

12 February 2024

Calix Investor Presentation – February 2024

Sydney, Australia | 12 February 2024 – Australian environmental technology company, Calix Limited (ASX: CXL) (“Calix” or “the Company”) is pleased to provide a copy of its latest investor presentation to the Bell Potter Unearthed Natural Resources Conference.

The following presentation is to be delivered by Managing Director and CEO, Phil Hodgson at 9.50am (Eastern Daylight Time) on Monday 12th February 2024.

-ENDS-

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

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About Calix

Calix Limited (ASX: CXL) is an environmental technology company solving global challenges in industrial decarbonisation and sustainability, including CO₂ mitigation, sustainable processing, advanced batteries, biotechnology and water treatment.

Calix's patented core platform technology delivers efficient indirect heating of raw materials to enable electrification of industries, efficient capture of unavoidable emissions, and green industrial processing solutions. Its flash heating approach can also produce unique nanoporous materials with enhanced chemical and/or bio-activity.

Leveraging its core platform technology and a global network of research and development collaborations, Calix is urgently developing multiple environmental businesses that deliver positive global impact. Because there's only one Earth..

Mars is for quitters.

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Decarbonising industry

Calix Limited
Bell Potter Unearthed

February 2024

calix.global

Important Disclaimer

This presentation has been prepared by Calix Limited (ABN 36 117 372 540) (“Company”).

SUMMARY INFORMATION

This presentation contains summary information about the Company and its subsidiaries (“Calix”) and their activities current as at 12 February 2023. The information in this presentation is a general background and does not purport to be complete.

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All dollar values are in Australian dollars (\$) or A\$) and financial data is presented as at or for the full financial year ended 30 June 2021, unless stated otherwise.

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About Calix

Calix is an environmental technology company that is 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 CO₂ 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

