Cement Production

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Climate Mitigation Services
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Italcementi

www.italcementigroup.com Milan

yellow column indicates original reported units

Founded in 1864

Cement production & emissions data

Year	Cement Prod		Energy Use		CO2 emissions	
	Clinker ratio	Annual production	Gross consumption	Gross consumption	Emissions rate	Net emissions
	Million tons/yr	Million tonnes/yr	Billion Btu	Terajoules	kg CO2/tonne	Million tonnes/yr
1950						
1951						
1952						
1953						
1954						
1955						
1956						
1957						
1958						
1959						
1960						
1961						
1962						
1963						
1964						
1965						
1966						
1967						
1968						
1969						
1970						
1971						
1972						
1973						
1974						
1975						
1976						
1977						
1978						
1979						
1980						
1981						
1982						
1983						
1984						
1985						
1986						
1987						
1988						
1989						
1990	79%		2.0%	4,276	723	36.99
1991						36.64
1992						36.29
1993						35.94
1994						35.59
1995						35.24
1996						34.89
1997						34.54
1998						34.19
1999						33.84
2000						33.49
2001			6.1%	3,932		33.14
2002			6.5%	3,952		32.79
2003	79.6%		6.6%	3,913	733	33.09
2004	80.2%		6.0%	4,042	740	34.96
2005	81.8%		5.5%	4,011	730	40.30
2006	82.0%		4.4%	4,087		44.65
2007	81.5%	65	4.2%	4,110		45.45
2008	80.9%	63	4.5%	4,089		43.17
2009		56			717	36.30
2010		55			723	36.70
2011	81.3%			3,805	708	42.50
2012	81.8%	41		3,820	712	40.40
2013	81.3%	43		3,798	694	36.00
2014						36.00
2015						36.00
2016						27.00
2017						
2018						
Total		-				986

Clinker factor	Cement sales	Thermal mix	Thermal efficiency	Net emissions rate	Net emissions	Gross emissions
% clinker in cement	million tonnes	percent alt fuels	MJ/tonne clinker	kg CO2/t cementitiou	million tonnes CO2	million tonnes CO2
				"kg CO2e per tonne cementitious product"		

R 20		38.1
interpolated		
interpolated		
interpolated		
interpolated		
interpolated		
interpolated		
int		29.17
interpolated		
interpolated		
interpolated		
interpolated		
interpolated		
interpolated		
CSR 2003		
CSR 2005		
CSR 2005		
CSR 2005		
CSI	45.1	
CSI	45.9	
CSI	43.6	
CS	36.7	
CS	37.8	

Emissions / Production	
Tonnes CO2/tonn	kWh/t cement
0.704	
0.690	
0.652	
0.673	
0.708	120.5
0.712	120.1
0.694	120.5

HeidelbergCement acquires Italcementi, October 2016

Conventional fuels by type, cement (%)	2013	2012	2011
Coal	35.3	34.4	35.3
Petroleum coke	32.8	30.2	29.2
High viscosity fuel	0.2	1.4	2.0
Natural gas	15.9	18.3	16.9
Fuel oil	6.4	9.1	10.8
Alternative fuels	9.4	6.5	5.9

Alternative fuels and biomass, cement (%)		2013	2012	2011
Mature markets		15.4	12.2	11.6
Emerging markets	% alternative fuels (including biomass)	4.9	2.2	1.4
Group		9.4	6.5	5.9
Mature markets		5.4	4.2	3.9
Emerging markets	% biomass	3.7	1.9	1.2
Group		4.4	2.9	2.4

Alternative fuels by type, cement (%)	2013	2012	2011
Animal meal	12.1	12.7	15.7
Liquid waste	16.7	20.5	21.9
Agricultural waste	21.5	16.5	11.1
Waste oils	8.3	8.0	8.5
Tyres and rubber	17.8	14.7	14.9
Solid waste	13.6	14.0	13.8
Plastic	3.8	3.8	4.7
RDF	4.6	7.6	7.8
Sludge	1.6	2.2	1.7

Italcementi Sustainability Disclosure 2013, page 341.

