

28 November 2023

Calix Investor Presentation – November 2023

Sydney, Australia | 28 November 2023 – Australian environmental technology company, Calix Limited (ASX: CXL) (“Calix” or “the Company”) is pleased to provide a copy of its latest investor presentation.

-ENDS-

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

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About Calix

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

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

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

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

Website: <https://www.calix.global/>

Twitter: @CalixLimited

YouTube: [CalixLimited](#)

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Calix Limited **Investor Briefing Paper**

November 2023

[CALIX.COM.AU](https://calix.com.au)

Important Disclaimer

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

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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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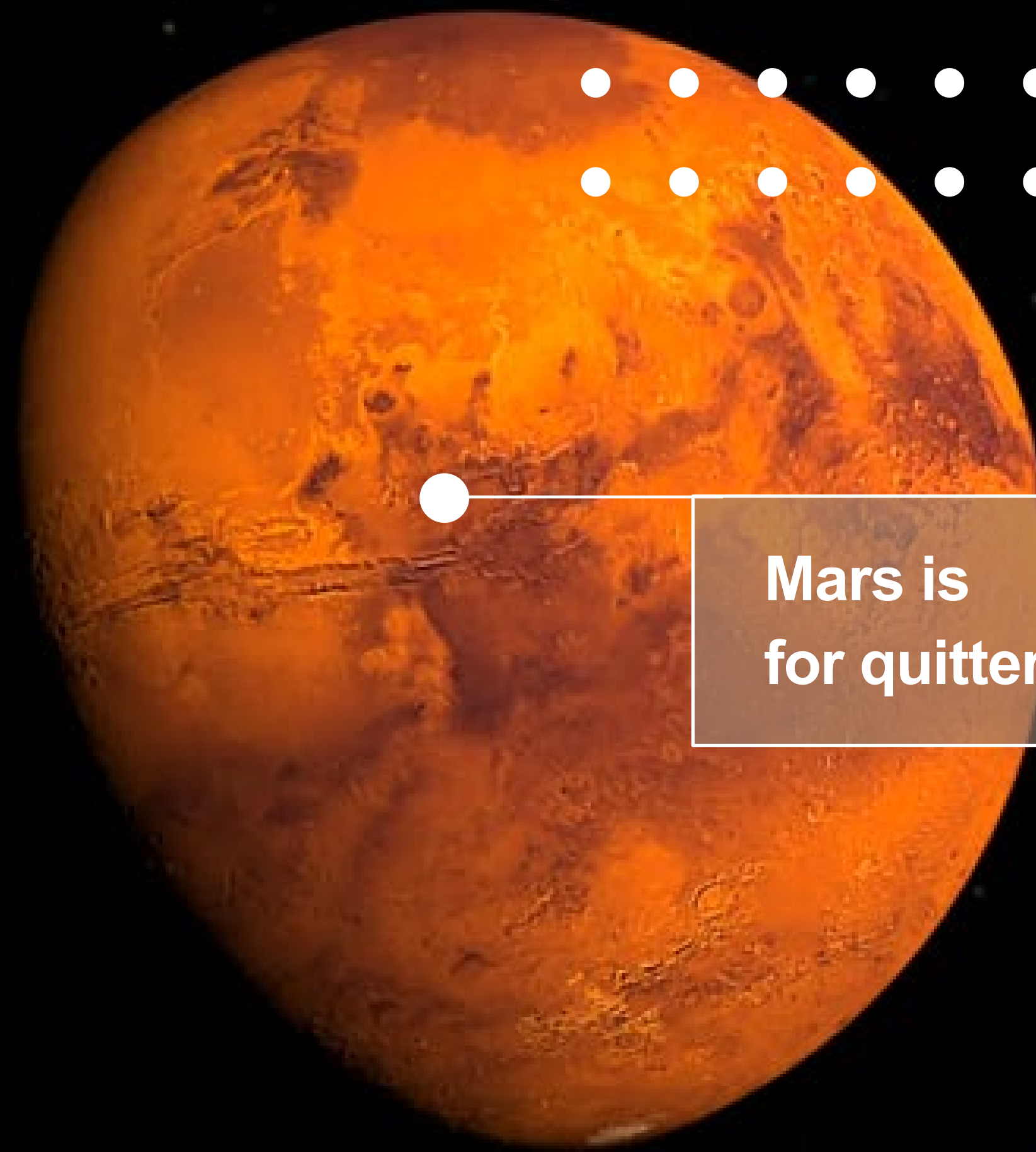




**“It is now cheaper
to save the world
than destroy it.”**

Akshat Rathi.

