Calix Limited
Half Year Results FY2023

21 February 2023

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ASX Announcement
Heirloom Direct Air Capture MOU

Calix Limited

21 February 2023

Leilac Direct Air Capture

Core lime technology applied to atmospheric CO_2 removal

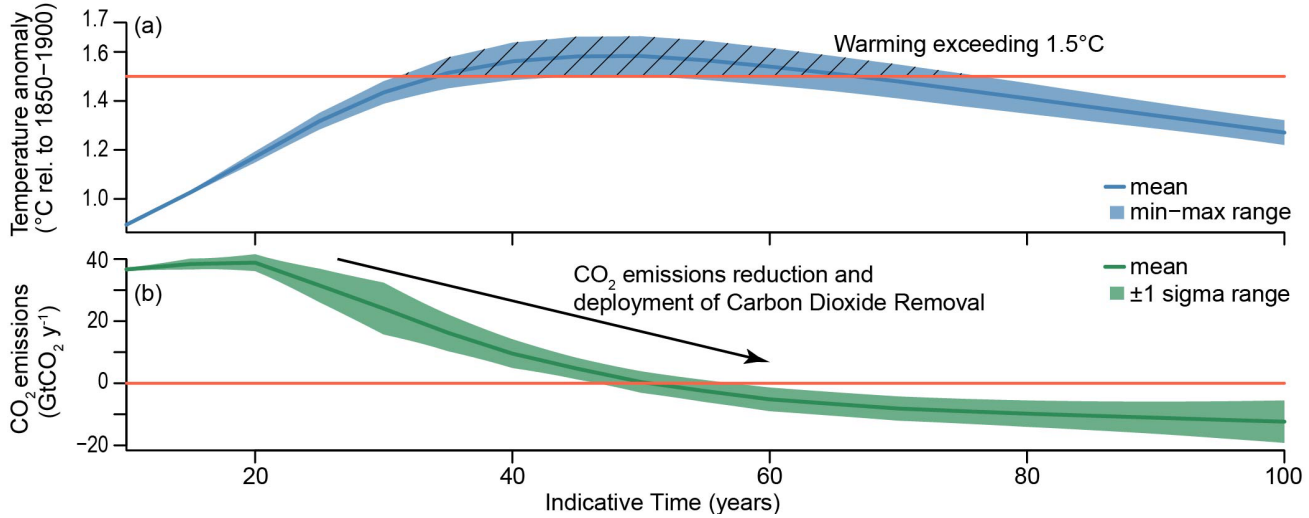
Direct Air Capture

- Removal of legacy CO_2 emissions directly from the atmosphere.
- 1-10 billion tonnes of CO_2 per annum removal likely needed to limit global warming to 1.5°C, following a peak.[1]
- Lime is a highly effective sorbent for CO_2 capture, but must be produced with zero emissions.
- Leilac's core technology can be applied as a lime carbon capture unit for DAC.
- This can be achieved using calcium looping, with efficient capture of CO_2 from limestone.
- Leilac electric calcination can use renewable energy sources.

"No matter how fast we decarbonize the nation's economy, we must tackle the legacy pollution already in our atmosphere to avoid the worst effects of climate change."

U.S. Secretary of Energy Jennifer M. Granholm.

Geophysical characteristics of mitigation pathways overshooting 1.5°C by mid-century



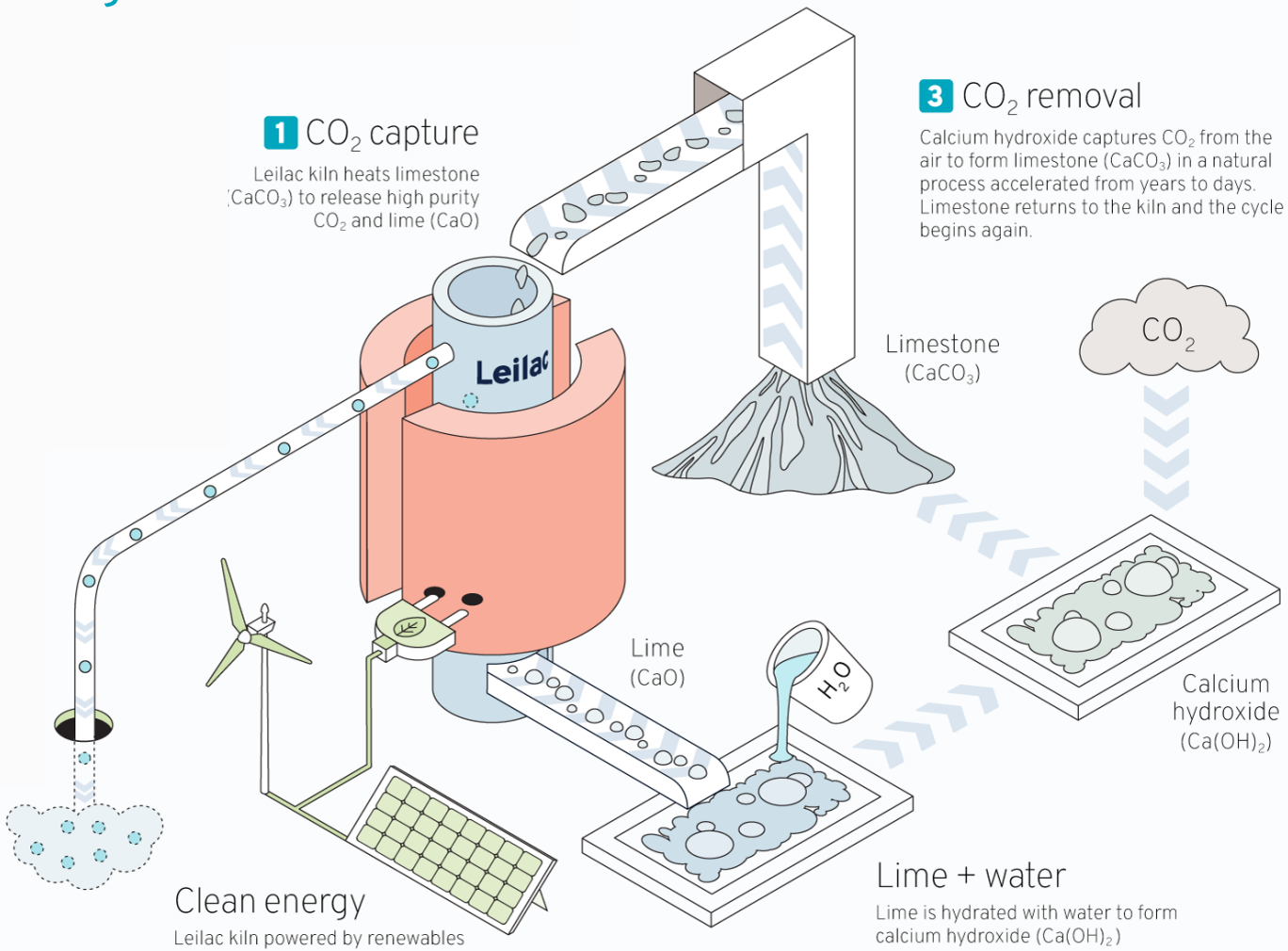
1. IPCC Special Report on Global Warming of 1.5°C Agency
2. Fourth IMO GHG Study, expressed in CO2 equivalents emissions, also including CH4 and N2O

Source: IPCC Special Report on Global Warming of 1.5°C

Leilac Direct Air Capture

Non-binding MOU for DAC global licence agreement with Heirloom

- Heirloom[1] is a Direct Air Capture company with an objective of capturing 1 billion tonnes of CO_2 by 2035.
- Heirloom's backers include Gates-led Breakthrough Energy Ventures, Carbon Direct and Microsoft.
- The MOU outlines key collaboration terms, including US$3m in R&D contribution from Heirloom to advance Leilac calcium looping.
- The MOU also covers key terms for a global licence agreement, which once executed, will apply to any Heirloom facility.
- The technology licence fee comprises:
  i. A royalty floor of US$3 per tonne of CO_2 captured; and
  ii. A variable royalty rate based on the prevailing CO_2 price for lime decarbonisation, less the amortised cost of capital of the Leilac kiln per tonne of CO_2 separated.



