



# Half Year Results FY2024

**Calix Limited**

23 February 2024

[calix.global](https://calix.global)



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# About Calix

Calix is an environmental technology company developing applications of its unique platform technology to solve global challenges in industrial decarbonisation and sustainability.

We are building multiple businesses to deliver positive global impact in CO<sub>2</sub> mitigation, sustainable processing, advanced batteries, biotechnology and water treatment.

Because there's only one Earth...

# MARS IS FOR QUITTERS.



2005  
FOUNDED



UNGC  
signatory  
= SINCE 2020 =

120+  
employees



A\$120m  
technology investment



9 operational  
SITES

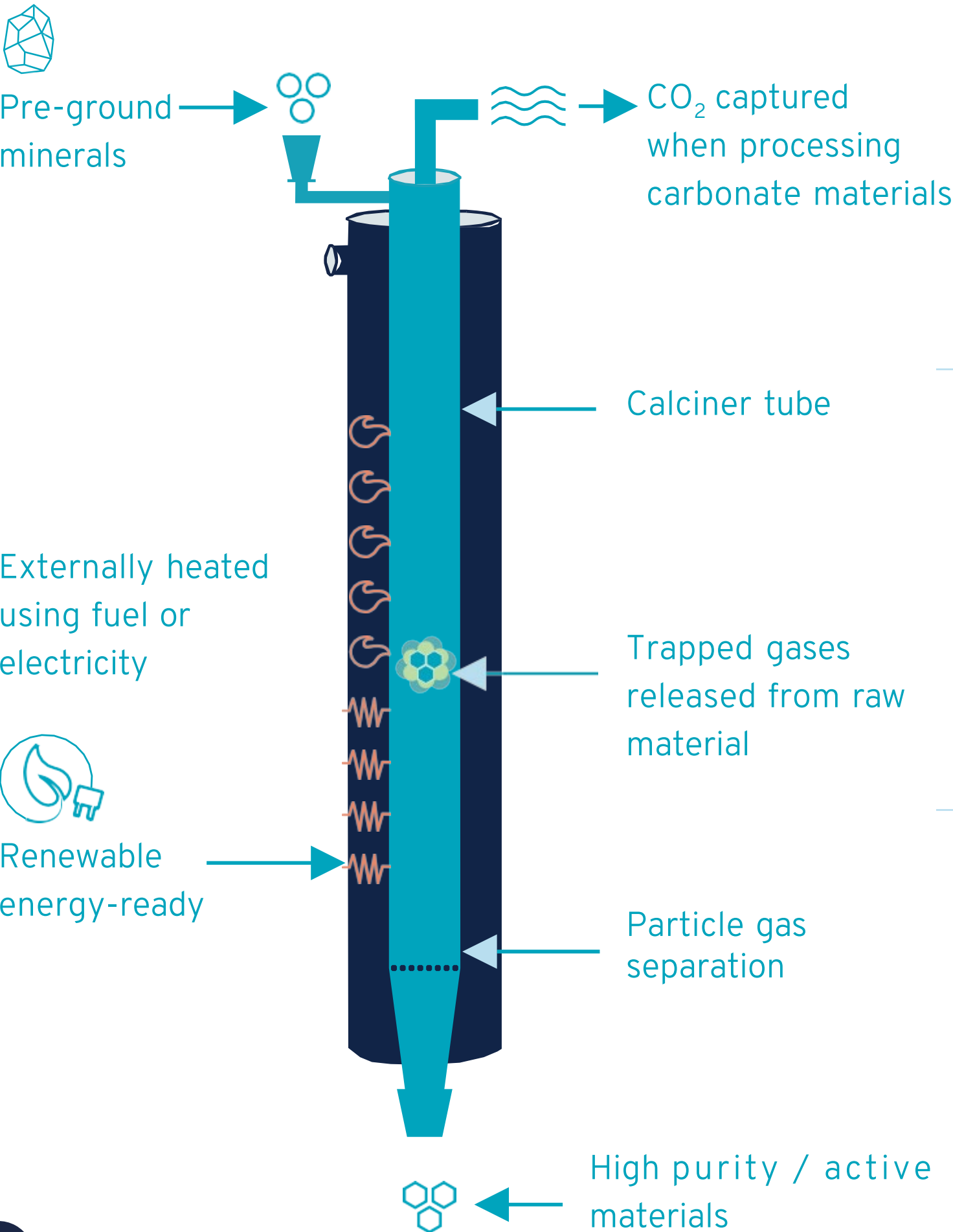
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PATENT  
families

ACTIVE IN  
7 5  
countries continents




# Calix's core platform technology


A new way to “heat stuff up”



  
**CO<sub>2</sub> CAPTURE**

 **Leilac**  
Unavoidable process CO<sub>2</sub> emissions from cement and lime production and CO<sub>2</sub> from the atmosphere are captured for use or storage.

  
**ELECTRIFICATION & RENEWABLE ENERGY-READY**

 **Sustainable Processing**  
Compatible with electricity and alternative fuels to provide viable, flexible and economical pathways to sustainable processing.