**Climate Capitalism: Winning the
Global Race to Zero Emissions.**



**Mars is
for quitters**

Policies driving decarbonisation – Latest News

Carbon penalties, value & support in Europe, US, & now Australia are accelerating the need for industrial decarbonisation...

Europe

Emissions Trading Scheme (EU ETS)

- EU ETS CO₂ price averaging €90 in 2023
- 2.2% year-on-year reduction in free CO₂ permits to 2030
- Jan 2024: EU ETS will extend into all shipping > 5000T

Carbon Border Adjustment Mechanism (CBAM)

- The CBAM commenced its initial reporting phase in October 2023
- CBAM paves the way for phase out of exemptions for heavy industry in the EU

Innovation Fund

- €10b funding from 2020 to 2030
- Up to 60% project cost contribution

Net-Zero Industry Act

- CCS identified as a strategic priority
- 50 million tonnes of annual CO₂ storage capacity to be developed by 2030

US

Inflation Reduction Act

- US\$85 / tonne of CO₂ permanently stored
- US\$180 / tonne for DAC + permanent CO₂ storage
- US\$130 / tonne for DAC + used CO₂

US-Australia Climate, Critical Minerals & Clean Energy Transformation Compact

- Fast-track critical mineral supply chains
- Access to US capital and IRA benefits for Australian companies as a 'domestic source'

Direct Air Capture (DAC) hubs

- US\$3.5 billion to establish Regional Direct Air Capture hubs
- Aug 2023: Project Cypress in Louisiana one of first two projects selected for up to US\$600 million in funding.
- Calix's partner Heirloom one of two DAC firms in Project Cypress

Australia

Safeguard Mechanism

- A price on carbon, capped at AU\$75 per tonne

AU\$15b National Reconstruction Fund

- Up to AU\$3b for renewables and low-emission technologies & AU\$1b for value-adding in resources.

AU\$1.9b Powering the Regions Fund

- AU\$400m over 3 years for Critical Inputs to Clean Energy Industries, such as steel, cement & lime, & alumina

Carbon Capture Technologies Program

- AU\$141m for hard-to-abate industries, such as cement

Critical Minerals Strategy

- Nov 2024: Value-add, downstream processing & decarbonisation – additional AU\$2b funding

