



Interview by Jacob Winskell & Peter Edwards, Global Cement Magazine

VDZ: CEMENT IN GERMANY

Global Cement speaks to the VDZ at a challenging time for the German cement sector...



VDZ Headquarters,
Düsseldorf, Germany.

Global Cement (GC): How has the German cement sector changed since you joined VDZ?

Dennis Behrouzi (DB): I joined VDZ in 2013 to observe and analyse the German cement market, which was characterised by growing construction demand. Before 2021 I only experienced two years in which demand fell, both times due to challenging weather conditions. When I joined, it was also easier to forecast the cement consumption in Germany, since projects that were permitted were usually realised after a few months. Today the market conditions are more challenging due to several factors, a lack of labour among them. It takes a lot longer to start and finish a construction project. Furthermore, the Covid-19 pandemic and the war in Ukraine are two major events with considerable impact on society in general and the construction

sector specifically. We now have material shortages, high inflation due to energy and food costs, rising interest rates and high costs for both building materials and construction services. All in all, while the underlying need for construction is high in Germany, there was still a 4% fall in cement demand in 2022.

GC: What contributed most to the fall in 2022?

DB: Cement demand in Germany comes one third from residential, one third from non-residential and one third from civil engineering. The number of completions in non-residential buildings fell in 2022. Civil engineering had a slight positive impact, mostly due to improvements to railroad infrastructure that are required to meet Germany's political target of a net-zero CO₂ economy by 2045.

Dennis Behrouzi is VDZ's Head of Statistics, Raw Materials & Construction Industry. An economics graduate from Berlin, he has worked at VDZ for more than 10 years.



GC: How does cement demand vary between different Federal States?

DB: Almost all Federal States were affected by declining cement demand last year. Only in Thuringia (+6.3%) and Hamburg (+0.7%) was more cement used during 2022 than in 2021.

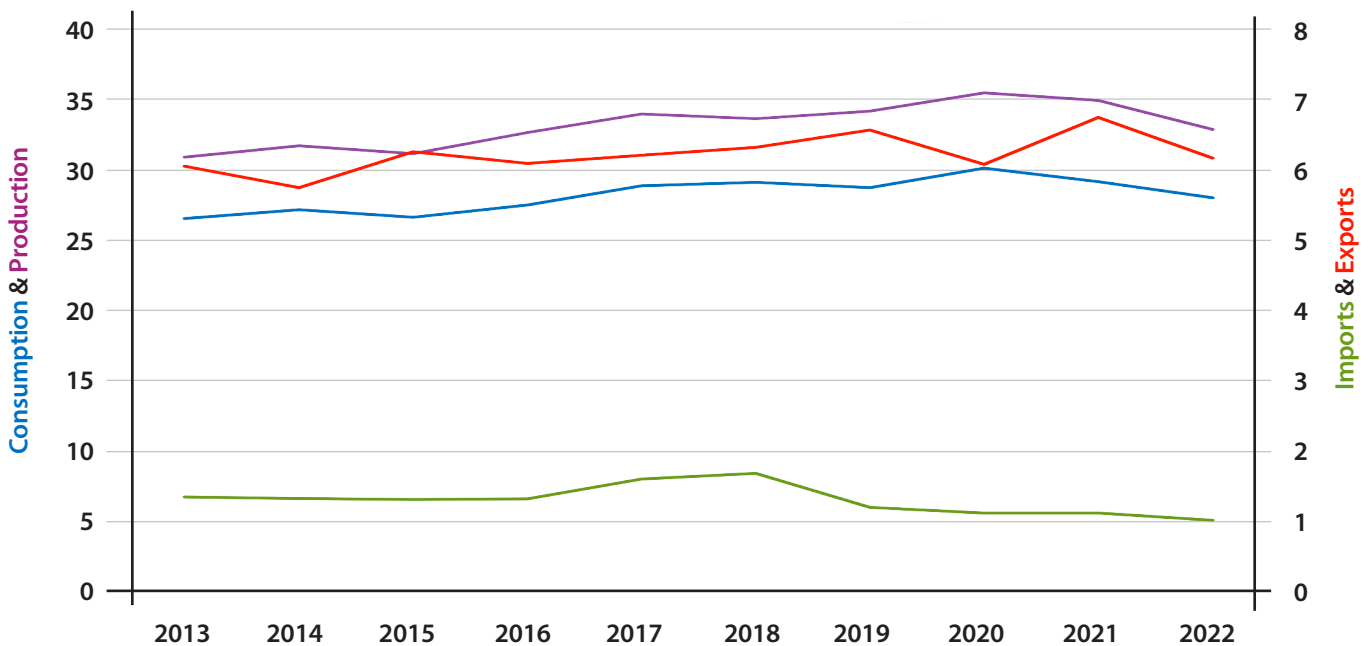
GC: What role will alternative fuels and raw materials play in Germany's climate neutral cement industry of 2045?

