



Next-Generation Batteries

Lithium-Sulfur and Zinc Batteries

Half Yearly Presentation

April 2024



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Technology disclaimer

Gelion Zinc Technology

Gelion has pivoted from targeting development of a Zinc Bromide Battery to a Zinc Hybrid Cell, as we aim to adapt the progress we have made with our zinc anode design to a hybrid cathode that offers path to a commercial product via lower investment, lower product cost, and faster release time horizon (safety and regulatory).

Technology risk remains until sufficient development and testing has been completed. Battery science is complex with all aspects of the cell design (e.g., anode, cathode and electrolyte) impacting each other. All advances need to be reconfirmed whenever any element of design is changed. For this reason, we are reviewing carefully before accelerating. We expect to validate the potential of this technology over the next few months and report back to shareholders in 2024.

Gelion Lithium-Sulfur Technology

Lithium-sulfur is a very exciting battery chemistry given its potential for high gravimetric energy density, low cost, and high safety. The technology has historically been held back by challenges including the conductivity of sulfur which has limited charge rate, and cycle life associated with “polysulfide shuttle”. There is a confidence emerging within the industry that a path to move the technology beyond these challenges has been established. OXIS (the source of some of the technology we acquired from Johnson Matthey) was a lead pioneer on two of the paths identified and Gelion believes to be well positioned to build on this technology to capture a position of relevance in the industry. While there are technology targets to still be confirmed and achieved, this activity is very high reward, but also high risk so we have applied strong discounts in creating our commercial models.

Competitive Risk

The market for new battery technologies is very competitive. Both our Zinc Hybrid and Lithium-Sulfur cell technologies have and will continue to have competition both from similar technologies and from completely different technologies aiming at the same performance and market segments. Gelion is developing and securing IP to achieve a scope around freedom to operate and domain of protection, we are also growing our team of technology experts and partnering to maximise our IP advantage and opportunity for success.

Leadership Team



Prof Thomas Maschmeyer
 Founder & Non-Executive Director

A serial entrepreneur with four successful companies so far, Thomas was most recently awarded Australia's top honour in technology – the Prime Minister's Prize for Innovation (2020). He is ranked #15 in the list of most influential chemists during 2010 – 2020 globally.

The founding Director of the University of Sydney's \$150M Nano Institute, Thomas is currently Professor of Chemistry, leading the University's Laboratory of Advanced Catalysis for Sustainability.



John Wood
 Chief Executive Officer

John is an experienced and successful CEO of private and public companies and has led businesses both in the technology and energy industry over a 30-year career. He is also a proven sector specialist with significant commercial, scaling and manufacturing experience.

John has deep experience in the battery sector having established Ecoult which gained recognition as one of the 100 Global Cleantech in 2013 and he implemented many seminal projects after its acquisition by East Penn Manufacturing.



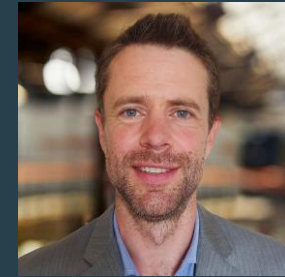
Amit Gupta
 Chief Financial Officer

Amit is a Chartered Accountant with over 15 years of experience in accounting and finance roles.

Amit is responsible for the financial strategy of the Gelion Group including financial reporting, corporate development, treasury, forecasting, transformation and M&A.

Prior to joining Gelion in August 2021, Amit worked for KPMG and Deloitte providing advice, predominantly for M&A and IPOs.

Amit holds a Bachelor of Commerce from St Xavier's College, India and a Master of Finance and Master of Accounting from Bond University, Australia



Louis Adriaenssens
 Chief Technology Officer

Louis has 20 years of experience in synthesis, characterization and electrochemistry. He has worked across continental Europe and in the UK where he held the position of Assistant Professor with a focus on electrochemically-active self-assembled materials.

Louis worked in manufacturing as the Supervisor of Chemistry for Panasonic at the Tesla Gigafactory in Nevada, USA. Overseeing the chemical considerations of a process that produces 5.5 million battery cells per day (a staggering 60 batteries per second). Louis' strategy towards successful commercial and manufacturing initiatives is to work through all scales, from the molecular-level all the way to giga-scale manufacture.

Gelion's battery technology opportunities



Gelion is building next-generation technologies to access >US\$1.92T^{4,5} market opportunity

