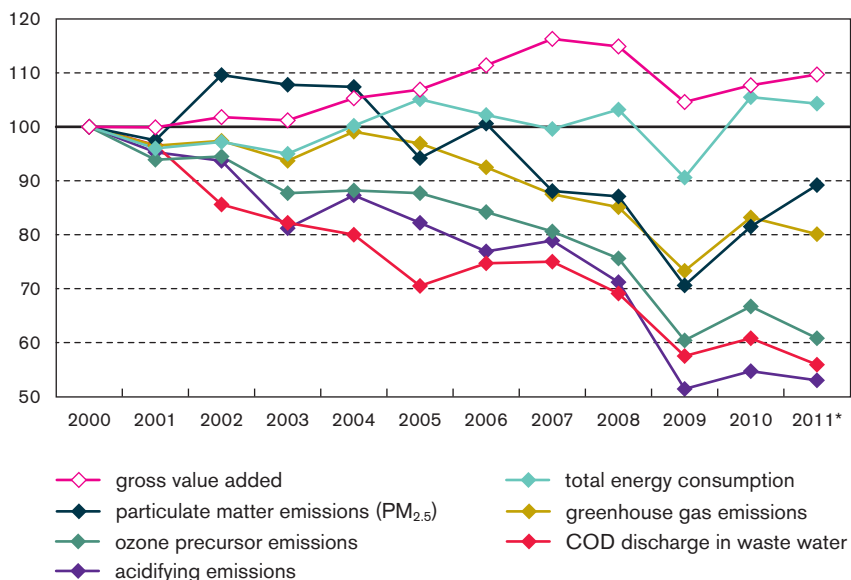




Eco-efficiency of industry

index (2000=100)



* provisional figures

Source: MIRA based on Flanders Energy Balance VITO, HERMREG, VMM

Environmental pressure decreases, except for energy consumption

In the period 2000-2011, industrial emissions and discharges clearly decreased. Only the industrial energy consumption in 2011 was higher than in 2000, mainly due to the increasing non-energetic use of fuels. In the period 2000 to 2007, in particular, industry succeeded in reducing its absolute environmental pressure while increasing its activity (gross value added +16 % in 2007 with respect to 2000). This was thanks to a variety of measures, such as the use of less environmentally harmful fuels, end-of-pipe techniques, process measures, organisational and structural process changes, energy-saving measures and CHPs. For the greenhouse gas emissions in the period 2000 to 2007, there is hardly any decrease in CO₂ emissions, but there is, above all, a strong reduction in CH₄ and N₂O emissions (-58 % and -65 % respectively).

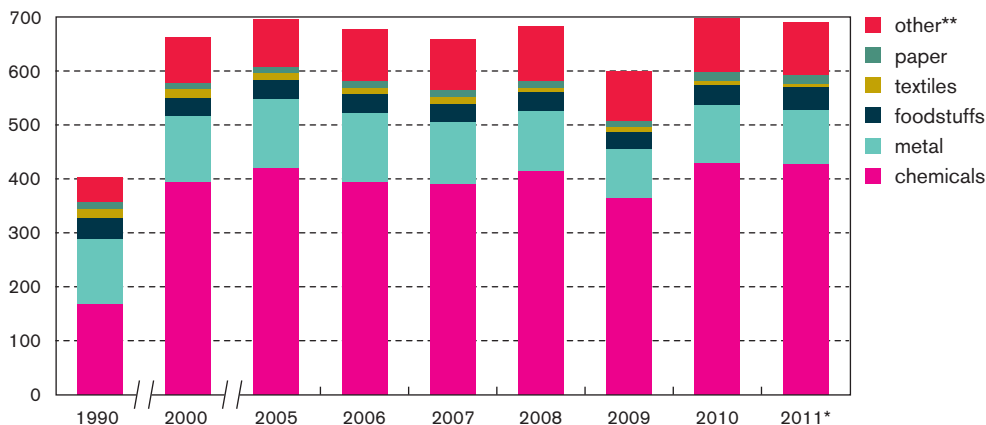
In the years 2008 and, above all, 2009, industrial activity was determined by the financial-economic crisis, resulting in a decrease in gross value added (-10 % in 2009 with respect to 2007). Partly as a result of this, the absolute value of industrial emissions and discharges decreased considerably. In 2010 and 2011, the economy recovered, resulting in an increase in industrial environmental pressure in most industrial subsectors. In 2011, most emissions and discharges were again slightly lower than in 2010 despite a limited increase in activity. Exceptions are emissions into air of particulate matter and of most heavy metals.

