

Belgium

Energy efficiency report



Objectives: 27.5 TWh of end-user energy savings in 2016

Overview	2010		2000-2010 (%/year)	
Primary intensity (EU=100) ¹	135	--	-1.2%	-
CO ₂ intensity (EU=100)	110	-	-2.5%	+
CO ₂ emissions per capita (in tCO ₂ /cap)	9	-	-1.7%	++
Power generation	2010		2000-2010 (%/year)	
Efficiency of thermal power plants (in %)	45	++	0.9%	+
Rate of electricity T&D losses (in %)	5	+	0.6%	--
CO ₂ emissions per kWh generated (in gCO ₂ /kWh)	193	++	-3.3%	++
Industry	2010		2000-2010 (%/year)	
Energy intensity (EU=100)	138	-	-4.4%	++
Share of industrial CHP in industrial consumption (in %)	11	-	11.5%	+
Unit consumption of steel (in toe/t)	0.28	+	-3.9%	+

++ Among best countries + Better than the EU average¹ - Below the EU average¹ --Among countries with the lowest performances

Latest update: April 2012

¹ The European Union, as the best performing region, is used as the benchmark.

1. Overview

1.1. Policies: 9% energy savings target for 2016

Belgium has adopted a National Energy Efficiency Action Plan 2008-2016 (NEEAP) which sets an energy savings target of 27.5 TWh (319.7 Mtoe) for 2016 in buildings, transport and small industries (excluding sectors under ETS). Around 62 percent of the planned energy savings should be achieved in Flanders, 30 percent in Wallonia and 8 percent in Brussels-Capital. A second NEEAP, still based on the energy savings targets for 2016 defined in the first NEEAP, was adopted in 2011. The new NEEAP includes additional measures for Flanders.

There is no federal energy agency for energy efficiency. Each region develops its own set of incentives and regulations regarding energy efficiency. At the federal level, in 2011 the National Reform Program set an energy savings target of 18 percent by 2020 compared to 2007, which corresponds to a 9.8 Mtoe reduction in primary energy consumption by 2020.

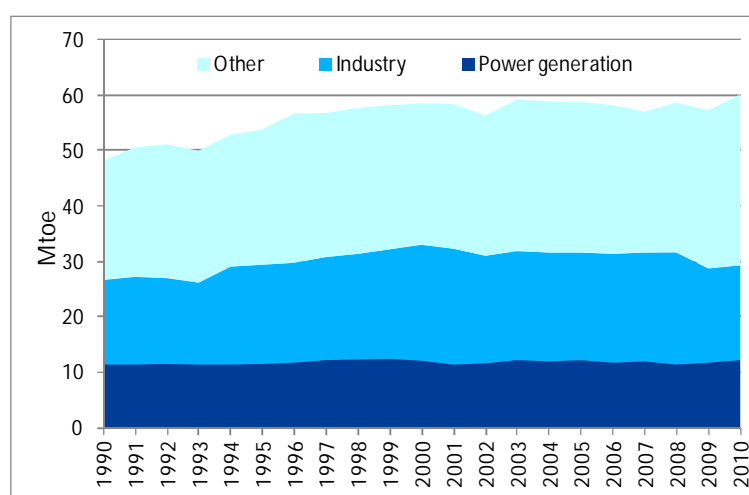
In 2009, a National Climate Plan for the period 2009-2012 was issued at a federal level with 11 strategic measures covering 6 sectors, including measures related to energy efficiency. In October 2009 Flanders issued its energy policy paper (2009-2014), which focuses on the implementation of EU directives on energy efficiency and energy services, as well as the energy performance of buildings. In April 2009 Wallonia prepared a draft update of the sustainable energy plan, proposing over 200 new measures on energy efficiency or renewable energy.

1.2. Energy consumption trends: above-average consumption levels

Overall energy consumption per capita is 62 percent higher than the EU average: 5.5 toe compared with 3.4 toe for the EU in 2010. The difference is mainly due to industry, which has a higher per capita energy consumption rate than average in the EU.