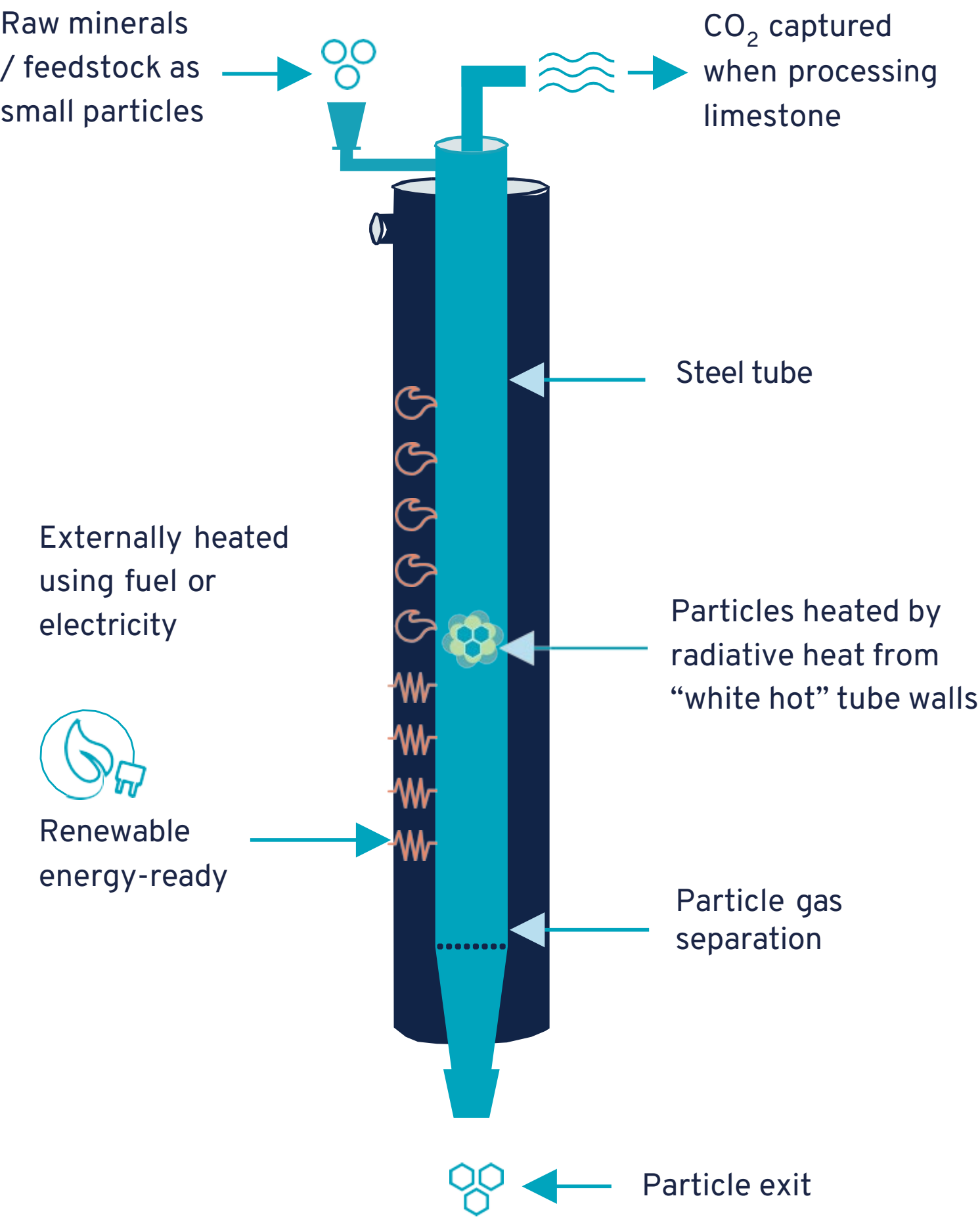
28
PATENT
families

ACTIVE IN

75
countries continents


Calix's Core Platform Technology

Decarbonising industry with a new way to “heat stuff up”...




**CO₂
CAPTURE**

Unavoidable carbon dioxide released directly from the raw material is kept pure, enabling it to be simply and efficiently captured for use of storage.


**RENEWABLE
ENERGY-READY**

Compatible with electricity and alternative fuels to provide viable, flexible and economical pathways to sustainable processing of minerals.



28 patent families
covering core
technology &
applications.



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February 2024

Calix has a strong competitive advantage

One core platform technology – multiple applications in major global markets

- Pressure from government policy and regulation is driving strong demand for decarbonisation solutions
- Funding through licensing, joint ventures and spin-offs at the subsidiary level facilitates accelerated growth and commercialisation
- Licensing model drives recurring revenue
- Unique and patented indirect heating technology provides strong competitive moat
- Operating in large addressable markets
- Established, profitable and growing water treatment subsidiary
- Reputable board, strong management team and proven technology



One Decarbonisation Technology – Multiple Applications

Our technology is designed to decarbonise some of the world’s largest and hardest-to-abate industries...



Cement & lime



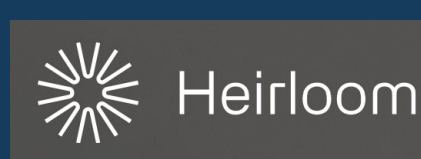
“Low Emissions Intensity Lime and Cement”

Cement and Lime ~8% global CO₂ emissions

~1.4 billion tonnes of unavoidable CO₂ to be captured annually by 2050¹



Direct Air Capture



Zero emissions lime as a sorbent for atmospheric CO₂

Up to 10 billion tonnes of CO₂ per annum removal may be needed to limit global warming to 1.5°C²



Lithium



Low-carbon, low-waste, value-add ‘mid-stream’ processing to lithium at the mine site

6x growth in lithium carbonate & equivalents market expected by 2030³



Alumina

Electrifying Aluminium Oxide production

Global Alumina production on steady growth past 141.5 Mtpa in 2021⁴

Second largest metal industry globally after iron / steel

Aluminium industry responsible for about 3 % of global CO₂ emissions⁶



Iron & steel

ZESTY

“Zero Emissions Steel Technology”

Electrifying Iron production with Green Hydrogen

~ Iron and Steel 7-9% global CO₂ emissions⁵

~80-85% CO₂ is from converting iron ore to iron⁵



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¹ Global Cement & Concrete Association. Concrete Future Roadmap

