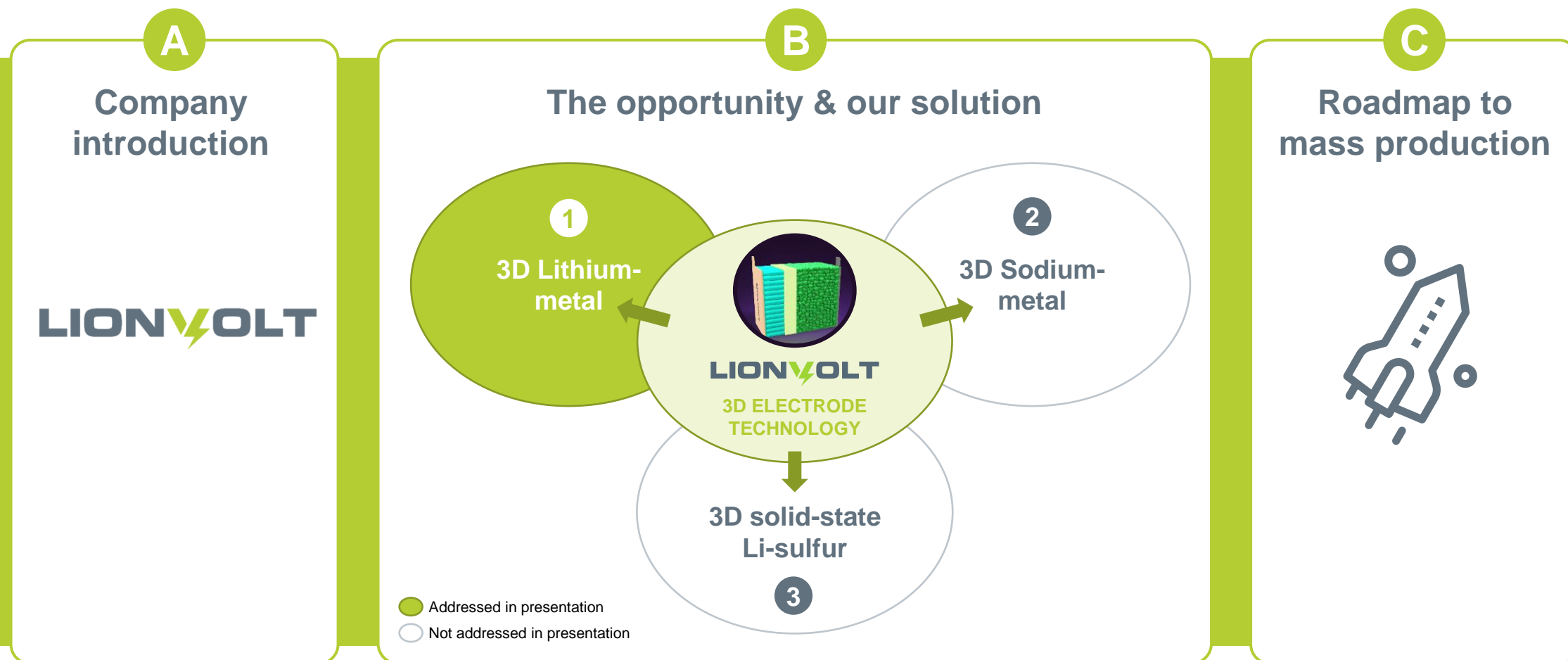




**Investor presentation for EUR25m Raise**

Q3-2024

# Presentation contents



# A. Company introduction

# We are a committed and experienced team dedicated to develop and scale LionVolt

## Leadership & advisory team

### Leadership team



#### Kevin Brundish | CEO

- 30 years experience inc. C-level
- Corporate, public and numerous high-tech startups & advisory boards



#### Sandeep Unnikrishnan | CTO

- PhD in Fuel cells & Nanotechnology
- 25 years relevant tech experience, 10 years experience in Batteries



#### Vivian Smetsers | CFO

- 10+ years experience in investment and CFO roles with corporates and start-ups



#### Joris Winkelman | Head of Strategy

- 10+ years experience in strategy consulting and deep tech start-up/scale-up advisory



### Selected investors

Innovation Industries



### Selected R&D partnerships



### Senior advisor

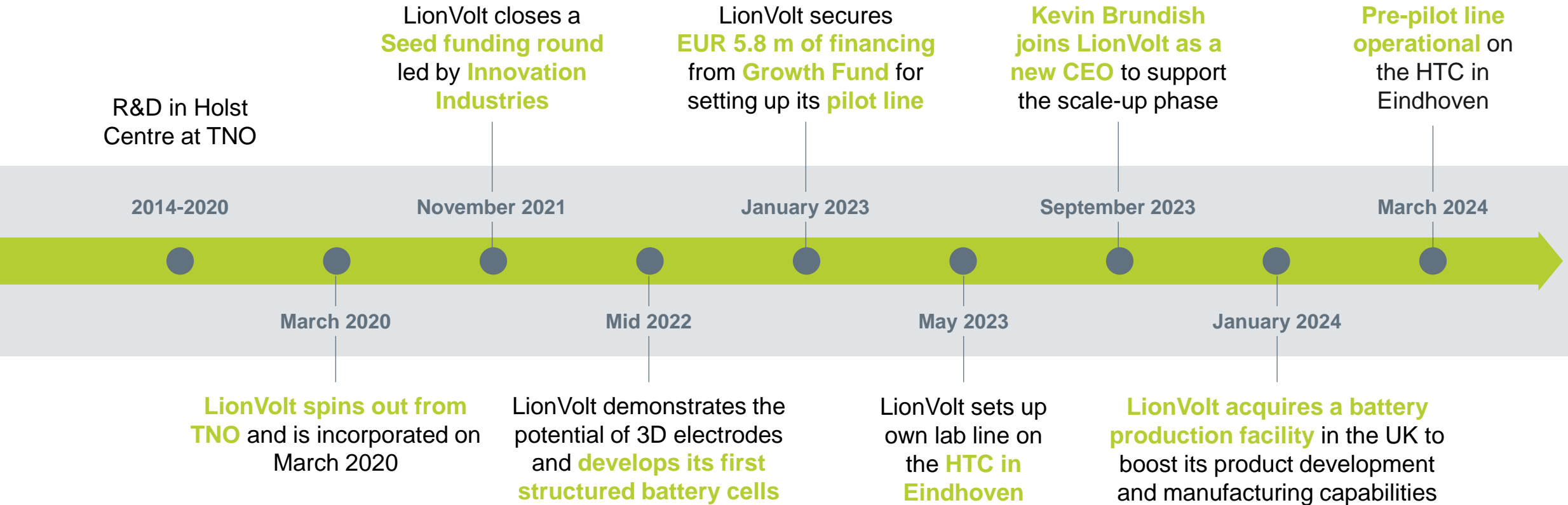


#### Steven Farmer | Senior product development & battery cell advisor

40+ years experience in technology development, with 25 years in batteries, incl. COO and Head of Product Development roles

# LionVolt was founded in 2020 and builds on a decade of R&D work

## Timeline



LionVolt is developing a unique 3D electrode architecture which enables next generation battery cells with superior performance

## LIONVOLT MISSION

Accelerating electrification with an innovative 3D electrode architecture which enables next generation battery cells with superior performance

