

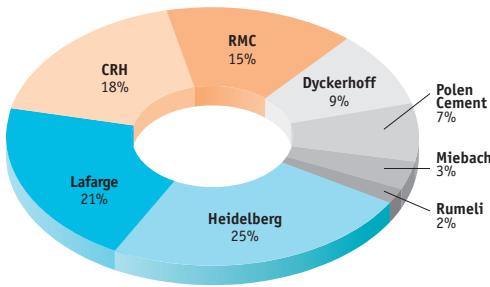


Cement industry in Poland

Cement industry in Poland is a leader in Europe in this sector. As concerns production volume in 2003, Poland scores seventh among European cement manufacturers. Thorough technical modernization which took place in the last decade in the industry caused significant change of its technical level. In this respect, the sector is among the strict European and world leaders.

Cement plants
in Poland – members
of the Polish Cement
and Lime Association





Distribution of domestic cement market in Poland in 2003

	2002	2003	2004
Clinker production	8751,1	8519,0	9354,9
Cement production	11345,3	11010,0	11413,1
Domestic deliveries	10789,3	10570,3	11061,7
Cement consumption	11297,0	11186,7	11500*
Cement export	457,5	276,0	361,7
Clinker export	6,4	75,8	226,0

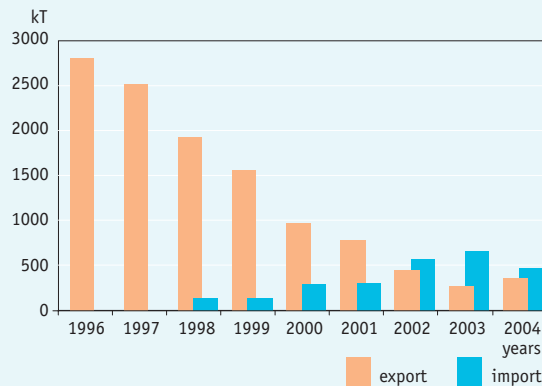
* assumption

Cement industry results in 2002 -2004

Cement manufacturers declare that presently the potential production kiln capacity amounts to over 12,200,000 tonnes a year (dry method). It may even be increased to 15 million tonnes a year. Capacity of the presently installed cement mills is sufficient for cement production amounting even to 18 million tonnes a year. It must be stressed that in each respect, the industry meets all the requirements of the European Union's regulations.

Market

In 2004, cement consumption in Poland amounted approximately to 11 500 th. tonnes and was higher by 3% as compared to 2003. Increase in cement consumption was recorded for the first time after the period of previous years, where cement consumption systematically decreased. As compared to 2000, where cement consumption was the highest in the entire period of Poland's transformation, this is still a result worse by about 25%. It should be expected, however, that this is the first year where the falling tendency of cement consumption has been breached, and it indicates further growth in future years. Such an opinion is also justified by the high pace of economic development of Poland, observed for almost two years, and a slow yet systematic growth of investments. Undoubtedly, this opinion will only be verified by the year 2005. This will be the first full year of our membership in the European Union, thus the year which will fully show the resulting negative (e.g. VAT rates) and positive (e.g. cohesion funds) factors impacting on the cement market. In 2004, the cement industry sold 11,061,700 tonnes of cement in Poland, i.e. 4.4% more than in 2003. Comparison of domestic consumption with industry sales shows that on the Polish

