

Cement

Sector scan

Tim Steinweg

Amsterdam, May 2008

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Contents

Contents	3
1 Introduction	4
1.1 Cement	4
2 Sector overview	6
2.1 Production	6
2.2 Trade	10
2.3 Imports	11
2.4 Exports	13
2.5 Consumption	14
3 Company profiles	17
3.1 Holcim	17
3.2 Lafarge	21
3.3 Heidelberg	25
4 Issues	29
4.1 Emissions	29
4.2 (Hazardous) waste as fuel	30
4.3 Solid waste and water pollution	31
4.4 Social issues	32
4.5 Labour issues	33
4.6 Economic issues	34
4.7 Cartels and anti-competitive behaviour	35
5 CSR initiatives	37
5.1 World Business Council's Sustainable Cement Initiative	37
6 Conclusions	39
6.1 Characteristics of the sector	39
6.2 Major issues	40

1 Introduction

This Quick Scan is a short piece of research undertaken in a relatively short period, and making use of publicly available internet sources and databases. The research is funded internally in order to make an overview of the global cement sector and an inventory of the known critical issues and initiatives. This leads to an analysis of knowledge gaps, issues of interest and cases that could potentially be further looked into. This scan can be divided in three parts. The first part gives an overview of the sector as a whole, providing figures and analyses of the production, trade and consumption of cement. This section also gives an overview of the most important regions of activity. Secondly, three of the largest multinational corporations active in the cement sector are briefly scanned, with basic company information about its organization, finances, production capacity and CSR approaches. Finally, an important focus of the scan is on known critical issues with regards to the sector's environmental, social and economic impact and on sector-wide CSR initiatives. More specifically this Quick Scan attempts to answer the following questions:

- ❑ What are the characteristics of the cement sector?
- ❑ What issues is the sector faced with?
- ❑ How does the sector respond?
- ❑ Where is the sector heading?
- ❑ What are the gaps in the current knowledge?
- ❑ What could be the focus of future research by SOMO?

The information in this Quick Scan report was obtained from websites, databases, international press and websites of relevant companies. This Quick Scan *does not provide a complete and detailed image of the sector* but is set out to serve as a starting point for possible further research and acquisition by SOMO.

1.1 Cement

In the most general of terms, cement is “a binder, a substance which sets and hardens independently, and can bind other materials together”.¹ Two types of cement can be distinguished; Hydraulic and non-hydraulic cement. Hydraulic cement hardens when water is added, and is the type that is used in almost all forms of modern construction. The most common type of hydraulic cement is Portland cement, for which limestone, clay and sand are used as ingredients.

Portland cement consists of four basic chemical elements; calcium, silicon, aluminium and iron.²

Cement production³

Calcium is found in limestone, which is one of the most common natural resources in the world. Limestone is usually quarried in the vicinity of cement factories, where it is extracted through blasting techniques. Step by step, these blasted stones are crushed to gravel before they are transported to the cement factory and mixed with the two other basic ingredients of cement; clay and sand.

¹ Wikipedia website, “Cement”, no date, <http://en.wikipedia.org/wiki/Cement> (06-12-07).

² Portland Cement Association website, Cement & concrete basics, “How Portland Cement is Made,” no date, <http://www.cement.org/basics/howmade.asp> (06-12-07).

³ Portland Cement Association website, “Flash Tour”, no date, <http://www.cement.org/basics/images/flashtour.html> 28-02-08).

At that point, there are two different manufacturing processes; the dry and the wet process. In the dry process, the raw materials are ground, mixed and fed into a cement kiln, a horizontal rotating cylinder. In the wet process, water is added to the raw materials before being fed into the kiln, to create a slurry. The dry process is more environmentally friendly and emits less CO₂, due to the additional use of fuel needed in the wet process.

The cement kiln is heated to a temperature of approximately 1,450°C, and uses a variety of fuels, ranging from coal and biomass to waste materials such as old rubber tires. Only at these high temperatures do the chemical and physical characteristics of the raw materials change. These changes create so-called 'clinkers', that come out of the kiln in small marble size pieces. After cooling, these clinkers are further ground to create Portland cement.

Cement use

The most important use of cement is "the production of mortar and concrete - the bonding of natural or artificial aggregates to form a strong building material which is durable in the face of normal environmental effects".⁴ As cement is used in practically every building in the world, it is said that it is the second most used product in the world, after water.⁵ According to Lafarge, one of the largest producers of cement, the average per capita consumption of cement was 420 kilograms in 2007.⁶

⁴ Wikipedia website, "Cement", no date, <http://en.wikipedia.org/wiki/Cement> (06-12-07).

⁵ Cement Sustainability Initiative website, "Concrete Miscellany," no date, http://www.wbcsdcement.org/concrete_misc.asp (06-12-07).

⁶ Olivier Luneau, Directeur Developpement Durable et Affaires Publiques Senior Vice President Sustainable Development and Public Affairs, Lafarge, email, 19 May 08.

2 Sector overview

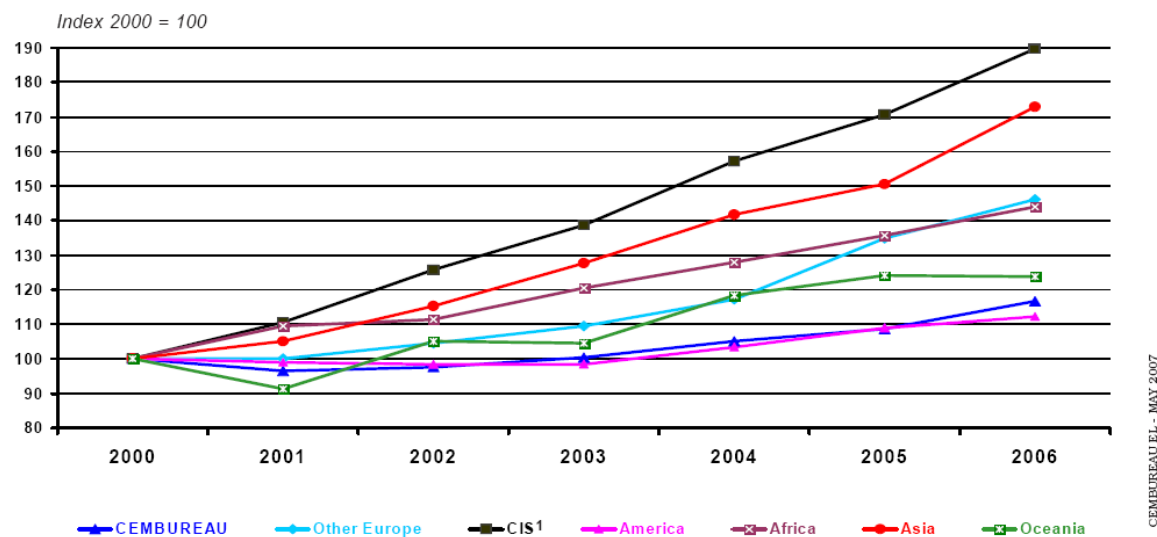
This chapter intends to give an overview of the global cement sector. It focuses specifically on the various stages (production, trade and consumption) and the most important regions of activity.

2.1 Production

According to the United States Geographical Survey, approximately 2.5 billion tons of cement was produced in 2006.⁷ This is an increase of 8% compared to the production in 2005. Figure 1 shows the production trends over the last five years per region.

Figure 1: World Cement Production trends

WORLD CEMENT PRODUCTION BY REGION - EVOLUTION 2000-2006



Source: CEMBUREAU⁸

Globally, around 150 countries produce either cement or clinker.⁹ China is by far the largest producer of cement, producing an estimated 1.1 billions tons in 2006. Table 1 shows the ten largest cement producing countries in the world. Figure 2 shows the production of selected countries relative to China's figures.

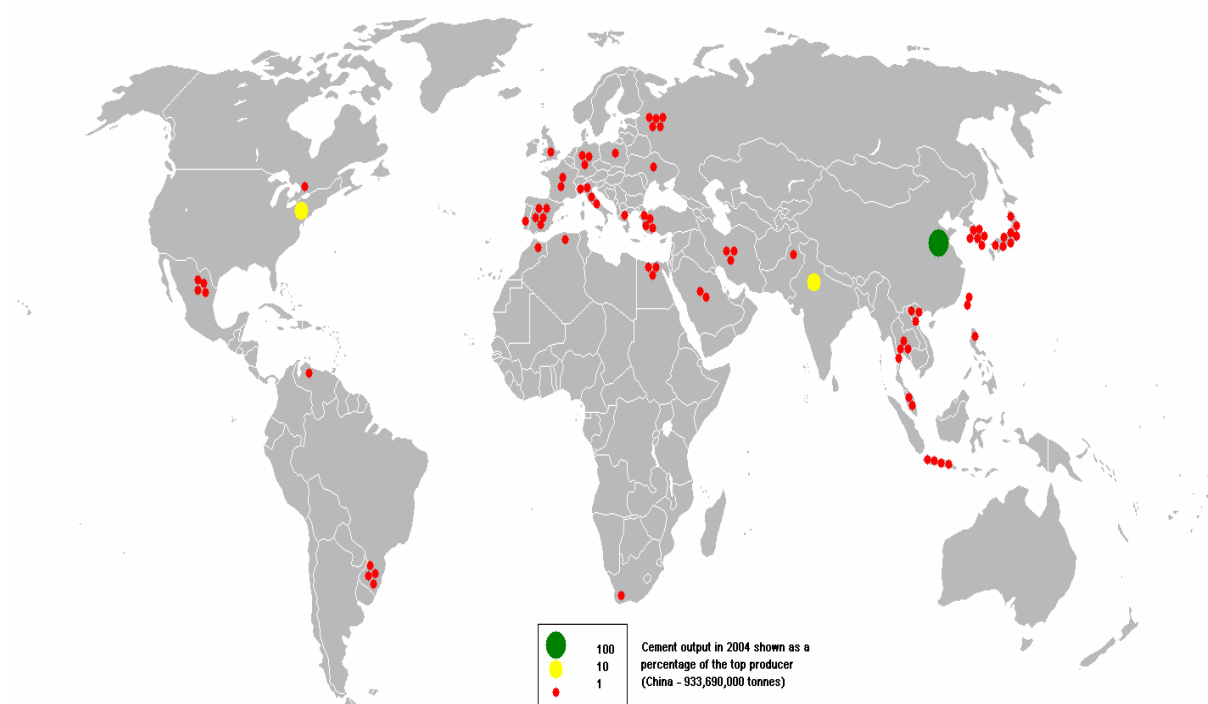
⁷ USGS website, Minerals Information, "Cement," 2007, <http://minerals.usgs.gov/minerals/pubs/commodity/cement/cemenmcs07.pdf> (06-12-07).

⁸ Cembureau website, "Key Facts", no date www.cembureau.be (28-02-08)

⁹ L.J. Hanle, CO2 Emissions Profile of the U.S. Cement Industry, Environmental Protection Agency, 2003, <http://www.epa.gov/ttn/chief/conference/ei13/ghg/hanle.pdf> (06-12-07).