Lithium-Sulfur

Industry acknowledged next-gen technology¹



Zinc-based hybrid cells

Targeting the lead-acid ecosystem



Total addressable market opportunity^{4,5} > US\$1.92 trillion by 2030

\$21b⁴



Drones, HAPS, and e-VTOL

\$1.4tr⁵



Electric vehicles

\$292b⁵



Heavy EVs

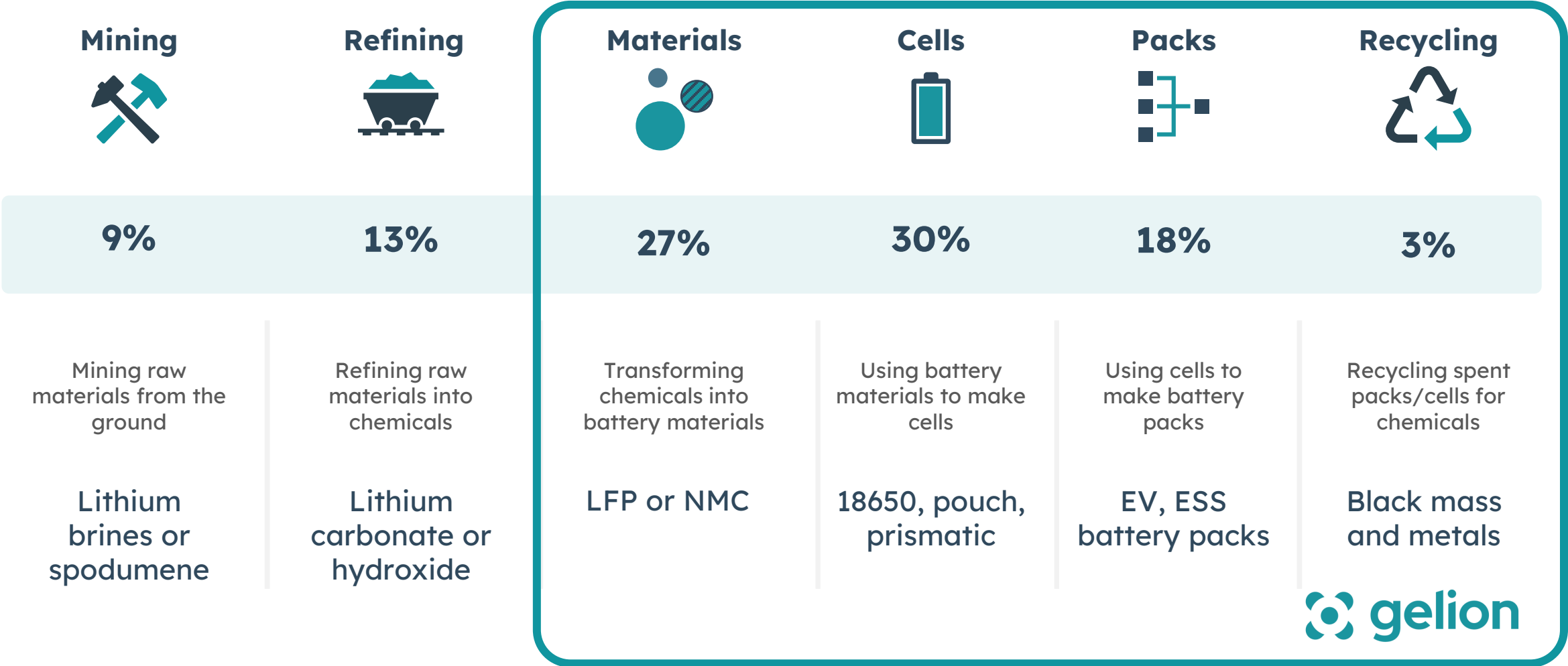
\$118b⁵



Stationary storage

Unlocking the revenue opportunity

Gelion is building a business to access ~80% of the value chain



Indicative Commercialisation Milestones

Lithium-sulfur

Johnson Matthey
Li-S IP
Acquisition

Li-S R&D
expansion
initiated

OXLiD
£4m Capital
raise + strategic
acquisition

IONBLOX
silicon
anode
partnership

Initial samples
to anode
partner(s)

Internal
cell safety
testing

Strategic
partner
agreement

Advanced Commercial
Prototyping Centre¹
(ACPC) established

**Demonstration
pouch format
test cell**

**Validation
cells to
Partners**

Partnering with global cell manufacturer(s), for Pilot and Commercial scale up

2023

2024

2025

2026

Gen 4
Over 1000 cells
manufactured at
lead-acid
partner's site

Gen 4
Anode success from
validation of
pre-commercial
cell packs

Gen 5
Cathode
Optimisation
Program

Gen 5
Zn cathode
optimisation
Feasibility
completed

Gen 5
Prototype
pouch cell

Strategic
manufacturing
Partner agreement

Gen 5
Pre-production
prototype

Manufacturing
process
development

**Pilot plant
production
& early revenue
generation**

**Validation
and scale-up**

Zinc

Delivering On Our Milestones

Lithium-sulfur

JM
Johnson Matthey
Li-S IP
Acquisition

Li-S R&D
expansion
initiated

OXLiD
£4m Capital
raise + strategic
acquisition

IONBLOX
silicon
anode
partnership

Initial samples
to anode
partner(s)

Manufacturing
simplicity

Strategic
partner
agreement

Advanced Commercial
Prototyping Centre¹
(ACPC) established

Demonstrating core differentiation

**Demonstration
pouch format
test cell**

**Validation
cells to
Partners**

Partnering with global cell manufacturer(s), for Pilot and Commercial scale up

2023

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Gen 4
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Gen 4
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Gen 5
Cathode
Optimisation
Program

Gen 5
Prismatic
cell test

Gen 5
Technical +
commercial
study

Strategic
manufacturing
Partner agreement

Gen 5
Pre-production
prototype

Manufacturing
process
development

**Pilot plant
production
& early revenue
generation**

**Validation
and scale-up**

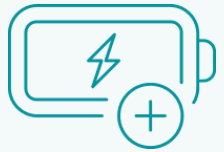
Zinc

Gelion's Lithium-Sulfur Technology



Gelion's Lithium-Sulfur Battery Advantages

Lighter, safer, greener batteries with double the energy density at a lower cost



Double the gravimetric energy density

Gelion's Li-S is targeting double the gravimetric energy density of current Li-ion batteries.