1. https://www.heirloomcarbon.com/

FY2023 Half Year Results Presentation

Calix Limited

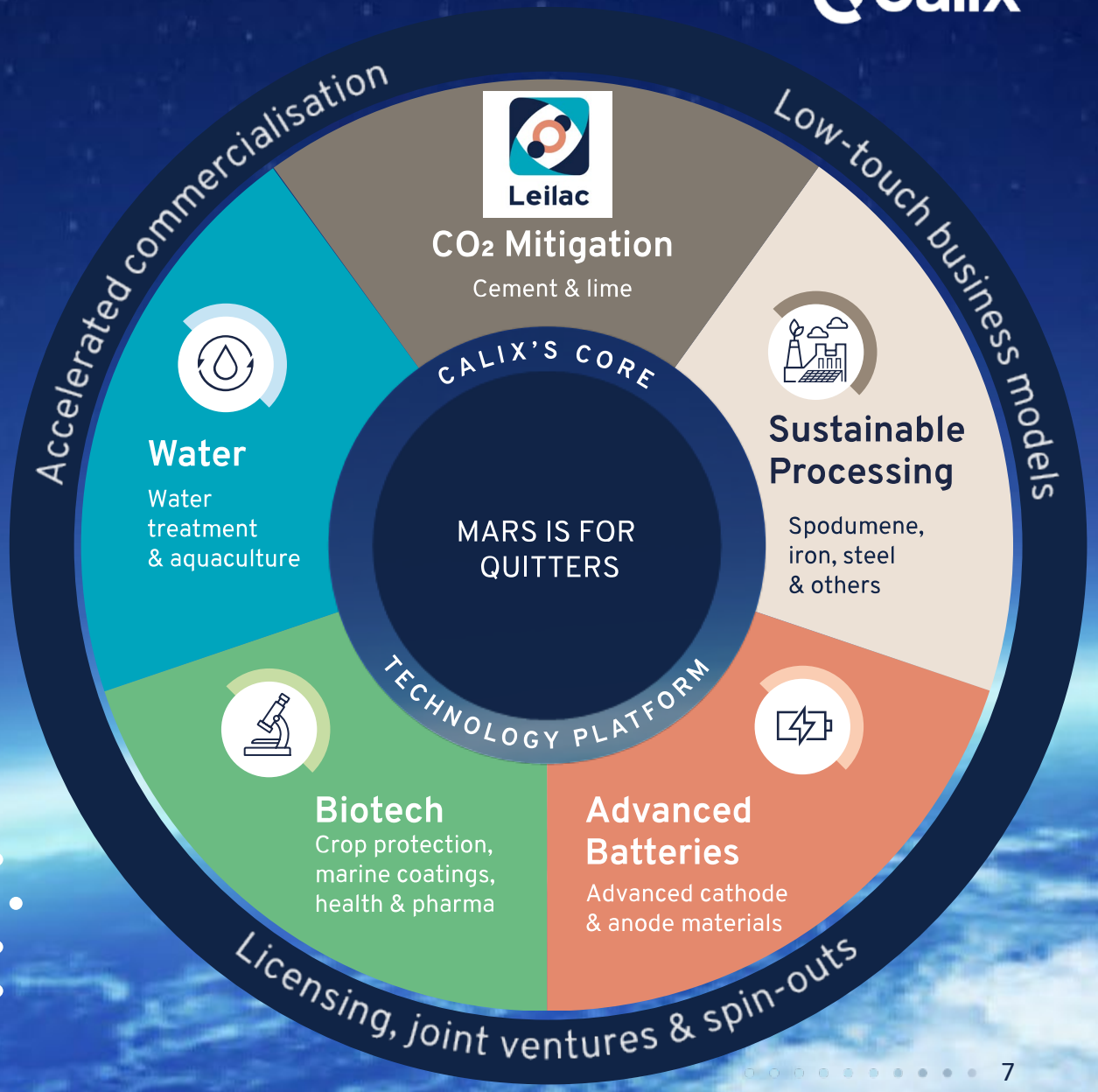
21 February 2023

Solving global challenges

One core technology platform
Five lines of business

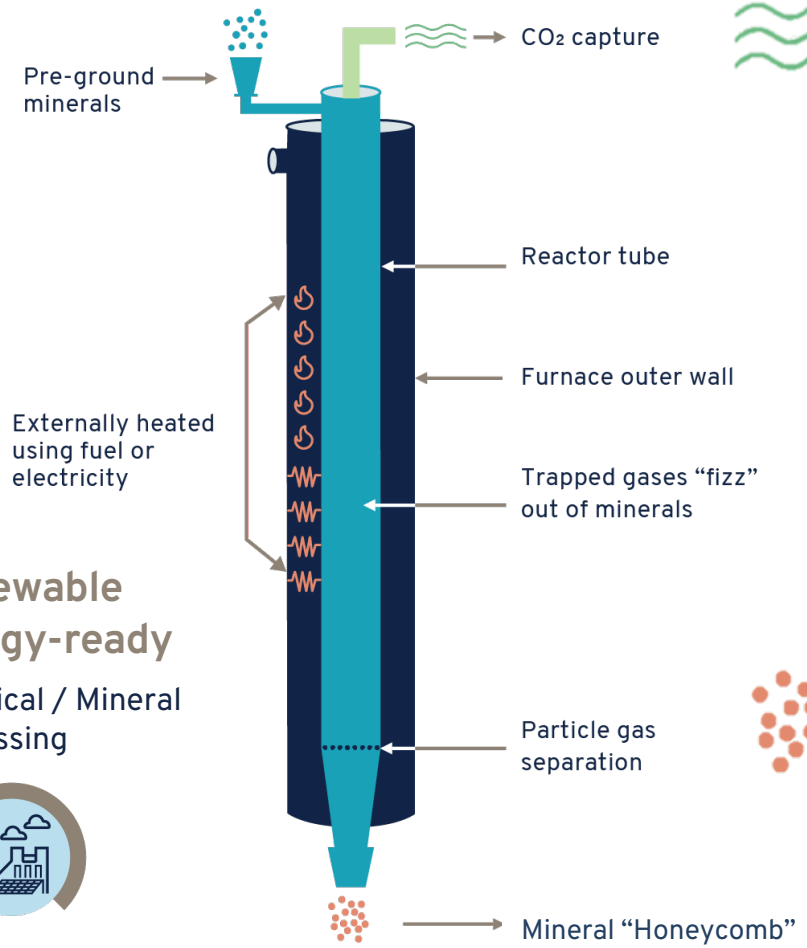
Multiple environmental business opportunities, focused on:

- A specific global challenge
- Consistent with our purpose, values & ethos
- Significant market and shared value potential
- Sustainable competitive advantages
- Scale and speed of impact



Calix's core technology platform

A new way to heat stuff up



CO_2 capture

Capture of high purity CO_2 when processing limestone

Renewable energy-ready

Chemical / Mineral processing

Highly-active materials

Highly porous "honeycomb" structure = more chemical- and/or bio-activity

An AUSTRALIAN invention...