Table 1: Top ten largest producers of hydraulic cement (thousand metric tons)

Country	2000	2001	2002	2003 ^e	2004 ^e
China	597.000	661.040	725.000	862.080	933.690
India (estimated)	95.000	105.000	115.000	123.000	125.000
United States, including Puerto Rico	89.510	90.450	91.266	94.329	99.015
Japan	81.097	76.550	71.828	68.766	67.369
Korea, Republic of	51.255	52.046	55.514	59.194	53.900
Spain, including Canary Islands	38.154	40.512	42.417	45.000	46.790
Russia	32,400	35,300	37,700	41,000	43,000
Turkey	35.825	30.125	32.577	35.077	38.019
Brazil	39.208	38.927	38.027	34.010	38.000
Italy	38.925	39.804	40.000	38.000	38.000
Total	1.660.000	1.750.000	1.850.000	2.020.000	2.130.000

Source: Index Mundi¹⁰**Figure 2: Cement production relative to the largest producer**Source: Wikipedia, based on data from Index Mundi¹¹

China

China produced approximately 1.1 billion tons of cement in 2006.¹² According to a slightly outdated news report, China's cement production reached an annual average growth rate of 6% between 1994

¹⁰ IndexMundi website, Minerals, Cement "Hydraulic Cement: World Production, By Country", no date, http://www.indexmundi.com/en/commodities/minerals/cement/cement_t22.html (28-02-08).

¹¹ Wikipedia website, "Image:2004cement (hydraulic).PNG", no date, http://en.wikipedia.org/wiki/Image:2004cement_%28hydraulic%29.PNG (28-02-08).

¹² USGS website, Minerals Information, "Cement," 2007, <http://minerals.usgs.gov/minerals/pubs/commodity/cement/cemenmcs07.pdf> (06-12-07).

and 2003, with more recent years reaching as high as 10.8%.¹³ One of the significant characteristics of the Chinese cement sector is that it is mostly spurred by government-led investments in infrastructure projects. In 2002, the government's investment in power-road and port projects increased with 18%. This in turn led to a surge in cement production, to keep up with domestic demand. In 2002, 51 new dry kilns came into production, while 242 new dry kilns were under construction in 2003. As the more recent production figures of China are much higher than mentioned in this older source, it can be assumed that this trend has continued over the last years. According to the US-based Freedonia group, cement production is expected to rise a further 5.1% to 1.3 billion tonnes in 2010.¹⁴

The largest issue facing the production of cement in China is environmental damage. The industry is responsible for 42% of China's dust emissions, while it is also considered as one of the major sectors in China's heavy industry, which accounts for 54% of the country's energy use.¹⁵ Due to the tighter environmental controls of recent years, many of the smaller cement factories, traditionally accounting for the lion share of cement production in China, had to close down. These recent developments have resulted in a trend of consolidation, with the number of cement producers halving between 1993 and 2003.

United States

In the United States, 39 companies operate 118 cement plants in 38 states.¹⁶ U.S. cement production not fully consolidated yet, with the largest company producing just over 13% of the industry total, and the top five companies collectively producing around 53%. Interestingly, foreign companies now own approximately 81% of U.S. cement capacity, up from about 22% in 1980. The trend is towards further concentration and vertical integration¹⁷, with a small number of mostly European and Mexican multinational companies increasing their ownership in cement manufacturing plants.

The top three cement producers in the US are Lafarge, Holcim and Cemex. To illustrate the consolidation and vertical integration strategies of these companies, below is given an overview of recent mergers and acquisitions of these companies;

- Lafarge
 - Bought out the remaining shares of its North American subsidiary for \$3 billion
 - Obtained Sun State Rock to enter the Arizona market
 - Purchase of Chicago-based Feltes Sand & Gravel
 - Considering acquiring the Tarmac operations from Anglo American
- Holcim
 - \$3.4 billion acquisition of Aggregate Industries
 - \$231 million acquisition of Meyer Materials
- Cemex
 - \$4.2 billion acquisition of RMC
 - Agreement with Ready Mix USA to create the largest producer of the south-eastern US

¹³ L.Y. Yang, "China's Way Forward Paved in Cement," Asia Times Online, January 2004, <http://www.atimes.com/atimes/China/FA07Ad02.html> (06-11-07).

¹⁴ "Cement demand growth", International Construction, Oct2006, Vol. 45 Issue 8, p7. <http://www.ft.com/cms/s/0/a92c5b5c-f7fc-11db-baa1-000b5df10621.html>

¹⁵ Portland Cement Association website, Cement & Concrete Basics, "Overview of the Cement Industry," no date, <http://www.cement.org/basics/cementindustry.asp> (06-12-07).

¹⁷ Cement Americas website, "U.S. Cement: A Most Integrated Enterprise," no date, http://cementamericas.com/mag/cement_us_cement/ (06-12-07).

- Take-over of Rinker with a price premium paid of over \$15 billion and becoming the country's largest cement producer

India

India has an installed capacity of 157 million tonnes per year, making it the second largest cement producer in the world.¹⁸ As is the case in the United States, several multinational cement producers have built up a larger share of India's cement production industry. For example, Holcim has acquired a 14.8% share in Gujarat Ambuja Cements, the second largest producer in India, while the company was already very active in India previously. This is just one example of the strong consolidation that is taking place in India, as it is in the other large cement producing countries. As opposed to the trends witnessed in China, the role of the public sector has decreased significantly over the last fifteen years.

Figure 3: Location of limestone mines in India

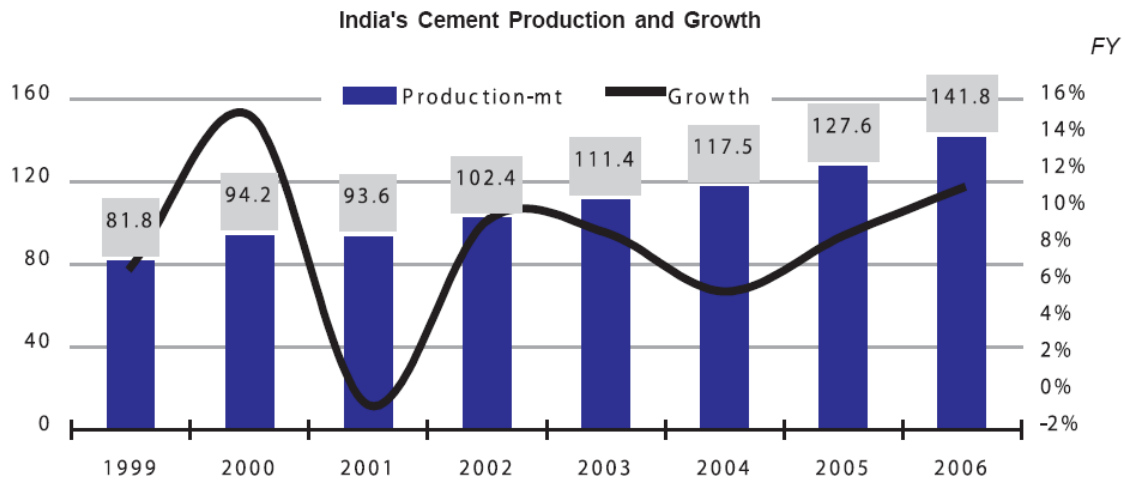


India has steadily phased out the less energy efficient wet manufacturing process and replaced it with the more modern dry process (see Chapter 1). It is expected that all production will make use of the dry process in the near future. The country's production increased 11.2% during 2006, to 142 million

¹⁸ ICRA, *The Indian Cement Industry*, July 2006, <http://icra.in/recentrel/Cement-200607.pdf> (06-12-07).

tonnes. This accounts for a 90.2% utilization rate of the country's installed capacity. Figure 4 shows the trend of India's cement production over the last seven years.

Figure 4: India's cement production and growth



Compiled by ICRA

Source: ICRA

2.2 Trade

The volume of cement traded internationally has traditionally been low relative to domestic consumption. This is due to the nature of cement, which is heavy and takes up large volumes, making it an expensive commodity to transport. According to a shipping consultancy and research company, the annual amount of traded cement accounts for an average of 6-7% of overall production.¹⁹

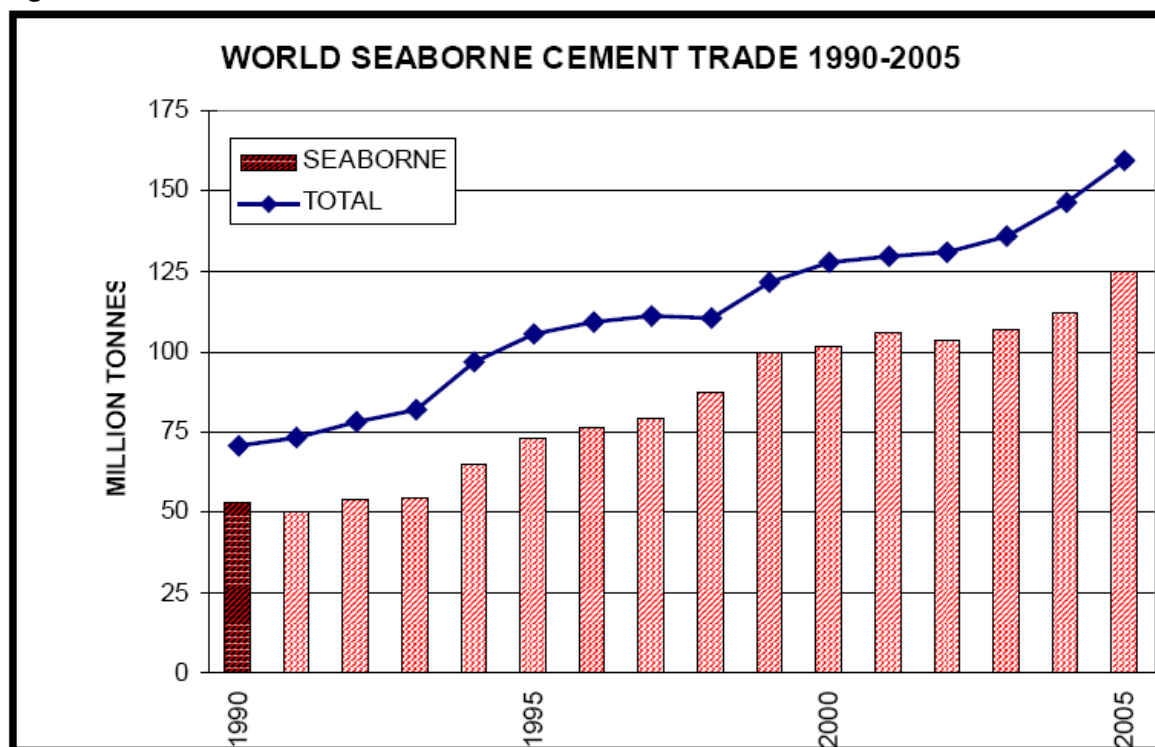
However, there seems to be an upward trend in absolute figures, with global cement trade going up from 128 million tonnes in 2000 to 160 million tonnes in 2006. Recent annual growth in trade has approximated 7.7% in 2004 and 9% in 2005. Comparatively, the estimated annual production growth was 8.2% in 2006.²⁰ Approximately 75-80% of all cement is traded by ship. Figure 5 shows the trend of cement trade by sea.

The relatively low trade figures are mostly accounted for by the enormous production and demand figures in China.

¹⁹ Ocean Shipping Consultants press release, "Global Cement Trade & Shipping Future Outlook To 2015," http://www.osclimited.com/releases/Global_Cement_to_2015.pdf (06-12-07).

²⁰ Calculated from USGS website, Minerals Information, "Cement," 2007, <http://minerals.usgs.gov/minerals/pubs/commodity/cement/cemenmcs07.pdf> (06-12-07).

Figure 5: World seaborne cement trade



Source: Ocean Shipping Consultants

2.3 Imports

Table 2 shows the ten largest cement importing countries in the world. The United States imports by far the most cement, both when measured by value and by net weight. Its import value was over \$2.5 billion in 2006. Spain is the only European country that has significant imports of cement, importing over 12 million tonnes.

