



accelerated materials innovation

**Fundraising July 2018**

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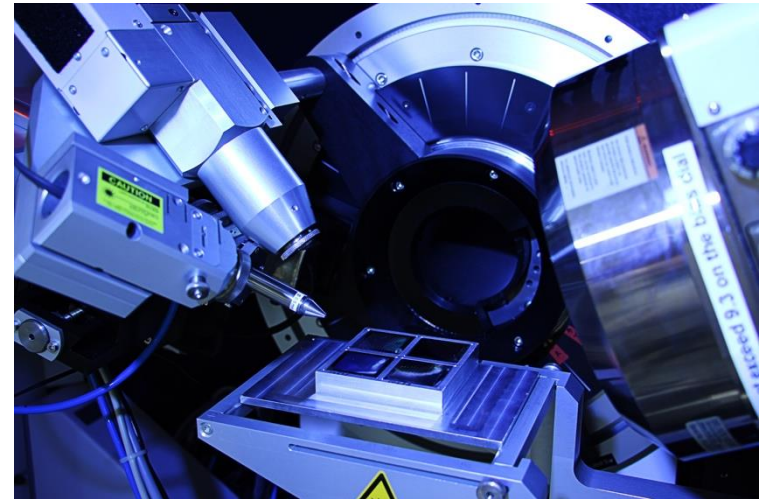
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# Business overview

Stereax<sup>®</sup> solid state  
battery technology



Rapid discovery of new  
materials for energy and  
electronics applications

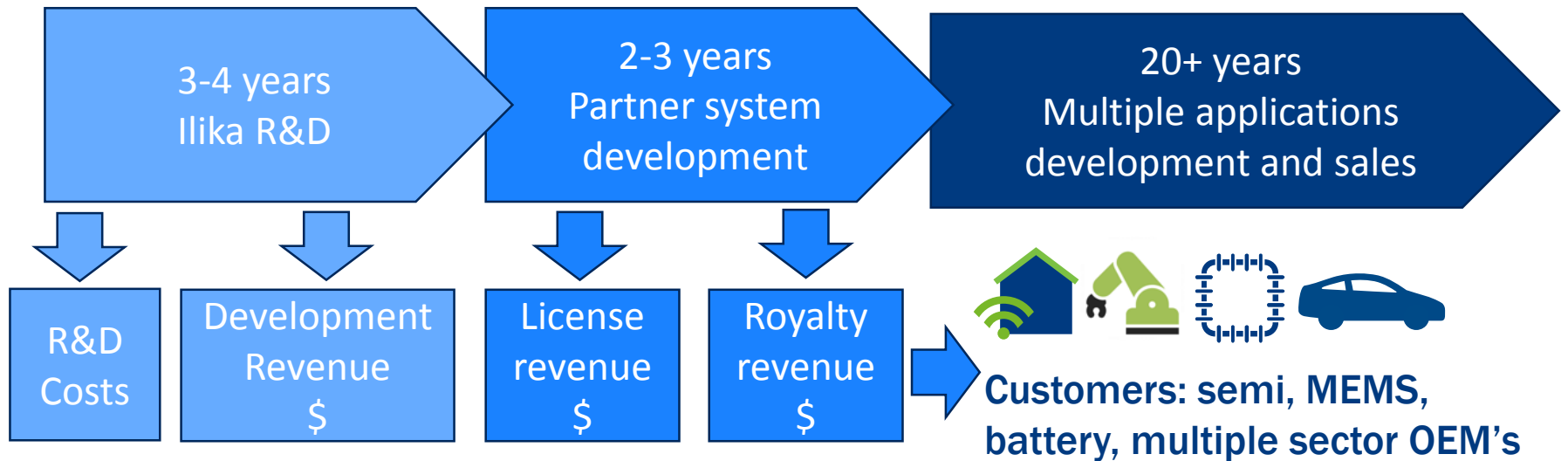


**TOYOTA**

**SHARP**

# Ilika business model

- ▲ **Advanced solid-state technology developer**
- ▲ **Business model to potentially yield high margins over time**
  - ▲ Upfront license fee from flexible licensing models
  - ▲ Ongoing royalties, based on a percentage of system volume shipped
  - ▲ Technology deployed across multiple applications
- ▲ **Long term, global growth markets**



# Collaboration with Toyota

## The requirement for solid state batteries

### Market requirement

- ▲ Significantly lighter
- ▲ Faster charge and discharge times
- ▲ Non-flammable

### Solution

- ▲ Advanced electrode & electrolyte materials for lithium-ion batteries

### Status

- ▲ Toyota appointed Ilika in 2008 to reduce technical risk
- ▲ 8 patents filed since then