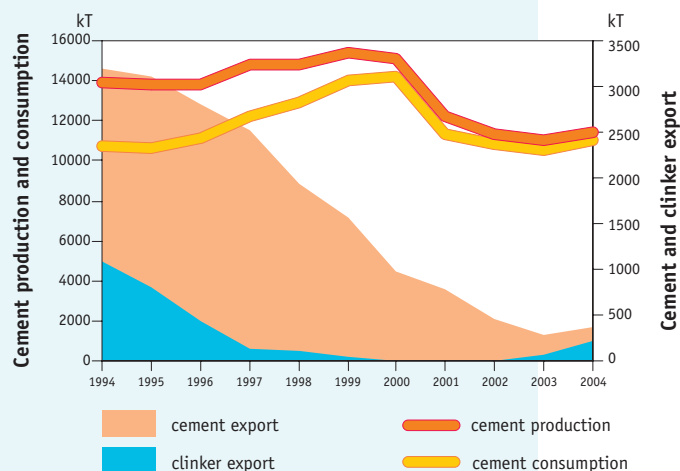


Export and import of cement in 1996-2004

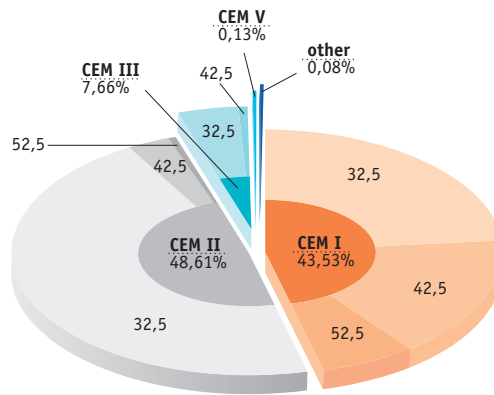
market about 475,000 tonnes of cement sold comes from import. It is a significant competition to domestic cement manufacturers. It must be added that profitability of import, particularly in recent years, is largely impacted by the strong exchange rate of PLN as compared to other currencies. Despite this, in the past year the industry exported 361,700 tonnes of cement, i.e. about 31% more than in 2003.

A characteristic feature of domestic cement market is the sale of large quantities of pac-

Cement production in the 1994-2004 years



Cement assortment produced in 2004



ked cement. In the total volume of cement sold, the share of packed cement amounts to about 36,8%. Despite the falling tendency, decrease in the share of packed cement (in 2003 – 38,8%) in total cement sales is very slow. In this respect our market is much different from other Europe-

an markets, where the volume of packed cement often forms only several percent.

Production

Cement production in 2004 amounted to 11 413.1 th. tons and was higher by 3.6% as compared to the previous year. Production of clinker totalled 9354.9 th. tons, i.e. almost 10% more than the year before. Increase in cement production was proportionate to the growth in cement sales. Cement industry can fully satisfy the market's demand in the nearest few years, even if the demand grows significantly. In the past year, its production capacity was only used in ca. 70%.

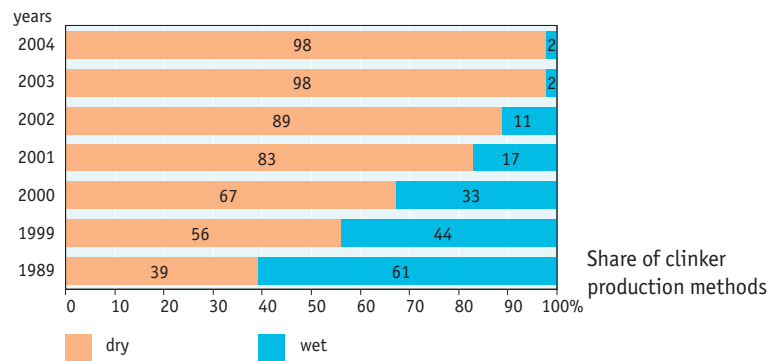
The market was supplied with over 30 types of cement, satisfying all consumer requirements as to cement properties wanted. In the total volume of cement produced, 43.5% was formed by pure cement, 48.6% by cement with additives, 8% by metallurgical cement and 0.1% by pozzolana and other cement. The cements are characterised with high stability of their properties, achieved due to strict control of technological regimes and minute control of production processes.

Technology

As a result of modernisation of cement clinker burning processes, performed in the recent years, since 2003 cement clinker has been produced almost solely with the low energy-consuming dry method. Only 2% of clinker in 2003, and 1.8% in 2004, designed for production of cement with special properties, were produced with wet method. Specific heat consumption for clinker burning amounted on average for the entire industry 3405 kJ/kg of clinker (3342 kJ/kg for dry method) in 2004. It is worth noticing

Cement assortment produced in 2004

	[kt]
CEM I 32,5 R	2 594,7
CEM I 32,5 R NA	280,0
CEM I 42,5 R	1403,7
CEM I 42,5 N NA	99,5
CEM I 42,5 R NA	82,8
CEM I 42,5 MSR NA	52,7
CEM I 42,5 N HSR NA	34,5
CEM I 52,5 R	367,6
CEM I 52,5 R NA	35,0
CEM I 52,5 N NA	18,1
CEM II/A-V 32,5 R	796,9
CEM II/A-V 42,5 N	108,8
CEM II/A-V 42,5 R	53,3
CEM II/B-V 32,5 R	1922,6
CEM II/B-V 32,5 N	118,8
CEM II/A-S 32,5 R	55,1
CEM II/A-S 42,5 N	109,9
CEM II/B-S 32,5 R	1275,8
CEM II/B-S 42,5 N	120,5
CEM II/B-S 52,5 N	17,5
CEM II/B-M(V-LL) 32,5 R	454,9
CEM II/B-M(S-V) 32,5 R	513,6
CEM III/A 32,5	159,3
CEM III/A 32,5 R	84,5
CEM III/A 32,5 N NA	263,1
CEM III/A 32,5 NW NA	119,8
CEM III/A 32,5 N LH/HSR/NA	121,1
CEM III/A 42,5 N	35,2
CEM III/A 42,5 N NA	59,3
CEM III/B 32,5 N LH/HSR/NA	31,5
CEM V/B 32,5	14,3
other	8,6
TOTAL	11 413,1



that in the European Union countries, before its extension, average heat consumption for clinker burning amounted to 3725 kJ/kg, which undoubtedly testifies to the high level of our industry.