Table 2: Global imports 2006

Reporter	Trade Value	NetWeight (kg)
USA	\$2,553,331,474	35,895,944,904
Spain	\$737,121,284	12,356,397,091
Italy	\$340,542,114	4,621,025,113
Netherlands	\$250,292,002	3,873,054,182
France	\$333,411,969	3,687,568,641
Rep. of Korea	\$141,625,690	3,260,128,876
Ghana	\$163,413,617	3,230,817,192
Singapore	\$127,909,094	2,986,054,476
Syria	\$212,592,885	2,812,010,319
Kazakhstan	\$165,412,275	2,610,647,332

Source: UN Comtrade

The United States imports significantly more in relation to its domestic production than the world average. The reported imports of 35 million tons account for approximately 27% of total national demand. While until recently, the United States sourced its largest share of cement imports from neighbouring Canada, for the last few years China has taken over as the leading importer into the US. In the context of the large transportation costs involved with cement trade, this is a surprising

development, as these costs for Chinese cement must be several times higher than for Canadian cement. The United States seems keen on Asian cement in general, as both Thailand and Korea are also large trading partners.²¹

Table 3: Imports of the United States

Partner	Trade Value	NetWeight (kg)
China	\$738,788,287	10,619,724,016
Canada	\$345,148,557	5,059,449,952
Thailand	\$268,166,110	3,798,028,016
Rep. of Korea	\$173,107,281	2,745,012,976
Mexico	\$173,743,457	2,276,116,936
Greece	\$135,493,327	1,949,922,032

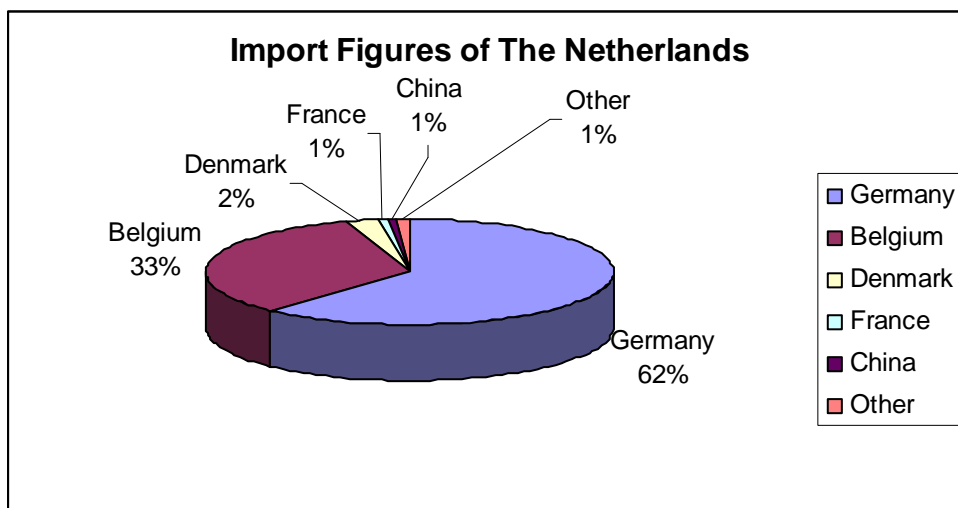
Spain, the second largest importer of cement in the world, also sourced most of its foreign cement from China. 40% of all its cement imports comes from this cement giant, while the remainder of Spain’s imports mostly originates from Mediterranean countries, such as Egypt, Portugal and Italy.

Table 4: Imports of Spain

Partner	Trade Value	NetWeight (kg)
China	\$272,471,071	5,082,996,774
Egypt	\$80,149,720	1,413,581,514
Portugal	\$66,938,717	1,165,856,199
Italy	\$58,830,766	934,561,034
Russian Federation	\$51,775,767	805,405,102

Figure 6 shows the relative shares of cement imported into The Netherlands. Apart from a relatively small amount coming from China, all cement is imported from neighbouring countries.

Figure 6: Import to The Netherlands



²¹ Cement Americas website, "U.S. Cement: A Most Integrated Enterprise," no date, http://cementamericas.com/mag/cement_us_cement/ (06-12-07).

2.4 Exports

Looking at the export figures, it is unsurprising that China leads this chart, as shown in Table 5.²² China exported over 36 million tonnes of cement in 2006, with a total value of more than \$1.1 billion. The two other significant exporters of cement are also in Asia, as Thailand and Japan complete the top three.

Table 5: Global exports 2006

Reporter	Trade Value	NetWeight (kg)
China	\$1,180,621,971	36,129,658,562
Thailand	\$520,744,807	14,980,341,699
Japan	\$269,264,156	10,121,146,931
Germany	\$521,101,000	7,286,091,431
Rep. of Korea	\$212,216,392	6,169,600,038
Canada	\$331,560,586	5,007,076,024
India	\$253,112,892	4,816,156,474
Turkey	\$250,240,781	3,803,691,757
Malaysia	\$137,963,081	3,721,707,074
Greece	\$184,186,904	3,354,438,405

Looking more in depth into China's export, it shows that the US is its largest export destination, followed by Spain and the United Arab Emirates. The US and Spain are the two largest importers of cement, while the enormous construction projects underway in Dubai are a likely explanation for UAE's high import figures of Chinese cement.

Table 6: Exports from China

Partner	Trade Value	NetWeight (kg)
USA	\$410,727,739	10,681,043,764
Spain	\$140,957,595	5,153,919,776
United Arab Emirates	\$76,488,844	2,752,280,552
Nigeria	\$51,647,382	1,671,807,016
Rep. of Korea	\$57,155,082	1,604,290,724
Italy	\$41,724,459	1,502,837,248
Bangladesh	\$31,612,418	1,238,636,992

The second largest exporter of cement, Thailand, also exports most of its produce to the USA, while it is also heavily involved in more regional trading with Vietnam, Bangladesh and Cambodia.

Table 7: Export from Thailand

Partner	Trade Value	NetWeight (kg)
USA	\$149,100,066	3,608,991,768
Vietnam	\$85,181,789	2,908,641,832
Bangladesh	\$71,721,441	2,285,307,168
Cambodia	\$72,510,544	2,080,905,752
United Arab Emirates	\$18,286,225	603,193,952
Spain	\$16,237,290	551,195,752
Lao People's Dem. Rep.	\$21,416,770	456,858,361

²² It should be noted that the export figures might not match the corresponding import figures. For more details on the data collection, see the UN Comtrade website.

Finally, the export figures of Japan show the high rationality of cement trading, as both of its two largest destination countries, Korea and Singapore, are in the close proximity.

Table 8: Export from Japan

Partner	Trade Value	NetWeight (kg)
Rep. of Korea	\$44,874,946	1,609,957,960
Singapore	\$38,966,079	1,522,065,024
Nigeria	\$22,709,498	796,520,032
Malaysia	\$18,131,844	751,070,008
China	\$13,631,517	725,943,000
Australia	\$18,751,408	647,572,016
Kuwait	\$20,191,448	628,994,976

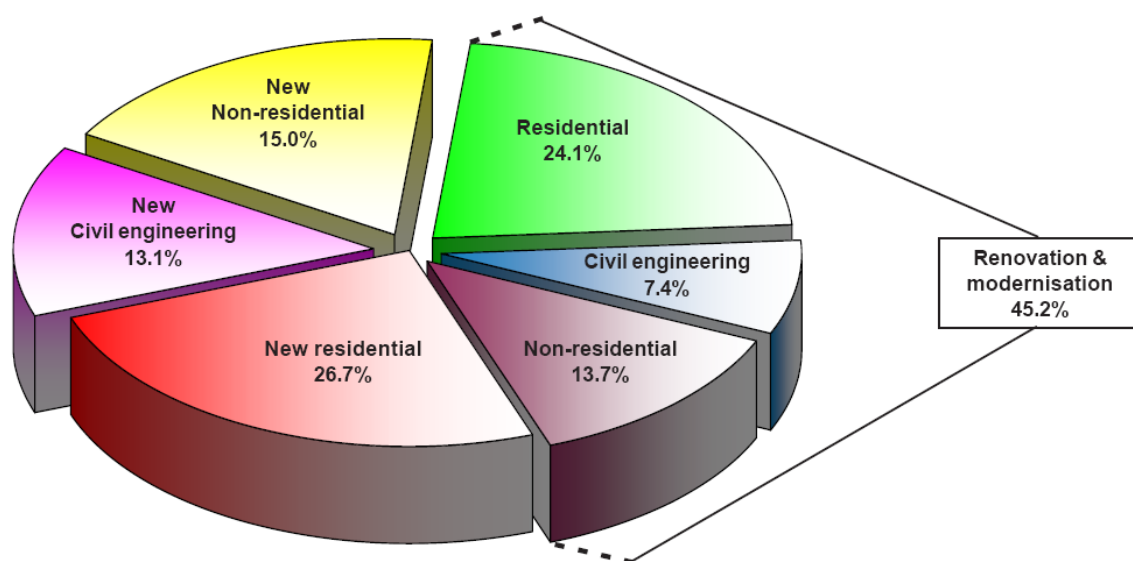
2.5 Consumption

Several figures were available for the consumption of cement in Europe and North America. No information was found about consumption in emerging economies or the Middle East. Figure 7 shows the relative shares of end users sectors for their demand of cement in Europe.

Figure 7: Relative demand figures per end using sector
2006 CONSTRUCTION VOLUME - BREAKDOWN PER SECTOR*

Billion EUR: 1 419

* European Union 25 less Cyprus, Greece, Luxembourg, Malta, Slovenia, plus Switzerland and Norway



Source: EUROCONSTRUCT and VTT

CEMBUREAU EL - MAY 2007

European consumption of cement is lead by Spain, who is also the largest producer and importer of the material. Figure 8 shows the consumption of Europe per region.