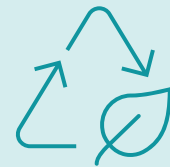
Bill of materials cost savings of 45%^{1,2}

Gelion estimate Li-S can achieve up to 45% saving on bill of materials versus Li-ion NMC (nickel, manganese, cobalt) ^{1,2}.



Improved safety

Sulfur cathode is more stable at high temperatures, minimising risk of thermal runaway related fires and explosions.



Rare metal free cathode, 30%³ reduction in carbon lifecycle

Research estimates sulfur batteries' carbon lifecycle will be 30% lower than current Li-ion technology with improved supply chain.

¹Bloomberg forecast modelling (2023)

²Gelion management estimates at multi GWh-scale based on Bloomberg forecast modelling (2023, India production)

³Comparative life cycle assessment of Li-Sulphur and Li-ion batteries for electric vehicles, G. Benveniste , Nov 2022

Demonstrating core differentiation

1

Manufacturing advantage

(sulfur cathode)

Made without toxic solvents

No rare or complex materials

Low cost

2

Silicon anode

(Ionblox)

Silicon-sulfur battery

Long cycle life

High safety

3

Protected lithium anode

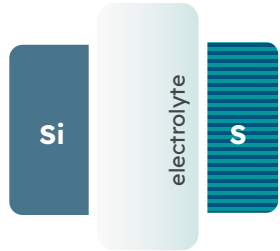
Lithium metal component

Long cycle life

High safety

Gelion's technology pathways to achieve mass electrification

1. Silicon-sulfur (Si-S)



Enabling technologies

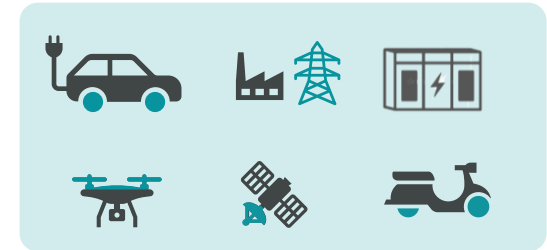
Silicon anodes & prelithiation

JDA signed with US based

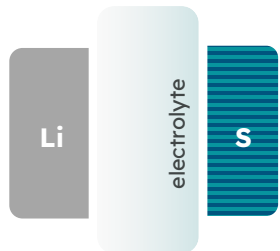


Market ready (2026+)²

>US\$1T global market



2. Lithium-sulfur (Li metal-S)



Enabling technologies

Lithium anode progress

Acquisition completed



Market match (current)³

Future potential pending the industry's lithium-anode performance improvement⁴



~US\$20B market

¹Based on Gelion Management's modelling, research and independent research papers

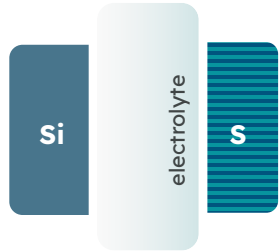
²Based on Gelion Management's modelling, research and commercialisation planning

³Based on Gelion's Johnson Matthey / OXIS prototype performance and research papers

⁴Based on Gelion Management's modelling, research and commercialisation planning, assumes the industry can solve the lifecycle and safety challenges with current Li metal anode

