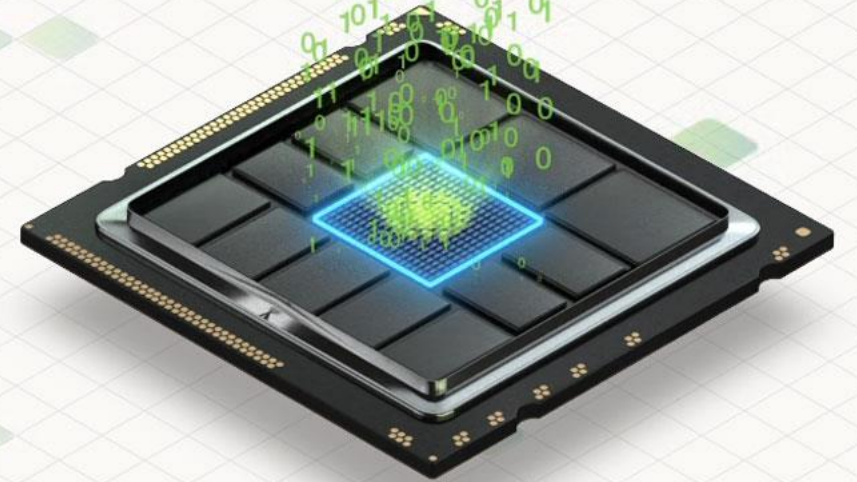




**Weebitnano**  
THE NEXT NVM IS HERE

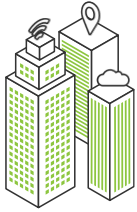
# ReRAM: Now in Commercialisation

August 2023



# Weebit: Leading Licensor of ReRAM IP

## Advanced Non-Volatile Memory (NVM) Now Entering Production



**Founded: 2015**

Located: Israel & France  
ASX: WBT



**Signed 1<sup>st</sup> commercial deal**

Ongoing discussions & evaluations with additional foundries and customers



**World-leading team**

50 personnel<sup>(1)</sup>  
(90% engineers/scientists)



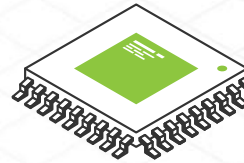
**Greener NVM**

Lower environmental impact than other types of NVM (CO<sub>2</sub>, resource use, materials)



**R&D partner**

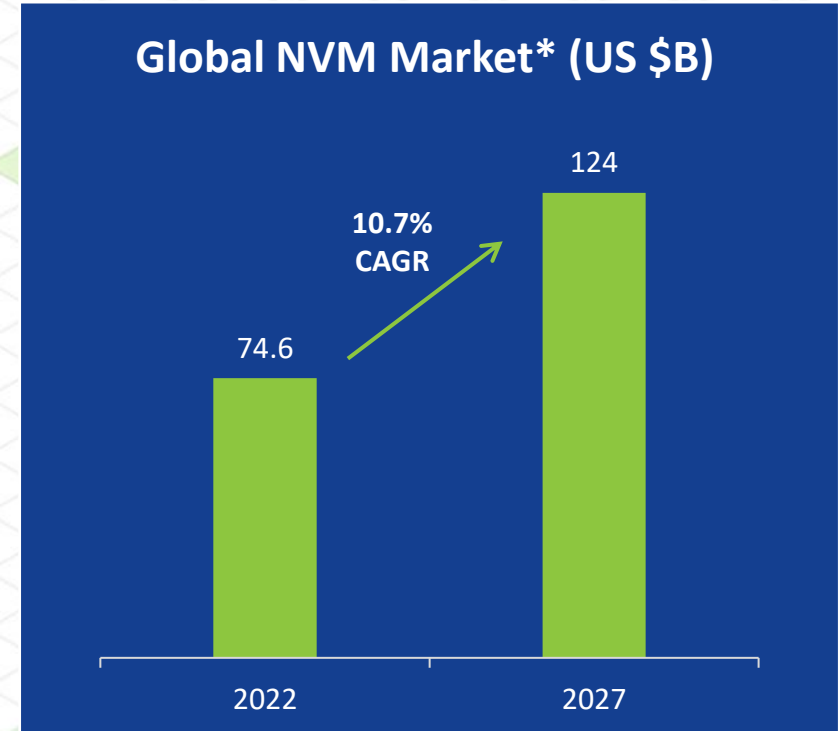
CEA-Leti, a leading microelectronics research institute



