



Cement is responsible for
3 to 8% of global CO₂ emissions.

Why are we using it?

Why does it emit so much CO₂

What can we do to reduce its footprint?



Cement is made from limestone, and used to make concrete. Cement is what is keeping the components of concrete (rocks, sand and water) together.

It is an amazing strong material, and used in construction. Since the world population is growing, we need more and more buildings, and especially in China the construction industry is booming.



To produce cement we need to modify limestone.

About 40% of the emissions are caused by heating the limestone to 1450 degree C;

the other 60% are caused by the modification of limestone into cement.

(For the chemist: $\text{CaCO}_3 \Rightarrow \text{CaO} + \text{CO}_2$)

One ton of Cement emits 0.9 tons of CO₂



How to reduce cements CO2 footprint:

- Can we use less concrete?

It is a cheap component, and it adds tons of structural reliability (which equals safety!). But new building designs manage to use less concrete, especially in non load bearing parts of the building.

- The heating of the limestone is typically done by burning coal or gas. There are experiments using (renewable) electricity, but it is hard to reach the temperature needed. Other experiments include burning waste.
- Regarding the CO2 emitted during the modification of the limestone; unfortunately there is no other solution than capture and storage. However, this is still experimental and expensive.

Cement is an very useful strong structural raw material
for construction.

But we need to address its CO2 emissions!
With a combination of all the options listed, we can
achieve it!

