A new, carbon-negative cement is heading for manufacturing reality thanks to Novacem, a spin-out company from Imperial College London. EPSRC funding has played a key role in developing both the cement itself and the manufacturing process.

-0.11 tonnes of CO₂ is produced manufacturing one tonne of Novacem cement - compared with 0.8 tonnes for one tonne of Portland cement.

A team of engineers and scientists at Imperial College London have developed a carbon-negative cement that absorbs CO₂ from the atmosphere during manufacture. This is because the cement isn’t limestone based, requires low process temperatures and contains carbon-negative additives. It could play a vital role in tackling climate change.

**IMPACT ON CARBON REDUCTION AND INTERNATIONAL DEVELOPMENT**

- Novacem cement could make a major contribution to meeting carbon reduction targets.
- As a manufacturing company offering a product with global appeal, Novacem could strengthen the UK’s manufacturing sector and its export performance.
- Developing countries’ prosperity will depend on the availability of huge volumes of cement for infrastructure projects. Novacem cement could help meet these needs in a sustainable way.

**Cost of a modern wonder**

A key constituent of buildings, roads and much more besides, cement holds the modern world together. Little wonder that global production is set to double to over five billion tonnes/year by 2050. But all of this comes at an environmental price, with the manufacture of Portland cement (the type most commonly used today) accounting for five percent of manmade CO₂ emissions.

**From first steps to the future**

An EPSRC-funded project in 2004 prompted the Imperial College team to consider the scope for designing a magnesium oxide-based, construction-quality cement with significant sustainability benefits. With support from EPSRC and the London Development Agency, they identified a way of manufacturing such a cement which had the right physical properties and was economic to produce.

This process, which effectively scales up existing technology, mixes powdered magnesium silicates with water and special additives. The resulting slurry is transformed into magnesium oxide, which is then turned into cement by blending it with hydrated magnesium carbonates.

Novacem has already reached a key milestone, with a batch pilot plant for manufacturing experimental quantities of the cement being commissioned. The company plans to have an industrial-scale pilot plant up and running in 2011, with the first volume production facilities operational from 2014/15.

Novacem believes that, within 20 years, 25 percent of the cement the world relies on could be based on Novacem technology.

For more information about EPSRC and the impact it is making visit www.epsrc.ac.uk
NEW CEMENT SET TO DRAMATICALLY REDUCE CO₂ EMISSIONS