

BUILDINGS

Decarbonizing Cement With AI: An Interview With Alcemy Founder Leopold Spenner



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What's the story behind [alcemy](#), and how did you arrive at the current product offering?

Rob built the dynamic pricing pipeline for Flixbus (that autonomously controls >100,000 ticket fares a day), and I had spent most of my life working around CO2 reduction of cement and concrete.

When we met at the second Entrepreneur First cohort in Berlin, it immediately clicked: I knew that the less CO2 concrete has, the more important autonomous control becomes.



How would you describe the problems in cement, and which of those can be solved with alchemy?

Cement, and later concrete, are made out of natural materials, so it is inherently challenging to produce it with consistent quality. Even more because one has to wait an entire month for the most important quality test result. Quality and production management is extremely manual and therefore imprecise — the resulting concrete has a high margin of error. This is a major roadblock for producing low-carbon concrete at scale (the construction material is responsible for 8% of worldwide CO₂). Our predictive production control system removes this roadblock by increasing precision and transparency.

Where will you be 5 years, and where will you be in 10 years?

5 years: Low-carbon concrete has become the standard in the EU and alchemy's technology is steering the production of every single cubic meter.

10 years: alchemy has made ready-mixed concrete so easy that the developing world starts adopting it to industrialize their concrete production, so that we have helped reduce 1 Gigaton of CO₂.

In your view, what other tech needs to develop to make the building

process less carbon intensive?

Speaking about the entire building process, much more focus should be spent on repurposing old buildings instead of building completely new (happens often in Germany for single-homes in the outskirts of cities while the city centers are abandoned). Secondly, I believe regulation that favors eco-friendly tenders of GCs will have a far greater impact than any technology.

Speaking about cement, it will be a combination of new natural input materials (e.g., clay), better quality control (with alchemy) and for the last 10-20% potentially carbon capture and reuse at a handful of Giga-Clinkerplants Europe-wide.

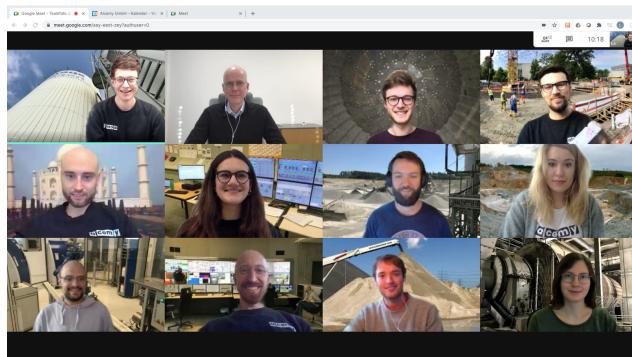
What cleantech companies and organizations inspire you, and why?

Definitely the efforts of Bill Gates and how he throws light on the huge CO₂ emissions from making things like steel, cement and plastic.

What are currently the biggest challenges for alchemy?

1. Finding product-market fit and a viable business model: the supply chain is very complex and carries lots of legacy — finding our sweet spot that makes a difference, helps save CO₂ and proves to be a viable business is a big challenge.

2. Developing the technology is challenging because we deal with real-time data that tends to be messy and need to steer production based on this — 24/7 and carrying high responsibility.
3. Hiring a diverse team — even though this was one of our key priorities, we are now 16 FTEs with only 4 females and 2 non-German-natives. We felt like efforts to get diverse talent into a pipeline that is already relatively empty makes it 10x harder and in our stage we did not have the capacity to handle this.



Is there a particular company (organization) you wish you could work together with? Maybe someone is reading this and can help make the connection.

Architects like Rem Koolhaas (OMA), Herzog & De Mauron, or Foster + Partners

If you look at all your entrepreneurial activities, what do you wish you had known, or what mistakes would you try to avoid going into the future?

I would try to avoid being too frugal, i.e., very conservative hiring roadmaps, and too critical with ourselves, i.e., not celebrating achievements along the way appropriately.

Are you interested and excited to get into a region like China or the US early with Alcemy? Is this realistic?

Not this early. We are a deep-tech company and have perfect conditions to develop our technology here in Europe (cement/concrete R&D happens predominantly in Europe // cluster of innovative large and SME producers, suppliers, universities and associations // CO2 imperative since 2005 through EU-ETS // strong and experienced talent). In 5-7 years down the line, an expansion to US and China is planned.

What do you wish politicians would understand, and which law would you enact if you could?

That public construction procurement should lead the way by incorporating CO2 into their tender criteria.

What are the most underrated or underappreciated big trends in cleantech and society?

1. Many people in my generation want to make an impact on halting global warming, usually with personal sacrifice (e.g. not flying, turning vegetarian, etc.).

But this does not scale, and cement is a good example for this: 90% of cement is consumed in the developing world that still has lots of infrastructure to build — and sacrifice is not a solution these countries will accept. What IMHO is overlooked is that individuals from my generation in Europe can make a huge impact that goes far beyond personal sacrifice — when working on technical innovations in carbon-intensive industries: just like cement. Employees at alchemy can help save more CO2 than the entire flight sector emits — and since so few people work on cement, chances are high each and every individual will make a measurable impact.

2. Industries that make things (steel, cement, plastic, aluminium, glass, paper, etc.) are not prominent in discussions around global warming — despite being system-critical, hardest to decarbonize and responsible for ~20% of worldwide CO2 emissions.
Decarbonizing them requires huge amounts of electricity (optimally renewable, i.e. more wind mills and solar cells) and infrastructure (electricity grids, hydrogen grids, industrial railway grids, etc.) — but expansion is extremely slow in Germany due to e.g. strong objection rights for

individuals and associations —
making net-zero in 2045 a dream
rather than a potential reality.

Images courtesy [alchemy](#)