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Calix News

April 2023

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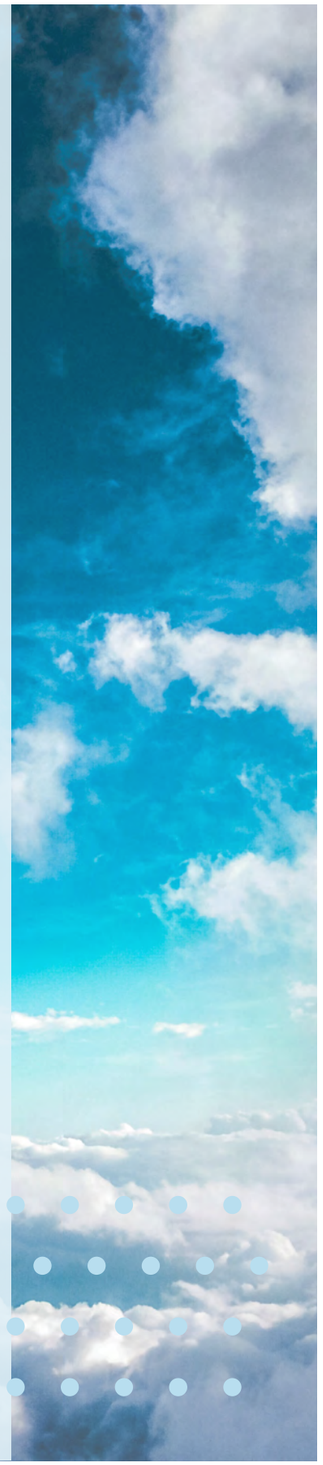
Phil Hodgson
CEO

Welcome to
Issue 44 of the Calix Newsletter



The year has leapt ahead and the pace of development of the business and opportunities is quickening. In the newsletter, we feature several articles on recent policy moves both in Australia and abroad, which serve to strengthen tailwinds for our technology in industrial decarbonisation. Calix has made submissions to the Australian Government on its Safeguard Mechanism and Critical Minerals Strategy – both important initiatives that are starting to galvanise action amidst improving clarity on Australia's position in decarbonisation. This clarity is essential if Australia is to re-build and add value via an expanding domestic manufacturing and processing capability. Our lithium project with Pilbara Minerals and the development of our Zero Emissions Steel TechnologY (ZESTY) are just a couple of examples of the opportunities we see in Australia, and overseas.

In the newsletter, we outline several new opportunities and updates for our Leilac (Low Emissions Intensity Lime and Cement) business, with an MOU outlining a development with Bill Gates-backed Heirloom for Direct Air Capture (DAC), progress in our UK low emissions lime project with Tarmac, a grant announced from the UK Government to progress our partnership with Windship for zero emissions shipping, and an article on our recent announcement to progress a sustainable fuels solution based on methanol with an Australian-German consortium lead by Vast Solar, with Adbri.

We also feature a couple of articles on the "often-for-gotten" development of the Calix technology into advanced materials such as for advanced batteries and biotech. We were pleased to execute formal arrangements with the CRC SAAFE research effort looking into solving anti-microbial resistance, using our unique, high activity and safe magnesium oxide. Next steps will involve setting up the project research streams, including potential veterinary applications.

We also report on the latest news on our battery materials development program, with commercial production and testing of our lithium manganese oxide cathode material with UK's AMTE Power in full swing, and new chemistries exhibiting excellent early results such as our lithium iron phosphate cathode material.

Calix would not be where we are without our great team, and in this newsletter we celebrate some of the great women in our team as part of International Women's Day. We also feature our new Non-Executive Director, Alison Deans, who recently joined the Calix Board in conjunction with the retirement of Dr Jack Hamilton, as part of our board renewal process. On behalf of the Chair, board and Calix team we extend our thanks to Jack for over 10 years of valuable advice and hard work over his tenure, and welcome Alison to the team.

As always, the Calix team extends its thanks to our shareholders and stakeholders for your ongoing support and interest in our efforts and we look forward to an exciting and fast-paced 2023!

Join us – Calix and Leilac are hiring

We're hiring! With a rapidly growing pipeline of projects across the globe, Calix, and its subsidiary, Leilac, are looking for talented and purpose-driven people to join our innovative and passionate teams solving global sustainability challenges.

Whether you're an engineer or scientist, plant manager or project manager, or simply passionate about our mission and interested to know more, please click below to learn about our current opportunities and to register your interest.

Latest Calix job opportunities

Latest Leilac job opportunities

CO_2 MITIGATION

Leilac announces Direct Air Capture application and partnership with Heirloom

Industrial decarbonisation is vital to achieving net zero emissions by 2050 and avoiding the most catastrophic effects of climate change. To achieve global climate goals, however, urgently decarbonising our industries will not be enough. The excess carbon dioxide already in the atmosphere must also be mitigated.

The Intergovernmental Panel on Climate Change projects that carbon dioxide removal in the order of 1-10 billion tonnes of CO_2 per year could mitigate residual emissions and, in most scenarios, achieve net negative emissions to return global warming to 1.5°C, following a peak.

