

Green Finance Taxonomy for South Africa- Workshop 3

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PPC

Cement and GHG Emissions

- **The cement sector is a significant, and growing, contributor to global GHG emissions:** the cement sector currently accounts for 8% of all global greenhouse gas emissions, which is more than all the world's cars put together (Zero Carbon Australia, 2017)
- **Various options to reduce cement sector GHG emissions exist but there remains uncertainty regarding how to achieve net-zero emissions.** Emission have decreased but further reductions will require investments in more expensive mitigation options. Undertakings by the industry, such as improving electricity efficiency, thermal efficiency and using substitute cementitious materials (SCMs), have resulted in CO₂ emissions per ton of cement decreasing globally from an average 0.94 in 1990 to 0.64 in 2016. In 2016, South African cement plants produced on average **671kg/t of CO₂** per ton of cement. This is above the global average of 642 kgCO₂/t cement but better than the Middle East (712kg), Russia (707kg) and North America (745 kg) (GNR Indicator n.d.). South Africa's emissions are, however, higher than those of its other BRICS trading partners with India producing on average just 582 kgCO₂/t cement and Brazil 604 kgCO₂/t cement (TIPS, 2020).

Cement and GHG Emissions cont'

- Cement is regarded as a “hard-to-abate” sector due to the lack of viable options to reduce emissions and the projected increase in demand for cement products, driven by urbanization and population growth (particularly in developing countries)

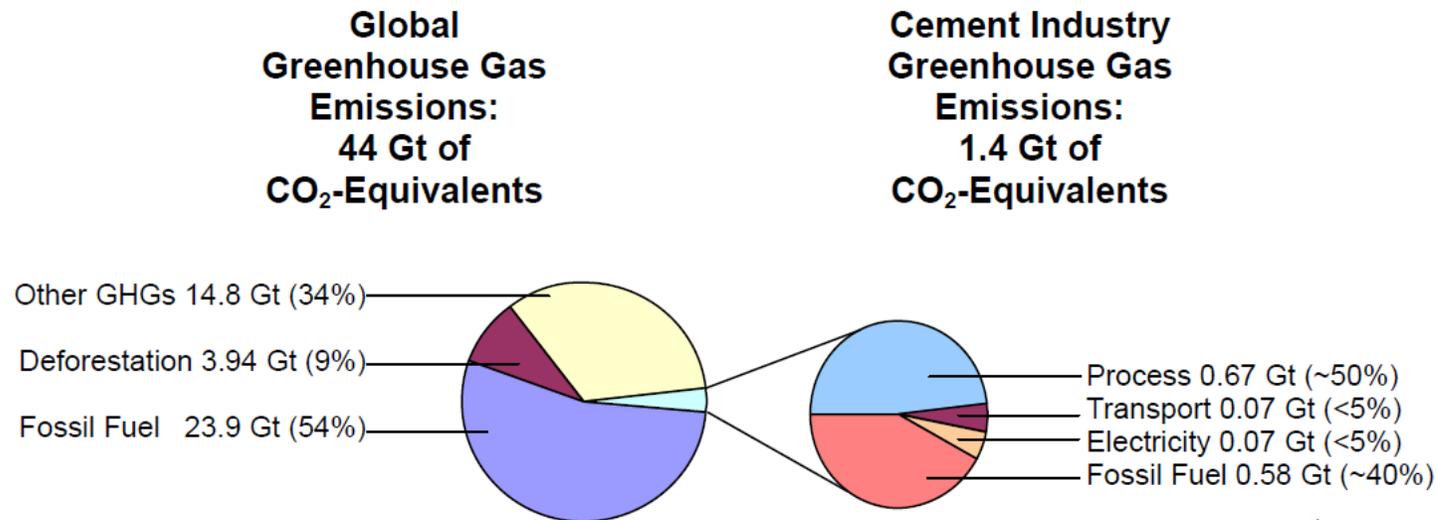


Figure 1-1: Year 2000 Greenhouse Gas Emissions from the Cement Industry*

* Battelle estimate based upon data from numerous sources, including the following major sources: Nakicenovic, N. and R. Swart;¹ IEA 1999²; IPCC 2001⁷; CEMBUREAU 1998;⁴ CEMBUREAU 1996;³ and CEMBUREAU 1999⁵.

