FINALIST IN THE BUSINESS IMPACT – ASPIRING CATEGORY

Imperial Innovations/Imperial College London/Novacem for Novacem

Cement is a commodity in high global demand – the industry is worth in the region of $170 billion a year. Annually, 2.9 billion tonnes of cement are produced, and demand is increasing as a result of rapid economic growth in countries such as China, India and Brazil. Total global cement demand is expected to increase 3–5% annually. As a result of the carbon intensive nature of cement production, the industry as a whole is responsible for 5% of global annual anthropogenic CO_2 emissions, more than the aviation industry. Novacem has developed novel cement which absorbs more CO_2 than it emits during production.

Innovation

The current industry standard, Portland cement, is based on limestone which is full of stored carbon and requires high temperatures in the production process. The raw materials for Novacem's product are naturally abundant magnesium silicates of which global reserves are estimated to exceed 20,000 billion tonnes. Overall, the production process for Novacem absorbs up to 100kg more CO_2 than it emits.

Knowledge transfer

Novacem was founded by Dr Nikolaos Vlasopolous and Dr Chris Cheeseman in 2007, with support from Imperial Innovations. In August 2009, Innovations led an initial funding round of over £1 million, alongside the London Technology Fund and the Royal Society Enterprise Fund. Novacem raised a further £1.6 million funding in January 2010, broadening its investor syndicate to include Laing O'Rourke, the UK's largest privately owned construction company. Imperial Innovations has an agreement with Imperial College London whereby IP generated at the college is assigned to Innovations. In return, the College receives a portion of any returns from the commercialisation of that IP. The process Innovations follows when a new technology is disclosed to them also played a role in providing Novacem with a strong IP position and a good understanding of the market. The first patent was prosecuted by Imperial Innovations to protect the technology, and the IP was transferred to the company to continue its development. Novacem owns IP related to its novel cement technology.

Impact

In addition to its potential to contribute significantly to a global reduction in CO_2 emissions, a TSB project demonstrated the impact of technology commercialisation on the University where the technology was developed. The project resulted in the production of a pilot plant in the Imperial College Incubator, which is owned by the college and managed by Imperial Innovations. The project incorporated work from two Imperial Postdoctoral students, who benefited from exposure to industry.

Novacem's cement has already demonstrated performance levels good enough for a range of applications, such as masonry products. The ultimate aim is to produce cement which achieves both price and performance parity with Portland cement – an important step to encourage adoption in the conservative cement industry.

Novacem is continually developing and optimising their cement in order to increase the number of target applications. In addition to Laing O'Rourkes involvement, other leading building and construction companies, such as Lafarge, are also engaged with Novacem to accelerate the development and commercialisation of the company's carbon negative cement.

Key points

- A carbon negative cement which absorbs more CO_2 than it emits during production
- The cement industry is worth $170 billion per year, expected to increase 3–5% annually
- £2.6 million funding raised

Primary team

Stuart Evans, Executive Chairman, Novacem

Dr Nikolaos Vlasopoulos, co-founder Novacem

Dr Chris Cheeseman, co-founder Novacem

Imperial Innovations

Novacem

PraxisUnico.
Commercialising research

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