  
**HIGHLY-ACTIVE MATERIALS**

 **Magnesia**  
Produces high purity / active materials with enhanced chemical and/or bioactivity.

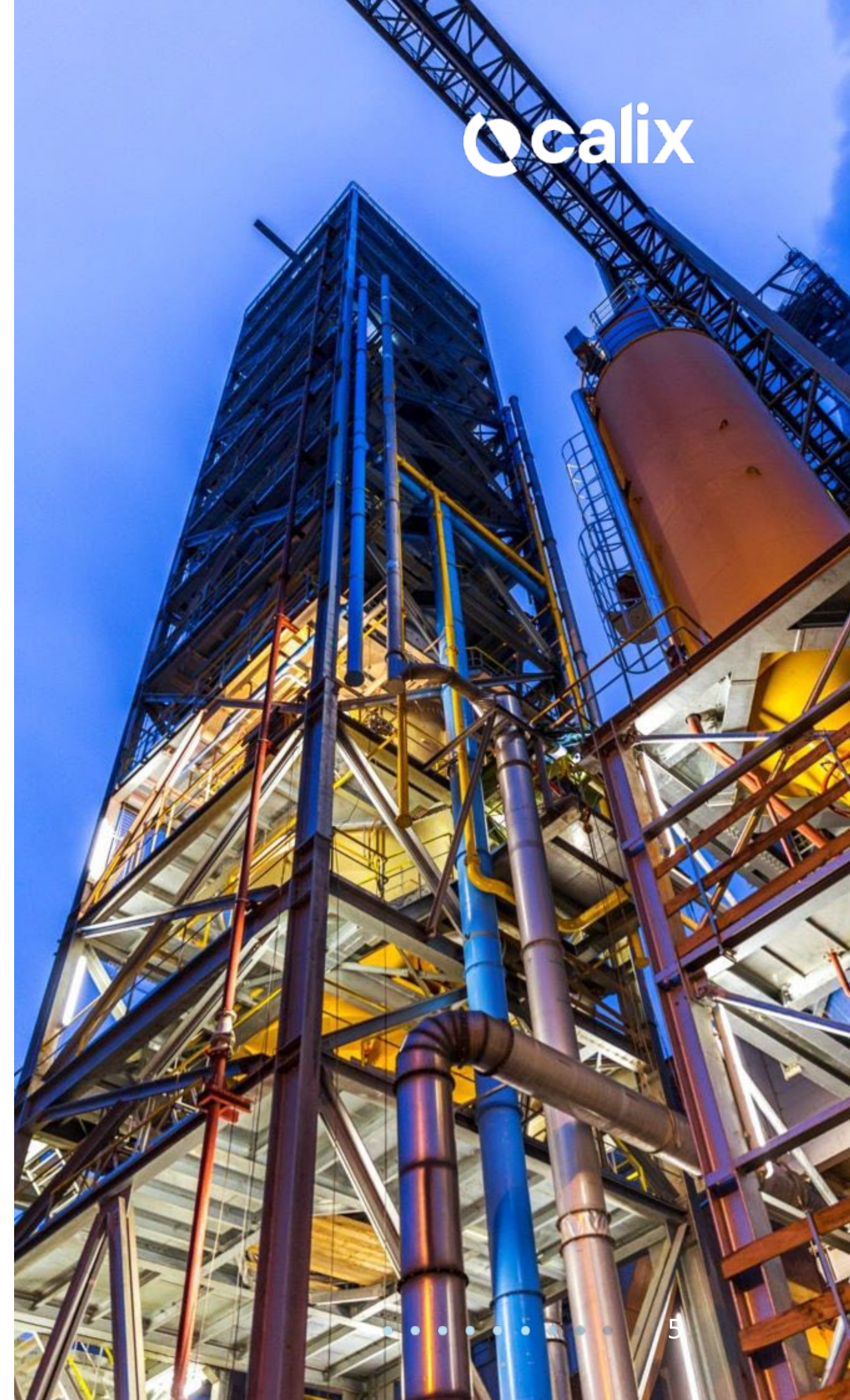




# Competitive advantage

## A unique platform technology with multiple applications in major global markets

- **Global demand for industrial decarbonisation** is being driven by government policy and regulation, climate commitments, and investor pressure.
- Calix's patented core platform technology is **uniquely positioned to address major global decarbonisation** challenges in 'hard-to-abate' industries.
- Calix's technology is designed to enable:
  - The **lowest cost** solution for **capture of unavoidable process emissions** in cement and lime
  - Efficient **electrification** of conventional carbon-intensive **mineral processing**
  - The **lowest cost** solution for the **production of zero emissions iron and steel**
  - Zero emissions lime for **direct capture of atmospheric carbon dioxide**
  - Value-adding and low waste **refining solutions at the mine site**
  - **Secure and stable critical mineral supplies** to global trading partners
  - Effective, low cost, and **sustainable products** for water and agriculture
- Calix is applying its core technology platform to develop multiple environmental business opportunities, each focused on a specific target application and market.
- **Each application is a multi-billion dollar opportunity**, collectively targeting **over 20% of global carbon emissions**.
- Funding through licensing, joint ventures and spin-offs at the subsidiary level facilitates accelerated growth and commercialisation.





























# Our strategy and business structure

One core technology with multiple, low carbon applications into huge global industries

## ONE CORE PLATFORM TECHNOLOGY

Our businesses	<div> <b>Leilac</b></div> <div>CO<sub>2</sub> Mitigation</div>		<div></div> <div>Sustainable Processing</div>			<div></div> <div>Magnesia</div>		
Target industries	<div></div> <div>Cement &amp; lime</div>	<div></div> <div>Direct Air Capture</div>	<div></div> <div>Lithium</div>	<div></div> <div>Alumina</div>	<div></div> <div>Iron &amp; steel</div>	<div></div> <div>Water</div>	<div></div> <div>Ag / Marine / Bio</div>	
Market size	1.4 BTpa CO <sub>2</sub> <sup>1</sup>		Targeting > 1 BTpa CO <sub>2</sub>	US\$7Bpa <sup>2</sup>	US\$45.5Bpa <sup>3</sup>	US\$640Bpa <sup>4</sup>	~US\$100m <sup>5</sup>	Multi-US\$Bpa <sup>6</sup>
Partners	<div><div> Heidelberg Materials</div><div> CINPORA</div><div> CEMEX</div><div> TARMAC A GRI COMPANY</div><div> ENGIE Laborelec</div><div> Lhoist</div><div></div> Heirloom</div>		<div></div> Pilbara Minerals	<div></div> HILTCRC Heavy Industry Low-carbon Transition	<div></div> ARENA 10 YEARS	<div></div> IER	<div></div> CEA-StAR Centre for Environmental and Agricultural Solutions to Antimicrobial Resistance	<div></div> SAAFE <sup>CRC</sup>
Strategy	Spin-out & Licensing (\$ per tonne CO <sub>2</sub> )		JV / spin-out & Licensing (% Total Revenues)			Growing direct / distributor sales		



1H FY24 Results

23 February 2024

1.

GCCA 2050 Net Zero Global Industry Roadmap

2.

Estimated as 50% of total lithium market as measured by lithium carbonate equivalent (LCE) derived from spodumene - <https://www.mckinsey.com/industries/metals-and-mining/our-insights/australias-potential-in-the-lithium-market>

3.

Alumina global market revenue estimated at <https://www.precedenceresearch.com/press-release/alumina-market#:~:text=The%20global%20alumina%20market%20size,combination%20of%20aluminum%20and%20oxygen.>

4.

Estimated as US\$400 per tonne of iron @ 1.6BTpa <https://www.statista.com/statistics/589979/metal-content-of-the-global-iron-ore-production/>

5.

US magnesium hydroxide market management estimate, caustic replacement market likely several multiples of this

6.

Frost and Sullivan – Independent Market Report – Calix IPO Prospectus 2018



# Policies driving decarbonisation

Carbon penalties, value, tariffs, & policy support continue in Europe, US, & coming in Asia-Pacific...

## Europe – Latest news

- **Jan 2024: Free EU ETS allowances will be progressively phased out** following the introduction of CBAM, reducing by **48.5% by 2030** and **100% by 2034**.<sup>1</sup>
- **Feb 2024: European Commission releases 2040 Roadmap recommending 90% CO<sub>2</sub> reduction by 2040**.<sup>2</sup>
- Feb 2024: European Commission **Industrial Carbon Management** communication states:<sup>3</sup>
  - To 2030: *“focus will be on capturing CO<sub>2</sub> from process emissions”*
  - **280 million tonnes of CCS** targeted by **2040**
  - **450 million tonnes of CCS** targeted by **2050**
  - Capture of CO<sub>2</sub> from the atmosphere is an *“essential complement”* to emissions reduction

### Supporting policies

- Emissions Trading Scheme (EU ETS)
- Carbon Border Adjustment Mechanism (CBAM)
- Innovation Fund
- Net-Zero Industry Act

## US – Latest news

- **Nov 2023: Strong bipartisan support for 45Q**<sup>4</sup>
  - Introduced in 2008, **45Q is a US tax incentive underpinning investment in CCUS & DAC**
  - **Most beneficiaries** are oil & gas companies located in **Republican states**
- **Nov 2023: Democrats & Republicans propose a US CBAM**<sup>5</sup>
  - A US CBAM is gaining bipartisan support
  - Democrats have proposed a CBAM to support emissions reduction efforts
  - Republicans have proposed a CBAM to protect US manufacturers from higher carbon imports
- **Aug 2023: Project Cypress selected for up to US\$600 million in funding**<sup>6</sup>
  - Heirloom one of two DAC firms in Project Cypress