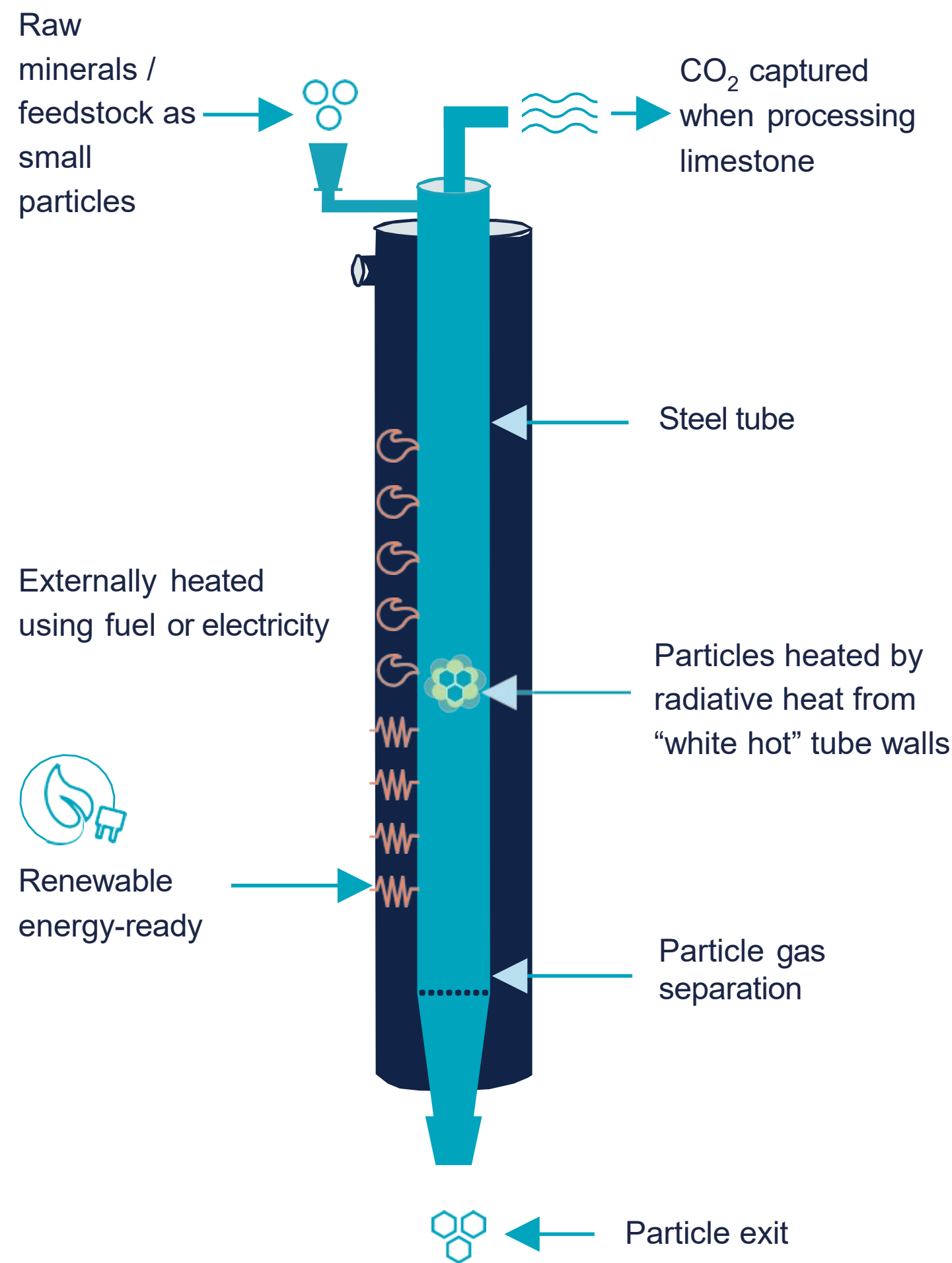
Carbon Border Adjustment Mechanism


- Nov 2024: Review of an Australian CBAM underway



Calix's Core Platform Technology


A new way to “heat stuff up”, for industrial decarbonisation...






CO₂ CAPTURE

Limestone contains nearly half by weight CO₂ – when heated this CO₂ is released and makes its way out the top of the tube as a nearly pure stream, ready for utilisation or sequestration



RENEWABLE ENERGY-READY

Compatible with electricity and alternative fuels to provide viable, flexible and economical pathways to sustainable processing of minerals such as limestone, spodumene, green iron and alumina.



28 patent families covering core technology & applications.



One Decarbonisation Technology – Multiple Applications

Our technology is addressing industrial decarbonisation for some of the world’s largest industries...



Cement & lime



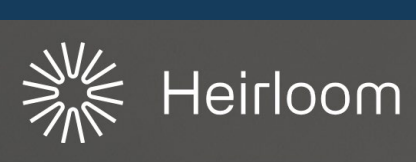
“Low Emissions Intensity Lime and Cement”

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

Electrifying Iron production with Green Hydrogen

~ Iron and Steel 7-9% global CO₂ emissions⁵

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



Our Strategy – Equity farm-in to subsidiaries, plus license fees...



2021

93% equity
30% license / royalty fees, regardless of equity



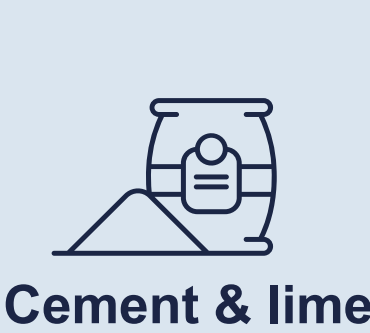
€15m for ~7% equity, of 70% of the royalty income stream

2023

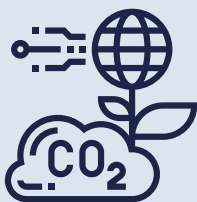
AU\$17.5m for 45% equity



AU\$65m for 55% equity



Cement & lime



Direct air capture

Lithium Salt Midstream Demonstration Project (and Licensing Company)



Lithium

Watch this space !



Alumina



Iron & steel

Watch this space !