	2000	2005	2008	2009	2010	2011*
gross value added (million euros)	37 089	39 632	42 599	38 790	39 951	40 690
total energy consumption (PJ)	662	696	683	600	699	691
particulate matter emissions (PM _{2.5}) (tonnes)	3 857	3 634	3 360	2 722	3 143	3 440
greenhouse gas emissions (ktonnes CO ₂ -eq)	24 687	23 929	21 012	18 095	20 545	19 784
ozone precursor emissions (tonnes TOFP)	127 843	112 133	96 647	77 170	85 238	77 737
COD discharge (tonnes O ₂)	53 246	37 553	36 818	30 591	32 396	29 744
acidifying emissions (million Aeq)	2 061	1 694	1 466	1 060	1 127	1 093



Energy consumption by industry

total energy consumption (PJ)



* provisional figures

** including the relatively insignificant consumption for low voltage and heat that cannot be attributed to the various subsectors

Source: Flanders Energy Balance VITO

No decrease in the industrial energy consumption

In 2011 at almost 44 %, industry was responsible for the largest part of the Flemish energy consumption. Mainly as a result of a strong increase in activity in the first years of the 1990s, industrial energy consumption increased significantly (+64 % between 1990 and 2000).

In 2009, total industrial energy consumption decreased by 12 % with respect to 2008 as a result of the reduced activity due to the financial-economic crisis (gross value added -9 %). In 2010 and 2011, the economy recovered again, resulting in an increase in energy consumption in nearly all industrial subsectors. For the total industry, the increase in the total energy consumption amounted to 15 % between 2009 and 2011, while the gross value added increased by 5 % in that period.

In 2011, the total industrial energy consumption was still well over 4 % higher than in 2000. This is caused by increasing non-energetic energy consumption (+21 % between 2000 and 2011).

Non-energetic energy consumption is found mostly in chemicals, which uses energy sources as raw material for various processes (for example, natural gas for the production of ammonia in synthetic fertiliser production, naphtha as the basis for plastics). This non-energetic energy consumption represented 43 % of the total industrial energy consumption in 2011.

Energetic energy consumption, in contrast, decreased by almost 6 % in the period 2000-2011, whereas the industrial activity increased (gross value added +10 %). This is indicative of a higher energy efficiency in the various industrial combustion processes.

total energy consumption (PJ)	1990	2000	2005	2008	2009	2010	2011*
chemicals	168.6	394.6	419.5	414.8	364.6	429.5	426.4
metal	119.7	121.7	127.6	109.5	89.1	107.3	101.5
foodstuffs	38.8	32.6	36.1	35.8	33.3	36.7	41.1
textiles	17.4	16.8	11.9	8.8	7.5	7.6	6.1
paper	11.6	12.2	12.7	12.8	11.9	15.7	17.3
other**	47.3	84.5	88.0	101.8	93.4	101.8	98.7
total	403.4	662.3	695.8	683.4	599.8	698.6	691.0



CO₂ emission by industry

CO₂ emissions (ktonnes)



* provisional figures

** including the emissions from the waste & waste water sector

Source: VMM

Industrial CO₂ emissions in 2011 still above 1990 level

In 2009, the CO₂ emissions, by far the most important greenhouse gas, for the first time fell below the 1990 level. This was mainly the result of the lower industrial activity due to the financial-economic crisis. In 2010 and 2011, the economy recovered, also resulting in an increase in the total (energetic + non-energetic) CO₂ emissions in nearly all industrial subsectors. In 2011, the CO₂ emissions were still well over 5 % above the 1990 level. The chemicals and metal subsectors had the largest share in the CO₂ emissions with 48 % and 29 % respectively.

In 2011, 15 % of the CO₂ emissions were attributable to non-energetic emissions originating from the use of energy sources as raw material in a production process (chemicals) and from the oxidation of carbon during the conversion of iron ore into steel (metal).