² Net Zero by 2020: A Roadmap <https://www.iea.org/reports/net-zero-by-2050>

³ Forecasts indicate that Lithium is on a 500% growth curve by 2050 (World Bank 2017)

⁴ Statista 2021 <https://www.statista.com/statistics/799525/global-alumina-production/>

⁵ Climate change and the production of iron and steel. World Steel Association. 2021

⁶ IEA: <https://www.iea.org/energy-system/industry/aluminium>

Policies driving decarbonisation – Latest News

Carbon penalties, value, tariffs, & policy support 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**.¹
- **Feb 2024:** European Commission releases **2040 Roadmap recommending 90% CO₂ reduction by 2040**.²
- Feb 2024: European Commission **Industrial Carbon Management** communication states:³
 - *“focus will be on capturing CO₂ from process emissions as well as some emissions from fossil and biogenic CO₂ sources”*
 - **280 million tonnes of CCS targeted by 2040**
 - **450 million tonnes of CCS targeted by 2050**
 - Capture of CO₂ 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**⁴
 - 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**⁵
 - 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**⁶
 - 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** ⁷
 - 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**⁷
 - **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**

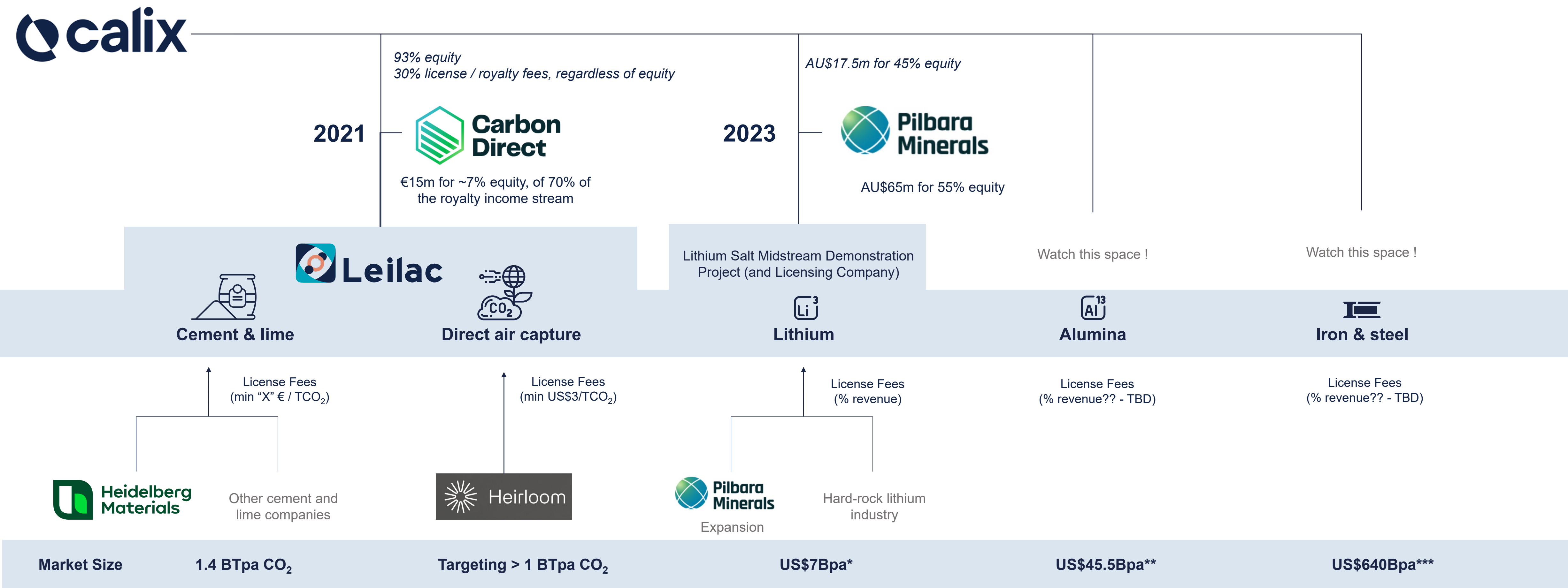
Supporting policies

- 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](#)

Our Strategy – Rapid commercialisation through licensing, spin-outs and joint ventures

- Head company well capitalised.
- Equity investment at a subsidiary level to accelerate commercialisation of specific applications.
- Licence fees guaranteed to head company regardless of future equity holding.