# TOYOTA

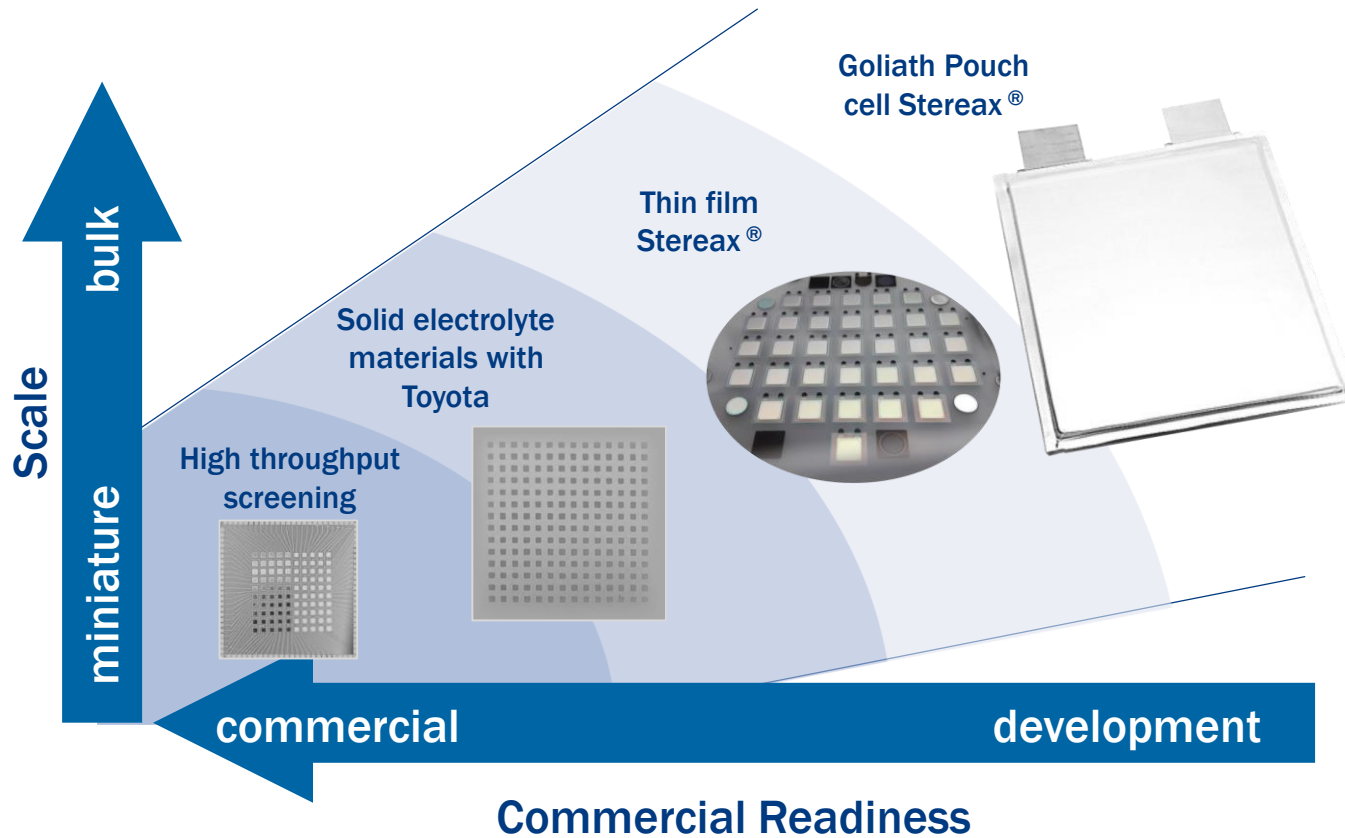
***“Ilika’s high-throughput techniques are essential to overcome some of the technological barriers we face in the development of leading edge technologies”***

Mr. Okajima, Project Manager at Toyota’s Frontier & Advanced Engineering Strategy Dept in its R&D Management Center.

