

INNOVATING TO REDUCE THE CARBON FOOTPRINT OF CEMENT PRODUCTION



Aether™



With the contribution of the LIFE+ financial instrument of the European Community

PROJECT AETHER: REDUCING THE INTRINSIC CO₂ EMISSIONS FROM CEMENT PRODUCTION

Project Aether aims to develop a new, innovative class of clinkers with a lower environmental footprint. Clinker is the main component used to produce cement, through grinding and mixing it with additions like sulphates, and cementitious materials such as fly ash, slag or other pozzolanic materials. Less limestone is required to produce Aether cements, which are also manufactured at lower temperatures and using less energy than conventional Portland cement.

This allows a **25-30% reduction in CO₂ emissions** during the production process.

Aether clinkers can be made from conventional raw materials that are suitable for use in large scale cement manufacture: limestone, clay, iron and bauxite. They can also be produced in existing industrial installations - 'rotary kilns' - after certain process adaptations have been made. Aether cements are expected to offer similar performances to conventional Portland cement in various concrete applications.

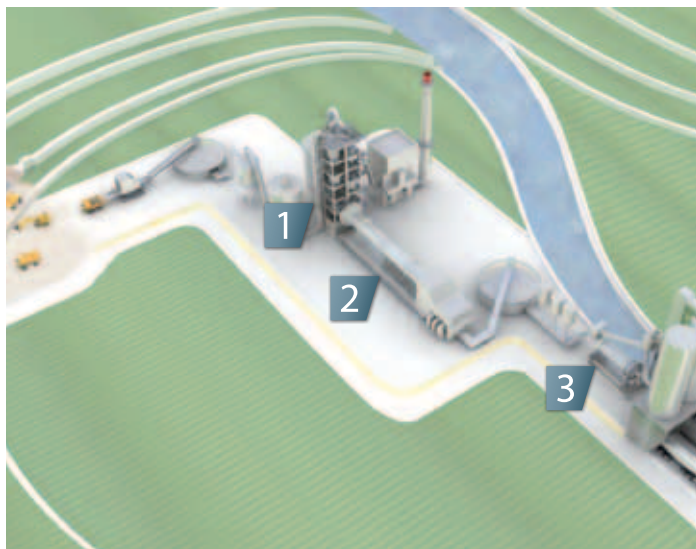
BACKGROUND

Cement is a vital product for a country's economic development, the basic ingredient required to build housing and infrastructure. However, cement manufacturing generates CO₂ and the cement industry as a whole is the source of around 5% of global CO₂ emissions.

- Around **60%** of these emissions result from the transformation of limestone at high temperatures - 'decarbonation' - to produce clinker, the basic component of cement.
- Approximately **40%** are generated from the energy used in the burning process.



HOW PROJECT AETHER AIMS TO REDUCE THE CARBON FOOTPRINT OF CEMENT PRODUCTION



- 1 Traditional Portland clinker is generally made from a 'raw mix' composed of around 80% limestone and 20% clay. The raw mix used to produce Aether clinkers has a lower limestone content, meaning less decarbonation during burning and therefore significantly lower CO₂ emissions.
- 2 Furthermore, Aether clinkers can be produced at kiln temperatures of around 1300°C (compared to 1450°C required for Portland clinker), resulting in lower energy consumption during the production process.
- 3 Finally, Aether clinkers are easier to grind than Portland clinkers, which means that less energy is required to grind Aether clinkers with additives to produce cement.



AN AMBITIOUS PROJECT BRINGING TOGETHER COMPLEMENTARY COMPETENCIES AND EXPERTISE FROM ACROSS EUROPE

Project Aether is run by Lafarge, world leader in building materials, working in partnership with BRE, the UK's leading centre of expertise on building and construction, and the Institute of Ceramics and Building Materials (ICiMB), the Polish research institute, which provides engineering and consulting support to the lime and cement industry, authorities and end-users.

The project is supported by the European Community through the LIFE+ financial instrument with up to 2.3 M€, out of a total budget of 5.9 M€.

This 3 year project will run from 1st September 2010 to 31st August 2013.



KEY STAGES IN THE PROJECT

The three-year project consists of:

- Two industrial trials at Lafarge cement plants in Europe to produce Aether clinkers.
- A pilot test before each trial at ICiMB's specialist cement-testing facilities in Krakow. Thanks to ICiMB's semi-industrial scale rotary kiln, certain parameters can be tested and conditions predicted for Aether clinker production in real industrial installations.
- Independent assessment of the trial results by BRE, to evaluate CO₂ emissions reductions and the properties of mortars and concretes made with the new Aether cements.
- Development by BRE of a roadmap for certification and normalization of the new cements, outlining the steps that will need to be taken, and the barriers to be overcome, if they are to be widely used in the construction sector.





Aether™

Project Aether has received the support of LIFE+, the European Union's financial instrument for the environment.

The project will contribute to the European Union's efforts to reduce greenhouse gas emissions, identified as a priority under the LIFE+ Programme.

Active communication will be undertaken throughout the project on the industrial tests and the results obtained, targeting a wide range of technical and non-technical audiences across Europe.



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