Gelion's technology pathways to achieve mass electrification

1. Silicon-sulfur (Si-S)



Enabling technologies

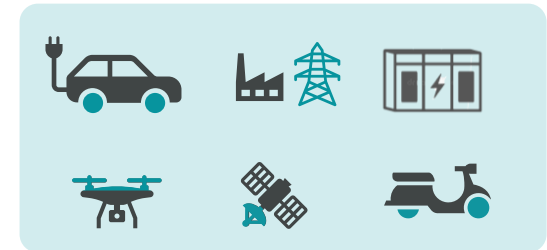
Silicon anodes & prelithiation

1. Samples provided
2. Initial results achieved

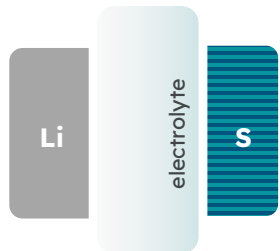
IONBLOX 

Market ready (2026+)²

>US\$1T global market



2. Lithium-sulfur (Li metal-S)



Enabling technologies

Lithium anode progress

1. Integration completed
2. Initial results achieved

OXLiD

Market match (current)³

Future potential pending the industry's lithium-anode performance improvement⁴



~US\$20B market

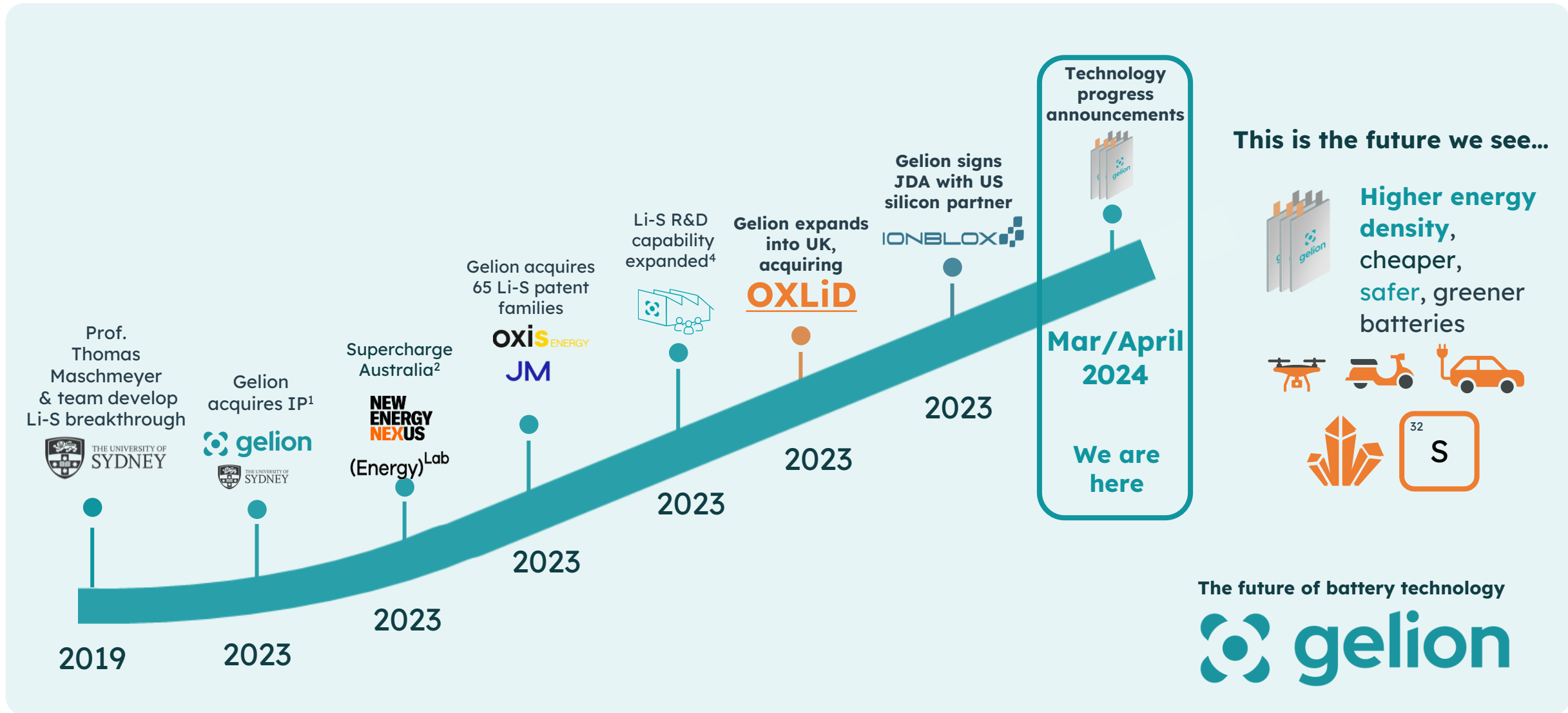
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Lithium Sulfur: Momentum toward global lithium-sulfur leadership



1 <https://polaris.brighterir.com/public/gelion/news/rns/story/rm4qdnr>
 2 <https://polaris.brighterir.com/public/gelion/news/rns/story/rm4qdnr>
 3 <https://polaris.brighterir.com/public/gelion/news/rns/story/x4gmz3x>
 4 <https://polaris.brighterir.com/public/gelion/news/rns/story/xql9znr>
<https://polaris.brighterir.com/public/gelion/news/rns/story/r7lez7x>

Validation of technology strategy

Progress of Gelion's technology plan, building on Li-S IP, OXLiD and Ionblox



Performance of acquired technology (OXIS, GEN2) validated

9.5Ah cells show 395 Wh/kg

(Announced 4 April 2024)



Gelion's Next-GEN (beyond GEN2) technology

0.5Ah pouch cells
Next-GEN cathode and electrolyte

(Announced 19 March 2024)