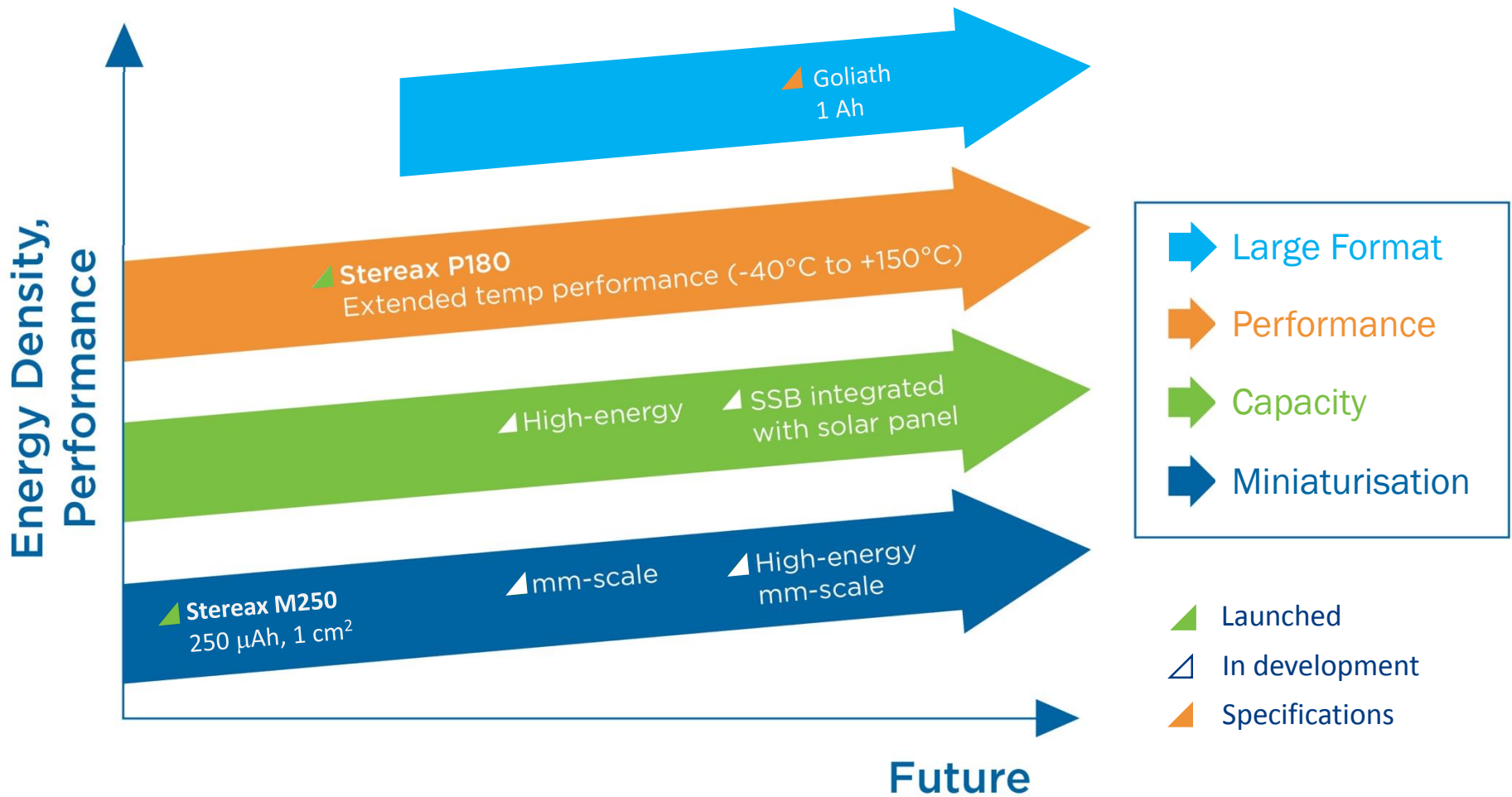
# Benefits of solid state

	Conventional Li-ion	Supercapacitors	Solid State Batteries
Non-flammable			
5,000 cycles+			
Ultra-compact			
Low leakage			
Power Density			