Figure 8: Cement consumption in Europe

CEMENT CONSUMPTION 2006

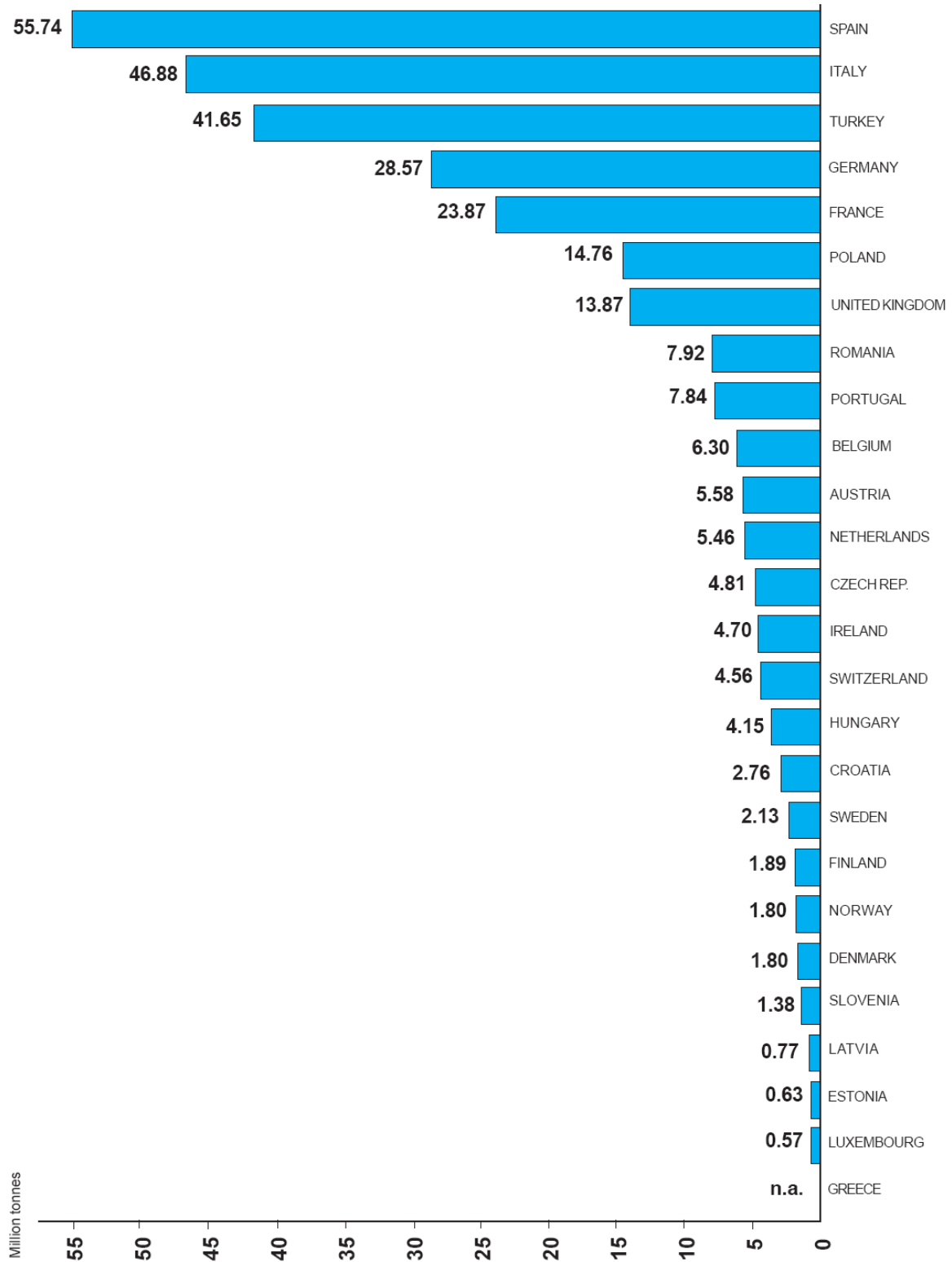


Figure 9 shows a number of statistics for cement in the United States, including its overall consumption, which was estimated to be 128 million tonnes in 2005. To put these figures in perspective, it is expected that demand for cement in China will reach 1.3 billion tonnes in 2010.²³

Figure 9: Cement statistics for the United States

SALIENT CEMENT STATISTICS¹

(Thousand metric tons and thousand dollars unless otherwise specified)

	2001	2002	2003	2004	2005
United States: ²					
Production:					
Cement ³	88,900	89,732	92,843	97,434	99,319
Clinker	78,451	81,517	81,882	86,658	87,405
Shipments from mills and terminals: ^{4,5}					
Quantity	112,510	108,500	111,000	120,000	127,000
Value ⁶	8,600,000	8,250,000	8,340,000	9,520,000 [†]	11,600,000
Average value ⁷ dollars per metric ton	76.50	76.00	75.00	79.50	91.00
Stocks at mills and terminals, yearend	6,600	7,680	6,610	6,710	7,390
Exports of cement and clinker	746	834	837	749 [†]	766
Imports for consumption:					
Cement ⁸	23,694	22,198	21,015	25,396	30,403
Clinker	1,782	1,603	1,808	1,630	2,858
Total ⁹	25,474	23,801	22,823	27,026	33,261
Consumption, apparent ¹⁰	112,810	110,020	114,090	121,980 [†]	128,280
World, production ^{6,11}	1,740,000 [†]	1,850,000	2,030,000 [†]	2,190,000 [†]	2,310,000

²³ Market Research website, Report Information, "Cement in China", no date, <http://www.marketresearch.com/product/display.asp?productid=1331744&q=1> (28-02-08).

3 Company profiles

This chapter gives an overview of three of the largest multinational players in the cement industry, to complement the sector overview in the previous chapter. The three companies that are profiled here are all based in Europe; Holcim in Switzerland, Lafarge in France and Heidelberg in Germany. Other major players in the sector include Cemex from Mexico and Titan from Greece.

A quick overview is given of the company's structure, its financial status, its production and employment figures, and its CSR policies. These policies are only mentioned here, as it was beyond the scope of this research to analyse the policies on the basis of actual performance. This could be included in further studies.

3.1 Holcim

Holcim is a Swiss cement producer, and is one of the largest multinational players in the sector. It was founded in 1912 and operates in 70 countries worldwide.

Overview

	
Headquarters	Holcim Ltd. Hagenholzstrasse 83, CH-8050 Zurich, Switzerland
2006 Sales (mil.)	€15170M
2006 Net Income (mil.)	€3852M
2006 Employees	88,783
CEO	Markus Akermann

Corporate structure

Holcim's corporate structure is based on its regional activities. The holding company is based in Switzerland, while the five group regions are Europe, North America, Latin America, Africa and Middle East, and Asia Pacific.²⁴ Additionally, Holcim also has three so-called 'service companies', around Trading, Group Support and White cement.

²⁴ Holcim Annual Report 2006, http://www.holcim.com/gc/CORP/uploads/Holcim_AnnualReport06_e.pdf (06-12-07).

Figure 10: Holcim's organisational structure

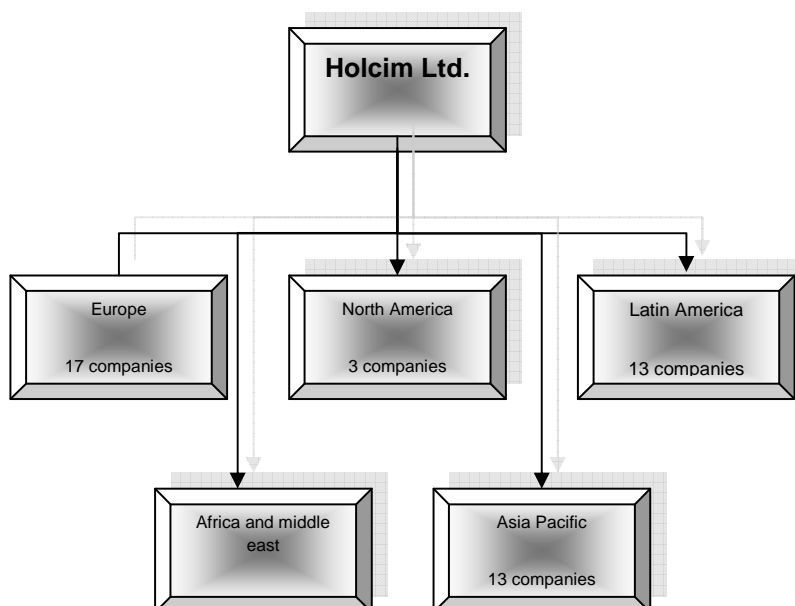


Figure 11 shows Holcim's principal financial and holding companies, as listed in their annual report.

Figure 11: Holcim's financial and holding companies

Principal finance and holding companies

	Nominal share capital in 000	Participation (voting right)
Holcim Ltd, Switzerland	CHF 510,697	100.0%
Aggregate Industries Holdings Limited, UK	GBP 505,581	100.0%
Holcibel S.A., Belgium	EUR 831,000	100.0%
Holcim Auslandbeteiligungs GmbH (Deutschland), Germany	EUR 2,556	100.0%
Holcim Beteiligungs GmbH (Deutschland), Germany	EUR 102,000	100.0%
Holcim Capital Corporation Ltd., Bermuda	USD 2,630	100.0%
Holcim Capital (Thailand) Ltd., Thailand	THB 1,100	100.0%
Holcim (Centroamérica) B.V., Netherlands	USD 655,019	100.0%
Holcim European Finance Ltd., Bermuda	EUR 25	100.0%
Holcim Finance (Australia) Pty Ltd, Australia	AUD 0	100.0%
Holcim Finance (Belgium) SA, Belgium	EUR 62	100.0%
Holcim Finance (Canada) Inc., Canada	CAD 0	100.0%
Holcim Finance (Luxembourg) SA, Luxemburg	EUR 1,900	100.0%
Holcim GB Finance Ltd., Bermuda	GBP 8	100.0%
Holcim (India) Private Limited, India	INR 18,385,105	100.0%
Holcim Investments (France) SAS, France	EUR 15,551	100.0%
Holcim Investments (Spain) S.L., Spain	EUR 60,003	100.0%
Holcim Overseas Finance Ltd., Bermuda	CHF 16	100.0%
Holcim Participations (UK) Limited, UK	GBP 0	100.0%
Holcim Reinsurance Ltd., Bermuda	CHF 1,453	100.0%
Holcim US Finance S.à r.l. & Cie S.C.S., Luxemburg	USD 10	100.0%
Holderfin B.V., Netherlands	EUR 3,423	100.0%

Financial figures

Table 9 shows a selection of Holcim's financial performance indicators.

Table 9: Financial figures Holcim 2006

Financial figures 2006	
Balance sheet	
Total current assets	€6,050M
Total long term assets	€21,711M
Total short-term liabilities	€5,355M
Total long term liabilities	€10,780M
Total shareholders' equity	€11,630M
Statement of income	
Net Sales	€15,170M
EBITDA	€3,852M
Net Profit	€2,775M

Source: Holcim Annual Report 2006

Figure 12 shows the division of sales per regional group.

Figure 12: Net sales by region

Net sales by region	2006		2005	
Million CHF				
Europe	8,673	35.1%	7,037	36.9%
North America	5,520	22.3%	4,704	24.7%
Latin America	3,675	14.9%	3,158	16.6%
Africa Middle East	2,086	8.5%	1,873	9.8%
Asia Pacific	4,745	19.2%	2,288	12.0%

Production and employment

Holcim operates a total of 152 cement and grinding plants, with a total production capacity of 197.8 million tonnes.²⁵ In 2006, the company sold 140.7 million tonnes, which would indicate a utilization rate of 71%. The company conducts a strategy of active growth of capacity, most notably in India. Here, Holcim has an annual capacity of 38.2 million tonnes, through its mergers with Gujarat Ambuja Cements and ACC. Between now and 2010, the company is commissioning 25 million tonnes of additional capacity in India.

The group employs a total of 88,783 employees. Table 10 shows the geographical distribution of employees. The high figure of employees in Asia is mostly due to the recent takeover of Gujarat Ambuja and ACC, which contributed to the 200% rise in employees in this region.²⁶

²⁵ Holcim, *Holcim at a Glance*, 2006, www.holcim.com/gc/CORP/uploads/Holcim_at_a_Glance_2006.pdf (07-12-07).

²⁶ Holcim annual report 2006, p.59.

Table 10: Employees in 2006

Holcim	
Europe	22,006
North America	11,268
Latin America	12,234
Africa Middle East	5,218
Asia Pacific	37,212
Corporate	845
Total	88,783

CSR approach

A short scan of the company's CSR policies reveals that it is a member of the following CSR initiatives and endorses the following codes;

- WBCSD's Cement Sustainability Initiative
- UN Global Compact
- GRI
- Strategic alliance with German Technical Cooperation (GTZ)

Holcim is present on the following sustainability indexes;

- Dow Jones Sustainability Index
- FTSE4Good
- Ethibel

In its own sustainability policy documents, Holcim makes mention of the following principles

- Social
 - employee training
 - no discrimination
 - relative high wages
 - app. 50% member trade union
 - occupational health and safety
 - community involvement
- Environmental
 - CO₂ reduction
 - fuel and raw material usage reduction
 - co-processing waste materials (waste as kiln fuel)
 - reduction of other emissions (NO_x, SO₂)
 - quarry rehabilitation
 - biodiversity management
 - water usage
 - solid waste
 - recycling
- Economic
 - product stewardship
 - promotion of sustainable products
 - low cost housing

- Operational principles
 - stakeholder involvement
 - supplier screening
 - transparency
 - external verification (KPMG)

3.2 Lafarge

Lafarge is the world’s largest producer of cement. It is a France-based company, that originates from 1833.