### Supporting policies

- 45Q Tax credit
- US-Australia Climate, Critical Minerals & Clean Energy Transformation Compact
- Direct Air Capture (DAC) hubs

## Asia-Pacific – Latest news

- **Jan 2024: China carbon pricing**<sup>7</sup>
  - China expected to add cement, steel and alumina to its Emissions Trading Scheme (ETS)
  - The CCER voluntary carbon market is expected to be restarted
  - Prices expected to remain low before increasing as emissions peak closer to 2030
- **Jan 2024: ETS momentum emerging across APAC**<sup>7</sup>
  - **Malaysia, Indonesia, Thailand, Vietnam** and others have **introduced regulatory framework for future ETS** launch
  - **India introduced the Carbon Credit Trading Scheme (CCTS) as a framework for an ETS launch**
- **Australian CBAM under review**

### Supporting policies

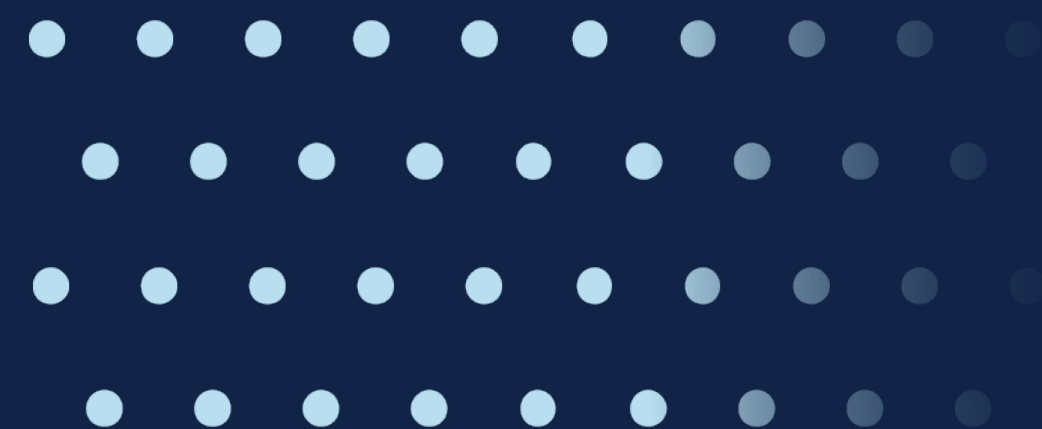
- Safeguard Mechanism
- AU\$15b National Reconstruction Fund
- AU\$1.9b Powering the Regions Fund
- Carbon Capture Technologies Program
- Critical Minerals Strategy

1. [Carbon border adjustment mechanism as part of the European Green Deal, European Parliament, 20 Jan 2024](#)  
2. [Europe's 2040 climate target and path to climate neutrality by 2050 building a sustainable, just and prosperous society, European Commission, 6 Feb 2024](#)  
3. [Industrial Carbon Management Communication, European Commission, 6 Feb 2024](#)  
4. [Ranking Member Shelley Moore Capito's Opening Statement to the Environment and Public Works Committee "Opportunities in Industrial Decarbonisation", 15 Nov 2023](#)  
5. [Senate Republicans introduce a climate bill – aimed at China, Politico, 2 Nov 2023](#)  
6. [Biden-Harris Administration Announces Up To \\$1.2 Billion For Nation's First Direct Air Capture Demonstrations in Texas and Louisiana, 11 Aug 2023](#)  
7. [China Carbon Pricing, J.P. Morgan, 10 Jan 2024](#)





# 1H FY24 FINANCIAL RESULTS



1H FY24 Results  
23 February 2024

calix





# 1H FY24 financial update

## Growth in revenue streams as decarbonisation applications progress

- Revenues grew to **\$16.3m**, up 28% on the same period last year.
  - Products & service revenues up **41% to \$12.2m**.
  - Grants & other income of **\$4.1m** was in line with prior period.
- Gross profit increased by 126% to \$5.9m.
- Revenue growth driven from:
  - Magnesia: Growing revenues in US & ANZ with strong margin improvement **Gross Margin of 38%**, up from 29% in prior period
  - Leilac: \$2.3m, up almost 1500% revenue stream associated with engineering services in support of customers.
- The combination of revenues and other income as well as the **\$3.4m** JV gain contributed **\$19.7m** to the comprehensive statement of profit or loss.
- Total operating expenses increased to \$19.8m (1H23: \$13.1m) as the Group continued to invest in technology development and commercialisation.



### Calix Limited 1H FY24 financial result highlights



**\$16.3m up 28%**

Total 1H24 revenue  
(1H23: \$12.7m)



**\$5.9m up 126%**

1H24 gross profit  
(1H23: \$2.6m)



**\$3.4m**

Gain on contribution of the  
PLS JV



**\$3.7m**

Grants and tax rebates





# Profit & Loss highlights

Revenue and margin growth supports investment in technology development and commercialisation

	1H 24 (\$m's)	1H 23 (\$m's)
<b>Revenue &amp; other income</b>	<b>16.3</b>	<b>12.7</b>
Magnesia revenues	9.9	8.5
Leilac revenues	2.3	0.2
Grants & other income	4.1	4.0
<b>Gross Profit</b>	<b>5.9</b>	<b>2.6</b>
<b>Operating expenses</b>	<b>19.8</b>	<b>13.1</b>
Sales & Marketing expenses	5.6	4.3
R&D	10.2	5.5
Admin	4.0	3.3
<b>Operating result</b>	<b>(9.8)</b>	<b>(6.5)</b>
<b>Other Items</b>		
Sustainable Processing – gain on investment in JV	3.4	-

## Key takeaways

- Diversification of revenue streams
  - Continued growth in Water business
  - New revenue through Leilac customer engineering studies - \$2.3m
- Increase in R&D spend in:-
  - Leilac to support Heirloom, Leilac-2 & growing pipeline
  - Sustainable processing – PLS JV & ZESTY
- Gain resulting from co-investment with PLS in UJV - \$3.4m



# Balance Sheet strength

Balance sheet strength & flexibility to pursue commercialisation opportunities



	31 Dec 23 (\$m's)	30 June 22 (\$m's)
<b>Total current assets</b>	<b>67.6</b>	<b>89.1</b>
Total Assets	113.2	127.5
Total Liabilities	19.0	22.6
<b>Net Assets/Total Equity</b>	<b>94.2</b>	<b>105.0</b>
<i>Excluding deferred revenue</i>		
Current assets	67.6	89.1
Current liabilities	7.6	7.7
<b>Net surplus of current assets over current liabilities [<i>ex deferred revenue</i>]</b>	<b>60.0</b>	<b>81.4</b>
<b>Property, plant &amp; equipment</b>	<b>29.4</b>	<b>24.4</b>
<b>Intangible assets, including goodwill</b>	<b>14.3</b>	<b>12.7</b>

## Key takeaways:

- Balance sheet remains strong & essentially debt free
- Flexibility retained to pursue the right capital & commercialisation strategy at the subsidiary level.