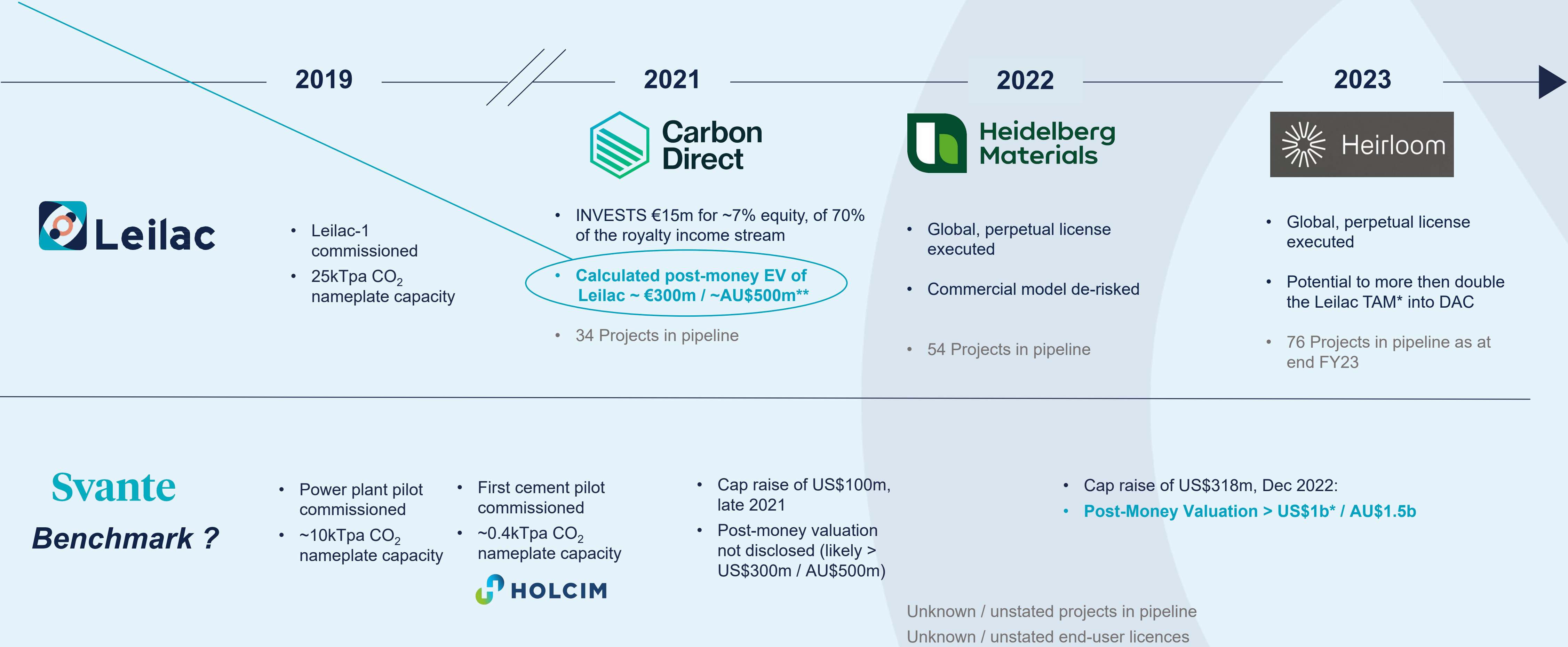
*Estimated as 50% of total lithium market as measured by lithium carbonate equivalent (LCE) derived from spodumene - <https://www.mckinsey.com/industries/metals-and-mining/our-insights/australias-potential-in-the-lithium-market>

**Alumina global market revenue estimated at [https://www.precedenceresearch.com/press-release/alumina-market#:~:text=The%20global%20alumina%20market%20is%20estimated%20to%20reach%20US\\$45.5Bpa%20by%202030](https://www.precedenceresearch.com/press-release/alumina-market#:~:text=The%20global%20alumina%20market%20is%20estimated%20to%20reach%20US$45.5Bpa%20by%202030)

