



Ilika – Half Year Results  
January 2024

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## Pioneer in Solid State Batteries (SSBs)

- ✓ Product lines:
  - ✓ **Stereax** miniature cells used primarily to power miniature medical devices and industrial IoT
  - ✓ **Goliath** large format cells targeting the automotive industry and cordless consumer appliances
- ✓ Developing SSBs for EV use with an oxide electrolyte and silicon anode which reduces raw material costs and increases cell life

### Key Statistics

**2004**  
Company Founded  
in Southampton, U.K.

**67**  
Patents

**\$280B**  
TAM for Automotive  
Batteries by 2030

**£13.2M**  
Cash Balance  
31st Oct 2023

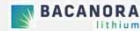


# Seasoned Management Team

Management Team and Board Offer a Wealth of Diversified Experience Across Multiple Industries



**Graeme Purdy**  
Chief Executive Officer & Co-Founder



- Founding CEO appointed in 2004
- Led two VC funding rounds and IPO
- Previously COO of Avantium BV and early career with Shell. Latterly NED with Bacanora Lithium plc.
- Chartered engineer with an MEng in Chemical Engineering from Cambridge and an MBA from INSEAD



**Jason Stewart**  
Chief Financial Officer



- CFO since Jan 2023
- Previously Interim CFO and other senior roles at Sunseeker International Ltd since 2010; prior to which was at B&Q and Kerry Foods
- CIMA qualified accountant, with a BSc in Business from Manchester Metropolitan University



**Jeremy Millard**  
Non-Executive Director



- Founded Iridium Corporate Finance
- Non-Executive Director at Omega Diagnostics Group, Blackbullion Ltd, and CFPro Ltd
- Leverages over 20 years of investment banking experience, providing corporate finance advice to science and deep technology sector clients



**Monika Biddulph**  
Non-Executive Director



- Non-Executive Director on the board of D4t4 Solutions Plc and AFC Energy Plc
- Wide range of experience in both the commercial and technical aspects of an international technology business
- Holds a PhD in Physics from the ETH Zurich



