



accelerated materials innovation

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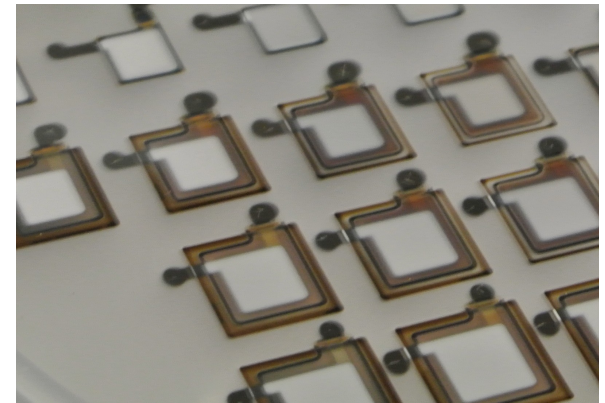
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# Business overview

Rapid discovery of new  
materials for the energy  
and electronics sectors



Solid-state batteries  
for IoT devices



TOYOTA



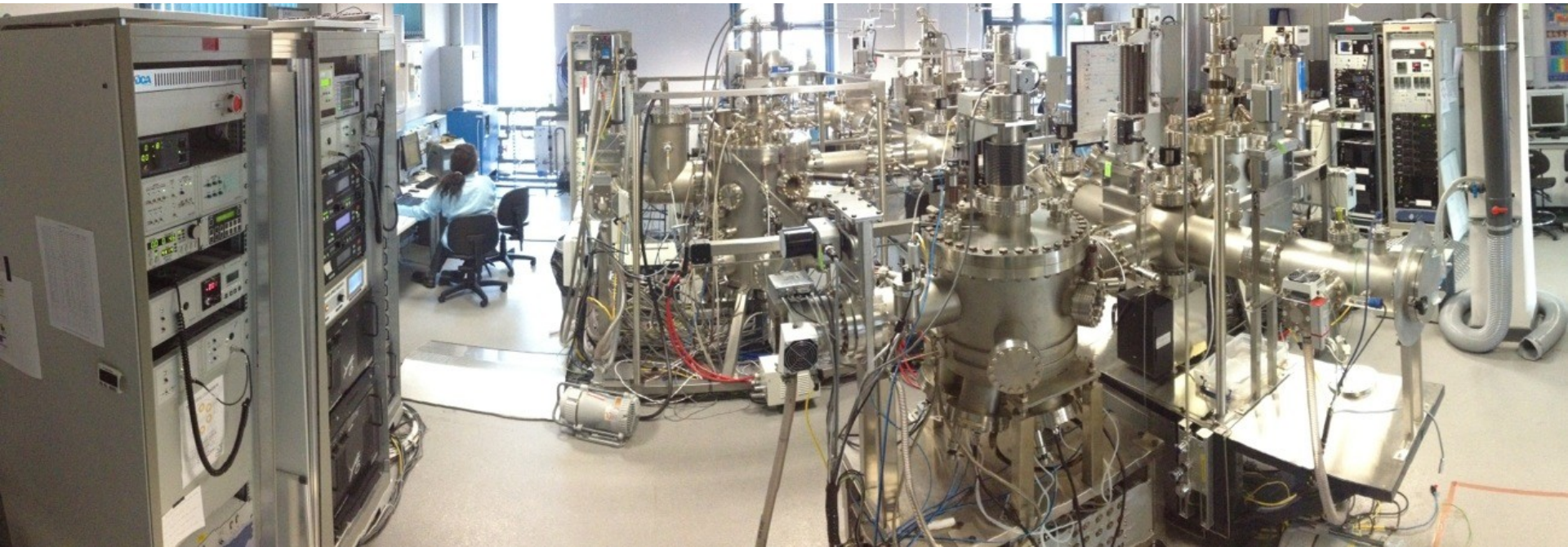
Rolls-Royce



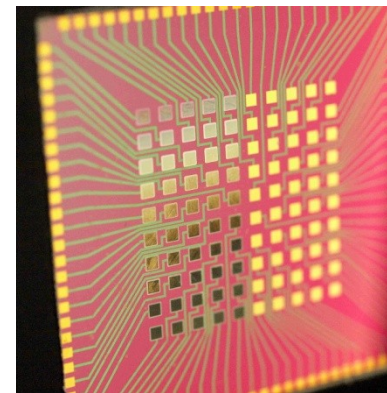
**TOSHIBA**  
Leading Innovation >>>



# High throughput technology platform



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



# Next generation batteries

## Market requirement:

- Higher energy density
- Faster charge and discharge times
- Non-flammable materials