28 patent families covering core technology and applications

>A$120m has been invested to date in developing the technology

FY23 achievements so far…

Commercialisation of industrial decarbonisation solutions accelerates

19 Oct — First licence agreement signed for cement
Leilac signs first-of-a-kind global licence agreement with Heidelberg Materials.

20 Oct — Completion of AU$60m institutional placement.

8 Nov — ZESTY awarded funding
$947k ARENA grant to help fund BOD and FEED study for renewably powered 30,000 tpa demonstration plant.

15 Nov — Completion of AU$21.6m Share Purchase Plan.

Capital raise of AU$81.6m
to accelerate the commercialisation of Calix's technology for industrial decarbonisation.

23 Nov — Leilac & CEMEX announce 3 new projects
Full-scale projects announced in Germany, Poland and the US, & progress towards a global licence agreement.

28 Nov — Joint Venture executed with Pilbara Minerals
JV, supported by $20m MMI grant, aims to develop a novel mid-stream lithium processing to produce low carbon, low waste, and high value concentrated lithium salt.

30 Jan — Calix partner in methanol project for sustainable fuels from CO_2
With funding from the HyGATE Initiative, the Project aims to use CO_2 captured by a Leilac kiln at an Adbri lime plant to produce sustainable fuels.

16 Feb — Leilac and Windship awarded £5m to demonstrate zero emissions shipping
The Project aims to demonstrate a combination of renewably powered propulsion and a lime-based carbon capture.

21 Feb — Leilac signs MOU for global licence for Direct Air Capture with Heirloom
Leilac announces a new application of its core technology for Direct Air Capture of atmospheric CO_2, and a global licence and collaboration agreement with Heirloom.

1H FY23 financial update

Investment in growth

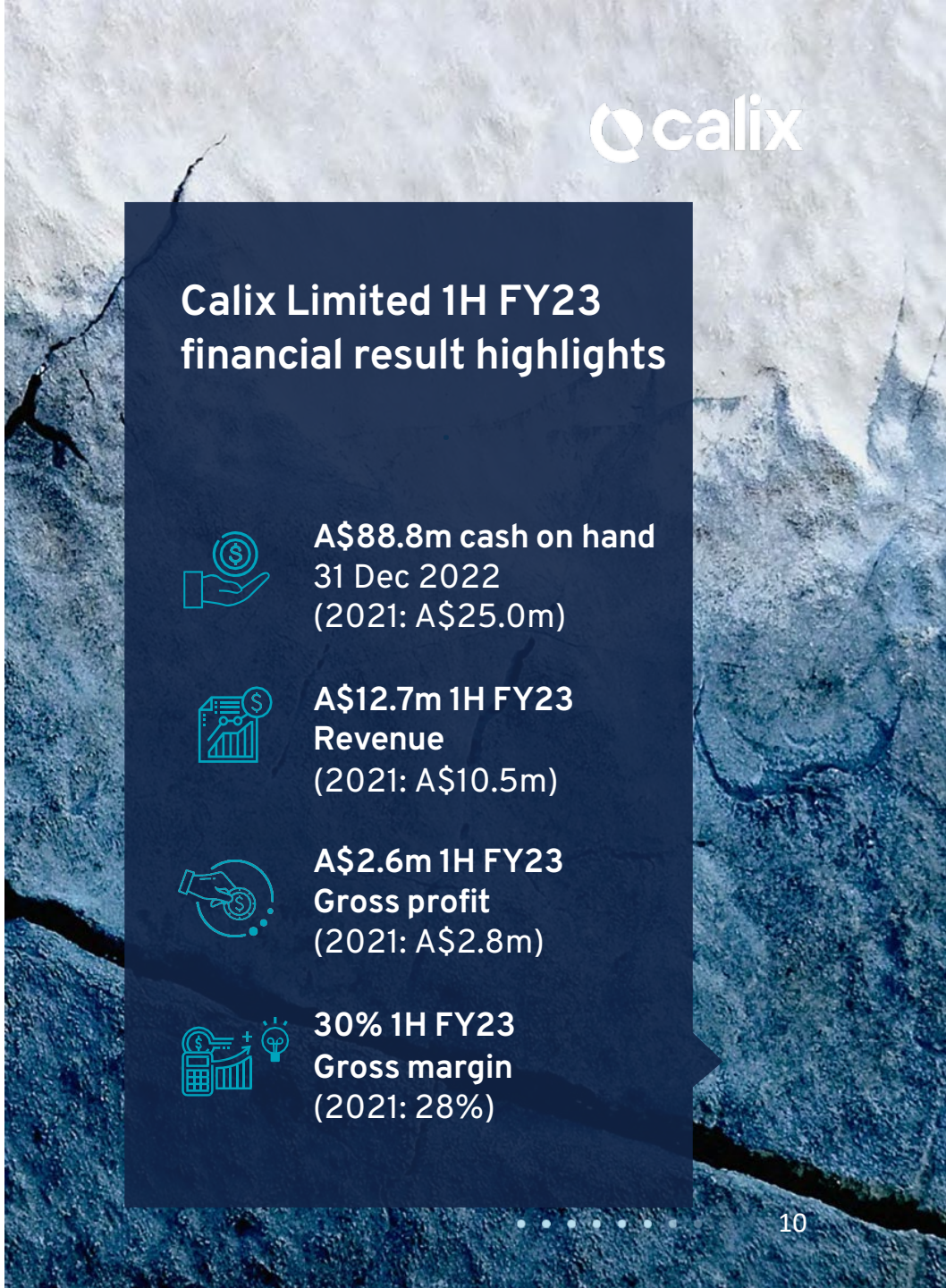
In 1H FY23 Calix continued its planned investment in:

1. **People**, including 11 new engineers, 5 new people in sales and business development and 1 person in finance;
2. **Plant & equipment** to enhance and accelerate technology development; and
3. **Professional services** to advance commercialisation.

The combined focus on people and ongoing fiscal prudence has enabled Calix to grow multiple successful lines of business simultaneously into large addressable markets.

The Group has a very strong balance sheet, underpinned via a **$60.0m** private placement in October and **$21.6m** from the SPP completed in November 2022.

This support from our shareholders for our growth plans is very much appreciated.



Summary of results 1H FY23 – profit & loss highlights

Investing heavily in capability to capitalise on technology commercialisation

	1H 23 ($m's)	1H 22 ($m's)	Comments
Revenues	**12.7**	**10.5**	**Increase of 20.3% for 1H**
Gross Profit	**2.6**	**2.8**	**Gross margin on sales up to 30%**
Operating expenses			
Sales & Marketing expenses	4.3	3.7	**Investing in commercialisation**
R&D	5.5	2.6	**Growing pipeline of growth opportunities to pursue**
Admin	3.3	2.4	
Operating Profit	**(6.5)**	**(5.2)**	

As mentioned in August 22, US coal fired power station tax credits have ceased. Excluding this business, Water business grown revenues 9% and margin from 28% to 30%.