Gelion's testing of Ionblox SiOx anode with Gelion technology

Capacities > Li-ion

Stable cycling indicated

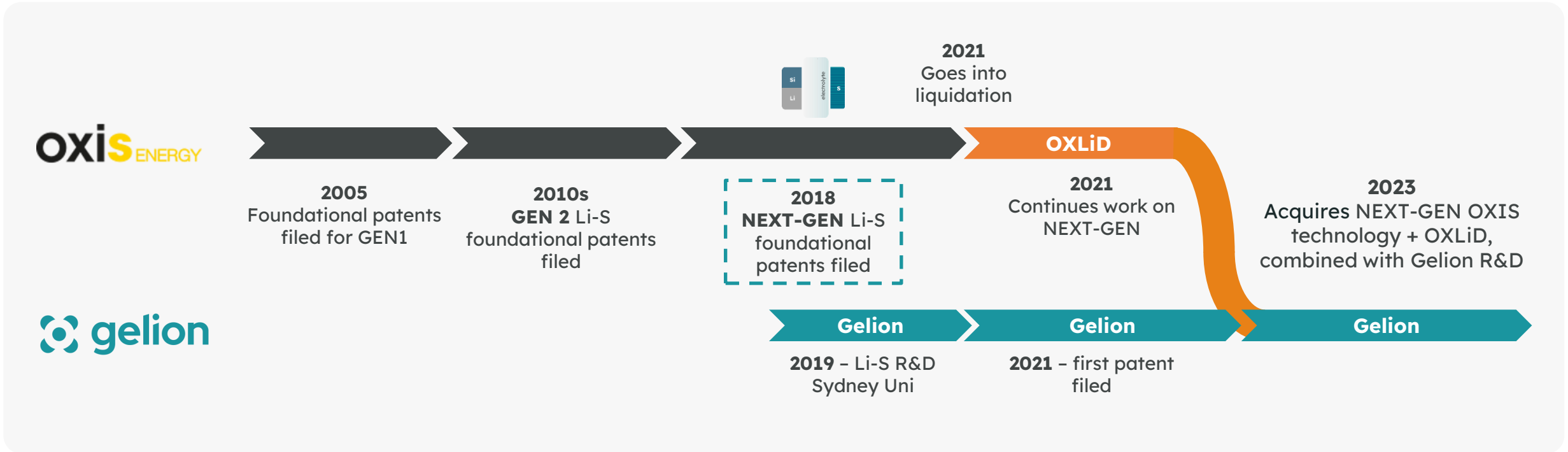
(Announced 19 March 2024)



Gelion anticipates that its metal-free cathode, based on abundant sulfur, will result in a cheaper, more stable, safer battery, with a localised supply chain.

Commercialisation of lithium-sulfur

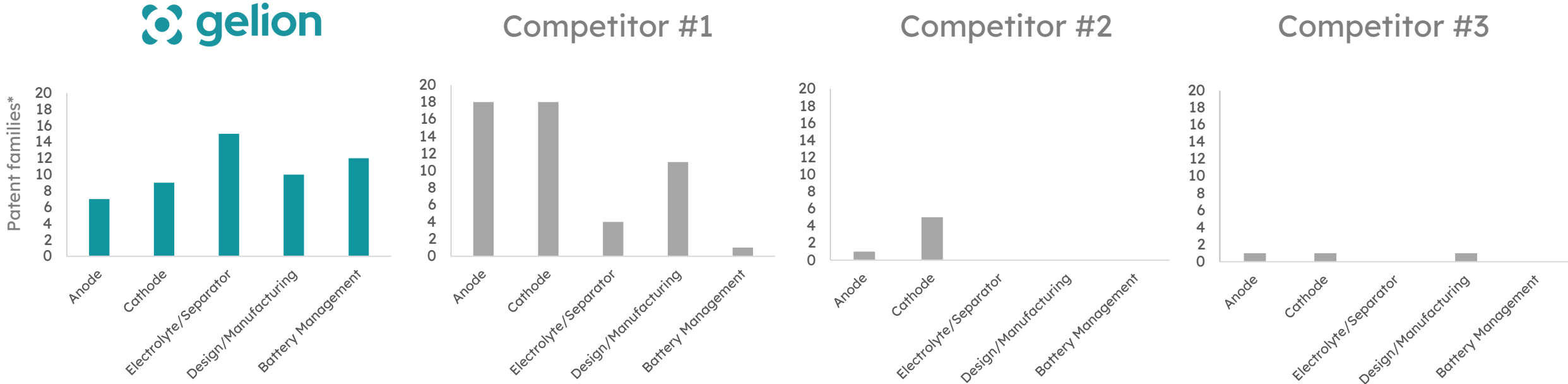
Leveraging inorganic route to leadership and accelerating development



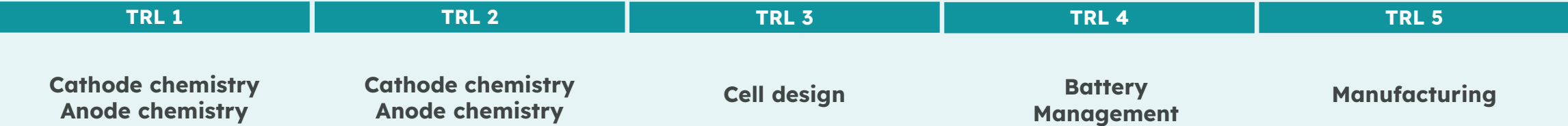
While some companies have started to scale uncompetitive sulfur chemistries, Gelion has ensured technology NEXT-GEN leadership