DB: The German cement industry used more than 70% alternative fuels (AFs) for its thermal energy needs in 2022, a performance equalled only by Austria. Most of the AFs were mixed fractions of

industrial, commercial and municipal solid waste, as well as waste plastics, sewage sludge and waste tyres.

By 2045 we are looking to reach 90% alternative fuels, of which 35% will be biomass from wastes, with a balance of green hydrogen. In combination with a CO₂ capture facility, this can also generate negative

Figure 1: German cement production, consumption, exports and imports, 2013-2022. **Source:** VDZ.



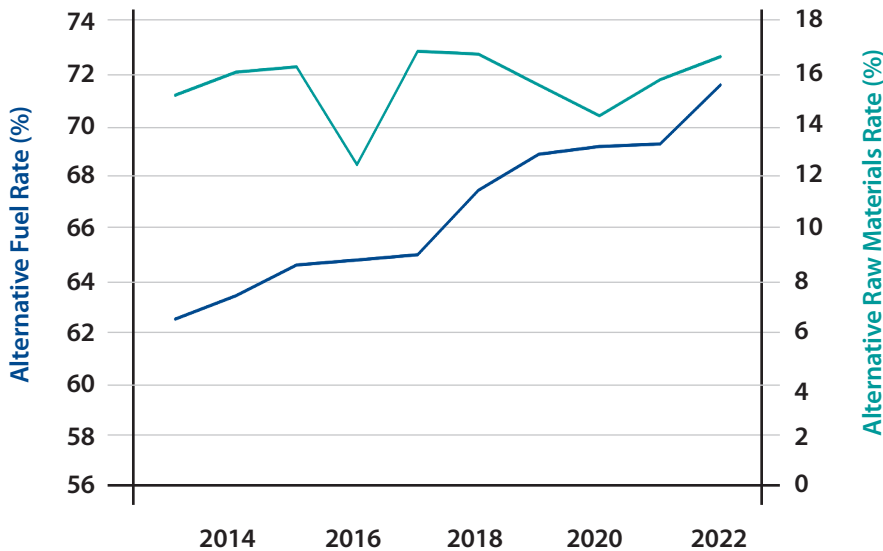


Figure 2: Alternative fuel and alternative raw material use in Germany, 2013-2022. **Source:** VDZ.

CO₂ emissions since we also remove biogenic CO₂ from the atmosphere.

Alternative raw materials (ARMs) meanwhile, have 'moved sideways' in recent years, depending on the availability of various supplementary cementitious materials (SCMs). In total the German cement manufacturers used 49Mt of raw material in 2022, of which 17% was ARMs. With 7Mt, the lion's share was ground granulated blast furnace slag (GGBFS), with the remainder comprising fly ash, used foundry sand, flue gas desulphurisation (FGD) gypsum and byproducts from other industries.

GC: How do you see ARM supplies in the future, particularly with reference to GGBFS?

DB: Like many other countries, German industry will undergo a massive transformation by 2045, by which time the Federal Government wants to achieve a climate-neutral economy. This means that the steel industry will also decarbonise, which is expected to result in a decline in GGBFS supplies. At the same time, fly ash supplies will fall to zero.

This will present quite a challenge for cement producers, which are already on the lookout for other materials to reduce the clinker content in cement to around 53% on average in 2045. Today it is about 70%. Potential replacements include limestone and calcined clay. Neither is strictly an ARM, but they both have a much lower CO₂ footprint than clinker. There will also be a rise in the use of recycled construction materials, like crushed concrete and bricks from demolition sites.

GC: You mentioned carbon capture in one of your earlier answers. How is the German cement sector ramping up its capacity for this?