Grants and rebates help offset costs of tech development with $4m contributed in 1H through tax incentives and grants – strong govt support across the territories we operate for decarbonisation investment

As promised, we're focusing our investment in people and tech development – specifically R&D & engineering capability. Our technology teams have doubled in just over 12 months!

Admin costs include one-off transaction costs associated with the Oct/Nov capital raising and services support for commercial development [licensing our tech across multiple industries!]

Balance Sheet strength

Balance sheet strength to pursue commercialisation opportunities

	31 Dec 22 ($m's)	30 June 22 ($m's)
Cash & Cash equivalents	**88.8**	**25.0**
Total Assets	130.7	61.2
Total Liabilities	15.0	16.4
Net Assets/Total Equity	**115.6**	**44.8**
Excluding deferred revenue		
Current assets	97.9	31.6
Current liabilities	5.5	5.8
Net surplus of current assets over current liabilities [ex deferred revenue]	**92.4**	**25.8**
Property, plant & equipment	**20.7**	**18.7**
Intangible assets, including goodwill	**11.2**	**10.1**

Key take-aways…

- **Balance sheet strength to pursue commercialisation opportunities across our lines of business.**
- **Flexibility retained to pursue the right capital/funding strategy for each investment opportunity – for Leilac and Sustainable Processing.**
- **Strong cash position, essentially debt free [$500k of borrowings] – can control our own destiny as we pursue our "multiple shots on goal"**

Industrial decarbonisation tailwinds

Calix's mission is being propelled by net zero commitments

Government policy

~90%

of global GDP now under net zero commitments.[1]

Investor activity

US$42tn

assets of signatories to the '**2022 Global Investor Statement to Governments on the Climate Crisis**'.[2]

Net zero spending

US$275tn

Estimated spend required by 2050 to fund the global energy transition.[3]

1. https://zerotracker.net/
2. 2022 Global Investor Statement to Governments on the Climate Crisis. The Investor Agenda
3. The net-zero transition: What it would cost, what it could bring. McKinsey Sustainability.

Policies driving decarbonisation

Carbon penalties, value & support in Europe, US, and now Australia…

EUROPE

Emissions Trading Scheme

- €80 – 2022 average EU ETS price, up from €50 in 2021
- 2.2% year-on-year reduction in free CO_2 permits to 2030

Carbon Border Adjustment Mechanism

- A new carbon tariff, commencing in 2023
- Paves the way for phase out of exemptions for heavy industry

Innovation Fund

- Energy, CCU/S, Energy Storage
- €10b funding from 2020 to 2030
- Up to 60% contribution for innovative projects

US

Inflation Reduction Act

- US$85 / tonne of CO_2 permanently stored
- US$180 / tonne for DAC + permanent CO_2 storage
- US$130 / tonne for DAC + used CO_2
- Open to projects commencing construction before 2033
  - > 12ktpa industry
  - > 1ktpa DAC

DAC hubs

- US3.5 billion to establish Regional Direct Air Capture hubs
- Develop networks to facilitate sequestration or carbon utilization.

AUSTRALIA

Safeguard Mechanism

- A price on carbon, capped at AU$75

National Reconstruction Fund

- $15b fund with up to $3b for renewables and low-emission technologies & $1b for value-adding in resources.

Powering the regions fund

- AU$600m for decarbonisation of trade-exposed businesses
- **Carbon Capture Technologies Program**
- AU$141m for hard-to-abate industries, such as cement

Critical Minerals Strategy

- Value-add, downstream processing & decarbonisation

Carbon Border Adjustment Mechanism?

- Introduction of an Australian CBAM under review…

Leilac

Decarbonising cement and lime

calix

Largest single source of industrial emissions

- ~8% of global emissions[1]
- Unavoidable process emissions released directly from limestone.

Net zero commitments

- GCCA member companies covering 40% of global cement production (80% outside of China) – have set a net zero by 2050 target.[2]
- 1.4 billion tonnes of CO_2 from cement needs to be captured and stored annually by 2050 to reach net zero.[2]

"Carbon Capture and Storage (CCS) plays a major role in decarbonizing the industry sector in the context of 1.5°C and 2°C pathways, especially in industries with higher process emissions, such as cement." – IPCC[3]

Market drivers

Carbon pricing: 36 carbon taxes & 32 Emissions Trading Systems, covering 23% of global emissions & generating $84bn in revenue[4]

>€80/tonne average EU carbon price for 2022

US$85/tonne
US tax credit for stored CO_2

SDG Impact

1. Trends in global CO2 emissions; 2016 Report, The Hague: PBL Netherlands Environmental Assessment Agency
2. Global Cement & Concrete Association. Concrete Future Roadmap.
3. SR1.5 Chapter 2. IPCC. 2018
4. https://zerotracker.net/, https://carbonpricingdashboard.worldbank.org/

Leilac

H1 FY23 – Leilac business model validation

Heidelberg Materials global licence executed

- The licence agreement applies to any Heidelberg Materials facility where the Leilac technology is installed.
  - Heidelberg Materials operates 149 cement plants across five continents.
  - On average, each plant emits 500-1000+ ktpa of CO_2
- The technology licence fee is a first-of-a-kind for the industry, comprising:
  i. A royalty floor;
  ii. A variable component linked to the European carbon price/value; and
  iii. A royalty cap linked to costs versus alternative technologies.
- The agreement requires the royalty quantums to remain commercial-in-confidence.
- The technology licence is a perpetual licence with Heidelberg Materials.
- Calix will retain all improvements to Calix IP.
- Further licence agreements are under negotiation with CEMEX and others

Scaling up the Leilac technology

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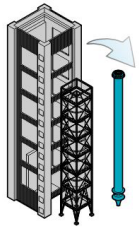
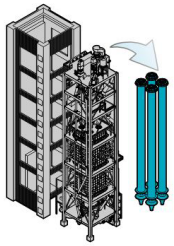
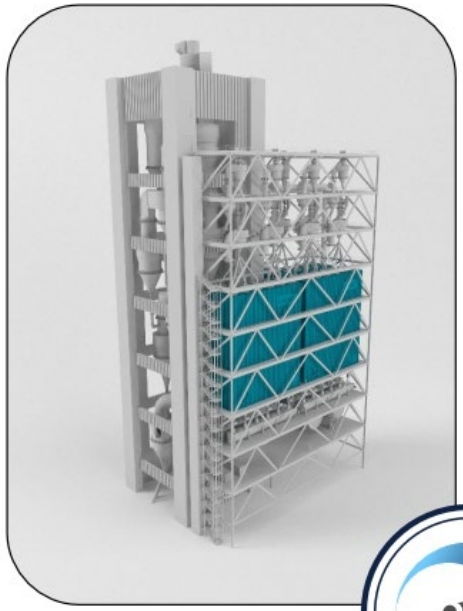
Leilac-1, Lixhe, Belgium
25,000 tonnes / year CO_2
1 tube
Built: operational 2019

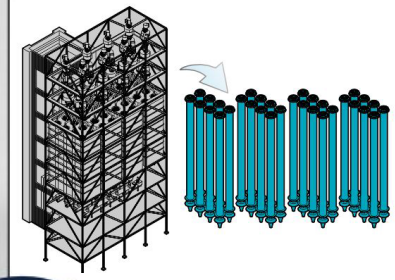


Leilac-2, Hannover
100,000 tonnes / year CO_2
4 tubes – 1 module
Passed FID



Leilac-3
1 million+ tonnes / year CO_2
Several multi-tube modules
Multiple in planning





Heidelberg Materials · TARMAC A CRH COMPANY · CEMEX Building a better future · SOLVAY · Lhoist · CIMPOR · ENGIE Laborelec · Port of Rotterdam

Leilac's full scale vision

BUT…we need to mitigate 1.4 billion tonnes per annum of process CO_2 emissions

= up to 3,000 Leilac-3s

~2 built every week from now until 2050 !!