**Proven, protected technology**

Fully qualified per JEDEC; available for chip designers; 50 patents & applications

### Global NVM Market\* (US \$B)



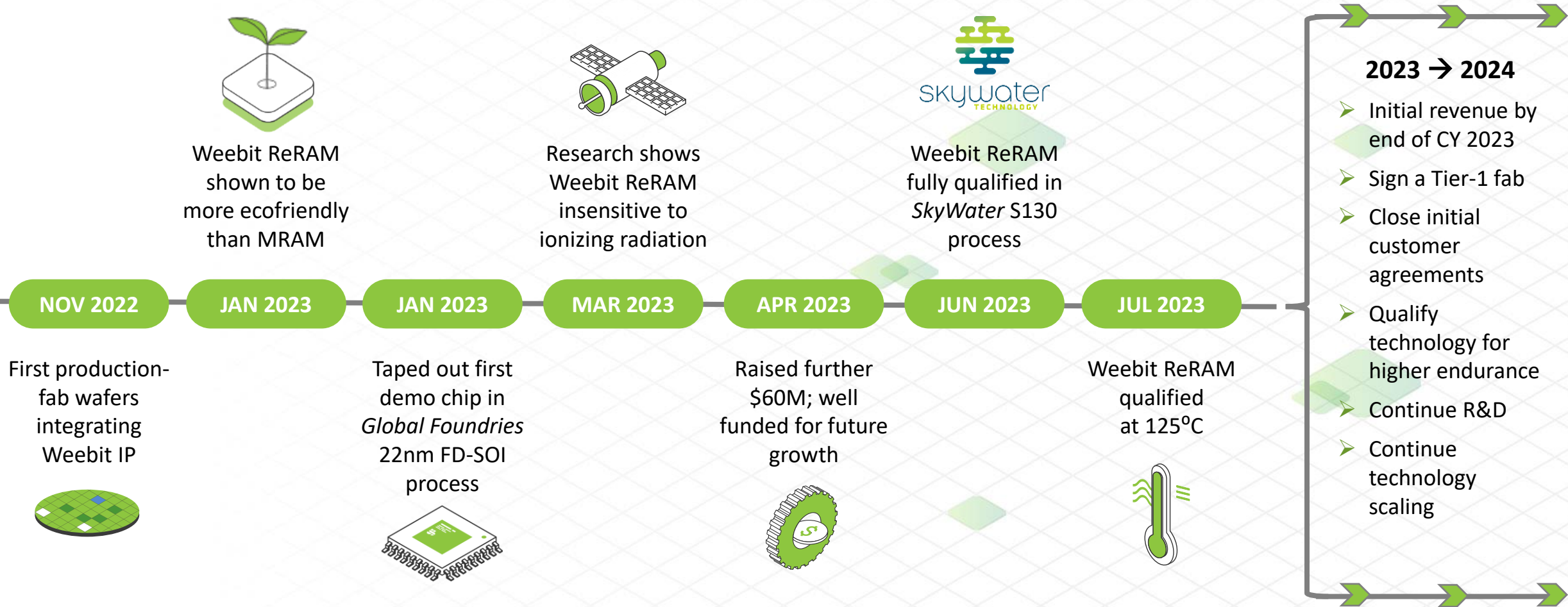
Recently added to

**MSCI**   
Global Small Cap Index

**S&P/ASX 300**

\* Source: MarketsandMarkets, December 2022  
(1) Includes employees and full-time contractors