In support of this goal, Leilac has signed a Memorandum of Understanding (MOU) for a global collaboration and licence agreement with Direct Air Capture (DAC) Company, Heirloom, to develop an efficient, modular and scalable approach to atmospheric carbon dioxide removal by DAC.

The partnership between Leilac and Heirloom, whose investors include Bill Gates-backed Breakthrough Energy Ventures, as well as existing Leilac shareholder Carbon Direct Capital Management, Ahren Innovation Capital and Microsoft, brings together two leading climate technologies, with Leilac's electric kiln powering Heirloom's limestone-based DAC technology.

Click here to watch a video on Leilac and Heirloom's partnership to bring Direct Air Capture to market.

In welcoming the partnership, Calix Managing Director and CEO, Phil Hodgson said, "Heirloom is a sophisticated and innovative Direct Air Capture company, and their partnership with Leilac represents a new application of Calix's core platform technology to address the global challenge of excess atmospheric CO_2 levels."

"The licence and collaboration agreement outlined in the MOU is the latest example of Calix's commercialisation strategy, designed to deliver the greatest positive impact at the greatest speed."

Leilac CEO, Daniel Rennie said, "Leilac is delighted to be partnering with Heirloom. Leilac and Heirloom are on a shared mission to help address global CO_2 emissions. Together, we are targeting an efficient and scalable approach to directly removing excess carbon dioxide from our atmosphere."

Heirloom CEO, Shashank Samala agreed, "We're incredibly excited about incorporating Leilac's world-leading electric kiln technology into our Direct Air Capture facilities because it will accelerate our efforts to capture 1 billion tons of CO_2 from the atmosphere by 2035 owing to its highly modular and energy-efficient design."

Heirloom & Leilac's unique approach to DAC

Heirloom's DAC solution harnesses limestone, one of the world's most abundant minerals, to provide a fast and low-cost path to permanent CO_2 removal. With a cost of approximately US$10-$50/tonne, limestone is inexpensive and easy to source. Combined with highly modular and easy to manufacture facilities, Heirloom's solution is designed to scale quickly to meet the urgency of climate action.

Leilac's calcination technology aims to efficiently separate and capture carbon dioxide from limestone to produce decarbonised lime. Its unique indirect heating approach requires no additional chemicals or processes and can be directly powered by renewable electricity. By keeping the process CO_2 emissions pure, Leilac's technology removes the need to separate gases from gases, enabling it to target the lowest cost solution for the capture of CO_2 from limestone.

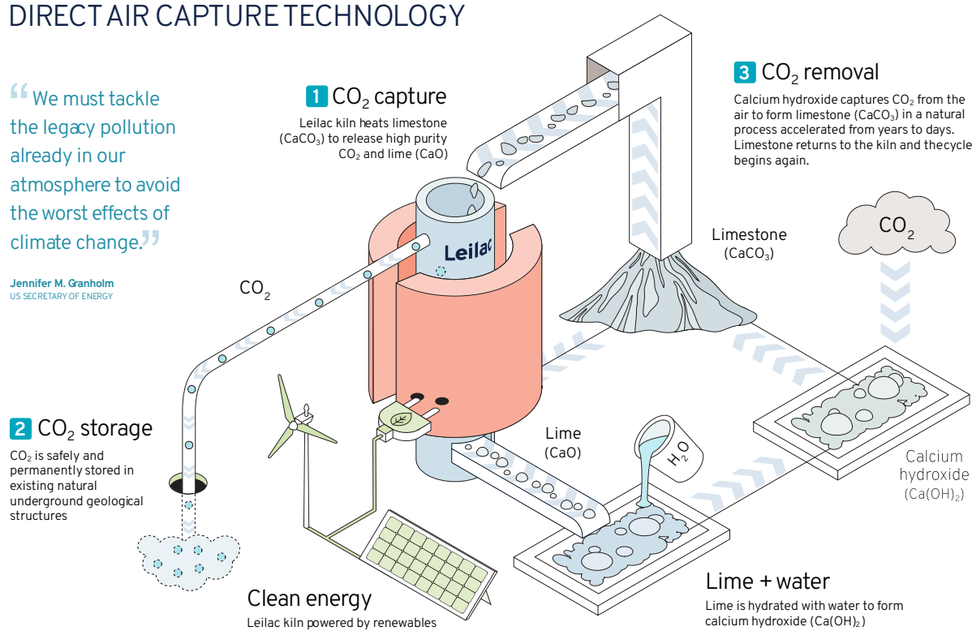
Heirloom's DAC technology uses lime in a novel carbonation process to directly capture CO_2 from the air and form limestone. This process accelerates the natural binding of CO_2 and lime from a period of years to just three days. After binding and removing CO_2 from the air, the reformed limestone is fed back into the renewably powered Leilac kiln, where the CO_2 is separated and captured, and the cycle begins again.

The CO_2 removed from the air will be mineralised, where it is bound to rocks or other materials, or injected underground into existing natural geological structures, where it remains safely and permanently stored. Other CO_2 uses, such as production of green methanol and synthetic aviation fuels are also being investigated (see article on page 9).

The integrated Heirloom and Leilac DAC solution will be 100% renewably powered to deliver the maximum net reduction of atmospheric carbon dioxide.