### New applications



Enabling **800+ kilometre** driving range



Unlocking **battery powered** airplanes



Allowing **AI** in **consumer wearables**

### Sustainable future



Helping the **world to electrify** and **bring down** global **CO2 emissions**

### Superior tech



Enabling **fast charge <10 minutes**



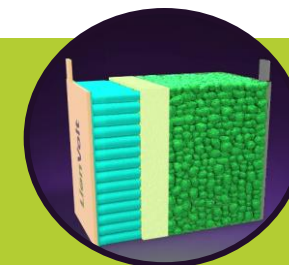
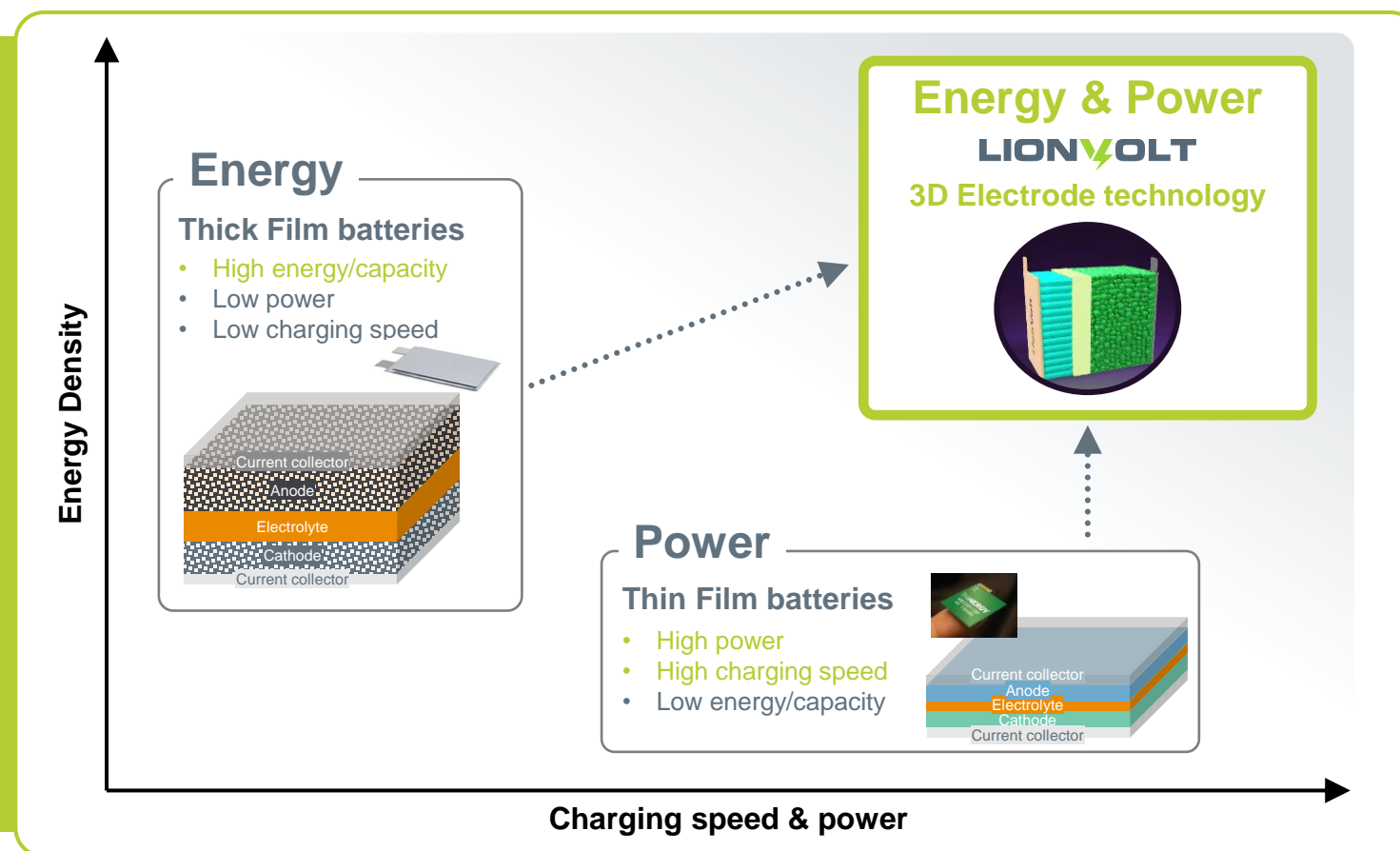
Delivering **superior energy density up to 3x**



Increasing battery cell **safety performance**

# The 3D electrode architecture is unique as it simultaneously boosts energy density and power

## LionVolt's 3D electrode technology



**LIONVOLT**

## 3D ELECTRODE TECHNOLOGY



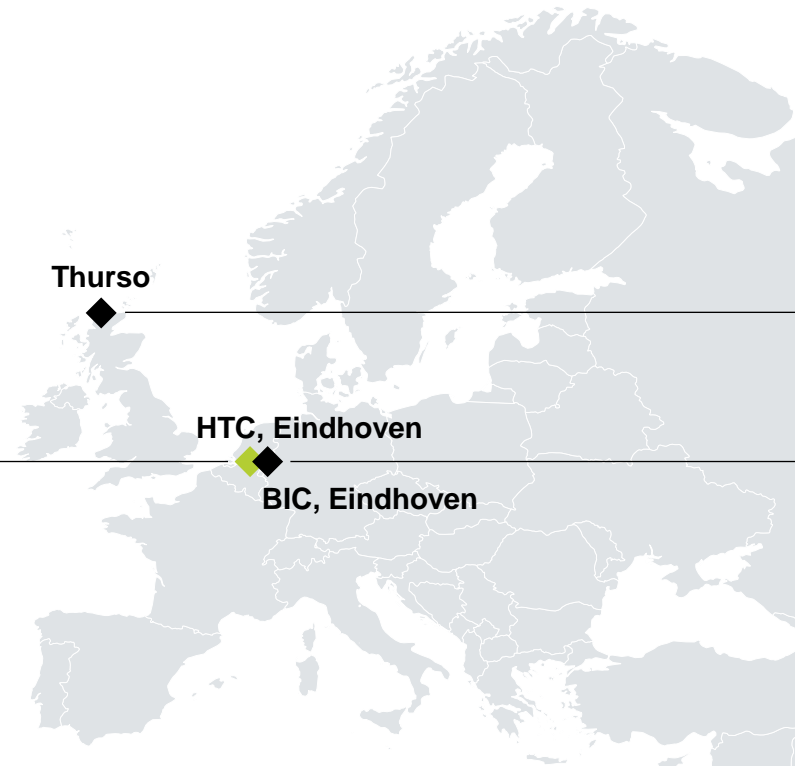
High energy density  
Light weight  
High power  
Fast charging  
High cycle life  
High safety  
Thin film roll-to-roll cost competitive production

LionVolt has an R&D center in Eindhoven (HTC) and two pilot production sites in the UK and NL

## LionVolt locations

### HQ & Innovation center

LionVolt's HQ is based in Eindhoven in the heart of the "Brainport" region in the Netherlands, leveraging decades of experience in thin film technologies in semi-conductor and photonics applications into our battery cell designs



- ◆ Product development & manufacturing
- ◆ Technology innovation & HQ

### Cell pilot plant

LionVolt has a product development and manufacturing site with a MWh capacity in Thurso, UK (acquired in 2024)



### 3D anode pilot plant

LionVolt is developing a pilot manufacturing line, located on the Brainport Industries Campus (BIC) for the production of 3D anodes and electrolytes