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Leilac

Leilac A growing pipeline of projects

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	Project discussions	Initial scoping	Detailed scoping / MOU	Pre-FEED / BOD	FEED	FID + construction	Operational	Total
Aug 2021	21	7	4	1			1	34
Aug 2022	25	13	9	5		1	1	54
Feb 2023	**34**	**19**	**8**	**6** (ADBRI, BORAL, CEMEX)	**2** (TARMAC)	**1** *Leilac-2*	**1** *Leilac-1*	**71**

- Pipeline growth: there are now **71 projects** in the pipeline
  - Projects are ~ 2/3 cement and 1/3 lime, at average capacity of 500kTpa CO_2 for cement and 80 kTpa CO_2 for lime.
  - Leilac pipeline represents potential for over **20 Mtpa of CO_2 abatement projects.**
- TARMAC project moves into FEED phase: 30kTpa lime facility with partial H_2 firing and CO_2 capture as part of HYNET project, UK.
- Three new projects with CEMEX announced in Germany, Poland and the US.
- Adbri – work continues on pre-FEED for a 20kTpa electric facility with CO_2 capture – **with up to 15kTpa CO_2 now targeted for supply to the HyGATE Project[1], to produce green methanol a precursor for sustainable aviation and marine fuels**
- **Windship** – Leilac awarded £1m as part of the £ 5m award to the Windship consortium to decarbonise shipping using zero emissions lime

1. https://arena.gov.au/funding/german-australian-hydrogen-innovation-and-technology-incubator-hygate/

Decarbonising shipping & aviation

Leilac's core technology applied into new markets

Carbon capture for shipping

- Combining renewably powered propulsion & lime-based carbon capture to develop a low-cost decarbonisation solution for shipping, in partnership with Windship Technologies Ltd.
- The project is supported by £5m (AU$8.73m) funding from the UK Government[1].
- It aims to demonstrate the potential for zero emissions lime to reduce and eliminate emissions from diesel powered vessels.
- Calcium looping for carbon capture with low emissions lime is an exciting application with significant potential into several markets.

Sustainable fuels from captured CO_2

- The Solar Methanol Project is developing a world-first methanol production plant using renewable energy, green hydrogen and captured industrial CO_2.
- Awarded ~$40m funding as part of the German-Australian HyGATE initiative.
- The project intends to use CO_2 captured by the Leilac technology during the production of low emissions lime, in partnership with Adbri (ASX: ABC).

Shipping & aviation are two of the hardest-to-abate transport sectors, responsible for 4.3% of global CO_2 emissions[3].

1. Leilac and Windship awarded £5m funding to demonstrate zero emissions shipping technology
2. Calix part of Australian-German consortium awarded funding to manufacture sustainable fuels from captured CO2
3. https://www.iea.org/reports/transport

Decarbonising iron and steel

Indispensable, carbon-intensive & hard-to-abate

~7% of global emissions[1]

~53% of global iron ore supplied by Australia[2]

80-85% CO_2 from iron ore reduction[3]

Australian iron

- >A$150b…44% of Australian export earnings in 2021[4]
- 96% of Australian iron ore is hematite[5]
- Value creation opportunity
  - 3-4x value add: iron ore → iron
  - Green Iron…

Decarbonisation solutions…ideally

- Resource efficient
  - Compatible with multiple ore types
  - Low waste
- Minimal supply chain disruption
- Fast route to impact
- Economical
  - Leverage existing assets
  - Efficient use of energy, reductant & raw material

Decarbonisation tailwinds

Net zero commitments 90% of global GDP[6]

Carbon pricing 36 carbon taxes & 32 Emissions Trading Systems, covering 23% of global emissions & generating $84bn in revenue[7]

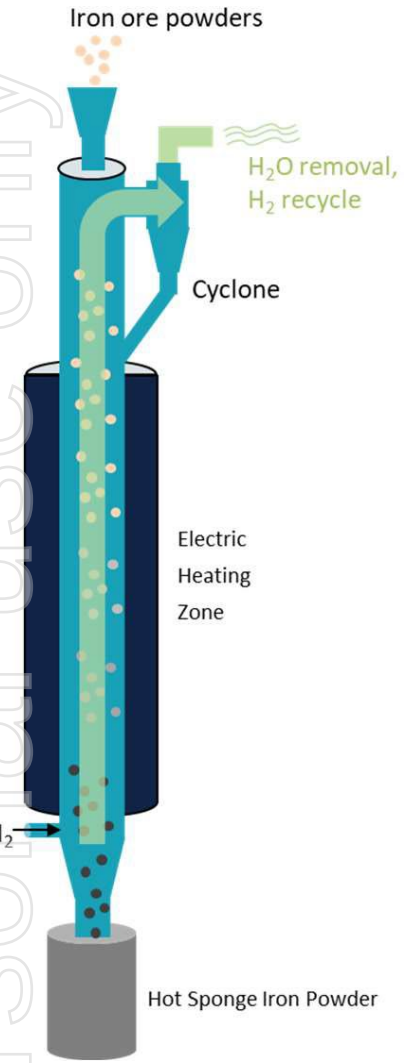
CBAM is coming! Carbon the new international trade tariff

SDG Impact

1. Climate change and the production of iron and steel. World Steel Association. 2021
2. www.statista.com
3. Climate change and the production of iron and steel. World Steel Association. 2021
4. https://www.minerals.org.au/news/record-high-resources-export-revenue
   Global Cement & Concrete Association. Concrete Future Roadmap.
5. Iron Ore | Geoscience Australia
6. https://zerotracker.net/

Zero Emissions Steel TechnologY

Potential lowest cost zero emissions iron & steel



About ZESTY

- Hydrogen reduction of iron ore
- Can be easily and efficiently renewably powered
- Targeting theoretical minimum hydrogen use – simple gas recycle
- Processes fines <~0.3mm, no pelletisation
- Targeting zero emissions iron and steel*