## Solution:

- Advanced electrode & electrolyte materials  
for lithium-ion batteries

## Status:

- Toyota appointed Ilika in 2008 to reduce technical risk
- 9 patents filed since then
- Current market size of \$8bn p.a. and expected to grow to \$32bn by 2018\*



**TOYOTA**

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

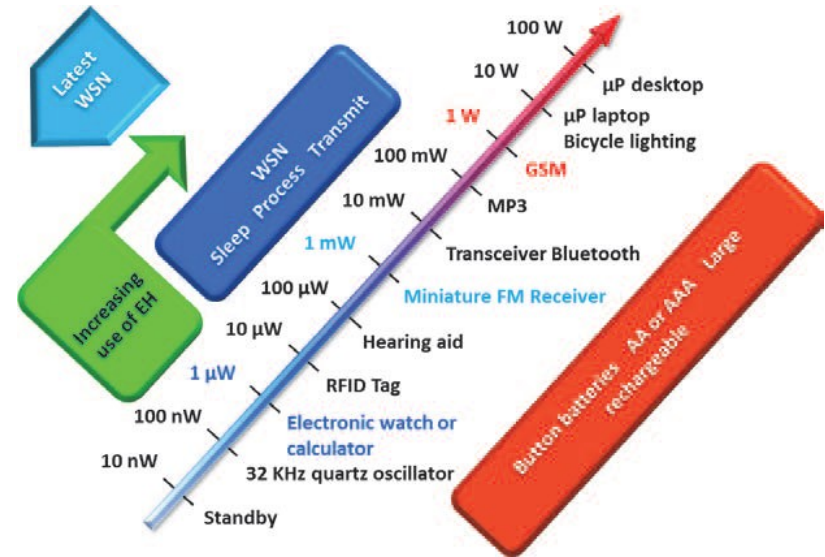
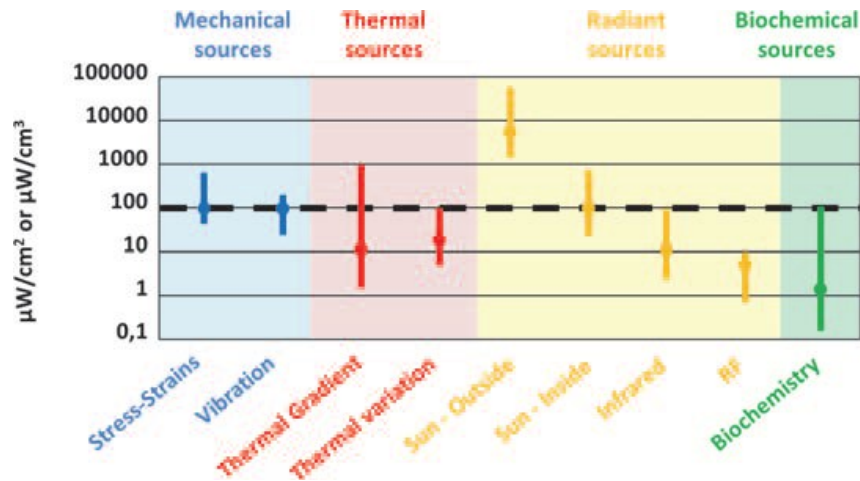
Mr. Okajima, Project Manager at Toyota's Frontier & Advanced Engineering Strategy Dept in its R&D Management Center.