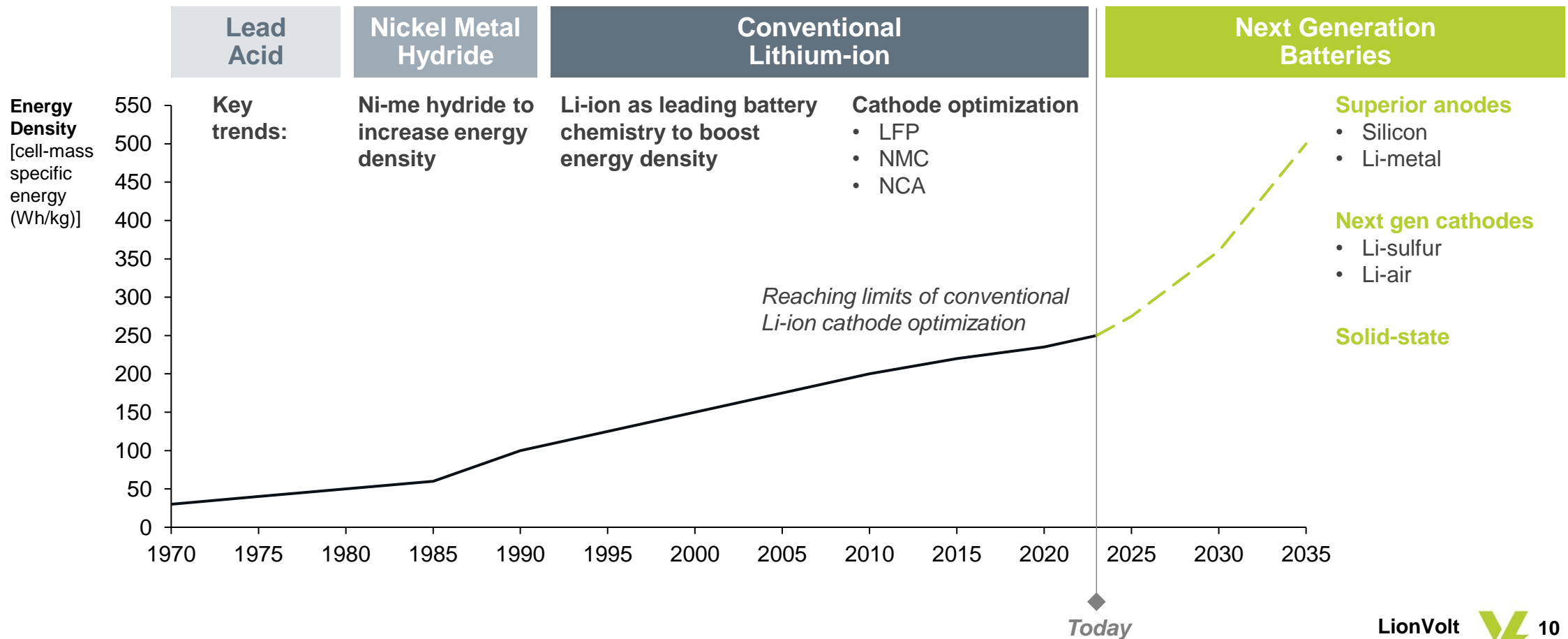




## **B. The opportunity & our solution: 3D li-metal anodes**

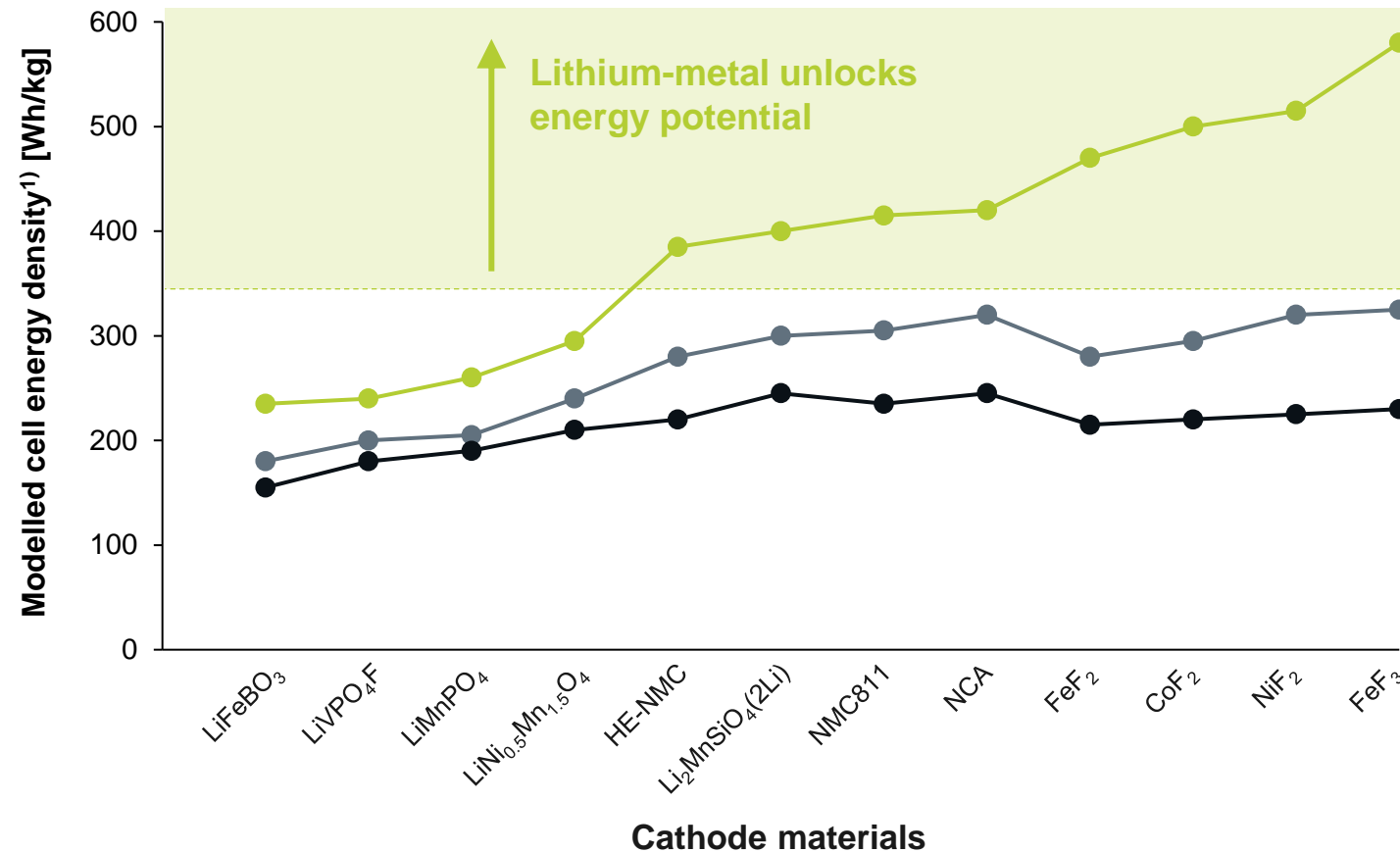
# The world is looking for next generation batteries to address the energy density limitations of conventional lithium-ion batteries

## Battery cell energy density development & forecast (illustrative)



# LiB players have long focused on cathode materials – The next performance boost will come from anode optimization, with Li-metal as most promising

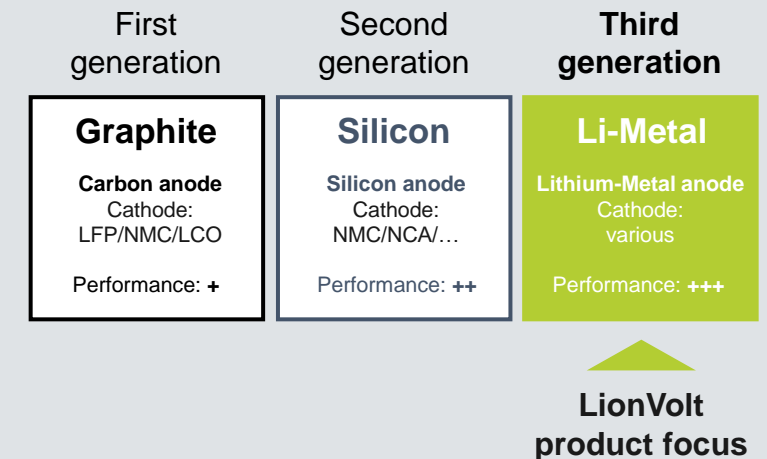
## Potential of Lithium-Metal Anodes



### Anode material

- Lithium-Metal Anode
- Graphite / Silicon Anode
- Graphite Anode

### Li-ion battery cell generations

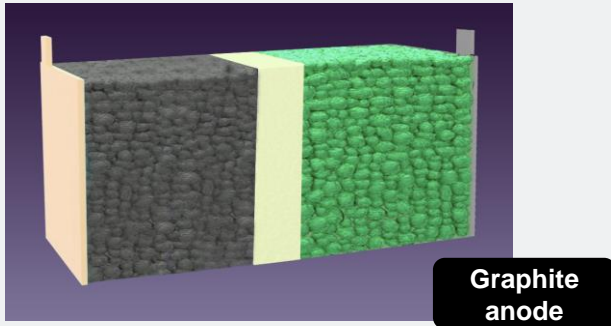


1) Cell specific energy is based on traditional cell design and architectures

The industry has been facing challenges to make Li-metal work – LionVolt has found a solution to address these challenges with its 3D structured anodes

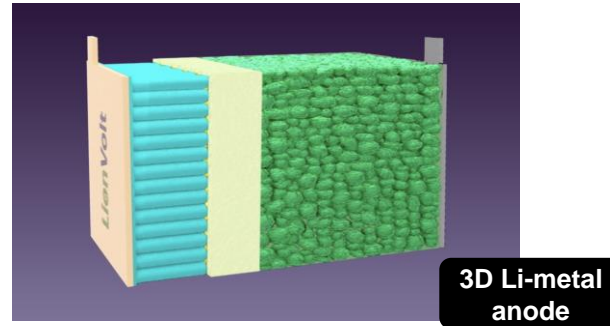
### LionVolt 3D Li-metal technology

#### Conventional Li-ion: Graphite anodes



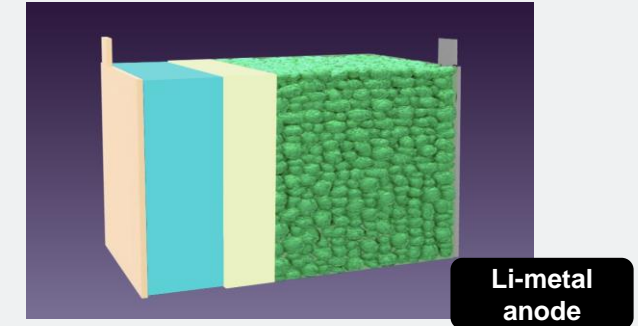
- High volume/weight of anode resulting in sub-optimal volumetric and gravimetric energy density
- + Low cell degradation allowing for high cycle life

#### LIONVOLT LionVolt's approach: 3D Li-metal anodes



- + Lower volume/weight of anode resulting in improved volumetric and gravimetric energy density
- + Large surface area of 3D architecture results in lower local current density:
  - + Preventing cell degradation (higher cycle life)
  - + Higher power and charging speed
  - + Increased safety

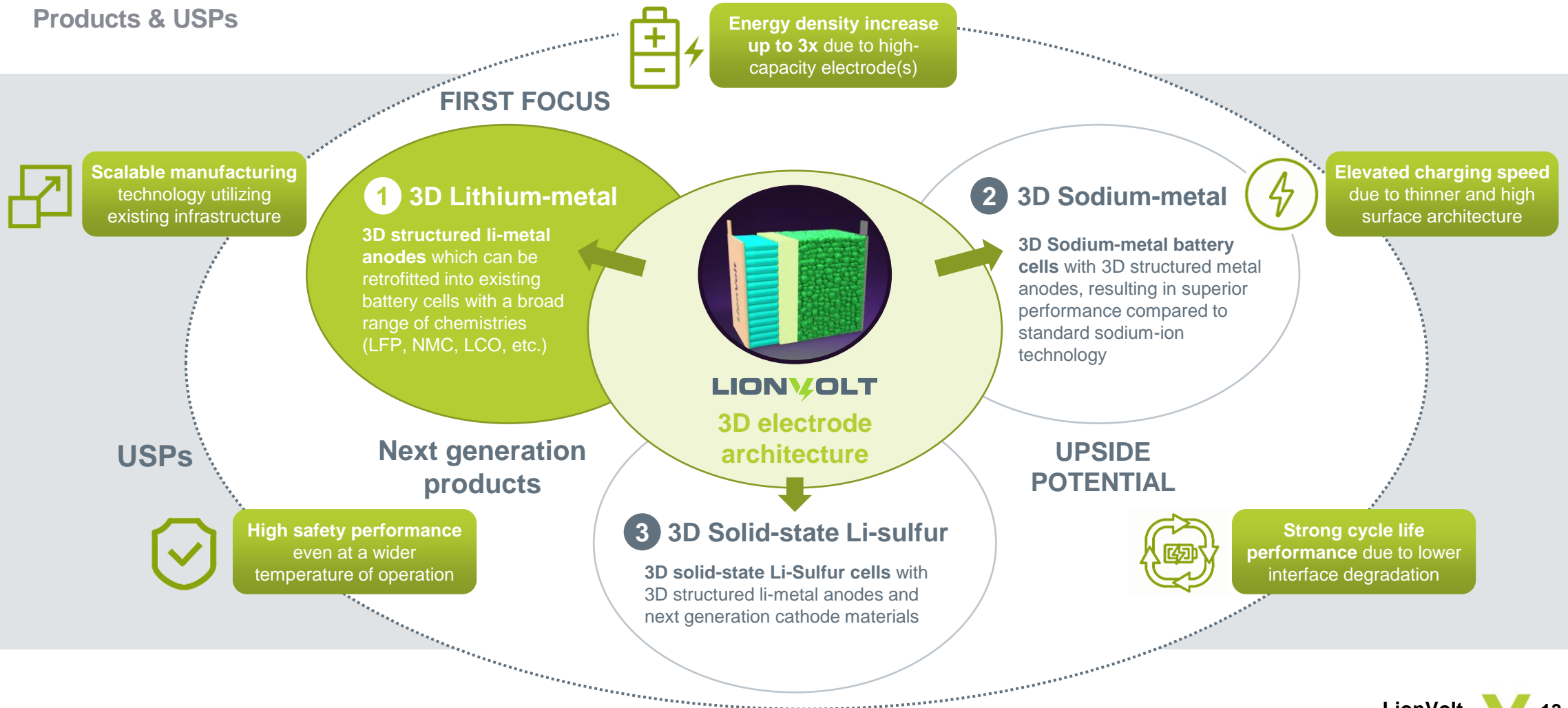
#### The industry approach: Li-metal anodes