	Simple process (low pressure / no fluid beds)	Compatible with fines & lower grade ores	No fossil fuel requirement	No CCS required	H_2 not combusted / easily recycled
BF / BOF + H_2	✓	✗	✗	✗	✗
DRI-MIDREX	✓	✗	✗	✗	✗
DRI-HISARNA	✓	✓	✗	✗	✗
FINMET	✗	✓	✗	✗	✗
HYBRIT	✓	✗	✓	✓	✗
DRI_MIDREX H_2	✓	✗	✗	✗	✗
Flash iron making	✓	✓	✓	✓	✗
HYFOR	✗	✓	✓	✓	✗
ZESTY	✓	✓	✓	✓	✓

in conjunction with Calix's "Leilac" zero emissions lime

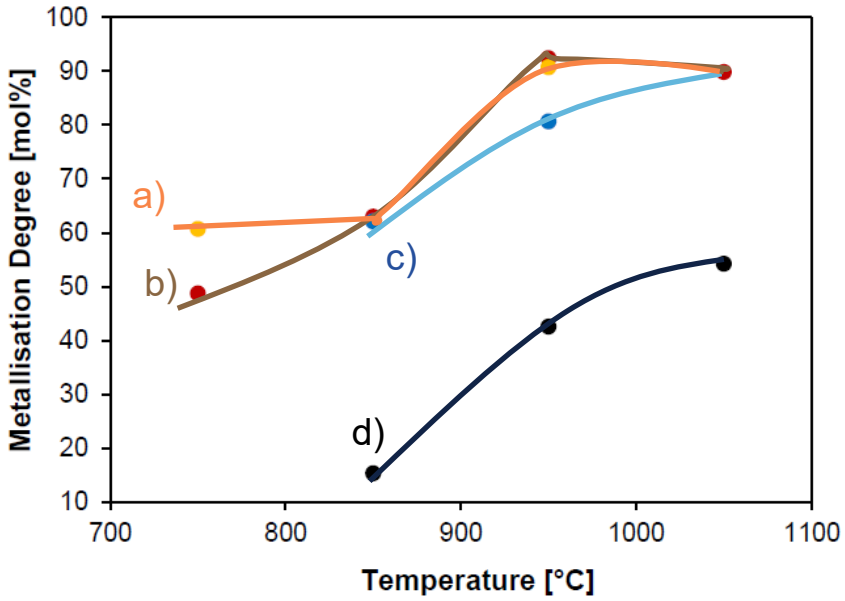
Zero Emissions Steel TechnologY

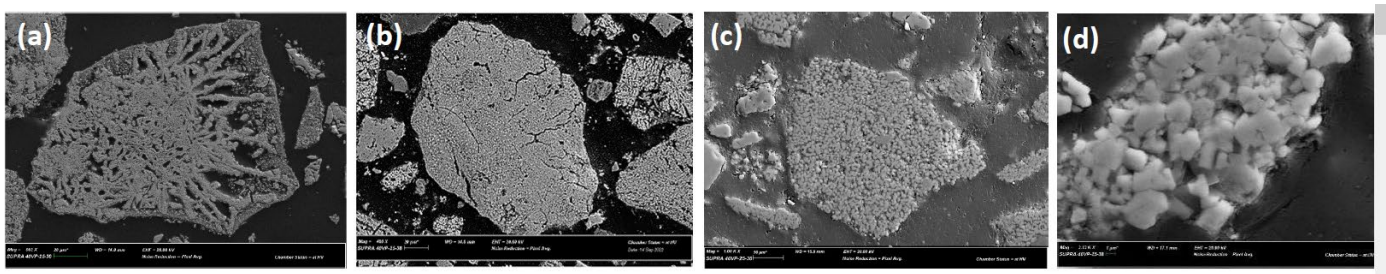
ZESTY development to date…

Phase 1 & 2: completed

- ✓ Theoretical kinetic studies
- ✓ Conversion of electric calciner to run hydrogen
- ✓ Confirmation of electric calciner + hydrogen reduction performance
- ✓ Successful pilot testing with multiple ores

		Fe Wt %)	D50 (um)	SSA (m^2/g)	Pore Volume (cm3/g)
a)	Siderite	43	87	25	0.035
b)	Goethite / Hematite	57	130	15	0.034
c)	Goethite / Hematite	59	129	14	0.039
d)	Magnetite	67.5	38	0.8	0.003

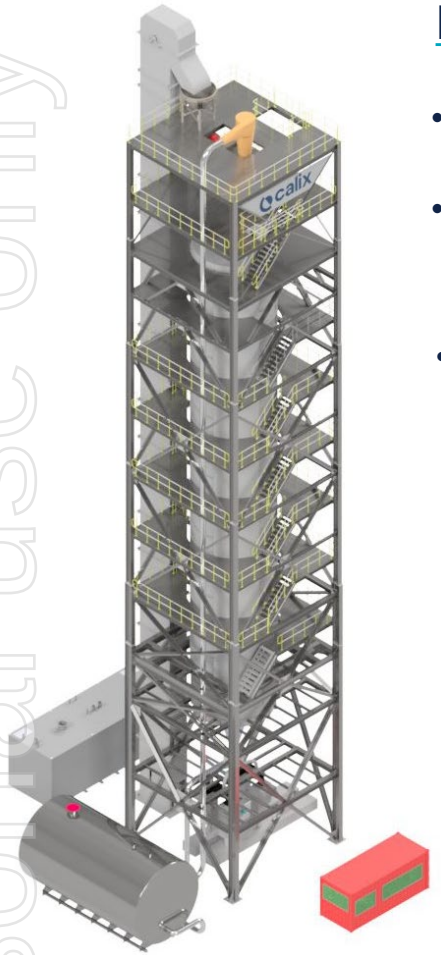




SEM Images of the different samples after processing @950C; H_2/O_{red} =2

Calix's ZESTY Technology: pre-FEED / FEED study

Towards Financial Investment Decision by end-2023



A render of the Calix fully electric ZESTY reactor rated for 30kTpa iron production

Pre-FEED / FEED study

- A$947,035 ARENA grant.
- Proposed 30,000 tpa, zero CO_2 emissions ZESTY-iron demonstration plant.
- Study towards final investment decision, including:
  - Testing / confirmation / design input from pilot test runs
  - Beneficiation / passivation / briquetting / smelting trials
  - Multiple ore testing
  - Site determination
  - Knowledge sharing & partnership development

HILTCRC
Heavy Industry Low-carbon Transition

Australian Government
Australian Renewable Energy Agency
ARENA 10 YEARS

The ZESTY reactor will be the same scale as Leilac-1 reactor for cement and lime

Phases 4 & 5: EPC & commercial demonstration

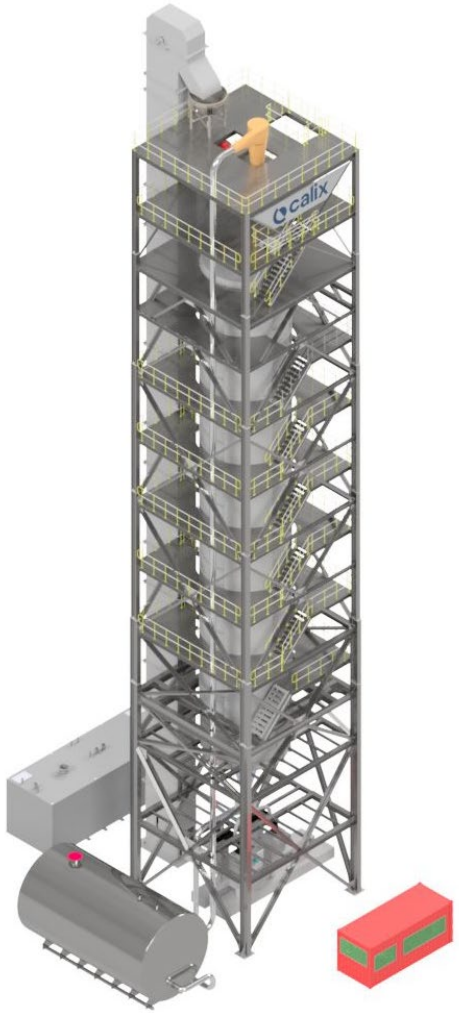
A commercial demonstration facility would target modest capex & possible revenue recovery from sales of green iron