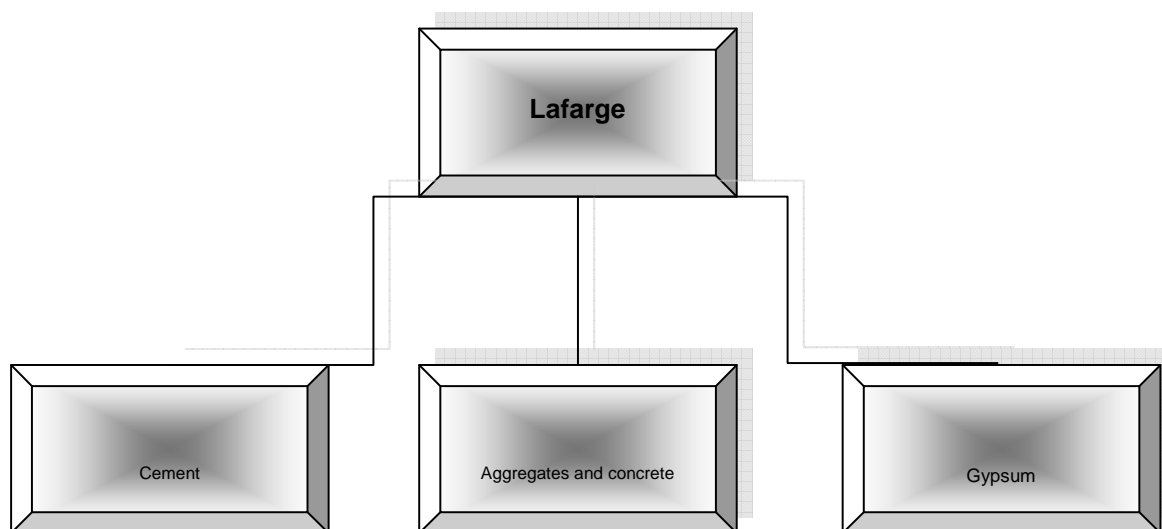
Overview

Headquarters	Lafarge SA 61 rue des Belles Feuilles, BP 40 – 75782 Paris Cedex 16
2007 Sales	€17,614M
2007 Net Income	€3,242M
2006 Employees	77,721
CEO	Bruno Lafont

Corporate structure

Lafarge has structured its operations around three divisions; Cement, Aggregates & Concrete, and Gypsum. There is a high level of vertical integration both within and across these divisions. For example, the Cement division supplies cement to the Aggregates & Concrete division, which mixes it with its internally produced aggregates to produce concrete.

Figure 13: Lafarge's corporate structure



The following tables give an overview of Lafarge's global presence

Figure 14: Lafarge's operations in Western Europe

WESTERN EUROPE (30% OF THE DIVISION'S 2007 SALES)

Countries	Number of		Cement production capacity (million tonnes)	Approximate market share (%)
	Cement plants	Grinding plants		
France	10	2	9.3	36
United Kingdom	7	-	7.5	41
Greece	3	-	9.8	53
Spain	3	1	5.2	10
Germany	3	-	3.4	10
Austria	2	-	1.9	28
Italy	2	-	1.2	2

Figure 15: Lafarge's operations in North America

NORTH AMERICA (18% OF THE DIVISION'S 2007 SALES)

Countries	Number of		Cement production capacity (million tonnes)	Approximate market share (%)
	Cement plants	Grinding plants		
United States	12	1	15.8	13
Canada	7	0	7.0	33

Figure 66: Lafarge's operations in Central and Eastern Europe

CENTRAL & EASTERN EUROPE (11% OF THE DIVISION'S 2007 SALES)

Countries	Number of		Cement production capacity (million tonnes)	Approximate market share (%)
	Cement plants	Grinding plants		
Poland	2	-	4.4	20
Romania	2	1	4.5	32
Moldavia	1	-	1.4	54
Russia	2	-	4.1	7
Ukraine	1	-	1.3	9
Serbia	1	-	2.0	45
Slovenia	1	-	0.6	38
Czech Republic	1	-	1.2	9

Figure 17: Lafarge's operations in the Mediterranean Basin and Middle East

MEDITERRANEAN BASIN & MIDDLE EAST (6% OF THE DIVISION'S 2007 SALES)

Countries	Number of		Cement production capacity (million tonnes)	Approximate market share (%)
	Cement plants	Grinding plants		
Jordan	2	-	4.8	90
Morocco	3	1	5.7	41
Turkey	1	1	1.7	4
Egypt*	2	-	3.2	8

Figure 18: Lafarge's operations in Latin America
LATIN AMERICA (6% OF THE DIVISION'S 2007 SALES)

Countries	Number of		Cement production capacity (million tonnes)	Approximate market share (%)
	Cement plants	Grinding plants		
Brazil	6	1	5.0	6
Chile	1	-	1.6	34
Venezuela	2	-	1.6	23
Ecuador	1	-	0.7	20
Honduras	1	1	1.2	55
Mexico	2	-	0.7	0.4
French West Indies/Guyana	-	3	1.0	100

Figure 19: Lafarge's operations in Sub-saharan Africa
SUB-SAHARAN AFRICA (14% OF THE DIVISION'S 2007 SALES)

Countries	Number of		Cement production capacity (million tonnes)	Approximate market share (%)
	Cement plants	Grinding plants		
South Africa	1	1	2.7	20
Zambia	2	-	0.7	91
Malawi	-	1	0.2	75
Tanzania	1	-	0.3	38
Kenya	1	1	2.0	60
Uganda	1	-	0.3	56
Nigeria	3	-	3.0	30
Cameroon	1	1	1.1	95
Benin	1	-	0.7	34

Figure 20: Lafarge's operations in Asia
ASIA (15% OF THE DIVISION'S 2007 SALES)

Countries	Number of		Cement production capacity (million tonnes)	Approximate market share (%)
	Cement plants	Grinding plants		
China	18	10	23.4	1.3
South Korea	1	2	9.6	10
India	2	1	5.5	3
Malaysia	3	1	12.0	43
Philippines	6	1	6.5	32
Indonesia	1	-	0.0 *	3
Vietnam	-	1	0.5	1
Bangladesh	1	-	1.6	-**

Financial figures

Table 11 shows Lafarge's financial figures.

Table 11: Lafarge's financial figures

2007	
Balance sheet	
Total current assets	€6,818M
Total long term assets	€21,490M
Total short-term liabilities	€5,511M
Total long term liabilities	€10,720M
Total shareholders' equity	€10,998M
Statement of income	
Revenue	€17,614M
EBITDA	€3,242M
Net Income	€2,156M

Production and employment

At the end of 2007, Lafarge operated 124 cement plants and 32 clinker grinding plants. In total, the company has a production capacity of 178 million tonnes of cement per year. Of this, it sells approximately 136 million tons each year.

The company employed 77,721 employees at the end of 2007, which is a sharp decrease of almost 16% from 2006, when it employed 92,466 employees. Europe was the continent where this decrease was the most prominent. Table 2 shows the geographical distribution;

Table 12: Lafarge's employees

Lafarge	
Western Europe	18,124
North America	15,417
Mediterranean Basin	3,889
Central and Eastern Europe	8,569
Sub-Saharan Africa	7,196
Latin America	4,847
Asia	19,679
Total	82,734

CSR approach

A short scan of the company's CSR policies reveals that it is a member of the following CSR initiatives and endorses the following codes:

- UN Global compact
- Global Business Coalition
- WBCSD's Cement Sustainability Initiative
- GRI
- Sustainable Buildings and Construction Initiative (SBCI)
- "Bâtiment-Energie" Foundation

In its own sustainability policy documents, Lafarge makes mention of the following principles:

- Social
 - employee training
 - no discrimination
 - salaries
 - unions (82% workforce collective agreement)
 - occupational health and safety
 - core ILO norms
 - HIV/AIDS policy
- Environmental
 - CO₂ reduction
 - fuel and raw material usage reduction
 - sourcing of raw materials
 - reduction of other emissions (NO_x, SO₂, dust)
 - quarry rehabilitation
 - biodiversity management
 - water consumption
- Economic
 - long-term relations with local communities
 - social & economic contribution to local communities²⁷
 - stakeholder relationships management guidelines²⁸
- Operational principles
 - stakeholder evaluation of CSR report
 - supply chain management
 - independent audit on environment
 - external verification of CSR report (Ernst & Young)

3.3 Heidelberg

Heidelberg Cement is a German building materials company that was founded in 1873 in the town of Heidelberg.

Overview

	
Headquarters	HeidelbergCement AG Berliner Strasse 6, 69120 Heidelberg, Germany
2007 revenues	€ 10,805M
2007 Net Income	€ 2,119M
2007 Employees	67,916
Chairman of the Managing Board	Bernd Scheifele

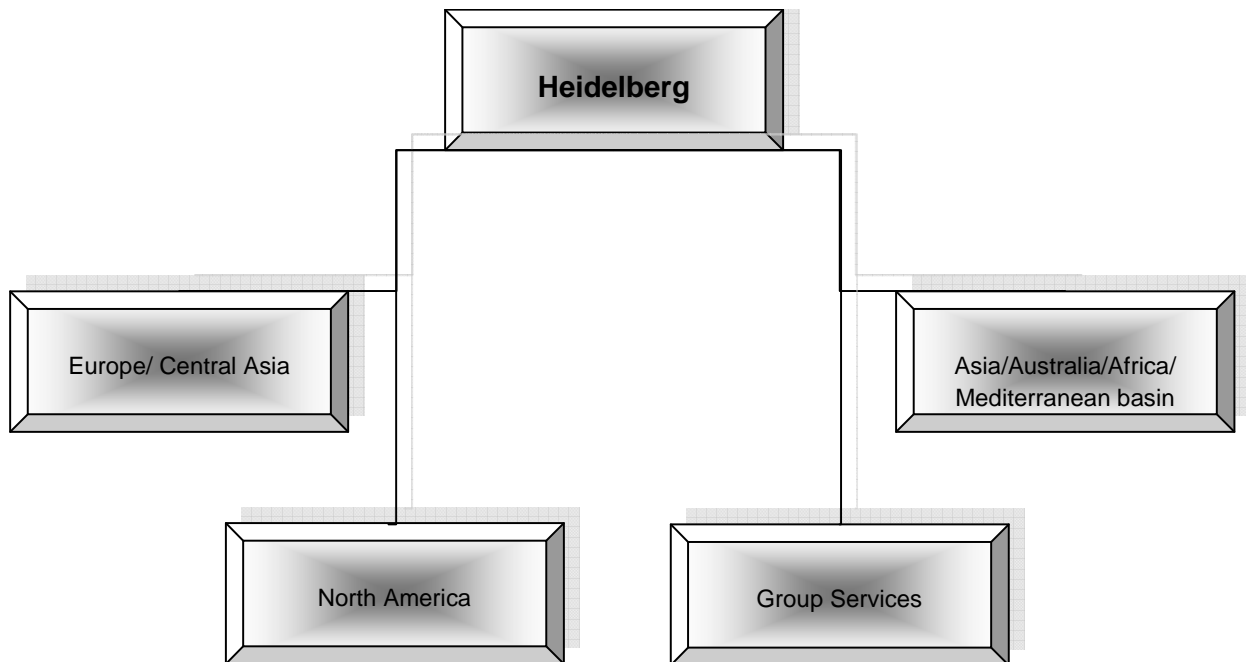
²⁷ Olivier Luneau, Directeur Developpement Durable et Affaires Publiques Senior Vice President Sustainable Development and Public Affairs, Lafarge, email, 19 May 08.

²⁸ Ibid.