# Stereax<sup>®</sup> product evolution

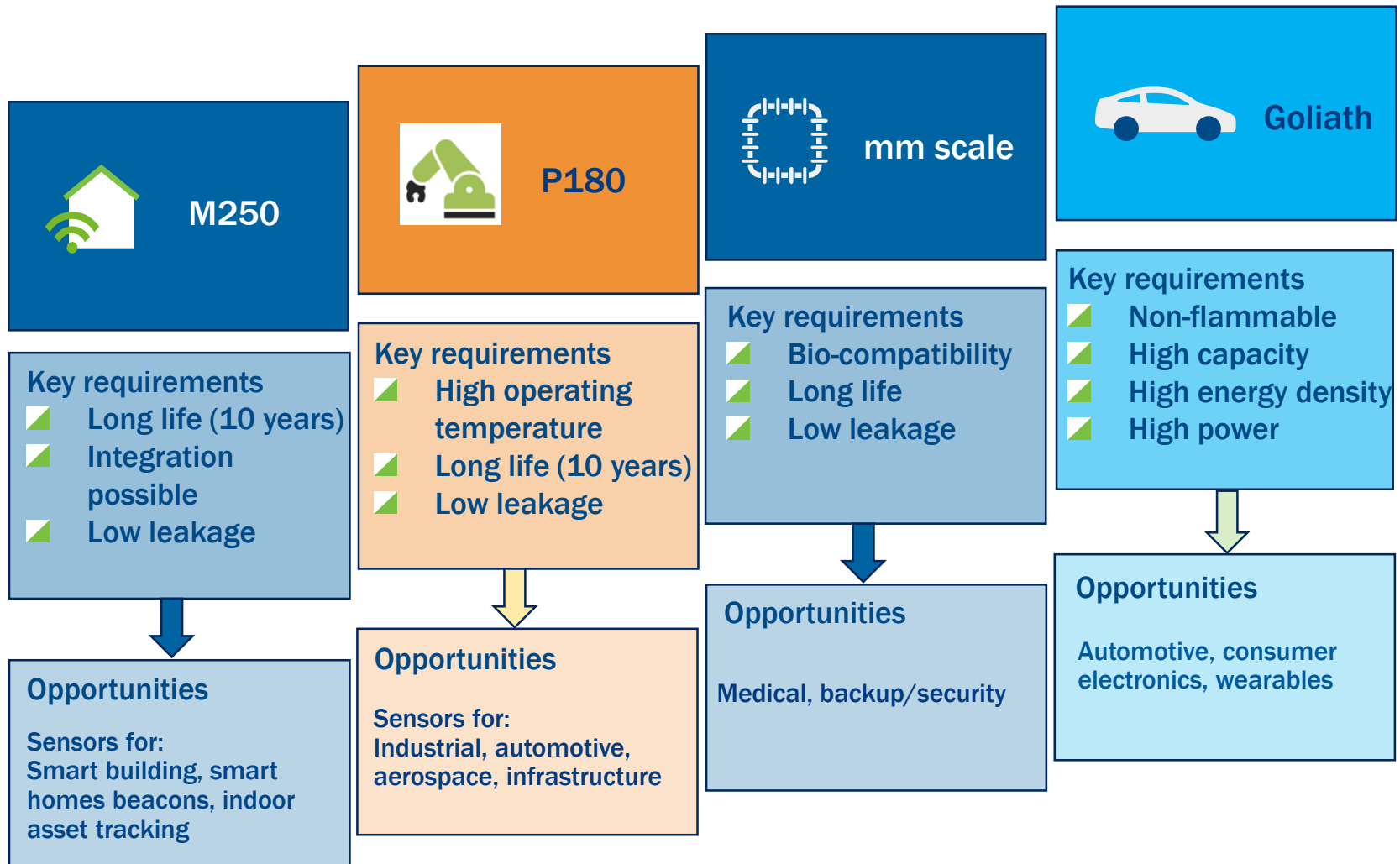


# Stereax<sup>®</sup> road map



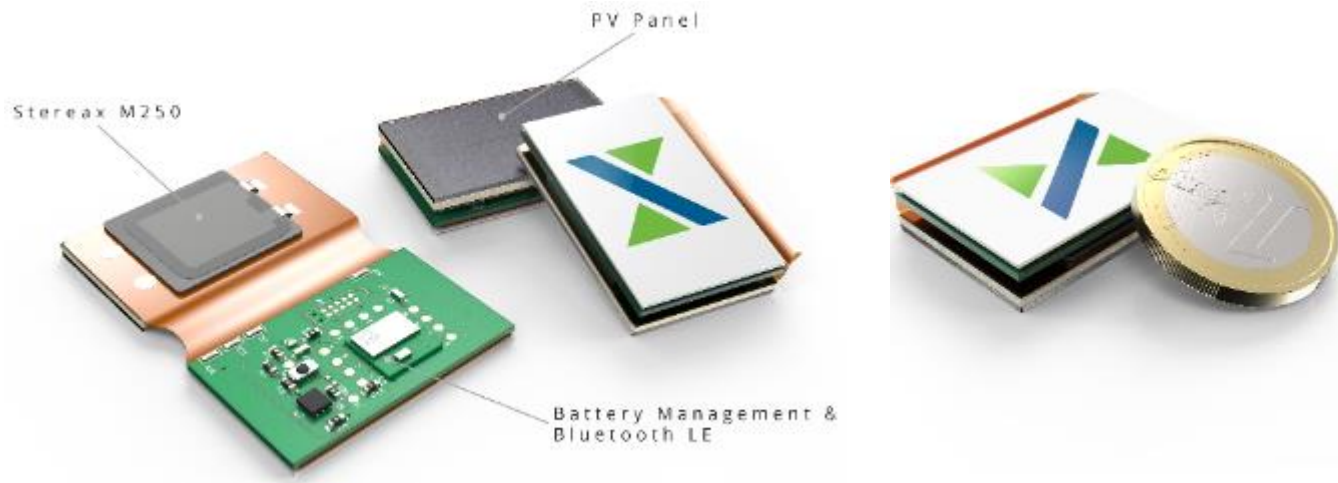


# Stereax<sup>®</sup> product to market