**Keith Jackson**  
Chairman

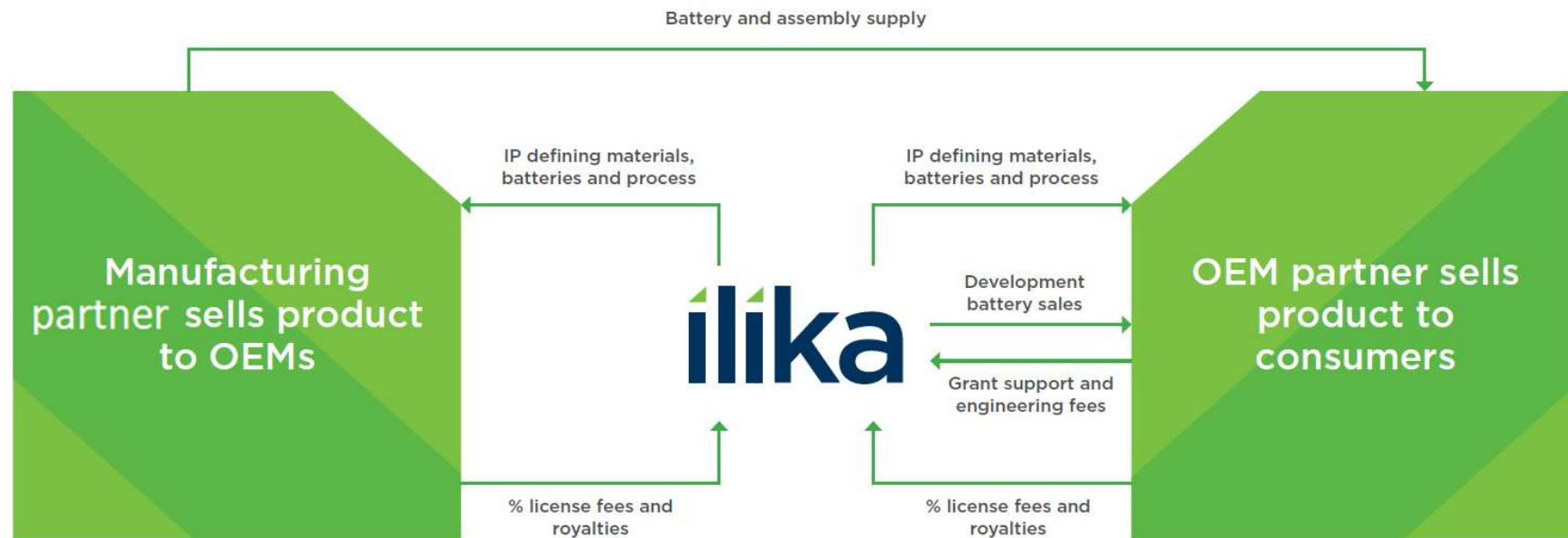


- Former Chief Technology Officer at Rolls Royce Engines PLC and Meggit PLC
- Professor at Sheffield University's Automated Control and Systems Engineering department
- Non-Executive Chairman of Libertine FPE

# Ilika Business Model



Asset-light licensing model demonstrated on production-intent equipment





# Stereax: Ilika's Unique Miniature Battery



## Stereax Technology is Capable of Revolutionising the Medical Implant Industry

**Reduced Surgical Intervention:** compact architecture offers higher energy density enabling smaller device designs

**Improved Safety:** no toxic fluid leakage possible

**Higher Power Density:** delivers power pulses for therapy and communication chips



# Stereax: Designed for a Burgeoning Market

Powering the Electroceutical Revolution



Demand for Medical Batteries to Being Driven by Innovation in Electroceuticals and Sensors