License Fees
(min "X" € / TCO₂)

License Fees
(min US\$3/TCO₂)

License Fees
(% revenue)

License Fees
(% revenue?? - TBD)

License Fees
(% revenue?? - TBD)



Other cement and lime companies



Expansion

Hard-rock lithium industry

Market Size

1.4 BTpa CO₂

Targeting > 1 BTpa CO₂

US\$7Bpa*

US\$45.5Bpa**

US\$640Bpa***



Investor Briefing Paper
November 2023

*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%20size,combination%20of%20aluminum%20and%20oxygen.>

***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 ?

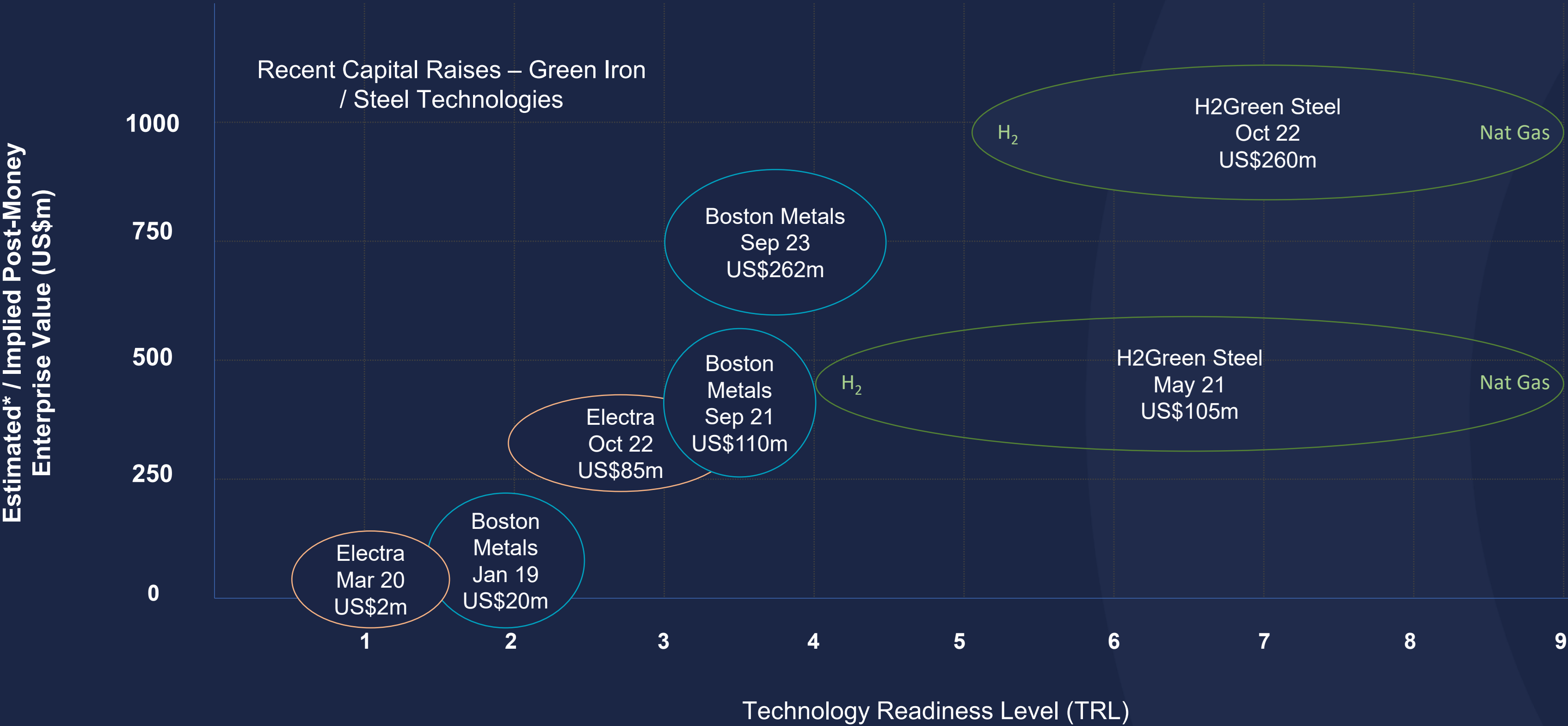
Since 2021, we have undertaken significant commercial de-risking and expanded the total addressable market



*<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

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
- Basis of 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-rounnds/#:~: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>
 ***<https://arena.gov.au/assets/2023/09/Calix-Zesty-Tech-Zero-Emissions-Iron-and-Steel-Pre-Feed-Report-Demo.pdf>

Alumina - an emerging opportunity

Calix's renewable / electric calciner solution is highly prospective for lower emissions alumina production