Phase 4: Engineering, procurement & construction

- Late 2023 to early 2025
- Construction, commissioning, testing of commercial demonstration scale ZESTY process

Phase 5: Commissioning and commercial demonstration

- Early 2025 onwards
- Commissioning / testing phase ~ target 4 months
- Operational proving phase ~ target 8+ months (leading to permanent use via modular expansion)



Sustainable lithium joint venture with Pilbara Minerals

Electrification and mid-stream mineral processing

Joint Venture Executed

- JV Full Documentation Executed with $20m in Federal Government funding announced under the Modern Manufacturing Initiative[1]
- Project CAPEX budget estimate from scoping study is $50-70m
- Calix will own 45% of the JV and contribute 35% of the capital (10% free carry negotiated as per Calix IP contribution)
- Targeting an innovative mid-stream process:
  - Increase lithia concentration: ~6% → 35%
  - Reduce waste ~94% → 0
  - Reduce carbon intensity with solar-powered electrification of calcination
  - Increase ore recovery

Sustainable lithium tailwinds

6x — 6x growth in lithium carbonate & equivalents market by 2030[2]

45% — Electrification of industrial manufacturing target by 2035[3]

CO_2 — Increasing demand for sustainable & dependable supply of essential mineral products

SDG Impact

1. Grant funding announced, awaiting contract finalisation following change in Federal Government in May 2022
2. Lithium mining: How new production technologies could fuel the global EV revolution – McKinsey April 2022
3. Electrification in Industrials. Deloitte Insights. August 2020

Development of lithium salt project with Pilbara Minerals

Targeting completion of FEED in FY23

Next steps

- JV established (covering Demonstration plant & joint marketing of technology)
- FID targeted H1 2023
- Market development – lithium phosphate salt
- Construction targeted from Q2/3 2023 to H1 2024
- Commissioning and testing during H2 2024, on way to achieving full production and sales, subject to market developing for lithium phosphate salt product
- Li-salt production technology to be licensed by the JV to Pilbara Minerals and the global spodumene industry

At current lithium prices, the demonstration scale plant running at full capacity could generate ~US$180m revenue for the JV on an annual basis[1]

First lithium phosphate salts produced in pilot plant

1. Trading Economics as at 20 February 2023 average Feb pricing @ 0.15 Yuan / USD = ~$US70875 per tonne Lithium Carbonate (LCE). Assumed Lithium Phosphate price = 85% LCE. Calix share of JV 45%

Advanced Batteries

Novel structured high power electrode materials

Overview

- Calix is developing high performance, lithium-ion hybrid batteries based on nano-active electrode materials produced by the BATMn reactor
- Targeting more sustainable, affordable and recyclable production methods
- Currently trialling pilot production of Lithium Manganese Oxide (LMO)
- Novel material testing shows suitability to high power applications
- Other chemistries (LFP, LNMO) under development

FY23 achievements to date

- Commenced commercial-scale trial production of its proprietary lithium battery cathode material with AMTE in the UK.
- Progressed R&D on new cathode and anode chemistries under the FBI CRC, StorEnergy ARC and EU Polystorage network.

Market trends

18x Global demand for lithium-ion batteries expected to reach 4500GWh by 2030, up from 250GWh in 2020.[1]

Increasing demand for more economical and & sustainable battery chemistries

Shift to simple, affordable & safe battery chemistries

SDG Impact

1. Power spike: How battery makers can respond to surging demand from EVs. McKinsey & Co. 2022

Biotech

Novel bioactive materials for multiple global applications

Overview

- Calix's Biotech business is developing novel magnesium oxide materials with high surface area and bio-activity, targeting three applications:
  - Crop protection: BOOSTER-Mag approved by APVMA
  - Advanced coatings: Trials show strong efficacy of MgO based marine coatings as a partial replacement for copper
  - Antimicrobials: Bioactive materials found to suppress antibiotic resistant bacteria

FY23 achievements so far

- Continued successful marine coating trials overseas with two marine coating manufacturers, and one significant local potential end-user.
- Commenced project planning for next phase anti-microbial studies under the CRC SAAFE program[1].

Market trends

Demand for non-chemical alternative crop protection products. Some existing chemicals & pesticides deregistered.

Need to reduce use of copper based marine coatings

Rise in antimicrobial-resistant bacterial infections.

SDG Impact

1. Cooperative Research Centre (CRC) Solving Antimicrobial Resistance in Agribusiness, Food and Environments (SAAFE) project

Water

Magnesium Hydroxide Liquid “MHL” – a safe alkali chemical

Overview

- Calix’s AQUA-Cal+ and ACTI-Mag provide safe, more effective, economical and sustainable solutions for the treatment of water and wastewater.
- Delivering an environmentally friendly alternative to existing products, such as caustic soda.

FY23 achievements so far

- Grew revenues from $7.8m to $8.5m[1] and margin from 28% to 30%.
- Commenced permitting and procurement for two new US-based production facilities to support growth into two new territories.
- SE Asian aquaculture sales have re-commenced in China,

1. Excluding Tinuum refined coal end-user – refined coal market has ceased

Market trends

80% Wastewater that flows back into the ecosystem without being treated or reused

Need for environmentally friendly alternatives to existing products, such as caustic soda.

Wastewater discharge limits are becoming tougher.

SDG Impact

Sustainability

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Sustainability achievements, commitments & ambitions

- Reaffirmed our commitment to the UNGC;
- Installed solar panels at Bacchus Marsh to power the BATMn all electric calciner; and
- Committed to measuring, monitoring and reducing its carbon footprint;
- Committed to measuring and reducing waste.
- 100% sustainable material inputs by 2030.
- Diversity across all levels of management.
- Ensure human rights are strictly upheld throughout our supply chain and operations.
- Zero incidents of bribery and corruption.

Read more about Sustainability at Calix in our 2022 Sustainability Report.

BECAUSE MARS IS FOR QUITTERS.

Calix's FY23 priorities and progress…

Continued acceleration – especially decarbonisation projects…

Successfully completed
On track
Watch point

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Water

Water treatment
Aquaculture

US: At least
- 2 new plants
- A second major new US state entry

China:
- Re-establish market entry

EU:
- Re-establish market entry

Biotech

Crop protection
Marine coatings
Health & pharma

Crop Protection
- 3rd licence agreement

Marine Coatings
- Successful phase 2 trials with MTA partners
- Next new biotech application…health/pharma
- Successful initial in-vivo studies

Advanced Batteries

Advanced cathode & anode materials

- First battery module – commercial format
- Basis of Design – demonstration facility for cathode production
- At least 1 new chemistry = pouch cell success

Sustainable Processing

Renewable-powered mineral & chemical processing

Refractories
- Convert MOU to full Project or licence agreement

Spodumene
- Full JV agreement
- Successful FEED study leading to FID

Iron and Steel
- Successful expanded ore program
- Basis of Design: Demonstration facility

Leilac

CO_2 mitigation for cement & lime

- Convert at least two MOUs to full project / licence agreements – "full-scale" application
- Convert at least 2 projects from BODs to FEED studies
- Leilac long lead items procured, site works commenced

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Thank you

Calix Limited
Half Year Results FY2023

21 February 2023

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Board of Directors, Equity Structure

Glossary

Board of Directors

Peter Turnbull, AM
Non-Executive Chair

Experienced Chair and Non-Executive Director with significant board and senior executive experience in the Australian and global resource, energy and technology commercialisation sectors.