Neuromodulation



\$8.6 Bn (2023)  
CAGR: 11.4%

Implanted sensors



\$6.0 Bn (2023)  
CAGR: 11.1%

Smart orthopedics



\$26 Bn (2023)  
CAGR: 4.2%

Smart surgical  
instruments



Projected: \$700 M  
(2030)\*

Smart contact  
lenses



Projected: \$1.3 Bn  
(2030)\*  
CAGR: 29.3%

Smart  
orthodontic



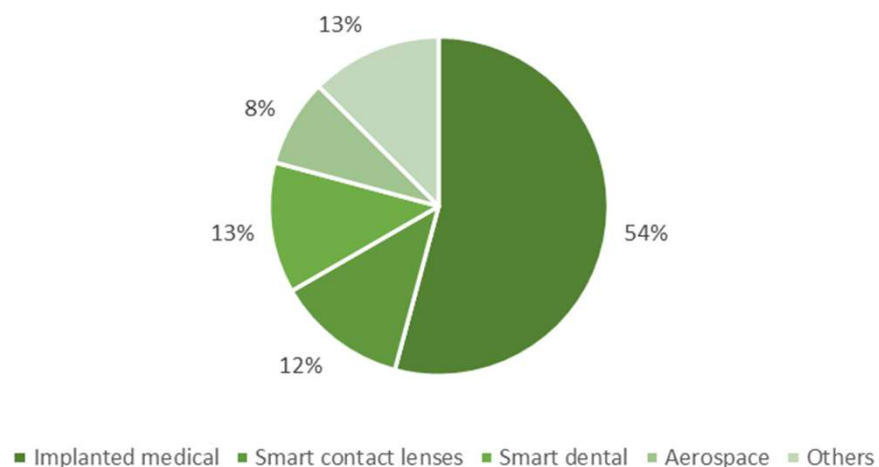
\$5.8 Bn  
CAGR: 24%

\* Assumed market penetration for emerging sectors

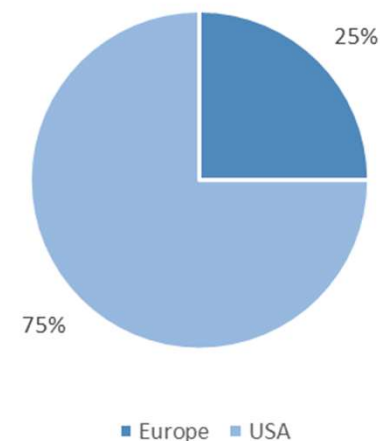
# Stereax: Commercial Order Analysis

## Initial commercial orders from a US-centric customer base

Ilika Stereax Orders by Application



Ilika Stereax Orders by Geography



21

Companies

24

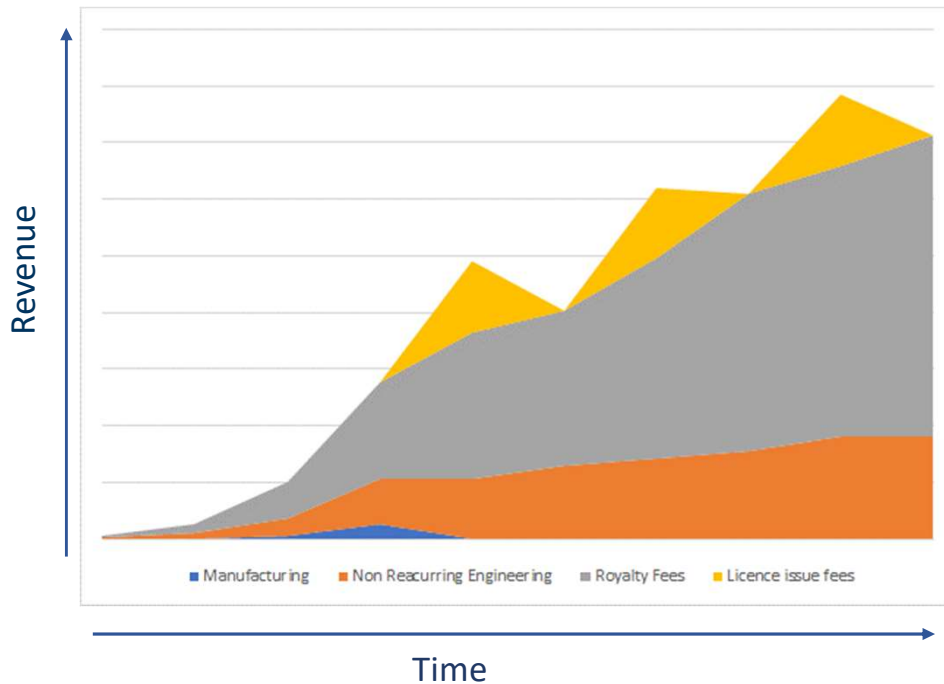
Orders



# Stereax: Commercial Growth



Income growth from Stereax product will be derived from several revenue streams which build as market penetration increases



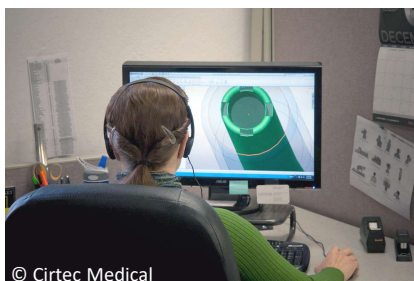
Customer interest remains strong with continued engagement from existing customers

Company Name	Type of Company	Country	Intended Application Area	Sector Size & CAGR	Customer Device SAM* (devices)	Customer Device SOM *
A	Start Up	France	Cardiac/Heart Rhythm	\$7bn/7%	100K's	10K's
B	Multinational (Listed)	USA/ Israel	Smart Orthodontics	\$2.5bn/19%	Millions	100K's
C	Multinational (PE Backed )	USA	Implanted Medical Devices	\$2bn/7%	100K's	10K's
D	SME	Israel	Neuromodulation / DBS	\$15bn/12%	100k's	30K
E	Start Up	USA	Implanted Medical Sensor	\$1bn/8%	Millions	100K
F	SME Contracted to Listed Multinational	USA	Smart Orthopaedics	\$8bn/6%	500K	25K
G	Start Up (FAANG owned)	USA	Smart Contact Lens	\$100M/39%	Millions	100K's
H	Start Up	USA	Smart Contact Lens	\$100M/39%	Millions	100K's
I	SME Contracted to Listed Multinational	USA	Trauma Screw Mounted Sensor	\$8bn/6%	Millions	100K's
J	Start Up	USA	Smart Dental	\$2.5bn/19%	Millions	80K
K	Government Research Centre	UK	Secure Communications	TBA	TBA	TBA
L	Start Up	USA	Implanted Cancer Sensor	\$1bn/8%	100K's	10K's
M	FAANG	USA	TBA	TBA	TBA	TBA