Corporate structure

Heidelberg has recently undergone a 'restructuring and organisational shuffle'.²⁹ The company has now structured its core activities of production and distribution of cement, gravel, sand ready-mixed concrete and building materials around the five organisational groups shown in Figure. Three of the groups are based around geographical activities, while the maxit Group is the dry-mortar producing branch, and Group Services comprises the company's trading and fuel activities. Heidelberg is active in around 50 countries worldwide.

Figure 21: Heidelberg's operational structure



Financial figures

Table 13: Financial figures 2007

Heidelberg	
Balance sheet	
Total current assets	€4,947M
Total long term assets	€22,929M
Total short-term liabilities	€4,776M
Total long term liabilities	€16,628M
Total shareholders' equity	€7,519M
Statement of income	
Operating revenues	€10,805M
EBITDA	€2,378M
Net profit	€2,119M

²⁹ Heidelberg annual report 2006, p.18.

Production and employment

Heidelberg has a total production capacity of 100 million tonnes of cement per year.³⁰ Total cement sales in 2007 amounted to a 88 million tonnes.³¹ Tables 14 to 18 give an overview of the plants Heidelberg operates in the various regions where it is active.

Table 14: number of plants in Europe & Central Asia

Type of plant	Amount
Cement kilns	39
Grinding Plants	9
Cement terminals	79
Ready-mixed concrete	890
Concrete products	58
Aggregates	316
Asphalt	48
Building materials	21

Source: Communication with Heidelberg

Table 15: number of plants in North America

Type of plant	Amount
Cement kilns	14
Grinding Plants	3
Cement terminals	83
Ready-mixed concrete	189
Concrete products	105
Aggregates	234
Asphalt	40
Building materials	13

Table 16: number of plants in Asia

Type of plant	Amount
Cement kilns	10
Grinding Plants	6
Cement terminals	9
Ready-mixed concrete	75
Aggregates	25
Asphalt	18

Table 17: number of plants in Africa

Type of plant	Amount
Cement kilns	2
Grinding Plants	9

Table 18: number of plants in the Mediterranean basin

Type of plant	Amount
Cement kilns	4
Grinding Plants	1
Cement terminals	3
Ready-mixed concrete	24
Concrete products	3
Aggregates	2

³⁰ Sustainability report.

³¹ Dr. Brigitte Fickel, Director Group Communication, Heidelberg Cement, email 16 May 2008.

Heidelberg currently employs 67,915 people worldwide. Table 19 shows the geographical distribution.

Table 19: Heidelberg's employee distribution

Segment	Number of employees
Europe/Central Asia	30,597
North America	19,267
Asia, Africa, Mediterranean Basin	17,999
Group Services	52

CSR approach

A short scan of the company's CSR policies reveals that it is a member of the following CSR initiatives and endorses the following codes;

- Endorsed initiatives³²
 - WBCSD Cement Sustainability Initiative
 - Clean Development Mechanism from the Kyoto Protocol
 - GRI
 - Initiative for Sustainability in the German cement industry
 - Econsense
 - BDI's Industry for Climate Protection initiative
 - Carbon Disclosure Project
- Social
 - occupational health and safety
 - noise control
 - freedom of association
 - discrimination
 - employee training
 - HIV/AIDS prevention
 - local employees in management positions
 - economic impetus for locations
- Environmental
 - energy and climate protection
 - biodiversity
 - CO₂ reduction
 - alternative raw materials and fuels
 - emissions (dust, SO_x & NO_x)
 - water usage
 - solid waste
 - biodiversity
 - subsequent use of quarries
- Economic
 - fair competition
- Operational
 - encourage sustainability in suppliers

³² Heidelberg sustainability report, p.34-35.

4 Issues

4.1 Emissions

Within the production chain of cement, most emissions are generated during the production phase. Here the characteristics of limestone, the raw materials needed to produce cement, are altered in such a way that CO₂ is released. Additionally, the energy that is used in the production also releases CO₂, as well as NO_x. On top of these two types of emissions, SO₂ cement dust, CO, dioxins and furans, PCB, PAH, BTEX, HCl and HF and trace elements such as mercury can also be emitted.³³

CO₂

The production of cement is a chemical process where large amounts of CO₂ are produced, unavoidably because of the high temperatures needed and the chemical decomposition of limestone.³⁴ This chemical process amounts to 60% of CO₂ produced, with the other 40% coming from the fuels needed in the process.³⁵ Cement can only partially be recycled in road applications, necessitating the production of cement for the majority of newly build buildings and roads.

The cement industry currently accounts for a whopping 5% of total global emissions of CO₂. This makes it the largest single material source of emissions in the world. The situation is likely to worsen, as the demand from emerging economies such as China and India is expected to double in the coming years. The development of greener production techniques only partially compensates for this dramatic increase in quantity. The best emissions reducing technologies manage to reduce the CO₂ output of a single plant by 20%.³⁶ However, as Julian Allwood, a professor of engineering at Cambridge University, was quoted: "If demand doubles and the best you can do is to reduce emissions by 30 percent, then emissions still rise very quickly."

Reduction measures such as emission caps and carbon trading schemes in the European Union do not seem to significantly improve the situation. As an article in the International Herald Tribune explains, "[t]he European Union subsidizes Western companies that buy outmoded cement plants in poor countries and refit them with green technology".³⁷

As the emissions caps of the EU effectively limit the production of cement within its member states, such trading schemes allow for European companies to increase their overall production by buying up plants in Eastern Europe. Consequently, this accelerates the overall CO₂ emissions, rather than establish the reduction that it intends.³⁸ However, the argument can be made that production of cement in developing countries is determined by the increase in demand, and that the greening of outdated plants in itself can be regarded as a positive development.

³³ Wikipedia; for list of abbreviations used here, see http://en.wikipedia.org/wiki/Cement_kiln.

³⁴ "The unheralded polluter: cement industry comes clean on its impact", The Guardian, Environment, 12 October 2007, <http://www.guardian.co.uk/environment/2007/oct/12/climatechange> (28-02-08).

³⁵ The International Herald Tribune website, Business, "In booming economies, cement is crucial for growth but an enemy of green", 21-10-07, <http://www.iht.com/articles/2007/10/21/business/cement.php> (28-02-08).

³⁶ Ibid.

³⁷ Ibid.

³⁸ In a reaction to the first draft of this report, a Lafarge representative denied that investments in Eastern Europe are motivated by CO₂ schemes, as Lafarge is short of its emission allocations in Western Europe. Investments in these regions are caused by the increase in demands. The same representative is quoted in the sourced article, stating "Because of our initiatives, emissions are growing slower than they would without the interventions".

Lafarge's mercury emissions in the US

Lafarge has received criticism for its mercury emissions from two different cement kilns in the United States. The environmental NGO Earthjustice has published an open letter it wrote to the commissioner of the New York State Department of Environmental Conservation regarding Lafarge's cement plant in Ravena, New York.³⁹ The Huron Environmental Action League, a local environmental NGO in Michigan, has clashed with Lafarge over the hazardous waste pollution and mercury air emissions at its Alpena, Michigan cement plant.⁴⁰

Dust clouds in Mozambique

Environmental NGOs, local residents and nearby factories have protested together to stop the emission of clouds of cement dust coming from a factory in the southern city of Matola in Mozambique, owned by the Portuguese company Cimentos de Mocambique.⁴¹ The argument by the company that the emissions are caused by malfunctioning electro-filters were not accepted by the protestors, who believe the company should stop operations at those times when dust is emitted.

The company had earlier come under civil society scrutiny because of the incineration of obsolete pesticides dumped in Mozambique by wealthier nations. These pesticides were not stored safely and the plant did not have adequate safety measures to secure a safe incineration process.⁴²

Energy demand in China

The cement industry in China is seen as one of the country's largest contributors to its rapidly increasing pollution caused by energy use.⁴³ China's heavy industry, including cement, consumes 54% of China's energy, up from 39% five years ago.

4.2 (Hazardous) waste as fuel

Several international and local campaigns have been initiated over the last year in protest against the widespread use of waste, some hazardous, as fuel for cement kilns. An example of such a campaign is by the South African NGO Groundwork, who opposes all forms of waste incinerations in cement kilns, and has lobbied the South African government for a ban on such practices.⁴⁴ The main argument is that waste incineration creates dioxins and that allowing companies to burn waste in South Africa is in direct violation of the Stockholm Convention, to which the country is a signatory.

The industry has, in response to a number of such allegations, commissioned its own research, in which it concluded that co-processing of alternative fuels does not influence the emissions of dioxins.⁴⁵

³⁹ Earthjustice, Friends of Hudson, New York Public Interest Research Group, Physicians for Social Responsibility & Sierra Club Atlantic Chapter, Open Letter to the Governor of New York, October 2007, <http://www.earthjustice.org/library/signon/letter-to-nysdec-to-limit-mercury-from-cement-kilns.pdf> (28-02-08).

⁴⁰ "Cement plants' mercury emissions draw closer scrutiny", The Associated Press State & Local Wire, October 19, 2006.

⁴¹ CorpWatch website, Issues, Environment, "MOZAMBIQUE: Cement Company Tries to Explain Pollution", July 2006, <http://www.corpwatch.org/article.php?id=13897> (28-02-08).

⁴² Oxfam Australia website, Oxfam News Magazine, "Toxic waste victory in Mozambique", no date, http://www.oxfam.org.au/oxfamnews/february_2003/mozambique.html (28-02-08).

⁴³ "China pollution fuelled by heavy industry", Financial Times, Sec. World, Asia-Pacific, China, May 2007, <http://www.ft.com/cms/s/0/a92c5b5c-f7fc-11db-baa1-000b5df10621.html> (28-02-08).

⁴⁴ Groundwork press release, "Cement Kilns: South Africa's New Hazardous Waste Dump Sites", 29-03-06, <http://www.groundwork.org.za/Press%20Releases/30March06.asp> (05-05-08).

⁴⁵ SINTEF, *Formation and Release of POPs in the Cement Industry*, January 2006, World Business Council for Sustainable

This sector scan did not allow sufficient time to analyse this difference in perception, and does not attempt to come to conclusive answers regarding the effects of incinerating waste in cement kilns. Rather, this section gives an overview of known campaigns and controversies.

Lafarge burning tires in Ontario

Lafarge has been burning tires as fuel to provide energy for its cement kiln in Ontario, Canada. Members of the local community of Bath, as well as environmentalists, have protested the decision of the government to allow Lafarge's operations, without a proper environmental impact assessment beforehand. The Environmental Review Tribunal have now accepted the case and are willing to listen to the complaints.⁴⁶ This review, was initiated in December 2007 with a preliminary hearing, where the Lafarge lawyer called for an adjournment of the case pending the outcome of another legal case.⁴⁷

FoE campaigning against UK protocol on substitute fuels

In 2005, Friends of the Earth UK was campaigning against the revisions of the Substitute Fuels Protocol in the UK.⁴⁸ According to FoE, this protocol would allow companies to burn waste as fuel, including hazardous waste, more easily. The revisions were also of concern because it would limit community influence, allow for greater NOx emissions, and would increase the distance waste travels, before it is used. This scan does not allow for further investigation into the outcomes of this campaign. In a reaction to this report, Heidelberg Cement indicated that it did not notice higher emissions of NOx due to the use of waste as fuel.⁴⁹

Cement kilns partial target of greater hazardous waste campaign by Greenpeace

According to Greenpeace, "emissions of dioxins are eight times higher from cement kilns burning hazardous waste, compared with those that do not".⁵⁰ The organisation also did a study which showed that it could be economically more profitable for those plants currently incinerating waste to switch back to conventional fuels.⁵¹ As part of the campaign, the Spanish branch of Greenpeace protested against the incineration of waste by a Holcim cement plant in Carboneras, by blockading a truck leaving the plant.⁵²

4.3 Solid waste and water pollution

Pollution of the Yangtze river

The Chinese State Environmental Protection Agency (SENA) issues the closing of a number of the most polluting factories around the Yangtze river in June 2007. The SENA published the names of the

Development, http://www.wbcsd.org/DocRoot/piF5rKj2ulwpFpYRMI8K/formation_release_pops_second_edition.pdf (21/05/08).