Leilac | Heirloom

DIRECT AIR CAPTURE TECHNOLOGY



Heirloom's Direct Air Capture processs, powered by Leilac's electric kiln technology

The licence agreement

Under the terms of the proposed global and binding perpetual licence agreement set out in the MOU, Leilac will receive a royalty based on the value of the CO_2 captured with the technology.

The royalty will:

- Have a floor price set at the greater of US$3/tonne of CO_2 separated in a Leilac kiln, or 3.5% of the prevailing CO_2 price for lime decarbonisation; and

- Have a variable price based upon the total volume of CO_2 capture capacity installed and the prevailing CO_2 price for lime decarbonisation, less the amortised cost of capital of the Leilac kiln per tonne of CO_2 separated.

It is expected that the floor price will be the initial royalty rate. As the technology application develops in scale and maturity, the costs of deployment are expected to fall correspondingly and cause the variable price to become the prevailing future royalty rate.

As part of the licence and collaboration agreement, Heirloom will contribute US$3m towards mutually agreed upon DAC and lime related research and development activities. Leilac will retain all IP relevant to its technology.

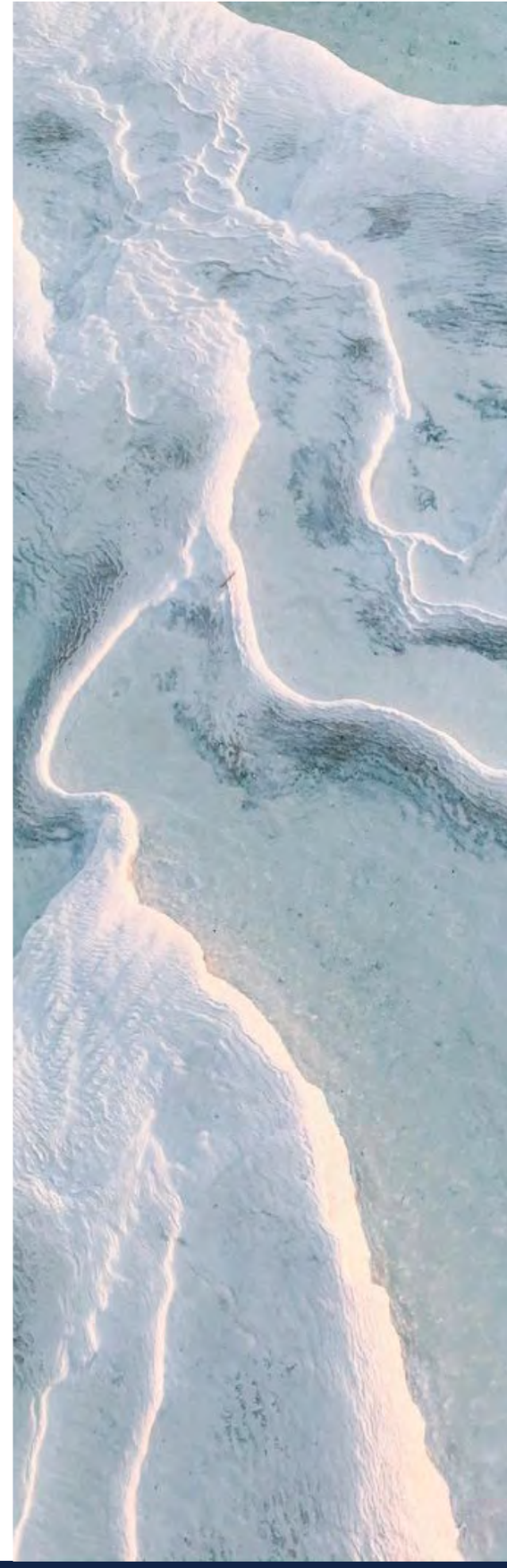
Applying Leilac's industrial decarbonisation technology to DAC

Leilac's decarbonisation technology was developed for, and in partnership with, the cement and lime industries. It aims to provide an efficient solution for the separation and abatement of unavoidable process emissions released in the production of cement and lime and is designed to be powered by renewable energy sources and clean alternative fuels.

Heirloom will apply the same core Leilac kiln technology for direct air capture of CO_2 emissions from the atmosphere, leveraging eight years of significant investment from the European Union and cement and lime industries to support and progress the DAC industry. The capacity of Leilac's Leilac-1 pilot plant is more than double the current combined capture capacity of all DAC facilities globally.

The partnership will also further accelerate development of Leilac's decarbonisation solutions for industrial emissions in cement and lime, helping to pave the way for full scale industrial electrification and CO_2 abatement.

Mr Rennie continued, "The collaborative and cooperative approach outlined in this agreement aims to accelerate the learning, synergies and steps to scaling that are needed to achieve our global climate ambitions and commitments. We are very excited to see the results we can achieve together."



CO₂ MITIGATION

Leilac partners with Windship for zero emissions shipping

International shipping, responsible for ~2% of global CO_2 emissions, is a particularly hard-to-abate sector of the economy. To help address this global challenge, Leilac is partnering with Windship Technology Limited to develop a combined wind propulsion and carbon capture system for low and zero emissions shipping.