\*Source: Avicenne AABC Europe 2013



# Powering IoT devices

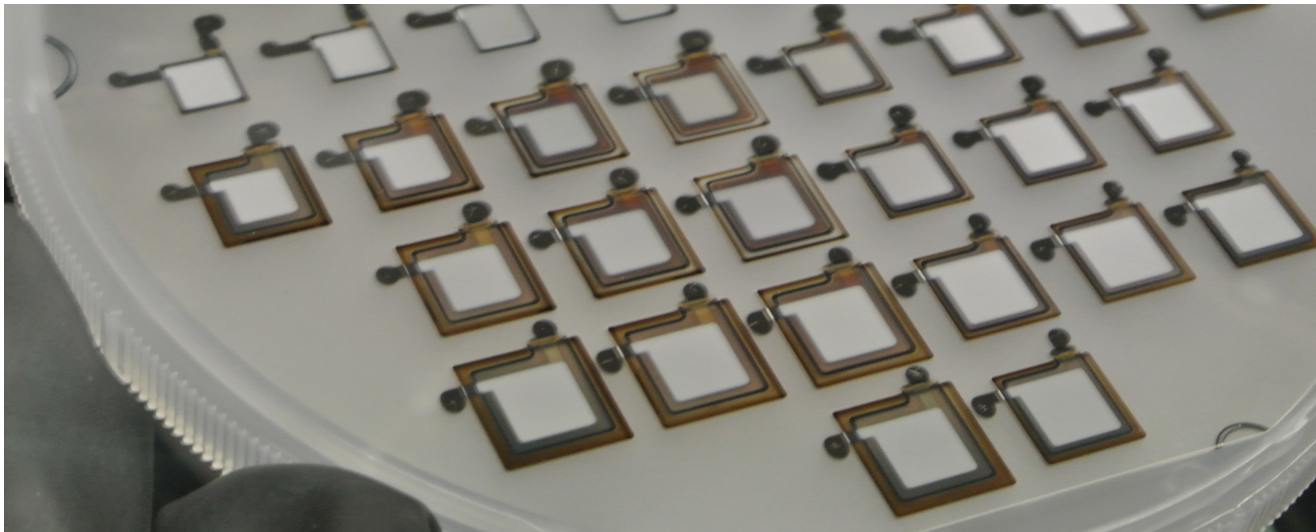
## Autonomous devices for WSN and IoT



- Increase in power generated by current energy harvesters
- At the same time, very low power electronics (sensors, MCU, transmission, ultra low power sleep modes)
- There is now a match between power generation and demand

# Benefits of solid-state batteries

- ▲ Non flammable
- ▲ Faster charging – can charge **6x faster**
- ▲ Longer lasting – can retain charge **4x longer**
- ▲ Increased energy density – can contain **2x the energy** for the same volume