- + Lower volume/weight of anode resulting in improved volumetric and gravimetric energy density
- Industry struggles with Li-metal due to fast cell degradation (formation of dendrites leading to lower cycle life)
- Challenges related to cell safety

# LionVolt's 3D electrode technology can be employed across lithium-ion chemistries and beyond that in sodium-ion and solid-state

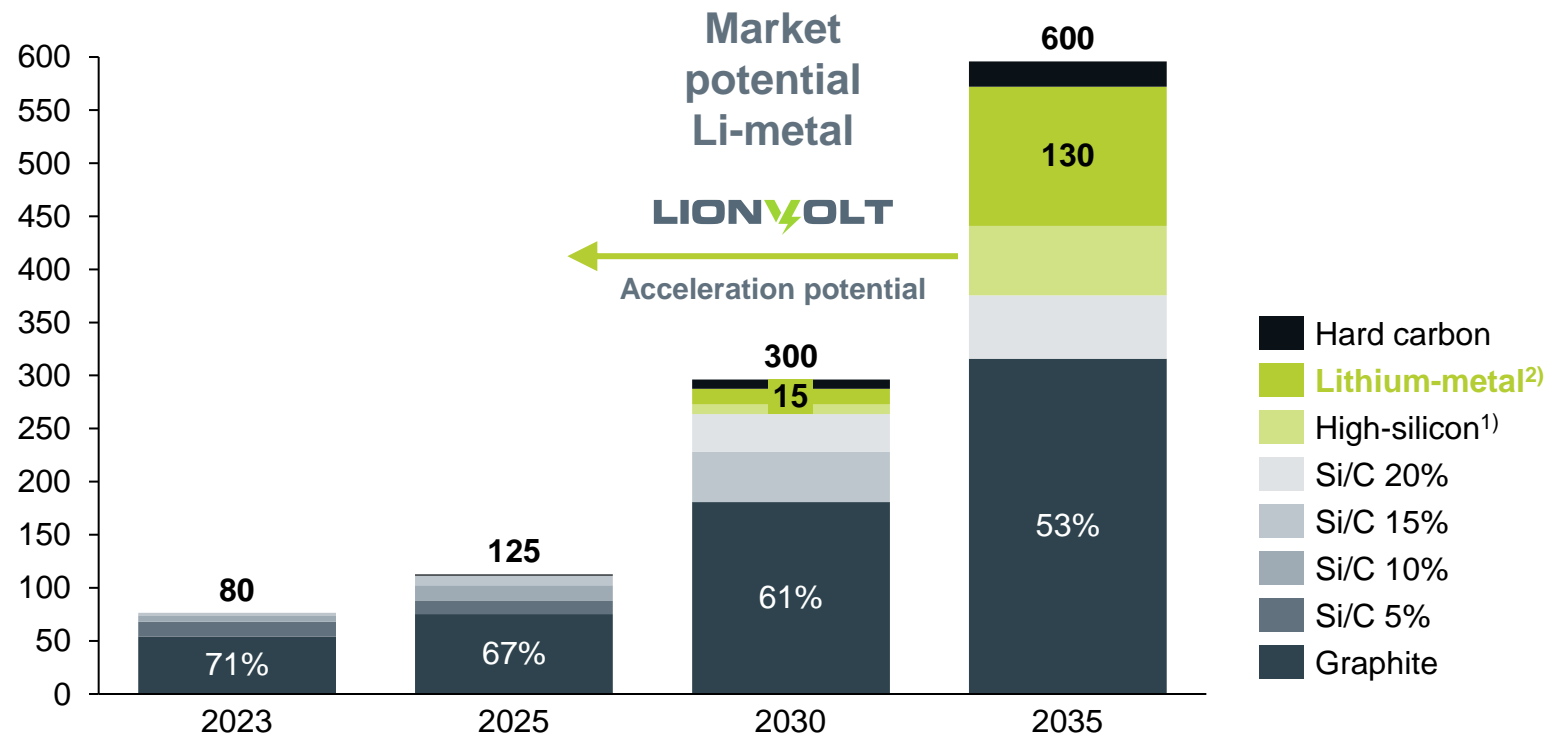
## Products & USPs



# The displacement potential of LionVolt's 3D Li-metal anodes is huge – The Li-metal market is estimated at EUR 15 bn in 2030 (and EUR 130 bn in 2035)

## Li-Metal market potential

### Li-ion battery cell market forecast by anode chemistry (2023-2035) [EUR bn]

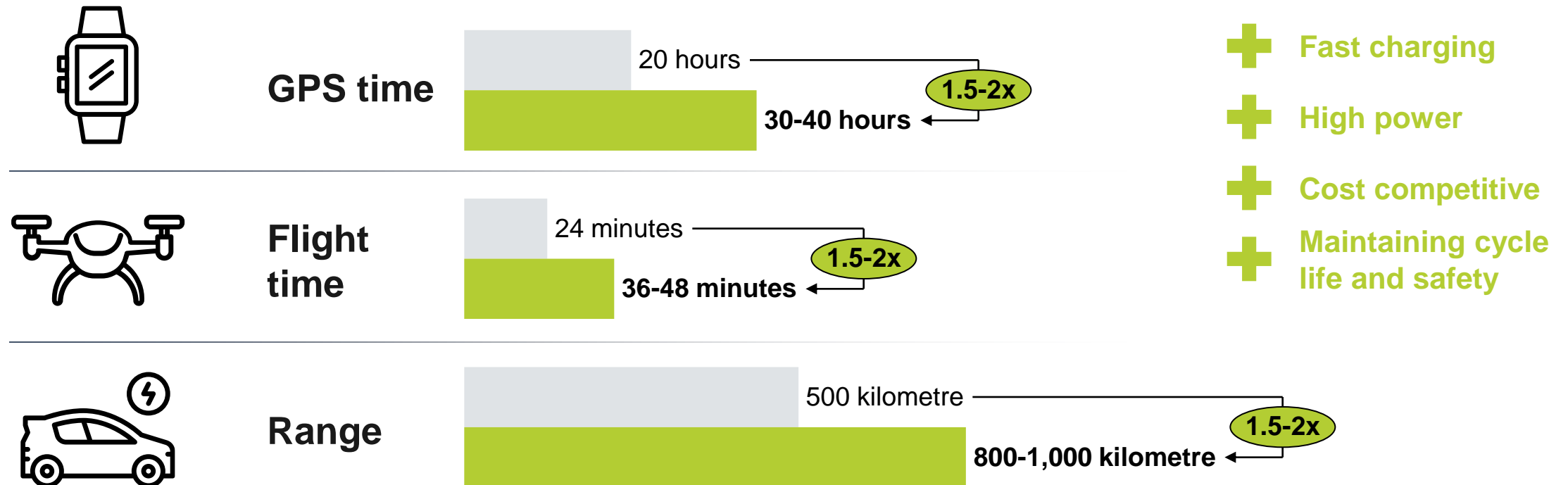


- The displacement potential of Li-metal cells is huge given its superior energy density performance characteristics
- Value share of li-metal is expected to overtake silicon-based anodes due to higher energy density potential of low silicon blends and high scalability cost of pure silicon options
- The li-metal anode share of the total battery market is estimated to exceed 22% by 2035 according to a BloombergNEF study
- LionVolt is one of the key players to drive the displacement of graphite anodes

1) High-silicon refers to silicon-graphite composite anodes using more than 50% silicon; 2) Market share of Li-Metal in BEV based on BNEF analysis and taken as a proxy for Li-Me share in other applications; 3) Li-ion value chain revenue in '30 based on McKinsey estimate and 80% Cell value share of pack [%]; 2035 market estimate based on a 15% CAGR in the period '30-'35

The first focus is to develop a 3D li-metal anode which can be used as a drop-in solution to increase conventional li-ion battery performance

LionVolt's 3D Li-metal anodes – target application impact<sup>1)</sup> [illustrative]