Together, Windship and Leilac's technologies aim to enable approximately 50% of the ship's power to be provided by renewable energy and emissions from the remaining conventional fuel requirements to be captured by zero emissions lime. Integration of the carbon capture system with the ship's engines can enable waste heat recovery from the capture reaction, further reducing fuel demand. This unique combination of technologies has the potential to deliver a highly economical approach to elimination of emissions from shipping.

A demonstration project, led by Windship, was awarded £5m by Innovate UK. As part of the funding, and subject to grant finalisation documentation, Leilac will receive a grant of £1m to demonstrate the delivery of lime to an exhaust gas scrubber for CO_2 capture.

Carbon capture for shipping

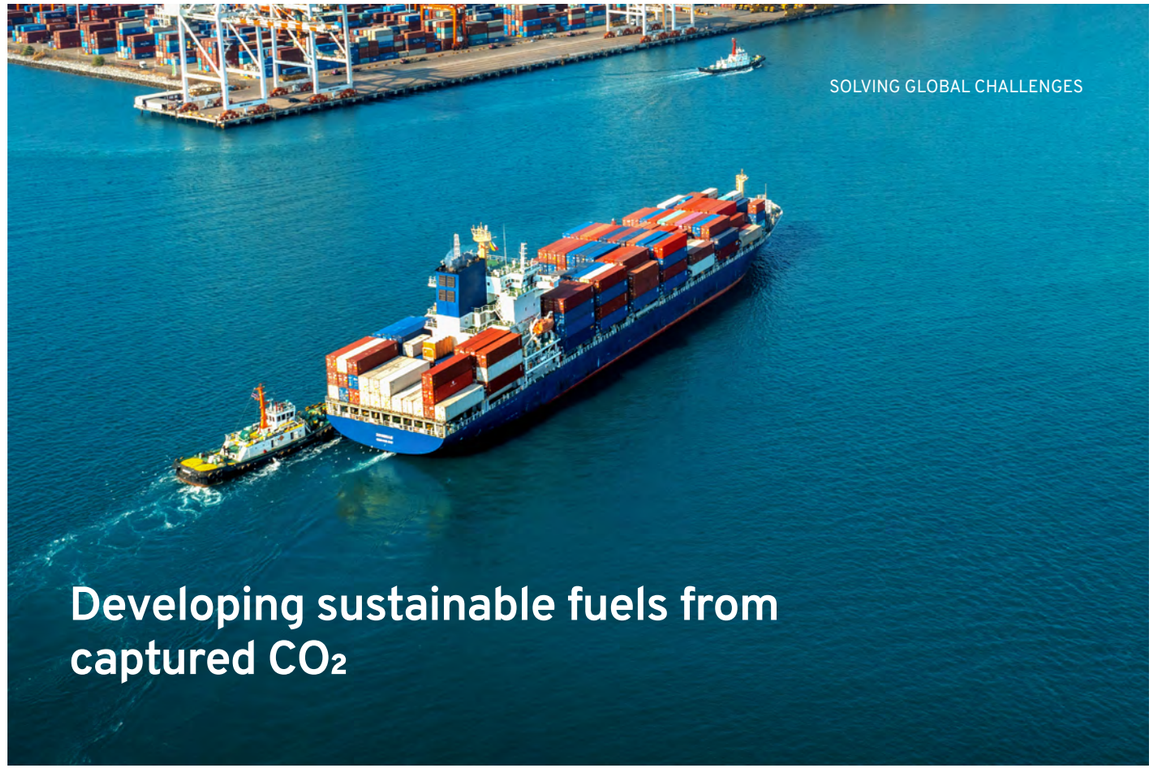
Lime is a highly effective sorbent for the capture of CO_2 and is being developed to be used in a carbon capture system for the abatement of emissions from conventional diesel engines. For this solution to provide a net reduction or elimination of emissions, the lime used for capture must be produced with low or zero carbon emissions, using shore-based decarbonisation of the lime.

Leilac's patented technology is being developed to produce low and zero emissions lime by efficiently capturing the unavoidable process CO_2 emissions released from limestone and using clean energy sources, such as hydrogen, electricity or alternative fuels.

For shipping, the decarbonised lime will be transferred to the relevant marine vessel, where the shipborne carbon capture process is applied. This system is compatible with a wide range of ship types, including tankers, container ships and cruise liners. It is retrofittable, fuel agnostic, and can be simply scaled to meet the decarbonisation ambitions of each ship. If successful, the adoption of lime as a sorbent for ships would also significantly expand the market for low and zero emissions lime.

Noting the benefits of research and development already undertaken in partnership with the cement and lime industries, Leilac CEO, Daniel Rennie said,

"This project marks a significant step in developing a potential route for the efficient and low-cost decarbonisation of the shipping industry. Marine shipping is a particularly hard-to-abate sector, and the very strong synergies that can be made from leveraging the large-scale industrial decarbonisation efforts in the lime and cement industries – combined with the innovative renewable approach by Windship – is an exciting development."



SOLVING GLOBAL CHALLENGES

Developing sustainable fuels from captured CO_2

Calix is a member of an Australian-German consortium that aims to demonstrate a new route to more sustainable transport fuels by producing methanol from renewable energy, green hydrogen and captured process CO_2 emissions.