# Meeting Milestones & Advancing Towards Sustained Growth





# Strong Board With World-renowned Semiconductor Industry Experience

**David (Dadi) Perlmutter**  
CHAIRMAN



**Dr. Yoav Nissan-Cohen**  
EXEC. DIRECTOR



**Atiq Raza**  
NON-EXEC.  
DIRECTOR



**Mark Licciardo**  
NON-EXEC.  
DIRECTOR



**Ashley Krongold**  
NON-EXEC.  
DIRECTOR



**Coby Hanoch**  
CEO



# Strong & Experienced Management

**Coby Hanoch**  
CEO



**Ishai Naveh**  
CTO



**Amir Regev**  
VP TECH.  
DEVELOPMENT



**Ilan Sever**  
VP R&D



**Eran Briman**  
VP MARKETING &  
BUSINESS DEV.



**Alla Felder**  
CFO

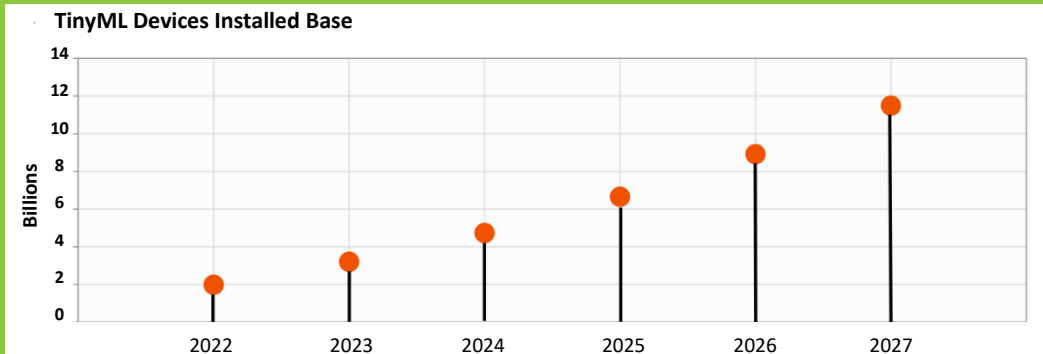


# AI at the Edge is Driving the Need for New Memory Technologies

## AI inference is increasingly local (edge), driven by:

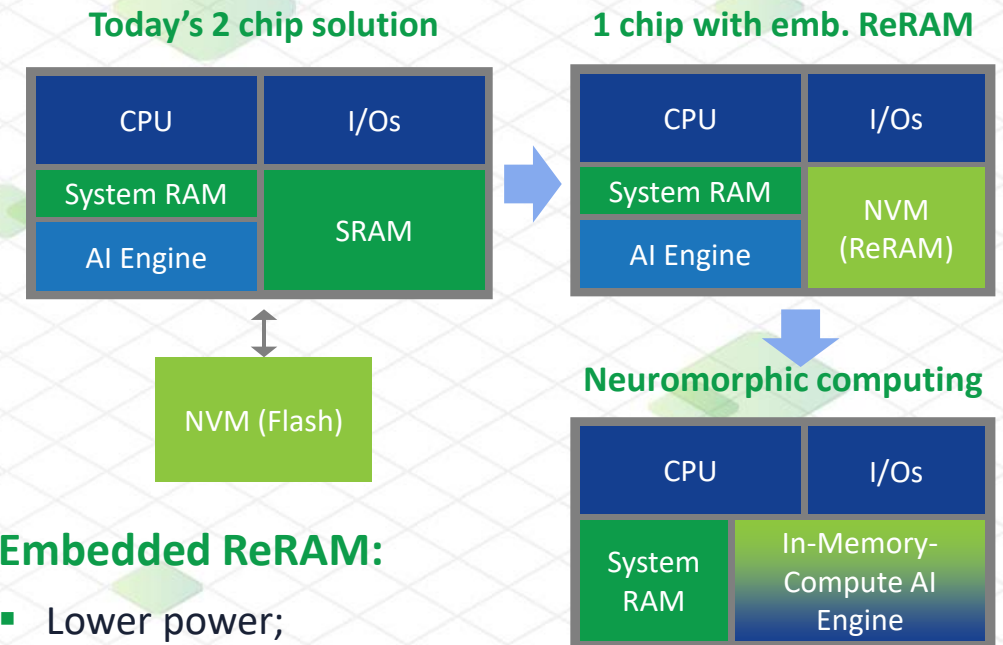
- Power efficiency
- Ultra-low latency
- Low bandwidth
- Security/privacy
- Smarter products; new applications

## Machine learning (ML) in IoT sensors & devices is growing rapidly



Source: <https://go.abiresearch.com/lp-37-technology-stats-you-need-to-know-for-2023>