Gelion's global competitive IP position

Gelion has broad IP coverage across all stages of sulfur battery development

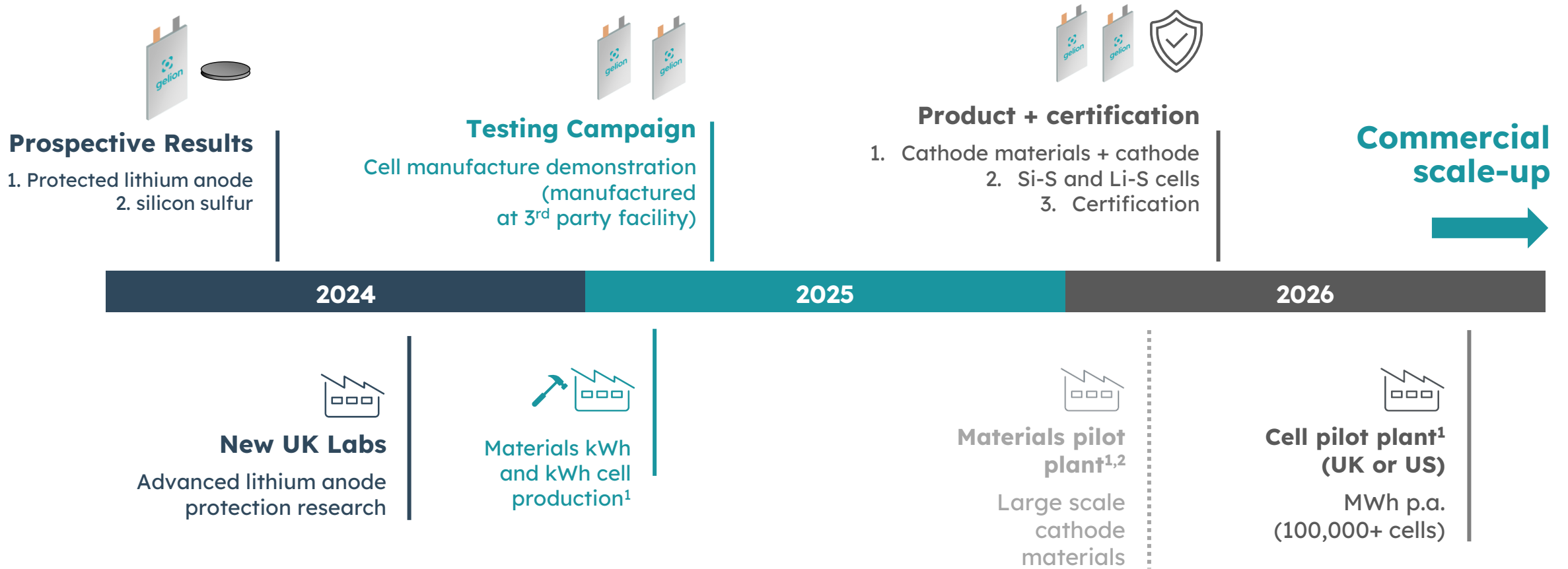


Primary development considerations



LG Energy Solution currently holds the largest number of patents (~300 families) relating to Li-S, Gelion has one of the largest IP portfolios among other industry sulfur battery players.

Technology proof points (top) and facilities (bottom)

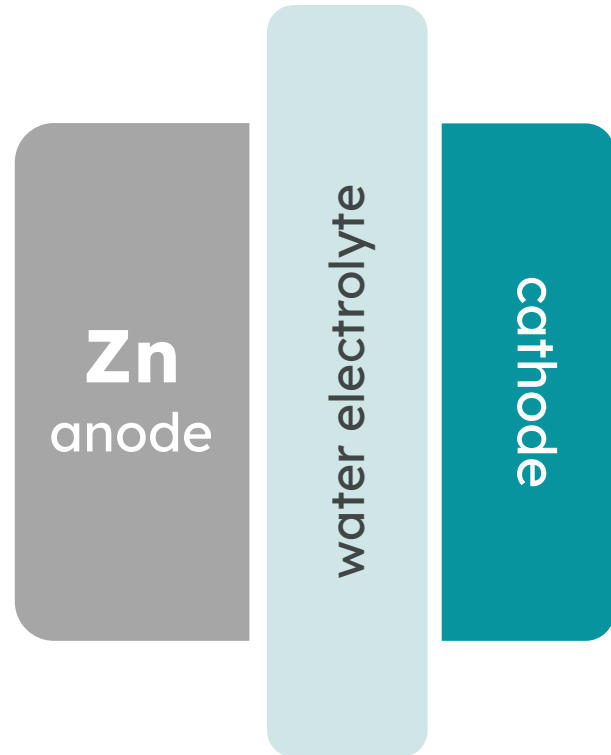


Gelion will continue to build up technology proof points, validating technology using a combination of in-house capabilities and 3rd party facilities to underpin commercial scale-up

Gelion's Zinc Technology



Why Zinc?