mapping



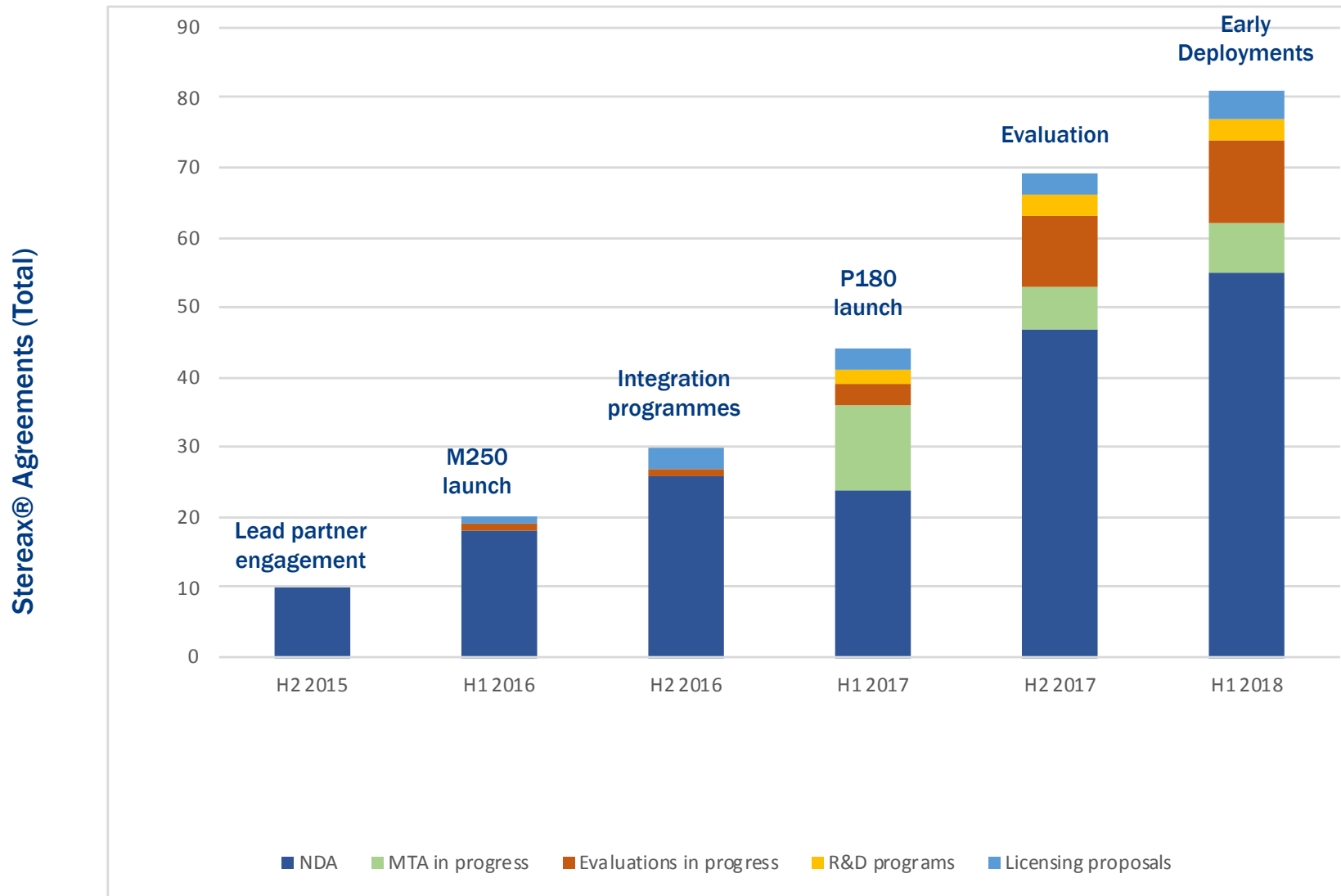
# Smart beacon demonstrators

- ▲ Perpetual beacon with temperature sensor powered by Ilika Stereax<sup>®</sup> Solid-State Battery and PV panel.