# Stereax: Cirtec Partnering



**Cirtec Medical: an industry-leading vertically-integrated outsource partner for medical devices and components**



## Partnership Benefits to Ilika:

**Validation:** of Stereax product and process

**Manufacturing:** partnership with economy of scale and ability to ramp production

**Business Development:** resources bringing additional commercial momentum

**Status:** key equipment sets transferred to Cirtec, commissioning proceeding.



# Goliath: Ilika's Cutting Edge Solid State EV Battery



## Goliath's Technology is Capable of Revolutionizing the EV Industry with High Performance Batteries

**Further Range:** Oxide electrolyte and silicon anode architecture offer higher energy density v LiB and so better range/weight

**Improved Safety:** Solid-state electrolyte is safer than flammable liquid electrolyte found in incumbent li-ion technologies

**Higher Energy Density:** Higher theoretical energy density threshold of ~500Wh/kg

**Reduced Cell Degradation:** Solid state technology not subject to dendrite degradation

**Better Recyclability:** Goliath can be safely recycled

**Lithium Efficiency:** Lower lithium content v Sulfide based SSB technologies



# Goliath: Target Market and Other Key Market Drivers

Ilika's Unique Position to Service a Fast Growing Market

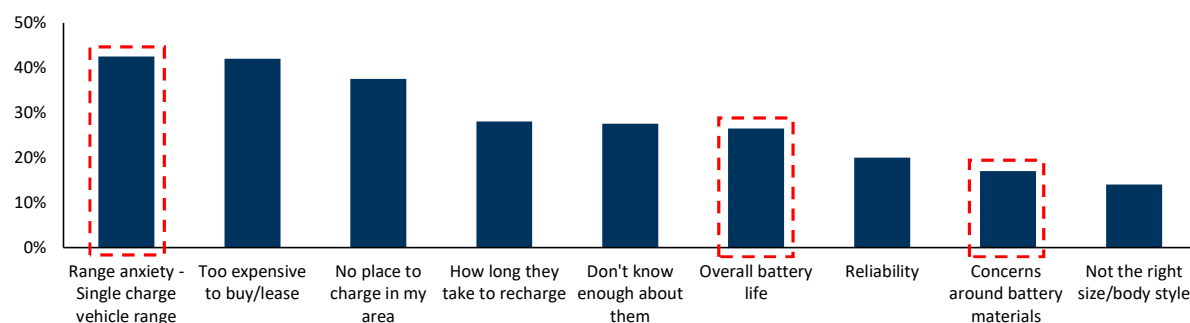


## Electrification of Transportation and Net-Zero Initiatives

- 19 national governments have committed to attaining net-zero emission by 2050
- Transportation remains one of the highest emitting sectors is one of the easiest to abate – high performance EVs play an important role in this transition
- The EU has banned the sale of new ICE cars and SUVs by 2035 – other governments such as the U.S have made similar commitments
- Transportation accounts for 24% of UK emissions, emitting >100Mt CO<sub>2</sub>e annually