Mitigation Options in the cement sector

The universe of options: There are seven areas to consider:

1. Increasing the electrical efficiency of plant processes especially grinding and cooling.
2. Increasing thermal efficiency in the manufacturing process.
3. Increasing the use of alternative fuels as a source of thermal energy
4. Decreasing the ratio of clinker to cement by introducing SCMs and creating blended cements.
5. Increasing the production of non-OPC cements, known as new binders or novel cements.
6. Disruptions in the built environment which lead to decreased demand for cement.
7. Carbon capture and storage.

Mitigation options in the cement sector cont'

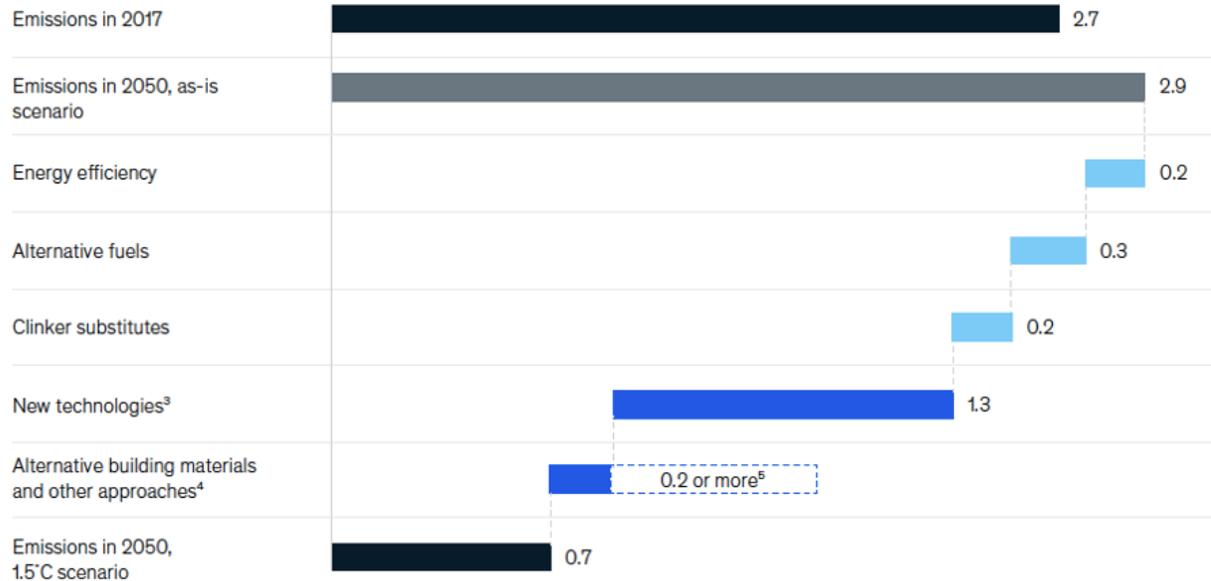


In greater depth: McKinsey (2020) – “Cement makers are approaching a moment of truth”

The cement industry could cut three-quarters of its CO₂ emissions by 2050.¹

Potential CO₂ emissions and reductions,² GtCO₂ annually

■ Traditional levers ■ Innovation levers



Source: McKinsey & Co (2020) Laying the Foundation for zero-carbon cement

- Decarbonizing cement requires large-scale investments in technologies, bringing down both fuel and process emissions
- CO₂ emissions are expected to decline worldwide compared with the 2050 ‘do nothing’ scenario as traditional and innovation levers can be exploited and further developed.

PPC Climate Change Mitigate Projects

- **Alternative Fuels**

- Tyres Co-processing at De Hoek plant with the aim to expand this to other plants
- Conducted Refuse Derived Fuel(RDF) feasibility study in the Western Cape

- **Solar PV**

- PPC has completed a detailed feasibility study on solar PV for its 3 mega plants – Slurry, Dwaalboom, De Hoek
- 10MW at each plant

- **Solar & Wind Wheeling**

- PPC is currently investigation solar and wind wheel option

- **Waste Heat Recovery**

- PPC is exploring the possibility of establishing a waste heat recovery plant at its De Hoek Plant
- 3MW of power per day

- **R&D projects**

- The Coal CO2 to X RDI Programme
- MCCU project – Carbon Capture and Use in Cement

Thank You