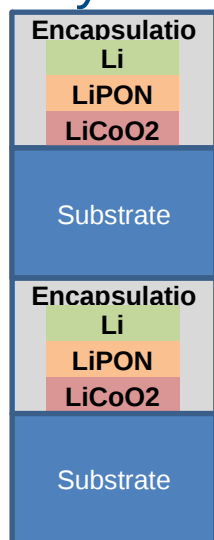


# A World First for Ilika

## ▲ Competition (IPS, Cymbet, STMicroelectronics)

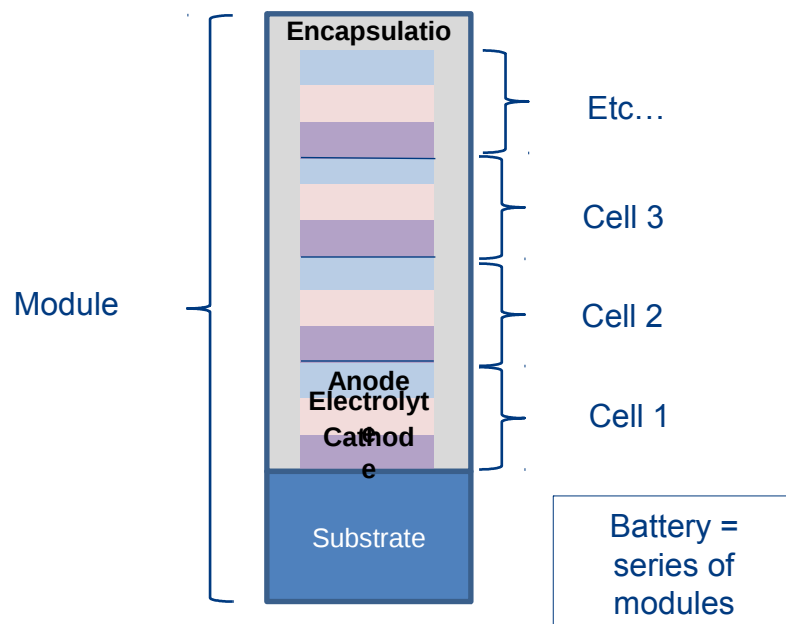
Competitors use technology and materials licensed by Oak Ridge which cannot be stacked because heat treatments in subsequent layers degrade previous layers.

