### Cement Production

![Image](https://example.com/image.png)

**Taiheiyo Cement**

![Image](https://example.com/image.png)

**Cement production & emissions data**

<table>
<thead>
<tr>
<th>Year</th>
<th>Cement Prod</th>
<th>Energy Use</th>
<th>CO2 emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Clinker ratio</td>
<td>Annual production</td>
<td>Gross consumption</td>
</tr>
<tr>
<td></td>
<td>Million tons/yr</td>
<td>Million tonnes/yr</td>
<td>Billion Btu</td>
</tr>
</tbody>
</table>

#### Key Performance Indicators of the CSI and GCCA for Fiscal 2018

- **Total CO2 emissions (million tonnes/year)**
  - FY2016: 18
  - FY2017: 18
  - FY2018: 18

- **Specific CO2 emissions per tonne of cementitious product** (kg CO2 per dry tonne)
  - FY2016: 18
  - FY2017: 18
  - FY2018: 18

- **Energy input**
  - Million Btu
  - FY2016: 18
  - FY2017: 18
  - FY2018: 18

- **Domestic sales**
  - Million tonnes
  - FY2016: 18
  - FY2017: 18
  - FY2018: 18

#### Emissions / Production Data

- **Taiheiyo SustRpt 2019, page 70.**
- **Taiheiyo SustRpt 2018, page 68.**
- **Taiheiyo SustRpt 2017, page 64.**

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**Cement.xls**
Taiheiyo

**Cell:** H9
**Comment:** Rick Heede:
"Chichibu Onoda Cement Corp. merged with Nihon Cement Co. to form Taiheiyo Cement Corporation. Taiheiyo CSR 2008."

**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 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 emissions of CO2. ** World Business Council for Sustainable Development Cement Sustainability Initiative (2009) Cement Industry Energy and CO2 Performance: 'Getting the Numbers Right', wbcscement.org, 44 pp. See GNR Indicator 326, reproduced at the "Cement industry data" worksheet in this portfolio.

**Cell:** K42
**Comment:** Rick Heede:

**Cell:** K71
**Comment:** Rick Heede:

**Cell:** M4
**Comment:** Rick Heede:
CSR 2008, page 17. Taiheiyo company-wide emissions total 37.51 million tonnes CO2 (net) and 38.41 MtCO2 (gross). "Net CO2 emissions: The total CO2 emissions minus the CO2 emissions from alternative fuels." Also (column *): 753 net kgCO2 per tonne of cementitious product (772 kgCO2/tonne gross). Unclear why CO2 emissions in table on page 19 shows 16.506 MtCO2 in FY2005, 16.730 MtCO2 in FY2006, and 15.660 MtCO2 in FY2007. Again, in table on page 24, "Trends in Net CO2 emissions," neither domestic (17.829 MtCO2) nor overseas (19.681 MtCO2) for FY2007 match the data above. Total (37.509 MtCO2) does equal "company-wide emissions" above. It is unclear whether this data includes non-cement operations, or whether the smaller data is for calcining operations only (excluding fuel inputs). CMS cites the lower data sets as a conservatism until unambiguous data is at hand.

**Cell:** K75
**Comment:** Rick Heede:

**Cell:** E67
**Comment:** Rick Heede:

**Cell:** K76
**Comment:** Rick Heede:

**Cell:** M76
**Comment:** Rick Heede:
Taiheiyo CSR Rpt 2009, page 17. "Company-wide emissions (the company also makes ceramics, construction materials, electronics)."

**Cell:** E77
**Comment:** Rick Heede:
2010AR pdf pg 7 in text

**Cell:** K78
**Comment:** Rick Heede:

**Cell:** G80
**Comment:** Rick Heede:
AR 2010 pdf pg 4

**Cell:** K81
**Comment:** Rick Heede:

**Cell:** G84
**Comment:** Rick Heede:

**Cell:** K84
**Comment:** Rick Heede:
Taiheiyo

**Cell:** K85  
**Comment:** Rick Heede:  
Taiheiyo Sust Rpt 2019. Key Performance Indicators, p. 70. Indicators table shown below. Gross emissions total 23.5 MtCO2; net emissions 22.6 MtCO2. (defined as: "Net CO2 emissions: gross CO2 emissions minus the CO2 emissions from alternative-derived fuels.") Clinker / cement ratio: 82.8%. Emissions from purchased electricity 0.963 MtCO2. Alternative fuel rate: 12% of thermal energy input.