## Main Reasons Consumers are Hesitant on Buying an Electric Vehicle

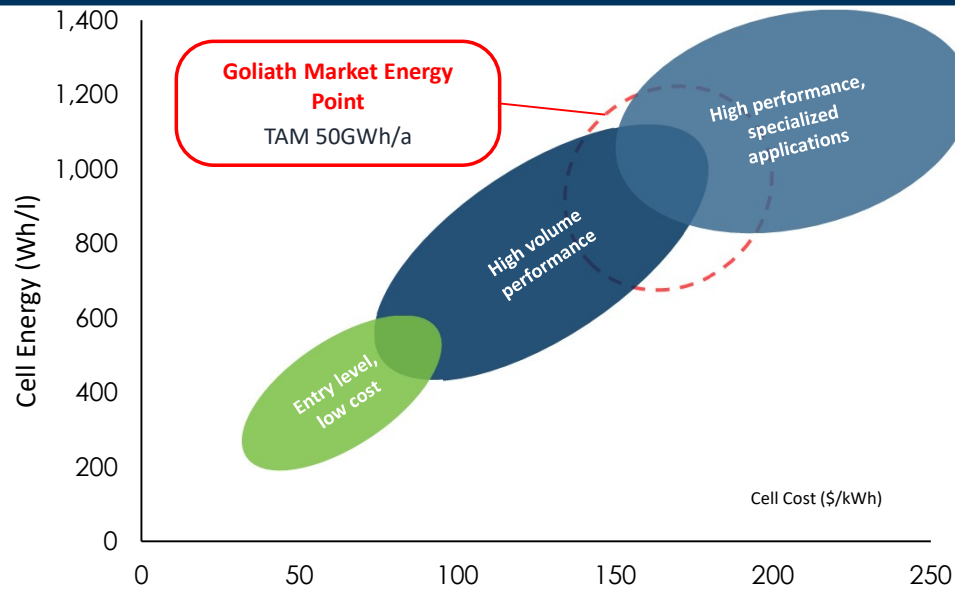


### Integration of Ilika's SSBs can tackle:

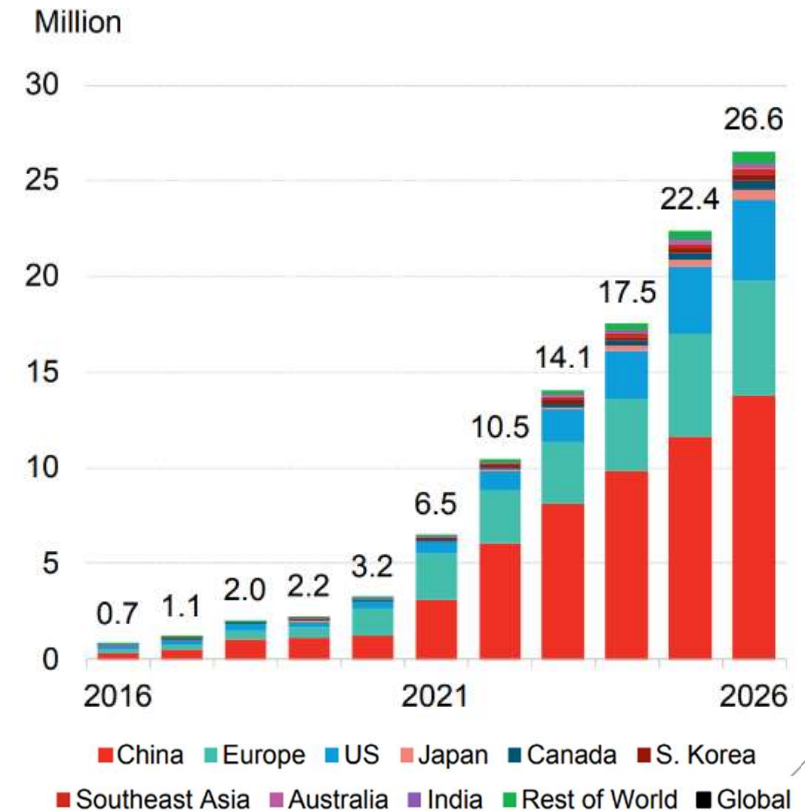
- Range anxiety
- Battery life
- Safety concerns

# Goliath: Addressable Sector

## ilika Targets Luxury Performance Market



2023 BNEF EV outlook projects EV sales to be 44% of global vehicle sales by 2030 and 75% by 2040





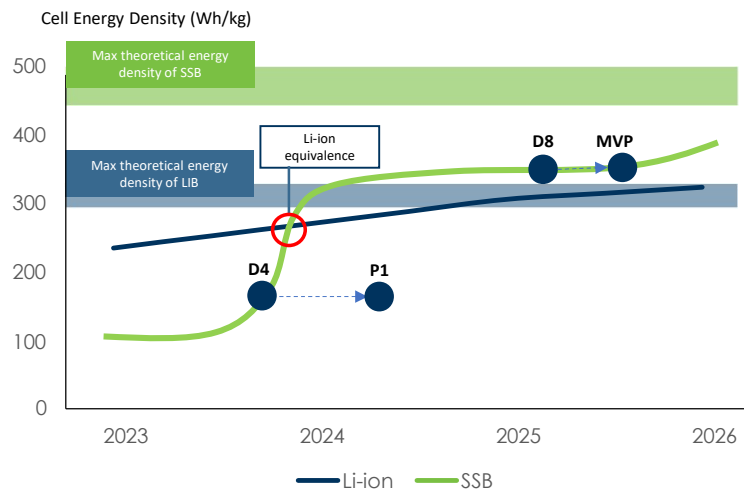
# Goliath: Technology Roadmap and Production Scale-Up