Methanol is a versatile hydrogen derivative that has the potential to act as an effective green hydrogen carrier, as well as a sustainable transport fuel for the aviation and shipping sectors, together accounting for over 4% of global CO_2 emissions. By using captured CO_2 in its synthesis, methanol can also provide a use for CO_2 that is an unavoidable by-product of industrial processes, such as the production of cement and lime.

The Solar Methanol Project

As announced by the Hon Chris Bowen MP, Minister for Climate Change and Energy on 27 January, the "HyGATE" Solar Methanol Project was awarded AU$19.48 million from the Australian Renewable Energy Agency (ARENA) and €13.2 million (~AU$20.19m) from Germany's Federal Ministry of Education and Research (BMBF) to develop a world-first green methanol demonstration plant in Port Augusta, South Australia.

The Solar Methanol Project aims to integrate several innovative low emission technologies to deliver renewable power and process heat, green hydrogen electrolysis, and, with the Leilac technology, renewably powered electric calcination of limestone and the efficient capture of unavoidable process CO_2 emissions.

Low and zero emissions lime

In collaboration with the project, Leilac and Adbri are pursuing opportunities to develop a renewably powered lime plant that would produce low emissions lime and capture process CO_2 for potential use in methanol synthesis by the Solar Methanol Project. While Calix and Adbri are not direct recipients of HyGATE funding, HyGATE represents excellent potential to derive direct value for captured CO_2 into an opportunity with significant potential to scale.

Calix CEO and Managing Director, Phil Hodgson said:

We are delighted to be progressing plans with Adbri for zero emissions lime with electrification and CO_2 capture. As part of the HyGATE consortium we look forward to the outcomes of the HyGATE project, which has the potential to further catalyse support for CO_2 capture and to pioneer new green fuels for aviation and shipping."

Adbri Interim CEO, Mark Irwin said:

"As a leading Australian producer of cement and lime with a commitment to be net zero by 2050, we recognise partnership with companies such as Calix are essential for the development of technology necessary to reach our goal. We are excited about the potential to supply zero emissions lime to our customers, a critical product in a decarbonised economy."

CO₂ MITIGATION

Zero emissions lime moves a step closer with Tarmac

Tarmac and Leilac have moved a step closer to delivering the world's first zero emissions lime plant, with the UK Government announcing that the Buxton Lime Net Zero project has successfully passed the due diligence phase of the Industrial Carbon Capture (ICC) funding scheme.

The proposed zero emissions plant would use the Leilac technology to capture up to 20,000tpa of process CO_2 produced unavoidably during the manufacture of lime. The lime plant would use clean hydrogen to fuel the kiln, eliminating CO_2 emissions that would otherwise result from the use of traditional carbon-based fuels.

Leilac CEO, Daniel Rennie, said: *"Leilac is delighted to be partnering with Tarmac to produce zero emissions lime. As an essential material across a range of industries, the decarbonisation of lime is an important enabling step towards low and zero carbon industry.*

"Demonstrating a viable and low-cost approach for the abatement of unavoidable emissions and the use of alternative clean fuel sources can provide a pathway for zero emissions lime that balances social, economic and environmental sustainability."

Seamus Lynch, managing director, Cement, Lime and Packed Products, at Tarmac said: *"Achieving the UK's legally binding net zero targets will require significant development of new infrastructure and ground-breaking technologies such as those proposed through this landmark project. It's therefore hugely encouraging to have progressed to the next step towards this proposed plant becoming a reality."*

High purity limes are essential for everyday life due to their use in pharmaceuticals and water purification. The net zero lime produced from the project would be used in the UK and help lower the carbon footprint of this important domestic industry. The project is part of the HyNet cluster, a leading UK industrial decarbonisation project, and forms part of the UK Government's plans to accelerate decarbonisation ambitions and kick start the hydrogen economy.

ADVANCED BATTERIES

Pilot scale electrode foil coating with Calix LMO at BatTRI-Hub in Victoria, Australia.

Advanced Batteries

Performance improvements, commercial testing and new chemistries

With global demand for lithium-ion batteries expected to grow 18 times this decade, there is an increasing need for more economical and environmentally friendly battery materials. To help solve this growing global challenge, Calix is using the renewably powered BATMn reactor to pioneer a more sustainable and more affordable production method for lithium-ion battery cathode materials.

Since the beginning of the year, Calix's Advanced Batteries line of business has continued to progress development of its cathode active materials across multiple fronts. The lithium manganese oxide (LMO) cathode materials continue to be optimised, with the latest samples exhibiting a specific discharge capacity of ~130mAh/g, up from ~120 mAh/g previously, based on lab-scale samples and test results.

In the UK, AMTE Power is currently testing Calix's LMO cathode materials in a commercial format, using 3.5Ah multi-layer pouch cells. In Australia, meanwhile, the Deakin University Battery Research and Innovation Hub (BatTRI-Hub) has begun pouch cell fabrication and testing of electrode foils manufactured in-house at pilot scale with Calix's LMO cathode active materials. Results from tests at AMTE and BatTRI-Hub are expected in the next quarter. Previous tests on Calix's LMO materials indicate excellent potential for high power applications, such as industrial vehicles and power tools.