DB: The sector is doing all of the 'traditional' things to reduce its CO₂ emissions, but a climate-neutral cement plant will require carbon capture technologies, due to its process emissions from clinker production. Germany is host to several high-profile projects, such as catch4climate in Mergelstetten, LEILAC 2 in Hanover, the Carbon2Business in Lägerdorf and GeZero in Geseke, not to mention several other initiatives.

VDZ currently estimates that the cement industry's CO₂ capture capacity will be at least 1Mt/yr by 2030. By 2045 this needs to be further expanded to be able to capture more than 10Mt/yr of CO₂. This is the amount of CO₂ we cannot avoid by other means, such as the reduction of the clinker factor, the optimisation of the fuel mix or a more resource efficient use of concrete in building components.

While capturing and storing or using CO₂ is already feasible today from a technical standpoint, it needs the proper framework conditions in the form of a carbon management strategy. This means, alongside the adjustment of legal frameworks, we need CO₂ transport infrastructure, including pipelines, and more electricity from renewable energy. After all, the use of carbon capture technologies requires a significant amount of electrical and thermal energy.



Schwenk Zement's Mergelstetten plant, home to the catch4climate project.



GC: How is the EU Emissions Trading Scheme (ETS) helping or hindering the cement sector?

DB: When I joined VDZ in 2013, emission certificates (EUAs) cost Euro3/t of CO₂ on the open market. During the first half of 2023, the average cost for an EUA was Euro80-100/t! In addition, the number of EUAs will continue to decrease in the future as well as the overall amounts of EUAs - defined as the cap. This has, at long last, turned the ETS into an effective tool that encourages investment in decarbonisation, especially in carbon capture.

However, as not every part of the world has CO₂ pricing, there is a certain risk of carbon leakage. This is why the EU will introduce a Carbon Border Adjustment Mechanism (CBAM), which will apply a charge to cement or clinker imported from outside of the EU, effectively expanding the ETS's sphere of influence.

GC: What are the prospects for the German cement sector in the coming 12-24 months?

DB: The ongoing war in Ukraine, the inflationary environment and the higher costs for financing a construction project are a very concerning mix. Materials, land, construction services, fuel, everything you need to build - has risen significantly in cost. Mortgage rates are now prohibitive for many, which has removed a lot of buoyancy from the property market, further reducing demand. This combination led to the start of a major downturn in German construction activity in the fourth quarter of 2022. For 2023, we expect a 7-10% drop in cement consumption, which might fall even further.

GC: When will the situation improve?

DB: We don't see grounds for too much optimism in 2024 unfortunately, as the European Central Bank (ECB) is already committed to higher interest rates. In addition, the geopolitical tensions around the world are keeping everyone in a 'wait-and-see' mindset. The economic uncertainty about the future is relatively big in Germany. Nevertheless, the need for construction in Germany is still very high, with demand for multiple-residence buildings in major cities, particularly social housing. Other drivers for demand include wind turbines and railway improvements, as mentioned earlier. There is also a lot of work to be done on road infrastructure, particularly the many bridges in disrepair. The Federal Government plans to modernise or rebuild up to 400 bridges every year.

GC: How else can the Federal Government help?

DB: The cement industry in Germany is facing several challenges today. On the one hand, there is this significant decline in construction activity, which reduces the demand for cement. The public sector in Germany, including state rail operator Deutsche Bahn, is the biggest single building contractor, with a certain impact on the demand side. It is important that, the Federal Government especially, but also the Federal States and municipalities, keep up and even expand their investments in traffic, energy and social infrastructure.

On the other hand, we want to decarbonise the cement industry by 2045. This requires funding of particularly cost-intensive technologies, such as carbon capture. One interesting example is the so-called carbon contracts for difference (CCfD). CO₂ avoidance costs for capture technologies are, at least today, higher than costs for emitting a tonne of CO₂. Nevertheless, in order to stimulate investment, the state takes over the costs exceeding the CO₂ price. The Federal Ministry of economic affairs and climate protection has published a draft funding guideline, which unfortunately comes with several challenging preconditions, so that this instrument might not be as widely used by our industry as we had expected. With regard to the size of the task and the ambitious schedule we need our Federal Government and the administration to design funding instruments in a pragmatic and uncomplicated manner. The German cement industry is ready to go much further on the way to decarbonised cement production and highly appreciates any political assistance.

GC: Dennis, it has been great to talk with you!

DB: You are very welcome indeed!



Heidelberg Materials' Hanover plant, home to the LEILAC 2 CO₂ capture project.