Cell based on graphite anode  
Cell based on LionVolt's 3D li-metal anode

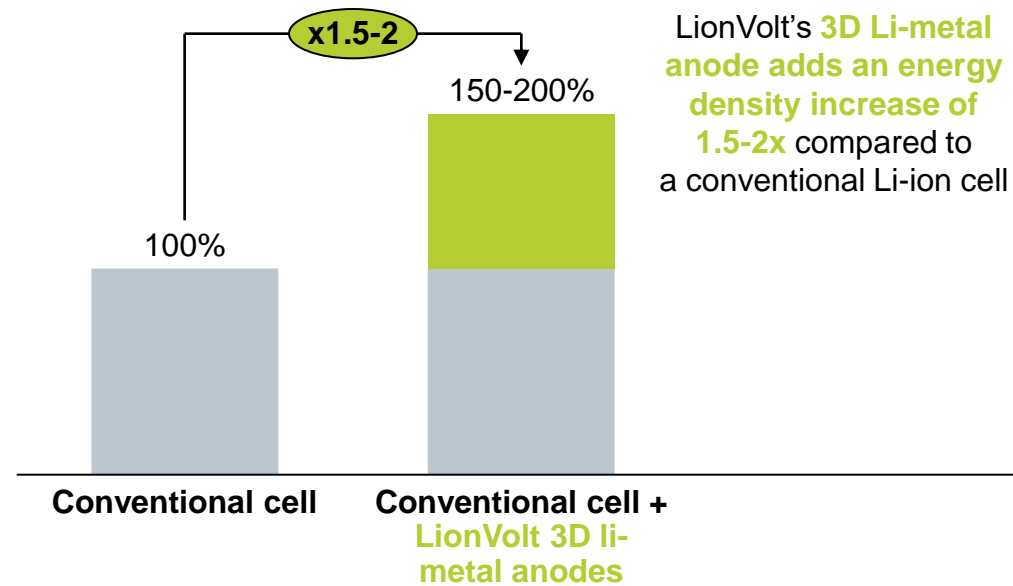
1) Application impact based on same cell dimensions

# Next generation cells which contain LionVolt's 3D electrodes will be highly competitive from a cost perspective

## Scalable manufacturing (illustrative)

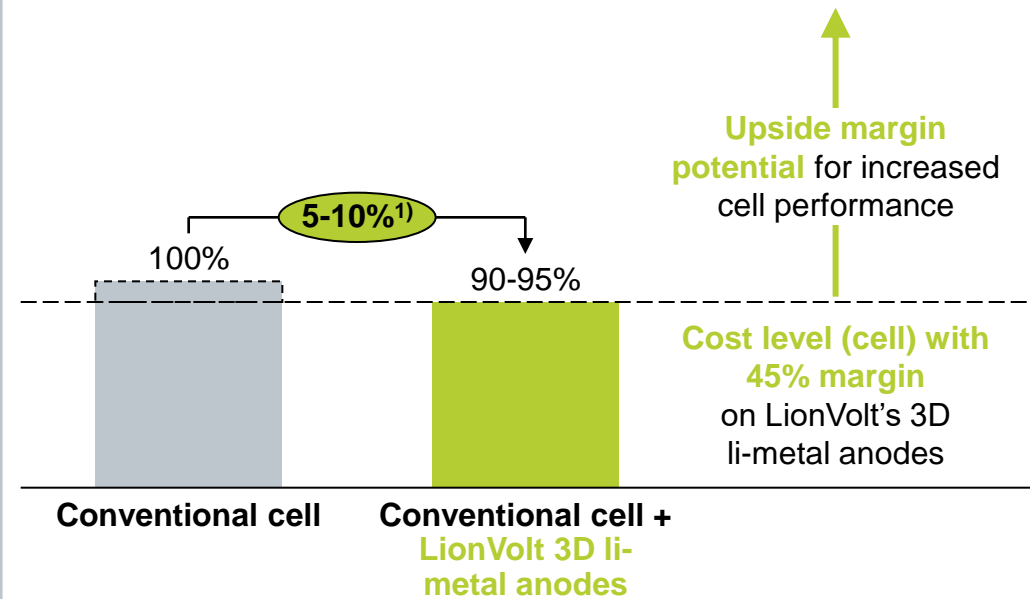
### Cell level energy density performance [index]

[Index 100% = energy density performance of conventional Li-ion cell]



### Cell level cost – at scale [index]

[Index 100% = EUR/kWh of a conventional Li-ion cell]

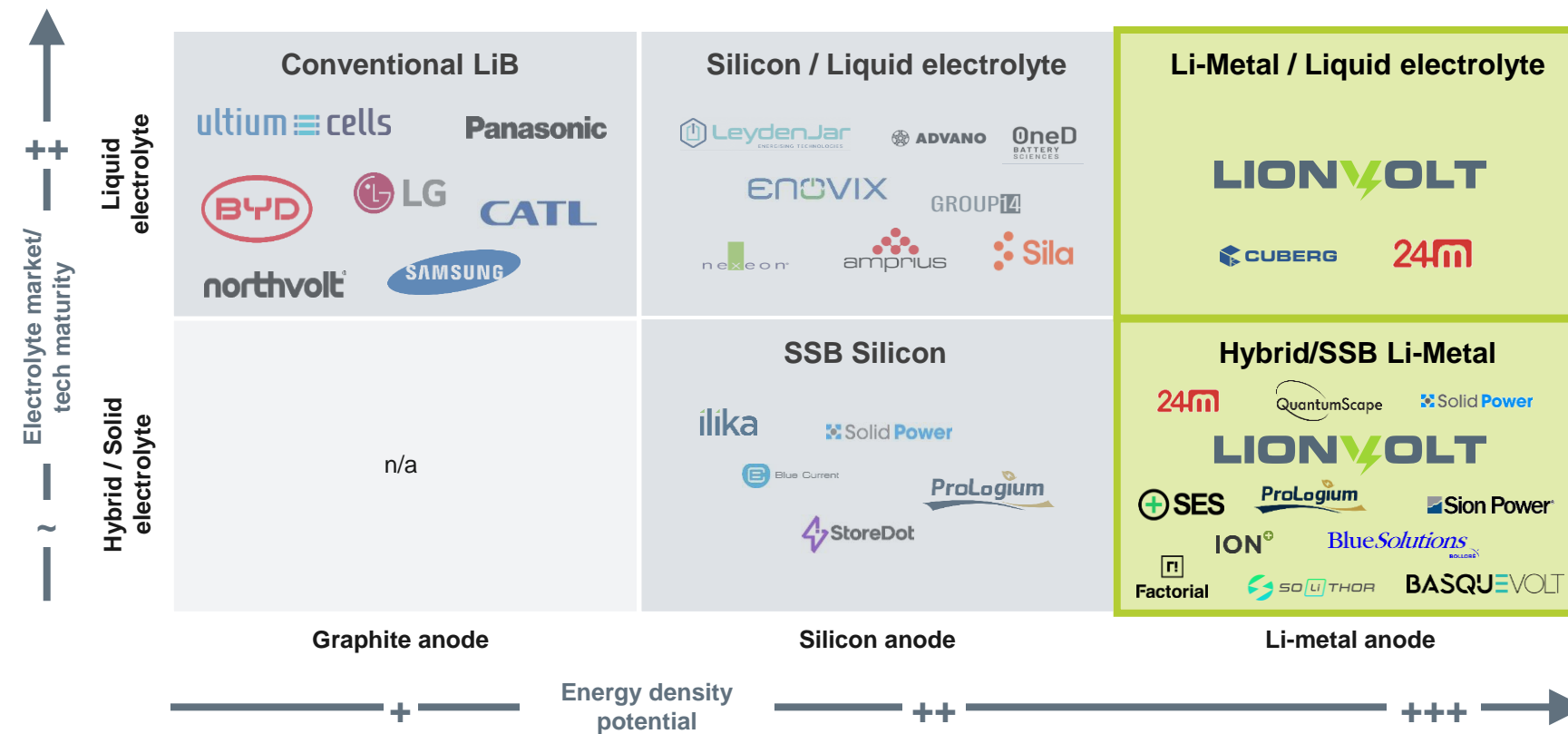


1) At scale, we believe that cells containing LV's 3D anodes will cost 5-10% less per kWh vs. conventional cells. Cost estimate includes anode and cell material and manufacturing costs and is based on initial cost modelling



# Key competitive advantages of LionVolt's Li-metal product are the ability to leverage existing infrastructure and the low-cost roll-to-roll method

Competitive landscape – selected companies (simplified and illustrative)