Total energy consumption grew by 2 percent/year between 1990 and 2000 and has been stable since then, at around 58 Mtoe. After a 2.3 percent decline in 2009 due to a slowdown in economic activities, it rose by 5 percent in 2010.

Figure 1: Total and final energy consumption trends

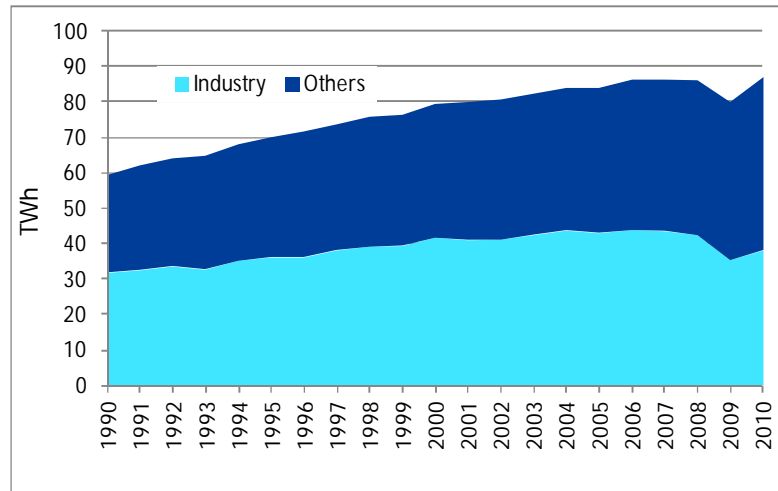


Source: Enerdata

The distribution of energy consumption in Belgium has been relatively stable since 1990, with the power sector accounting for about 20 percent of total energy consumption (24 percent in 1990). Industry accounts for a substantial share of energy consumption, at 28 percent of the total energy consumption (including non-energy uses) in 2010, compared with 32 percent in 1990.

Electricity consumption per capita is about 8,000 kWh, which is a full 37 percent higher than the average consumption in European countries (2010). Electricity accounts for 17 percent of energy consumption, up slightly since 1990 when it stood at 15 percent. Belgian electricity consumption increased at the regular pace of 2.1 percent/year between 1990 and 2008. In 2009 it dropped by 7.2 percent, but in 2010 rapidly recovered (+8.8 percent), even exceeding its 2008 level. The industrial sector accounts for a large share of overall electricity consumption, with around 44 percent of the total. That share has shrunk since 1990, when it accounted for 54 percent, due to the strong growth in electricity consumption in the residential sector (+3 percent/year between 1990 and 2010).

Figure 2: Electricity consumption trends by sector



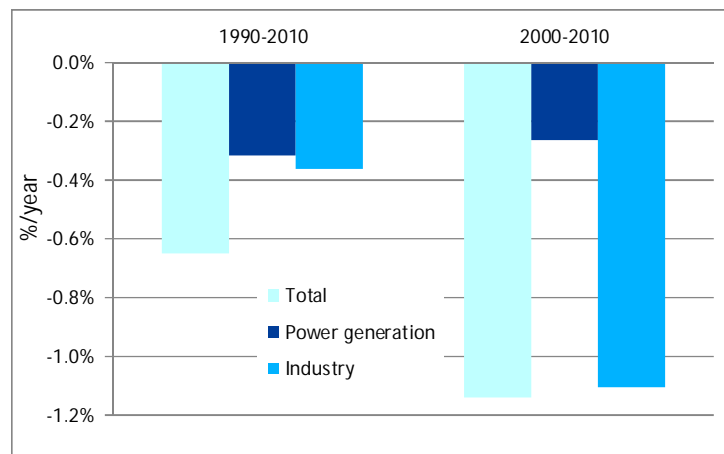
Source: Enerdata

1.3. Energy efficiency trends: small decrease in energy intensity

Belgium's total energy consumption per unit of GDP is high. Measured at purchasing power parity, it is 40 percent higher than the EU average, and it is decreasing at a slower pace.