AI/ML training and inference models continue to increase in size & sophistication → Need higher density embedded memories, in more advanced process nodes



## Embedded ReRAM:

- Lower power; longer battery life
- Lower cost; reduced SRAM
- Enhanced security
- System integration



# Weebit ReRAM Memory Inherent Advantages

**100x**

Better **endurance**  
vs. flash

- ✓  $10^5$ - $10^6$  P/E cycles



**~100x**

More **energy efficient**  
vs. flash

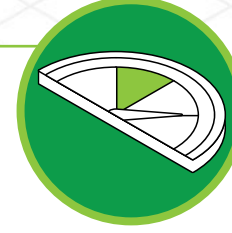
- ✓ Low voltage, low currents
- ✓ Zero standby power



**~100x**

Faster **programming time** than flash

- ✓ Bit/byte addressable



**3-4x**

**Lower added wafer cost** vs. flash

- ✓ 2-mask adder
- ✓ Standard materials



**<40nm**

**Scales** to processes far  
below limits of flash

- ✓ Proven @ 28nm
- ✓ Scaling to 22nm & below



**150°C**

**Reliability** for up to  
10 years

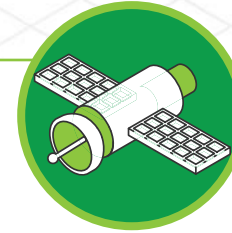
- ✓ Endures 9 SMT reflow  
cycles



**~350x**

Better **radiation tolerance** vs. flash<sup>(1)</sup>

- ✓ Also tolerant to EMI



**53%**

Less **minerals and metals**  
resource use vs. MRAM

- ✓ Greener technology
- ✓ No rare earth materials



# Weebit ReRAM Addresses a Broad Range of Application Requirements

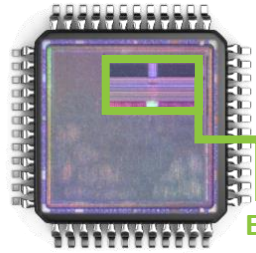


## Example Applications:

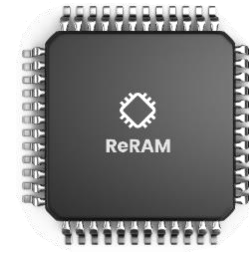
	Mixed-Signal / Power Mgmt	IoT / MCUs	Edge AI	Automotive	Aerospace & Defense	Medical
	Wireless charging; Motor control	Wearables; Smart cards	Security cameras; Industrial	ECUs for sensors & controllers	Flight safety systems; Satellites	Implantables; Hearables; Disposable
Back-end-of-line tech for easy analog integration	✓					✓
Cost-efficiency	✓	✓	✓	✓		✓
Ultra-low power consumption	✓	✓	✓			✓
Robustness in high temp / extreme environments	✓	✓		✓	✓	
Scaling advantage at 28nm and below		✓	✓	✓		
High endurance		✓		✓	✓	✓
Small footprint to store very large arrays			✓	✓		✓
Longevity		✓		✓	✓	✓
Roadmap to neuromorphic computing			✓			