Huge volume and mass waste when cells are stacked



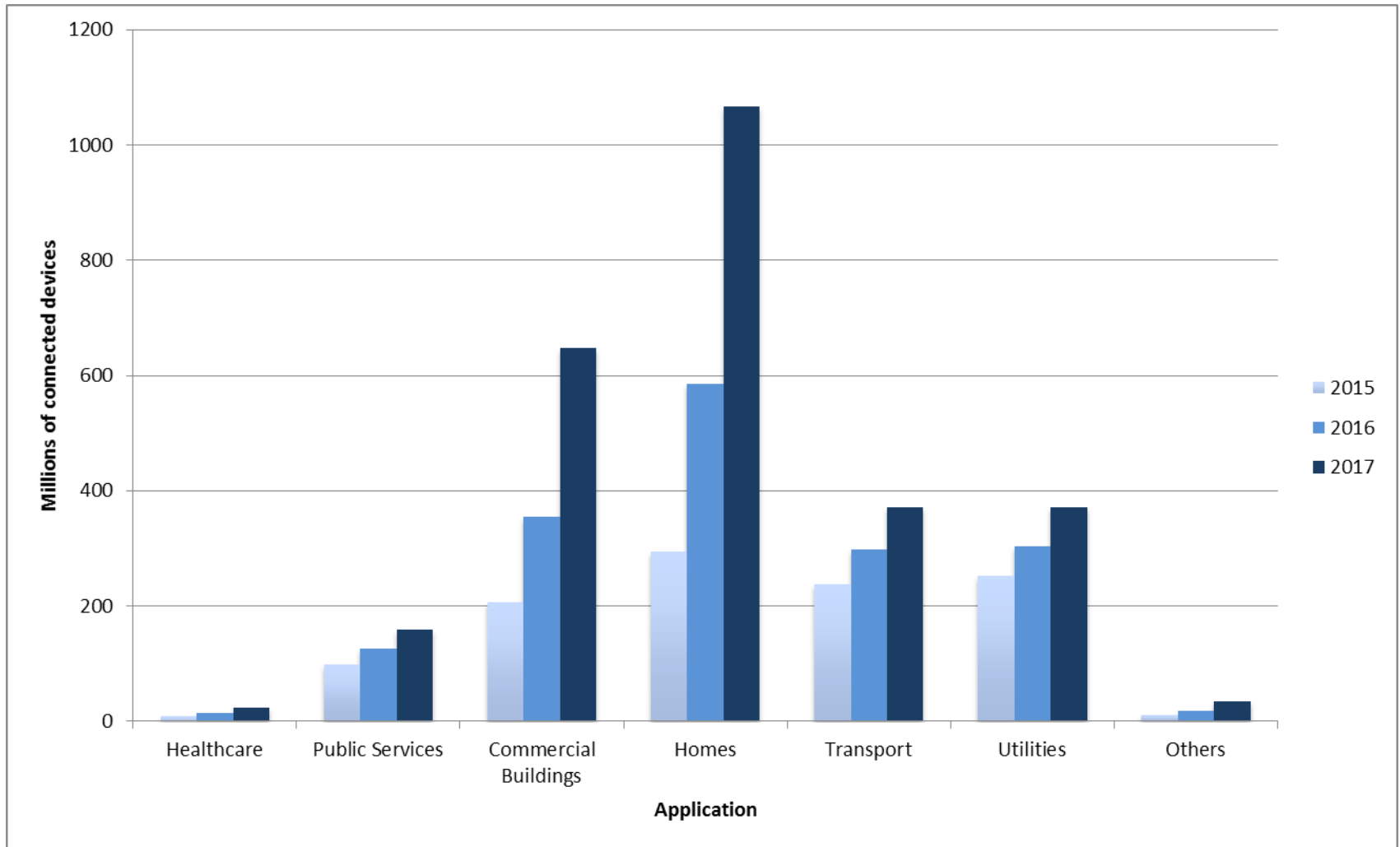
## ▲ Ilika Thin Film Batteries

Ilika's technology enables stacking cells by using thermally compatible materials and isothermal processes.





# IoT connected devices



# WSN devices for the Smart Home

▲ Energy autonomous and attendance free (“fit and forget”)