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

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)



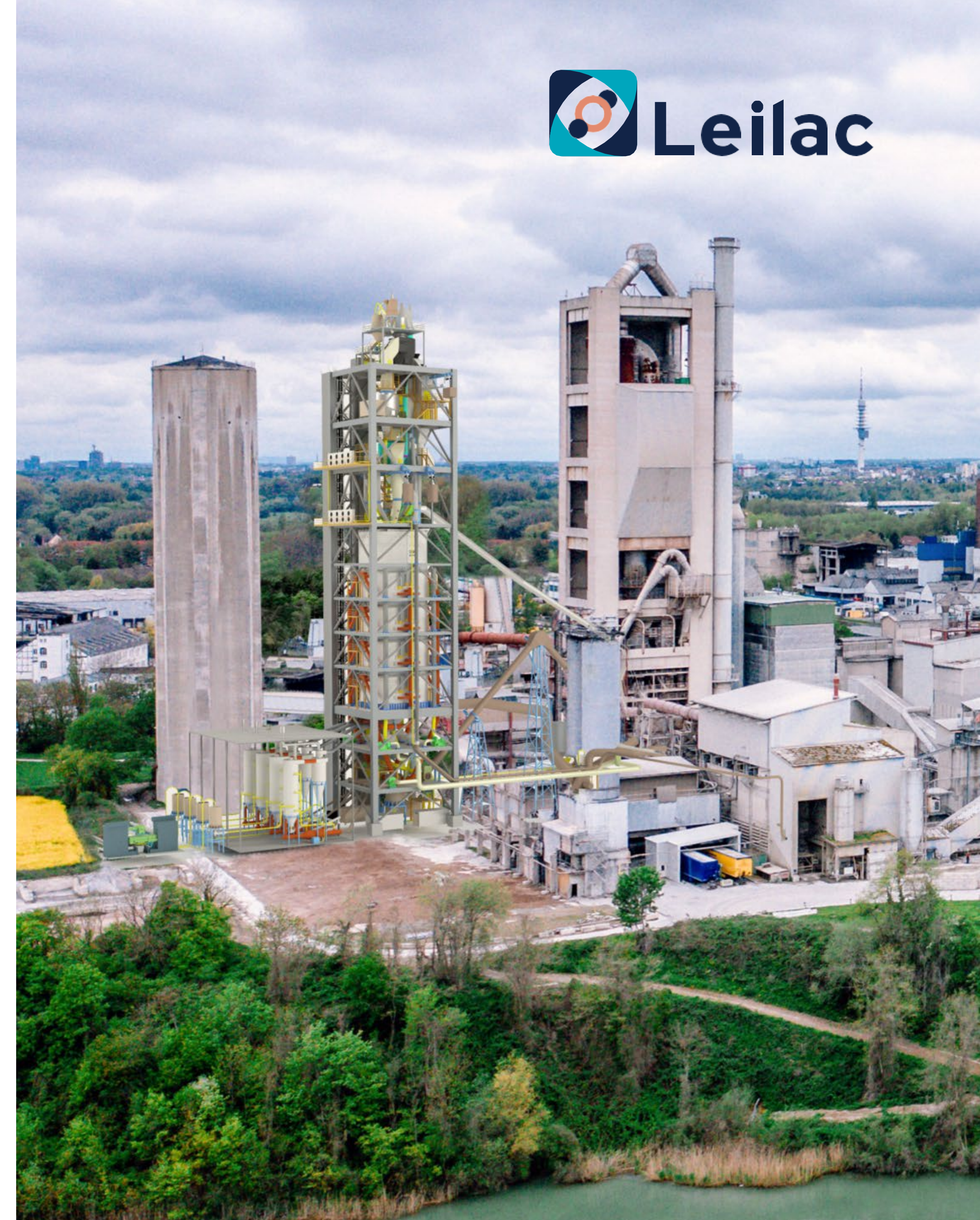
**<https://www.svanteinc.com/coverage/ogci-climate-investments-continues-to-back-svante-a-new-unicorn-in-latest-funding-round/>*
*** AU\$ / US\$ assumed at 0.66*

Leilac Project Update

- Leilac-2 – targeting 100,000 tonnes per annum of CO₂ separation at an operating cement plant.
- 26th January – Heidelberg Materials announced the **Leilac-2 Project will be relocated** to another site following their decision to end clinker production in Hanover, due to a decline in cement sales amid a weak macroeconomic environment in 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**, and after a site is chosen about 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 – project pipeline will be updated at our half-year results presentation February 23rd.
- 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.