# Consolidated cash flows

Balance sheet strength to pursue commercialisation opportunities



	1H 24 (\$m's)	1H 23 (\$m's)
<b>Cash flows used in operating activities</b>	<b>(16.4)</b>	<b>(11.0)</b>
Receipts	10.4	9.0
Payments	(26.8)	(20.0)
<b>Cash flows used in investing activities</b>	<b>(10.0)</b>	<b>(5.2)</b>
Property, plant & equipment	(9.8)	(3.8)
Intellectual property	(3.2)	(1.4)
<b>Cash flows from financing activities</b>	<b>(0.2)</b>	<b>80.0</b>
Proceeds from issue of shares	-	79.4
Payment of lease	(0.3)	(0.2)
Movements in loans/borrowings	0.1	0.8
<b>Cash at the end of the year</b>	<b>47.8</b>	<b>88.8</b>

## Key takeaways:

- Working capital for investment in capability will be partially offset through draw down on receivables and working capital in coming months
- Investing in:
  - adding US manufacturing capacity to support growth opportunity
  - Leilac-2 long lead item procurement
  - Midstream pilot plant UJV with PLS (joint operation).





# 1H FY24 OPERATIONAL UPDATE CO<sub>2</sub> Mitigation





# Valuing the Opportunity – Leilac and Svante Inc...benchmark?

Since 2021, we have undertaken significant commercial de-risking and expanded the total addressable market into Direct Air Capture (DAC)



## Svante Benchmark ?

- Power plant pilot commissioned
- ~10kTpa CO<sub>2</sub> nameplate capacity
- First cement pilot commissioned
- ~0.4kTpa CO<sub>2</sub> nameplate capacity



- Cap raise of US\$100m, late 2021
- Post-money valuation not disclosed (likely > US\$300m / AU\$500m)

- Cap raise of US\$318m, Dec 2022:
- Post-Money Valuation > US\$1b\* / AU\$1.5b**

Unknown / unstated projects in pipeline  
Unknown / unstated end-user licences



\*<https://www.svanteinc.com/coverage/ogci-climate-investments-continues-to-back-svante-a-new-unicorn-in-latest-funding-round/>  
\*\* AU\$ / US\$ assumed at 0.66



# Leilac Project Updates

## Leilac-2

- Leilac-2 – targeting 100,000 tonnes per annum of CO<sub>2</sub> separation at an operating cement plant.
- 26<sup>th</sup> January – Heidelberg Materials announced the **Leilac-2 Project will be relocated** to another site following their decision to end clinker production in Hanover, Germany.
- Heidelberg Materials is working with Leilac to expedite confirmation of a suitable new site, and **detailed site assessments are underway**.
- The Leilac-2 project is **ready for construction**. After a site is chosen, ~6 months site-specific engineering is envisaged at an estimated cost of €100k /month.
- Engineering studies and commercial **discussions continue for full scale projects** with multiple partners at sites around the world.
- Leilac-2 project is an important pre-cursor project to roll-out to the **alternative fuel cement plant market**.
- **Fully electric applications** in cement, lime and Direct Air Capture (DAC) are **unaffected** by this slight delay.



Business line	Leilac
Value proposition	CO <sub>2</sub> capture
Industries	Cement, lime & direct air capture
Market size	1-10 Btpa CO <sub>2</sub>
Investor	Carbon Direct (2010 - €15m for 7%)
Partners	Heidelberg Materials, Heirloom, Cemex, Lhoist, ++



# Leilac Project Updates

## Direct Air Capture

- Leilac and Heirloom have signed a global and perpetual licence agreement that applies to all future Heirloom facilities, with a royalty floor of US\$3 / tonne CO<sub>2</sub> captured.
- Heirloom is a Direct Air Capture (DAC) company with an objective of capturing 1 billion tonnes of CO<sub>2</sub> by 2035.
- Heirloom part of Project Cypress, one of 2 projects selected for the US Department of Energy’s US\$1.2b DAC Hubs program.<sup>1</sup>
- Microsoft has purchased 315,000 tonnes of carbon dioxide removal (CDR) from Heirloom at an estimated value of US\$200million.<sup>2</sup>
- A collaboration agreement includes US\$3m in R&D contribution from Heirloom.
- Extensive and successful “calcium looping” test work has been completed at Calix’s Bacchus Marsh facility
- **Paid engineering work has commenced on Heirloom’s first commercial module**



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Industries	Cement, lime & DAC
Market size	1-10 Btpa CO <sub>2</sub>
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Partners	Heidelberg Materials, Heirloom, Cemex +






1. [Biden-Harris Administration Announces Up To \\$1.2 Billion For Nation’s First Direct Air Capture Demonstrations in Texas and Louisiana](#)  
2. <https://www.wsj.com/us-news/climate-environment/microsoft-will-use-carbon-absorbing-rocks-to-meet-climate-goals-57ea802a>



# A robust pipeline of projects



	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 2024	34	28	11	<div> ADBRI 5</div> <div></div>	<div>2</div> <div> Heirloom</div>	<div>1</div> <div><i>Leilac-2</i></div>	<div>1</div> <div><i>Leilac-1</i></div>	82

- Pipeline growth: as of February 2024, there are **82 projects** in the pipeline.
  - Projects are ~ 2/3 cement and 1/3 lime, at average capacity of 500kTpa CO<sub>2</sub> for cement and 80 kTpa CO<sub>2</sub> for lime.
  - Leilac pipeline represents potential for over **20 Mtpa of CO<sub>2</sub> abatement projects**.
- **The focus in FY24 is on moving projects down the pipeline...and increasingly recovering engineering fees as projects advance. Engineering fees in the half year to December 2023 were \$2.3m compared to \$0.2m in the half year to December 2022.**



# Leilac's full-scale vision

## FOR CEMENT...

*we need to mitigate 1.4 billion tonnes per annum of process CO<sub>2</sub> emissions*

*= up to 3,000 Leilac-3s*

*~2 built every week from now until 2050!!*

## FOR DAC...

*potentially a similar scale opportunity !*





1H FY24  
OPERATIONAL UPDATE  
Sustainable Processing





# Zero Emissions Steel Technology

Targeting lowest cost zero emissions iron & steel

## About ZESTY

- Calix technology applied to Hydrogen Direct Reduction of Iron ore (H-DRI)
- Can be easily and efficiently renewably-powered
- Targeting theoretical minimum hydrogen use – simple gas recycle, no hydrogen wastage
- Processes “iron ore fines” (<~0.3mm) – typically low value or waste material
- No pelletisation or sintering required
- Compatible with multiple ore types
- An enabling and complementary technology for multiple decarbonisation pathways\* for iron and steel, including:
  - H-DRI -> Electric Smelting (ESF) -> Blast Furnace (BF/BOF)
  - Electric Arc Furnace (EAF)

*\*in conjunction with Calix’s “Leilac” zero emissions lime*  
1. Estimated as US\$400 per tonne of iron @ 1.6BTpa <https://www.statista.com/statistics/589979/metal-content-of-the-global-iron-ore-production/>