Minimization of heat consumption for clinker burning is of fundamental significance to manufacturers, as fuel purchase constitutes the greatest position in the cement production costs. Hence, for many years, industries in many countries, including Poland, have taken steps to use combustible wastes as alternative sources of energy. Consistent activities in this respect, taken already in the mid 1990s, where the industry faced much opposition on the part of administrative authorities and local communities, have lead to a situation where combustion of alternative fuels in our industry is presently accepted and even supported. In 2003, about 6.5%, and in 2004 ca. 10% of heat energy for clinker burning was obtained from burning alternative fuels. The industry's target is to at least double the amount.

The industry is also characterised with much lower than before electrical energy consumption.

It amounted to 102,6 kWh/tonne in 2004. Cement industries in many other European countries consume even more than ten percent more of electricity. In Poland still several years ago, there were plants consuming over 200 kWh/t of cement produced.

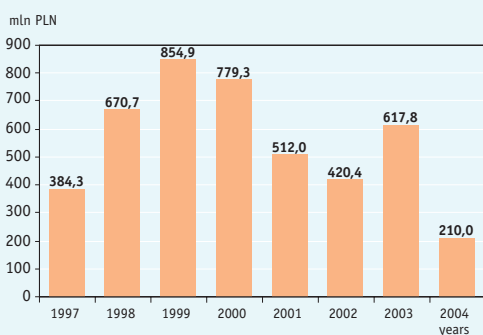
Environment

Activity of the cement industry is connected with the emissions to air and exploitation of raw materials. In the cement production process there is no waste problem, as it is an entirely waste-free process.

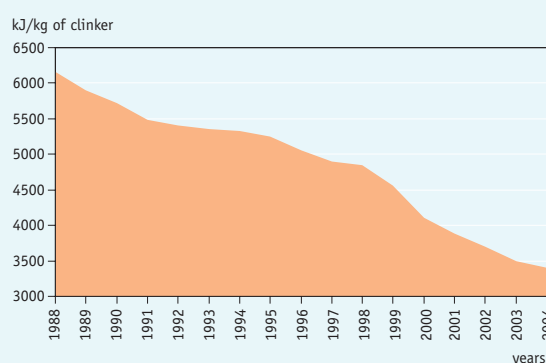
In its strategy, the cement industry treats the issues of minimising the environmental impact as equal to activities aimed at achieving a better economic result. It must be stated that consistent activities taken by the industry have lead to a decisive limitation of its negative environmental impact.

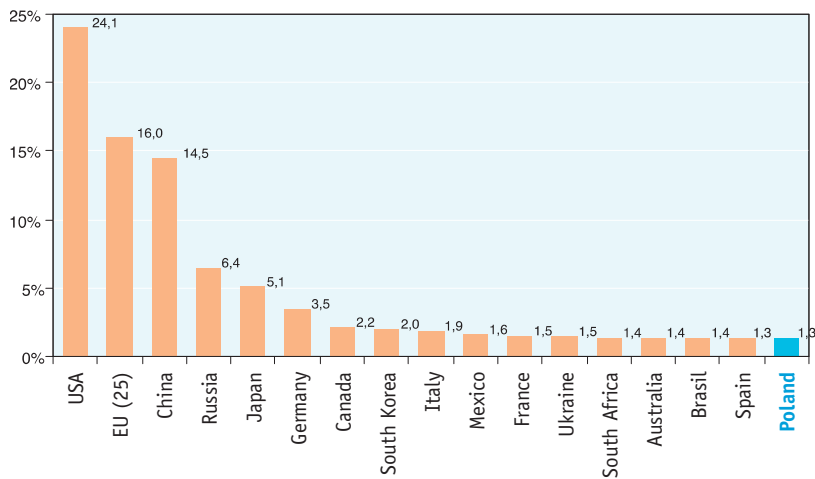
Dust emission to air has been reduced. In 2003, it amounted to 1997 tonnes a year, i.e. 0.18 kg per tonne of cement produced. The year before, the index amounted to 0.27 kg/tonne of cement. Such large limitation of still low emission has

