness of the ozone layer in recent years as a permanent recovery of the ozone layer.

3.12 Climate change

Greenhouse gas emissions

DPSIR



* provisional figures
** target MINA plan 3: 30 % reduction of greenhouse gas emissions in 2020 compared to 1990

Source: VMM

Starting to drop towards the Kyoto target

During the distribution of the Belgian Kyoto target, it was agreed that Flanders would reduce its annual CO_2, CH_4, N_2O and F-gas emissions (SF_6, HFCs and PFHs) by 5.2 % in the period 2008-2012 compared to 1990, to a ceiling of 82.463 Mtonnes CO_2-eq. In 2006 the emission of greenhouse gases in Flanders fell below the reference value of the Kyoto protocol for the first time (these are the emissions in 1990 for CO_2, CH_4 and N_2O and in 1995 for F-gases). This means that the stabilisation target which was included in MINA plan 3 was reached with a one-year delay. Moreover, in 2006 Flanders was 3.2 % from its Kyoto target for the period 2008-2012; in 2003 this was still 9.5 %.

Measures helped by milder climate

Important contributions to the recent drop were made by:

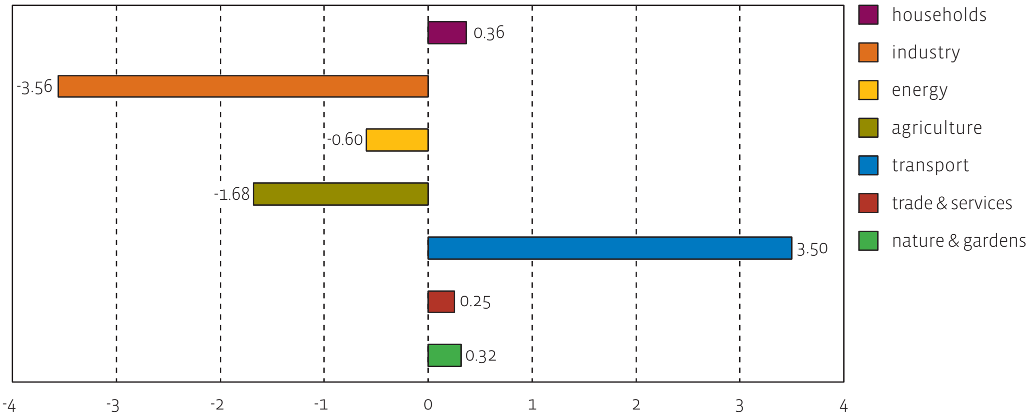
- the simultaneous (more efficient) generation of electricity and heat in CHP installations and the increasing power production from renewable energy sources;
- the introduction of catalytic converters in the nitric acid production (chemical industry);
- milder climate conditions and (probably also already) the effect of energy-saving investments in buildings.

greenhouse gas emission (ktonnes CO_2 equivalents)	1990	1995	2000	2005	2006*
CO_2	67 631	71 461	74 250	76 434	74 009
CH_4	7 636	7 318	6 605	5 473	5 367
N_2O	6 783	7 605	7 234	5 784	4 987
HFCs	(259)	259	510	878	878
PFHs	(2 335)	2 335	361	142	142
SF_6	(2 165)	2 165	92	32	32
all gases together	*86 810*	*91 143*	*89 052*	*88 742*	*85 415*
total to test against Kyoto target	86 837	91 032	88 821	88 458	85 131

Greenhouse gas emissions per sector

DPSIR

difference 2006* compared to 1990 (Mtonnes CO_2-eq)



* provisional figures

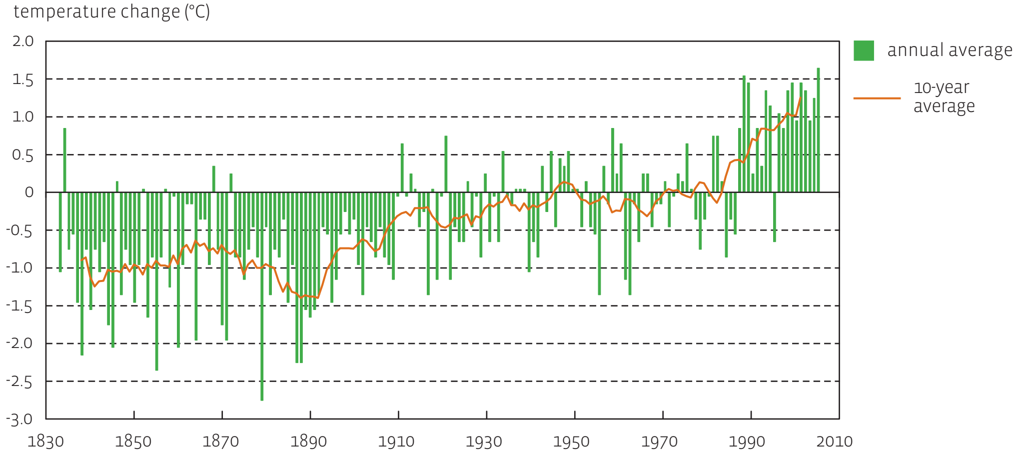
Source: VMM

Energy sector and industry responsible for half of the greenhouse gas emissions
Whereas in the first half of the 1990s the industry was still the main source of greenhouse gases in Flanders, the energy sector has now taken over that role. The industry (23.9 %) and the energy sector (27.2 %) together are responsible for more than half of the greenhouse gas emissions. Transport (18.4 %), including private transport, and households (14.9 %) are also important sources. Nature & gardens cause a net sink of greenhouse gases in Flanders, but that sink has decreased in comparison with 1990.

Transport undoes the emission reductions of the industry, agriculture and the energy sector
Despite the increased energy-efficiency of most modes of transport, emissions in the transport sector in absolute terms increased considerably in the period 1990-2006. The cause of this are the growing transport flows. This way, the emission reductions achieved in the industry, agriculture and the energy sector were largely undone. Due to the decreasing number of household members and the strong increase in economic activities, households and the trade & services sector have not yet succeeded in reducing their emissions to a level below that of 1990 either.

greenhouse gas emission (ktonnes CO_2-eq)	1990	1995	2000	2005	2006*	difference 2006/1990
households	12 362	13 613	12 895	13 501	12 727	+3.0 %
industry	23 962	25 400	22 518	21 739	20 404	-14.8 %
energy	23 806	22 958	23 573	24 217	23 209	-2.5 %
agriculture	11 543	11 664	10 929	9 985	9 865	-14.5 %
transport	12 218	13 706	15 216	15 718	15 719	+28.7 %
trade & services	4 173	4 900	4 912	4 518	4 427	+6.1 %
nature & gardens	-1 255	-1 098	-991	-936	-936	-25.4 %

☹ Temperature evolution in Belgium since the mid 19th century DPSIR



Temperature change in Belgium (Ukkel) is expressed as 1) the deviation from the annual average temperature with respect to the average temperature during the official WMO reference period 1961-1990, 2) the ten-year progressive average of the deviation compared to the same reference.

Source: MIRA based on data from the KMI

World temperature clearly on the rise

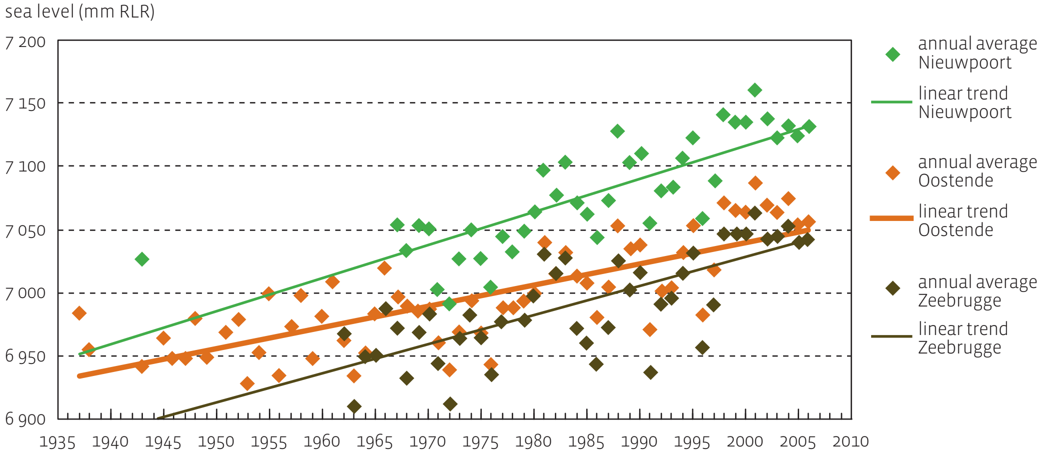
Since the beginning of the 20th century the earth's temperature has risen by 0.74°C. This change is unusual both in size and in speed, and exceeds by far the natural climate fluctuations of the past 1 000 years. Moreover, the average annual warming over the past 50 years is nearly double that of the average warming over the past 100 years. The 21 warmest years since 1850 are all contained in the period 1980-2006. As the cause of this undeniable warming of the earth the IPCC indicates in the first place the rising greenhouse gas concentrations in the atmosphere under the influence of anthropogenic activities related to the industrial revolution and the changing agricultural methods.

Greenhouse gas emissions are the key factor in the temperature evolution in Belgium (Ukkel)

In Belgium as well, the measurements are indicating a clear upward trend. With an annual average temperature of 11.4°C, 2006 was an absolute record year since the start of the measurements in 1833. The 10 warmest years since 1833 all come after 1989, while the 10 coldest years occurred before 1888. The KMI relates the warming in the first decades of the 20th century to an increase in solar activity and the relatively weak volcanic activity during that period. But the increase since the mid1980s by approximately 0.9°C could be mainly the result of a constantly growing greenhouse effect caused by the emission of greenhouse gases. The natural variation in the climate, the homogeneous or not so homogeneous temperature set, urbanisation, solar activity (which increased by 9.4 % in Ukkel between 1984 and 2005) and the presence of aerosols in the atmosphere play only a minimal role in that measured temperature increase (together their contribution is estimated at between 0.2 and 0.3°C).

☹ Sea level

DPSIR



The sea level is expressed in mm RLR (Revised Local Reference). The data of a local reference (for the Belgian coast this is TAW, 'Tweede Algemene Waterpassing') are converted to the international reference level.

Source: MIRA based on the Flemish Agency for Maritime Services and Coast and PSML

Worldwide sea level rise is accelerating

It is very likely that the rise in temperature under the influence of greenhouse gas emissions of human origin has already contributed to the worldwide rise of the mean sea level through the expansion of the seawater and the melting of ice caps and glaciers. The local differences can be explained by other causes, such as the vertical shifts of earth plates and changes in dominant wind or current directions.

In total, the global mean sea level has risen by approximately 120 metres since the end of the last ice age 20 000 years ago, and by 1 to 2 mm per year in the 20th century. Recently, it was discovered that since the 1950s a significant acceleration of the worldwide sea level rise has occurred, with a rise of 0.013 mm per year. In the meantime, the annual sea level rise amounts to 3 mm per year and more.

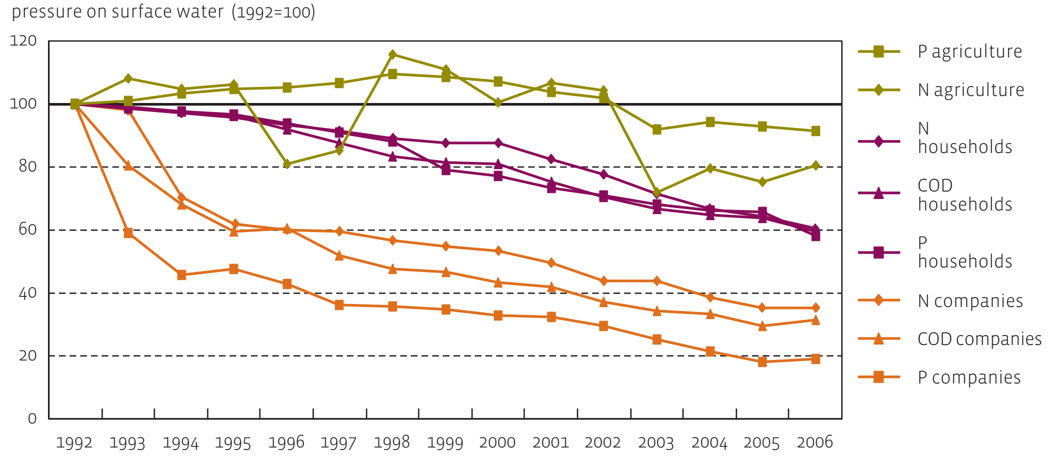
Sea level rise generally observed at the Belgian coast

At the Belgian coast, the rise of the sea level has been observed as well. Measurements in Oostende, for instance, for which the largest time series is available, show an average rise of 1.7 mm/y over the period 1937-2006. The measurement series in Zeebrugge and Nieuwpoort, which were started later, even show rises of 2.3 mm/y and 2.6 mm/y. Further research has shown that the average rise is the result of an average linear rise of 18 cm/century and a sinusoid fluctuation (consequence of the slow variation of the angle formed by earth, sun and moon). The time series for the Belgian coast is not long enough yet to be able to make significant statements concerning the possible acceleration of the sea level rise. What has been proved is that the rise is more pronounced at high tide than at low tide.

3.13 Surface water quality

Pressure on surface water from households, companies and agriculture

DPSIR



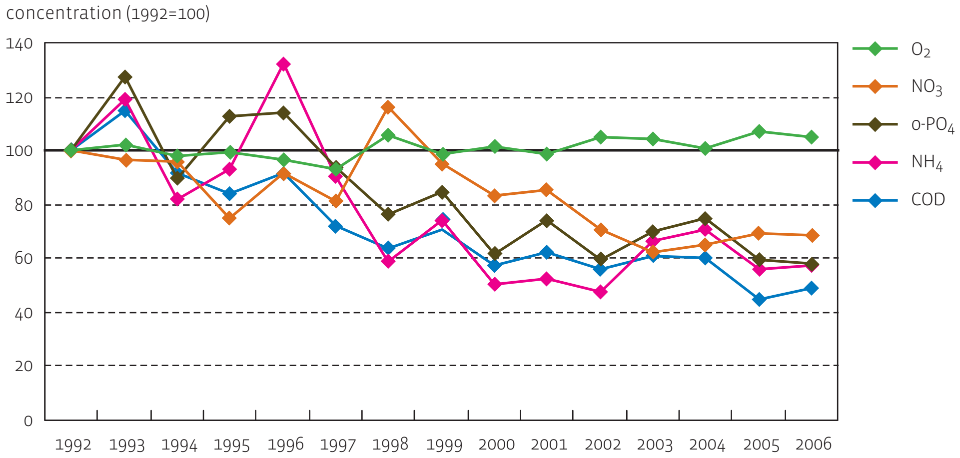
Source: VMM

Pollutant loads from households, companies and agriculture put pressure on the surface water

The indicator shows the pollutant loads of COD (chemical oxygen demand), N (nitrogen) and P (phosphorus) which actually end up in the surface water. Domestic pollution loads have gradually declined due to the expansion and improvement of the public waste water treatment network. As a result of more stringent discharge standards, better enforcement, the introduction of cleaner production methods, the environmental tax on industrial waste water and increased environmental awareness, many companies (MIRA sectors industry, energy and trade & services) have made a big effort to reduce pollutant loads. This effort resulted in a very marked decrease in the pollutant loads during the 1990s. Since then, the decrease is less strong. For the first time in 2006 there was a rise in pollutant loads. In the coming years, it will become clear whether it concerns a changing trend. Pollutant loads from the use of fertiliser in agriculture have decreased much less.

pressure on surface water	agriculture		households			companies		
	P	N	N	COD	P	N	COD	P
reduction 2006 vs. 1992 (%)	8.7	19.4	39.5	40.2	42.0	64.8	68.5	80.9

Nutrients and oxygen-related parameters in surface water DPSIR



The results of the MAP monitoring network were not included in this analysis.

Source: VMM

Complex interplay of factors

The presence of a sufficiently high concentration of dissolved oxygen (O_2) is extremely important for the life in the water. The presence of oxygen-binding substances in water decreases the oxygen concentration and can be estimated by means of chemical oxidation (chemical oxygen demand or COD). Nitrogen and phosphorus are important nutrients or plant-feeding elements which are essential for the growth of plants. Nitrogen can be taken up by plants in the form of ammonia (NH_4) or nitrate (NO_3). Phosphorus is taken up as dissolved (ortho)phosphate (o-PO_4). Nitrogen and phosphorus compounds play an important role in the undesirable process of eutrophication. Eutrophication implies that there are too many nutrients, which leads to an explosive growth of plant life in a watercourse, resulting in e.g. algae blooms.

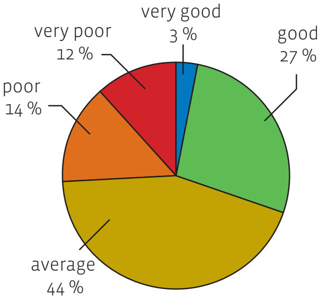
Water quality stagnates

Most parameters improved notably during the 1990s. However, nitrate concentrations fluctuated. Since then, little or no improvement has been observed. The cause of this can be found, firstly, in the pollutant loads, which have hardly decreased over the past few years. In order to achieve the current standards and future targets, the first thing that is needed is a further reduction of pollutant loads. Secondly, it will be necessary to improve structural characteristics and clean up watercourse sediments in order to boost the self-cleaning potential of watercourses.

	1994	1998	2002	2006
o-PO_4 (mg P/l)	0.8	0.7	0.6	0.5
O_2 (mg/l)	6.7	7.2	7.2	7.2
NH_4 (mg N/l)	4.4	3.2	2.6	3.1
NO_3 (mg N/l)	5.5	6.6	4.0	3.9
COD (mg O_2/l)	80.3	55.5	48.9	42.7

Belgian Biotic Index

DPSIR



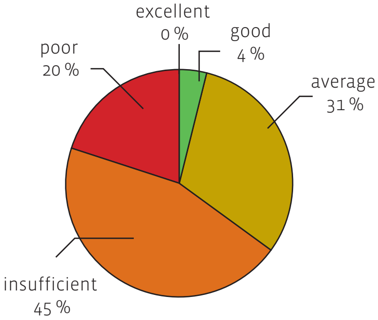
Source: VMM

Invertebrates tell a multifaceted story
Biological water quality is assessed using the *Belgian Biotic Index (BBI)*, an index based on the presence or absence of aquatic macro-invertebrates, bigger invertebrates which can be observed with the naked eye, such as insects (larvae), molluscs, crustaceans, worms, etc. The BBI assesses the quality of a watercourse as a biotope. The physico-chemical quality of the water column is but a part of that – albeit a very important part. The quality of the watercourse sediment and the structural characteristics of the watercourse are other important elements.

Biological quality still very insufficient
During the 2006 measurement campaign the BBI was determined at 660 measurement points. 30 % of the measurement points scored in the quality classes 'good' or 'very good' and therefore met the prescribed Flemish basic quality standard (BBI ≥7). This 30 % is still a long way from the 40 % aimed for in 2007. The biological quality of nearly half of the measurement points (44 %) was average, while at 14 % of the measurement points the biological quality was poor. At approximately 11 % of the measurement points the biological quality was very poor. Since the beginning of the 1990s there has been a positive evolution, but in recent years very little improvement can be seen.

Fish index

DPSIR



Source: INBO

Converting catch data into index scores

The ecological status of watercourses is determined with the help of assessment systems which evaluate different ecological quality elements. Fish is one of those quality elements. Based on the natural characteristics of the fish community, a score system has been developed for each water type. These *fish indices* integrate the evaluation of different aspects of the local fish community (e.g. number of fish species, percentage of predatory fish, etc.). The final score is assessed in an analogous, qualitative way, evaluating the fish community as a whole. This makes it possible to compare the results for different types of watercourses.

Fish are still in a difficult situation

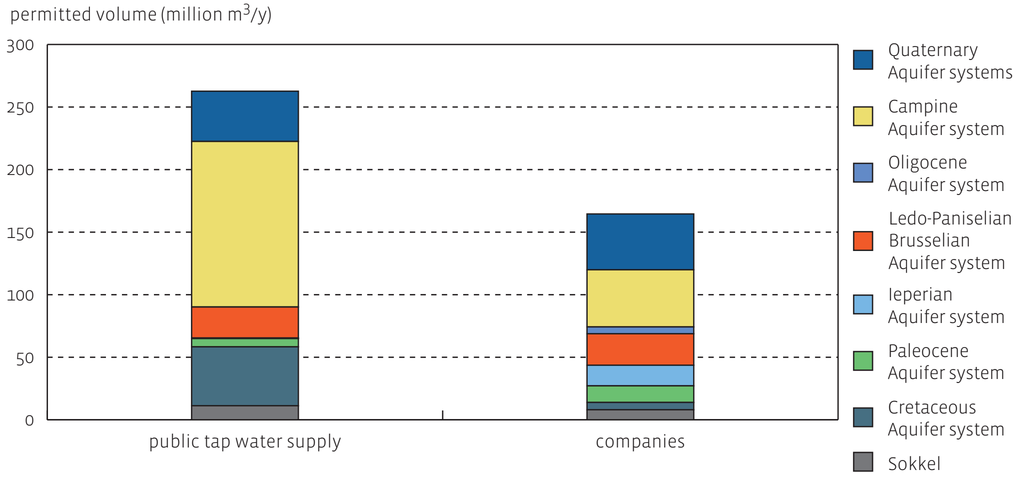
None of the 794 measurement points in Flemish watercourses (2002-2007) has an excellent quality. In the whole of Flanders, only 4 % obtained a good score. Most measurement points obtained an average (31 %) or insufficient (45 %) score; 1 out of 5 scored badly (20 %).

From the comparison of measurement points which were also sampled in the period 1996-2001, it is clear that just over half did not show any change, at 30 % of the measurement points the situation had improved and at approximately 18 % the quality of the fish community had deteriorated.

3.14 Water balance

Permitted volume for groundwater abstraction

DPSIR



Source: Groundwater permits databank, Water division, VMM (2006)

Total permitted volume decreases

Groundwater is high-quality water with a much more stable composition than surface water. Hence, groundwater is more attractive for tap water supply and industrial use. To pump groundwater a permit is required. At the start of 2006 the total permitted volume for the production of tap water was 262.5 million m^3/year and for the other sectors (industry, energy, trade & services and agriculture) 165.7 million m^3/year. 42 % of the total permitted volume corresponds to the Campine Aquifer system (75 % tap water supply and 25 % other sectors). The Quaternary accounts for 20 % of the permitted volume (47 % tap water provision, 53 % other sectors).

Small abstractions (<500 m^3/year), however, do not require a permit, and it is suspected that there are a lot of illegal abstractions as well. Furthermore, the permitted volume often differs from the real abstracted amount of groundwater because companies tend to leave a margin in their permit application. The total permitted volume is therefore an incomplete view of the total amount of groundwater which is abstracted in Flanders.

Groundwater supply under pressure

The Sokkel, with approx. 5 % of the permitted volume, does not seem very significant, but in West Flanders the production of tap water from groundwater largely makes use of the Sokkel (the Kolenkalk), and the industry in the south of East and West Flanders is highly dependent on it as well. Moreover, in conformity with the European Water Framework Directive, the abstraction of groundwater has to be in accordance with the capacity of the water system. For the Sokkel this would mean approximately a 75 % decrease in the abstraction for industry and agriculture with respect to 2000. The abstraction in the Kolenkalk has already been partly reduced, e.g. via the supply of drinking water from Wallonia. In 2000, 12 million m^3 of groundwater was permitted for abstraction by agriculture and industry from the Sokkel, whereas in 2006 only 8 million m^3 was permitted (-32 %).

☹ Water availability in Flanders

DPSIR

Source: MOW, WLH

Water shortage in Flanders due to high population density

The *annual average water availability* is the sum of the average annual precipitation surplus (precipitation - evaporation) and half of the water that enters Flanders from neighbouring regions and countries every year, divided between the number of inhabitants in Flanders.

The long-term annual average water availability in Flanders shows a falling trend between 2000 and 2006. This fall is exclusively determined by the population growth in the period under study. The long-term annual average water availability is lower than 1 000 m^3/inhabitant/year. This means that, on a global scale, Flanders is regarded as a region with a serious water shortage. The high population density in Flanders is the cause of this.