## Solid-State Battery Energy Density

### 2023/5 Highlights

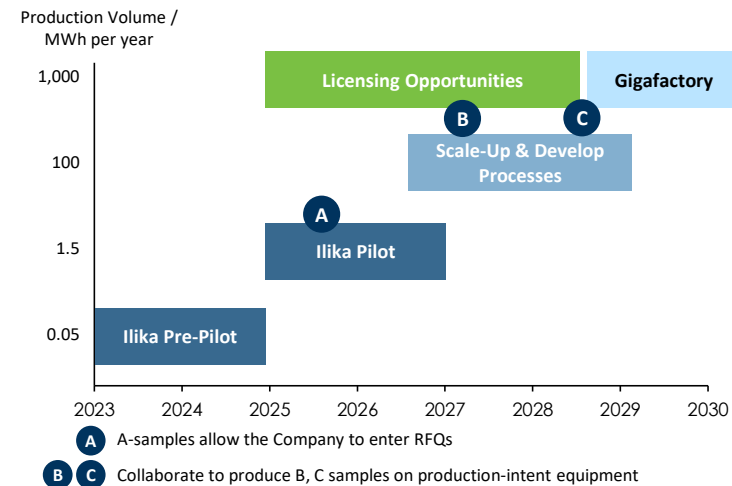
- 2023: D4 design freeze of multi-layer pouch cells followed by lithium-ion parity.
- 2024: P1 prototypes for restricted sale to OEMs for testing with further development to D8 in parallel
- 2025: Programs on repeatability, testing and characterisation to reach P2 (MVP)



## Iluka Scale-up Plan and Business Model






















### 2025/6 Highlights

- Testing electrode printing at near Giga scale
- Developing automated cell assembly line to give repeatability for A Samples
- Entering OEM RFQ's with A Samples
- Gaining an OEM platform win and collaborating with Tier-1 partner to scale-up



# Goliath: Solid-State Battery Technology Landscape

Different chemistries are optimal for different applications

	Oxide Electrolyte	Sulfide Electrolyte	Polymer Electrolyte
Si anode	   5	 2	 2
Li anode	 3	    11	 3
Anode-less	 1	      	 

Chemistry					
Sulfide Electrolyte	Oxide Electrolyte	Polymer Electrolyte	Lithium Anode	Silicon Anode	Anode-less
<ul style="list-style-type: none"> <li>+ High ionic conductivity</li> <li>+ Malleable</li> <li>- Reacts easily with O<sub>2</sub> and moisture to make toxic H<sub>2</sub>S</li> <li>- Expensive to manufacture</li> </ul>	<ul style="list-style-type: none"> <li>+ Stable in air</li> <li>- More difficult to manage interfacial resistance</li> </ul>	<ul style="list-style-type: none"> <li>+ High ionic conductivity</li> <li>- Needs pre-heating to 50-60°C</li> </ul>	<ul style="list-style-type: none"> <li>+ Constant cell voltage</li> <li>+ High energy density</li> <li>- Expensive</li> <li>- Dendrite formation can lead to short life</li> </ul>	<ul style="list-style-type: none"> <li>+ Longer cell life</li> <li>+ Less expensive than lithium</li> <li>- Can lead to volumetric expansion</li> </ul>	<ul style="list-style-type: none"> <li>+ Cheaper than lithium anode</li> <li>+ Very high energy density</li> <li>- Cell life compromise</li> <li>- Volumetric expansion</li> </ul>

# Goliath: Partnerships for Technology Deployment

Ilika has Entered Critical Partnerships to Fast Track Commercialization of Goliath



## Faraday Battery Challenge Round 5: HISTORY

- A 24-month FBC Collaborative R&D programme
- Duration: 1 Feb 23 until 31 Jan 25
- Total programme value: £8M/Ilika grant £2.8M
- Nine Collaborative and steering partners
- Objective: delivery of a multi-layer, solid state pouch cell with specifications aligned with automotive requirements