Investment expenses in the cement industry in 1997-2004



Specific heat consumption in the cement industry





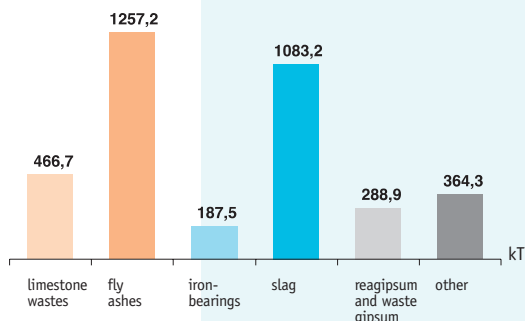
CO₂ emissions from fossil fuels by countries



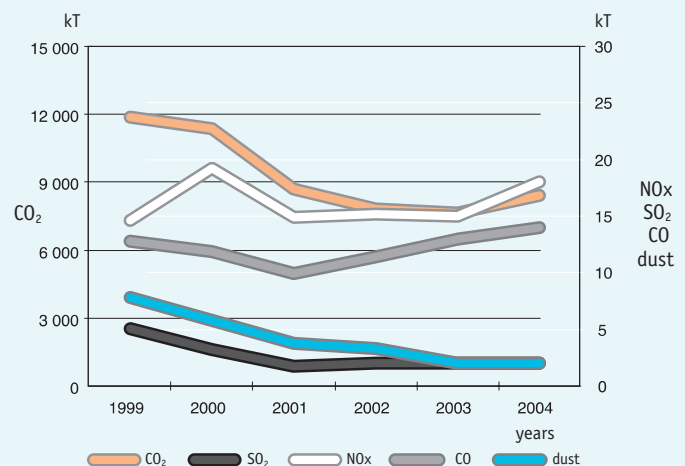
been achieved owing to the change of production technology in Kujawy cement plant, which has operated one of the latest clinker burning lines with dry method since 2003. In 2004, dust emission amounted to 1710,6 tonnes, i.e. 0,15 kg/tonne of cement produced. For comparison, early in the 1990s dust emission amounted to about 5 kg/tonne of cement produced. Owing to the decrease of specific heat consumption for clinker burning, emission of gases to air has dropped. Emission of carbon dioxide, the main component of combustion gases, has reached the level of below 0.9 kg CO₂/kg of clinker burnt, i.e. to the level that is theoretically achievable in the latest furnace installations. The industry takes great care to minimise the arduousness related to raw material exploitation. All requirements of the mining law concerning recultivation of excavations are met through e.g. establishment of recreation areas. The environment can also have benefits related

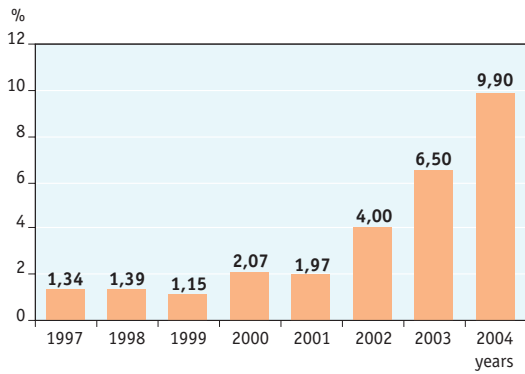
to the industry. The previously mentioned use of alternative fuels allows for decreasing consumption of fossil fuels, and thus for protecting their resources. On the global scale, the industry also helps to limit the emission of gases or decreasing of the number of deposited waste. Combustion of alternative fuels is also an effective and the most economical method for waste utilisation, with full use of energy contained there in the technological process. The volume of waste utilised in this way amounted to 102,300 tonnes in 2003. In 2004, 201 100 tonnes of alternative fuels were used. Another benefit is the use of industrial waste as secondary raw materials in the cement production process. As components of the raw material set for clinker production, and as additives to cement, 3,464,000 tonnes of waste were used in 2003. In 2004, the volume amounted to 3,647,800 tonnes. Owing to this, large volumes of natural raw materials were saved. Use of wa-

Secondary raw materials for clinker and cement production in 2004



Dust and gas emissions from the cement industry in 1999-2004





Percentage of heat from alternative fuels

ste as additives to cement allows for shaping its properties, which is highly important for particular applications of cement. At the same time, such activities result in direct lowering of gas emissions per unit of cement produced.

CO₂ intensity from fossil fuels and cement production