Yearly fluctuations in water availability as a result of variation in the precipitation pattern

The current annual average water availability shows great variations between 2000 and 2006. This indicator is very dependent on the precipitation surplus. In periods with a lot of precipitation, water availability is higher, while in relatively dry years it is lower. The inflow from neighbouring regions softens this pattern somewhat.

annual average water availability (m^3/inhabitant/y)	2000	2001	2002	2003	2004	2005	2006
long-term water availability	872	870	865	861	857	848	841
current water availability	860	1 466	1 355	54	612	223	539

? Risk of damage from floods

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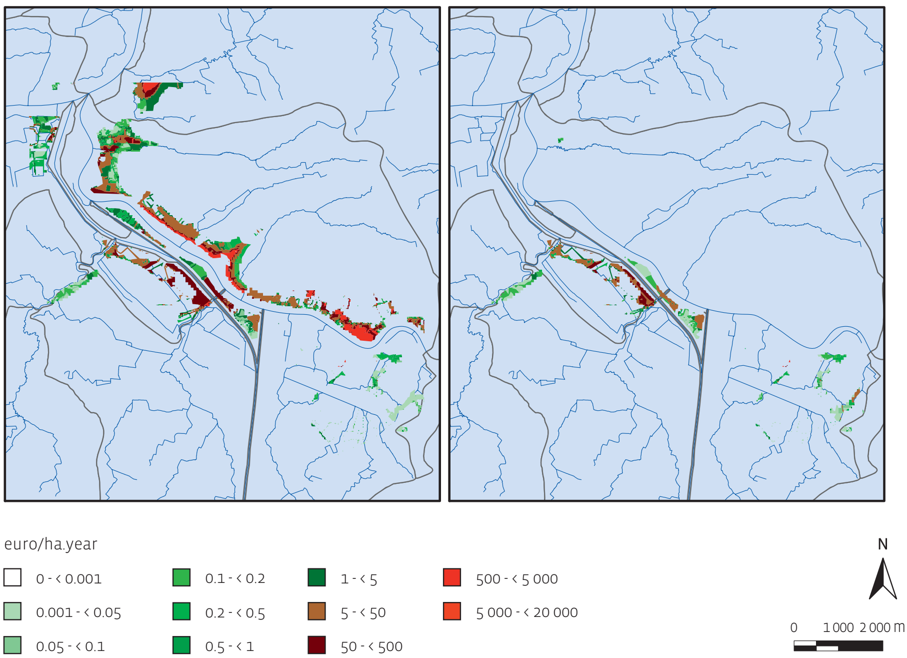


Source: MOW (2007)

Risk mapped

Floods are a natural and hence unavoidable phenomenon. But human actions can influence the risk of floods and an excess of water. The risk of damage from a flood is determined by the chance of flooding, water depth and current speed in the flooded area and the economic value of the location. The economic damage per area is biggest for houses, industrial premises, etc. Agricultural land has a lower economic value per area, but due to the large area occupied by agriculture, the share of agriculture in the total risk of damage is not negligible. Before, floods were fought locally. Now, the Flemish government gives preference to source-oriented measures, then to extra buffering and storage via (natural) floodplains. Only after that comes drainage and the securing of constructions.

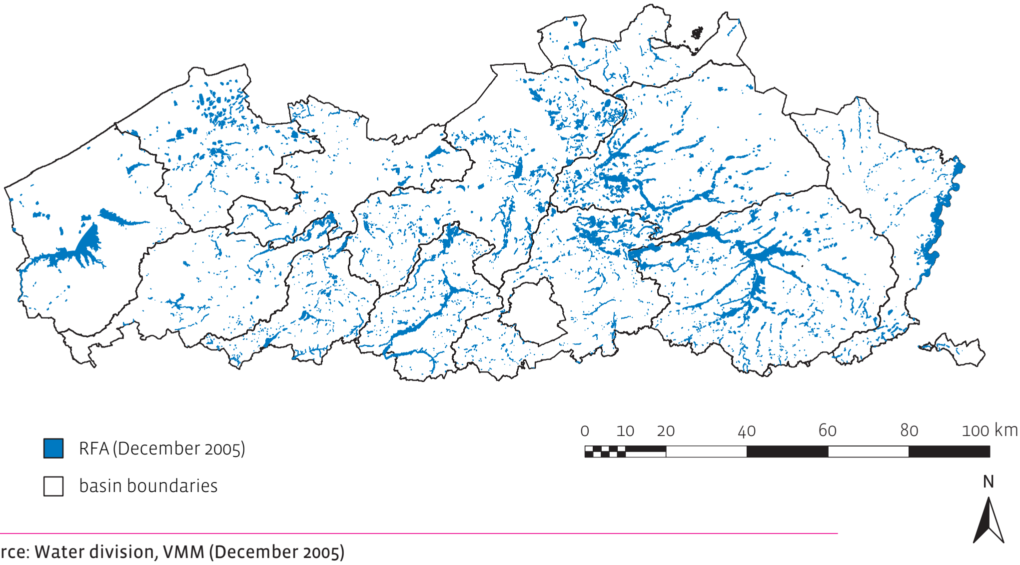
Risk in large water management plans

The maps above show part of the risk maps from the Sigma plan. The risk (left) is strongly reduced by the planned actions (right), but it is not reduced to zero. No matter how much one tries to reduce the risk of floods, there can always be unforeseen events such as the bursting of a dike. Further reduction of the risk is only possible by investing huge amounts of money, which is not acceptable anymore, either financially or socially.

Currently an Integrated Coastal Safety Plan is being elaborated, as well as risk calculations for the renovation of dams along the Dender. Only the replacement of dams and sluices will reduce the risk by nearly 20 %. And besides a reduction of the risk (damage) there are also positive effects with regard to operational security and navigation.

Recently Flooded Areas (RFA)

DPSIR



Source: Water division, VMM (December 2005)

Historical floods versus recently flooded areas
The map of recently flooded areas (RFA) shows those areas in Flanders which have recently (1998-December 2005) flooded at least once and hence are sensitive to flooding.

The RFA map largely overlaps with the areas which had flooded in the past and are therefore considered naturally floodable areas (NFA). However, approximately 35 % of the RFA fall outside the NFA. This can be explained, in part, because not all floods in the past could be mapped adequately. However, other factors play a role as well: the current protective infrastructure may have changed the natural course of the rivers, watercourses may have been displaced (e.g. as a result of broken through meanders) and peak flow rates are larger now, which increases the risk of floods.

Modelling to protect from future floods
Controlled floodplains at crucial locations have to collect the excess water during periods of excessive rainfall. This way, areas which have flooded recently and where there is a high risk of damage can be protected from future floods. The selection of locations for controlled floodplains is done via models.

3.15 Soil

☺ Studied and polluted sites

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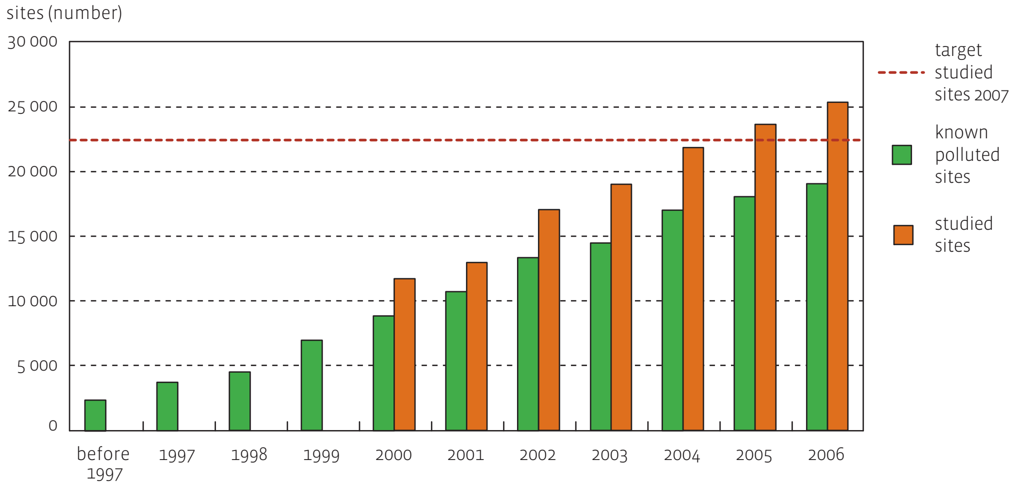


Source: OVAM

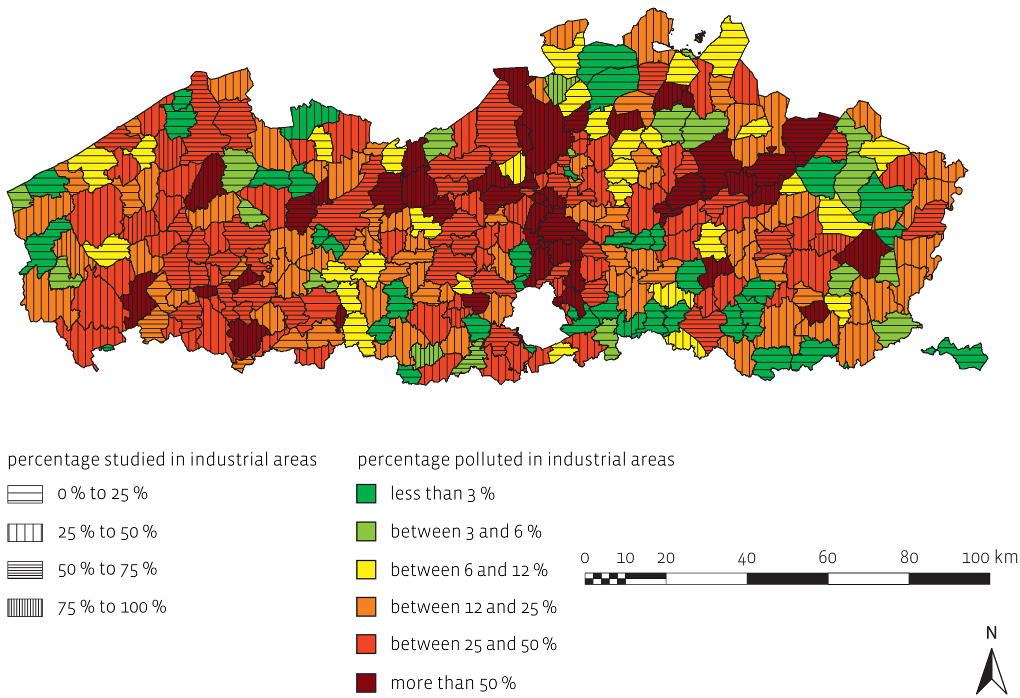
76 200 high-risk sites in Flanders
Soil pollution is caused by economic or private risk activities. Sites on which these activities are carried out or were carried out in the past are classified as high-risk sites. The number of high-risk sites in Flanders is estimated at 76 200. For these sites an exploratory soil survey (ESS) has to show whether they are polluted or not.

A step-by-step procedure
According to the MINA plan 3 (2003-2007) target, 30 % (or 22 500 sites) of high-risk land has to be studied by 2007. This target was reached because in 2006 an exploratory soil survey was completed for 25 213 sites.

Based on the exploratory soil survey it is determined whether a descriptive soil survey is necessary. A descriptive soil survey (DSS) determines whether remediation of the soil pollution is required. This study has already been carried out for 6 675 sites, which is 29 % of the estimated required number. If soil remediation is necessary, a soil remediation project (SRP) is drawn up and the soil remediation works (SRW) are carried out.

study phase	estimated required number	number completed	progress (%)
ESS	76 200	25 213	33.1
DSS	23 000	6 675	29
SRP	11 000	2 694	24.5
SRW	11 000	618	5.6

Polluted sites per municipality



Source: OVAM

Risks of soil pollution

In order to determine the gravity of the soil pollution and the need for soil remediation, a risk assessment is performed. This consists of three parts:

- risk to humans;
- risk to plants, animals and ecosystems;
- risk of spreading to groundwater, air and surface water.

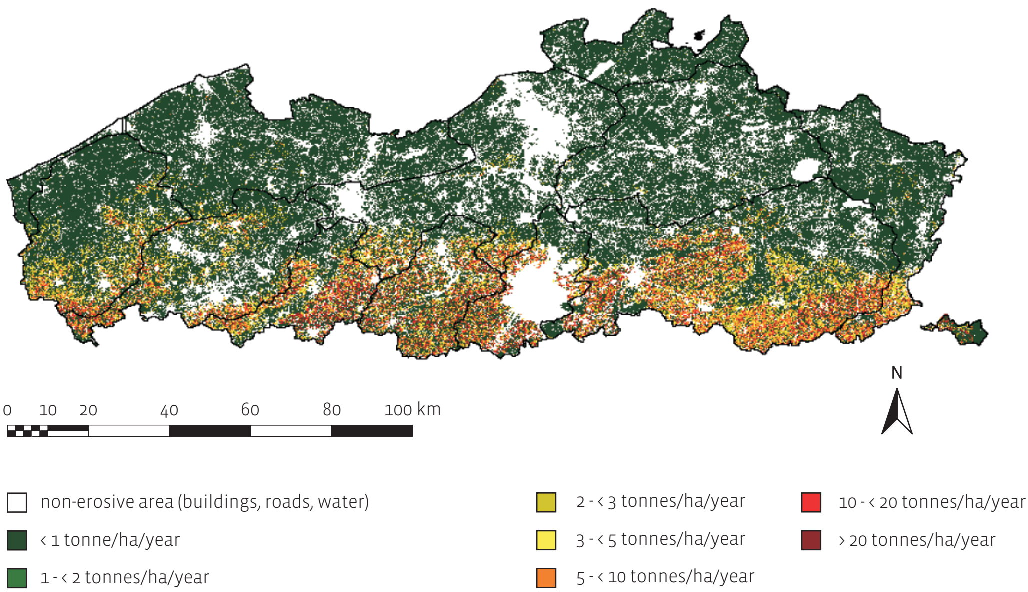
In order to be able to estimate the current state of soil pollution in Flanders, we take into account the number of sites at which a high-risk economic activity is performed (high-risk sites) and the number of sites actually studied and polluted.

Polluted sites in Flemish industrial areas

This map shows per municipality the share of industrial area which has been examined and is polluted compared to the total area intended for industrial use according to the regional plan. Municipalities where more than 50 % was examined and polluted are mainly located around the industrial axes of the Brussels-Rupel channel, the E17, the E19 and in industrial core areas. It is remarkable that in several municipalities less than 25 % of the total area of industrial land was examined. It is possible that it concerns recent industrial sites, where companies established themselves after the soil remediation decree came into effect, so that they were not yet obliged to carry out soil surveys. They could be industrial premises where few companies under the obligation to carry out the survey are established. It is also possible that several companies wish not to comply with the obligation to carry out the survey.

Soil erosion in Flanders

DPSIR



Source: K.U.Leuven

Water washes away the soil

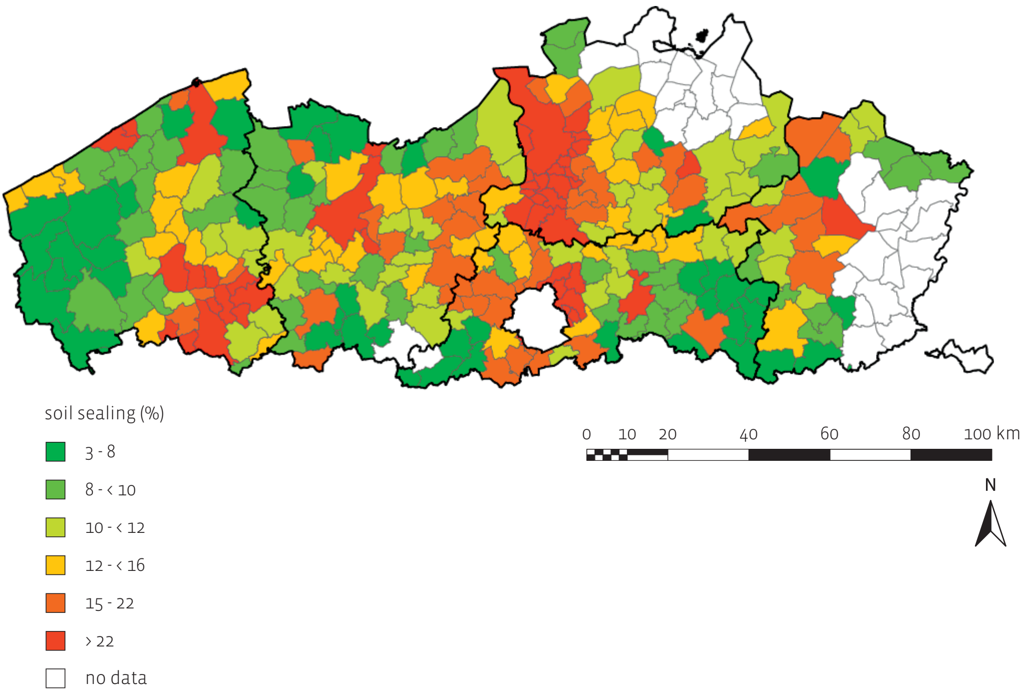
Soil erosion by water is one of the processes which affect the Flemish soils and have negative impacts for humans and nature:

- The thickness of the fertile top soil layer decreases, which in the long term can result in decreasing crop yields and a drop in the natural buffering and filtering capacity of the soil.
- During heavy rains (especially in spring and summer) intense soil erosion can cause local nuisance as a result of muddy floods.
- Soil erosion leads to high sediment pressure in Flemish watercourses, making them (as well as many storm water balancing basins) silt up quickly. This leads to a heightened risk of flooding.
- Soil erosion causes the deposition of nutrient-rich sediment in valley areas. This diminishes the natural quality of those areas.

Big differences within Flanders

Each year approx. 2 million tonnes of soil material is eroded and approx. 0.4 million tonnes of this sediment ends up in the watercourses. The measure in which soil erosion occurs depends on the precipitation, the relief, the soil type and the soil use. As a result, erosion is mainly a problem in the south of Flanders. This hilly region with a high percentage of loamy and sandy loam soils is much more prone to soil erosion than the sandy soils in the flatter north of Flanders. The average soil loss can amount to 10 or even more than 20 tonnes per hectare per year, depending on the location. Municipalities can obtain subsidies for drawing up an anti-erosion plan, and for carrying out small-scale anti-erosion works (construction of sediment collection basins and grass strips along plot boundaries, adaptation of crop rotation and growing methods). Farmers can sign anti-erosion management agreements with the Flemish Region (planting of strips of grass, direct sowing and ploughless tillage).

☹ Soil sealing in Flanders



Source: K.U.Leuven

Flanders is hermetically sealed

In many places, the Flemish soil is hermetically sealed by houses, roads and other constructions. This implies a loss of the original functions of that soil, such as agriculture or forestry. The sealing of natural soils also influences the hydrological status: the water cannot infiltrate anymore and runs off via the paved surface, causing the soil to dry out. Moreover, the open space becomes fragmented by the presence of that paved surface.

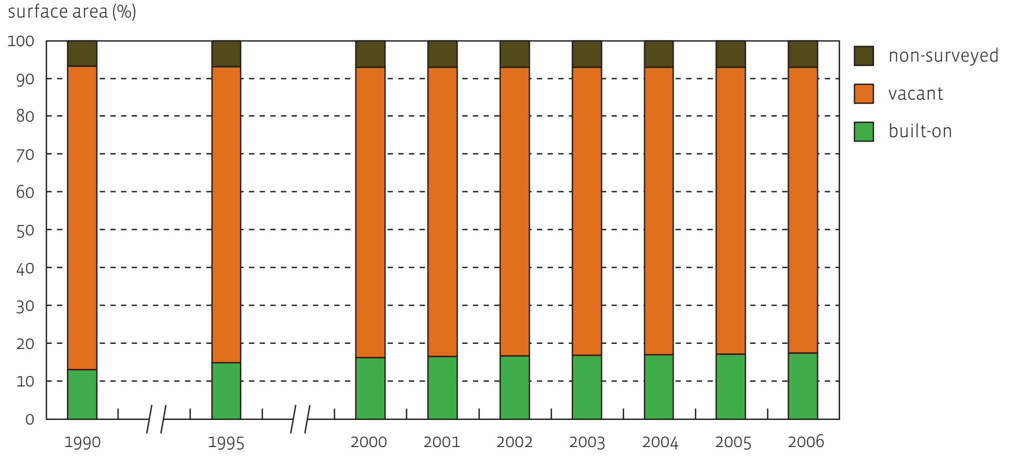
Paved surface in Flemish municipalities

179 843 ha or 13.3 % of the Flemish soil is sealed. There are still a few areas in Flanders which contain municipalities where the percentage of sealing is lower than 15 %, especially in the Westhoek, South Limburg and Meetjesland. 20 % of the surface in most municipalities situated in the Flemish Diamond (Ghent, Antwerp, Leuven and Brussels) is sealed. The percentage of sealing along the coastline is relatively high as well, especially in comparison with the nearby Westhoek.

3.16 Fragmentation

☹ Land use

DPSIR



Source: Land register

Pressure on the open space

The total built-on area in Flanders increased by 577 km² or 32 % between 1990 and 2006. In 2006, 17 % of the area of Flanders (13 522 km²) is built up. In 1990, this was 13 %. This increase can mainly be attributed to the building of houses, which rose by 34 % and now occupies 13 % of the built-on area. The area occupied by industrial buildings rose sharply as well, by 36 %. The area used up by buildings for trade and services increased by 23 %. As a result of all this building, 628 km² of open space (incl. agricultural land, forests, parks) has been lost.

The urbanisation of Flanders continues

Flanders is characterised by a densely built-up landscape and urbanisation is still on the rise. This rise has impact in different areas:

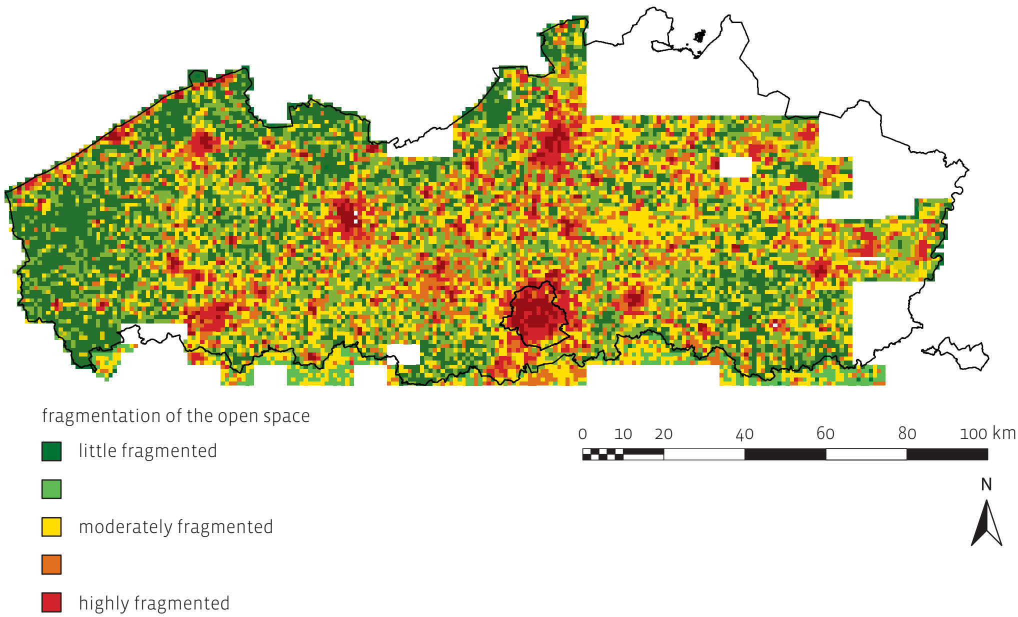
- loss of current and future soil functions: e.g. the disappearance of forests or the building up of open spaces;
- soil sealing, which results in the disturbance of the water balance;
- fragmentation of the open space (e.g. forests, arable land) by dividing large areas into smaller pieces.

surface area (km²)	houses	industrial buildings	buildings for trade & services	others*	vacant area	non-surveyed area
1990	1 305	217	185	77	10 842	895
1994	1 444	249	200	84	10 635	910
2000	1 624	281	221	89	10 374	932
2006	1 745	296	228	92	10 214	946

* ruins, monuments, buildings for sport

☹ Fragmentation of the open space

DPSIR



Source: NGI (2004)

Fragmentation affects nature and the landscape
As a result of the still increasing built-on area in Flanders, the open space has been fragmented into small areas or fragments which are surrounded by other functions such as company premises, roads and residential areas. In order to estimate this fragmentation, the number of fragments of open space in Flanders per square kilometre and the size of these fragments is measured. Little fragmented areas are characterised by a small number of fragments with a large average surface area. Highly fragmented areas consist of a large number of fragments with a small average surface area. The little fragmented areas in Flanders are situated in the Westhoek, the Meetjesland and the Scheldt Polders. Strong fragmentation occurs mainly in and near cities, but also in the Flemish Diamond and in the area between Roeselare and Kortrijk.