“Heidelberg Materials remains firmly committed to the Leilac-2 project. Leilac continues to be an important technology option in our portfolio of solutions to lead the world to net-zero cement.”

Heidelberg Materials General Manager Germany, Christian Knell. February 2024



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February 2024



Sustainable lithium demonstration plant update

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

- Calix and Pilbara Minerals (ASX: PLS) are building a 55%/45% JV **mid-stream lithium-phosphate demonstration plant**, which will use **Calix's electric calciner** and be located at **Pilbara Minerals' Pilgangoora Project**
- **Project objectives:**
 - **Reduce carbon intensity, waste and transport costs**
 - 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



Carbon emissions savings

A Life Cycle Assessment study¹ found that renewably powered electric calcination of spodumene would reduce emissions by:

↓ **90% vs a coal-fired rotary kiln**

↓ **80% vs a natural gas-fired rotary kiln**



Zero Emissions Steel Technology

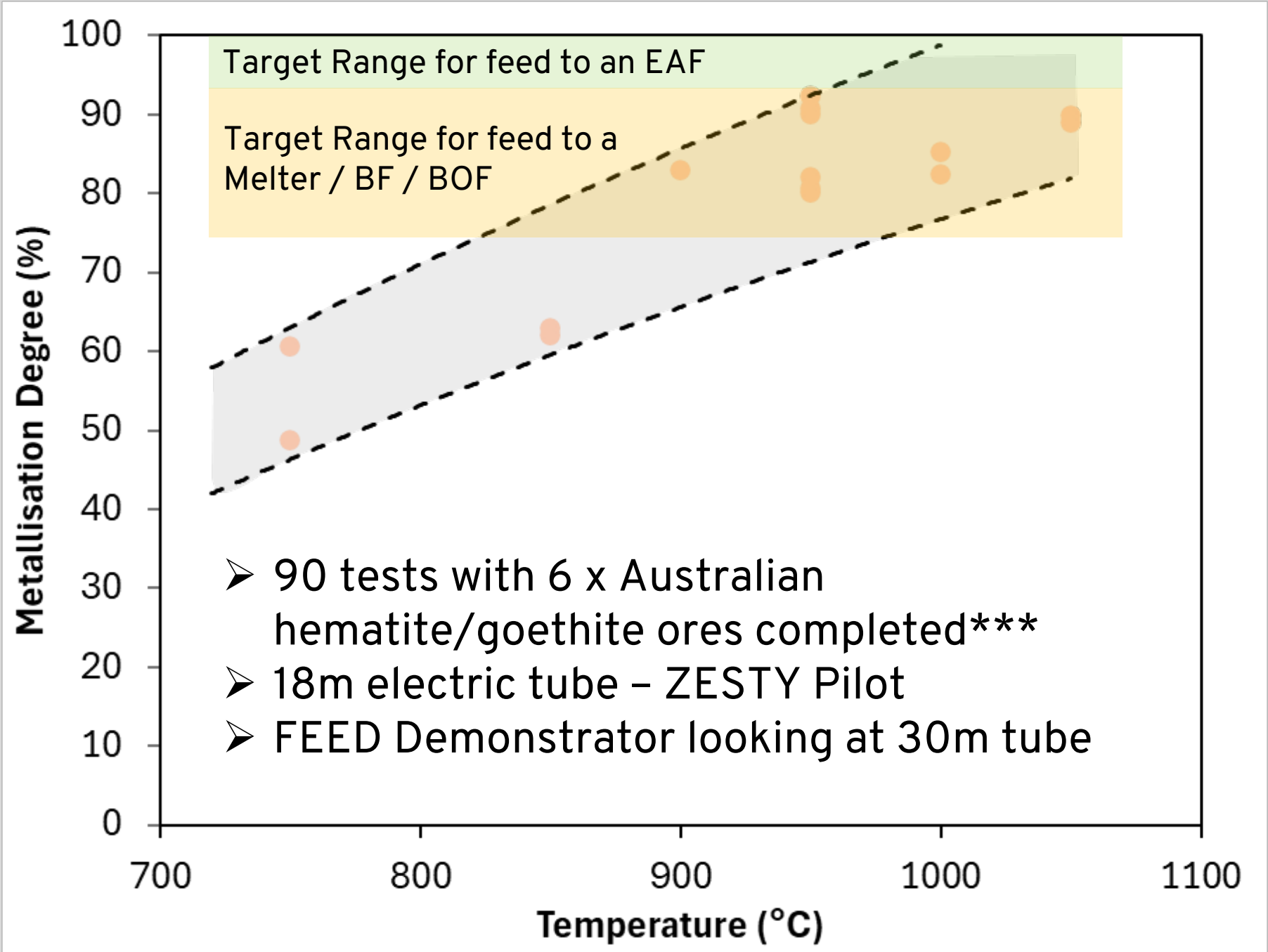
- We have completed the ZESTY Front-End-Engineering and Design (FEED) study for a 30,000 tonne per annum demonstration facility and an extended ore testing program
- The excellent outcomes of the study and results of the testing program are highly encouraging...