Business line	Sustainable Processing
Industries	Iron & Steel
Value proposition	Electrification and hydrogen reduction
Market size	US\$640Bpa <sup>1</sup>
Partners	ARENA, HILT CRC, Swinburne



1H FY24 Results  
23 February 2024

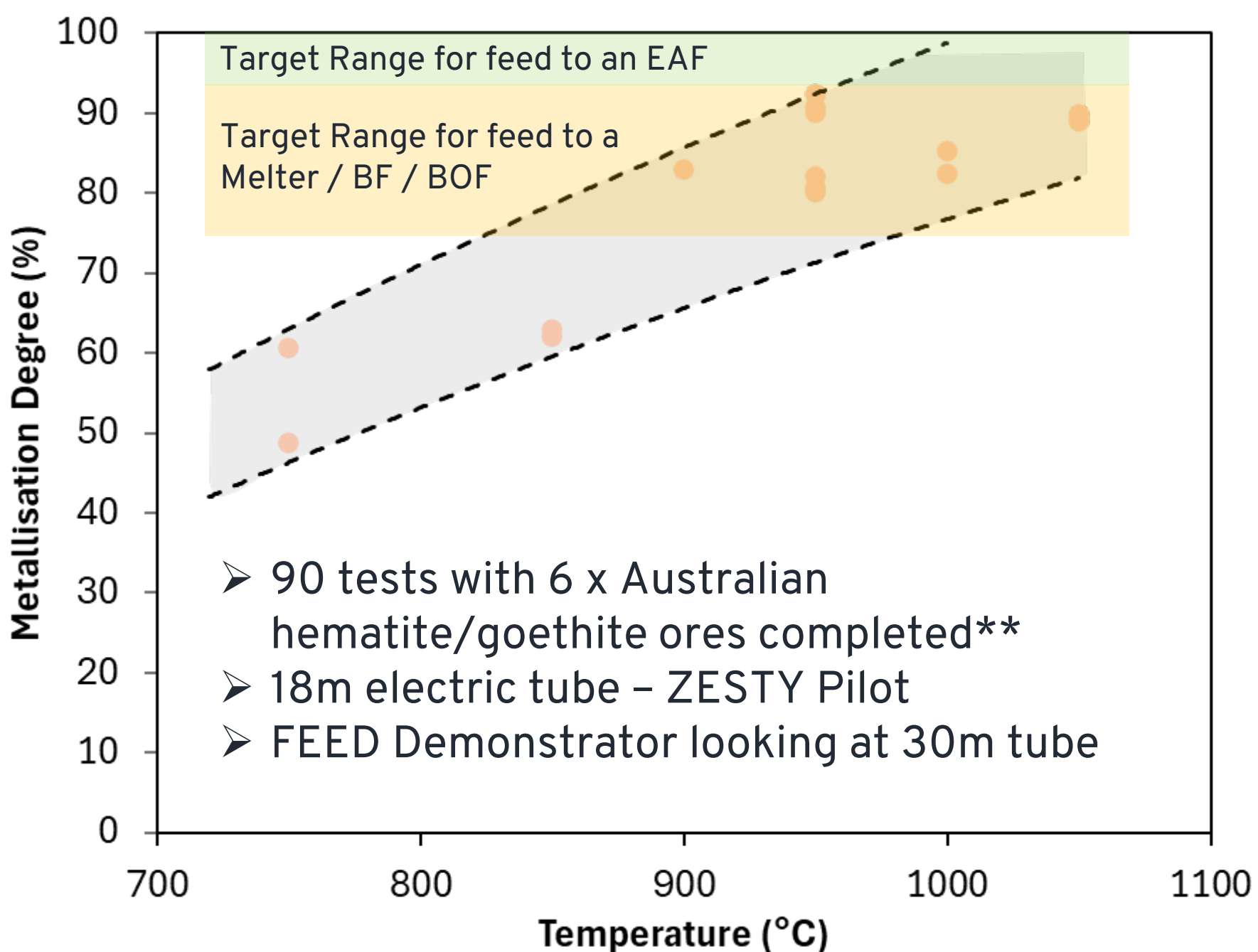




# Zero Emissions Steel Technology

## ZESTY Demonstration Plant FEED study results

- The ZESTY FEED study for a 30,000 tonne per annum demonstration facility and an extended ore testing program have been completed.
- The FEED study estimates ZESTY can produce near-zero emissions hot briquetted iron (HBI) from low grade iron ore for ~AUD\$630–800 per tonne of HBI.
- This cost is close to the range of existing, carbon-intensive HBI processing costs.
- The ZESTY technology is therefore a potential economic proposition for the production of HBI *before* the cost of carbon is taken into account.
- Carbon pricing would further strengthen ZESTY’s value proposition.
- An expansive ore testing program demonstrated metallisation degrees of commercial grade for a range of ores, including low grade Australian hematite ore.
- ZESTY’s low cost of production is driven by efficient hydrogen use, efficient electric heating, and the elimination of additional processing steps.
- Further cost savings are expected as the technology is scaled and refined.
- Calix is progressing the site selection and commercial arrangements necessary to reach a Final Investment Decision for the project.



Ore type	Fe	D80	SSA	Pore Volume
(6 variants)	(Wt %)	(µm)	(m <sup>2</sup> /g)	(cm <sup>3</sup> /g)
Goethite / Hematite	56-61	50-185	9-15	0.03-0.05

\*Assumed electricity price range AUS\$ 34 -48 / MW

\*\*Only some data points approved for public disclosure

Fe Wt% = the percentage of Iron by weight in the ore

D80 = the particle size at which 80% of particles are smaller, in millions of a metre (µm)