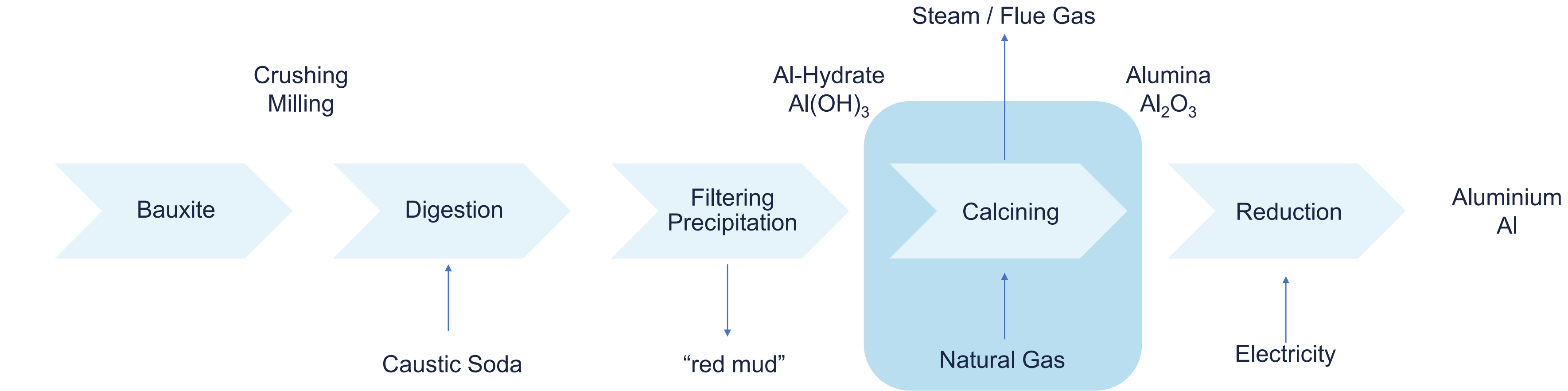
Market Tailwinds - Alumina

- Global production 141.5 MT*, CAGR 4.7% to 2032
- Increasing costs of natural gas
- Net zero pressures
- Alumina refineries are already approaching their maximum cost and energy efficiency using existing technologies

Calix Technology – Key Features

Potential to:

- Target lowest energy
- Achieve opex parity with natural gas
- Offer grid load balancing
- Recovery and re-use of steam



CALIX FIRST TESTED ALUMINA IN 2015, AND RECENT TESTING CONTINUES TO CONFIRM HIGH POTENTIAL

Competitive Technology Comparison			
	Steam recycle ?	Achieve Near-Zero CO ₂ ?	Cost
Hydrogen Combustion	Possible / Difficult	Yes	High
Electric pre-calcination / gas heating	No	Nat gas still required	?
Electric Rotary Kiln	Yes	Yes	Efficiency? low TRL
Calix	Yes	Yes	Target lowest

Technical Development - Heavy Industry Low Carbon Transition (HILT) CRC

Several partners in the HILT-CRC are in our main decarbonisation focus areas



Steel Producers



Alumina



Iron Ore Producers



Cement and Lime

Core Partners



Affiliate Partners



Key Partners



FY23 Financial Commentary

Balance sheet strength to pursue commercialisation opportunities

- Capitalised today to pursue our operational objectives and committed capital projects over next two years
- Flexibility retained to pursue the right capital / funding strategy for each application and investment opportunities as they arise
- Essentially debt free – can control our own destiny as we pursue our multiple shots on target
- Growing revenues
 - 42% increase in revenues in FY 23, including grants and rebates
 - FY24 expect to see continued growth in sales within Magnesia business [water treatment products], at growing margins, and
 - Growing contribution from paid engineering services

Calix Limited FY23 financial result highlights



\$74.5m

Cash on hand 30 June 2023
(30 June 2022: A\$25.0m)



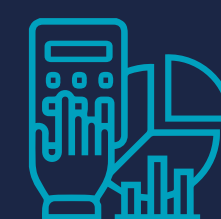
\$29.6m up 42%

FY23 revenue
(FY22: A\$20.8m)



\$6.2m up 19%

FY23 gross profit
(FY22: A\$5.2m)



33% up 18%

FY23 gross margin
(FY22: 28%)



About Calix

Calix is an environmental technology company that is developing a 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, and it's already ours.

Mars is for quitters !

2005
FOUNDED

ASX2018

120+
employees

A\$120m
technology investment

28
PATENT
families


UNGC
signatory
= SINCE 2020 =




9
operational
SITES

ACTIVE IN
75
countries continents



Board of 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 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.



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 Calix Audit and Risk Management Committee.



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.



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.

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 A
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
BOD	Basis of Design
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
CO₂	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
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 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
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



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



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