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Calix's innovative project for capturing CO₂ emissions from cement and lime sectors – “LEILAC-2” – passes Financial Investment Decision milestone

Sydney, Australia | 23 March 2022 – Australian environmental technology company Calix Limited (ASX: CXL) (“Calix” or “the Company”) is pleased to announce that LEILAC-2 has passed the Financial Investment Decision milestone.

Highlights:

- The Calix lead LEILAC-2 project has passed its Financial Investment Decision (FID) to build a plant capable of capturing 20% of a cement plant's CO₂ at very low cost, which will be integrated into HeidelbergCement's operational plant in Hannover, Germany.
- Supported by the EU's Horizon 2020 scheme, the Calix design is for a new type of capture technology, designed as a retrofit, scalable module, that aims to use alternative and renewable fuels.
- This FID milestone has been achieved despite the complications arising from the global pandemic and Russian invasion of Ukraine. We are now proceeding with detailed design, purchasing long-lead items, and expecting to commence construction in 2023. There remain key project risk flag points prior to purchasing major components, given the market situation.
- The LEILAC approach is designed to enable a green and just transition to a low-carbon future with the objective of strengthening local industry and maximise the use of local resources – while addressing climate change.
- This first-of-a-kind modular retrofit, aiming to address a cement plant's unavoidable emissions, is aiming to ultimately separate CO₂ for a cost of €20 to 25 per tonne of CO₂.
- The LEILAC-2 plant is located at Hannover, providing a potential testing and backbone for future use and offshore storage options, and an excellent opportunity for decarbonising central European industry.
- The LEILAC-2 Project Consortium includes HeidelbergCement, Calix, CEMEX, Cimpor, Engie, IKN, Lhoist, and other global research and governmental partners.
- Critical global climate change targets have been committed to for 2050, with the IPCC assessment reports emphasising the need to accelerate the deployment of all CO₂ mitigation technologies, and it is hoped that LEILAC can play a key role.

LEILAC - Low Emissions Intensity Lime And Cement – aims to demonstrate, at industrial scale, a breakthrough technology that can capture a cement or lime plant's unavoidable process emissions for minimal cost, thereby providing a viable and effective decarbonisation solution. The LEILAC-2 plant is being designed to capture 100ktpa of CO₂.

The cement and lime industries play a vital role in our society. Cement is used in our roads, buildings, homes, offices and almost all infrastructure. Lime is used in a variety of applications, including the iron and steel, chemical, paper, pharmaceutical, drinking water, food, and farming industries. However, the cement industry alone is responsible for around 8% of global CO₂ emission, as most of its emissions are inherent to the production process and are therefore difficult to avoid.

Most cement associations and companies have committed to "net-zero" environmental processes, requiring the majority of cement plants to have carbon capture and storage solutions in place as quickly as possible.

The LEILAC Group, a subsidiary of Calix Limited, aims to apply a breakthrough in carbon capture technology that will enable the cement and lime industries to reduce their emissions dramatically - while retaining their international competitiveness – by capturing those process emissions at low cost. This is a completely new ‘type’ of carbon capture technology: which is a “process modification” approach, rather than requiring additional chemicals or processes to be added, so can separate CO₂ at a very low cost. The technology can also be retrofitted in a modular form at any scale, and aims to use any fuel or energy source (such as biomass, hydrogen, or electricity) – providing a ‘future proof’ solution.

The LEILAC-2 project was established to demonstrate that the Calix technology can be a retrofitted solution capable of capturing 20% of a plant’s emissions; be integrated without causing issues or major interruptions to the host plant; to investigate the use of alternative fuels; and be a replicable module enabling significant scale up. Since the LEILAC-2 project commenced in 2020, as a global society we have faced significant challenges: resulting in delays and price increases across the supply chain. Despite these challenges, the project teams – involving talented individuals from all of the project partners - have managed to progress, de-risk and develop a costed and technically viable design. The project successfully passed its FID decision milestone, and will now proceed into detailed design phase through 2022, followed by procurement and construction of the plant itself. There will be risk related gateways throughout the coming months to assess and deal with various risks, particularly for purchasing long lead items, to address the current market volatility.

Despite the considerable challenges ahead, LEILAC-2 – despite being a first of a kind demonstration retrofit – has the potential to separate CO₂ at low cost at a commercial scale. Including expected compression, fees and, capex costs – this equates to an “abatement” (not just capture) cost of around €20-25 per tonne.

If the LEILAC-2 plant can reach its nameplate capacity, this EU funded plant may capture €7.5 - 9.5million worth (EU ETS) of CO₂ annually for a total annual operating cost of €2million. The design is a replicable module, that can be duplicated to and scaled to capture 100% of a plant’s emissions. The storage of the CO₂, using well established, regulated and safe practices, would be required to ensure it does not reach the atmosphere, with a variety of options being put in place globally. The LEILAC-2 plant itself is located at Hannover, providing a potential testing and backbone for future use and offshore storage options, and an excellent opportunity for decarbonising central European industry.

LEILAC-2 remains a research and development plant, with risks as noted above, but is designed to deliver a replicable module that will be a step change in capturing carbon emissions in the cement and lime sector.

To mark this success, there will be a new website, and logo for the LEILAC Group – underscoring the central vision of successfully and economically decarbonising hard-to-abate sectors. The LEILAC technology is unfolding as a practical and affordable pathway for local industries to thrive in a carbon-constrained future.

Antonio Clausi, HeidelbergCement Group Director Competence Center Cement

"At HeidelbergCement, we are testing a wide range of new technologies to decarbonise the cement production process. Our goal is to achieve these CO₂ reductions while minimizing the need for additional resources, particularly fossil-based energy, and lowering costs. Maturing the LEILAC technology, steered by the highly committed Calix team, is therefore one of our priorities."

Phil Hodgson, Calix MD and CEO and Chairman of the LEILAC-2 Executive Board commented:

"The positive FID decision marks a significant milestone and further demonstrates the momentum which is building around the LEILAC-2 project. The completion of the FEED has been achieved despite the challenging circumstances and is a testament to the strong level of collaboration which has been cultivated between the consortium partners, who have all worked together to make significant progress on this breakthrough project."

The consortium is led by the LEILAC Group (technology provider Calix), and comprises HeidelbergCement, CEMEX, Cimpor, IKN, Lhoist, Port of Rotterdam, BGR, GSB, CERTH, POLIMI, LEAP, and Engie.

It is supported by GCCA, GCCSI, CEMBUREAU, ECRA, University of Clausthal and EuLA. The project aims to apply and demonstrate a breakthrough technology that will enable the cement and lime industries to reduce their carbon footprint significantly.

This announcement has been authorised for release to the ASX by:-

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About Calix

Calix is a team of dedicated people who are urgently developing great businesses, leveraging our patented technology, that deliver positive global impact.

The core technology is being used to develop more environmentally-friendly solutions for water treatment, CO₂ mitigation, biotechnology, advanced batteries, and more sustainable mineral and chemical processing.

Calix develops its technology via a global network of research and development collaborations, including governments, research institutes and universities, some of world's largest companies, and a growing customer base and distributor network for its commercialised products and processes.

Because there's only one Earth – Mars is for Quitters.

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