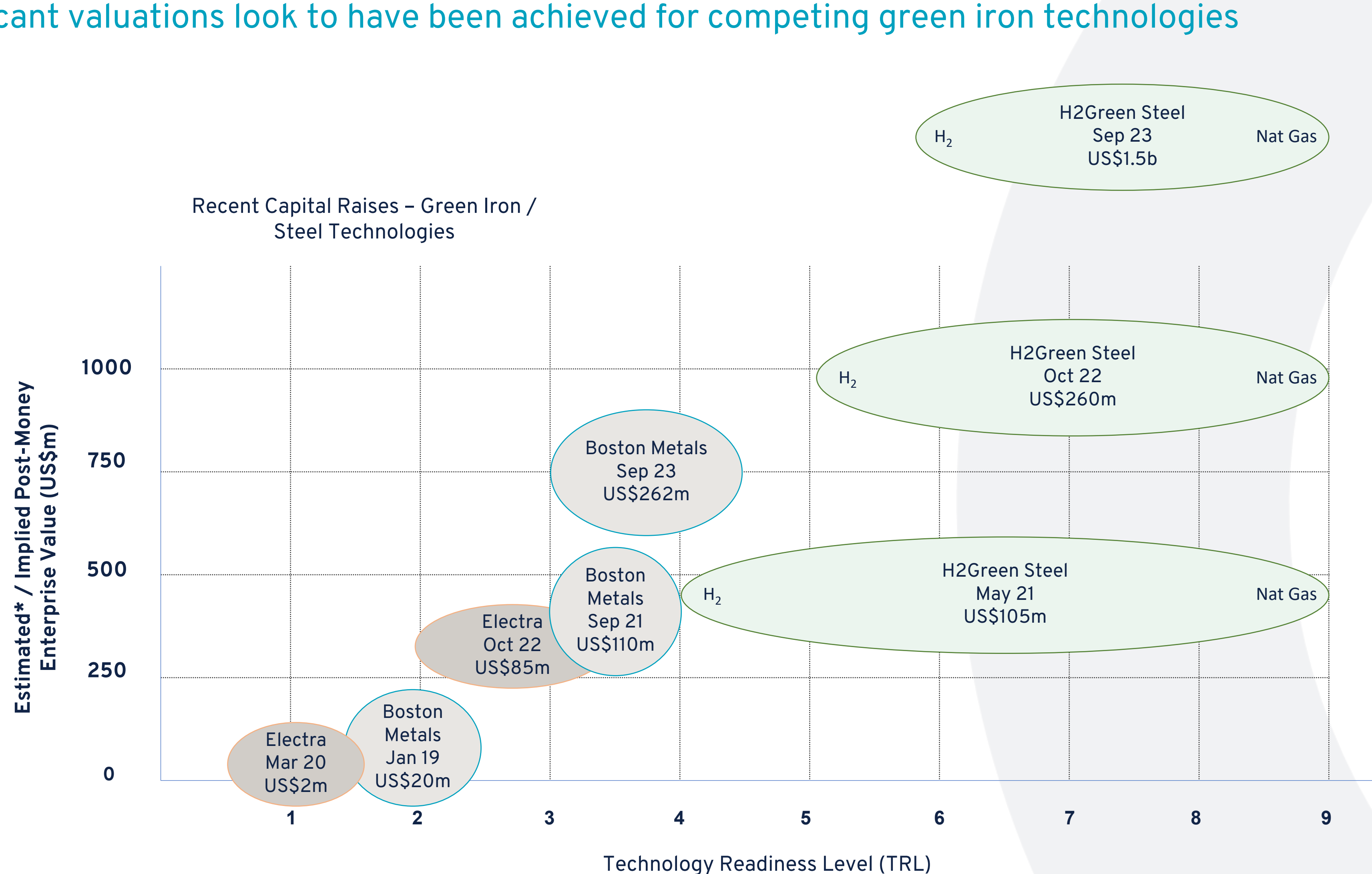
SSA = specific surface area in square meters per gram, a measure of how porous the ore is

Pore Volume = the volume of pores in the ore in cubic centimetres per gram



# Valuing the opportunity - iron and steel

Significant valuations look to have been achieved for competing green iron technologies



- Midrex technology – TRL9 for Nat Gas, maybe 6 for H<sub>2</sub> \*\*
- No data on production capacity – still lab scale
- No data on production capacity – still lab scale

## Calix ZESTY TRL?

- Core Tech definitely “out of the lab” / TRL4 +
- Current piloting at up to ~500 Tpa feed rates
- Front End Engineering and Design complete for 30kTpa Demonstration Plant\*\*\*

\*Where public data is not available, estimate is 30% which is worst-case based upon averages <https://www.saastr.com/carta-the-actual-real-dilution-from-series-a-b-c-and-d-rounds/#:~:text=20%25%20dilution%20in%20an%20A,much%20you%20need%20the%20money>  
\*\*<https://www.estep.eu/assets/Uploads/210308-D1-2-Assessment-and-roadmapping-of-technologies-Publishable-version.pdf>  
\*\*\*Public version to be published soon via ARENA



# Sustainable lithium demonstration plant



Project is proceeding well – *remains on time and budget*

- Calix and Pilbara Minerals (ASX: PLS) are building a 45%/55% JV mid-stream lithium-phosphate demonstration plant, which will use Calix’s electric calciner and be located at Pilbara Minerals’ Pilgangoora Operation.
- Project objectives:
  - Reduce carbon intensity and waste transportation
  - Demonstrate lower CAPEX and OPEX with electric calcination
  - Create a higher value lithium product at the mine site
- Construction expected to commence in Apr-Jun Qtr 2024.
- Targeting production of first lithium salt in Apr-Jun Qtr 2025.
- Demonstration Plant CAPEX is ~ AU\$105m
  - Supported by \$20m in Australian Government funding
  - Calix will receive ~24% free carried equity in the facility, targeting \$17.5m CAPEX contribution for 45% equity



Business line	Sustainable Processing
Industries	Spodumene / lithium
Value proposition	Electrification, lower carbon lithium production
Market size	US\$7Bpa <sup>1</sup>
Partners	Pilbara Minerals (ASX: PLS)



1. Estimated as 50% of total lithium market as measured by lithium carbonate equivalent (LCE) derived from spodumene - <https://www.mckinsey.com/industries/metals-and-mining/our-insights/australias-potential-in-the-lithium-market>



# Advanced Batteries restructure

Now included as part of the Sustainable Processing line of business

- Calix has produced Lithium Manganese Oxide based batteries in a commercial format battery pack and expanded its capability to new battery chemistries.
- Analysis of Calix’s battery applications identified the potential for improved performance, cost and carbon-intensity of cathode materials.
- This value proposition mostly relates to the technology’s application as a process improvement.
- As such, the Advanced Batteries business will be incorporated into Calix’s Sustainable Processing line of business
- Further development of battery material applications will be prioritised relative to other Sustainable Processing applications.
- All people, IP and know-how from the batteries team have been retained.
- The restructure will support Calix in continuing to appropriately allocate resources to the technology applications that can have the largest environmental impact and create the greatest shareholder value.



Business line	Sustainable Processing
Industries	Rechargeable Batteries
Value proposition	Electrification, lower carbon cathode production
Partners	FBI CRC, Deakin





# 1H FY24 OPERATIONAL UPDATE Magnesia



1H FY24 Results  
23 February 2024

calix





# Magnesia

## Water

- Revenue grew to \$9.9m, up 17% from the \$8.5m in 1H23, supported by US sales from new product, ALKA-Mag at improved gross margins - 38%
- Two new hydration plants now commissioned and able to support further growth in new and existing sales regions

## Agriculture:

- EU field trials continue to provide further and compelling evidence that **Calix bioactive materials are both antibacterial and antifungal.**
- Excellent recent results for treatment of globally significant **olive leaf spot disease** have generated new technology licencing opportunities.

## Marine:

- Static tests with global coatings firms continue in North America, Korea, Australia, and New Zealand. **Testing is progressing well** with additional in-field static trials in planning.
- **Dynamic tests and coatings formulation work underway** in sites across North America, Australia, New Zealand and Asia.

## Antimicrobial Resistance (AMR):

- The initial CRC SAAFE livestock health project has confirmed **Calix materials provide control of pathogenic and drug resistant bacteria.**
- An additional project is being developed to prevent **fungicide resistance** in crop protection.
- Calix joined Australia’s **ARC CEA StAR** collaborative research program with three new projects.

## Magnesium Metal

- Critical mineral – US / EU – we have a mine and the low carbon technology!
  - work continues on this opportunity.