## Key LionVolt competitive advantages

3D technology



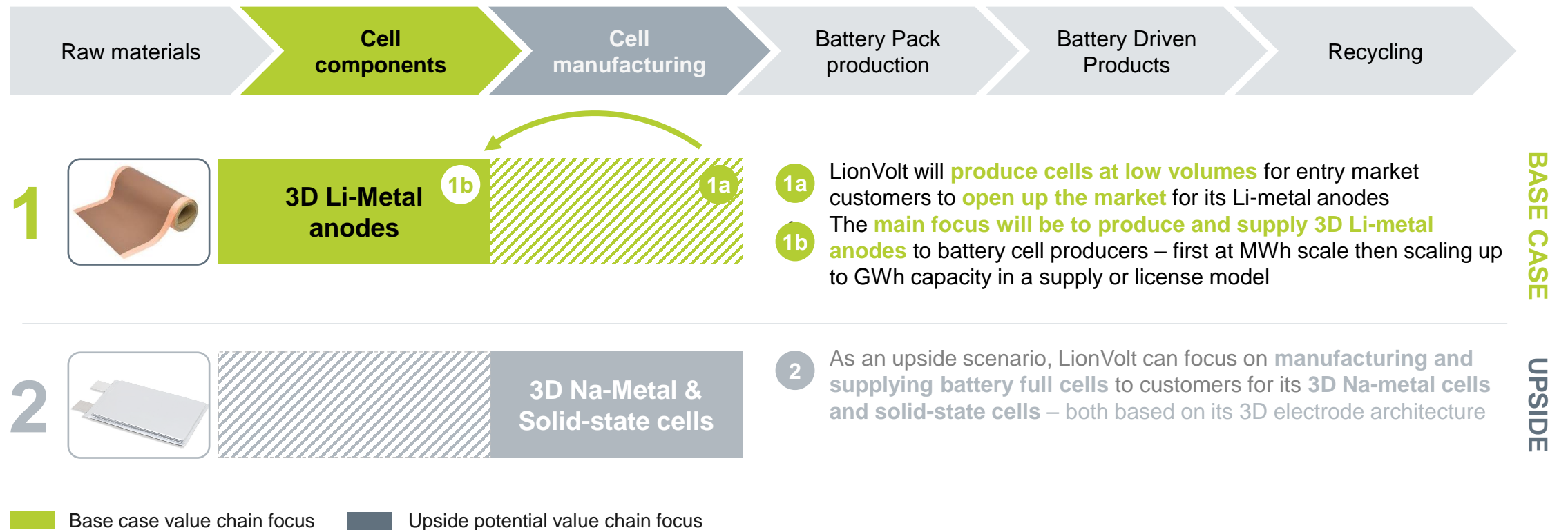
- 1 Unique 3D technology avoids dendrite formation in Li-metal cells improving cycle life
- 2 Fast charge rates driven by 3D architecture
- 3 Drop-in solution: High ability to leverage existing LiB production infrastructure
- 4 Low-cost roll-to-roll manufacturing approach
- 5 No reliance on solid state electrolyte technology to make li-metal work

# C. Roadmap to mass production

# The main focus of LionVolt is to produce and supply 3D li-metal anodes to battery cell manufacturers

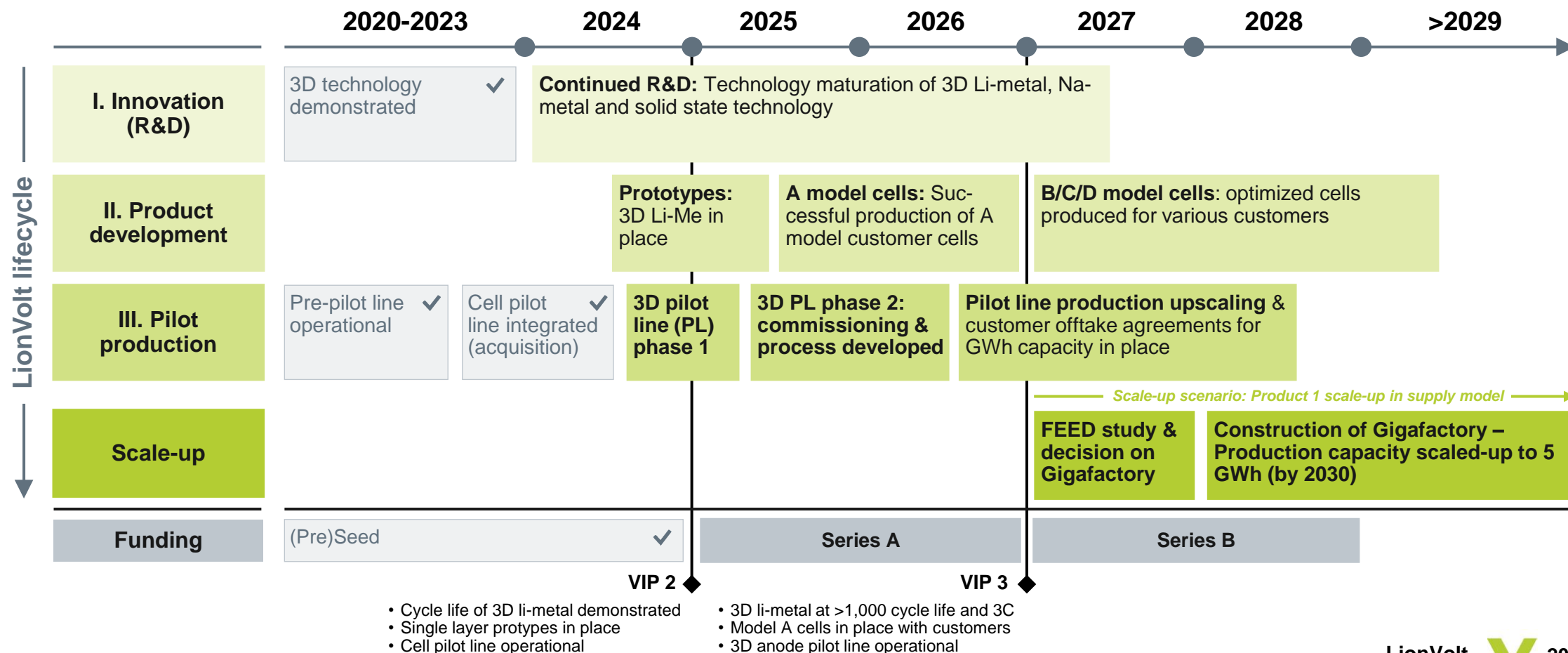
## Business model & value chain focus

### LionVolt value chain focus



# LionVolt's roadmap is anchored around reaching a 5 GWh capacity by end of 2030

## Roadmap

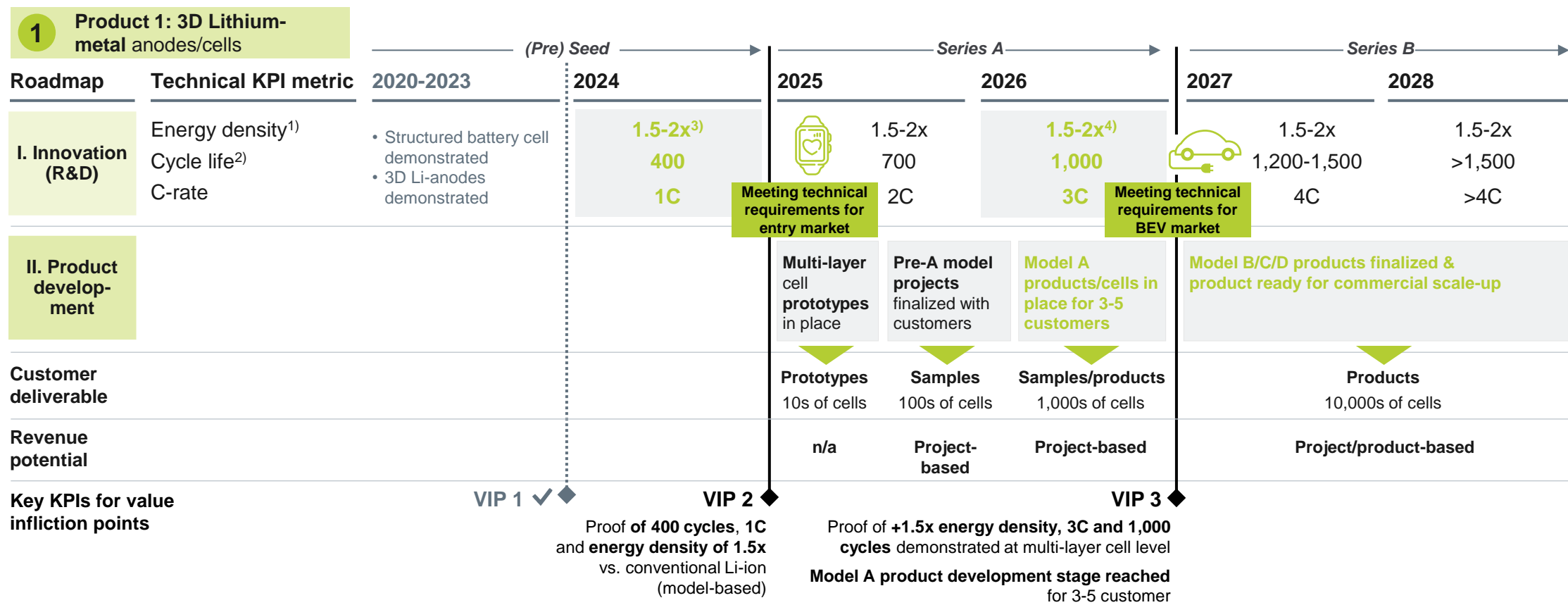


- Cycle life of 3D li-metal demonstrated
- Single layer prototypes in place
- Cell pilot line operational

- 3D li-metal at >1,000 cycle life and 3C
- Model A cells in place with customers
- 3D anode pilot line operational

The next key milestone for LV's 3D Li-metal product is reaching 1,000 cycles at 3C and having model A customer cells in place (end of 2026)

## Product 1 (3D Li-metal) roadmap & key milestones






1) Energy density performance compared to conventional lithium-ion and sodium-ion technology and various cathode chemistries (incl. LFP/NMC/NCA/LCO);