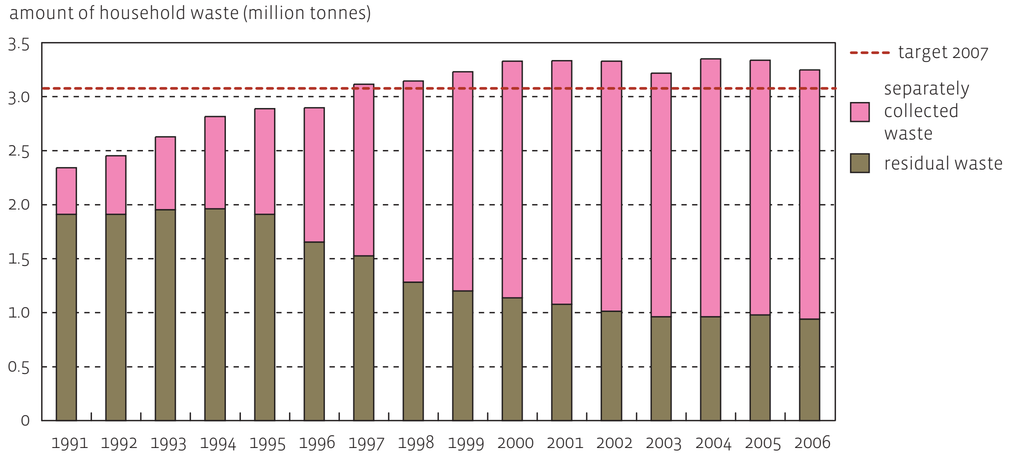
The impact of fragmentation is diverse: ecological deterioration resulting from isolation and less solidarity between communities, a loss of quality of the landscape, and more locations suffering disturbances such as noise nuisance and air, water and soil pollution.

3.17 Waste

Collected amount of household waste

DPSIR

total — residual waste



Source: OVAM

Total volume of household waste has stabilised

Until 2000 the annual volume of collected household waste grew continually. Since then, the amount seems to have stabilised. In 2006, 88 ktonnes less were collected than in 2005. This is mainly due to the reduced amount of residual waste (-37 ktonnes) and separately collected construction and demolition waste (-61 ktonnes), wood waste (-15 ktonnes) and vegetable, fruit and garden waste (-8.5 ktonnes). For a number of other flows, the amount increased: for instance, the amount of separately collected paper and cardboard increased by 20 ktonnes. The drop in the total amount of household waste can partly be explained by a better separation of the waste generated by independent professionals and small businesses from the household waste statistics.

Residual waste target almost achieved

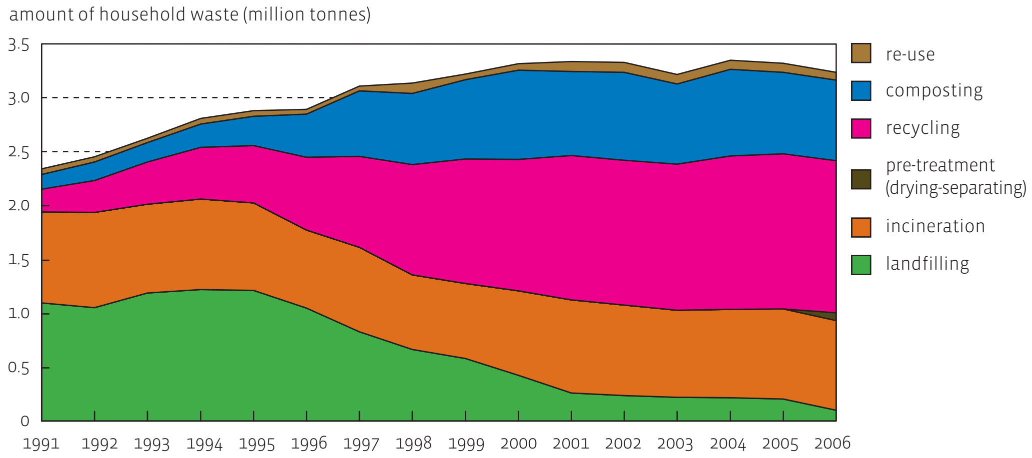
In the period 1995-2003 the annually collected amount of residual waste was halved. After that, the amount remained fairly stable. Nevertheless, in 2006 7 kg less of residual waste per inhabitant was collected than in 2005. Every inhabitant now puts out an average of 154 kg of residual waste. This means that the target for 2007 (a maximum of 150 kg of residual waste) has almost been reached.

Separate collection ceiling reached?

The share of household waste which was collected separately increased from 18 % in 1991 to 70 % in 2002. The target of 69 % of separately collected waste in 2007 has therefore been reached well in time. Since 2002 the share of separately collected waste has hovered around 70-71 %.

amount of household waste (ktonnes)	1991	1995	2003	2004	2005	2006	target 2007
residual waste	1 912	1 911	961	960	977	939	
separately collected waste	428	977	2 255	2 390	2 360	2 310	
total	*2 341*	*2 888*	*3 216*	*3 349*	*3 337*	*3 249*	*3 059*

☺ Processing of household waste



up to and including 2000: excluding small hazardous waste

Source: OVAM

Most household waste is recycled, composted or incinerated
Preventing waste is the first priority of the waste policy. Waste which cannot be prevented should be processed with the greatest possible respect for the environment. Re-use comes in the first place, followed by recycling and composting. After that comes incineration with energy recovery. Landfilling is the last option.

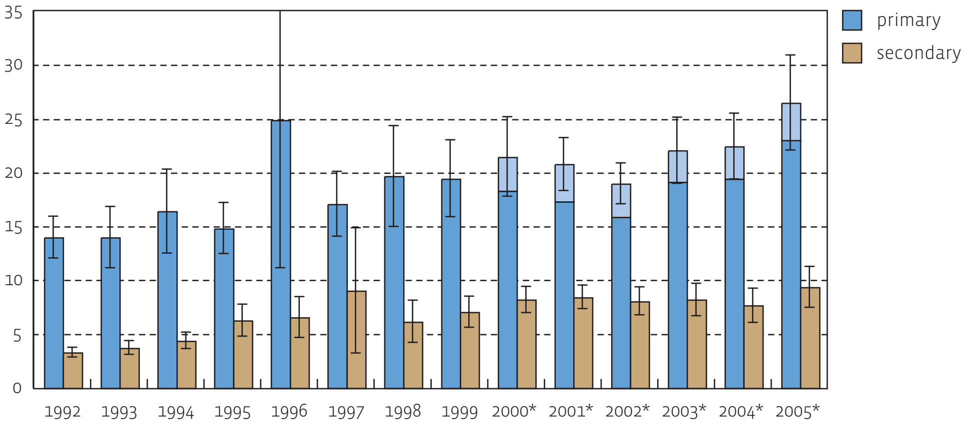
The total amount of household waste collected in 2006 was distributed as follows over the different options:
- 2 % was re-used
- 67 % was recycled or composted
- 2 % was pre-treated (dried-separated)
- 26 % was incinerated
- 3 % was landfilled

Landfilling decreased sharply, pre-treatment is making a start
Between 1991 and 2001 the share of landfilled household waste decreased sharply. After that, the share remained fairly stable during several years. In 2006 there was another considerable decrease: 100 ktonnes less residual waste was landfilled than in 2005, reducing the share of landfilling from 6 % to 3 %. This reduction is the result of the stricter application of the ban on landfilling for non-recyclable flammable household waste since 1 January 2006. 8 % of the residual waste is now processed in the pre-treatment installation which was put into operation at the end of 2005.

amount of household waste (ktonnes)	1991	1995	2003	2004	2005	2006
re-use	50	52	87	85	82	74
composting/recycling	351	806	2 102	2 228	2 197	2 159
pre-treatment (drying-separating)	0	0	0	0	1	72
incineration	844	812	809	822	834	831
landfilling	1 094	1 212	219	214	205	100

☹ Amount of industrial waste

DPSIR



including waste from the trade & services sector
* additional subsectors taken into account (light blue bar). Primary waste results at the moment when a product becomes waste for the first time, i.e. with the first producer; secondary waste is the waste from the waste processing companies. Figures calculated by extrapolation of reported data. Error bars are the 95 % confidence intervals for the total quantity of primary and secondary industrial waste respectively.

Source: OVAM

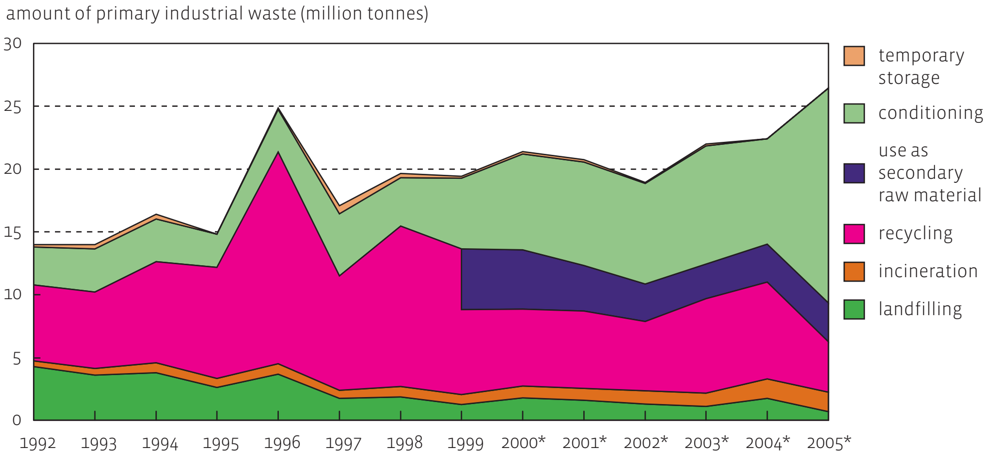
Production of primary industrial waste not uncoupled yet from economic growth
In 2005 companies produced 26.5 million tonnes of primary industrial waste; this accounts for approx. 90 % of the total amount of primary waste in Flanders. 69 % of the primary industrial waste comes from the industry, 25 % from trade & services, 5 % from the energy sector and 1 % from agriculture.

According to MINA plan 3 (2003-2007) the amount of primary industrial waste in 2007 should be lower than in 2002, and it should be decoupled from the economic growth. The annually produced amount of primary industrial waste fluctuates a lot. One of the reasons for this is the great variation in the amount of construction and demolition waste. This makes it difficult to observe possible trends. If the construction sector is left out of consideration, waste production rose a bit faster than the gross domestic product between 2000 and 2005.

Primary waste versus secondary waste
The processing of primary industrial and household waste by waste processing companies generated 9.3 million tonnes of secondary waste in 2005. Secondary waste includes (among other things) the waste coming from sorting facilities, residual waste from recycling processes and the bottom ashes and fly ashes from incineration plants. The longer the processing chain, the more secondary waste is produced.

amount of industrial waste (million tonnes)	1992	1996	2002	2003	2004	2005
primary waste	14.0	24.8	15.9	19.1	19.4	23.0
primary waste additional sectors			3.1	2.9	3.0	3.5
secondary waste	3.3	6.6	8.1	8.2	7.6	9.3

☹ Processing of industrial waste



including waste from the trade & services sector
Primary industrial waste results at the moment when a product becomes waste for the first time, i.e. with the first producer. Figures calculated by extrapolation of reported data.
* additional subsectors taken into account

Source: OVAM

Three quarters of primary industrial waste goes to material recovery
From all the primary industrial waste generated in 2005, 35 % went directly to recycling, use as secondary raw material, incineration or landfilling. The remaining 65 % was pre-treated or conditioned first. In the end, from the total amount of primary industrial waste produced in 2005, roughly:

- 75 % was recycled or used as secondary raw material
- 13 % was incinerated
- 12 % was landfilled

Landfilling of flammable industrial waste remains a problem
A little more than half of the landfilled industrial waste ends up at public landfills. The arrival of industrial waste at public landfills has not decreased significantly since 2002, and it even increased slightly in 2005 and 2006. An important problem is the massive arrival of flammable waste: in 2006, 63 % of the industrial waste received at public landfills was flammable. More than half of this waste fell under the ban on landfilling. In order to discourage landfilling of flammable industrial waste, levies on landfilling and incineration were adjusted on 1 January 2007. As a result, for the first time the landfilling of flammable industrial waste at the full rate became more expensive than incineration.

Amount of industrial waste at public landfills

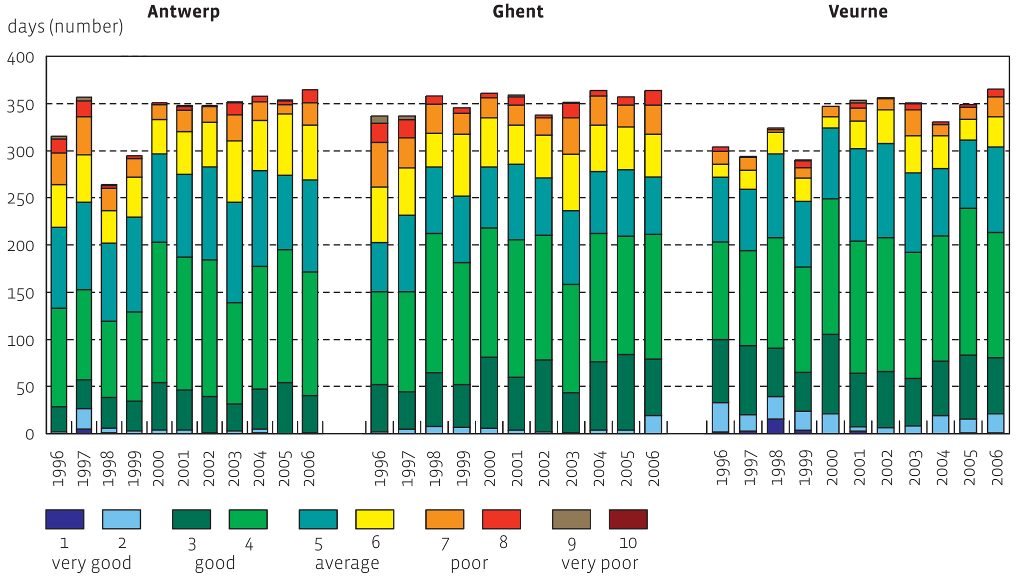
(ktonnes)	2000	2001	2002	2003	2004	2005	2006
total	1 912	1 911	1 436	1 350	1 365	1 467	1 583
flammable fraction	1 192	1 150	863	879	808	921	992
flammable fraction, part under ban on landfilling		819	550	523	436	534	583

including secondary waste

3.18 Urban environment

☹ Air quality index

DPSIR



Source: IRCEL

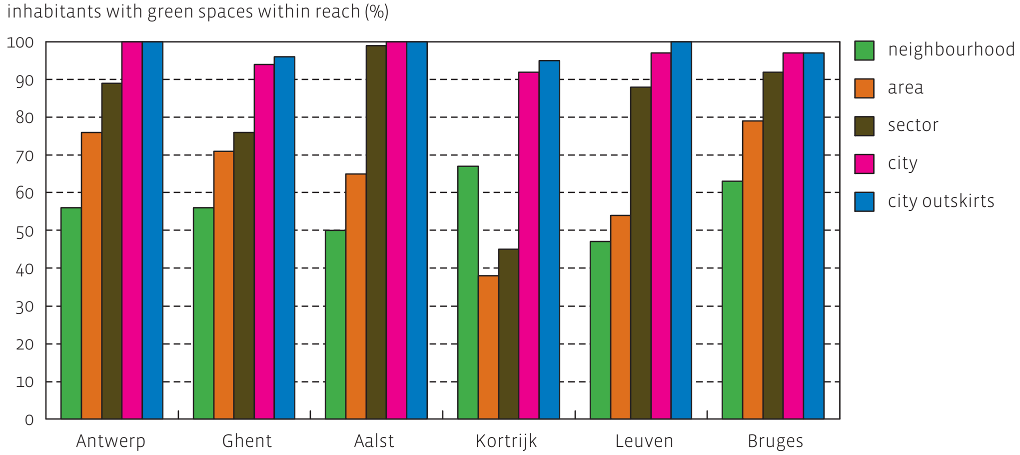
Air quality based on the air quality index

The quality of the air can be evaluated using the air quality index (IRCEL). The air quality index is based on continuous measurements of the concentration of ozone (O_3), nitrogen dioxide (NO_2), sulphur dioxide (SO_2) and fine particles (PM10) in the ambient air. These four pollutants mainly originate from human activity. The measurements are carried out at different measuring stations in Belgium (telemetric monitoring network, VMM) and are published in the Internet on a daily basis (www.irceline.be).

Index in Ghent improves, indices in Antwerp and Veurne become worse

In 2006 there were more measurements showing a very good air quality in Ghent than in 2005. However, the total number of measurements resulting in good or very good air quality did not change. In Veurne and Antwerp the air quality in 2006 deteriorated compared to 2005. The air quality index in 2006 is lower in Antwerp than in the other measuring stations.

☹ Accessibility of urban green spaces



Source: Human Ecology Department, VUB (2005)

Insufficient green spaces in cities

The aim of the Flemish green policy is for every inhabitant of a city to have at least 1 green space at each functional level (neighbourhood, area, sector, city, city outskirts) within reach. In 2003 nearly all inhabitants of the examined cities had urban and suburban green spaces within reach. At sector level, however, only in Aalst all inhabitants had at least one green space within reach. Especially in Kortrijk and Ghent the situation was insufficient. In all cities, there were insufficient green spaces at area level. The big cities (Antwerp and Ghent) obtained better results in this respect than regional cities, with the exception of Bruges (thanks to the green belt around the historic city centre). Nevertheless, 21 % of inhabitants of Bruges did not have green spaces in their area. In Kortrijk, this was even the case for 62 % of inhabitants. Accessible green spaces were not available to 33 % of inhabitants in Kortrijk and 53 % of inhabitants in Leuven. Barriers limit the sphere of influence of green spaces. They are present at all functional levels, but especially at neighbourhood and area level.

Not all available green spaces are of high quality

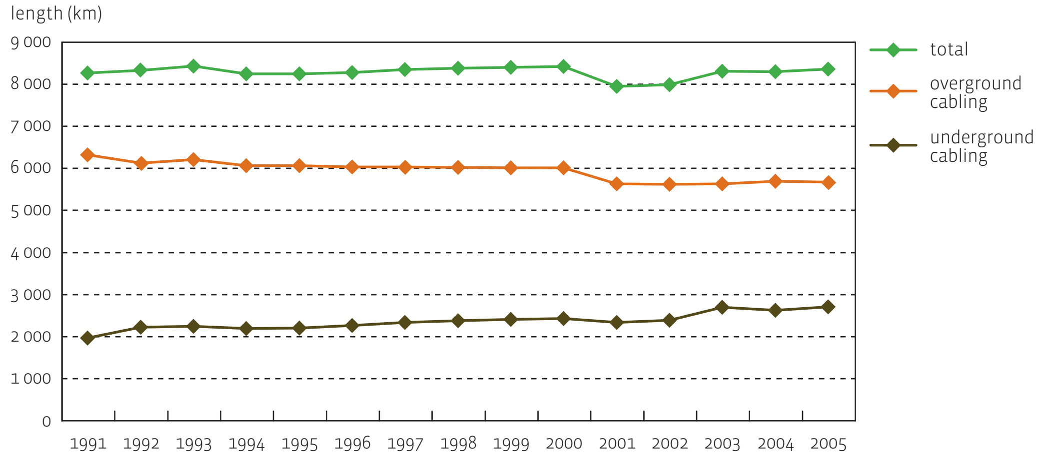
The quality of a green space is very important as well. A bad general quality of a green space can reduce the sphere of influence of that space by up to 50 %. After Aalst, Antwerp scores best of all examined cities. High-quality green spaces are distributed regularly in the immediate vicinity of the city centre. In Kortrijk, there is a lack of high-quality green spaces at all levels.

functional level	surface area (ha)	reachable distance (m)
neighbourhood	0.5-10 (parks: 0.5-5)	0-400
area	10-30 (parks: 5-10)	400-800
sector	30-60 (parks: 10-60)	800-1 600
city	60-200	1 600-3 200
city outskirts	200-300+	3 200-5 000

3.19 Non-ionising radiation

Length of the high-voltage network in Belgium

DPSIR



Source: CPTE (1991-2000), Operational reports Elia (2000-2005)

Exposure to magnetic fields

A well-known source of extreme low frequencies are *high-voltage lines*. On average, 56 % of the Belgian high-voltage network is situated in Flanders. In 2005 the length of underground cabling increased by 37.7 % compared to 1991.The length of overground cabling decreased in that same period by 10.2 %.

In epidemiological research, a relationship has been found between exposure higher than 0.4 μT (e.g. when living below a high-voltage line) and the incidence of *children's leukaemia*. However, the causality of this relationship has not yet been proved. In Flanders, 0.7 to 1.4 % of the population is thought to be exposed to >0.4 μT due to overground cabling, which would lead to one extra case of children's leukaemia every two years.

length (km)	1991	1995	2000	2005
overground cabling	6 302	6 043	5 993	5 658
underground cabling	1 950	2 184	2 405	2 686
total	*8 252*	*8 227*	*8 398*	*8 344*

Number of TV and radio broadcasting stations

DPSIR

number of broadcasting stations	2000	2002	2004
FM radio broadcasting stations for private local radio	310	296	293
FM radio broadcasting stations for private regional radio networks		46	43
FM radio broadcasting stations for public regional radio networks	32	32	32
total FM radio broadcasting stations	*342*	*374*	*368*
AM radio broadcasting stations (medium wave)	4	4	4
digital radio broadcasting stations (DAB)	-	16	17
analogue TV broadcasting stations	7	8	8
digital TV broadcasting stations (DVB-T)	-	2	8
total TV broadcasting stations	*7*	*10*	*16*

DAB: digital audio broadcasting, DVB-T: digital video broadcasting-terrestrial

Source: Media administration, VRT

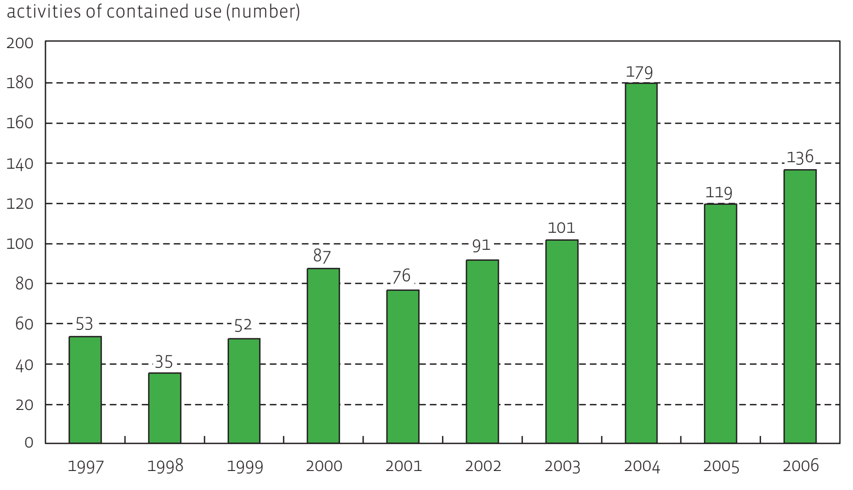
Number of TV and radio broadcasting stations
Within radiofrequency radiation, the application for mobile telephony (e.g. mobile phones and mobile phone masts) is well-known among the general public. There are, however, a number of other sources of radiofrequency radiation such as TV and radio broadcasting stations. In 2004 there were about 368 broadcasting stations for FM radio in Flanders. There were four medium wave radio broadcasting stations (AM) and 17 digital radio broadcasting stations (DAB). In addition, there are also 16 television broadcasting stations. Half of these are digital and date from after 2000. The number of radio and TV broadcasting stations gives an idea of the activities which cause non-ionising radiation, and concretely radiofrequency radiation in the environment.

Broadcast capacity
The total broadcast capacity for radiofrequency radiation from antennas for broadcasting and mobile communication is estimated at 956 kW in 2002 and 1 057 kW in 2005. For Flanders, this corresponds to an average broadcast capacity of 71 W/km² for 2002 and 80 W/km² for 2005.