Business line	Magnesia
Value proposition	Sustainable, bioactive MgO products
Industries	Water, agriculture, marine, biotech
Market size	Multi-US\$Bpa
Partners	CRC SAAFE



# Sustainability Update

Ambition	1H FY24 achievements
Science-based emission reduction in line with the 1.5-degree pathway	<ul style="list-style-type: none"><li>• Data collection for FY23 greenhouse gas collection completed</li><li>• Continuous process improvements for more accurate emissions data collection.</li><li>• Supplier engagement to obtain more accurate scope-three emissions data.</li></ul>
Gender balance of 40:40 at all levels of the organisation by 2030	<ul style="list-style-type: none"><li>• Job advertisement practices reviewed and updated to support attracting a diverse range of candidates.</li><li>• Parental leave entitlements increased</li><li>• Introduction of wellbeing leave.</li></ul>
100% sustainable material inputs that are renewable, reusable or recyclable by 2030	<ul style="list-style-type: none"><li>• Waste and water usage measured from MHL production at Australian operational sites.</li><li>• Hazard waste tracked at all sites globally.</li><li>• Circular economy model in development for IBC &amp; pallet waste.</li></ul>

MARS IS FOR QUITTERS



SUSTAINABLE  
DEVELOPMENT  
GOALS

Calix supports the Sustainable Development Goals

1  
NO  
POVERTY

2  
ZERO  
HUNGER

3  
GOOD HEALTH  
AND WELL-BEING

4  
QUALITY  
EDUCATION

5  
GENDER  
EQUALITY

6  
CLEAN WATER  
AND SANITATION

7  
AFFORDABLE AND  
CLEAN ENERGY

8  
DECENT WORK AND  
ECONOMIC GROWTH

9  
INDUSTRY, INNOVATION  
AND INFRASTRUCTURE

10  
REDUCED  
INEQUALITIES

11  
SUSTAINABLE CITIES  
AND COMMUNITIES

12  
RESPONSIBLE  
CONSUMPTION  
AND PRODUCTION

13  
CLIMATE  
ACTION

14  
LIFE  
BELOW WATER

15  
LIFE  
ON LAND

16  
PEACE, JUSTICE  
AND STRONG  
INSTITUTIONS

17  
PARTNERSHIPS  
FOR THE GOALS



# Board of Directors

Board further strengthened with two new Directors – Dr Sarah Ryan and Peter Dixon



**Peter Turnbull, AM**  
Non-Executive Chair  
(Retiring 2024)

- Experienced Chair and Non-Executive Director with significant board and senior executive experience in the Australian and global resource, energy and technology sectors.
- Non-Executive Director of Karoon Energy Ltd. (ASX: KAR), Chair of Canadian medtech Auxita Pty Ltd, and Immediate Past President of the Chartered Governance Institute (London).
- Member of People, Culture and Nomination Committee, and Member of Audit and Risk Management Committee



**Alison Deans**  
Non-Executive Director  
(Chair-Elect)

- Experienced Chair and Non-Executive Director with significant board and senior executive experience in technology-enabled growth companies.
- 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. Venture Partner at Main Sequence Ventures (CSIRO's innovation fund) and member of the Investment Committee.
- Previously CEO at eBay Australia and New Zealand, and two technology investment companies (eCorp Limited, and netus Pty Ltd) and a consultant with McKinsey & Company.
- MBA from the Stanford Graduate School of Business and a MA (Natural Sciences) from Cambridge University.



**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 Audit and Risk Management Committee and Sustainability Committee



**Dr Sarah Ryan**  
Non-Executive Director

- Non-executive director of Viva Energy Group Limited (ASX:VEA), Aurizon Holdings Limited (ASX:AZJ), Transurban Group (ASX:TCL) and the Future Battery Industries Co-operative Research Centre.
- Previously a non-executive director of Oz Minerals Limited (ASX:OZL) and Woodside Energy Group Limited (ASX:WDS).
- Strategic Advisory Panel Member of the ARC Centre of Excellence for Green Electrochemical Transformation of Carbon Dioxide, Chair of the Energy Forum for the Australian Academy of Technological Sciences and Engineering.
- Fellow of the Australian Academy of Technological Sciences and Engineering (ATSE), the Australian Institute of Energy,
- Bachelor of Science in Geology from the University of Melbourne, a Bachelor of Science (First Class Honours) in Geophysics from the University of Adelaide, PhD in Petroleum Geology and Geophysics from the University of Adelaide.
- Chair of Technology committee



**Peter Dixon**  
Non-Executive Director

- Over 25 years of diverse corporate experience across the legal, investment banking, strategy and funds management sectors.
- Provides deep expertise in corporate strategy, investment management, corporate advisory (including equity capital markets) and legal governance to the Calix board.
- Currently Chief Strategy Officer for HPX Group Pty Ltd and a non-executive director at Johns Lyng Group Limited (ASX:JLG).
- Investment banking and legal experience includes private legal practice experience at Mallesons Stephen Jacques (Sydney) and Linklaters (London), and corporate advisory experience at MA Financial Group (ASX:MAF) and Macquarie Group Limited (ASX:MQG).
- Bachelor of Commerce (Finance) and a Bachelor of Laws from the University of New South Wales.
- Chair of People, Culture and Nomination Committee



**Dr 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.
- Member of Calix's Technology Committee.



**Dr Mark Sceats**  
Executive Director & 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.
- Fellow of the Australian Academy of Technological Sciences and Engineering (ATSE).
- Author of more than 165 academic papers in physical chemistry and inventor of 55 patented inventions.



# FY24 KPI Dashboard

Strong progress so far, with most KPIs on track

## KPI Dashboard for FY24

- ON TRACK
- WATCH POINT
- BEHIND

GATEWAY  
All High Level  
SHESQ action  
items  
completed on  
time



### CO<sub>2</sub> Capture

- Leilac2 all permitting and civil works complete
- Continue to move projects down the pipeline
- BOD for green methanol consortia project



### Sustainable Processing

#### Spodumene

- Spodumene Project Construction commenced

#### Iron and Steel – “ZESTY”

- Successful expanded ore program
- Completed FEED study leading to FID

#### Alumina

- First successful Pre-FEED study

#### Advanced Batteries\*

- Consumer Product Battery Module + new electrode chemistry



### Magnesia

#### Water

- Continued growth US, Asia; Lufkin operational; Ripon in Feb

#### Mg Metal

- BOD for Mg Metal plant

#### Specialties

- Continued commercialisation of Ag, Coatings and Biotech applications

\*From January 2024, Advanced Batteries will be developed as part of the sustainable processing line of business, given the key value proposition involves electrification, lower carbon and more efficient processing



# Summary and H2 FY24 outlook

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- Calix has developed a unique technology that can be applied across many industries, with a focus on key projects for the decarbonisation of cement and lime, iron and steel, and lithium processing.
- Strong demand for Calix's technology is being driven by government policy and a need for urgent, affordable and scalable solutions.

## Capital

- Building head company revenues and gross margins.
- Strong balance sheet and prudent, focused investment to build technology value.
- Equity farm-in at the subsidiary level continues to be an interesting option to facilitate accelerated growth, commercialisation, and look-through value.