- ▲ Fit and forget solutions for wireless sensors.

# Stereax® thin film commercialisation



# Stereax<sup>®</sup> thin film deployment projects

## Medical

- ▲ Miniature medical implants with a medical device company
- ▲ £695k over two years from March 17
- ▲ Total addressable market est. 50m units\*



## Transportation

- ▲ Autonomous sensors with Lightricity (ex-Sharp)
- ▲ £328k over 21 months from July 17
- ▲ Total addressable market est. 245m units\*



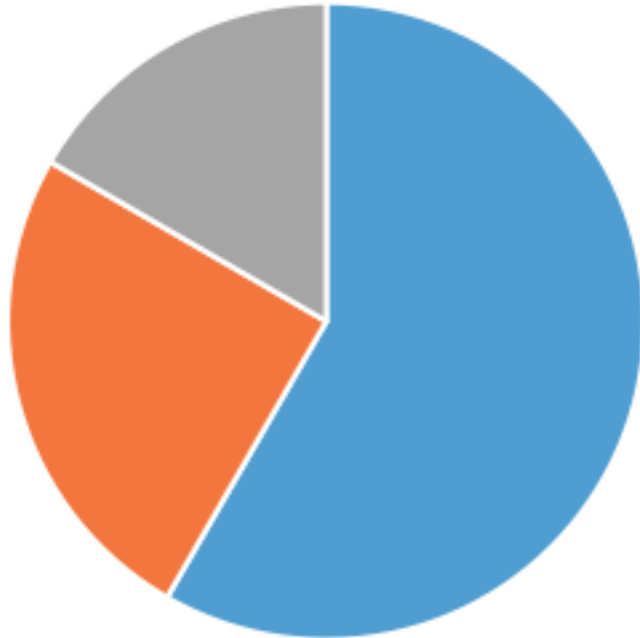
## Industrial

- ▲ Condition monitoring of turbine blades with Titan Wind Energy
- ▲ £395k over two years from March 18
- ▲ Total addressable market est. 137m units\*

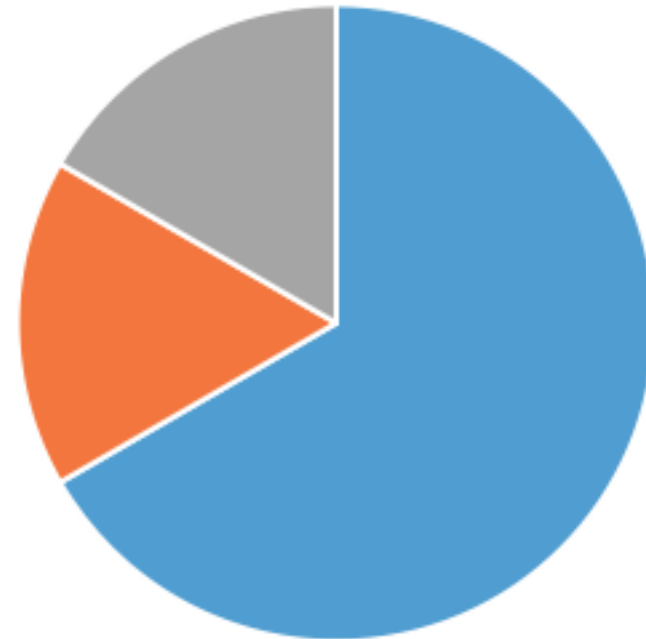


\* Source Liberum estimates for TAM in 2022

# Stereax<sup>®</sup> thin film evaluation distribution



■ Medical Device ■ Industrial ■ IDM/Foundry



■ US ■ EU ■ Asia

# Goliath – Large format batteries for automotive

# What the industry says

## ▲ Toyota in the Chunichi Shimbun, July 2017

- ▲ "By the early 2020's Toyota will put solid-state batteries into production".

## ▲ Audi: Dr Peter Mertens, Telegraph, March 2018

- ▲ "Solid-state batteries will be the next technology we believe and we are currently looking at it in terms of secondary measures, cooling safety and so on, but it does have a better power density....."