3.20 Use of GMOs

Contained use of GMOs and pathogens

DPSIR



Source: Scientific Institute of Public Health

Increase in contained use is being followed up

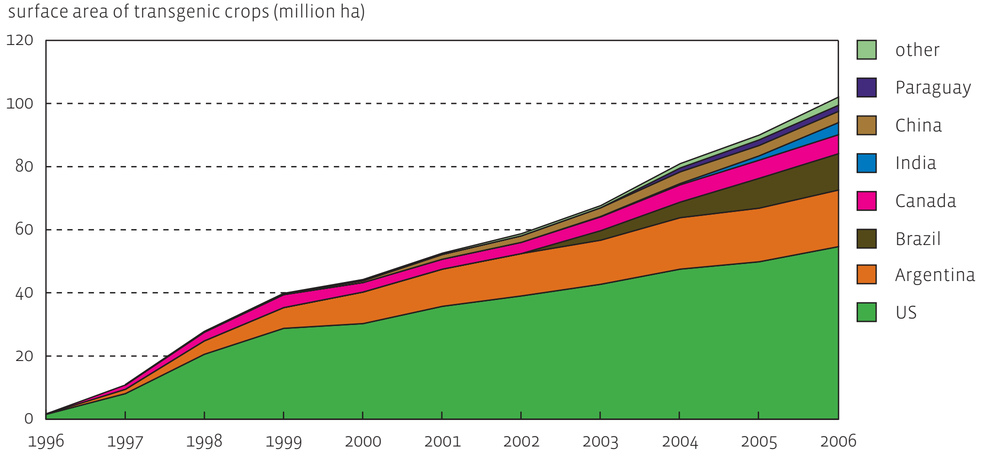
The contained use of genetically modified organisms (GMOs) and pathogenic organisms is their use in a closed environment, such as a laboratory or reactor. It is required to report this activity or have a permit for it. The organisms that are worked with are genetically modified or pathogenic bacteria, yeasts, cell cultures, viruses, parasites, plants and animals. The increase in the number of reported activities in 2000 is partly the result of an increase in the contained use of GMOs and partly due to the universities catching up. The second peak in 2004 is attributable to the number of requests for the renewal of permission, the notification of new activities or changes in existing activities and the regularisation of clinical diagnosis activities. In 2005 and 2006 the regularisation of clinical diagnosis activities was still growing steadily, while the number of research activities declined.

Biotechnology for health, the environment and agriculture

In 2004, 78 % of the activities of contained use fell under the heading research and development, and encompasses both very fundamental and much applied research. Many of these activities are related to the study of the function of certain genes in pathological processes. 17 % of the activities fall under diagnosis, such as the analysis of clinical samples from the environment or the study of pathogenic organisms. Clinical research – only 1 % in 2004 – includes tests with recombinant viruses (gene therapy). The Flemish industry uses GMOs for the production of enzymes or vaccines, for the development of new medicines and diagnostic kits, and for the development of new agricultural crops. Under normal circumstances the contained use of GMOs hardly puts any pressure on the environment. A possible risk factor is biologically infected waste.

Area of transgenic crops worldwide

DPSIR



Source: International Service for the Acquisition of Agri-Biotech Applications, www.isaaa.org

Worldwide advance

The cultivation of transgenic or genetically modified crops increases every year. In 2006 transgenic soy beans were grown on 59 million ha or 57 % of the transgenic acreage, followed by maize with 25 % (25 million ha), cotton with 13 % (13 million ha) and Canola rape seed with 5 % (5 million ha). The number of countries cultivating transgenic crops rose in parallel to the acreage (from 6 in 1996 to 22 countries in 2006). In Europe, farmers in Spain, Portugal, Germany, France, the Czech Republic and Slovakia grow transgenic maize. In Rumania transgenic soy beans are grown. Flemish farmers are not yet cultivating any transgenic crops. The coexistence with GMO-free agriculture, such as biological agriculture, requires special measures, which are still under development.

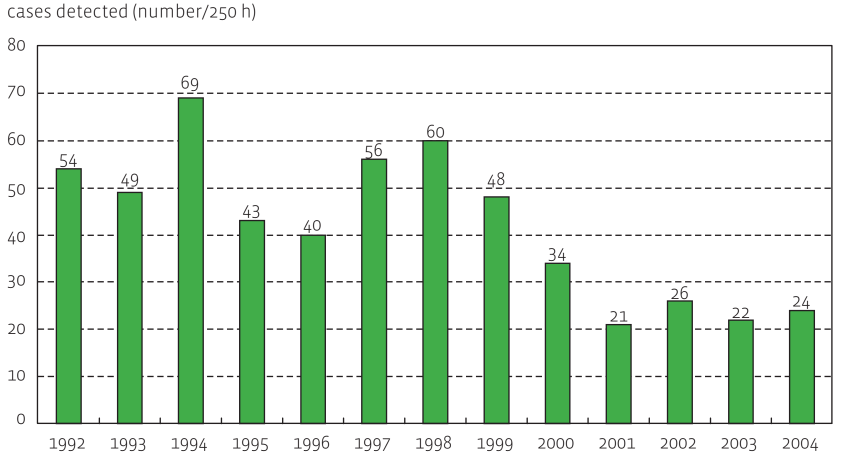
Freedom of choice guaranteed?

Traded foodstuffs and animal feeds originating from countries where transgenic crops are grown can contain GMOs. Unintentional mixing or traces of transgenic crops may not exceed 0.9 % per ingredient for permitted transgenic crops. If the threshold value of 0.9 % is exceeded, the product must carry a label mentioning that it contains GMOs in order to guarantee the customer's freedom of choice.

surface area of transgenic crops (million ha)	1996	1999	2001	2003	2005	2006
United States	1.5	28.7	35.7	42.8	49.8	54.8
Argentina	0.1	6.7	11.8	13.9	17.1	18
Canada	0.1	4	3.2	4.4	5.8	6.1
Brazil	-	-	-	3	9.4	11.5
India	-	-	-	0.5	1.8	3.8
China	-	0.3	1.5	2.8	3.3	3.5
Paraguay	-	-	-	-	1.8	2
other (e.g. Europe)	-	0.2	0.4	0.8	2.8	2.5
total	*1.7*	*39.9*	*52.6*	*67.7*	*90.0*	*102*

Oil pollution at sea

DPSIR



Source: BMM

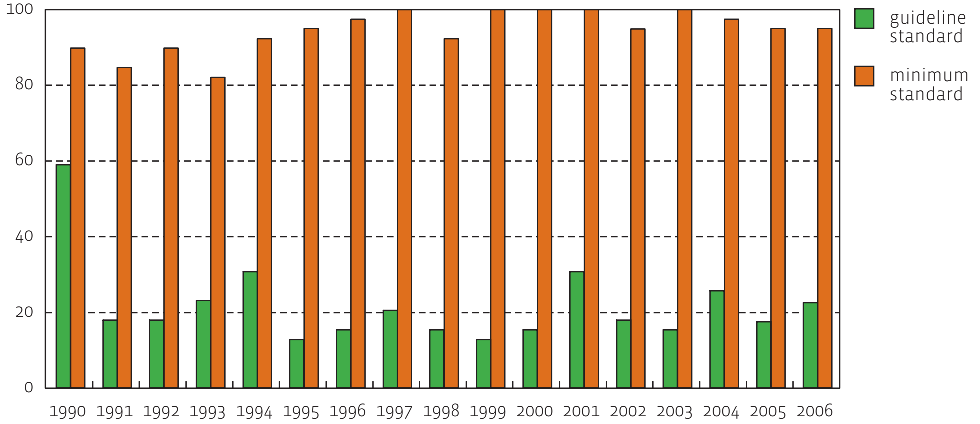
Tracing oil pollution from the air

Operational oil pollution from ships is pollution that is caused wilfully e.g. by the cleaning of tanks or the discharge of waste water. Inspection from the air is an important control mechanism in order to detect oil pollution.

Inspection and other measures have produced results

Belgium has the highest number of observed oil pollutions in the world for each executed inspection flight. However, inspections are not carried out in the same way everywhere. Since the beginning of the aerial inspection programme in 1991, the number of observed cases of oil pollution has notably decreased. In the 1990s, approximately 50 cases of oil pollution were detected per 250 flying hours. Since 2000 only around thirty cases are detected. This drop is probably due to the deterrent effect of the inspection aircraft. Moreover, improved port facilities, technical innovation, a stricter prosecution policy, a bigger chance of catching offenders thanks to better detection methods and greater prosecution efforts probably also play a part.

Beach water quality



Source: EEA, VMM

Measuring and interpreting beach water quality

A poor bacteriological quality of beach water can lead to health problems for bathers and swimmers. In order to determine swimming water quality at the Belgian coast, VMM routinely samples 40 bathing areas once or twice a week between April and September. The beach water quality indicator is defined as the percentage of sampled swimming areas at the Flemish coast which comply with the European standards regarding the bacteriological quality of swimming water.

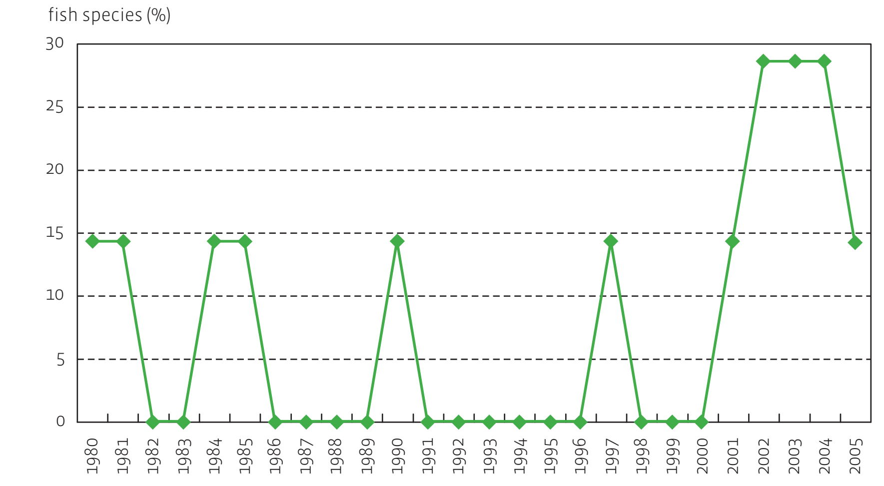
Minimum standards not a big problem; guideline standards often are

Since 1990 more than 80 % of the measurement points on the Flemish coast meet the required minimum standard for beach swimming water. This is even the case for more than 90 % of the measurement points during the past ten years. We note, however, no improvement with regard to the stricter guideline standards of the European Bathing Water Directive.

Poor bacteriological quality often occurs when a large amount of precipitation falls in a short time, which leads to an increased drainage of surface water from the interior with extra pollution of the coastal water as a result.

coastal bathing areas (%)	1990	1992	1994	1996	1998	2000	2002	2004	2006
guideline standard	59	18	31	15	15	15	18	26	23
minimum standard	90	90	92	97	92	100	95	97	95

☹ Commercial fish stocks within safe reference values DPSIR



Source: ICES

Sustainability of fisheries

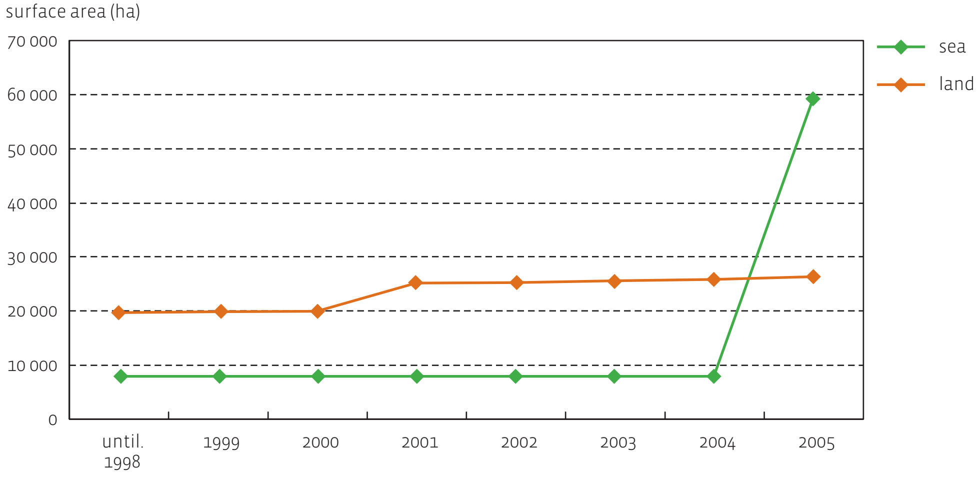
The proportion of commercial fish stocks within safe reference values indicates to what extent fishing is sustainable. A fish stock is within safe reference values if two conditions are fulfilled. Firstly, mortality as a result of fishing must be lower than the precautionary value for mortality. Secondly, the spawning-stock biomass must be larger than the precautionary value for the reproduction potential. Both precautionary values are specific to each fish stock. The indicator used here encompasses seven commercial fish stocks: herring, mackerel, cod, haddock, whiting, plaice and sole.

Commercial fish stocks far from safe values

Since 1980 the fishing mortality for most stocks is (far) above the precautionary value, whereas in more than half of the cases the biomass is below the precautionary value. As a result, the number of commercial fish stocks in the North Sea (and adjoining areas) falling within safe reference values is very low (2 out of 7 at most). Herring fulfilled the criteria in 2002-2003, haddock in 1997 and 2001-2005, plaice in 1980-1981, 1984-1985 and 1990, and sole in 2004. Thus, the aim of the fisheries policy to bring or keep all commercial fish stocks within safe limits is still far from being reached.

In order to restore the balance between exploitation and natural growth it is necessary to reduce the pressure from fishing. The reduction of fishing efforts (e.g. via a limitation of the number of days at sea) is the most effective measure. Imposing national or individual catch quota is far less effective.

Protected area in the coastal region



Source: ANB

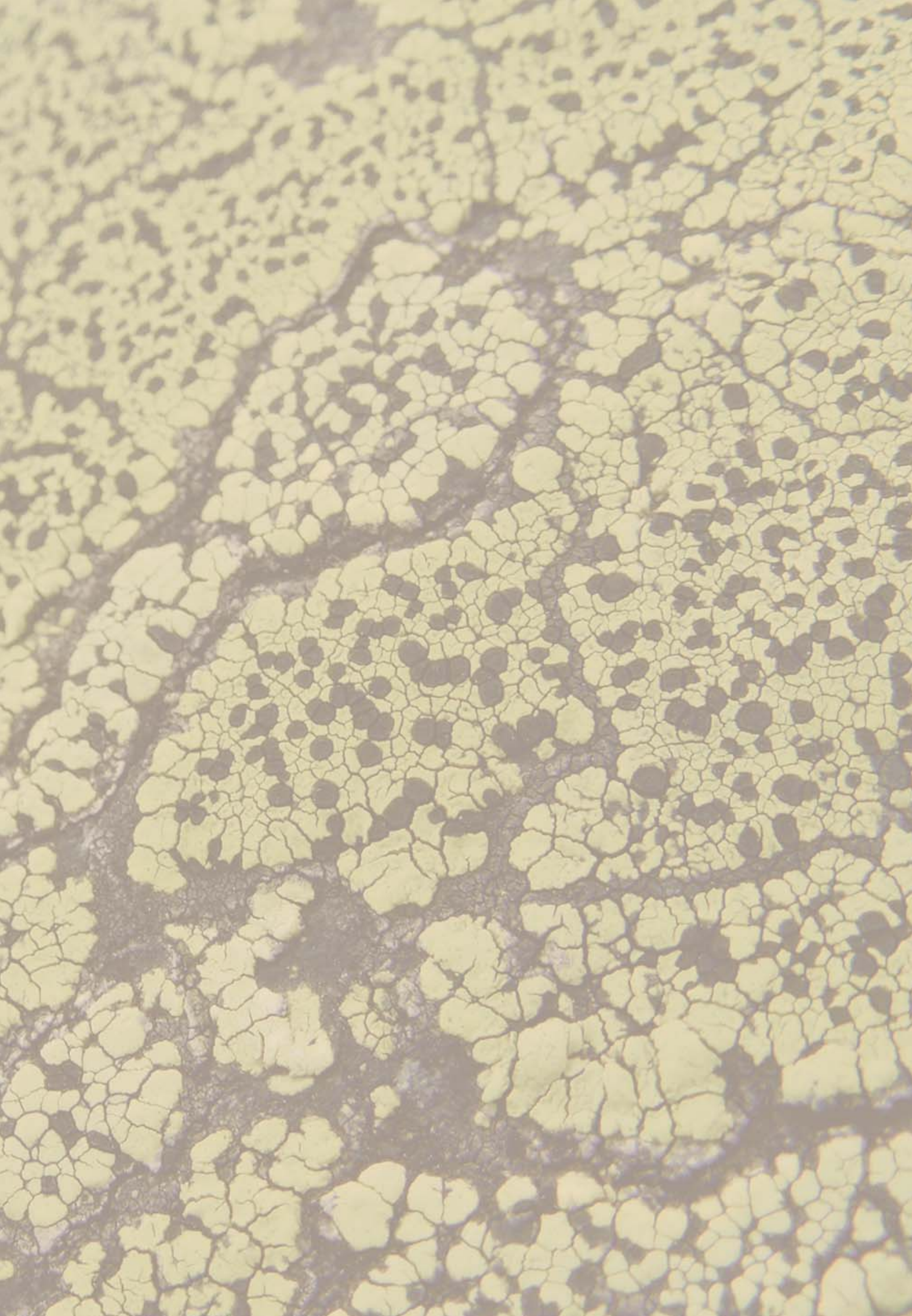
Protected areas

The indicator shows the annual evolution in the amount of protected area in the coastal region. The coastal region includes all coastal and 9 polder municipalities, as well as the entire Belgian part of the North Sea. The protected area includes areas falling under the following national, European or international (planning or legal) designations: Flemish and recognised (private) nature reserves, Bird Directive areas, Habitat Directive areas and Ramsar areas. For now, there are no forest reserves in the coastal area.

Gradual increase

Onshore, the share of nature reserves is rising, although most nature reserves were defined in 2000. The first definition of offshore protected areas refers to the Flemish banks of the North Sea, designated as a Ramsar area in 1984. It was not until 2005 that the protected offshore area (as proposed in 1996) was thoroughly expanded.

surface area (ha)	until 1998	1999	2000	2001	2002	2003	2004	2005
land	19 523	19 682	19 765	24 979	25 042	25 421	25 624	26 154
sea	7 768	7 768	7 768	7 768	7 768	7 768	7 768	59 037



4

Impacts on humans, the environment and nature

4.1 The environment, people & health

Biomonitoring among newborn babies – reference values for the exposure biomarkers

DPSIR

exposure biomarker	number	reference mean (95 % CI)	reference P90 (95 % CI)
dioxin-like substances (pg TEQ/g fat)	871	23 (21-24)	55 (44-67)
sum PCBs (ng/g fat)	1 054	64 (61-68)	166 (140-192)
p,p'-DDE (ng/g fat)	1 112	110 (104-116)	332 (237-428)
HCB (ng/g fat)	1 044	18.9 (17.9-20.0)	48.0 (39.2-56.8)
lead (µg/L)	1 107	14.7 (14.0-15.5)	42.6 (27.7-57.5)
cadmium (µg/L)	1 107	0.21 (0.19-0.23)	1.28 (0.87-1.68)

95 % CI = 95 % confidence interval, TEQ = toxic equivalents; p,p'-DDE = dichlorodiphenyldichloroethylene, metabolite of DDT; HCB = hexachlorobenzene

Dioxin-like substances (dioxins, furans, PCBs and dioxin-like PCBs) are measured using the DRCalux® bioassay. Sum PCBs = sum of marker PCBs 138, 153 and 180. All markers were corrected for age and smoking habits of the mother.

Source: Support Centre for Environment & Health (2005)

Biomonitoring and the Flemish Human Biomonitoring Programme

Integrated exposure to pollutants can be examined with the aid of biomonitoring. Thus, the concentration of pollutants or their degradation products – exposure biomarkers – and/or early biological effects in humans – effect biomarkers – is measured. The Flemish Human Biomonitoring Programme (VHBP) tries to find differences between 8 area types which each have their own environmental problems, namely Antwerp metropolitan area, Ghent metropolitan area, fruit area, rural area, port area, Olen, Albert channel area and incinerators. For this purpose, three different age groups were studied: new-borns (blood from umbilical cord), young people and adults.

Reference values for new-borns

The study of the blood from a baby's umbilical cord is a measure of the exposure of the mother and the initial burden on new-borns. Reference values have been calculated for the exposure markers for this group. The reference mean indicates average exposure, the reference P90 indicates peak values. When compared to measurement values from other countries, the average values (except for cadmium) are similar. For cadmium the average value is higher than the measurement values of other European countries.

Biomonitoring among young people – reference values for the exposure biomarkers

DPSIR

exposure biomarker	number	reference mean (95 % CI)	reference P90 (95 % CI)
sum PCBs (ng/g fat)	1 645	68 (66-70)	116 (111-121)
p,p'-DDE (ng/g fat)	1 645	94 (89-99)	274 (242-306)
HCB (ng/g fat)	1 581	20.9 (20.4-21.3)	30.6 (29.3-31.9)
lead (µg/L)	1 659	21.7 (20.8-22.6)	46.7 (44.2-49.2)
cadmium (µg/L)	1 659	0.36 (0.33-0.38)	1.32 (1.23-1.40)
PAH marker (1-hydroxypyrene in ng/g creatinine)	1 598	88 (81-95)	484 (409-559)
benzene marker (t,t'-muconic acid in µg/g creatinine)	1 598	72 (69-79)	271 (241-300)

95 % CI = 95 % confidence interval; p,p'-DDE: dichlorodiphenyldichloroethylene, metabolite of DDT; HCB: hexachlorobenzene, sum PCBs = sum of marker PCBs 138, 153 and 180.
All markers were corrected for age, gender and smoking. PCBs, p,p'-DDE and HCB were also corrected for Body Mass Index (BMI).

Source: Support Centre for Environment & Health (2006)

Flemish Human Biomonitoring Programme integrated exposure measurement
In the framework of the Support Centre for Environment and Health, a Flemish Human Biomonitoring Programme (VHBP) was started. This programme tries to study the integrated exposure to pollutants by means of measurements. In order to do this, the concentration of pollutants or their degradation products – exposure biomarkers – and/or early biological effects in humans – effect biomarkers – is measured. From this, reference means and reference P90 values were calculated per age group. The reference means and reference P90 respectively indicate standard exposure and peak values. These are not standards or target values based on health risks, but they are usable as a base for comparison in specific exposure situations (e.g. local environmental accident).

Reference values for young people
Young people were studied in order to obtain insight into recent exposure to pollutants in Flanders. When compared to foreign values, exposure in young people is average to moderately high. There are not always standards or target values available for harmful substances in the studied medium (e.g. blood, urine). Where these values are available, the reference mean and the reference P90 do not exceed these.

Biomonitoring among adults – reference values for the exposure biomarkers

DPSIR

exposure biomarker	number	reference mean (95 % CI)	reference P90 (95 % CI)
dioxin-like substances (pg Calux TEQ/g fat)	1 397	19.2 (18.2-20.2)	46.1 (43.3-49.0)
sum PCBs (ng/g fat)	1 530	333 (325-341)	515 (499-531)
p,p'-DDE (ng/g fat)	1 530	423 (398-449)	1 360 (1 253-1 467)
HCB (ng/g fat)	1 530	56.9 (55.2-58.6)	110 (104-115)
lead (µg/L)	1 534	39.6 (38.4-40.9)	77.3 (73.8-80.9)
cadmium (µg/L)	1 534	0.42 (0.40-0.44)	1.03 (0.96-1.09)
cadmium (µg/g creatinine)	1 535	0.62 (0.60-0.64)	1.21 (1.14-1.28)
PAH marker (1-hydroxypyrene in ng/g creatinine)	1 529	147 (138-157)	610 (529-690)
benzene marker (t,t'-muconic acid in µg/g creatinine)	1 349	85 (79-92)	331 (280-381)

95 % CI = 95 % confidence interval; p,p'-DDE: dichlorodiphenyldichloroethylene, metabolite of DDT;
HCB: hexachlorobenzene, sum PCBs = sum of marker PCBs 138, 153 and 180.
Dioxin-like substances (dioxins and furans) were determined using the XDS-Calux® assay. All markers were corrected for age, gender and smoking. Dioxin-like substances, PCBs, p,p'-DDE and HCB were also corrected for Body Mass Index (BMI).

Source: Support Centre for Environment & Health (2006)

Biomonitoring and the Flemish Human Biomonitoring Programme
In order to study the integrated exposure to pollutants by means of measurements, human biomonitoring can be used. With this method, the concentration of pollutants or their degradation products or early biological effects in humans are measured by means of exposure biomarkers and effect biomarkers respectively. In Flanders, this method has been applied in the Flemish Human Biomonitoring Programme (VHBP), which was set up in the framework of the Support Centre for Environment and Health. In this programme, three age groups (new-borns, young people and adults) were studied in 8 area types.