Energy intensity in Belgium has decreased by around 0.7 percent/year since 1990, compared with the EU average of 1.6 percent/year. The decrease was mainly driven by the industrial sector and, to a lesser extent, by the power generation sector.

Figure 3: Energy intensity trends

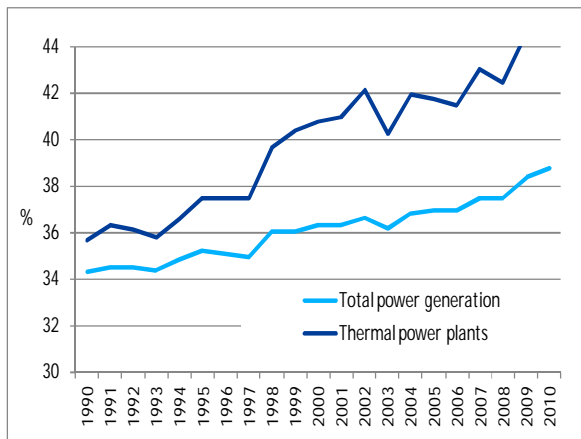


Source: Enerdata

2. Power generation: large increase in the sector's energy efficiency

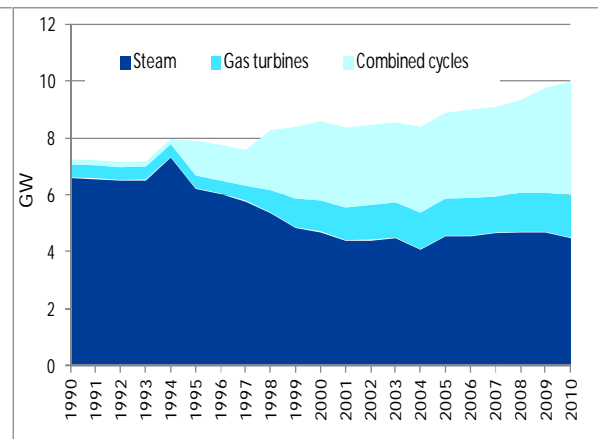
The average efficiency of the power sector has increased regularly since 1990 and reached 39 percent in 2010. That improvement was driven by the development of natural gas and renewables in the power mix, as well as the use of more efficient technologies such as combined cycle and cogeneration plants. The increase in the efficiency of thermal power plants was even more noticeable, rising from 36 percent in 1990 to 45 percent in 2010. That improvement was mainly linked to the switch from coal to natural gas in the power mix, together with the spread of combined cycle plants, which now account for around 40 percent of the thermal electricity capacity.

Figure 4: Efficiency of the power generation and thermal power plants



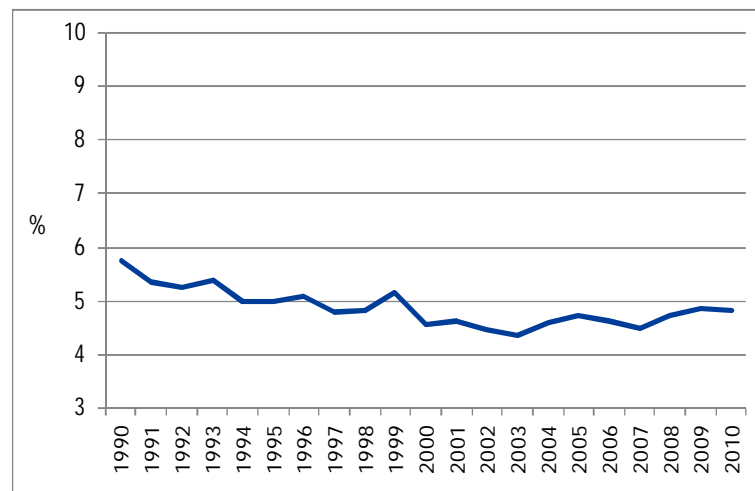
Source: Enerdata

Figure 5: Thermal electricity capacity, by technology



The rate of transmission and distribution losses (T&D) in the Belgian grid is low, dropping from 5.7 percent in 1990 to 4.8 percent of the distributed volumes in 2010. That rate is 26 percent lower than the EU average.