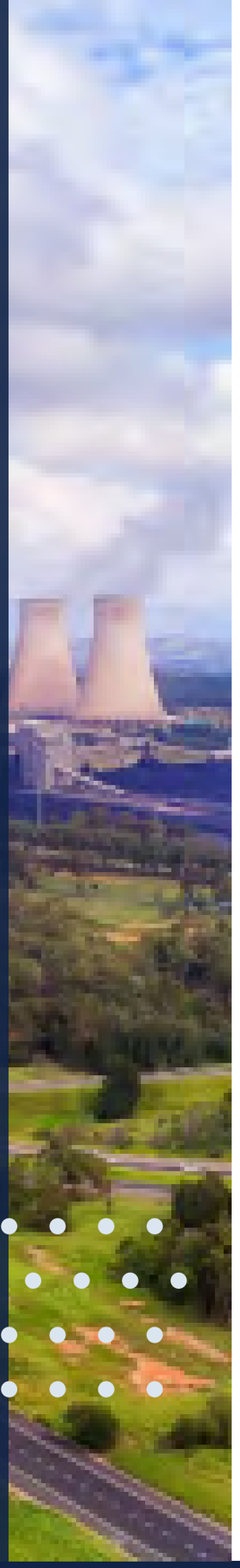
For other segments of the battery market, including electric vehicles, alternative battery chemistries such as lithium iron phosphate (LFP) and lithium nickel manganese oxide (LNMO) chemistries are preferred. Calix's development of LFP and LNMO battery chemistries continues to gather pace. The development of alternative battery chemistries not only opens opportunities in new and larger segments of the battery market, but also demonstrates the potential of Calix's production methods as a more sustainable and low-cost chemistry agnostic platform technology.

Calix's submissions to the Australian government on the Safeguard Mechanism Reforms and the Critical Minerals Strategy

The decarbonisation of the global economy represents one of our greatest global challenges. For Australia, with perhaps unrivalled natural resources in renewable energy and critical minerals, this challenge also represents a moment of significant opportunity.

Strong and stable policy settings are essential to enabling Australia to both meet its emission reduction targets, and to incentivise investment in low and zero carbon technologies and products that will underpin a future net zero economy.

This quarter, Calix was pleased to make submissions to the Australian Government regarding the Safeguard Mechanism Reforms and the Critical Minerals Strategy 2023.



Safeguard Mechanism Reforms

Calix commends the Australian Government on its announced changes to the carbon emissions Safeguard Mechanism, its support for investment in decarbonisation technologies and its consideration of a carbon border adjustment mechanism.

A price on carbon provides strong incentives for emitters to decarbonise and importantly, a stable base from which investment decisions on decarbonisation strategies and technologies can be made. Furthermore, these policies combined provide strong incentives and support for Australia's largest emitters to both reduce emissions on a pathway to net zero by 2050, and maintain and improve their competitiveness in a decarbonising global economy.

Please find a copy of Calix's submission on the Safeguard Mechanism Reforms below.

Download Calix's Safeguard Mechanism Reforms submission

Critical Minerals Strategy 2023

The critical minerals industry is a vital sector of the Australian economy, providing jobs and resources for a wide range of industries. It is also facing a period of significant risk and disruption, as global decarbonisation efforts and supply chain issues manifest for Australian producers and their exports.

It is crucial for the critical minerals industry to find ways to mitigate these risks in order to ensure the continuity of supply and maintain a competitive edge. At the same time, increasing global demand for a reliable and sustainable supply of critical minerals presents significant opportunities for Australian mineral producers.

Please find a copy of Calix's submission on the Critical Minerals Strategy 2023 below.

Download Calix's Critical Minerals Strategy 2023 submission

Properties of magnesium hydroxide for wastewater treatment

Magnesium hydroxide's powerful, but gentle properties for pH control have been known for centuries, as 19th century users of Milk of Magnesia antacids would have been able to attest. This ability to gently control pH and alkalinity applies not only to upset stomachs, but also to multi-million-gallon wastewater treatment plants. In both cases, a suitable, stable environment is needed to allow bacteria to convert unwanted contaminants into harmless by-products.

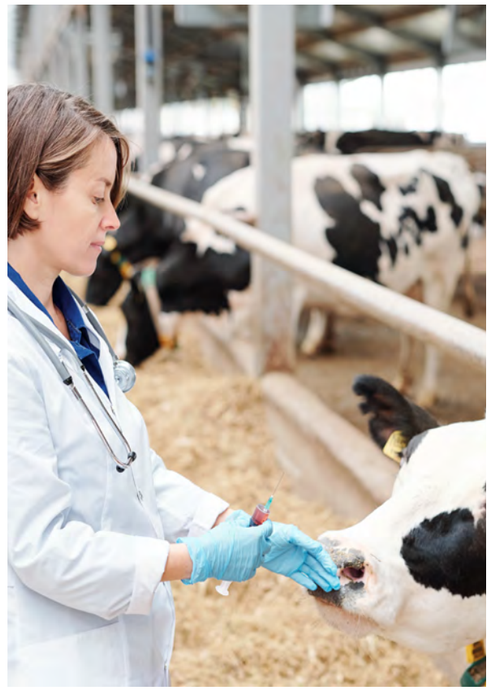
The following three-part article explores the unique properties of magnesium hydroxide and how they make it the most effective, yet non-hazardous solution for more sustainable wastewater treatment.