2) Cycle life defined as the number of cycles until 80% state of health is reached; 3) Model-based energy density improvement vs. conventional Li-ion;

4) Energy density performance improvement demonstrated at multi-layer pouch cell level

# The pre-pilot line supports research activities – The 3D anode and cell pilot lines support product development activities with customers

## Overview of LV (pilot) production facilities

Production facility	Operational	Illustration	Location	Key function	Start of operations	Selected capabilities	Production capacity
<b>Pre-pilot line</b> (HTC)	<input checked="" type="checkbox"/>		<b>High Tech Campus,</b> Eindhoven (NL)	<ul style="list-style-type: none"> <li>• Production of <b>3D anodes at small scale for research</b></li> <li>• Manufacturing of <b>coin cells &amp; single-layer cells</b></li> </ul>	<b>Start of 2024</b>	<ul style="list-style-type: none"> <li>• 3D technology capabilities for 3D anode and solid electrolyte (research scale)</li> <li>• Coin cell production</li> </ul>	<b>kWhs/year</b>
<b>Cell pilot line</b> (Thurso)	<input checked="" type="checkbox"/>		<b>Thurso Business Park,</b> Thurso (UK)	<ul style="list-style-type: none"> <li>• <b>Production of multi-layer (sample) cells</b> for technology demonstration and entry market cell sales</li> </ul>	<b>Operational since 1990s (acquired in January 2024)</b>	<ul style="list-style-type: none"> <li>• Full scope of wet end (mixing/coating)</li> <li>• Full scope dry end</li> <li>• Pouch cells and cylindrical cells (various formats)</li> </ul>	<b>MWhs/year</b>
<b>3D anode pilot line</b> (BIC)	<input type="checkbox"/>		<b>Brainport Industries Campus,</b> Eindhoven (NL)	<ul style="list-style-type: none"> <li>• Production of <b>3D anodes and solid electrolyte</b> at larger scale for customer samples and cells</li> </ul>	<b>2025 (phase 1) 2026 (phase 2)</b>	<ul style="list-style-type: none"> <li>• 3D technology capabilities for anode and electrolyte (large scale)</li> </ul>	<b>MWhs/year</b>

Construction ongoing

Consumer wearables & electronics are prioritized as early adopter markets, after which the high-volume mobility market will be targeted

Go to market approach (illustrative)

Application	Fit with LionVolt target products			Opportunity size (volume potential)	Fit with LionVolt target products		
	Need for battery innovation +	Willingness-to-pay +	Time-to-market <sup>1)</sup>		Product 1: 3D Li-metal	Product 2: 3D Na-metal	Product 3: 3D solid-state li-sulfur
Consumer wearables	●	●	●	◐	●	○	●
Consumer electronics	●	●	●	◐	●	○	●
Unmanned arial vehicles (drones)	●	◐	◐	◐	●	○	●
2&3 wheeler mobility	◐	◐	◐	◐	●	●	●
Battery electric vehicles (BEV)	◐	◐ – ◐	◐	●	●	●	●
Battery electric aircrafts	●	◐	○	◐	●	○	●
Industrial & power tools	◐	◐	◐	◐	◐	◐	◐
Energy storage systems	◐	◐	◐	◐	◐	◐	◐

◐ Limited / slow    ● High / fast

Go-to-market approach

1

Consumer electronics and UAV/drones are prioritized as early adopter markets. These markets are characterized by:

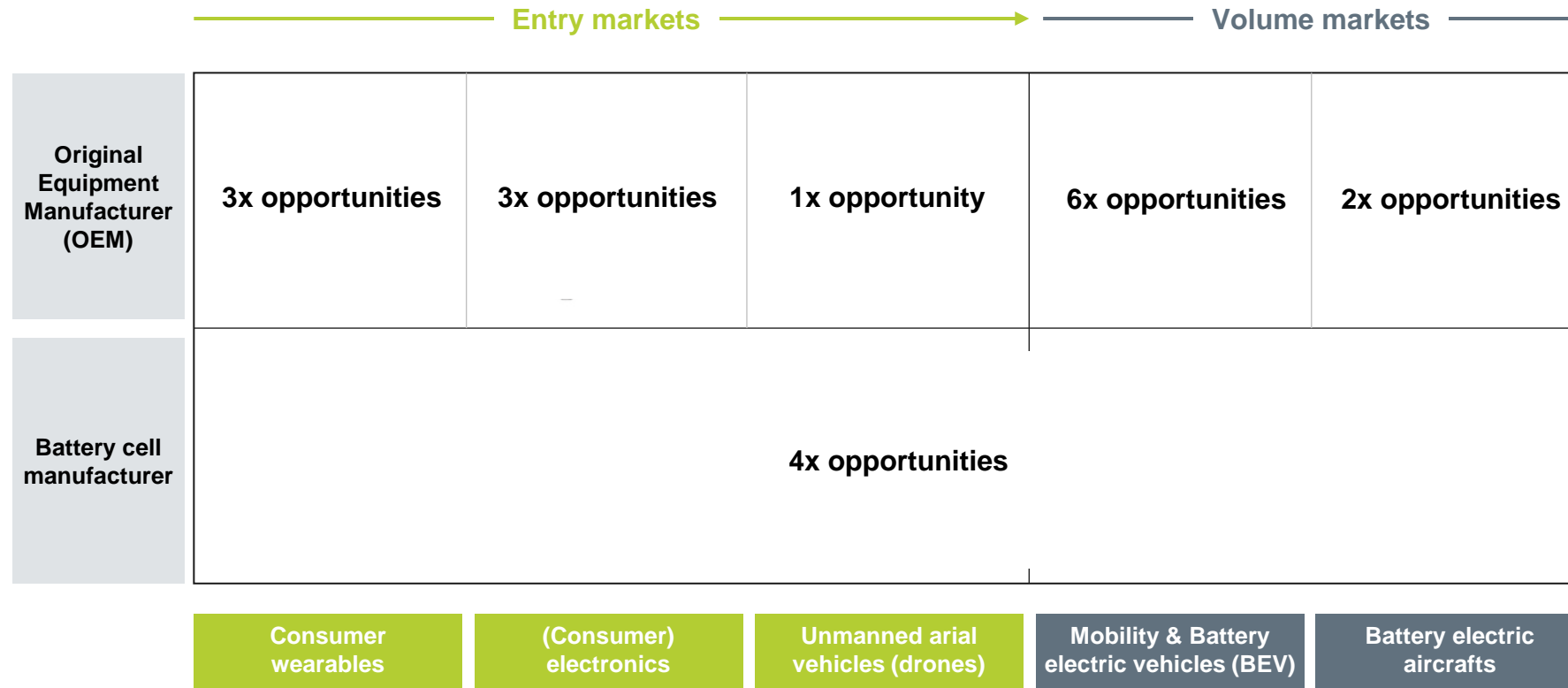
- High demand for improved performance
- Relative ease of market access
- Higher margins

After LionVolt has proven its technology in early adopter markets, the company will enter the high volume / high growth mobility market. This market demands larger capacities, faster charging and safety at the right price

2

# LionVolt experiences high traction from potential customers

## Commercial opportunity overview

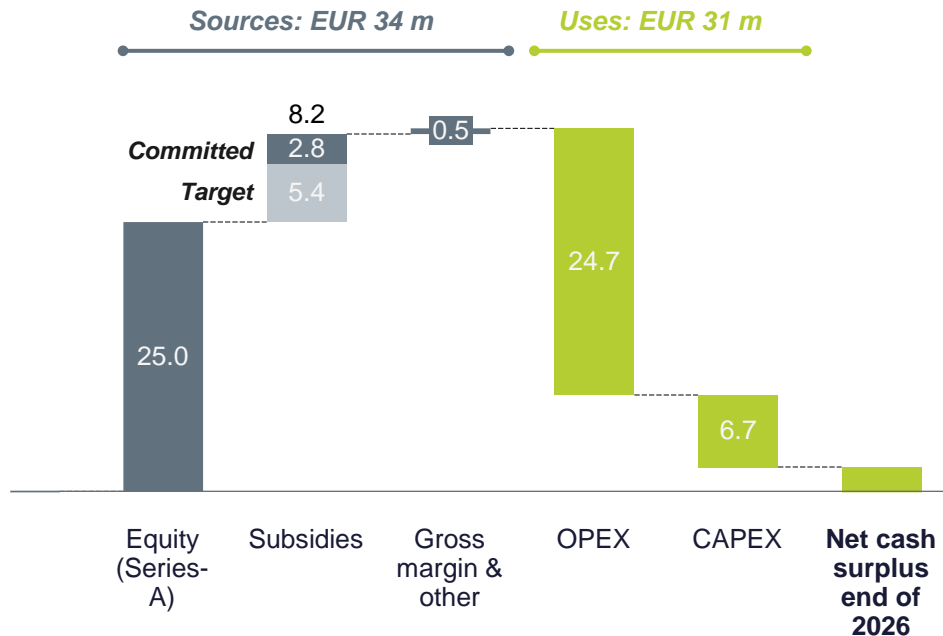




# LionVolt is targeting a funding round of EUR 25 m – Main uses are pilot line CAPEX and personnel cost

P&L, cash flow and cash balance forecast (2025-2026) [EUR m]

## Sources & uses (2025-2026)



## Remarks

### Sources

- EUR 25 m equity fundraise
- EUR 2.8 m in non-dilutive funding (incl. GFII and GFIII)
- EUR 5.5 m additional targeted non-dilutive funding