Figure 6: Electric T&D losses



Source: Enerdata

3. Industry

3.1. Policies: voluntary agreements and tax deductions for energy efficiency investments

At the national level, tax deductions for energy-saving investments in businesses are the only measure aimed at promoting energy efficiency in industry. The energy efficiency policies in industry are implemented at the regional level, through voluntary agreements with each regional government. Voluntary agreements were introduced in 1999 in the Brussels area. Flanders adopted a "benchmark" agreement, including a commitment to bring the energy efficiency to the world top ten by 2012 (172 companies). In Wallonia, 13 sector associations (around 160 companies) signed a voluntary agreement under which they commit themselves to a quantified energy efficiency improvement over the period 2003-2012.

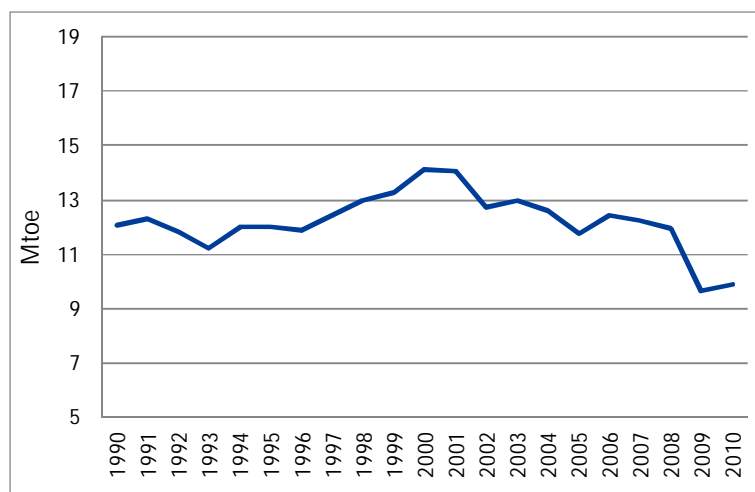
Green certificates were implemented to promote cogeneration in 2004 (Wallonia) and 2005 (Flanders and Brussels region). In Flanders, the quota for cogeneration was 1.19 percent in 2005 and has reached 5.23 percent in 2012. Plans have been adopted to increase the share to 10.5 percent by 2021.

Flemish industrial companies with an annual energy consumption of more than 0.5 petajoules (PJ) (approximately equal to 139,000 MWh of electricity) have to establish an energy plan involving energy saving measures with an internal rate of return (IRR) of 15 percent after tax. These measures have to be taken within the four years following the approval of their energy plan.

3.2. Energy consumption trends: drop in industrial energy consumption

Industrial energy consumption increased by 1.6 percent/year between 1990 and 2000. Since then it has decreased by 3.5 percent/year, with a noticeable 19 percent drop in 2009 (+2 percent in 2010).

Figure 7: Trends in industrial energy consumption



Source: Enerdata

Natural gas accounted for 45 percent of industrial energy consumption in 2010, up from about 25 percent in 1990. The share of electricity has also grown since 1990, from 22 percent to 31 percent in 2010. In turn, the use of coal was scaled down to 6 percent, compared with around 38 percent in 1990. Oil also accounts for a decreasing share in the sector's consumption: it currently represents 6 percent of overall consumption, down from around 13 percent in 1990. The use of biomass is growing steadily and in 2010 accounted for 7 percent of overall industrial consumption.