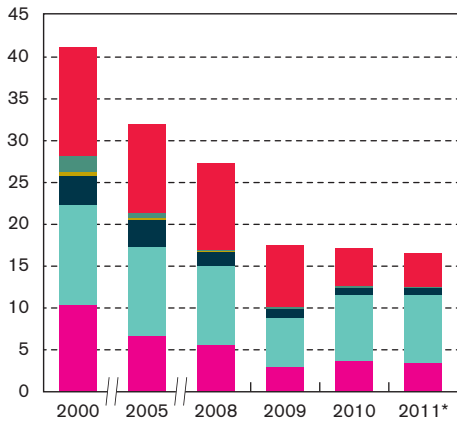
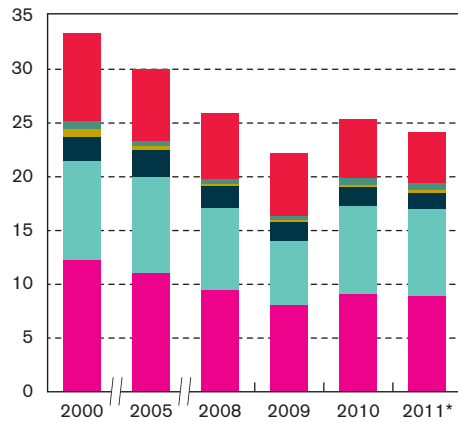
Majority of industrial CO₂ emissions under the European Emissions Trading System

A major part of the greenhouse gas emissions from the industry sector is regulated by the European Emissions Trading System (ETS). Through an extension of the area of application of ETS within industry, the share of the energetic CO₂ emissions under ETS increased from approximately 50 % in the first trading period (2005-2007) to around 90 % in 2011. A great deal of industrial process emissions are also covered by the ETS provisions. Since the introduction of this ETS in 2005, all of the industrial subsectors succeeded in reducing their CO₂ emissions between 2005 and 2009 (-7 % for all industry). However, in 2010 and 2011, partly as a result of the recovering economy, this downward trend was reversed (+20 % between 2009 and 2011).

CO ₂ emissions (ktonnes)	1990	2000	2005	2008	2009	2010	2011*
chemicals	5 392	8 579	9 447	8 719	7 753	8 400	8 241
metal	5 613	5 824	6 268	5 707	4 362	5 478	4 988
foodstuffs	2 331	1 413	1 503	1 376	1 217	1 416	1 554
textiles	794	586	375	258	225	238	157
paper	414	396	327	283	283	410	429
other**	1 894	2 375	2 179	2 284	2 037	2 093	1 956
total	16 436	19 173	20 100	18 628	15 877	18 034	17 325

Emission of SO₂ and NO_x by industry

DPSIR

SO₂ emissions (ktonnes)NO_x emissions (ktonnes)

■ chemicals ■ metal ■ foodstuffs ■ textiles ■ paper ■ other

* provisional figures

Source: VMM

No further decrease in the SO₂ and NO_x emission

In 2011, industrial SO₂ emissions were only 40 % of the emissions in 2000. The strong reduction in emissions from the chemicals and metal subsectors, on the one hand, and the financial-economic crisis in 2008 and 2009, on the other hand, were the main reasons for this decrease. From 2010, industrial activity recovered but total industrial SO₂ emissions remained more or less at the 2009 level. There was, however, a strong increase in SO₂ emissions in the metal subsector between 2009 and 2011 (+40 %), which could possibly be explained by plant restarts or the renewed use at full capacity of large installations. SO₂ emissions from the other industry subsector decreased by 55 % between 2009 and 2011. This was mainly due to the application (since 1 January 2010) of tighter SO₂ emission limit values for the processing of all types of clay in the glass and ceramics industry.

Industrial SO₂ emissions, which represented 44 % of the total emissions in Flanders in 2011, can be reduced further by more widespread use of low-sulphur fuels such as natural gas, DeSO_x installations and a higher energy efficiency.