### Uses (selection)

- CAPEX to finalize the 3D anode pilot line
- Ramping up personnel base (product development and pilot manufacturing team)

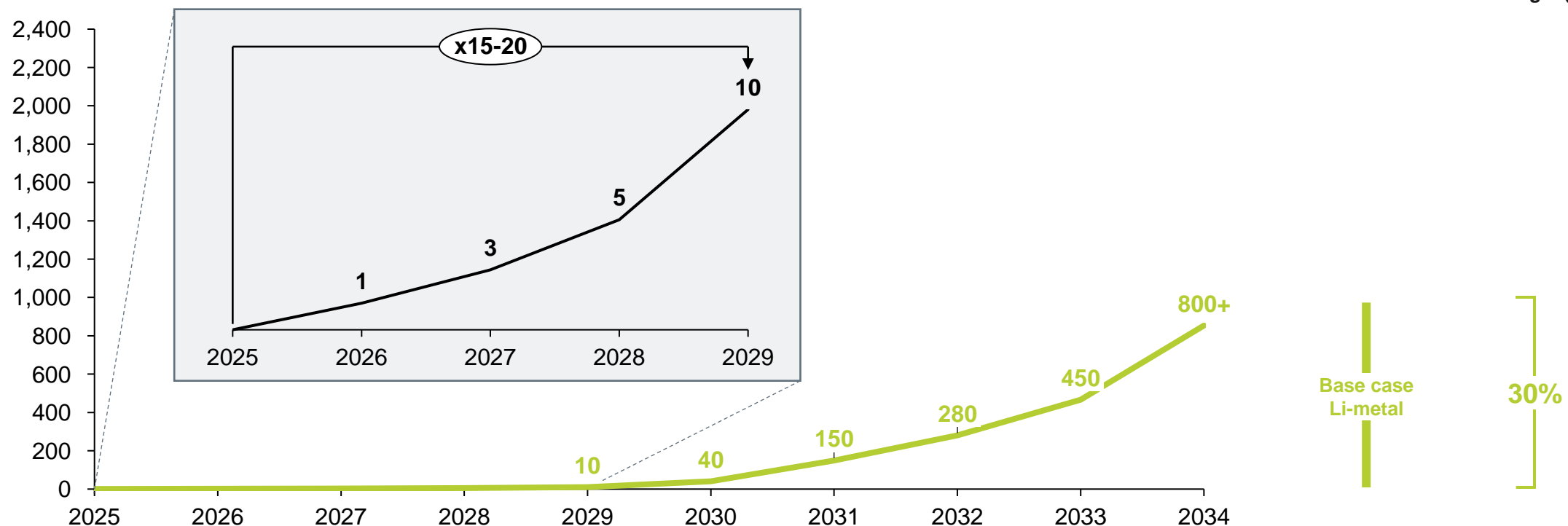
### Follow-up funding

- A next funding round of EUR 50 m is foreseen in 2027 to support further scale-up and preparations for the GWh-facility

# Revenue of LionVolt is forecasted to reach EUR 800 m by 2034 in the base case scenario at ~30% EBIT margin – Upside potential is substantial

## Revenue forecast 2025-2034 [EUR m]

EBIT margin  
target (2034)



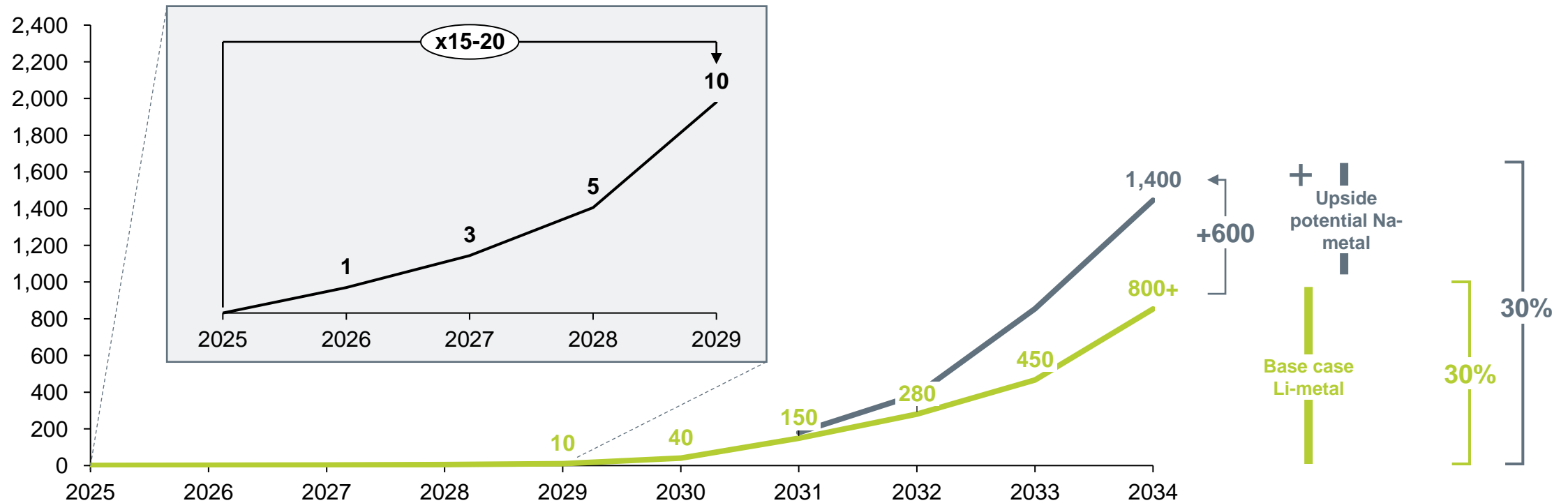
- Base case: Fast penetration of 3D Li-metal anode (product 1) only
- Upside Na-metal: Base case + Scale-up of 3D Na-metal cell capacity (product 2)
- Upside solid-state: Base case + Upside Na-metal + Scale-up of 3D Solid-state Li-sulfur cell capacity (product 3)

Scale-up assumptions: Base case scenario is based on scaling up capacity in 5 tranches of 5/5/5/5/10 GWh, operational in the period 2030-2034. Upside potential Na-metal is based on scaling up capacity of Na-metal cells in 4 tranches of 1/1/2/2 GWh, operational in the period 2031-2034. Upside potential solid-state is based on scaling up capacity of solid-state cells in 3 tranches of 1/1/2 GWh, operational in the period 2032-2034.

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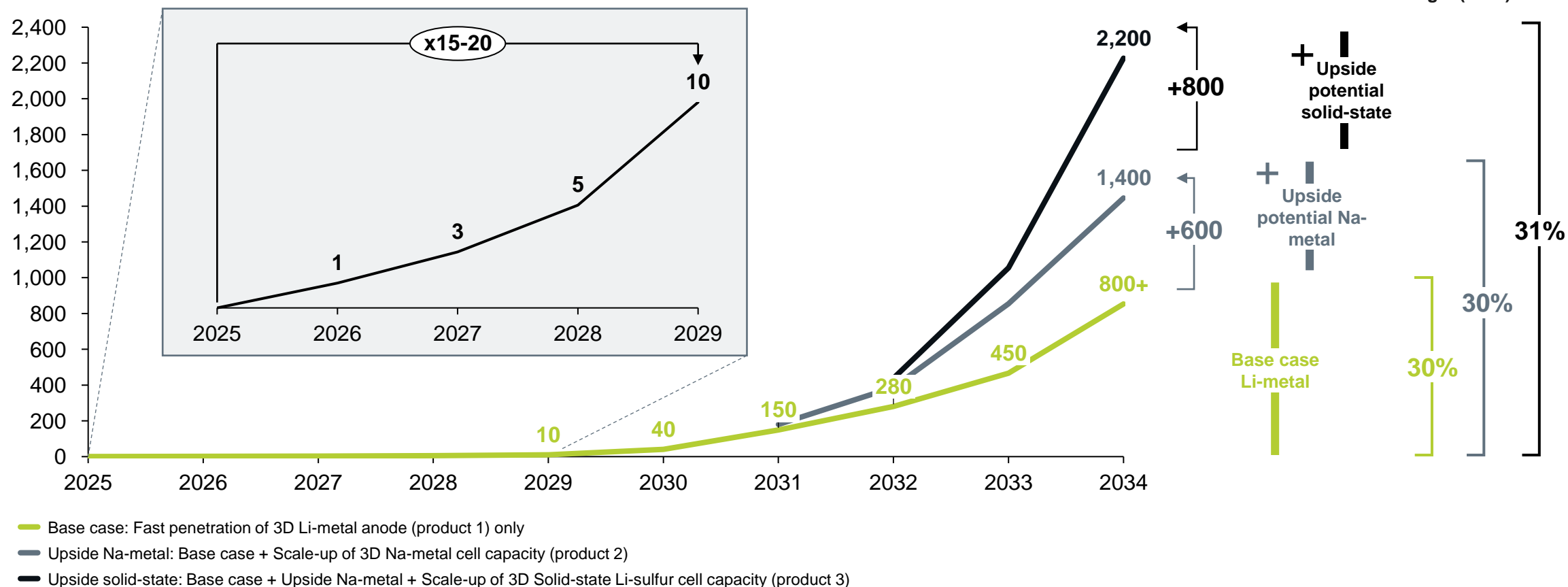


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**Thank you**

website: [www.lionvolt.com](http://www.lionvolt.com)