Non-Executive Director of Karoon Energy Ltd. (ASX: KAR), Chair of medtech Auxita Pty Ltd, Chair of Airlie Energy, Chair of QADO Group/QADO Ventures and President of the Chartered Governance Institute (London).

Chair of Calix Remuneration and Nomination Committee, and Member of Audit and Risk Management Committee.

Helen Fisher
Non-Executive Director

CEO and Managing Director of Bio Capital Impact Fund (BCIF), a Non-Executive director and Chair of the Audit and Risk Management Committee of Paradigm Biopharmaceuticals Ltd (ASX:PAR) and Chair of the Victorian branch of AusBiotech.

Previously a partner of Deloitte for over 11 years, and led Deloitte's life sciences practice in Australia for 5 years, specialising in the financial services sector, with significant M&A transactions and strategic tax advice to publicly listed and large multinational companies.

Chair of Calix Audit and Risk Management Committee and member of the Rem and Nom Committee

Jack Hamilton
Non-Executive Director

30 years multidisciplinary experience in local and overseas energy industries, including as a Director of NWS Ventures (Woodside North-West Shelf project).

Currently a Non-Executive Director of Hazar Group (ASX:HZR). Previous Non-Executive Director positions include AnteoTech Ltd (ASX:ADO), Renu Energy (ASX:RNE) and DUET Group (ASX:DUE).

Chair of Calix Technology Committee, and member of Audit and Risk, and Rem and Nom Committees.

Phil Hodgson
Managing Director & Chief Executive Officer

14 years of multidisciplinary experience with Shell, including as the General Manager and Alternate Director of its subsidiary Fuelink Pty Ltd, a $700m revenue, 300-employee distribution and sales subsidiary.

7 years running a private consultancy providing strategy and M&A services across energy, food, infrastructure and water sectors.

Joined Calix in 2013 as CEO, became a Director in 2014 and is a member of Calix's Technology Committee.

Dr Mark Sceats
Executive Director And Chief Scientist

Co-founder of Calix, and a member of Calix's Technology Committee.

Qualified physical chemist with over 52 years' experience, numerous academic roles, and numerous fellowships and recognitions.

CEO of the Australian Photonics CRC for 14 years.

Author of more than 165 academic papers in physical chemistry and inventor of 55 patented inventions.

Listed on the ASX in July, 2018

ASX:CXL

Share Price Performance Since Listing

	As at 20 Feb 2023
Shares on issue	~161.0m
Share price on IPO	$0.62 per share
Current Share price	$5.25 per share
Market capitalisation	~$950m

Further Equity Detail	As at 20 Feb 2023
Free Float	181.0m shares
Employee Incentive Scheme Options	5.2m options

Major shareholders	As at 20 Feb 2023
Board & Management	13.4%
Australian Super Pty Ltd	10.7%
Nicholas Merriman and associates	6.3%

Glossary

Term	Meaning
Aluminium (Al)	Chemical element with the symbol Al
Anode	The negative electrode of a battery
APVMA	Australian Pesticides and Veterinary Medicines Authority
BATMn	Calix's core kiln technology – electrified – for battery and catalyst materials production
C, 2C, 4C, D	Charge rate, 1 C = charge in 1 hour, 2C charge in 30 min, 4C charge in 15 min etc. D is discharge – same metrics
Calcium (Ca)	Chemical element with the symbol Ca
Carbonation	The capture of carbon dioxide by contacting with lime (calcium oxide), to form limestone (calcium carbonate)
Cathode	The positive electrode of a battery
CCS	Carbon Capture and Storage
CCUS	Carbon Capture, Utilisation and Storage
CO_2	Carbon Dioxide
Copper (Cu)	Chemical element with the symbol Cu
DAC	Direct Air Capture
EBITDA	Earnings Before Interest, Tax, Depreciation and Amortisation
Electrode	The material that stores the lithium ions in a charged (anode) or discharged (cathode) state in a lithium ion battery
Electrolyte	The medium that allows ions to move between the battery electrodes, via the separator
ESG	Environment, Social and Governance considerations
FID	Final Investment Decision
Fines	Small particles, which are usually very difficult to handle in kilns etc as they simply get blown out
Green Hydrogen	Hydrogen that is produced from and electrolyser using renewable energy
HBI	Hot Briquetted Iron – "bricks" of relatively high purity iron ready for steel-making
HPO	"Hierarchical Porous Onion" - a crystal structure of lithium manganese oxide resembling tiny onion layers – allowing both strength and easier passage of lithium ions

Glossary

Term	Meaning
Iron	The chemical element, represent by “Fe” on the periodic table
Iron Ore	Iron oxide mixed with various other minerals, as mined and “pre-processed” (purified) as best as possible
LFP	Lithium Iron Phosphate – a battery cathode material
LMO	Lithium Manganese Oxide – a battery cathode material
Lithium (Li)	Chemical element with the symbol Li
Lithium Concentrate / Lithium Salt / “Mid-Stream” Lithium	A form of lithium that is high in lithium content, to be shipped and utilised by battery producers
Lithium ion	The ionic form of lithium (Li+) – a positively charged atom of lithium
LTO	Lithium Titanium Oxide – a battery anode material
LEILAC	Calix’s core kiln technology for Low Emissions Intensity Lime and Cement production with CO_2 capture
Manganese Carbonate ($MnCO_3$)	Form of manganese used mainly in agriculture as a fertiliser supplement
Magnesium (Mg)	Chemical element with the symbol Mg
Manganese (Mn)	Chemical element with the symbol Mn
Metallurgical Coal	Very high carbon coal
MgO	Magnesium Oxide
MHL	Magnesium Hydroxide Liquid

Glossary

Term	Meaning
Nickel (Ni)	Chemical element with the symbol Ni
NCA	A battery cathode material made from nickel, aluminium and cobalt
NCM, or NMC	A battery cathode material made from nickel, manganese and cobalt
Pelletisation	The formation of pellets from finer materials to aid in handling
Potassium (K)	Chemical element with the symbol K
Separator	The barrier between the anode and the cathode that prevents them touching, inside the battery
Sodium (Na)	Chemical element with the symbol Na
Spodumene	A high lithium-containing ore, and the source of the majority of the world's lithium supply
α-Spodumene	A tight Li-crystal formation, from which extraction of Li is difficult
β-Spodumene	A loose Li-crystal formation, from which extraction of Li is much easier than the alpha-form
Reduce / Reduction	The process by which oxygen is removed
Reductant	A material that, through its chemical properties, carries out reduction
Sponge Iron	Iron Ore that has been reduced (had the oxygen removed)
Steel	Mainly iron, with some carbon and other trace metals such as nickel, manganese etc depending upon the grade of steel being made
Sulphur (S)	Chemical element with the symbol S
Tpa	Tonnes per annum
Wh / kWh	Watt-hours / kilowatt-hours - a measure of energy

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