Celitement - Reducing the CO₂ Footprint of Cement

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Cement Production – a Challenge

- For each ton of Ordinary Portland Cement (OPC) ~ 0.9 ton of CO₂ is emitted
- 2/3 of the CO₂-emissions derive from the calcination of natural limestone, 1/3 from fuels and electric power
- Cement production causes 8-10% of global CO₂-emissions
- Supplementary materials which are used to substitute OPC are derived from fossil power plants and steel industry
- A reuse of concrete for cement production in order to save CO₂ is not possible in today's plants
Production: 2 step process
- Autoclaving at 190 degree C
- Milling
- Properties and use as OPC
- Compared to OPC the demand for calcined limestone is reduced by 2/3.
- 50% less energy
- 50% less CO₂
- Flexible feedstock: recycled concrete, calcined limestone….
- 2014 Pilot-Plant in full operation
- 2020 Commissioning of first industrial plant (50,000 t/a)
The development of Celitement takes place during a global cement revolution.

Global Cement Production 1990-2013 with prediction to 2050 [in Gt/a]*

- **2005** Celitement Proof of principle Laboratory, KIT
- **2009** Foundation Celitement GmbH
- **2014** Pilot plant in operation 25 t/a
- **2020** Commissioning first industrial plant 50,000 t/a = 0.00005 Gt/a

Today 4.2 Gt/a

- **China**
- **India**
- **Other developing countries** prediction (2013)
- **OECD + other industrialized countries**

* 2013 CEMBUREAU, the European Cement association Cement & Concrete: key facts and figures