Energy-intensive industries account for about 2/3 of the sector's energy consumption (3/4 in 1990). Chemicals represent an increasing share of the total: 32 percent in 2009, compared with less than 20 percent in 1990. The share of the steel industry was drastically reduced over the period but still accounts for about 20 percent of

industrial energy consumption. The non-metallic minerals industry (cement, ceramics, etc.) has a stable market share of 11 percent, while the share of the paper industry has doubled, from 3 percent in 1990 to 8 percent in 2009.

Figure 8: Energy consumption of industry, by source

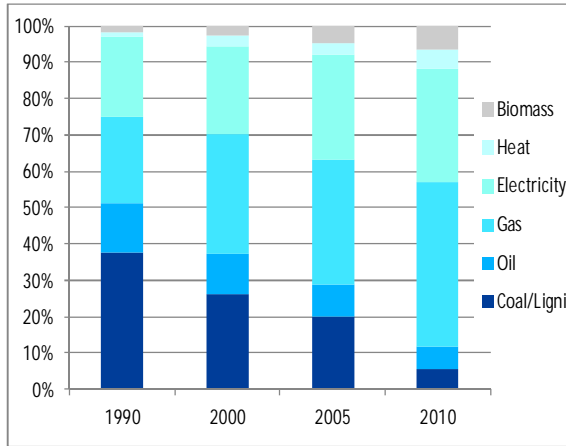
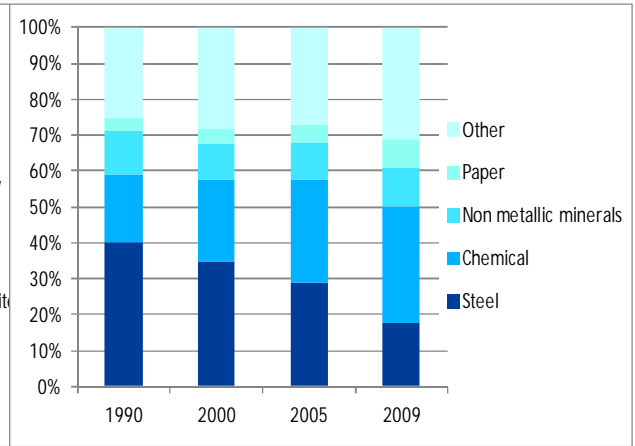


Figure 9: Energy consumption of industry, by branch

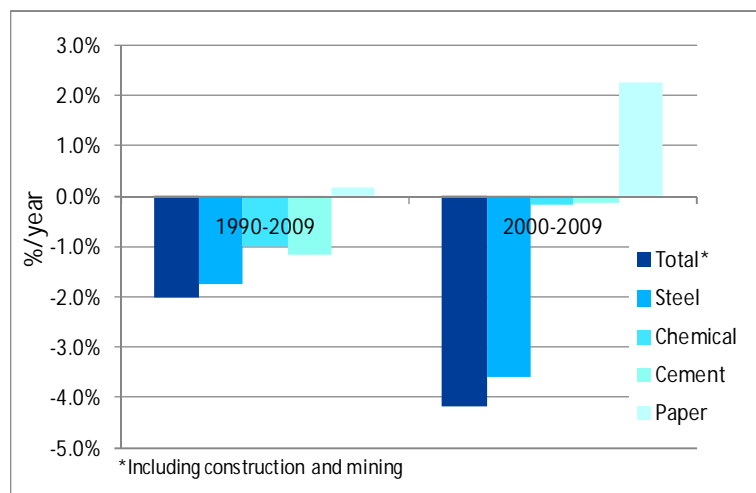


Source: Enerdata

3.3. Energy intensity trends: increase in industrial energy efficiency

Energy consumption per unit of industrial value added (energy intensity) decreased by 2 percent/year between 1990 and 2009, ie at a faster pace than the EU average (-1.6 percent). An above-average fall in the energy consumption per ton produced was seen in the steel industry (1.7 percent/year). In the cement industry, the consumption per ton has decreased by 1.2 percent/year since 1990. The chemical industry's energy consumption per unit of value added fell moderately (1 percent/year). By contrast, the paper industry has shown a slight increase in the amount of energy consumed per ton of paper produced (0.2 percent/year). The drop in energy intensity was larger over the 2000-2009 period (-4.2 percent/year), mainly due to the decrease in the energy intensity of the steel branch (-3.6 percent/year).