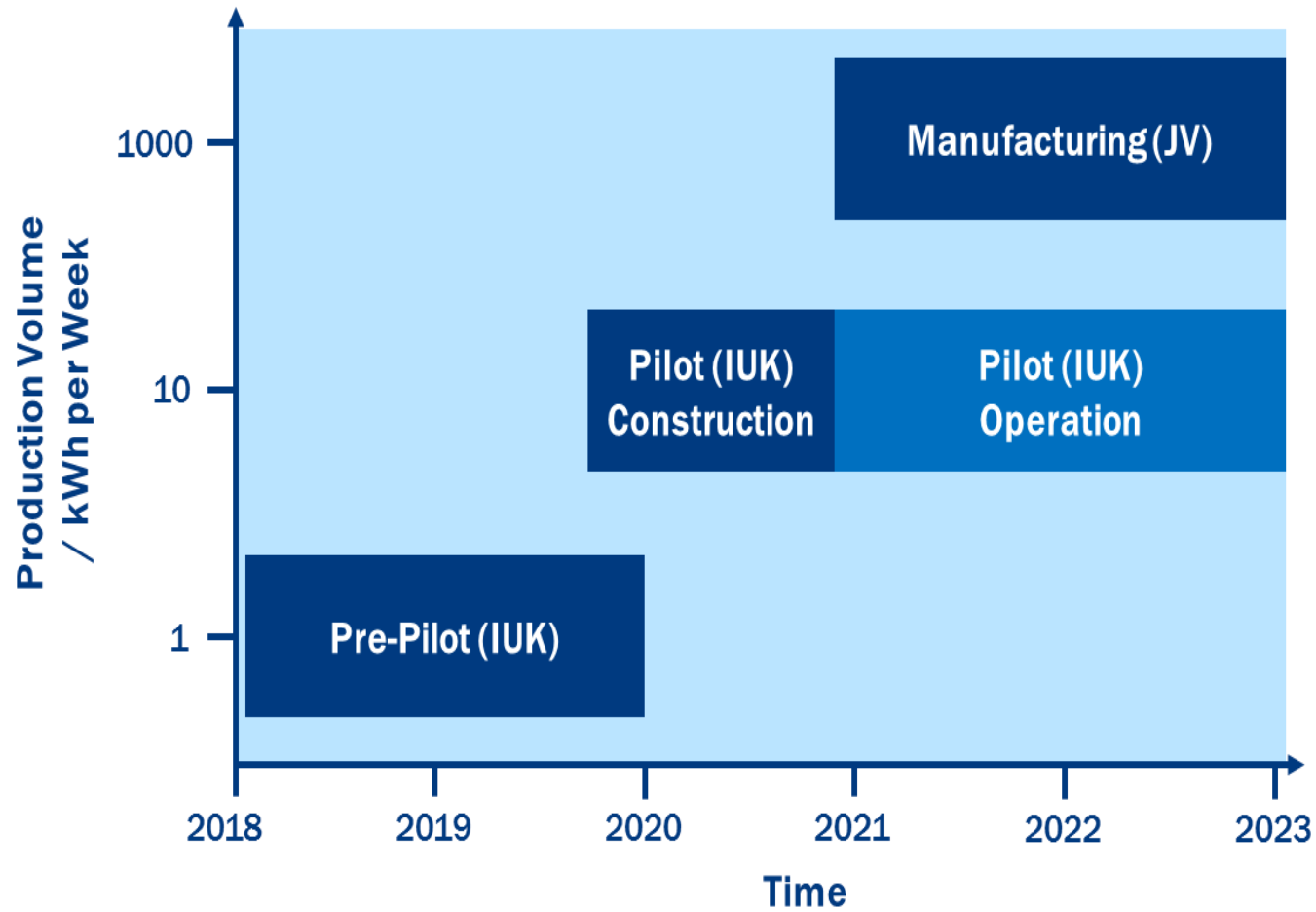
## ▲ Renault-Nissan-Mitsubishi: Gilles Normand, FT, March 2018

- ▲ "(Solid-state) promises huge advantages over current lithium-ion batteries in cost, density and thermal stability".

- ▲ Argonne National Laboratory estimates 50% of vehicle production by 2030 to be EV or PHEV
- ▲ In July 2017, UK govt announced £246m commitment over 4 years on automotive battery development
  - ▲ Cell manufacture
  - ▲ Modules
  - ▲ Battery pack design
  - ▲ Vehicle application
- ▲ In Nov 2017, IUK announced £80m National Battery Manufacturing Development Facility in Warwick
- ▲ IUK announced 2 significant grant offers to Ilika from Faraday competition for “Powerdrive Line” and “MoSeSS”, contracts subject to this fundraise.