# Weebit is Addressing Both Segments of the Non-Volatile Memory Market



**Embedded Memory**  
Part of an SoC  
(System-on-a-Chip)  
*Embedded Memory*



**Discrete Memory Chip**  
Contains only memory

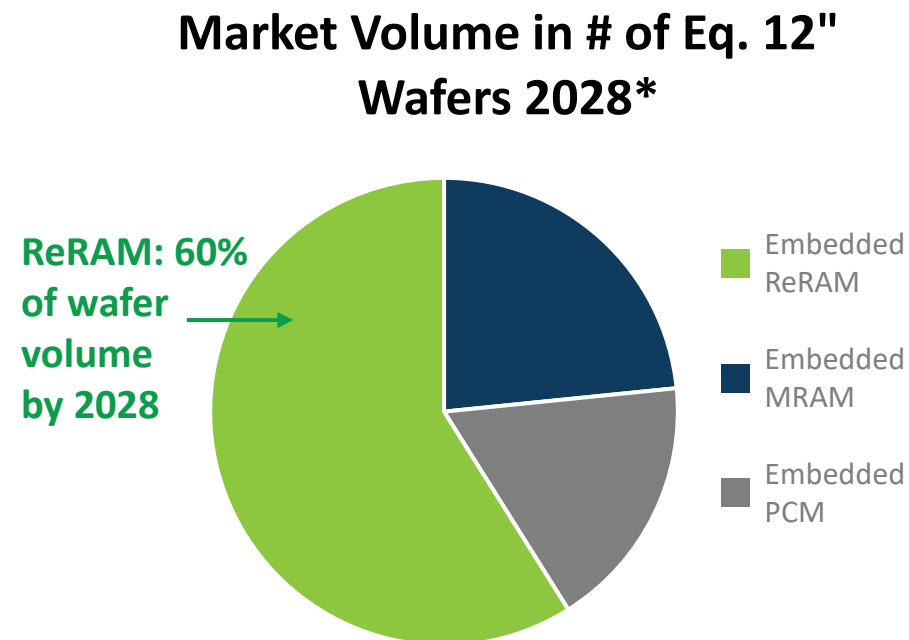
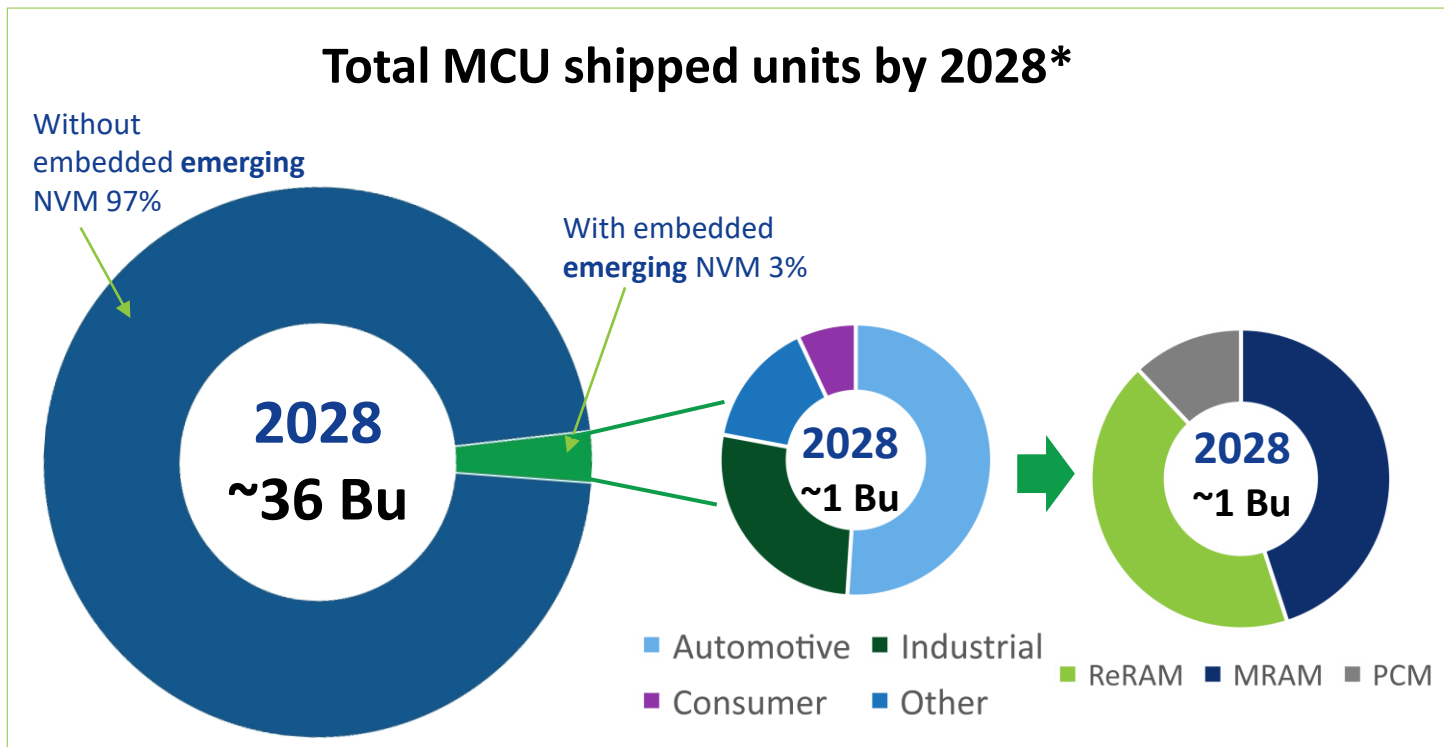
Embedded memory modules (with ReRAM IP):  
immediate opportunity