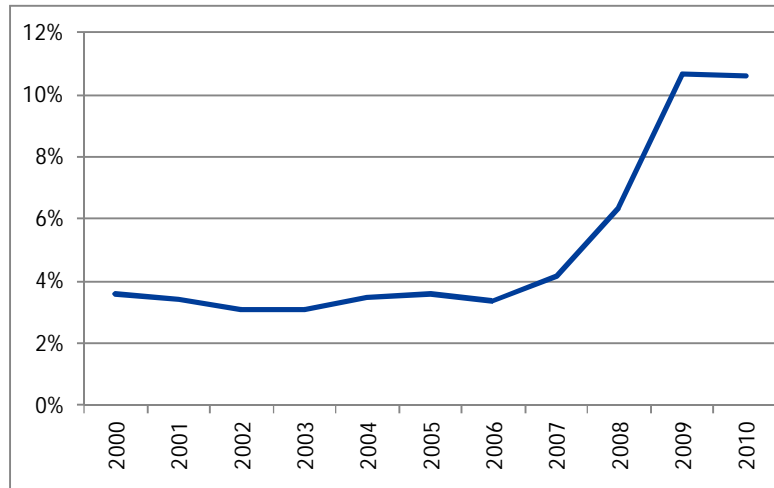
Figure 10: Trends in the energy intensity of industrial branches



Source: Enerdata, Odyssee

The share of CHP generation in industrial electricity consumption has surged since 2006, indicating the widespread dissemination of the technology in the sector. In 2010, CHP accounted for 11 percent of industrial electricity consumption, up from 3.5 percent in 2006.

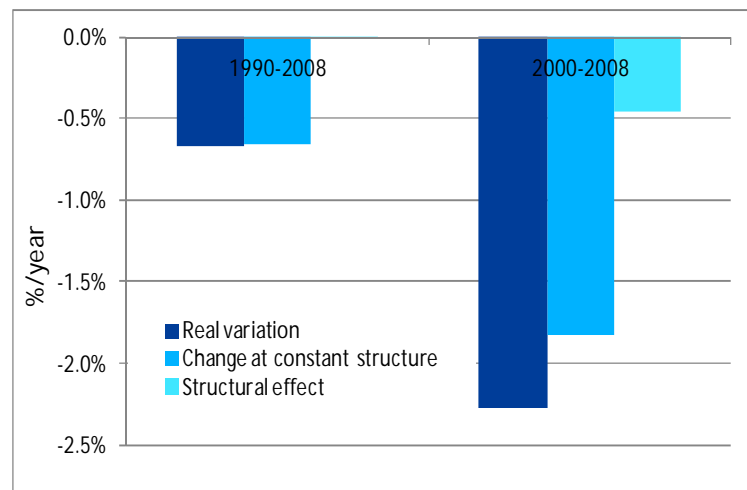
Figure 11: Share of industrial CHP in industrial consumption



Source: Enerdata

When calculating industrial energy intensity, the influence of changes in the structure of the value added must be taken into account. The comparison with the variation of energy intensity at constant structure aims to assess the impact of that structural effect. So, between 2000 and 2008, the energy intensity of the manufacturing industry (ie excluding mining and construction) showed a 2.3 percent/year decrease, while at constant structure the pace was a slower 1.8 percent/year. This means that structural changes towards less energy-intensive branches accounted for around 20 percent of the reduction in the energy intensity of manufacturing over the period, and that energy efficiency improvements can be estimated at 1.8 percent/year.

Figure 12: Trends in the energy intensity of manufacturing and structural effect



Source: Enerdata