Reference values for adults
In order to know more about the accumulation of exposure throughout life, *adults* (between 50 and 60 years old) were studied. The values found among older people are higher than those for young people because people accumulate substances which are difficult to degrade (persistent substances) in their bodies during their lifetime.

Comparison with an older Flemish study (the pilot study from 1999) shows that the values for lead in blood, cadmium in urine and the PAH marker were very similar to the values in the VHBP. The values for PCBs, hexachlorobenzene and cadmium in blood were much lower. The VHBP values for adults are comparable to the average values from German and American biomonitoring studies.

Healthy life years lost as a result of environmental factors DPSIR

(DALYs)	2002	2003	2004* central estimate
total	*33 248 (100 %)*	*35 908 (100 %)*	*92 429 (100 %)*
total PM10 & PM2.5	22 300 (67 %)	25 518 (71 %)	68 473 (74.1 %)
total ozone	785 (2 %)	879 (2 %)	669 (0.7 %)
total noise	6 528 (20 %)	6 528 (18 %)	19 151 (20.7 %)
total carcinogenic substances (except PM10)	2 032 (6 %)	2 009 (6 %)	3 155 (3.4 %)
total Pb	1 601 (5 %)	974 (3 %)	981 (1.1 %)
DALY/inhabitant/year	*0.006*	*0.006*	*0.015*
DALY/inhabitant/70 years	*0.41*	*0.44*	*1.1*

* For 2004 a different method was used to calculate DALYs from noise, including the health effects ischemic heart diseases and high blood pressure, which results in a higher estimate. The method for the impact of PM2.5 was adjusted in accordance with European studies.

Source: VITO

Disability Adjusted Life Years

In order to estimate and compare the impact of different environmental factors on health, it is necessary to reduce all the different effects to a common denominator. For this purpose, the Disability Adjusted Life Years (DALY) indicator was developed. This measure reflects the healthy life years a population loses by death or illness, taking into account the seriousness and the duration of the illness.

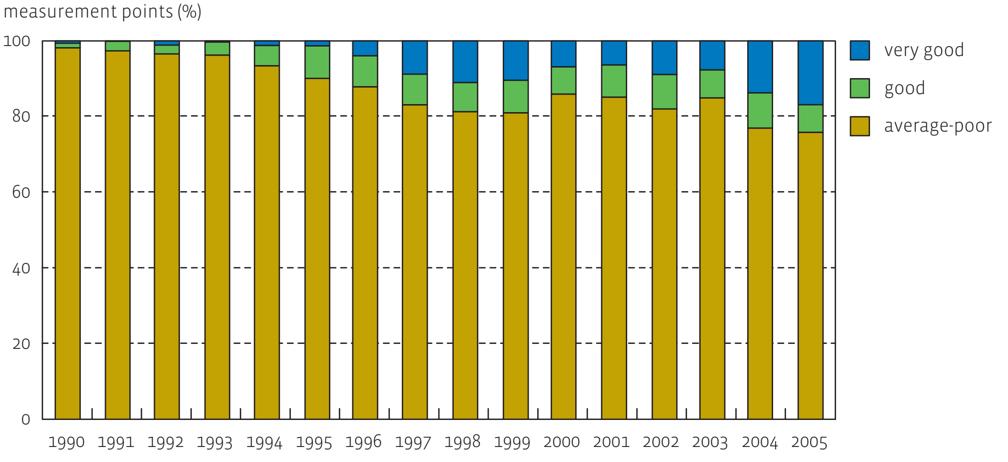
Loss of a healthy life year

For Flanders, the number of lost healthy life years was determined for a series of pollutants and noise. In 2004 each inhabitant of Flanders lost 0.015 healthy life years due to this set of environmental factors. A life-long exposure to concentrations such as those in 2004 would amount to the loss of a little more than 1 healthy life year. These values are higher than those reported before as a result of a change in the method, which now includes the health effects ischemic heart diseases and high blood pressure resulting from noise in the calculations. The method for the calculation of the effects of PM2.5 was also adjusted to recent European studies.

4.2 The environment & nature

Phosphorus concentrations in rivers

DPSIR



Source: INBO based on VMM data

Good ecological status

The Water Framework Directive (WFD) states that each member state must work to reach at least a good ecological status by 2015 in all natural surface waters. The Decree on Integrated Water Policy (BS 14/11/2003) endorses that objective. Phosphorus concentrations in rivers are a good indicator for the description and evaluation of the eutrophication status. In conformity with the WFD, for each river type two guideline values have been determined for an average orthophosphate concentration: one to reach a very good and one to reach a good ecological status. The indicator shows the evolution in the number of measurement points which complies with these guideline values. The guideline values for phosphorus should be seen as a necessary precondition in order to restore ecological communities.

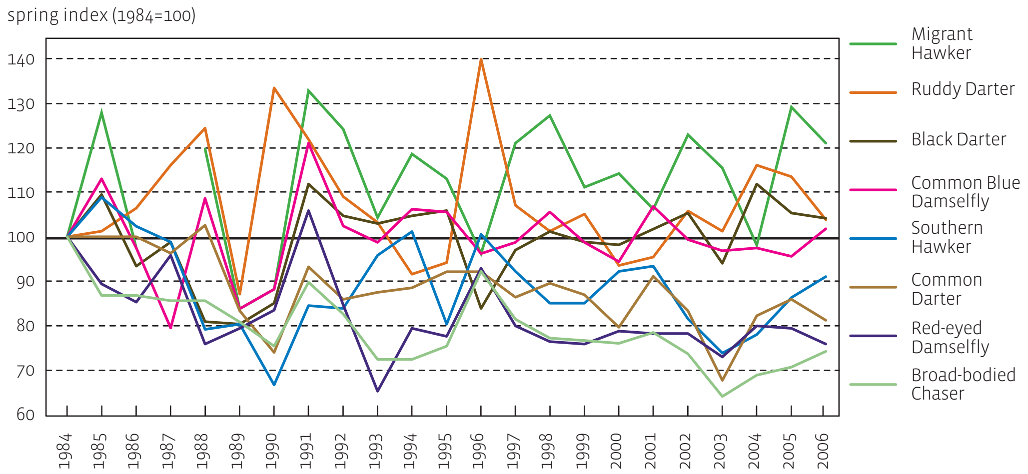
Distance to target remains huge

Thanks to the efforts with respect to water treatment and the reduction of phosphate-based detergents, the share of measurement points in rivers where a very good or good ecological status was obtained gradually increased until 1998. After that, the number usually fluctuated from one year to another. This has to do with large fluctuations in precipitation. In 2005, 25 % reached a very good or good ecological status. The distance to the target (100 % in 2015) remains huge. In order to start overcoming this distance by 2015, a well thought out selection of instruments, such as the building of buffer zones, management agreements, additional treatment, erosion reduction and limitations on fertiliser, is advisable.

number of measurement points (%)	1990	1994	1998	2002	2003	2004	2005
very good	0.6	1.2	11.0	8.9	7.7	13.7	16.9
good	1.2	5.4	7.7	9.0	7.3	9.4	7.2
average-poor	98.2	93.4	81.3	82.1	85.0	76.9	75.9

First dragonfly observation (spring index)

DPSIR



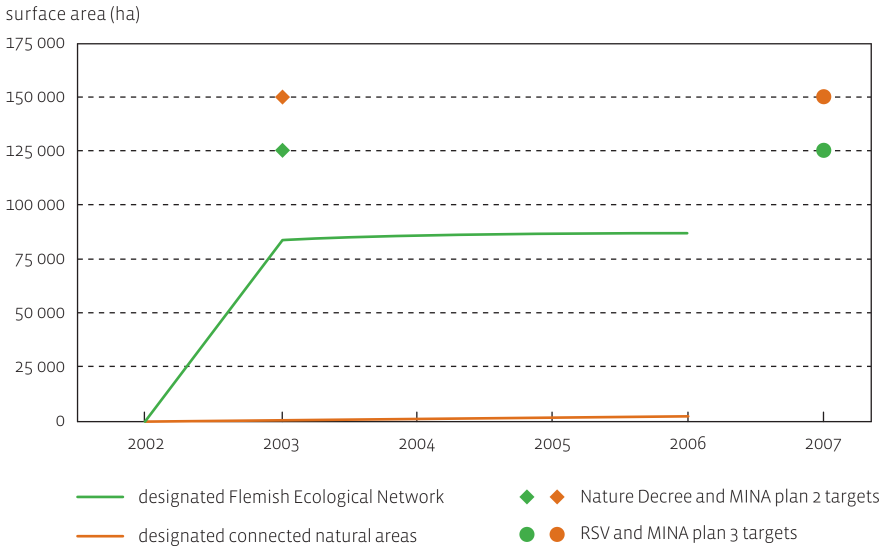
Source: NARA based on data from Libellenwerkgroep Vlaanderen

Climate change and seasonal activities
Climate change has an influence on seasonal activities of fauna and flora. As a result of higher temperatures, it warms up faster in spring and it stays warmer for longer in autumn so that temperature-related activities such as the budding of trees, the hatching of insects or the migration of toads occur earlier in spring. Autumn activities, such as the falling of leaves, on the other hand, occur later.

First dragonfly observation
In 2006 the average first observation of dragonflies occurred earlier than in 1984. However, this is not the case for all species. Of the 26 species which could be tested, there were eight for which the first observation occurred earlier in the course of 22 years. For 18 species no change was recorded. For 11 species the average peak flying period also moved forward in the season; for two species it moved to a later date. There seems to be a positive relationship between the extension of the flying season and the extension of the area covered by the species. Species which extend their flying period and area react positively to climate change. However, the risk is that some species adapt better than others, leading to modifications in the food chain and a loss of ecological coherence.

Designated area of the Flemish Ecological Network (VEN) and connected natural areas

DPSIR



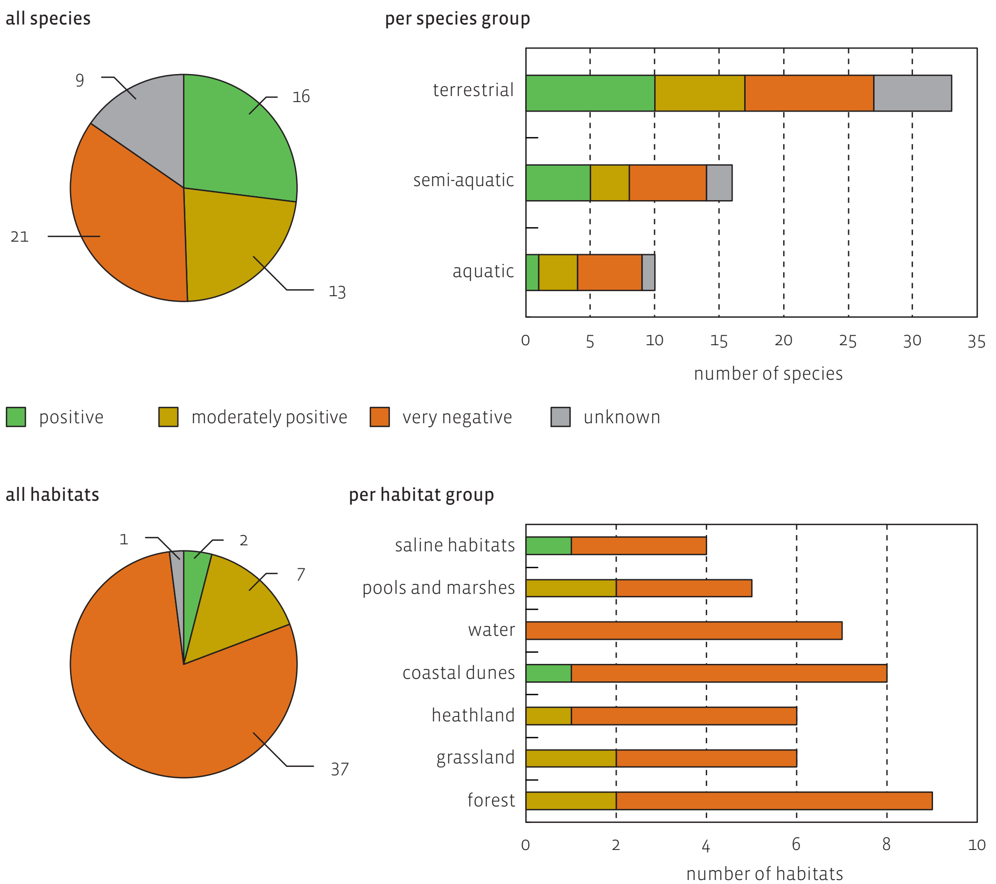
Source: NARA, based on data of the RWO Department, Land Use division

Designation is behind, and there has hardly been any progress in recent years
The Nature Decree, MINA plan 3 (2003-2007) and the Regional Land Use Plan for Flanders (RSV) provide for the designation of 125 000 ha of 'large units of nature' and 'large units of nature under development', which together form the Flemish Ecological Network (VEN). In these areas, nature is the principal function; other functions are subordinate. In addition, 150 000 ha of connected natural areas (NVWG) have to be designated; there, the nature function is of equal importance. According to the Nature Decree, the designation of VEN and NVWG had to be completed by 20 January 2003. According to the RSV and other policy plans (e.g. MINA plan 3) this designation is planned for the end of 2007. VEN and NVWG are supported by nature connecting areas (NVBG), for which no area with corresponding tasks has been defined. NVBG and NVWG together form the IVON or Integral Connective and Supporting Network.

In the first phase of the designation process of the areas for natural structuring, a total of 86 823 ha of VEN and 75 ha of agricultural land functioning as connected natural areas was designated. In several other designation processes or individual cases, an additional 222 ha of VEN and 859 ha of NVWG was designated. On 31 December 2006 approx. 70 % (87 022 ha) of the VEN and 0.7 % (934 ha) of the NVWG had been designated.

Not only was the target date of the Nature Decree (20 January 2003) not reached, but the target date stipulated by the RSV (end of 2007), is also impossible to reach.

☹ Status of species and habitats from the Habitat Directive DPSIR



The state of conservation for habitats and species from the Habitat Directive

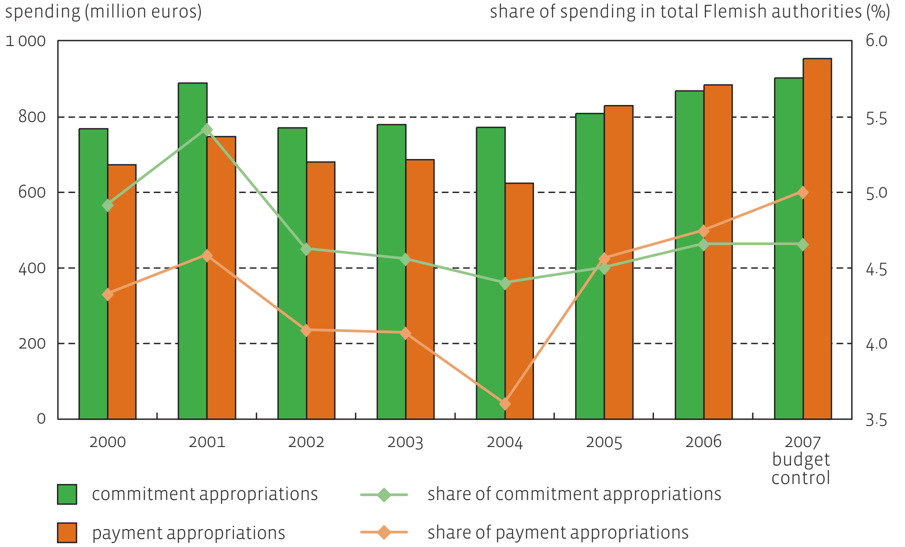
Source: NARA based on INBO

The state of conservation of species which are important in Europe
The EU member countries are obliged, in the framework of the six-yearly reporting on the progress of the implementation of the EU Habitat Directive, to submit a detailed report (article 17 of the Habitat Directive). This report implies, among other things, that per habitat and species of the directive (appendices I, II, IV, V) a state of conservation is indicated at the level of the biogeographical regions within the member countries. The state of conservation of the habitats from the Habitat Directive is evaluated on the basis of four criteria: the surface area of the habitat, the acreage, the quality and the expectations for the future. For species, the criteria are the population of the species, the acreage, the habitat and the expectations for the future.

Both habitats and species score badly
Three quarters (37) of the habitats obtained a very negative score because they scored badly on at least one of the criteria. Furthermore, there are seven other habitats (15 %) which receive a moderately negative score. This means that there are only two habitats which obtain a positive score for all criteria. Just over a quarter of the species (16) is evaluated positively. For 13 species the score is moderately negative and for 21 species very negative.

4.3 The environment & the economy

Spending of the Flemish environmental authorities DPSIR



The amounts are expressed in constant 2000 prices. Commitment appropriations (CA) indicate the available room for policymaking. Payment appropriations (PA) give the approval to actually make the payments.
BC = budget control

Source: Environmental Economics Unit, LNE Department

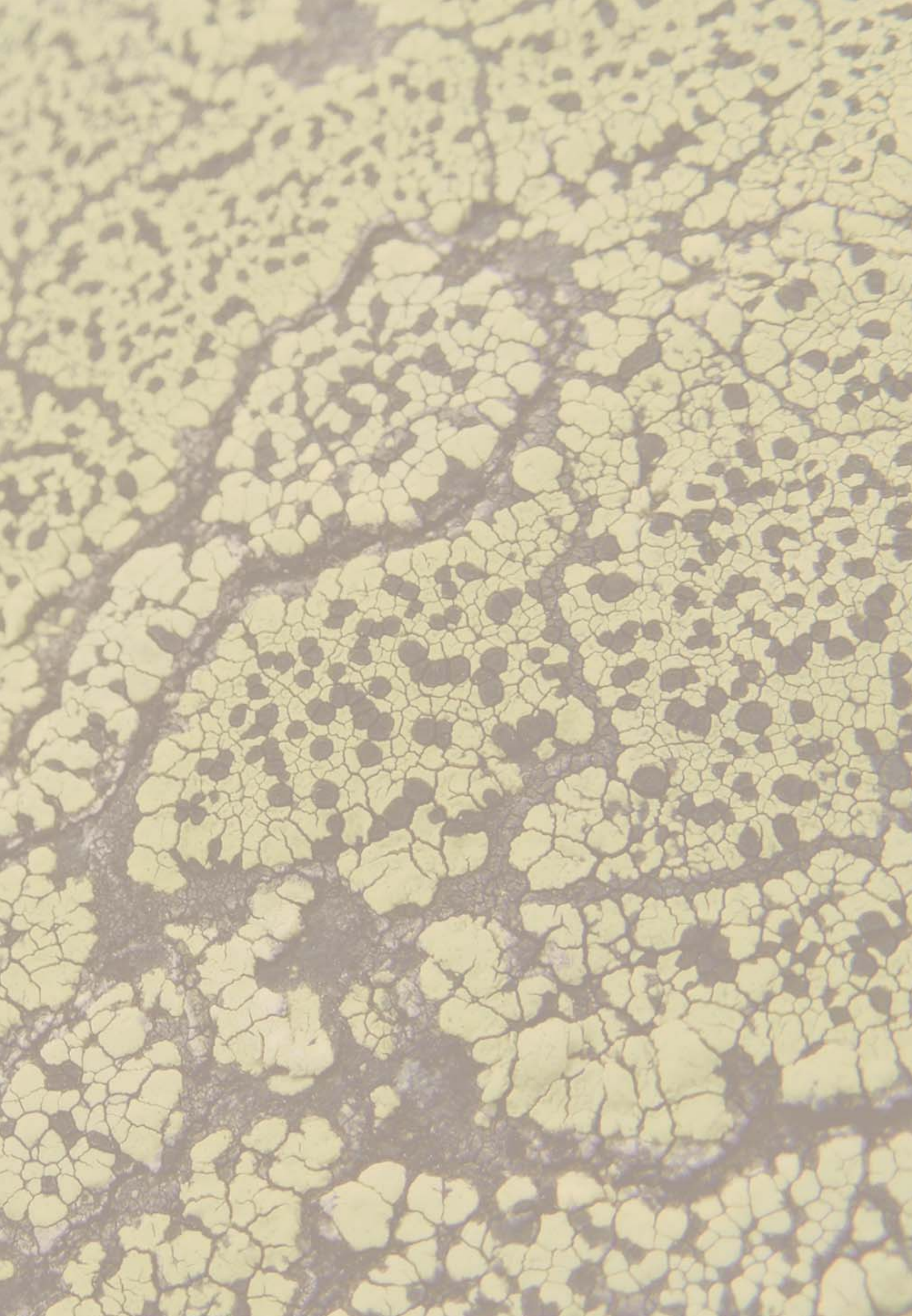
More and more resources for our environment

In 2007 the total resources of the Flemish government for the environment rose to 903 million euros in commitment appropriations in constant prices. Compared to the total resources in 2006 this means a status quo.

In payment appropriations resources rose to 955 million euros in constant prices. This results in the share of the environment in the total Flemish budget of 5.0 % in payment appropriations. With these figures, payment appropriations have reached their highest level since 2000. More than half of the resources is still going to fighting surface water pollution.

From the 2005 budget control onwards, the Aquafin expenditure will be partially financed by the drinking water companies instead of the Flemish government. In order to obtain comparable figures, all expenditure is included in the figures cited here. Moreover, since the 2006 budget control, as a result of the Better Administrative Policy reform, the budget resources for energy are added to the total environmental resources on a retroactive basis. The share of energy remains limited to 2.3 % of the total environmental resources.

Appendices



Core set of environmental data

Hugo Van Hooste, Johan Brouwers, MIRA, VMM

Table 1: Water consumption in m^3 (Flanders, 1991-2003, 2005)
Table 2: Energy consumption in PJ (Flanders, 1990-2006)
Table 3: Land use in ha (Flanders, 1990-2006)
Table 4: Emission of ozone-depleting substances in tonnes CFC-11-eq (Flanders, 1995-2005)
Table 5: Emission of greenhouse gases in ktonnes CO_2-eq (Flanders, 1990-2006)
Table 6: Emissions into the air (Flanders, 1990-2006)
Table 7: Waste production in tonnes (Flanders, 1991-2006 for household waste and 1992-2005 for industrial waste)
Table 8: Discharges of industrial waste water (Flanders, 1992-2006)
Table 9: Pressure on surface water from households (Flanders, 1990-2006)
Table 10: Diffuse discharges into surface water from agriculture (Flanders, 1990-2006)

More extensive tables can be consulted at www.environmentflanders.be.

Where possible, the data in the core set of environmental data have been subdivided into 6 sectors. This allows obtaining a coherent overview of environmental pressure per sector. The table below shows the designation of these sectors and the further division into subsectors based on the NACE-BEL codes.

Designation of the sectors in MIRA-T 2007

no.	sector	subsectors	NACE-BEL code
1	households		
2	industry	chemical	24
		metal (iron, steel, nonferrous)	27 to 35
		foodstuffs	15, 16
		textile	17, 18, 19
		paper	21, 22
		other industries (e.g. metal ores and minerals, wood, construction, waste recovery)	13, 14, 20, 25, 26, 36, 37, 41, 45
3	energy	electricity companies	40.1, 40.3
		petroleum refineries	23.2
		gas companies	40.2, 60.3
		other energy companies	10, 11, 12, 23.1, 23.3
4	agriculture	arable farming, horticulture, stockbreeding, hunting	01
		forestry	02
		fisheries and fish farming	05
5	transport*		
6	trade & services	trade	50 to 52
		hotels and restaurants	55
		offices and administration	60.1, 60.2, 61 to 67, 70 to 75, 99
		education	80
		health care and social services	85
		community facilities, social-cultural and personal services (incl. waste water treatment plants and waste processing)	90 to 93

* also includes all transport with private vehicles

More *extensive versions* of these tables (subdivided further to subsector level, with additional parameters, with data for years in-between ...) and *other tables* with basic data are available as Excel files at the MIRA website (www.environmentflanders.be).

Datasets in MIRA

In MIRA various datasets are reported and used in the different chapters. These data are related to the emissions and discharges of different pollutants into the air, water and soil, energy and water consumption, land use, waste production, etc., of all relevant sectors, such as households, industry, energy, agriculture & fisheries, transport and trade & services, and to the concentrations of different substances in air, water and soil.

The reported datasets are the final result of the making of inventories by various government bodies. This data inventory is a complex whole and is composed of the results of, among other things, information gathering imposed by law such as environmental (emissions) annual reports, collective emissions registration, measurements by public authorities such as the sampling of industrial waste water, scientific studies, surveys of companies and private persons, statistical information (e.g. traffic and agriculture counts, figures on the use of products which are taxing on the environment), emission models in combination with internationally accepted emission factors …

The inventory is always as complete and correct as possible an estimate of the data at a given moment. This does not take away the fact that there are always uncertainties regarding the figures. However, it is currently impossible to assign a concrete margin of error to the different data. Only for greenhouse gas emissions, at the Belgian level, a determination of the degree of uncertainty has been carried out and results in a margin of error of 7.5 % for 2003 (and a similar margin of error for the other years).