Gelion's **Gen 5 Zn cells** anticipate high safety, low-cost, and scalability that enable **rapid market adoption** by leveraging existing infrastructure.

Advantages of zinc



low cost

Cost. Zinc is an abundant low-cost material (US\$2.4/kg)¹



Sustainable. Components are non-toxic and highly recyclable.



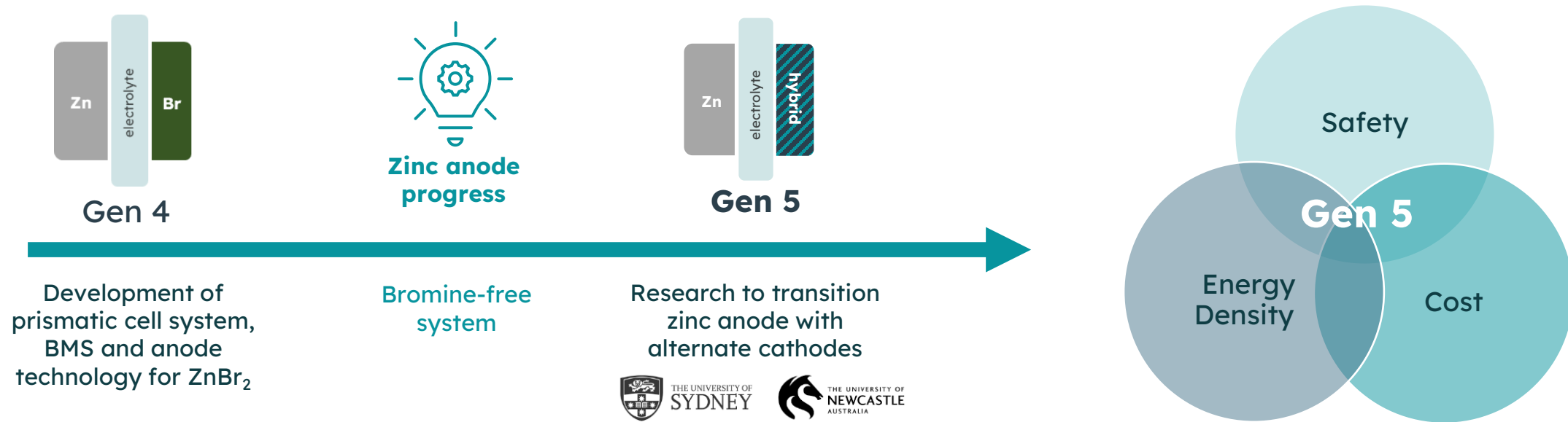
Scalability. Cell format means existing lead-acid ecosystem can be leveraged



Safety. Water-based chemistries are low toxicity and non-flammable

¹London metal exchange, 3 month rolling price for Zinc at 8th Sept 2023.

Zinc Gen 4 anode progress informs Gen 5 pathway



Key progress on Zinc Hybrid technology:

- Identified high capacity Gen5 cathode material within USyd partnership
- Gen5 cathode material tested in 20 Ah cells, using Gen4 prismatic cell form factor
- Validated Gen4 BMS and assessed compatibility with Gen5 system
- **Initiated technology and commercial study**

Financial information



Summarised financial information

Key highlights

- Cost savings have started to be realised in H1 FY24
- Adjusted EBITDA loss better than prior comparable period and budget
 - £1.3m (28.9%) lower due to saving initiatives introduced in March 2023 and completion of Acciona project in FY23
- Cash position of £7.5m
 - Higher than at year end due to successful capital raise and the acquisition of OXLiD Ltd

Notes:

¹ – H1 FY24 includes the results of OXLiD Ltd from the date of acquisition

² – Acquisition and capital raising related costs

£'000	Notes	Six months ended	
		31-Dec-22 Unaudited £'000	31-Dec-23 ¹ Unaudited £'000
Other income		-	35
Total Income		-	35
Administrative expenses		(2,142)	(1,482)
Research and development expenditure		(2,294)	(1,708)
Adjusted EBITDA before share based payments and non-recurring items		(4,436)	(3,155)
Depreciation and amortization		(206)	(297)
Adjusted EBIT before share based payments and non-recurring items		(4,642)	(3,452)
Share based payments		(367)	(416)
Non-recurring items	2	-	(313)
Reported EBIT		(5,009)	(4,181)
Cash Position			
£'000	Notes	30-Jun-23 Audited £'000	31-Dec-23 Unaudited £'000
Cash & cash equivalents		7,268	7,451

Use of funds

Successful capital raising of £4.1m in Nov 2023

Expansion of our footprint in the UK through the acquisition of OXLiD Ltd

Capital raising - use of funds

	£000
Total capital raised	4,100
Use of funds	
OXLiD acquisition	1,250
OXLiD acquisition (deferred consideration)	400
Transaction costs (Capital raise and acquisition related)	650
OXLiD 18 months - capex and opex	1,350
Working capital in the business - Zinc and LiS	500