# Goliath Scale-up



# Financial Results

	2017-18	2016-17
	£m	£m
Turnover	2.1	1.1
Expenses	(4.9)	(4.4)
Share based payment charge	(0.5)	(0.5)
Loss before tax	(3.3)	(3.9)
Tax credit	0.4	0.4
Loss for the year	(2.9)	(3.5)
Cash balance at year end	2.8	5.4

# Use of Funds Raised

	Goliath	Other	Total
	£m	£m	£m
pre-pilot capex	1.6		
project costs	1.5		
funding offered by IUK	(2.3)		
Goliath funding			0.8
Capex		0.2	
Working capital		3.0	
Other funding			3.2
Target funding			4.0

# Milestones achieved and planned

Since Oct 2016:

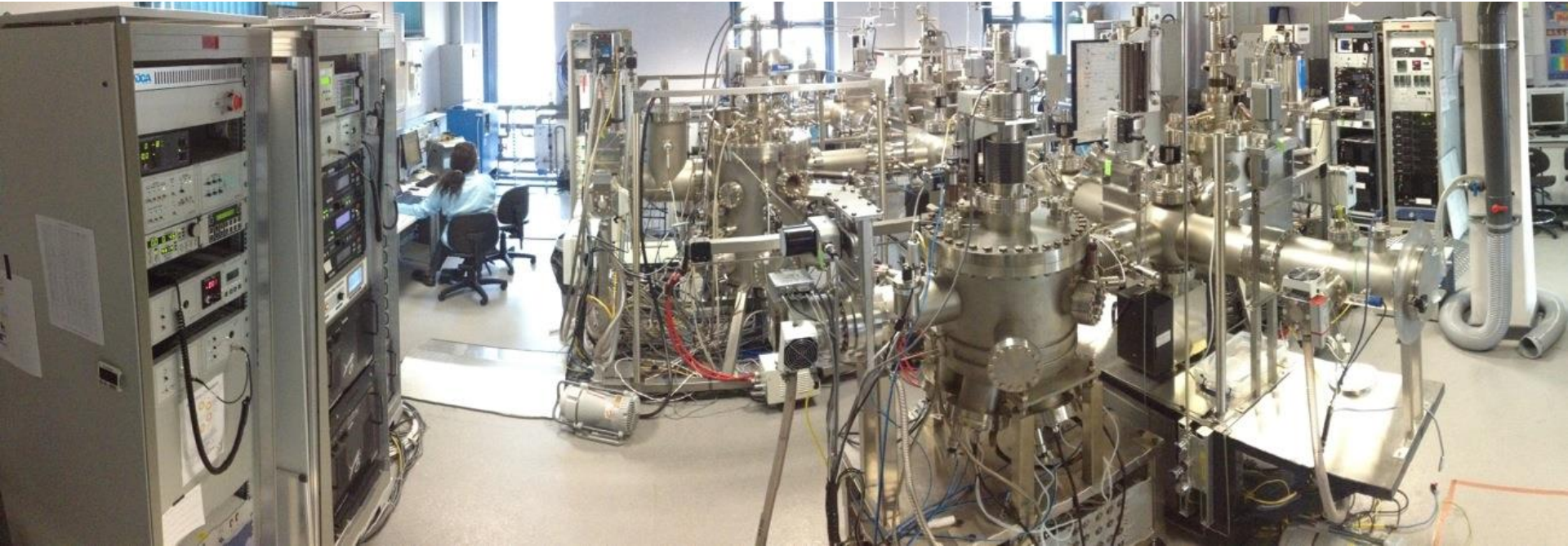
- ▲ Secured IP (6 patent families filed)
- ▲ Qualified and launched Stereax<sup>®</sup> P180
- ▲ Announced 3 Stereax<sup>®</sup> deployment partners
- ▲ Engaged with 60 potential licensees
- ▲ Doubled turnover

2018/19:

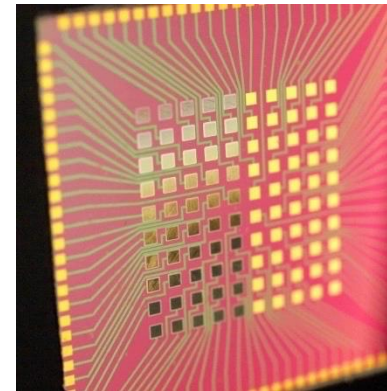
- ▲ Grant funding from the Faraday fund
- ▲ Secure initial licensing partnerships
- ▲ Commission Goliath pre-pilot line
- ▲ Material increase in turnover

# Appendix

# High throughput innovation platform



- **10-100x faster innovation**
- **Improved ROI**
- **Scalable**
- **Patent protected**



# Stereax thin film pilot line

- ▲ 6" wafer pilot line
- ▲ Production of samples of M250 and P180
- ▲ Development of next thin film cells





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