



FuturZement | FuturBeton

nanostructured green cement/concrete

high strength ☀ CO₂-low ☀ super durability

all advantages for EUR 7,00 / ton of concrete

(additional full cost, Simoyer® CM900, Germany 2012-10)



CO2-Emission Saving-Cost

automobile vs. total processing cost HKP-GGBS

Cement is mankind's product utmost relevant to manmade CO₂-emissions while most efforts in CO₂-saving are undertaken at automotive industry, even modern vehicles already operate quite CO₂-clean. The cost-comparison for further CO₂-saving in automotive vs. HKP/FuturZement suggests that this is economically wrong.

This is even valid, if for comparability, the value of FuturZement res. of HKP-GGBS is set to zero, thus HKP would aim CO₂-saving only and HKP-GGBS/FuturZement would come along as a zero-value side-product.

primary target CO ₂ -emission saving, additional cost [7] (2013)		Auto	CM900	total processing cost HKP-GGBS, CO ₂ -saving as a side-effect	
CO ₂ -emission today		136	[g/km]	140	total processing cost (2012)
CO ₂ -emission base (target 2015)		130		[€/t]	
CO ₂ -fleet-goal		95		395	CO ₂ -saving per replaced ton OPC-fraction in FuturZement
CO ₂ saving (-CE-)		35		[kg/t]	
CE at 12.500 km p. a. / 12 years	[t/vhc]	5,3	0 !!	[€/t]	product value share of FuturZement
additional cost / vehicle (-vhc-)	[€]	3.600			
additional cost for CO₂-saving	[€/t]	678	354	[€/t]	total cost for CO₂-saving

[7] Communication with Dr. Ulrich Eichhorn, Managing Director VDA (Association of the German Automotive Industry, Berlin [05-2013])

The simple but full cost calculation from 2013 (not updated) gives the surprising result, that society could save 2x more CO₂-emission for the same cost (€678/t vs. €354/t) if investing into clean cement manufacturing.

Result does NOT take into account, that

- (a) due to higher concrete strength, less material for the same construction is required and due to the virtually endless durability, we would build less often
 - (b) cement res. FuturZement itself has a value, in fact as high as UHPC
 - (c) automotive at million-fold production is compared to a single Simoyer®
- (a-c) multiply efficiency and CO₂-savings at significantly lower cost.**



Game changer, high potential or fairytale ?

If national concrete consumption is 250 Mt, 5.787 units CM900 could cover the German market. In mass production/application, 40% performance increase at 70% equipment cost decrease may be predicted. Thus 3.472 units would cover DE where the remaining additional cost per ton of concrete at stable energy/labor-cost would decrease for about 6% from 7€/t to about 6.6€/t respectively (2013).

Assuming that 4 times higher strength at 4 times longer durability would lead to the saving of at least 50% of concrete required, **1.736 CM900-units would cover DE**.

If Germany has 50 cement manufacturing sites, this would refer to 35 CM900-units per cement plant requiring floor space in the range of one single cement rotary kiln usually 60-90m long at a diameter up to 5 meters. Ø5m x 60m provides a processing volume of 1.000 m³. 35 units CM900 provide 31.5 m³ chamber volume.

If service time of CM900 is 20 years, in Germany 1.736 CM900-units would need to be manufactured in such period resulting in 87 units p.a. or 8 units p.m.

So far, this is not science fiction. See OnePager "Emission CO₂ vs. Government"