Efforts are being made continually by the different institutions to keep refining and optimising the data inventories and to complete them where necessary. All this is done using the latest and improved scientific insights, e.g. in order to better map emission flows and international agreements regarding emission factors. It is always carefully checked that the complete time series is studied and included in a consistent way. Also, a valuation is made based on provisional figures for the last year. A consequence of this is that the collected datasets can differ from previously reported figures in MIRA and other reports.

Table 1: Water consumption in m³ (Flanders, 1991, 1995, 2000-2003, 2005)

sector	water type	1991	1995	2000	2001	2002	2003	2004	2005	2006
1 Households	other water	0	0	0	0	0	0	-	-	-
1 Households	groundwater	14 070 000	14 070 000	14 070 000	14 070 000	18 797 670	18 361 588	-	-	-
1 Households	cooling water	0	0	0	0	0	0	-	-	-
1 Households	tap water	228 461 770	231 260 509	224 329 121	232 381 129	225 964 894	221 520 444	-	-	189 000 000
1 Households	surface water excl. cooling water	0	0	0	0	0	0	-	-	-
1 Households	rain water	19 300 000	19 300 000	19 300 000	19 300 000	25 455 220	25 941 283	-	-	-
1 Households	total (excl. cooling water)	261 831 770	264 630 509	257 699 121	265 751 129	270 217 783	265 823 315	-	-	-
1 Households	total (incl. cooling water)	261 831 770	264 630 509	257 699 121	265 751 129	270 217 783	265 823 315	-	-	-
2 Industry	other water	4 650 962	20 908 297	13 880 049	11 790 823	13 006 930	11 822 816	-	-	-
2 Industry	groundwater	100 768 544	147 277 370	81 522 572	80 685 506	74 379 429	75 219 357	-	-	-
2 Industry	cooling water	608 836 346	735 576 940	658 013 118	570 642 172	621 365 265	622 053 752	-	-	-
2 Industry	tap water	102 427 555	104 364 645	120 560 769	119 790 060	114 788 924	115 854 064	-	-	-
2 Industry	surface water excl. cooling water	214 238 838	225 074 208	123 853 822	129 647 236	135 070 956	156 506 252	-	-	-
2 Industry	rain water	8 138 497	3 680 536	7 021 650	8 327 332	7 943 819	5 954 090	-	-	-
2 Industry	total (excl. cooling water)	430 224 397	501 305 055	346 838 862	350 240 957	345 190 058	365 356 578	-	-	-
2 Industry	total (incl. cooling water)	1 039 060 743	1 236 881 995	1 004 851 980	920 883 129	966 555 323	987 410 330	-	-	-
3 Energy	other water	844 306	801 077	107 558	69 659	103 200	109 235	117 385	254 221	-
3 Energy	groundwater	2 702 515	645 237	312 876	286 366	165 952	192 133	178 098	175 598	-
3 Energy	cooling water	3 459 368 553	3 279 994 293	2 831 773 749	2 624 694 109	2 579 930 679	2 742 272 387	2 527 939 756	2 560 437 223	-
3 Energy	tap water	13 434 446	11 366 038	16 530 918	11 463 857	11 875 275	11 771 459	13 103 666	12 306 315	-
3 Energy	surface water excl. cooling water	134 478 297	44 727 582	35 992 525	35 845 591	33 370 055	33 868 261	34 007 572	36 481 791	-
3 Energy	rain water	438 020	1 331 329	1 866 761	1 953 607	1 947 375	1 153 065	1 458 465	1 384 093	-
3 Energy	total (excl. cooling water)	151 897 584	58 871 263	54 810 638	49 619 080	47 461 857	47 094 153	48 865 186	50 602 018	-
3 Energy	total (incl. cooling water)	3 611 266 137	3 338 865 556	2 886 584 387	2 674 313 189	2 627 392 536	2 789 366 540	2 576 804 942	2 611 039 241	-
4 Agriculture	other water	366 414	381 258	300 607	295 483	285 846	278 363	273 581	269 317	-
4 Agriculture	groundwater	18 360 121	19 349 338	53 851 957	55 951 952	52 839 062	54 200 027	53 184 719	52 641 601	-
4 Agriculture	cooling water	1 654	1 698	4 799	4 519	4 406	4 034	3 995	3 828	-
4 Agriculture	tap water	23 748 018	24 672 311	11 914 393	12 214 551	11 616 708	11 752 243	11 560 105	11 416 357	-
4 Agriculture	surface water excl. cooling water	843 955	883 593	816 180	875 657	816 506	861 063	845 001	838 278	-
4 Agriculture	rain water	7 167 837	7 494 801	1 862 065	1 877 838	1 797 472	1 794 270	1 762 599	1 740 619	-
4 Agriculture	total (excl. cooling water)	50 486 346	52 781 302	68 745 201	71 215 481	67 355 594	68 885 966	67 626 005	66 906 172	-
4 Agriculture	total (incl. cooling water)	50 488 000	52 783 000	68 750 000	71 220 000	67 360 000	68 890 000	67 630 000	66 910 000	-

6 Trade & services	other water	51 786	160 241	1 971 951	2 096 180	2 381 254	2 140 785	-	-	-
6 Trade & services	groundwater	4 444 472	4 358 986	6 069 024	3 677 798	5 629 517	5 249 241	-	-	-
6 Trade & services	cooling water	74 666	88 552	930 193	699 612	969 736	586 354	-	-	-
6 Trade & services	tap water	14 836 542	20 993 994	26 053 449	16 832 834	26 926 968	28 166 072	-	-	-
6 Trade & services	surface water excl. cooling water	401 155	318 691	817 006	1 872 728	2 161 967	1 545 611	-	-	-
6 Trade & services	rain water	50 744	521 608	1 383 451	1 191 331	1 677 001	1 328 522	-	-	-
6 Trade & services	total (excl. cooling water)	19 784 699	26 353 520	36 294 881	25 670 871	38 776 707	38 430 231	-	-	-
6 Trade & services	total (incl. cooling water)	19 859 365	26 442 072	37 225 074	26 370 483	39 746 443	39 016 585	-	-	-
Flanders	other water	5 547 054	21 869 615	15 959 558	13 956 662	15 491 384	14 072 835	-	-	-
Flanders	groundwater	121 985 531	166 351 593	101 974 472	98 719 670	98 972 567	99 022 319	-	-	-
Flanders	cooling water	4 068 279 565	4 015 659 785	3 490 717 060	3 196 035 893	3 202 265 680	3 364 912 493	-	-	-
Flanders	tap water	359 160 313	367 985 185	387 474 258	380 467 880	379 556 061	377 312 039	-	-	-
Flanders	surface water excl. cooling water	349 118 290	270 120 481	160 663 353	167 365 555	170 602 978	191 920 123	-	-	-
Flanders	rain water	27 927 261	24 833 473	29 571 862	30 772 270	37 023 415	34 376 959	-	-	-
Flanders	total (excl. cooling water)	863 738 450	851 160 347	695 643 503	691 282 037	701 646 406	716 704 276	-	-	-
Flanders	total (incl. cooling water)	4 932 018 015	4 866 820 132	4 186 360 562	3 887 317 930	3 903 912 086	4 081 616 769	-	-	-

Remarks:
- other water = water coming from the product, ice, waste water from another company, etc.
- The databases consulted in order to draw up this table do not offer a complete picture for the sector of trade & services. The real water consumption for these sectors is higher than the amounts shown here.
- water consumption per water source: in agriculture two distribution codes were used so that the total consumption per subsector could be divided into consumption per water source: the proportion of water consumption per source based on the levies databases for 1995 and 2003 and the proportion of water consumption per subsector based on MIRA-S 2000 and the ILVO study for 2000-2005.

Source: MIRA and ILVO based on VMM, NIS databases

Table 2: Energy consumption in PJ (Flanders, 1990-2006)

		1 Households	2 Industry	3 Energy	4 Agriculture	5 Transport	6 Trade & services	Flanders (gross domestic energy consumption = total excl. bunkers)**	International bunkers
1990	coal, cokes, coal tar	8.5	91.1	127.1	2.2	0.0	0.0	229.1	0.0
	petroleum products	106.9	131.0	68.2	28.7	164.0	14.1	512.9	218.6
	gas	57.4	72.6	52.8	1.2	0.0	18.8	202.8	0.0
	other fuels		22.2	5.2	0.0	0.0	0.4	27.8	0.0
	renewable fuels	3.8	0.2	4.2	0.0	0.0	0.0	8.2	0.0
	electricity	27.9	70.7	-122.1	3.6	1.9	20.2	2.2	0.0
	heat		2.5	0.0	0.0	0.0	0.0	2.5	0.0
	nuclear heat		0.0	208.0	0.0	0.0	0.0	208.0	0.0
	total	204.4	390.2	343.5	35.7	165.9	53.7	1 193.5	218.6
1995	coal, cokes, coal tar	4.7	80.7	123.7	0.9	0.0	0.0	210.1	0.0
	petroleum products	115.1	236.1	73.7	29.4	183.1	20.4	657.7	211.1
	gas	75.6	100.2	69.2	2.6	0.0	28.0	275.6	0.0
	other fuels		53.6	3.0	0.0	0.0	1.1	57.7	0.0
	renewable fuels	4.3	0.5	3.5	0.0	0.0	0.0	8.3	0.0
	electricity	33.6	85.7	-129.3	3.9	1.9	26.3	22.1	0.0
	heat		9.3	-8.8	0.0	0.0	0.0	0.5	0.0
	nuclear heat		0.0	207.5	0.0	0.0	0.0	207.5	0.0
	total	233.4	566.0	342.4	36.8	185.0	75.8	1 439.5	211.1
2000	coal, cokes, coal tar	2.6	82.9	93.2	0.8	0.0	0.0	179.6	0.0
	petroleum products	103.2	243.1	68.8	22.8	201.5	21.8	661.0	273.3
	gas	83.1	123.1	122.5	5.2	0.0	32.5	366.4	0.0
	other fuels		80.3	5.5	0.0	0.0	0.9	86.8	0.0
	renewable fuels	4.4	1.0	3.7	0.0	0.0	0.1	9.2	0.0
	electricity	36.1	98.5	-150.8	3.8	2.8	31.1	21.5	0.0
	heat		22.0	-19.3	0.0	0.0	0.0	3.8	0.0
	nuclear heat	0.0	0.0	242.4	0.0	0.0	0.0	242.4	0.0
	total	229.4	651.0	366.0	32.6	204.3	86.4	1 570.8	273.3
2003	coal, cokes, coal tar	3.0	83.9	78.6	0.8	0.0	0.0	166.4	0.0
	petroleum products	115.1	224.1	89.7	22.3	203.8	20.1	675.2	347.4
	gas	95.9	118.9	149.0	5.2	0.0	39.6	408.6	0.0
	other fuels		70.0	6.9	0.0	0.0	0.8	77.8	0.0
	renewable fuels	3.9	4.2	7.1	0.0	0.0	0.1	15.4	0.0
	electricity	39.2	96.6	-158.7	3.9	2.6	40.4	24.0	0.0
	heat		17.0	-15.4	0.0	0.0	0.0	3.4	0.0
	nuclear heat		0.0	238.8	0.0	0.0	0.0	238.8	0.0
	total	257.1	614.7	396.2	32.3	206.5	101.1	1 609.6	347.4

2004	coal, cokes, coal tar	3.8	95.0	71.4	0.8	0.0	0.0	171.0	0.0
	petroleum products	109.2	242.8	82.7	22.3	205.7	16.4	679.1	362.4
	gas	87.0	115.1	142.3	6.7	0.0	45.4	396.5	0.0
	other fuels		73.3	7.1	0.0	0.0	1.2	81.6	0.0
	renewable fuels	3.9	4.4	8.7	0.0	0.0	0.4	17.4	0.0
	electricity	40.3	95.4	-155.7	3.1	2.7	41.7	27.6	0.0
	heat		17.8	-15.7	0.0	0.0	0.0	4.9	0.0
	nuclear heat		0.0	234.5	0.0	0.0	0.0	234.5	0.0
	total	244.2	643.8	375.2	33.0	208.5	105.1	1 612.5	362.4
2005	coal, cokes, coal tar	3.6	90.1	69.2	0.8	0.0	0.0	163.7	0.0
	petroleum products	107.5	272.7	80.4	22.0	206.4	14.7	703.8	371.4
	gas	87.0	120.2	154.7	6.6	0.0	44.1	412.6	0.0
	other fuels		73.6	7.1	0.0	0.0	1.5	82.2	0.0
	renewable fuels	3.8	5.0	11.2	0.0	0.0	0.3	20.3	0.0
	electricity	39.2	96.3	-161.9	3.2	2.8	43.2	22.8	0.0
	heat		20.5	-15.8	0.0	0.0	0.0	8.3	0.0
	nuclear heat		0.0	239.4	0.0	0.0	0.0	239.4	0.0
	total	241.1	678.5	384.5	32.7	209.2	103.7	1 653.2	371.4
2006*	coal, cokes, coal tar	3.6	91.7	57.2	0.8	0.0	0.0	153.4	0.0
	petroleum products	95.9	251.0	98.5	21.9	206.3	14.4	688.0	403.2
	gas	87.9	115.6	157.4	5.9	0.0	47.2	414.0	0.0
	other fuels		72.8	9.2	0.0	0.0	1.5	83.5	0.0
	renewable fuels	3.7	5.9	13.0	0.1	0.0	0.3	23.0	0.0
	electricity	40.1	101.3	-158.1	3.0	2.8	43.7	32.9	0.0
	heat		20.6	-18.0	0.0	0.0	0.0	5.4	0.0
	nuclear heat		0.0	235.8	0.0	0.0	0.0	235.8	0.0
	total	231.2	659.0	395.0	31.8	209.1	107.1	1 636.0	403.2

database situation on 3 October 2007

* provisional figures

** including the (very limited) energy consumption which cannot be attributed to the different subsectors

Remarks:

- energy consumption by the energy sector itself is the sum of transformation losses, own consumption and losses which occur during transport and distribution;
- 'petroleum products' = petroleum and intermediary products, refinery gas, LPG, petrol, kerosene, gas and diesel oil, lamp oil, heavy fuel oil, naphtha, petroleum cokes and other petroleum products;
- 'gas' = natural gas, mine gas, coking gas and blast-furnace gas;
- 'other fuels' = mainly residual fuels from the chemical industry (3/4 own fuel crackers) and non-renewable part of waste incineration;
- 'renewable fuels' = biomass;
- 'bunkers' = bunkers with fuels for international shipping and aviation.

Source: Flanders Energy Balance VITO; VMM

Table 3: Land use in ha (Flanders, 1990-2006)

sector	specification	1990	2000	2001	2002	2003	2004	2005	2006
1 Households	flats	1 592	2 737	2 910	3 031	3 189	3 360	3 533	3 820
1 Households	buildings	1 110	1 497	1 513	1 529	1 555	1 583	1 610	1 659
1 Households	houses, farmhouses	119 045	146 318	148 164	149 690	151 434	152 843	154 265	155 853
1 Households	total	121 747	150 552	152 587	154 250	156 178	157 786	159 408	161 332
2 Industry + 3 Energy	trade and industrial buildings	17 026	20 651	20 728	20 823	20 731	20 852	20 881	20 878
4 Agriculture	temporary grass	38 080	61 899	57 262	48 756	48 207	48 528	52 968	53 414
4 Agriculture	permanent grass	213 811	179 414	180 673	186 914	185 571	181 383	173 487	169 433
4 Agriculture	feed crops excl. grass	100 811	120 062	134 164	120 231	120 578	116 174	116 687	115 061
4 Agriculture	arable farming	208 811	219 736	203 153	220 222	219 266	229 994	229 773	229 567
4 Agriculture	horticulture	38 498	47 825	50 614	50 734	51 899	50 145	48 982	47 943
4 Agriculture	vacant and other agricultural land	3 885	7 940	9 289	9 029	9 413	7 545	8 140	7 631
4 Agriculture	total	603 896	636 876	635 155	635 886	634 934	633 769	630 037	623 049
5 Transport	roads				55 790	56 046	56 258	56 542	56 868
5 Transport	railroads				4 278	4 278	4 372	4 372	4 390
5 Transport	waterways				10 640	10 640	10 640	10 640	10 640
5 Transport	airports				1 820	1 820	1 820	1 820	1 803
5 Transport	total				72 528	72 784	73 090	73 374	73 701
6 Trade & services	warehouses	4 718	7 493	7 773	8 013	8 128	8 425	8 591	8 734
6 Trade & services	office buildings	488	938	974	1 006	1 053	1 083	1 107	1 145
6 Trade & services	commercial buildings	6 675	7 922	7 951	7 988	7 987	8 008	8 591	7 964
6 Trade & services	public buildings	3 183	3 666	3 613	3 601	3 635	3 670	3 725	3 782
6 Trade & services	utilities	1 129	1 769	1 842	1 866	1 904	1 943	1 971	1 980
6 Trade & services	social welfare and health care buildings	1 969	2 445	2 466	2 483	2 509	2 527	2 555	2 580
6 Trade & services	buildings for education, research and culture	4 127	4 407	4 431	4 428	4 450	4 461	4 476	4 481
6 Trade & services	religious buildings	921	925	919	927	932	925	919	915
6 Trade & services	total	23 210	29 565	29 969	30 312	30 598	31 042	31 935	31 581
7 Tourism & recreation	recreational and sport buildings	6 996	8 228	8 280	8 272	8 369	8 412	8 451	8 463
7 Tourism & recreation	recreational grounds	4 222	4 603	4 588	4 606	4 567	4 568	4 545	4 520
7 Tourism & recreation		11 218	12 831	12 868	12 878	12 936	12 980	12 996	12 983
X Nature	acid grassland		5 267						
X Nature	neutral/acid grassland		33 749						
X Nature	calcareous grassland		2 692						
X Nature	wet heath		1 564						
X Nature	dry heath		12 044						
X Nature	deciduous forest		74 857						
X Nature	coniferous forest		57 806						
X Nature	total		187 979						

Remark: As different sources need to be used in order to get a good idea per sector, it is not possible to compare figures between the different sectors unambiguously. It is possible to compare with respect to the **total area of Flanders (13 522 km² or 1 352 225 ha)**. It should be taken into account, however, that 5.75 % of the total area of Flanders has not been included in the land register (e.g. public roads, squares, watercourses, etc.).

Sources:
- for the sectors Households, Industry + Energy, Trade & services and Tourism & recreation: Land Register, 2006
- for the Transport sector: MIRA Achtergronddocument 2006, Transport
- for the Agricultural sector: NIS, 15 May count
- for Nature: Janssen L. & Mensink C. (2002) based on Boskartering (2001) and Biologische Waarderingskaart (1997)

Table 4: Total emission of ozone-depleting substances in tonnes CFC-11-eq (Flanders, 1995, 2000-2005)

sector	1995	2000	2001	2002	2003	2004	2005
1 Households	50.4	46.7	42.8	33.4	24.7	16.3	10.1
2 Industry	387.7	233.3	211.2	164.7	153.2	108.6	87.8
3 Energy	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 Agriculture	129.7	59.9	23.9	22.2	22.6	26.1	8.5
5 Transport	31.0	9.3	9.3	9.3	9.2	9.2	9.1
6 Trade & services	389.6	254.0	236.2	215.8	198.6	177.8	129.8
Flanders (total)	988.5	603.2	523.5	445.3	408.3	337.9	245.2

database situation on 18 July 2007

Source: Econotec, VITO, 2007

Table 5: Emission of greenhouse gases in ktonnes CO_2 equivalents (Flanders, 1990-2006)

sector	substance	1990	1995	2000	2001	2002	2003	2004	2005	2006*
1 Households	CO_2	11 765	13 032	12 417	13 432	12 641	14 058	13 193	13 058	12 288
1 Households	CH_4	300	281	216	213	197	200	199	195	193
1 Households	N_2O	199	201	179	183	178	185	185	185	184
1 Households	HFCs		98	83	83	86	85	83	63	63
1 Households	all gases together	12 362	13 613	12 895	13 912	13 102	14 528	13 659	13 501	12 727
2 Industry	CO_2	16 278	17 043	18 400	17 810	17 993	18 513	18 918	18 613	18 019
2 Industry	CH_4	14	15	17	17	18	16	25	56	69
2 Industry	N_2O	3 050	3 723	3 373	3 317	3 127	2 291	2 341	2 396	1 642
2 Industry	HFCs		131	287	346	481	515	523	508	508
2 Industry	PFHs		2 335	361	223	82	209	306	142	142
2 Industry	SF_6		2 153	79	77	66	48	33	25	25
2 Industry	all gases together	23 962	25 400	22 518	21 790	21 766	21 592	22 147	21 739	20 404
3 Energy	CO_2	23 021	22 456	23 083	21 852	23 150	24 492	23 970	23 847	22 854
3 Energy	CH_4	584	301	276	274	264	251	246	250	250
3 Energy	N_2O	189	189	201	195	193	205	196	113	98
3 Energy	SF_6		12	12	12	12	13	7	7	7
3 Energy	all gases together	23 806	22 958	23 573	22 333	23 619	24 961	24 418	24 217	23 209
4 Agriculture	CO_2	3 687	3 662	3 302	3 278	3 281	3 279	3 352	3 327	3 280
4 Agriculture	CH_4	4 904	5 004	4 758	4 654	4 503	4 347	4 269	4 209	4 161
4 Agriculture	N_2O	2 952	2 998	2 869	2 786	2 695	2 472	2 511	2 449	2 424
4 Agriculture	HFCs, PFHs, SF_6		0	0	0	0	0	0	0	0
4 Agriculture	all gases together	11 543	11 664	10 929	10 718	10 479	10 098	10 133	9 985	9 865
5 Transport	CO_2	11 899	13 291	14 658	14 731	14 880	14 860	15 018	15 072	15 074
5 Transport	CH_4	73	68	47	42	37	35	32	28	28
5 Transport	N_2O	236	337	458	468	477	476	485	489	489
5 Transport	HFCs		10	54	68	82	96	111	129	129
5 Transport	all gases together	12 218	13 706	15 216	15 308	15 477	15 467	15 646	15 718	15 719
6 Trade & services	CO_2	2 356	3 195	3 501	3 705	3 639	3 774	3 774	3 573	3 552
6 Trade & services	CH_4	1 641	1 528	1 171	991	882	781	693	615	546
6 Trade & services	N_2O	157	158	154	154	153	152	151	151	151
6 Trade & services	HFCs		19	86	113	132	161	174	179	179
6 Trade & services	PFHs		0	0	0	0	0	0	0	0
6 Trade & services	all gases together	4 173	4 900	4 912	4 964	4 806	4 869	4 793	4 518	4 427

7 Nature & gardens	CO_2	-1 375	-1 217	-1 111	-1 056	-1 056	-1 056	-1 056	-1 056	-1 056
7 Nature & gardens	CH_4	120	120	120	120	120	120	120	120	120
7 Nature & gardens	all gases together	-1 255	-1 098	-991	-936	-936	-936	-936	-936	-936
Flanders (total)	CO_2	67 631	71 461	74 250	73 753	74 528	77 920	77 169	76 434	74 009
Flanders (total)	CH_4	7 636	7 318	6 605	6 311	6 020	5 750	5 584	5 473	5 367
Flanders (total)	N_2O	6 783	7 605	7 234	7 102	6 823	5 781	5 870	5 784	4 987
Flanders (total)	HFCs		259	510	610	781	857	891	878	878
Flanders (total)	PFHs		2 335	361	223	82	209	307	142	142
Flanders (total)	SF_6		2 165	92	89	78	61	40	32	32
Flanders (total)	energy-related emissions	67 362	70 436	72 945	72 565	72 844	75 873	74 618	73 723	71 655
Flanders (total)	non-energy-related emissions	19 448	20 708	16 107	15 523	15 468	14 705	15 243	15 020	13 761
Flanders (total)	all gases together	86 810	91 143	89 052	88 088	88 313	90 579	89 860	88 742	85 415
Flanders (total to be taken into account for comparison against Kyoto target)**	all gases together	86 837	91 032	88 821	87 804	88 018	90 286	89 578	88 458	85 131

data for 1990-2005: database situation on 2 August 2007; data for 2006: database situation on 5 October 2007

* The figures for 2006 are provisional.

** The Kyoto target for Flanders (recalculated after the 'Initial Review' of the Belgian emissions inventory by the UNFCCC in May 2007) is 82 463 ktonnes CO_2-eq for the average annual emission of greenhouse gases in the period 2008-2012.