## Leilac

- Heidelberg Materials has reiterated its commitment to the Leilac-2 project. Leilac is working with Heidelberg Materials to expedite confirmation of a suitable new site and minimise delays to the project.
- Leilac continues to develop fully electric applications for cement, lime, and Direct Air Capture.

## Pilbara Minerals JV

- Calix's joint venture with Pilbara Minerals, which aims to develop a low carbon, low waste, and high value mid-stream lithium salt product, remains on track and on budget.

## ZESTY

- A FEED study found ZESTY has the potential to produce HBI at prices close to existing, carbon-intensive methods, before the cost of carbon is accounted for.
- Following the completion of the ZESTY FEED study, Calix aims to progress the site selection and commercial arrangements necessary to reach a Final Investment Decision for the project.





# Calix Limited

## 1H FY24 Results

23 February 2024



**Thank you**

### **Acknowledgement of country**

Calix acknowledges the First Nations people and traditional custodians of the lands upon which we live and work. We acknowledge their rich cultures and their continuing connection to land, waters and community. We pay respect to the culture and people, their Elders and leaders, past, present and emerging.

### **Social inclusion statement**

Calix embraces diversity and inclusion. It is one of our core values. We promote an inclusive and safe space for all and proudly welcome and support people of any race, ability, gender and identity.

### **Sustainability statement**

At Calix, sustainability means meeting our own needs without compromising the ability of future generations to meet their own needs. It is deeply embedded in our purpose: Mars is for quitters.





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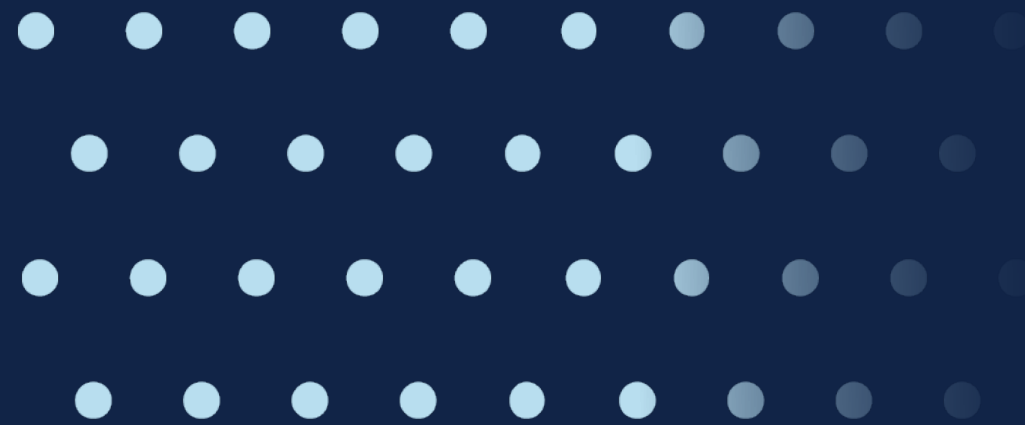


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# Glossary





# Glossary

Term	Meaning
Aluminium (Al)	Chemical element with the symbol Al
Anode	The negative electrode of a battery
Antimicrobial	Antimicrobial products kill or slow the spread of microorganisms, including bacteria, viruses and fungi.
AMR	Antimicrobial resistance – the development of resistance in bacteria, viruses, fungi and parasites to antimicrobials
ARENA	The Australian Renewable Energy Agency
ASX	The Australian Securities Exchange
APVMA	Australian Pesticides and Veterinary Medicines Authority
BATMn	Calix’s core kiln technology – electrified – for battery and catalyst materials production and other applications testing
BOD	Basis of Design
BOS	Basic Oxygen Steelmaking
CAGR	Compound Average Growth Rate (%)
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 <sub>2</sub>	Carbon Dioxide
Copper (Cu)	Chemical element with the symbol Cu
CRC	Cooperative Research Centre – Australian Government supported industry-led collaborative research centres
CRC SAAFE	Cooperative Research Centre Solving Antimicrobial Resistance in Agribusiness, Food, and Environments
DAC	Direct Air Capture – the extraction of carbon dioxide directly from the atmosphere
EAF	Electric arc furnace – a furnace that heats material by means of an electric arc between two electrodes



# Glossary

Term	Meaning
EAP	Employee Assistance Program
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
ESF	Electric Smelting Furnace – Used to convert Direct Reduced Iron (DRI) to iron suitable for a Basic Oxygen Steelmaking (BOS) process.
ESG	Environment, Social and Governance considerations
FEED	Front-End Engineering Design
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 an electrolyser using renewable energy
Goethite	A mineral that is an ore of iron
HBI	Hot Briquetted Iron – “bricks” of relatively high purity iron ready for steel-making
H-DRI	The process of directly reducing iron ore to metallic iron with hydrogen as the reductant
Hematite	A mineral that is an ore of iron
HILT CRC	Heavy Industry Low-carbon Transition Cooperative Research Centre
HPO	“Hierarchical Porous Onion” - a crystal structure of lithium manganese oxide resembling tiny onion layers – allowing both strength and easier passage of lithium ions
Hydrometallurgy	A metal recovery method used to obtain metals from ores and waste materials
Iron (Fe)	The chemical element, represented 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
Leilac	Calix’s core kiln technology for Low Emissions Intensity Lime and Cement production with CO <sub>2</sub> capture
LFP	Lithium Iron Phosphate – a battery cathode material



# Glossary

Term	Meaning
LHM	Lithium Hydroxide Monohydrate – used in the production of cathode active materials for lithium-ion batteries
Lithium (Li)	Chemical element with the symbol Li
Lithium-phosphate / 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
LMO	Lithium Manganese Oxide – a battery cathode material
LNMO	Lithium Nickel Manganese Oxide – a battery cathode material
LTO	Lithium Titanium Oxide – a battery anode material
Manganese Carbonate (MnCO3)	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
Magnetite	A mineral that is an ore of iron
Metallurgical Coal	Very high carbon coal
MgO	Magnesium Oxide
MHL	Magnesium Hydroxide Liquid
MOU	Memorandum of Understanding
Nanoporous	A material with a regular, porous structure, with a pore size generally less than 100 nanometres.
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



# Glossary

Term	Meaning
Process emissions	Process emissions are inherent to the chemical reaction and are released directly and unavoidably from the chemical processing of raw material. They are distinct from energy related emissions that may result from the consumption of fuel to heat the reaction.
SDGs	The UN’s Sustainable Development Goals or Global Goals are a collection of seventeen interlinked objectives designed to serve as a "shared blueprint for peace and prosperity for people and the planet, now and into the future.”
Separator	The barrier between the anode and the cathode that prevents them touching, inside the battery
Siderite	A mineral that is an ore of iron
SLP	Single layer pouch cells – a soft battery design where most of the cell components are enclosed in a aluminium-coated plastic film.
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
RDF	Refuse-derived fuel – a fuel produced from various types of waste
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
TAM	Total Addressable Market
Tpa	Tonnes per annum
TRL	Technology Readiness Level, as measured on the NASA scale
UNGC	The United Nations Global Compact, the world’s largest corporate sustainability initiative
Wh / kWh	Watt-hours / kilowatt-hours - a measure of energy
ZESTY	Calix’s Zero Emissions Steel TechnologY





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