Italcementi Group Sust Dev Rpt 2008, pp. 20-21.

Cell: K11
Comment: Rick Heede:
Emissions from cement fabrication are of two main types: Calcining process of calcium carbonate into clinker liberates carbon dioxide, and emissions from the energy used in the manufacturing process. Typically not included in the emissions estimates are transportation energy, the burning of wastes, or plant construction.

Cell: E12
Comment: Rick Heede:
The industry calcination factor ranges from 525 to 900 kg CO2 per tonne of clinker (net), but of course varies from company to company, and will tend to decrease over time as process efficiencies improve.
WBCSD (2002) "Toward a Sustainable Cement Industry: Key Performance Indicators," by Joseph Fiksel, Battelle, for WBCSD. "Each tonne of Ordinary Portland Cement generates ~900 kg of net CO2 emissions ... and consumes roughly 3,000 MJ of total electrical and thermal energy," p. 8.

Cell: H12
Comment: Rick Heede:
Most cement companies will aggregate emissions from energy use with emissions from cement fabrication. This column is provided for companies that provide both data.

Cell: K12
Comment: Rick Heede:
Average CO2 emissions intensity have declined 16.5 percent from 1990 to 2009 -- from 758 net kg CO2 per tonne of cementitious product in 1990 to 633 kg CO2/t in 2009, according to WBCSD data.** This project estimates process emissions from calcining limestone and thus excludes emissions from fuel and electricity inputs inputs to cement manufacturing. The emission rates and net total company emissions both include process and energy-related emission; a subsequent worksheet (SumCement.xls) estimates process emions of CO2.
** World Business Council for Sustainable Development Cement Sustainability Initiative (2009) Cement Industry Energy and CO2 Performance: 'Getting the Numbers Right', wbcsdcement.org, 44 pp. See GNR Indicator 326, reproduced at the "Cement industry data" worksheet in this portfolio.

Cell: K57
Comment: Rick Heede:
Italcementi CSR Rpt 2008 reports 36.99 Mt CO2 in 1990 under its 2008 boundary and plant ownership.

Cell: M63
Comment: Rick Heede:
The 2008 CSR Rpt shows 36.99 Mt CO2 for its then-boundary, but reported as 29.17 Mt CO2 for 1990 in the 2003 CSR Rpt.

Cell: J70
Comment: Rick Heede:
CSR Rpt 2005, group emission rates; for EU-plants, 653 kgCO2/tonne (730 for Group) in 2005, 668 vs 740 in 2004, 661 vs 733 in 2003, and 657 vs 722 in 1990.

Cell: K70
Comment: Rick Heede:
Italcementi CSR Rpt 2005, page 27. 2005 boundary for 2005, 2004 boundary for 2003 and 2004

Cell: G72
Comment: Rick Heede:
94.5 percent conventional fuel, 5.5 percent alt fuel (of which 1.5 % biomass).

Cell: K73
Comment: Rick Heede:
Italcementi CSR Rpt 2008

Cell: E75
Comment: Rick Heede:
Italcementi Group AnnRpt 2008, page 34: "Cement and clinker (million tonnes)"; 2007: 3.1 percent higher.

Cell: E76
Comment: Rick Heede:
2010 AR pdf pg 20

Cell: J76
Comment: Rick Heede:
2010 CSR pdf pg 5

Cell: K76
Comment: Rick Heede:
2010CSR pdf pg39

Cell: J78
Comment: Rick Heede:
Italcementi SustRpt 2013, page 340 (pdf p. 20).

Cell: K78
Comment: Rick Heede:
Italcementi AnnRpt (Sust Disclosure), page 330.

Cell: K79
Comment: Rick Heede:
Italcementi Sustainability Disclosure 2013, "million tonnes CO2," 2011-2013, sum of Scopes 1, 2, and 3.

Cell: K81
Comment: Rick Heede:
Italcementi annual reports after 2013 no longer available (May2018). CAI assumes 3024 and 2015 equal to known 2013 net emissions, and that 2016 is 75% of 2013, since the company was acquired by HeidelbergCement in October 2016.