



## Media Release

# Research collaboration pushes the boundaries of low-carbon concrete technology

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A new research project, bringing together industry technology and engineering experts from Boral, the University of Technology Sydney (UTS) and Southern Highland Concrete Constructions, is set to develop advanced technology for manufacturing, placing and curing novel ultra-sustainable concrete in Australia.

The two-year project is co-funded by UTS-Boral Centre for Sustainable Building and the Innovative Manufacturing Cooperative Research Centre (IMCRC) with both organisations investing \$770,000 into the research. The project aims to overcome current technological barriers of low-carbon concrete manufacturing and accelerate the development of Boral's lower carbon [ENVISIA® concrete](#).

Boral General Manager – Innovation Development, Dr Louise Keyte, says that ENVISIA® already performs as well as conventional concrete while containing a sizable cement replacement – achieved through the inclusion of alternative binders.

“Our ambition, through the collaboration with UTS and Southern Highland Concrete Constructions, is to accelerate our research into new binders and develop the next generation of ENVISIA® concrete. We want to push low carbon boundaries even further while maintaining the practical properties of regular concrete.”

Low-carbon concrete uses supplementary cementitious materials (SCMs), such as ground granulated blast-furnace slag, fly ash and calcined clay, as binders instead of ordinary Portland cement (OPC). OPC is a major contributor to carbon emissions after fossil fuels.

To date, the percentage of SCM in low carbon concrete products is limited to 50% to ensure, for instance, the blended concrete meets the set workability, durability and strength requirements without demanding specialised high-temperature curing schemes or the use of highly alkaline activators.

The project team, led by Professor Vute Sirivivatnanon from UTS, will advance existing SCM treatment and activation technology and develop a new curing technology to control the formation of efflorescence – a white powdered salt deposition on the concrete surface – which is quite high using current SCM activation processes.

“Our aim is to push the technological boundaries of manufacturing SCMs and lift the maximal replacement rate of OPCs,” explains Professor Sirivivatnanon.

“An increase in the SCM content to 70% would present a significant advancement in the technology and could create a step change in carbon reduction for the industry.”

The core research will be undertaken at the UTS Boral Centre for Sustainable Building at the

UTS Tech Lab in Sydney where the researchers will test the performance of the new ultra-sustainable concrete and evaluate the effectiveness of proposed manufacturing approaches in tackling the strength development and efflorescence formation challenges.

Once lab-tested, the team will work with Southern Highlands Concrete Construction, a growing SME specialising in placing and curing of concrete, to trial the ultra-sustainable concrete in the field – on construction sites.

Benjamin Clarke, Managing Director at Southern Highland Concrete Constructions, highlights that low-carbon concrete will be the future of the construction industry.

“We are excited to be part of this project, sharing our expertise and techniques to make sure this next generation of low-carbon concrete achieves its desired strength and durability, and can be deployed cost-effectively,” says Clarke.

CEO and Managing Director of IMCRC, David Chuter describes the project as a great example of pushing industry boundaries by investing in research and development, developing new materials and products.

“Boral is at the forefront of low-carbon concrete development,” says Chuter.

“This research collaboration will not only see Boral develop an ultra-sustainable concrete that will be the first product of its kind and contribute to leading the way to reduce the carbon footprint of concrete production – domestically and internationally.”

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