⁴⁶ "Lafarge-Tire-Burning", Broadcast News (BN), April 11, 2007.

⁴⁷ The Whig Standard website, "Lafarge emissions within legal limit", 04-12-07, <http://www.thewhig.com/ArticleDisplayGenContent.aspx?e=4436> (05-05-08).

⁴⁸ Friends of the Earth, Briefing: Burning waste in cement and lime kilns, July 2005, http://www.foe.co.uk/resource/briefings/waste_in_cement_kilns.pdf (28-02-08).

⁴⁹ Dr. Brigitte Fickel, Director Group Communication, Heidelberg Cement, email 16 May 2008.

⁵⁰ Greenpeace International website, What we do, Eliminate Toxic Chemicals, "The Problem", no date, <http://www.greenpeace.org/international/campaigns/toxics/incineration/the-problem> (28-02-08).

⁵¹ Greenpeace International website, What we do, Eliminate Toxic Chemicals, "Alternatives to Incinerations", no date, <http://www.greenpeace.org/international/campaigns/toxics/incineration/alternatives-to-incineration> (28-02-08).

⁵² Greenpeace International website, Greenpeace news, "Cement Plant Blockade", October 2002, <http://www.greenpeace.org/international/news/cement-plant-blockade> (28-02-08).

companies who were forced to close down permanently or stop production temporarily. Included in this list of names are a number of cement plants, including the Wanwei chemical and cement plant in the province of Chaohu.⁵³ This company, employing 4,200 workers, was forced to close down and could not reopen until it had cleaned its pollution. While this cement factory undoubtedly contributed to the pollution of the river, it should be noted that some questioned the move by Sepa as it singled out a number of companies and it is suspected that all these companies were selected because of its bad connections with local officials.⁵⁴

Oil spill in Lebanon

A Lebanese cement plant owned by Holcim spilled 50 tonnes of oil, used to fuel its cement productions into nearby waters, killing wildlife, including birds and fish, and damaged the livelihoods of local fishermen.⁵⁵

Ship carrying toxic ashes from a Lafarge plants sank off the coast of Turkey

In September 2004, the ship MV Ulla, carrying a load of toxic, cancer-causing ashes from a Lafarge cement plant, sank off the coast of Turkey, after being there for four years.⁵⁶ According to the Turkish Minister of Foreign Affairs, Spain has taken responsibility and agreed to remove the ship, while Lafarge agreed to pay the removal costs of the cargo.⁵⁷

4.4 Social issues

Lafarge project in Meghalaya, India

In April 2007, Lafarge was ordered by the Union Ministry of Environment and Forests (MOEF) in India to close operations at its limestone quarry supplying raw materials to its cement plant in Bangladesh. The project, in part funded by the Asian Development Bank, had received criticism in the years before for several reasons. Firstly, Lafarge has been accused of purchasing tribal lands, and subsequently mortgaging these lands to acquire additional loans.⁵⁸ This is in direct violation of India's Land Transfer Act, according to the NGO Hynniewtrep People's Social Organisation, as it is a transfer of land between one non-tribal actor to another.⁵⁹

Secondly, an Indian news report shows how permission for Lafarge's mining operations in Cherrapunjee, one of India's vastest and wettest forests, was given on the basis of an Environmental Impact Assessment by a Delhi company describing the area as a 'rocky wasteland'. The EIA also does not cover Lafarge's large conveyor belt, transporting the limestone to the Bangladeshi cement

⁵³ "Campaign to clean the Yangtze under way", Financial Times UK, July 2007, http://www.ft.com/cms/s/0/363cd36c-2e7d-11dc-821c-0000779fd2ac.html?nclick_check=1 (28-02-08).

⁵⁴ "Taking the waters", Financial Times UK, July 2007, <http://www.ft.com/cms/s/0/8f48afe8-397d-11dc-ab48-0000779fd2ac.html> (28-02-08).

⁵⁵ Greenpeace International website, Greenpeace news, "Cement giant pollutes Lebanese coast", January 2003, <http://www.greenpeace.org/international/news/cement-giant-pollutes-lebanese> (28-02-08).

⁵⁶ "Spain to remove sunken ship with toxic cargo off Turkish coast", Agence France Presse February 20, 2005. In response to a draft of this report, Lafarge stressed the 'non-hazardous status of fly ash'.

⁵⁷ Greenpeace website, "Victory: Spanish boat ship-shape", 22-10-04, <http://www.greenpeace.org/international/news/spanish-boat-victory> (05-05-08).

⁵⁸ "Agitation against Lafarge in Meghalaya", The Press Trust of India, June 6, 2006.

⁵⁹ Shillong website, "NGO demands CBI probe into Lafarge land deal", December 2007, <http://www.shillongonline.com/index.php?name=News&file=article&sid=932> (28-02-08).

plant, that runs through vast forest lands. In all, the report concludes that Lafarge is violating a number of environmental laws.⁶⁰

In a response to a draft version of this report, Lafarge has indicated that it acted on information of the MOEF that said that the area was not a forest, and that no clearance permit was needed. It also indicated that it suspended its operations of transporting limestone from Meghalaya to Bangladesh while it asked the authorities for clarifications on the issue. After the Supreme Court of India came to a judgement in the case, Lafarge could resume its operations.

Relocations in Dominican Republic, because of pollution

20 families in the town of Palo Amarillo in the Dominican Republic were relocated because of pollution coming from a Cemento Cibao cement plant.⁶¹

Cement dust from Lafarge plant disrupts Boston life

A malfunctioning silo threw a thick layer of cement dust onto 60 nearby school buses, and causing one person to be taken to the hospital with burning eyes and a dry throat.⁶²

4.5 Labour issues

Lafarge accused of violating labour laws

Trade union leader and member of the Communist Party of India – Marxist Gurudas Dasgupta has accused Lafarge of paying its employees less than minimum wage in its plant in Jamshedpur.⁶³

Lafarge fined for worker's death

In November 2007, Lafarge Paving & Construction (Eastern) Ltd., a Canadian Lafarge subsidiary, was fined \$325,000 for failing to have proper safety procedures in place. The court felt that the lack of such safety measures contributed to the death of a worker in May 2006, when his head was crushed in a hopper.⁶⁴

Four deaths in a Holcim cement plant in Spain

Four Holcim employees died in July 2007 when a carbon silo collapsed in Almería.⁶⁵ According to a Holcim source, the accident happened at a time when a single team with a reduced amount of workers was active at the plant. This could indicate a lack of adequate safety measures, although no further information was found.

⁶⁰ IBNLive website, video item, "Cement giant rains trouble on Cherrapunjee", no date, <http://www.ibnlive.com/videos/44796/.html> (28-02-08).

⁶¹ El Caribe website, Contaminación, "Acuerdan reubicar familias", March 2007, http://www.elcaribecdn.com/articulo_caribe.aspx?id=119566&guid=366991712794410CA642D188C31A8935&Seccion=3 (28-02-08).

⁶² "Dust from Boston cement plant covers school buses, disrupting student commutes", The Associated Press, September 29, 2006.

⁶³ "Maruti, Lafarge violating labour laws, alleges CPI-M member", The Press Trust of India, April 27, 2007.

⁶⁴ "Lafarge Paving & Construction (Eastern) Ltd., fined \$325,000 in worker's death", Canada NewsWire, November 23, 2007.

⁶⁵ "Cuatro muertos al desplomarse un contenedor de carbón en Almería", El Mundo, 6 July 2007, <http://www.elmundo.es/elmundo/2007/07/05/espana/1183651744.html> (28-02-08).

Asbestos-related illnesses in India

In an assessment of employees of the Asbestos Cement Company, run by the NGO Kalyaneshwari, based in Kolkata, India, 55 workers were diagnosed with asbestos-related illnesses. The wives of three of the workers were also suffering from similar diseases, transmitted through the clothes of their husbands.⁶⁶ The use of asbestos in the production of cement is a method banned in several countries, due to the dangerous qualities of asbestos.

Labour conditions at Chinese cement plant in DRC

Congolese workers at a cement plant in Loutété describe their working conditions as 'slave-like'.⁶⁷ The company, Société nouvelle des ciments de Congo (SONOCC) is paying its Congolese workers a mere 20,000MFA (€ 30) per month, while they are contractually entitled to 46,799MFA (€ 75). It should be noted that DRC's legal minimum wage is 50,000MFA. The company, rebuilt after the Congolese civil war by Chinese investors, has a two-tier staffing policy, where the Congolese labourers are not allowed to make use of the company infirmary, which is only accessible to the company's Chinese employees. Workers are denied to form unions and do not receive any holiday or sick-leave pay. The company produces 30,000 tonnes of cement per year.⁶⁸

4.6 Economic issues

The case of Ghacem, a Holcim subsidiary in Ghana

A former state-owned cement producer, Ghacem, was bought by Norwegian Scancem (formerly Norcem), in turned owned by Heidelberg, in 1999.⁶⁹ As Ghacem is Ghana's only cement producer, the company has been able to use its monopoly position to hike up cement prices without being challenged. Over the last years, prices on the local market have skyrocketed, creating a situation unfavourable for new construction projects. Concerns about the monopoly status of the foreign-owned company have been raised through various media⁷⁰, as well as by Ghana's current president, J.A. Kufuor.

In addition to these monopoly concerns, Scancem has been accused of paying bribes to the former government of Jerry Rawlings between 1993 and 1998, ending just before the final phase of privatising Ghacem was completed. In a case at the Norwegian court of justice, evidence was given that Ghanaian top officials, including president Rawlings, his wife and top presidential staff PV Obeng, received approximately \$ 4 million in order to consolidate Scancem's hold on Ghana's local cement market.⁷¹

Another twist to the story is that Scancem itself has filed a civil case against Tor Egil Kjelsaal, a former employee, whom the company accuses of stealing the money earmarked for bribing Ghanaian officials. Surprisingly, the Norwegian court stated that "*the two parties [in the case] agree that the*

⁶⁶ Asia Monitor Resource Centre website, "Struggle for Justice - Case Study of an Asbestos Victim", 2004, http://www.amrc.org.hk/alu_special/ohs/struggle_for_justice_case_study_of_an_asbestos_victim (28-02-08).

⁶⁷ Libcom.org website, "Congo: discrimination and illegal practices in cement factory", May 2007, <http://libcom.org/news/congo-discrimination-and-illegal-practices-cement-factory-07052007> (28-02-08).

⁶⁸ Congoplus.info website, Societe, "Cimenterie de Loutété: les Chinois traitent les Congolais comme des esclaves", May 2007, http://www.congoplus.info/article_congoplus-3182.html (28-02-08).

⁶⁹ Modern Ghana website, "General News", April 2007, <http://www.modernghana.com/low/content.asp?which=1&id=VFZSTmVrMXFVWGs9> (28-02-08).

⁷⁰ See for example <http://www.youtube.com/watch?v=9waV7dN7Pzs>

⁷¹ "Norwegian Minister 'sad' about Scancem bribery", The Statesman, News, 9 August 2007, http://www.thestatesmanonline.com/pages/news_detail.php?newsid=4396§ion=1 (28-02-08).

bribery had not been contrary to Norwegian, Ghana or Nigerian law'.⁷² In all, an amount of \$ 4.3 million never reached its intended politicians, but was transferred to an unknown accounts in Luxembourg and Switzerland⁷³.