Remarks:

- 'All gases' refers to the basket of 6 greenhouse gases which are included in the Kyoto protocol: CO_2, CH_4, N_2O, HFCs, PFHs and SF_6.
- For HFCs, PFHs and SF_6 data are only available from 1995 onwards. For the totals for 'all gases together' the values of HFCs, PFHs and SF_6 for 1995 were maintained constant for 1990.
- For the conversion from tonnes to CO_2 equivalents, in this table the GWP values from the 'Second Assessment Report' of the IPCC from 1996 have been used, in accordance with the reporting requirements for the Climate Conference (UNFCCC): 1 for CO_2, 21 for CH_4, 310 for N_2O, 23 900 for SF_6 , 140 to 11 700 for the different HFCs, and 6 500 to 9 200 for the different PFHs.
- CO_2 emissions from waste incineration with generation of electricity are included in the Energy sector.
- A negative figure indicates a net uptake ('sink') instead of an emission.
- In accordance with the core set data relating to energy consumption and in line with the international reporting requirements (UNFCCC, NEC, EMEP, etc.), all greenhouse gas emissions from CHPs used in different sectors (often in cooperation with electricity companies) were assigned to sector 3 Energy.
- Greenhouse gas emissions resulting from the incineration of renewable fuels (biomass, biogas) were not included in the table due to their CO_2-neutral character: the same amount enters the air as that which was previously used during the generation of the plant material.
- The data sets differ in some places over the whole time series with respect to the data reported in MIRA-T 2006. The main reason for this is some adjustments which have taken place as a result of the 'Initial Review' by a UNFCCC team of experts in May 2007. In addition, there has been a validation of the then provisional data for 2005.

Table 6: Emissions into the air (Flanders 1990, 1995, 2000-2006)

sector	year	As [kg]	benzene [kg]	Cd [kg]	Co [kg]	CO [tonnes TOFP]	CO [tonnes]	Cr (total) [kg]	Cu [kg]	dioxins [mg]	H2S [tonnes]	Mn [kg]	monovinyl chloride [kg]	NH3 [million Aeq]	NH3 [tonnes]	Ni [kg]
1 Households	1990					4 977	45 242			9 085				200	3 399	
1 Households	1995	123		123		4 896	44 513	1 806	1 013	9 819				197	3 353	26 199
1 Households	2000	110		110		4 609	41 897	1 648	900	32 552				132	2 252	24 134
1 Households	2001	118		118		4 940	44 905	1 776	967	33 245				122	2 081	26 045
1 Households	2002	109		109		4 107	37 340	1 648	895	30 889				113	1 927	24 159
1 Households	2003	123		123		4 573	41 574	1 859	1 009	31 848				107	1 825	27 265
1 Households	2004	119		119		4 550	41 362	1 767	975	31 764				102	1 735	25 765
1 Households	2005	117		117		4 442	40 385	1 741	959	31 522				100	1 693	25 415
1 Households	2006	105		105		4 333	39 390	1 561	867	31 274				100	1 707	22 751
2 Industry	1990					21 996	199 968			202 315				104	1 770	
2 Industry	1995	2 635	31 859	2 734	3 569	23 193	210 845	6 062	8 828	201 115	117	2 732	33 596	60	1 020	38 818
2 Industry	2000	1 213	32 609	490	554	23 624	214 766	2 362	4 800	11 228	149	3 495	8 014	49	831	18 438
2 Industry	2001	1 432	29 312	401	637	17 650	160 457	2 429	3 455	8 293	143	1 063	6 094	44	744	22 343
2 Industry	2002	1 294	37 256	541	525	21 225	192 955	2 037	4 288	7 446	138	4 589	7 810	45	757	20 613
2 Industry	2003	979	32 949	452	462	20 841	189 463	1 477	3 443	6 556	119	2 528	4 992	41	698	18 216
2 Industry	2004	1 050	94 768	719	2 207	24 650	224 092	1 258	3 174	7 008	301	1 435	11 064	50	849	16 316
2 Industry	2005	1 042	37 904	516	526	24 060	218 723	1 464	4 064	9 936	25	1 174	9 000	35	598	16 063
2 Industry	2006	1 232	31 262	546	716	23 923	217 485	1 631	3 351	6 551	16	1 253	8 226	38	643	15 304
3 Energy	1990					1 625	14 771			1 600				2	39	
3 Energy	1995	327	66 704	18	371	2 075	18 865	1 172	441	1 640	51	1 073	0	0	0	14 451
3 Energy	2000	137	49 944	21	335	864	7 852	978	391	1 090	43	1 042	0	0	1	16 895
3 Energy	2001	84	49 833	22	333	821	7 464	875	351	1 720	43	858	0	0	1	19 582
3 Energy	2002	78	58 368	55	281	2 907	26 423	924	373	1 208	38	934	0	0	1	16 384
3 Energy	2003	74	41 198	62	348	1 062	9 658	996	373	497	41	754	0	0	1	21 202
3 Energy	2004	90	28 647	66	296	696	6 330	594	347	346	41	810	0	0	1	18 833
3 Energy	2005	78	23 709	18	254	824	7 487	531	398	250	42	809	0	0	2	11 590
3 Energy	2006	67	21 889	21	164	915	8 314	337	218	40	24	333	0	0	1	11 341
4 Agriculture	1990					545	4 955							5 451	92 667	
4 Agriculture	1995	27		2		475	4 315	298	174					5 179	88 041	5 698
4 Agriculture	2000	19		2		473	4 303	210	125					3 480	59 159	3 978
4 Agriculture	2001	19		2		464	4 222	210	124					3 305	56 185	3 959
4 Agriculture	2002	19	0	2	0	474	4 310	208	123		0	0	0	3 199	54 392	3 927
4 Agriculture	2003	19	0	2	0	494	4 494	206	122		0	0	0	3 052	51 880	3 880
4 Agriculture	2004	19	0	2	0	509	4 624	204	121		0	0	0	2 648	45 025	3 839
4 Agriculture	2005	19	0	2	0	491	4 459	203	121		0	0	0	2 587	43 977	3 825
4 Agriculture	2006	19		2		487	4 431	203	121					2 547	43 295	3 829

sector	year	NMVOC: total org. substances [tonnes TOFP]	NMVOC: total org. substances [tonnes]	NOx [million Aeq]	NOx [tonnes TOFP]	NOx [tonnes]	PAHs [kg]	Pb [kg]	SOx as SO2 [million Aeq]	SOx as SO2 [tonnes]	particles (PM10) [tonnes]	particles (PM2.5) [tonnes]	particles (total) [tonnes]	V [kg]	Zn [tonnes]
1 Households	1990	15 978	15 978	206	11 538	9 457	65 891		460	14 728					
1 Households	1995	15 662	15 662	228	12 794	10 487	74 924	2 526	412	13 188	1 915	1 815	2 149		2.58
1 Households	2000	15 526	15 526	216	12 105	9 922	83 175	2 125	348	11 147	1 906	1 836	2 086		2.06
1 Households	2001	15 923	15 923	234	13 115	10 750	88 763	2 265	372	11 902	1 948	1 876	2 131		2.17
1 Households	2002	15 265	15 265	219	12 270	10 057	68 296	2 102	350	11 202	1 785	1 720	1 962		1.96
1 Households	2003	15 428	15 428	242	13 608	11 154	75 605	2 366	394	12 618	1 897	1 825	2 085		2.20
1 Households	2004	15 475	15 475	227	12 762	10 461	74 706	2 362	390	12 477	1 887	1 804	2 098		2.30
1 Households	2005	15 756	15 756	225	12 636	10 357	72 797	2 313	383	12 241	1 880	1 800	2 085		2.24
1 Households	2006	15 602	15 602	214	12 008	9 843	71 472	2 123	348	11 137	1 803	1 725	2 006		2.12
2 Industry	1990	87 984	87 984	549	30 792	25 240	194 043		2 530	80 963					
2 Industry	1995	72 104	72 104	708	39 745	32 578	43 448	53 032	1 756	56 191	10 798	9 122	12 717	134 778	56.78
2 Industry	2000	55 668	55 668	597	33 489	27 450	21 315	49 461	1 227	39 253	5 516	4 650	6 837	59 409	48.12
2 Industry	2001	55 466	55 466	591	33 172	27 190	18 474	26 145	1 259	40 294	5 178	4 356	6 551	73 628	42.30
2 Industry	2002	52 629	52 629	625	35 084	28 757	29 430	37 528	1 175	37 587	5 332	4 497	6 706	66 588	41.55
2 Industry	2003	48 582	48 582	552	30 966	25 382	33 704	32 807	981	31 395	5 644	4 787	7 077	60 315	37.69
2 Industry	2004	44 742	44 742	580	32 562	26 690	21 459	43 501	1 083	34 644	5 681	4 719	7 084	54 040	56.24
2 Industry	2005	45 247	45 247	584	32 781	26 869	30 086	41 153	1 001	32 017	5 004	4 062	6 369	49 391	31.75
2 Industry	2006	44 586	44 586	544	30 520	25 016	29 543	44 232	947	30 312	5 184	4 251	6 610	48 170	27.22
3 Energy	1990	18 394	18 394	1 238	69 462	56 936	820		3 603	115 304					
3 Energy	1995	17 369	17 369	1 076	60 382	49 493	857	664	3 026	96 831	3 049	1 735	4 673	33 973	1.80
3 Energy	2000	15 256	15 256	829	46 541	38 148	644	724	1 702	54 452	2 621	1 571	3 902	36 185	2.32
3 Energy	2001	14 713	14 713	738	41 443	33 969	662	626	1 552	49 680	2 047	1 336	3 081	41 544	1.99
3 Energy	2002	13 913	13 913	597	33 485	27 446	1 281	335	1 426	45 627	2 033	1 253	3 052	39 246	1.25
3 Energy	2003	13 228	13 228	673	37 779	30 966	1 296	412	1 500	47 992	2 697	1 599	3 973	50 408	1.27
3 Energy	2004	11 650	11 650	683	38 346	31 431	1 169	429	1 644	52 612	2 815	1 581	4 295	41 686	1.12
3 Energy	2005	9 779	9 779	660	37 020	30 345	777	467	1 421	45 467	1 686	1 034	2 718	25 160	1.26
3 Energy	2006	8 173	8 173	585	32 815	26 897	491	338	1 386	44 353	1 382	908	2 171	28 601	0.93
4 Agriculture	1990	1 839	1 839	599	33 596	27 537	748		905	28 973					
4 Agriculture	1995	1 474	1 474	577	32 406	26 562	728	499	291	9 303	7 877	3 275	18 785		0.39
4 Agriculture	2000	1 614	1 614	552	30 978	25 392	566	376	198	6 349	7 845	3 153	19 031		0.31
4 Agriculture	2001	1 592	1 592	531	29 809	24 434	559	375	198	6 321	7 613	3 047	18 588		0.31
4 Agriculture	2002	1 641	1 641	520	29 176	23 914	557	373	197	6 312	7 588	3 038	18 572	0	0.31
4 Agriculture	2003	1 696	1 696	512	28 716	23 538	556	370	197	6 310	7 457	3 028	18 288	0	0.31
4 Agriculture	2004	1 743	1 743	515	28 897	23 686	555	368	197	6 305	7 571	3 074	18 539	0	0.31
4 Agriculture	2005	1 695	1 695	505	28 362	23 248	554	367	196	6 282	7 478	3 004	18 453	0	0.30
4 Agriculture	2006	1 656	1 656	498	27 970	22 926	547	367	196	6 278	7 435	2 973	18 438		0.31

5 Transport	1990					44 959	408 714			682				5	91		57 282	57 282	2 502	140 388	115 072	19 884		328	10 495					
5 Transport	1995		1 790 977	41		33 765	306 958	207	7 051	476				39	666	290	45 198	45 198	2 362	132 549	108 647	27 092	54 621	370	11 831	8 447	7 613	22 496		4.15
5 Transport	2000		942 618	45		21 990	199 913	227	7 706	249				68	1 161	317	27 218	27 218	2 198	123 366	101 120	61 124	5 606	103	3 310	6 537	5 587	22 690		4.53
5 Transport	2001		827 520	45		20 035	182 135	227	7 730	221				69	1 177	318	24 586	24 586	2 135	119 813	98 207	66 993	5 327	105	3 364	6 110	5 155	22 377		4.55
5 Transport	2002		693 214	46		17 956	163 236	230	7 803	201				70	1 187	321	21 542	21 542	2 069	116 089	95 155	72 358	5 104	106	3 379	5 748	4 788	22 179		4.59
5 Transport	2003		693 198	46		17 280	157 093	230	7 804	198				69	1 166	321	21 504	21 504	2 016	113 161	92 755	74 615	4 979	56	1 781	5 493	4 534	21 914		4.59
5 Transport	2004		529 665	46		15 846	144 054	232	7 889	183				68	1 162	325	18 798	18 798	1 961	110 029	90 188	79 375	4 752	57	1 812	5 327	4 358	21 951		4.64
5 Transport	2005		458 705	46		14 085	128 043	232	7 882	169				66	1 129	325	17 374	17 374	1 888	105 942	86 837	82 921	4 445	57	1 822	5 147	4 179	21 816		4.64
5 Transport	2006		458 705	46		14 088	128 072	232	7 882	160				66	1 129	325	17 369	17 369	1 889	106 023	86 904	85 783	4 445	58	1 846	5 149	4 181	21 822		4.64
6 Trade & services	1990					134	1 221			256 572				0	0		5 308	5 308	68	3 824	3 134	366		93	2 982					
6 Trade & services	1995	66	217 660	294	9	105	952	840	1 172	130 750	0	278	0	0	0	5 549	4 331	4 331	100	5 623	4 609	534	12 531	81	2 598	759	599	959	0	0.17
6 Trade & services	2000	201	29 709	109	132	83	758	496	327	13 897	0	131	0	1	15	5 718	3 445	3 445	113	6 355	5 209	581	704	82	2 623	159	150	175	142	0.17
6 Trade & services	2001	198	31 424	25	130	95	860	415	280	14 756	0	344	0	0	1	5 676	3 191	3 191	126	7 054	5 782	585	528	82	2 627	169	158	188	88	0.21
6 Trade & services	2002	96	20 024	25	44	88	804	344	207	4 079	0	54	0	0	0	5 720	2 810	2 810	130	7 280	5 967	604	454	90	2 872	203	186	228	246	0.18
6 Trade & services	2003	164	18 890	8	64	88	797	392	222	4 443	0	59	0	0	0	5 283	2 500	2 500	118	6 630	5 435	561	459	79	2 541	165	151	188	145	0.16
6 Trade & services	2004	145	17 409	58	108	103	937	534	251	3 901	0	127	0	2	28	4 340	1 906	1 906	128	7 158	5 868	469	519	68	2 186	131	120	153	119	0.23
6 Trade & services	2005	264	12 702	42	99	93	848	575	228	3 892	0	103	0	0	1	4 267	1 656	1 656	117	6 582	5 395	386	449	63	2 021	101	94	117	99	0.15
6 Trade & services	2006	95	9 928	46	80	91	829	457	184	3 830	0	80	0	0	2	3 741	1 545	1 545	102	5 723	4 691	381	372	56	1 788	97	91	112	80	0.11
X Nature & gardens	1990																13 108	13 108												
X Nature & gardens	1995																14 440	14 440												
X Nature & gardens	2000																12 493	12 493												
X Nature & gardens	2001																12 893	12 893												
X Nature & gardens	2002																12 750	12 750												
X Nature & gardens	2003																14 563	14 563												
X Nature & gardens	2004																12 430	12 430												
X Nature & gardens	2005																13 048	13 048												
X Nature & gardens	2006																13 048	13 048												
Flanders (total)	1990					74 236	674 871			470 254				5 762	97 965		199 894	199 894	5 161	289 600	237 377	281 751		7 920	253 445					
Flanders (total)	1995	3 178	2 107 200	3 213	3 949	64 509	586 449	10 385	18 679	343 800	168	4 083	33 596	5 475	93 081	91 006	170 578	170 578	5 052	283 499	232 376	147 582	123 873	5 936	189 941	32 843	24 159	61 780	168 752	65.86
Flanders (total)	2000	1 681	1 054 881	777	1 022	51 644	469 488	5 920	14 249	59 017	192	4 668	8 014	3 730	63 419	69 480	131 220	131 220	4 505	252 833	207 241	167 406	58 996	3 660	117 134	24 583	16 948	54 720	95 736	57.51
Flanders (total)	2001	1 851	938 089	613	1 100	44 005	400 043	5 931	12 907	58 235	186	2 264	6 094	3 540	60 189	77 923	128 363	128 363	4 355	244 406	200 333	176 037	35 265	3 568	114 187	23 065	15 928	52 915	115 260	51.52
Flanders (total)	2002	1 597	808 862	778	851	46 757	425 068	5 390	13 689	43 823	176	5 578	7 810	3 427	58 265	71 124	120 549	120 549	4 159	233 383	191 298	172 526	45 897	3 343	106 978	22 689	15 481	52 698	106 079	49.84
Flanders (total)	2003	1 360	786 234	692	874	44 339	403 079	5 159	12 974	43 543	160	3 341	4 992	3 269	55 570	76 166	117 501	117 501	4 114	230 859	189 229	186 338	41 394	3 207	102 636	23 353	15 924	53 526	110 867	46.21
Flanders (total)	2004	1 423	670 489	1 010	2 611	46 354	421 400	4 588	12 757	43 202	342	2 372	11 064	2 870	48 800	69 418	106 743	106 743	4 094	229 755	188 324	177 729	51 932	3 439	110 035	23 413	15 657	54 120	95 845	64.83
Flanders (total)	2005	1 520	533 020	742	879	43 994	399 946	4 745	13 651	45 769	67	2 086	9 000	2 788	47 400	61 484	104 555	104 555	3 980	223 322	183 051	187 521	49 194	3 120	99 851	21 296	14 174	51 558	74 650	40.34
Flanders (total)	2006	1 517	521 784	766	961	43 837	398 522	4 422	12 622	41 855	40	1 667	8 226	2 751	46 777	57 290	101 979	101 979	3 832	215 059	176 278	188 217	51 877	2 991	95 714	21 052	14 128	51 159	76 851	35.32

data for 1990-2005: database situation on 2 August 2007; data for 2006: database situation on 5 October 2007

Remarks:

1) Emissions of acidifying substances were converted to Aeq (acid equivalents) using the following conversion factors:
   SO_2: 0.03125 - NO_x (expressed as NO_2): 0.02174 - NH_3: 0.05882
   With these, grams are converted to Aeq: 1 tonne SO_2 corresponds to 0.03125 x 10^6 Aeq or 31.25 x 10^3 Aeq.
2) Emissions of ozone precursors were converted to TOFPs (tropospheric ozone forming potentials) using the following conversion factors: NMVOC: 1 - NO_x (expressed as NO_2): 1.22 - CH_4: 0.014 - CO: 0.11
   With these, tonnes are converted to TOFPs: 1 tonne NO_x corresponds to a TOFP of 1.22 tonnes.
3) For details of emissions of ozone-depleting substances and greenhouse gases we refer to respectively tables 4 and 5.
4) The figures for 2006 are provisional figures.

Source: VMM, VITO

Table 7a: Primary waste production in tonnes (Flanders, 1992, 1995, 2000-2006 for household waste and 1992, 1995, 2000-2005 for industrial waste)

sector	year	separately collected waste	residual waste	total
1 Households (household waste)	1992	539 887	1 912 283	2 452 170
1 Households (household waste)	1995	977 161	1 911 250	2 888 412
1 Households (household waste)	2000	2 192 472	1 138 385	3 330 857
1 Households (household waste)	2001	2 256 434	1 076 895	3 333 328
1 Households (household waste)	2002	2 315 599	1 014 359	3 329 957
1 Households (household waste)	2003	2 255 236	960 585	3 215 821
1 Households (household waste)	2004	2 389 647	959 632	3 349 279
1 Households (household waste)	2005	2 360 496	976 581	3 337 077
1 Households (household waste)	2006	2 309 724	939 171	3 248 895
2 Industry (industrial waste)	1992			10 734 174
2 Industry (industrial waste)	1995			11 060 622
2 Industry (industrial waste)	2000*			14 003 950
2 Industry (industrial waste)	2001*			12 809 891
2 Industry (industrial waste)	2002*			12 505 650
2 Industry (industrial waste)	2003*			15 347 792
2 Industry (industrial waste)	2004*			15 308 322
2 Industry (industrial waste)	2005*			18 149 477
3 Energy (industrial waste)	1992			1 078 465
3 Energy (industrial waste)	1995			880 706
3 Energy (industrial waste)	2000*			1 228 736
3 Energy (industrial waste)	2001*			1 205 871
3 Energy (industrial waste)	2002*			603 700
3 Energy (industrial waste)	2003*			584 371
3 Energy (industrial waste)	2004*			991 159
3 Energy (industrial waste)	2005*			1 388 864
4 Agriculture (industrial waste)	2000*			482 716
4 Agriculture (industrial waste)	2001*			331 476
4 Agriculture (industrial waste)	2002*			207 590
4 Agriculture (industrial waste)	2003*			398 634
4 Agriculture (industrial waste)	2004*			140 520
4 Agriculture (industrial waste)	2005*			247 410
6 Trade & services, excl. waste processing companies (industrial waste)	1992			2 174 660
6 Trade & services, excl. waste processing companies (industrial waste)	1995			2 876 241
6 Trade & services, excl. waste processing companies (industrial waste)	2000*			5 724 851
6 Trade & services, excl. waste processing companies (industrial waste)	2001*			6 395 931

6 Trade & services, excl. waste processing companies (industrial waste)	2002*	5 619 230
6 Trade & services, excl. waste processing companies (industrial waste)	2003*	5 701 638
6 Trade & services, excl. waste processing companies (industrial waste)	2004*	5 964 351
6 Trade & services, excl. waste processing companies (industrial waste)	2005*	6 661 408
X Other (industrial waste)	2000*	12 285
X Other (industrial waste)	2001*	30 645
X Other (industrial waste)	2002*	27 702
X Other (industrial waste)	2003*	11 078
X Other (industrial waste)	2004*	17 128
X Other (industrial waste)	2005*	10 602
Flanders (total primary waste)	1992	16 439 469
Flanders (total primary waste)	1995	17 705 981
Flanders (total primary waste)	2000*	24 783 395
Flanders (total primary waste)	2001*	24 107 143
Flanders (total primary waste)	2002*	22 293 830
Flanders (total primary waste)	2003*	25 259 334
Flanders (total primary waste)	2004*	25 770 760
Flanders (total primary waste)	2005*	29 794 838

data for household waste: database situation on 1 October 2007, data for industrial waste: database situation on 27 September 2007
* From the year 2000 onwards, the industrial waste production of a number of new subsectors was estimated. An increase in the waste production of the different sectors and in the total industrial waste is hence partly the result of this new approach.