H1 FY24 Cash use



OPEX and CAPEX

c. £2.4m



Acquisition

(incl. transaction costs*)

c. £2.1m

*Transaction costs also include costs related to capital raise

Investment into business



IP investment

c. £830k



Property, Plant & Equipment

c. £400k



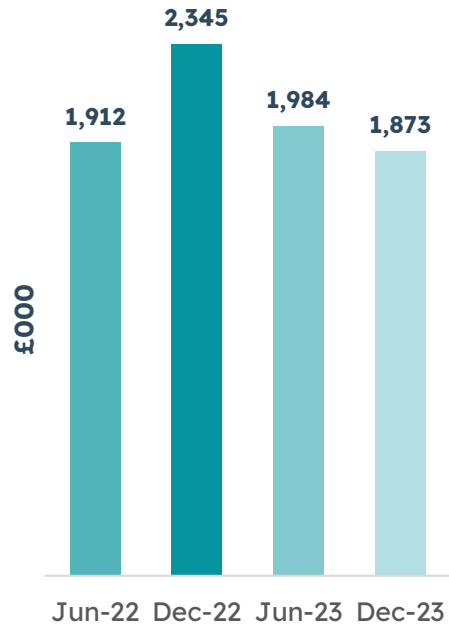
R&D and other expenses

(net of R&D tax incentives & IP OPEX)

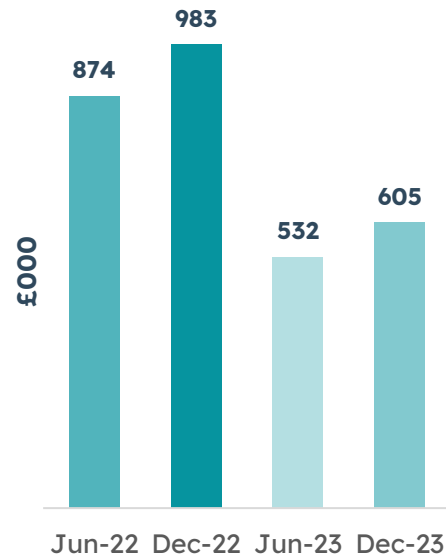
c. £1.2m

H1 FY24 continued focus on cost management

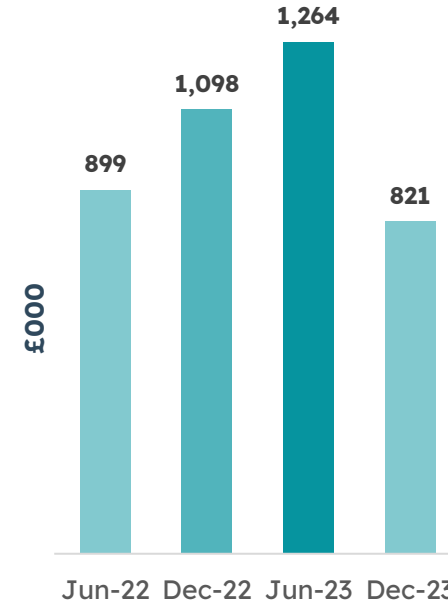
Interim results confirm the effectiveness of Gelion’s cost saving initiative and strategic capital deployment



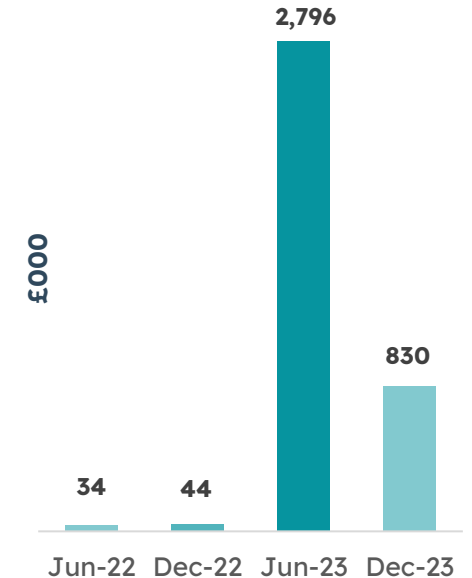
Employee expenses



R&D expenses



Business expenses



**IP (renewals & prosecutions)
(incl. IP acquisition cost)**

Summary and outlook

2023

Established technology foundation and global platform for LiS

1. Acquired JM/OXIS IP to secure competitive moat and establish next-gen technology platform
2. Acquired OXLiD to advance the technology, build the team, IP, facilities, and UK presence
3. Signed Ionblox JDA to secure silicon anode technology and US presence

2024

Zinc

- Technical and commercial study

LiS: Demonstrating core differentiation

- Demonstrated validation of primary elements of Gelion's technology plan:
 - Next-Gen Li-S demonstration
 - Initial silicon-sulfur testing
 - High energy density 9.5 Ah pouch cell achieving 395 Wh/kg
- Continue to demonstrate Gelion's technology proof points:
 - Test and validate next generation pouch cell prototypes
 - Complete manufacturing simplicity demonstration
 - Produce materials and cells for partner validation to underpin future scale-up and offtake
 - Secure global strategic partnership

Thank you.



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