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 fines** <~0.3mm, no pelletisation, no sintering required
- **An enabling and complementary technology for multiple decarbonisation pathways*** for iron and steel, including (H-)DRI -> Electric Smelting (ESF) -> Blast Furnace (BF/BOF) or Electric Arc Furnace (EAF)

Key FEED Study Findings

- The ZESTY *demonstrator* has the **potential to produce *low carbon* hot briquetted iron (HBI) from Australian iron ore in the range of AUD\$630–800/tonne, close to the range of *current HBI market prices***, including OPEX** and levelised CAPEX.
- A cost on carbon / carbon border adjustment mechanism would add “icing to the (financial) cake” of a ZESTY H-DRI / HBI process, with significant potential to lower costs even further as the technology scales.
- The ZESTY technology is therefore **a potential economic proposition for the production of HBI *before* the cost of carbon** is taken into account, especially as costs come down as the technology scales.



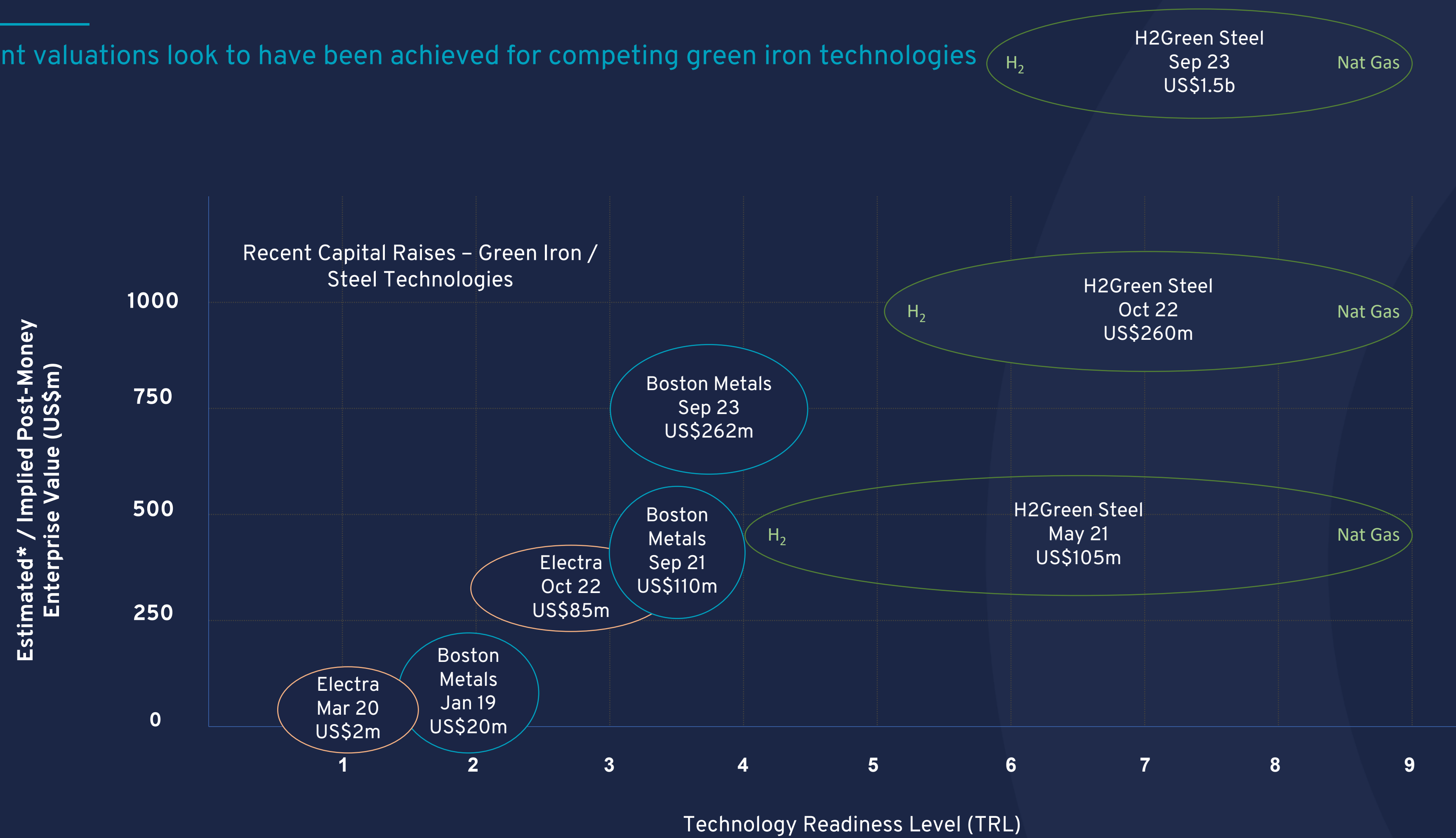
Ore type	Fe	D80	SSA	Pore Volume
(6 variants)	(Wt %)	(µm)	(m²/g)	(cm³/g)
Goethite / Hematite	56-61	50-185	9-15	0.03-0.05

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

*in conjunction with Calix’s “Leilac” zero emissions lime
**Assumed electricity price range AU\$ 34 -48 / MW
***Only some data points approved for public disclosure

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 H₂**
- 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”
- 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

Board of Directors further strengthened with two new Directors



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)