▲ Virtually invisible

▲ Lighting

▲ Window position

▲ Blind position

▲ Door position

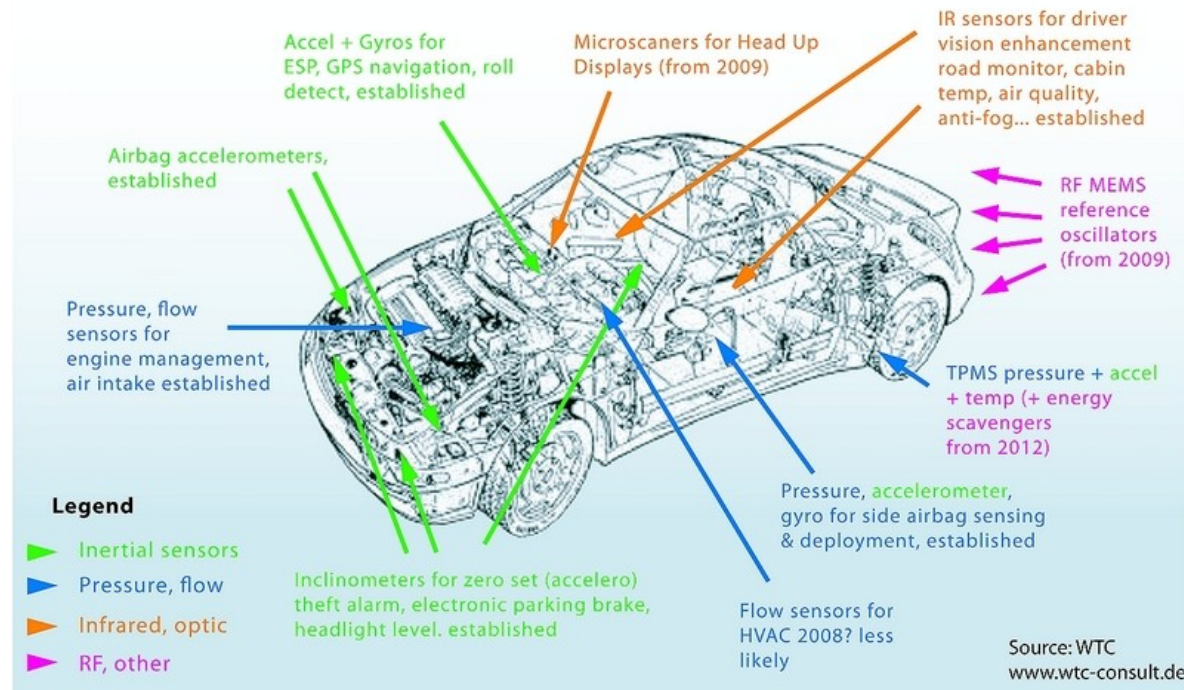
▲ Humidity



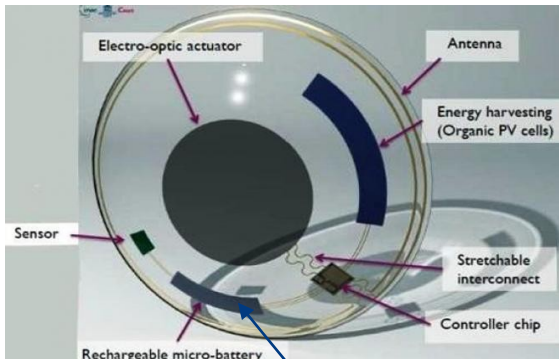
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# WSN devices for Automotive

- ▲ Energy autonomous and attendance free (“fit and forget”)
- ▲ Virtually invisible
- ▲ Average modern car has 50-140 MEMS devices\*
- ▲ Cabling is 3rd heaviest component (behind chassis and engine), averaging 100kg\*
- ▲ Cable installation is manually intensive



# Google contact lens for diabetes



3  $\mu$ Ah, 1 mm x 1 mm Solid State Battery

Google Contact Lens is a smart contact lens project announced by Google X on 16 January 2014.

The project aims to assist people with diabetes by constantly measuring the glucose levels in their tears.

## SOFT CONTACT LENS:

- Encapsulates electronic signals

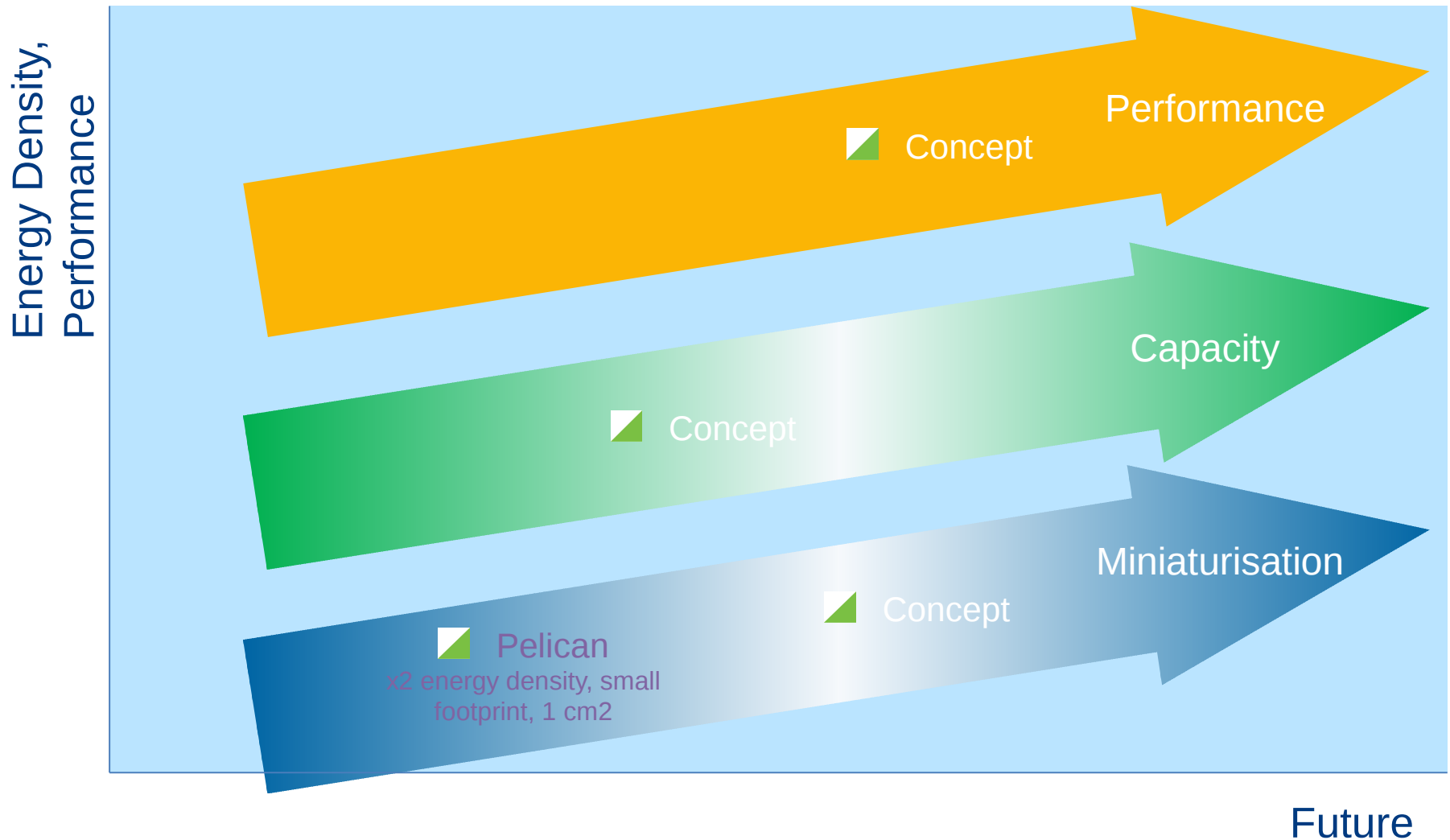
## SENSOR:

- Detects glucose in tears.

## CHIP AND ANTENNA:

- Receives power and sends information.

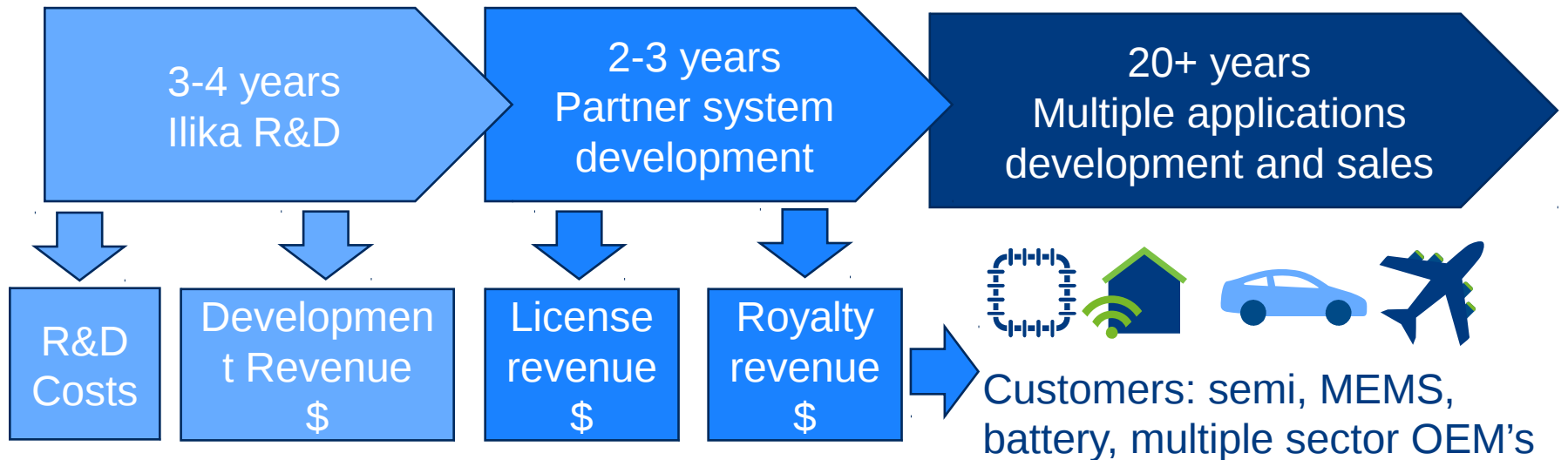
# IoT solid state battery road map





# Ilika business model

- ▲ Advanced solid-state technology developer
- ▲ Business model yielding potential 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



# Outlook for 2016

- ▲ Continue to operate pilot line to produce prototype batteries and performance data
- ▲ First product launch in H1 2016
- ▲ Continue development of licensing opportunities

***Thank you for your time***

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