Source: OVAM

Table 7b: Secondary waste production in tonnes (Flanders, 1992, 1995, 2000-2005)

sector	year	total
Waste processing companies	1992	3 288 902
Waste processing companies	1995	6 263 475
Waste processing companies	2000	8 187 163
Waste processing companies	2001	8 429 966
Waste processing companies	2002	8 055 873
Waste processing companies	2003	8 187 749
Waste processing companies	2004	7 649 960
Waste processing companies	2005	9 341 856

database situation on 27 September 2007

Source: OVAM

Table 8: Discharges of industrial waste water (Flanders, 1992, 1995, 2000, 2003-2006)

sector	year	BOD [tonnes O_2]	COD [tonnes O_2]	particulate matter [tonnes]	N [tonnes]	P [tonnes]	As [kg]	Cd [kg]	Cr [kg]	Cu [kg]	Hg [kg]	Ni [kg]	Pb [kg]	Zn [kg]	volume (1000 m^3)
2 Industry	1992	31 132	97 373	157 855	7 197	1 850	1 878	887	40 771	14 256	1 740	30 586	17 383	81 848	232 149
2 Industry	1995	20 098	63 089	12 446	4 713	929	1 260	658	5 105	9 203	63	9 517	5 581	40 493	233 878
2 Industry	2000	15 818	49 931	7 856	3 964	679	1 066	231	3 784	5 151	33	5 876	1 431	26 504	223 151
2 Industry	2003	10 543	40 003	6 932	3 323	520	736	270	1 605	3 405	19	4 763	1 689	21 408	202 609
2 Industry	2004	10 856	38 938	6 397	3 032	440	1 198	201	1 745	2 986	10	4 041	2 211	16 197	206 170
2 Industry	2005	9 773	33 869	5 324	2 700	385	702	253	1 490	2 840	19	3 992	3 446	17 710	210 365
2 Industry	2006	10 759	36 128	6 270	2 766	398	966	142	1 433	2 705	14	4 171	1 707	18 034	213 232
3 Energy	1992	183	1 621	657	404	19	148	22	508	65	6	168	164	2 103	28 208
3 Energy	1995	147	1 146	349	185	13	30	119	151	106	0	196	126	1 693	18 422
3 Energy	2000	169	1 398	453	285	10	43	1	25	75	1	86	355	1 208	22 273
3 Energy	2003	130	1 059	356	239	9	43	2	133	50	2	141	20	871	19 041
3 Energy	2004	143	1 241	595	249	12	36	2	21	67	3	100	46	1 060	20 591
3 Energy	2005	154	1 135	451	274	10	39	4	23	90	1	59	35	1 054	22 492
3 Energy	2006	169	1 401	459	235	10	41	14	39	81	2	113	46	1 048	22 131
4 Agriculture	1992	12	35	32	60	6	0	0	0	11	0	0	0	14	290
4 Agriculture	1995	21	50	18	4	1	0	0	0	8	0	0	3	31	200
4 Agriculture	2000	5	22	10	6	1	0	0	0	4	0	0	0	22	145
4 Agriculture	2003	1	4	1	1	0	0	0	0	1	0	0	0	2	41
4 Agriculture	2004	0	2	0	1	0	0	0	0	1	0	0	0	1	31
4 Agriculture	2005	0	2	0	1	0	0	0	0	1	0	0	0	1	31
4 Agriculture	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 Trade & services	1992	1 344	6 318	1 798	340	81	719	115	242	492	65	1 307	492	8 197	13 872
6 Trade & services	1995	1 845	4 586	915	385	57	16	45	192	503	12	197	311	2 587	8 967
6 Trade & services	2000	1 996	5 138	1 233	450	73	38	38	212	540	12	249	187	3 827	11 523
6 Trade & services	2003	1 479	4 082	922	387	53	23	122	94	425	6	350	118	2 191	12 110
6 Trade & services	2004	1 672	4 365	888	388	51	47	30	88	434	4	453	142	2 162	12 980
6 Trade & services	2005	1 665	4 319	935	357	51	18	83	100	524	5	341	149	2 484	13 494
6 Trade & services	2006	1 650	4 539	1 312	380	62	46	25	117	525	5	767	148	2 855	10 300

database situation on 1 July 2007
Remark: the data in this tab are trend figures for the sectors Industry, Energy, Agriculture and Trade & services. These figures only apply to companies from those 4 sectors sampled by VMM itself, without taking into account possible treatment in a public waste water treatment plant. As especially very big 'dischargers' are sampled by VMM, we can expect for the sectors Industry and Energy that these emissions will encompass the most part of the waste loads of all sectors. For Trade & services this is not the case, as only a small percentage of this sector is sampled. For Agriculture the emissions listed here are even less representative for the whole sector because only a few companies from that sector were sampled.

Source: VMM

Tabel 9: Pressure on surface water from households (Flanders, 1990, 1995, 2000-2006)

sector	discharge situation	year	BOD [tonnes O_2]	COD [tonnes O_2]	particulate matter [tonnes]	N [tonnes]	P [tonnes]
1 Households	directly into surface water	1900	8 359	19 579	7 260	3 414	493
1 Households	directly into surface water	1995	7 735	18 115	6 717	3 159	456
1 Households	directly into surface water	2000	6 330	14 824	5 497	2 585	373
1 Households	directly into surface water	2001	5 972	13 988	5 186	2 439	352
1 Households	directly into surface water	2002	5 760	13 490	5 002	2 352	340
1 Households	directly into surface water	2003	5 675	13 290	4 928	2 318	335
1 Households	directly into surface water	2004	5 628	13 181	4 887	2 299	332
1 Households	directly into surface water	2005	5 588	13 087	4 853	2 282	329
1 Households	directly into surface water	2006	5 500	12 881	4 776	2 246	324
1 Households	indirectly into surface water *	1990	39 966	93 605	34 707	10 202	1 472
1 Households	indirectly into surface water *	1995	37 028	86 724	32 156	9 452	1 364
1 Households	indirectly into surface water *	2000	28 553	66 874	24 796	7 289	1 052
1 Households	indirectly into surface water *	2001	25 335	59 337	22 001	6 467	933
1 Households	indirectly into surface water *	2002	23 502	55 043	20 409	5 999	866
1 Households	indirectly into surface water *	2003	22 227	52 058	19 302	5 674	819
1 Households	indirectly into surface water *	2004	21 512	50 384	18 682	5 491	793
1 Households	indirectly into surface water *	2005	20 619	48 291	17 906	5 263	760
1 Households	indirectly into surface water *	2006	18 974	44 440	16 478	4 843	699
1 Households	via waste water treatment plant	1990	2 259	10 126	2 298	4 202	375
1 Households	via waste water treatment plant	1995	2 266	10 838	1 982	3 978	391
1 Households	via waste water treatment plant	2000	2 116	15 437	2 690	5 334	340
1 Households	via waste water treatment plant	2001	2 191	17 292	2 980	5 330	395
1 Households	via waste water treatment plant	2002	1 986	16 375	2 744	5 096	414
1 Households	via waste water treatment plant	2003	1 705	14 830	2 671	4 420	407
1 Households	via waste water treatment plant	2004	1 325	14 556	2 563	3 760	389
1 Households	via waste water treatment plant	2005	1 395	15 099	2 546	3 582	413
1 Households	via waste water treatment plant	2006	1 491	14 543	2 644	3 395	304
1 Households	total	1990	50 584	123 309	44 265	17 818	2 340
1 Households	total	1995	47 029	115 678	40 855	16 589	2 211
1 Households	total	1998	38 988	100 236	34 582	15 429	2 018
1 Households	total	1999	38 003	97 990	33 862	15 173	1 813
1 Households	total	2000	36 999	97 136	32 983	15 208	1 765
1 Households	total	2001	33 498	90 617	30 168	14 236	1 681
1 Households	total	2002	31 247	84 909	28 156	13 448	1 620
1 Households	total	2003	29 607	80 179	26 901	12 411	1 560
1 Households	total	2004	28 466	78 122	26 132	11 550	1 513
1 Households	total	2005	27 602	76 477	25 304	11 127	1 502
1 Households	total	2006	25 965	71 863	23 898	10 484	1 327

database situation on 1 July 2007
* via a sewer which is not connected to a waste water treatment plant or via an overflow

Source: VMM

Table 10: Diffuse discharges into the surface water from agriculture (Flanders, 1990, 1995, 2000-2006)

sector	year	N [tonnes]	P [tonnes]
4 Agriculture	1990	23 489	1 421
4 Agriculture	1995	24 417	1 481
4 Agriculture	2000	23 152	1 515
4 Agriculture	2001	24 592	1 468
4 Agriculture	2002	24 063	1 439
4 Agriculture	2003	16 550	1 298
4 Agriculture	2004	18 293	1 338
4 Agriculture	2005*	17 370	1 316
4 Agriculture	2006*	18 565	1 292

database situation on 1 July 2007
* 2004 data for artificial fertiliser
Remarks:
These discharges only refer to diffuse discharges of N and P from agriculture. Direct discharges - insofar as it concerns companies sampled by VMM - are mentioned in table 8.
– Sanitary discharges from the agricultural sector are not included here either. These are included in the sector Households in table 9.

Source: VMM

Abbreviations

ACEA: Association des Constructeurs Européens d'Automobiles

Aeq: acidification equivalent

AMINABEL: General Environment and Nature Policy division

ANB: Agency for Nature and Forest

AOT40ppb: accumulated exposure over threshold (40 ppb)

ATF: Acoustics and Thermal Physics Department

B(a)P: benzo(a)pyrene

BBI: Belgian Biotic Index

Beama: Belgian Association of Asset Managers

BIAC: Brussels International Airport Company

BMI: Body Mass Index

BMM: Management Unit of the Mathematic Model of the North Sea

BOD: biochemical oxygen demand

BS: Belgian Official Journal

CDO: Centre for Sustainable Development

CFC: chlorofluorocarbon

CHP: combined heat and power (cogeneration)

CHPC: combined heat and power certificate

CPTE: Coordination of Production and Transport of Electric Power (cooperative)

COD: chemical oxygen demand

DAB: digital audio broadcasting

DALY: disability adjusted life year

DDE: dichlorodiphenyldichloroethylene

DDT: dichlorodiphenyltrichloroethane

DIV: Vehicle Registration Service

DSS: descriptive soil survey

DVB-T: digital video broadcasting – terrestrial

EC: European Commission

EEA: European Environment Agency

Eeq: eutrophication equivalent

ESS: exploratory soil survey

EU: European Union

EWI: Economy, Science and Innovation Department

FM: frequency modulation

FOD: Federal Public Service

FOD Economie: Federal Public Service for Economy

FOD MV: Federal Public Service for Mobility and Transport

GBO: area with odour nuisance

GDEC: Gross Domestic Energy Consumption

GDP: Gross Domestic Product

GEC: green energy certificate

GMO: genetically modified organism

HCB: hexachlorobenzene

HF: hidden flows

HFC: hydrofluorocarbon

ICES: International Council for the Exploration of the Sea

ILVO: Research Institute for Agriculture and Fisheries

INBO: Research Institute for Nature and Forest

INTEC: Information Technology Department

IPCC: Intergovernmental Panel on Climate Change

IRCEL: Belgian Interregional Centre for Air Quality

IVON: Integral Connective and Supporting Network

K.U.Leuven: Catholic University of Leuven

KMI: National Meteorological Institute

LNE: Environment, Nature and Energy Department

LTT: long-term target

MAC: maximum admissible concentration

MAP: manure action plan

MINA plan: Flemish Environmental Policy Plan

MIRA: Flanders Environment Report

MOW: Mobility and Public Works Department

MTT: medium-term target

NARA: Nature Report

NBB: National Bank of Belgium

NEC: national emission ceilings

NET60ppb: number of exceedances of the 60 ppb threshold

NFA: naturally floodable areas

NGI: National Geographical Institute

NIRAS: Belgian Agency for Radioactive Waste and Enriched Fissile Materials

NIS: National Statistics Institute

NMBS: Belgian National Railway Company

NMVOC: non-methane volatile organic compounds

NVBG: nature connecting area

NVWG: connected natural area

OU_E: European odour units

OVAM: Public Waste Agency of Flanders

PAH: polyaromatic hydrocarbon

PBV: Promotion Office for Inland Navigation in Flanders

PCB: polychlorinated biphenyl

PFH: perfluorinated hydrocarbon

PM: particulate matter

POCER: pesticide occupational and environmental risk indicator

PSML: Permanent Service for Mean Sea Level

PV: photovoltaic

RFA: recently flooded area

RI: Risk Index

RLR: Revised Local Reference

RSV: Regional Land Use Plan for Flanders

RWO: Land Use, Housing and Immovable Heritage Department

RWZI: waste water treatment plant

Seq: spread equivalent

SERV: Flanders Social and Economic Council

SLO: Written Environmental Investigation

SRP: soil remediation project

SRW: soil remediation works

STEG: steam and gas turbine or gas turbine with combined cycle

SVR: Research Department of the Flemish Government

TAW: Tweede Algemene Waterpassing (reference sea level for altitude measurements in Belgium)

Teq: toxicity equivalent

TOFP: tropospheric ozone forming potential

UA: University of Antwerp

UGent: University of Ghent

UNSCEAR: United Nations Scientific Committee on the Effects of Atomic Radiation

VEA: Flemish Energy Agency

VEN: Flemish Ecological Network

VHBP: Flemish Human Biomonitoring Programme

VITO: Flemish Institute for Technological Research

Vlaco: Flemish Compost Organisation

VMM: Flemish Environment Agency

VOC: volatile organic compounds

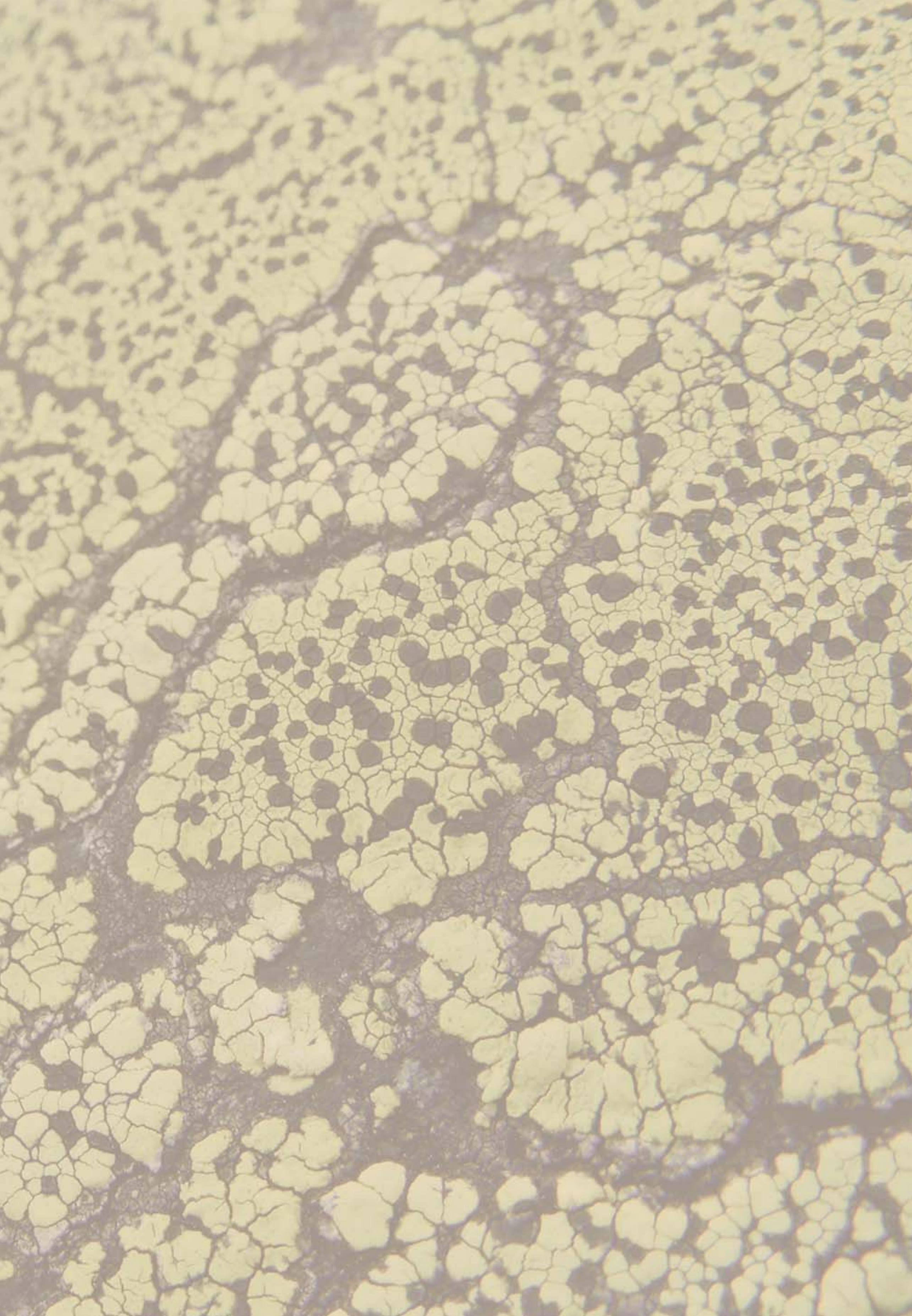
VRT: Flemish radio and television broadcasting company

VUB: Free University of Brussels

WFD: Water Framework Directive

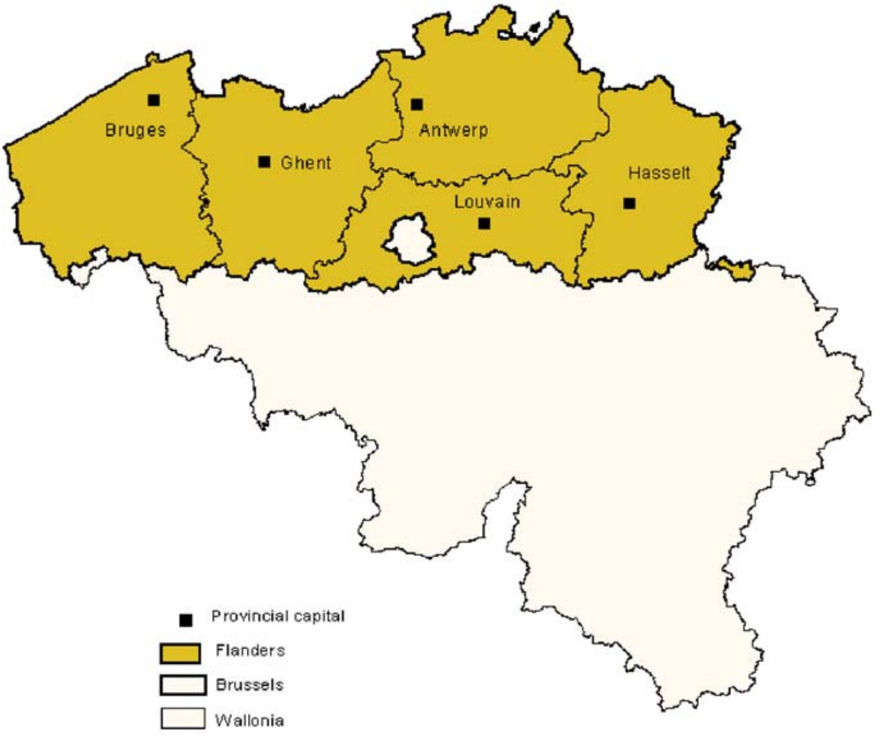
WLH: Hydraulic Research Laboratory and Hydrological Research Division

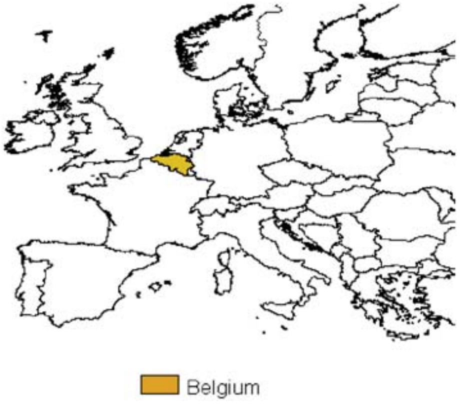
WMO: World Meteorological Organisation



File on Flanders

Flanders, the heart of Europe





Flanders is one of the three Belgian regions with its own government, parliament and administration. The other two are the Brussels-Capital Region and the Walloon Region. Comprised of the Dutch-speaking part of the country, the Flemish Region has the largest population of the three (58 %). As a result of various state structure reforms over the last 35 years, Belgium has been transformed into a federal state, giving the regions more and more responsibilities. Apart from the environment (the subject of this pocket edition), the Flemish government is also competent in other matters, such as the economy, employment, education and culture, agriculture, foreign trade, land planning, urban development, housing, public works ...

	Flanders	Belgium	EU-27
total population (1-1-2007)	6 117 440	10 584 534	495 072 299
surface area	13 522 km²	30 528 km²	4 325 900 km²
capital	Brussels	Brussels	Brussels
highest point	Voeren (288 m)	Botrange (694 m)	Mont Blanc (4 808 m)
population density	452 inhabitants/km²	347 inhabitants/km²	113 inhabitants/km²
population growth (1997-2007)	3.7 %	4.1 %	1.9 %
share of population aged 65 or over in 2006	17.8 %	17.2 %	16.5 % (EU-25, 2004)
share of population aged 15 or under in 2006	16.4 %	17.1 %	16.4 % (EU-25, 2004)
gross domestic product (GDP) (2005)	170.3 billion euros	298.0 billion euros	10 938 billion euros
GDP per inhabitant (2005)	26 483 euros	26 748 euros	21 544 euros
average annual real growth GDP during 1997-2006	2.3 %	2.3 %	2.4 % (EU-25)
employment rate (a) (2006)	65.0 %	61.0 %	64.4 %
unemployment rate (b) (2006)	5.0 %	8.3 %	8.3 %
number of traffic deaths per 100 000 inhabitants (2005)	9.4	10.4	9.3
life expectancy (at birth) (2005)			
men	77.6 year (2004)	75.8 year	73.6 year
women	82.9 year (2004)	81.9 year	80.2 year
share of electricity from CHP (%) (2006)	14	8.4 (2004)	10.2 (EU-25, 2004)
share of electricity from renewable sources (%) (2006)	2.4	2.1 (2004)	15.3 (2004)

(a) number of employed in % of the population at a working age (15-64 years)
(b) number of unemployed in % of the population at a working age (15-64 years)

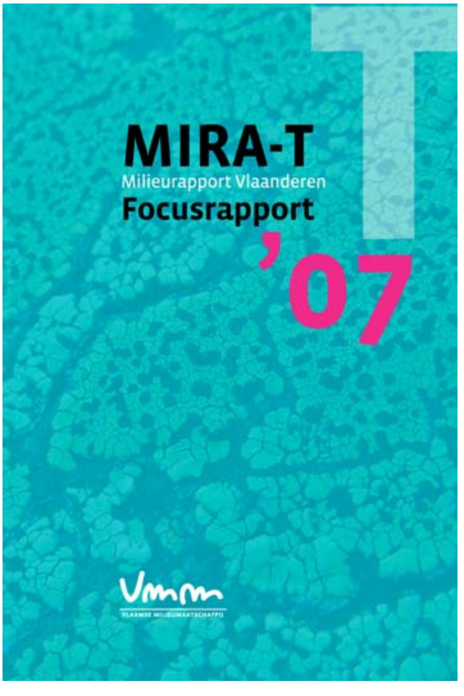
Source: APS, Eurostat Yearbook 2006-2007, FOD Economie (Statistics Division), EEA, FGOV

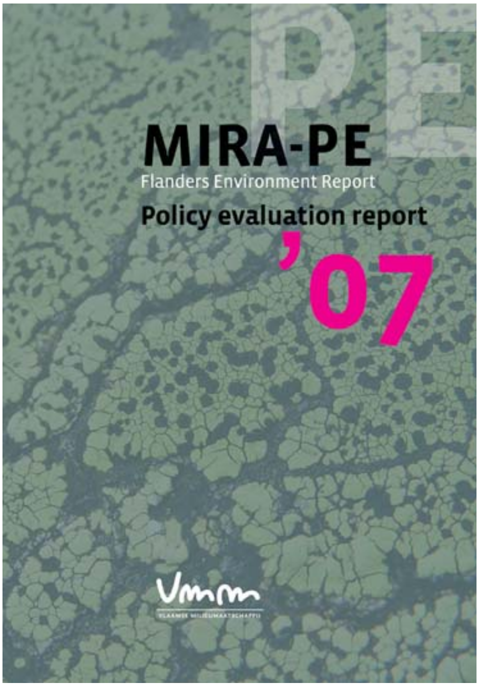
MIRA reports in 2007

Besides this MIRA-T 2007 Indicator Report, the Flemish Environment Agency has also published two other environmental reports.

MIRA-T 2007 Focus Report
(only in Dutch)
A critical analysis of 11 topical environmental issues in which there is policy and/or social interest.

MIRA-PE 2007 Policy Evaluation Report
(available in English)
An overview and analysis of the environmental policy evaluation research published since 2005 and the measure in which policy evaluation is embedded in the functioning of the environmental authorities.





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About the Flemish Environment Agency

The **Flemish Environment Agency (VMM)** contributes to the realisation of the targets of the environmental policy by preventing, reducing and reversing harmful effects in water systems and the atmosphere. Moreover, it reports on the state of the environment and contributes to the realisation of the integral water policy. More information at www.vmm.be.

The task of the **Flanders Environment Report (MIRA)**, determined by decree[1], is threefold:

- a description, analysis and evaluation of the current state of the environment;
- an evaluation of the environmental policy conducted to date;
- a description of expected environmental developments in case of unchanged policy as well as in case of a change in policy according to a number of scenarios that are thought relevant.

Furthermore, the report must be well publicised. MIRA provides the scientific foundation for environmental policy planning in Flanders. The study of the situation is reflected in the annual MIRA-T reports, in which policy makers and citizens find answers to questions regarding the state of the environment, what the underlying causes are and how the environmental situation can be improved. The first scenario report, MIRA-S 2000, was published in 2000; the next edition is planned for 2009. The first policy evaluation report (MIRA-PE) appeared in June 2003, the third edition in the autumn of 2007.

[1] *DABM, Decree containing general provisions regarding environmental policy of 5 April 1995, published in the Belgian Official Journal of 3 June 1995*

Flanders Environment Report

MIRA-T 2007 Indicator Report

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VLAAMSE MILIEUMAATSCHAPPIJ