- 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, CEO of Hoyts Cinemas, CEO of netus Pty Ltd, and a consultant with McKinsey & Company. Ms Deans holds a MBA from the Stanford Graduate School of Business and a MA (Physics) 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.



In summary

- Calix has developed a **unique technology** that can be applied across many industries.
- **Strong demand** for Calix's technology driven by government policy and a need for urgent, affordable and scalable solutions.
- Calix is an established global company operating **in large addressable markets**.
- **Equity farm-in at the subsidiary level** facilitates accelerated growth and commercialization.

Leilac-2

- Project slightly delayed while a new site is chosen. Budget **remains largely on track with some small relocation costs**.
- **Heidelberg Materials** and the other consortium members remain **committed to the project**.
- **Leilac electric calciner developments** in cement, lime and Direct Air Capture **unaffected** by Leilac-2 project delay.

Pilbara Minerals JV

- Mid-stream lithium salt **project remains on time and budget** – no change

ZESTY

- **FEED study delivers highly encouraging results** for the Zero Emissions Steel TechnologY (ZESTY) application.
- The study estimates **ZESTY can produce near-zero emissions hot briquetted iron (HBI) close to the cost range of existing, carbon-intensive HBI processing costs**. This is **before any benefit of emissions reduction is accounted for**.
- A **Financial Investment Decision** on a ZESTY HBI Demonstration facility is being progressed subject to **plant location and commercial agreements currently under negotiation**.





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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 ₂	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 ₂ 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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