Read full article

BIOTECH

Antimicrobial alternatives

A foundation CRC SAAFE project aims to develop Calix's bioactive materials as an alternative to antibiotics and other antimicrobials for sustainable agriculture.



A newly approved foundation CRC SAAFE project aims to use the antibacterial properties of Calix's unique bioactive magnesium oxide materials to develop alternatives to antibiotics and other antimicrobials for livestock producers.

The project will evaluate the safety and antimicrobial efficacy of Calix's bioactive materials, as well as develop products that improve animal health and productivity in intensive livestock systems with minimal antibiotic intervention.

The project builds on last year's announcement that Calix is a Tier 1 partner in CRC SAAFE, a collaborative research centre established to develop, commercialise and apply new solutions to antimicrobial resistance (AMR) in agriculture, supported by more than A$112m in funding.

The successful development of effective antimicrobial alternatives can enable intensive livestock producers to help ensure animal welfare by managing disease, while minimising antibiotic use.

Antimicrobial resistance: getting ahead of the next pandemic

Following many years of antibiotic overuse, the rise in infections caused by antimicrobial-resistant bacteria is now recognised as a global crisis. The United Nations projects AMR will cost the global economy US$100 trillion and cause 10 million deaths per year by 2050.

AMR solutions are urgently needed to reduce the reliance on conventional pesticides, biocides and antibiotics, extend the life of remaining effective biocides and antibiotics, and help improve food safety and agricultural sustainability.

Calix's magnesium oxide-based materials are non-toxic and exhibit unique bioactive properties that suppress pathogenic microorganisms, insect pests, and marine bio-foulants. Early results indicate these novel materials are safe and attenuate both drug susceptible and resistant microorganisms with very low resistance development potential. They offer a generally non-lethal mode of action and display synergies with existing biocides and antibiotics.

A successful foundation CRC SAAFE project will help maintain antibiotic effectiveness and position Australian livestock producers as leaders in sustainability and AMR pressure reduction.

In addition to helping address the rise of antimicrobial resistance, the continued development of Calix's bioactive materials offers multiple other potential applications that can replace polluting or damaging products in agriculture and marine coatings.

Welcome to Calix's new Non-Executive Director, Alison Deans and farewell to Dr Jack Hamilton

"Calix brings together a rare combination of world-leading Australian technology, enormous market potential, an inspiring purpose, and a capable, entrepreneurial and values-driven team.

"I look forward to working with the board and the executive team towards realising the potential of Calix's technology to address significant global challenges, including the decarbonisation of heavy industries."

Alison Deans
Non-Executive Director

Calix board renewal

Calix was delighted to recently welcome Alison Deans to the board as a Non-Executive Director, as we also farewelled long-serving Non-Executive Director, Dr Jack Hamilton.

These changes are the latest example of a proactive approach to board succession and renewal, as the board seeks to ensure its size and composition is appropriate to support the continued delivery of Calix's growth strategies, and best practice governance standards.

Appointment of Alison Deans as Non-Executive Director

Ms Deans' brings extensive experience leading and building technology-enabled businesses across ecommerce, media, financial services and health, and in leadership roles as a senior executive, a non-executive director and chair, as well as venture capital experience.

Ms Deans is currently Chair of Cochlear Limited (ASX: COH), Non-Executive Director at Ramsay Health Care Limited (ASX: RHC), and Non-Executive Director at Deputy Group Pty Ltd. Ms Deans is also a member of the Investment Committee at Main Sequence Ventures (CSIRO's innovation fund) and a Member of the AICD Corporate Governance Committee. Ms Deans' previous directorships include Westpac Banking Corporation, Insurance Australia Group Limited and Social Ventures Australia.

In her executive career, Ms Deans was previously the CEO of eBay Australia and New Zealand, CEO of eCorp Limited (a publicly listed portfolio of digital businesses), CEO of Hoyts Cinemas, CEO of netus Pty Ltd (a technology investment company acquired by Fairfax), and a consultant with McKinsey & Company. She holds a Master of Business Administration from the Stanford Graduate School of Business and a Master of Arts (Physics) from Cambridge University.

In welcoming Ms Deans, Calix Chair of the board of directors, Peter Turnbull said, "I am delighted to welcome Alison to the Calix board. Her depth and breadth of experience as a non-executive director and impressive experience leading technology-enabled businesses will be of significant benefit to the board, the company and its growth ambitions.

"The decarbonisation of industry in the pursuit of a net zero economy is one of the greatest global challenges. Calix's technology solutions, particularly those aimed at solving global challenges in industrial decarbonisation, are well placed to capitalise on these strong and growing market tailwinds.

"Alison's appointment is a reflection of Calix's growth trajectory, and potential for significant impact and value creation in the future."

Retirement of Non-Executive Director, Dr Jack Hamilton

Following Ms Dean's appointment, Dr Jack Hamilton retired from the Calix board of directors. Dr Hamilton's considerable experience, both executive and non-executive, has been pivotal to Calix achieving its growth milestones to date. Calix thanks Dr Hamilton sincerely for his service, focus, availability and wise counsel.