According to Heidelberg, the case was settled in 2007.⁷⁴

Price increase in Jordanian cement after privatisation process

As part of a greater privatisation wave, the Jordanian government decided to sell a 33% share of its national cement company to Lafarge in 2003.⁷⁵ After this move, local cement prices went up 15%, as a large part of the company's cement production is earmarked for export.

4.7 Cartels and anti-competitive behaviour

Germany

In 2002, a cartel was discovered in the German cement sector, which involved six cement companies, including Heidelberg, Holcim, Lafarge, Cemex, Dyckerhoff and Schwenk Zementwerk. 29 middle-sized costumers have filed for compensations, totalling an amount of € 114M, claiming they paid excessive prices for products and services for over ten years. Indirect evidence of this claim can be found in the fact that cement prices slumped significantly after the cartel was discovered.⁷⁶ No final verdict was given to this day.

UK

In March 2007, the British Aggregates Association announced that it is investigating cartel-like behaviour by six Portland Cement producing companies, including Holcim, Lafarge, Castle (Heidelberg), Cemex and Buxton Lime Industries (Anglo American). The association has received complaints about short supply and difficulties for individual companies to purchase cement at competitive prices.⁷⁷

Poland

Lafarge has announced that it is one of the companies investigated by the Polish competition authority OCCP for alleged anti-competitive behaviour in the Polish cement industry.⁷⁸

Colombia

Cementos Argos S.A., Cemex and Holcim were accused of price-fixing by the Colombian senator Hugo Cerrano. The Colombian government announced investigations into the simultaneous price cut of 40% of the three companies, a move to crush smaller cement producers. Subsequently, the three

⁷² Ibid.

⁷³ "Who owns Barclays account in Geneva?", The Statesman, News, 13 August 2007, http://www.thestatesmanonline.com/pages/news_detail.php?section=1&newsid=4426 (28-02-08).

⁷⁴ Dr. Brigitte Fickel, Director Group Communication, Heidelberg Cement, email 16 May 2008.

⁷⁵ Corpwatch website, Industries, Natural Resources, "Jordanian Privatization Extended to the Dead Sea", December 2003, <http://www.corpwatch.org/article.php?id=9336> (28-02-08).

⁷⁶ "Germany Court Finds Claim against Cement Firms Cartel Admissible", German Business Digest, February 21, 2007.

⁷⁷ <http://www.british-aggregates.co.uk/news/doc70.pdf>

⁷⁸ "LaFarge in U.S., polish probes ", AFX International Focus, July 11, 2006.

companies raised their prices by 48% in a period of three weeks in December 2006. The companies face fines up to \$360,000.⁷⁹

Romania

Romania's antitrust body has fined Lafarge €10.4M, Holcim €8M and Heidelberg €8.6M for fixing prices on the local market.⁸⁰ According to Heidelberg, its Romanian subsidiary successfully appealed against this fine.⁸¹

France

Lafarge was fined € 17M for engaging in illegal deals with major cement distributors on Corsica, 'with the aim of reserving the island's supply and hindering cement imports mostly from Greece and Italy'.⁸²

⁷⁹ "Colombia cement makers agree to cut prices amid price-fixing allegations ", Associated Press Financial Wire, February 8, 2006.

⁸⁰ "Romania Fines Cement Producers \$36M ", Associated Press Financial Wire, May 26, 2005.

⁸¹ Dr. Brigitte Fickel, Director Group Communication, Heidelberg Cement, email 16 May 2008.

⁸² "French Lafarge fined 22 mln dollars for illegal deals in Corsica ", Xinhua General News Service, March 12, 2007. Please note that Lafarge indicated in a response that it was only fined €10M. The €17M stated is a calculation of euro's from the dollar amount as reported in the news report.

5 CSR initiatives

The World Business Council's Sustainable Cement Initiative currently is the most prominent CSR initiative that deals specifically with the cement sector.

5.1 World Business Council's Sustainable Cement Initiative⁸³

According to its website, the World Business Council for Sustainable Development (WBCSD) is 'a CEO-led, global association of some 200 companies dealing exclusively with business and sustainable development'.⁸⁴ It was established in 1992, just before the Rio Convention, and intends to bring forth the business perspective on sustainable development. Its members come from 35 different countries and 20 different sectors. The initiative has a number of thematic and sector-specific programs, including a cement initiative.

The Cement Sustainability Initiative was founded in 1999, and its working group has 18 members, that account for 40% of the world's cement production⁸⁵ and includes the three companies mentioned in this report. In addition there are 8 participating members, 4 project partners and five communication partners. Its normative framework is put forth in the initiative's Charter, and includes principles on the following themes⁸⁶;

- CO₂ and climate change
 - use the tools set out in the carbon dioxide protocol to define and make public our baseline CO₂ emissions.
 - develop a climate change mitigation strategy, and publish targets and progress.
 - report annually on CO₂ emissions in line with the protocol.
- Responsible use of fuels and raw materials
 - follow the guidelines developed for fuel and raw material use.
- Employee health and safety
 - respond to the recommendations of the Health and Safety Task Force on systems, measurement and public reporting.
- Emissions reductions
 - apply the protocol developed for measurement, monitoring and reporting of emissions.
 - make emissions data publicly available and accessible to stakeholders.
 - set emissions targets on relevant materials and report publicly on progress
- Local impacts on land and communities
 - adopt the Environmental and Social Impact Assessment guidelines and develop tools to integrate them into decision making processes.

⁸³ Cement Sustainability Initiative website, <http://www.wbcSDcement.org/> (28-02-08).

⁸⁴ World Business Council for Sustainable Development, "About WBCSD", no date, <http://www.wbcSD.org/templates/TemplateWBCSD5/layout.asp?type=p&MenuId=NjA&doOpen=1&ClickMenu=LeftMenu> (28-02-08).

⁸⁵ "The unheralded polluter: cement industry comes clean on its impact", The Guardian, Environment, 12 October 2007, <http://www.guardian.co.uk/environment/2007/oct/12/climatechange> (28-02-08).

⁸⁶ Cement Sustainability Initiative, The Company Charter of the Cement Sustainability Initiative, no date, http://www.wbcSDcement.org/pdf/csi_charter.pdf (28-02-08).

- draw up rehabilitation plans for our operating quarries and plant sites, and make them available to local constituencies.
- Reporting and communications
 - integrate sustainable development programs into existing management, monitoring and reporting systems.
 - commit to publishing a statement of business ethics.
 - establish a systematic dialogue process with stakeholders to understand and address their expectations.
 - report progress on developing stakeholder engagement programs.

The initiative expects from the companies that they start reporting about these principles no later than four years after joining the initiative. The initiative seems to have been working towards independent third party verification, but it is unclear in whether or in what form this has taken place. In a response to a draft of this report, Lafarge pointed towards the verification of its emissions report by Ernst & Young.⁸⁷

The details of the management of this initiative needs to be looked into further, but it seems like it is a business oriented initiative with limited space for other stakeholders to participate. Mention is made about regular workshops and meetings with NGOs, and the development of a sectoral approach towards sustainability, but no information was found regarding the involvements of NGOs or other stakeholders in decision making processes.⁸⁸ When evaluated in the light of the principles put forth in the CSR Frame of Reference of the Dutch CSR Platform, questions can be raised about the effectiveness on true sustainability in the cement sector.⁸⁹

⁸⁷ Olivier Luneau, Directeur Développement Durable et Affaires Publiques Senior Vice President Sustainable Development and Public Affairs, Lafarge, email, 19 May 08.

⁸⁸ Ibid.

⁸⁹ For more information regarding the CSR Frame of Reference, visit www.mvoplatform.nl

6 Conclusions

6.1 Characteristics of the sector

1. Traditionally, the mining of raw materials and the production of cement occur in close proximity to each other and to the end use of cement. Due to the weight of cement and the quantities needed in end use, transport, and therefore trade has proven to be expensive. For most countries, international trade is therefore insignificant in relation to domestic use. The context in which the large multinational corporations operate in developing countries are therefore less determined by trade agreements as they are by local laws and international and bilateral investment agreements. This sector scan has not looked into the specifics of investments and specific demands in agreements, and additional research is needed to properly evaluate the effects for different countries.
2. The one notable exception to the limited trade figures are China, which is by far the largest exporter of cement, and the only country that transports significant amounts of cement around the globe. Other trade tends to be very local, and occurring between neighbouring countries. Given the high cost of cement transport, the role of China in global cement trade is an extraordinary one. It raises the question why Chinese cement is such a sought after commodity, that countries are willing to pay the additional transport costs. While this is an interesting question to raise in further research, two likely hypotheses can be drawn up from the available information;
 - China is the only country with adequate quantities to meet demand of high consuming countries like Spain and USA.
 - China's cement is so much cheaper that it can be competitive even with additional transportation costs.

Another exceptional trading role is that of the USA, which imports a lot of cement due to its exceptionally high demands, and also sources from non-neighbouring countries, most notable China and other Asian countries.

3. Global demand is growing significantly, mostly spurred by emerging economies such as India and China, as well as the building boom in the Middle East. There are signs that demands might slow down in the United States due to the housing crisis caused by the mortgage crisis. The growth in demand will very likely be followed by a continuous growth in production, as well as in international trade, as some of the larger cement consuming countries are already unable to produce enough domestically.
4. The major players in the sector seem to consolidate their global positions, both through mergers and acquisitions as well as through vertical integration. All three companies discussed in chapter 3 have global operations, and seem keen to expand into new markets. At the same time all three companies indicate their interest in a greater control throughout the production chain. Most of the leading companies are European, with the Mexican company Cemex being the exception. Interestingly, there are no major U.S. companies in the cement industry, not even within the United States.

6.2 Major issues

1. The most stressing and most widely acknowledged issue in the cement industry is the CO₂ emissions of the industry. Several reports state that the industry accounts for 5% of global CO₂ emissions, thereby being the largest single material source. The development of greener technologies does not seem to weigh up against the additional emissions caused by larger production figures. As CO₂ is produced during the chemical process to produce cement, all companies, countries and plants are faced with this issue.
2. The other stressing environmental issue that causes concerns throughout the world is the use of waste as an alternative to conventional fuels. Industrial waste, old tyres and other forms of waste cause a number of environmental problems when burned. Both international environmental NGOs such as FoE and Greenpeace, as well as local organisations have protested the use of waste as fuel.
3. Cartels, price fixing and other anti-competitive behaviour seem to occur throughout the world between the major cement players. This quick scan identified seven different cases of violations, convictions and fines handed to cement producers for keeping prices too high. To illustrate the scope of the problem, the website of Cartel Damage Claims, a company specialized in claims based on antitrust violations, posts the following quote by professor Richard Whish: *"The first thing for any regulator to do is go out and find the cement cartel. [...] The only countries in which I had been unable to find the cement cartel is where there is a national state-owned monopoly for cement."*⁹⁰
4. Not much general information is available about either the working conditions at cement plants, or the effects on neighbouring communities. A handful of specific cases found during this research show that serious problems do occur, but it is unclear whether these can be considered incidents or whether they are structural problems. Further research is required to get an insight in relevant labour issues and the links between the pollution of production of cement, working conditions and local communities.
5. There seems to be a lack of well organised and credible CSR initiatives. The only cement-specific initiative is clearly a business initiative, with apparently limited involvement of NGOs, labour unions or local stakeholders, whose roles are confined to participation in stakeholder meetings. The UN Global Compact seems to be the only other CSR initiative that the major cement players are committed to, but this initiative is also under an ever-growing amount of criticism.⁹¹

⁹⁰ Prof. Richard Whish, Kings College London

⁹¹ See for example, www.unglobalcompactcritics.org