# Goliath: Partnering for Manufacturing Scale-up

Ilika is receiving support from the Automotive Transformation Fund

ilika



- ▲ ATF SuRV2: SiSTEM
- ▲ 17-months from Oct 2023
- ▲ Programme value £2.7m/£400k Ilika grant funding

## Objectives:

- Undertake physical trials of Ilika's electrode production at UKBIC
- Design, build and commission a 1.5MWh assembly line capable of delivering A sample batteries



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Company  
Overview

Stereax

Goliath

ESG

Finances

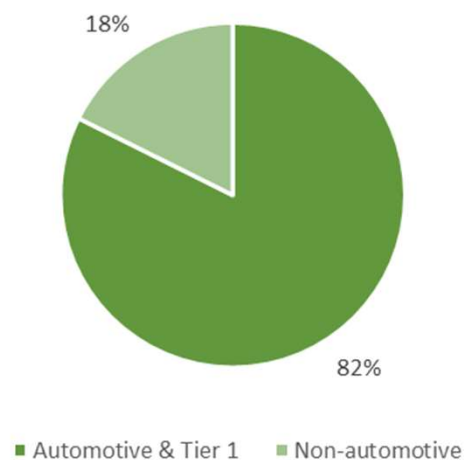
Outlook

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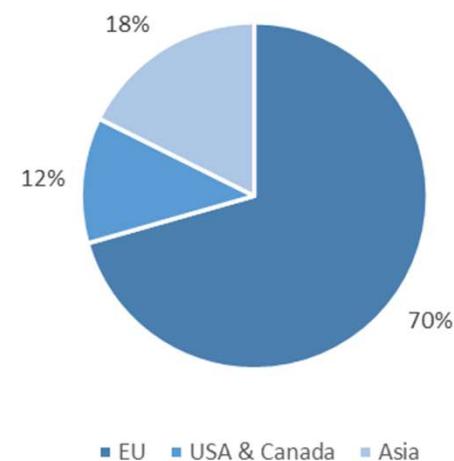
# Goliath: Commercial Interaction Analysis

Strongest demand from European automotive OEMs

Goliath MTA / NDA by Application



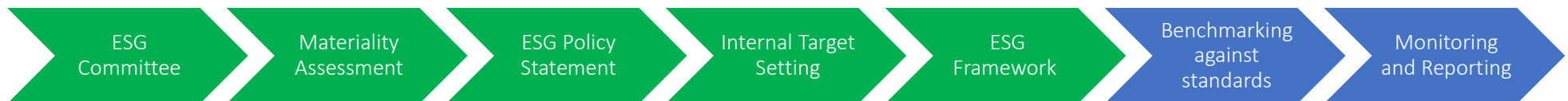
Goliath MTA / NDA by Geography



17  
Companies



ESG is of utmost importance to Ilika and is monitored at board level  
We continue to remain ahead of reporting requirements through our commitment to ESG



- Integration of most material items to business risk and opportunities registers
- ISO 14001, ISO 9001, Carbon Reduced Organisation
- Long Range Strategic Plan and ESG Framework initiated:
  - Risk and Governance
  - Ethical Supply Chain Planning
  - Environmental Commitment
  - Development and Opportunities



## Iluka Plc, un-audited financial results for the half-year ending 31 October 2023

### ▲ Total Income £1.3m (H1 2023: £0.2m)

- Substantial increase due to HISTORY grant, supporting Goliath.
- Income from grants of £1.3m (H1 2023: £0.2m)
- Lower income expected in second half due to phasing.
- HISTORY will continue through to the beginning of 2025, with the total project income expected to be £2.8m.

### ▲ EBITDA loss, excluding share-based payment £1.9m (H1 2023: £4.1m loss)

- Improved due to higher grant income and a reduction in operating costs.
- Operating cost reduction through Cirtec technology transfer process and normalisation of the UK inflationary environment.

### ▲ Cash balance £13.2m (H1 2023: £18.6m)

Cash balance remains in line with expectations

**Scale** Stereax through joint manufacturing and marketing with Cirtec

**Mature** Goliath technology with partners through defined technical milestones

**Continue** pursuing grant support and commercial revenue through partnering

Commercial opportunity continues to build for Ilika's technology across the large addressable markets providing a strong platform for future growth