Mr Turnbull said, "On behalf of the board and the whole Calix team, I would also like to express my sincere gratitude to Jack Hamilton for his substantial and valuable contribution over many years. Calix has achieved a great deal during Jack's tenure on the board and we all wish him well in the future."

"It has been an honour to work with a great team to bring an Australian technology successfully to the world stage over the past 10 years. The Calix technology platform is positioned to make a significant contribution to decarbonise many of our hard-to-abate essential industrial processes. As well as positively impacting other environmental areas such as electrification, water, agriculture and marine.

"I look forward to watching the Calix team continue to realise the Company's potential over the coming years."

Dr Jack Hamilton

Celebrating International Women's Day

At Calix Limited, we believe fostering a diverse and inclusive culture is both a moral imperative and foundational to driving innovation and success. On 8 March 2023, we celebrated International Women's Day by taking the opportunity to shine a light on some of our talented women developing innovative solutions to global sustainability challenges.

Introducing **Chloe Lian**, a Senior Process Engineer at Calix with a background in Chemical Engineering. Chloe is currently working on the process flow design for various projects, including developing an innovative 'midstream' process for more sustainable lithium products.

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"Good engineering is the result of creativity and innovation that is born from the fundamental differences of an individual's thought processes and experiences. With critical demand for innovation in sustainable engineering, it is more important than ever for diverse teams to come together to bring great ideas to life.

The traditional gender bias of STEM has resulted in many talented young women being displaced from careers in technical and scientific fields. It is important for us all to advocate for and encourage passionate young girls to choose STEM in school."

Chloe Lian
Senior Process Engineer

Meet **Shammi Ferdousi**, a material scientist with over 13 years' research experience in nanomaterials, electrochemistry, and surface science. As a Materials Engineer at Calix, Shammi is leading a team developing innovative and more sustainable cathode materials for Li-ion batteries.

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"International Women's Day is an opportunity to both celebrate women's accomplishments and highlight the work that remains to be done towards gender equality. It is a call to action to continue to break down gender stereotypes and to encourage girls to excel in STEM subjects.

A degree in STEM can be a gateway to a wide variety of career choices. More women in STEM will create a more diverse workforce, enabling businesses to recruit new talent, drive innovation and be more inclusive and responsive. By closing the gender employment gap, we can create safer, healthier and more prosperous communities."

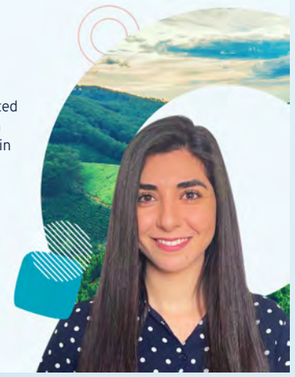
Shammi Ferdousi
Materials Engineer

With a background in Materials Engineering, **Rana Hawly** is a Procurement Manager at Leilac, responsible for developing the procurement process for materials, products, and services for Leilac projects and ensuring that they meet quality, cost, and delivery requirements.

Leilac

"Women and girls will be better represented in STEM if they are encouraged and given support to pursue education and careers in these fields. Doing so will also help to promote gender diversity, economic empowerment, innovation, and problem solving from a variety of angles, with the objective of building a more inclusive and equitable future for everyone."

Rana Hawly
Procurement Manager



Meet Environmental Process Engineer, **Annie Minga**. With a background in operations and pollution control equipment design, Annie is applying her experience in high heat industrial applications to advance the Leilac technology and help to urgently address global climate goals.

Leilac

"I am the beneficiary of a strong and progressive education that exposed me to art, music, language and science in the company of multi-national and socio-economically diverse kids. In my career, my healthiest teams have also included a skilled and diverse group of team members.

More equitable education could help deliver more diversity in the teams directing investment and decision-making in society. And perhaps extra effort is needed in society to encourage those who have not been encouraged in the past. Today is International Women's Day, and I am grateful that extra effort was made by others to make sure I succeeded in science and engineering."

Annie Minga
Environmental Process Engineer

Calix circumvents concrete creation challenge

"Efficiency is at the heart of the Leilac technology. Our process modification approach has, in theory, no energy penalty compared with existing production methods. Even when retrofitted to an operational cement plant, the energy penalty is being developed to be minimal. This efficiency is enabling us to develop the potentially lowest cost carbon abatement solution for the industry." – Leilac CEO, Daniel Rennie.

Read Leilac CEO, Daniel Rennie's recent conversation with Quarry Magazine about how Leilac has reimagined carbon capture for sustainable cement and lime.

https://www.quarrymagazine.com/2023/03/16/calix-circumvents-concrete-creation-challenge/

The Net-Zero Industry Act

Policy support and infrastructure for CCS in the EU

In support of the EU's climate-neutrality commitment, the European Commission has proposed the introduction of the Net-Zero Industry Act to provide a regulatory framework for the rapid development of net zero industry in the EU.

Learn how the EU's Net-Zero Industry Act is prioritising carbon capture technologies and the development of infrastructure for the storage of 50 million tonnes of CO_2 per year by 2030.

https://www.leilac.com/news/net-zero-industry-act-support-infrastructure-ccs-eu/

calix

Mars is for quitters.

Meet Youssef Aaraj - Process Engineer at Leilac

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