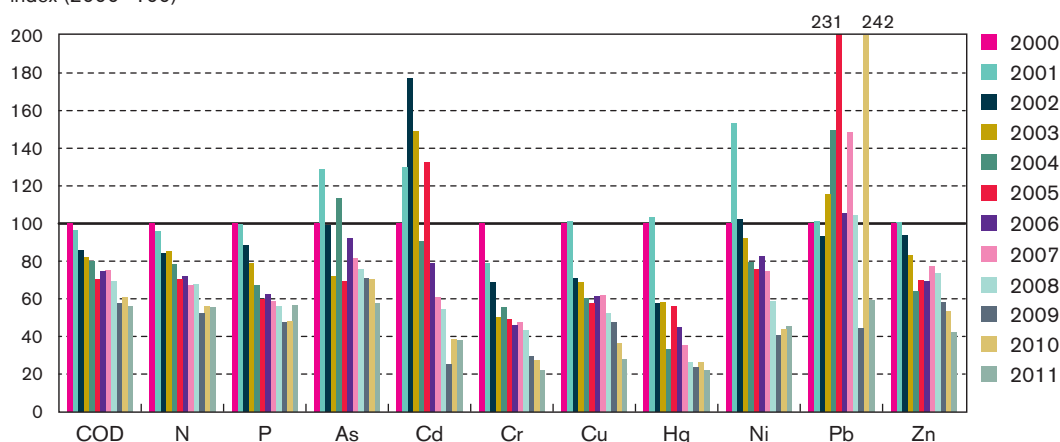
Industrial NO_x emissions decreased much less sharply than the SO₂ emissions and, in 2011, they were still 72 % of those in 2000. The greatest decrease in emissions occurred in 2009 as a result of the financial-economic crisis. In recent years, industrial NO_x emissions have again increased partly due to the recovery of the economy. The increase between 2009 and 2010 was the most pronounced in the metal subsector (+38 %).

The industry has a 17 % share in NO_x emissions in Flanders. In chemicals, NO_x emissions have remained at the same level in recent years, despite an increase in production. This can be attributed to the Environmental Policy Agreement of 9 July 2009, which imposed an NO_x emissions ceiling of 9.8 tonnes to be reached by 2013 at the latest. This subsector continued to invest heavily in NO_x filters, low NO_x burners, catalytic converters and other measures, so that this target was reached in 2011. Also in 2009 and 2010, chemicals remained below this ceiling partly as a result of the reduced activity due to the financial-economic crisis.

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

DPSIR

index (2000=100)



This concerns discharges at industrial sites, so that any treatment at a public waste water treatment plant is not taken into account.

Source: VMM

Industrial discharges in waste water decreased considerably

The industrial discharges of chemical oxygen demand (COD), nitrogen (N), phosphorus (P) and the eight heavy metals show a downward trend in the period 2000-2011. This decrease varies from 41 % for lead (Pb) to 78 % for mercury (Hg). This in spite of an increase in industrial activities, expressed in gross value added, of approximately 10 %.

Under the influence of policy measures (e.g. discharge standards, environmental tax on waste water discharges), a considerable number of companies have also made substantial efforts to reduce their discharges. The financial-economic crisis perhaps played a major role in reducing the pollutant loads in 2008 and 2009. Since 2010, the discharged pollutant loads have showed far less pronounced trends despite a slight increase in industrial activities. The increase in P-loads in 2011 is to be attributed to the discharge by a single company, as was the large peak in lead discharges in 2010.

All major industrial subsectors succeeded in reducing their discharges between 2000 and 2011. The chemicals subsector represents a major part of discharges of nearly all substances, the metal subsector is significant mainly for a number of heavy metals, and the foodstuffs subsector is primarily responsible for the discharges of COD, N and P.

share in discharges 2011 (%)	COD	N	P	As	Cd	Cr	Cu	Hg	Ni	Pb	Zn
chemicals	33.8	38.0	48.5	35.7	50.4	34.6	19.6	59.4	48.5	2.4	32.3
metal	4.3	17.8	5.2	26.9	10.8	10.1	33.7	21.4	31.2	82.4	18.6
foodstuffs	38.0	27.5	35.0	5.5	0.7	7.4	13.8	5.5	5.8	0.9	17.8
textiles	7.1	3.3	2.9	1.0	0.3	26.8	13.8	2.2	2.3	0.3	5.5
paper	10.6	4.9	4.0	1.9	16.5	0.3	6.5	1.5	0.7	0.1	10.6
waste & waste water	2.9	3.5	1.1	1.9	19.9	3.4	4.9	7.7	8.3	6.9	6.7
other industry	3.4	5.2	3.3	27.0	1.5	17.5	7.7	2.4	3.2	7.1	8.4