Discrete (stand-alone) memory chips:  
short/mid-term opportunity

<b>Volatile Memory</b> <i>(Erased when power removed)</i>	SRAM	DRAM
<b>Non-Volatile Memory (NVM)</b> <i>(Retained when power removed)</i>	eFlash <b>ReRAM</b> MRAM OTP/MTP	NAND Flash NOR Flash <b>ReRAM</b> MRAM EEPROM
<b>Business Model</b>	Licensing License fees + NRE + Royalties	Product Sell chips

# Embedded ReRAM Market – Approaching the Tipping Point

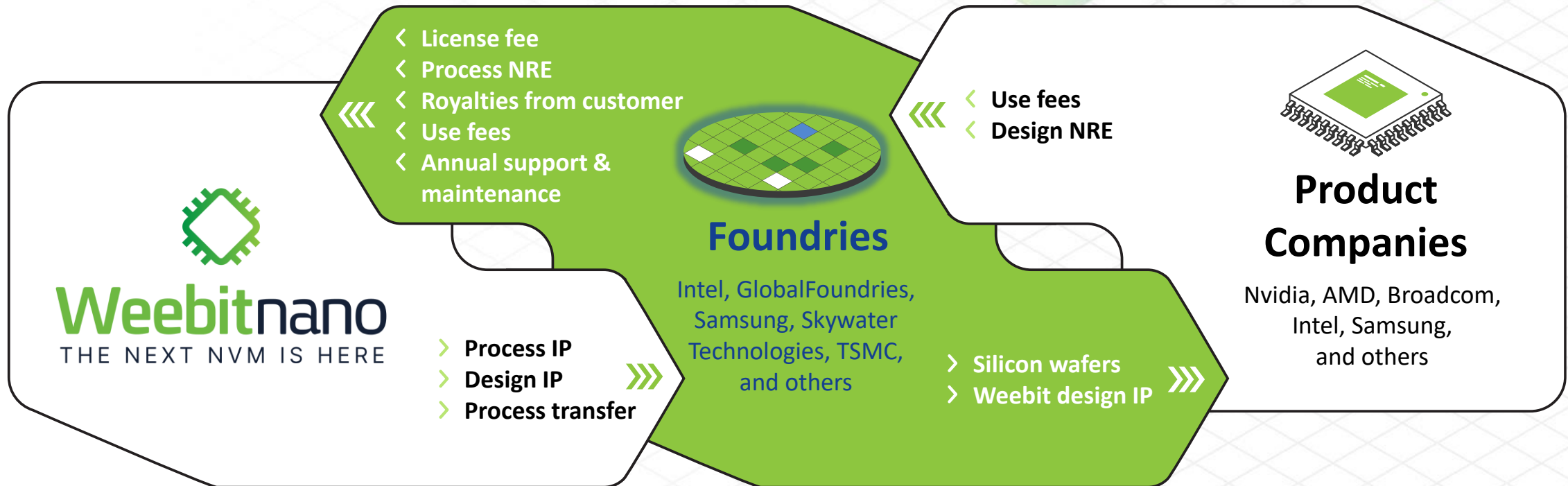
The embedded emerging NVM market is expected to reach \$2.7B by 2028, with ReRAM expected to represent 37%\*



\* Source: Emerging Non-Volatile Memory report, Yole Intelligence, 2023

# Foundry-centric IP Business Model for Embedded Market

- ❖ Foundry offers the IP to customers; collects up-front use fees from customers
- ❖ Foundry pays royalties based on % of wafer price



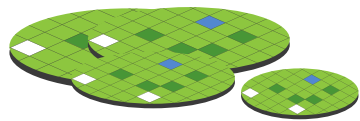


# 3-Way Business Model

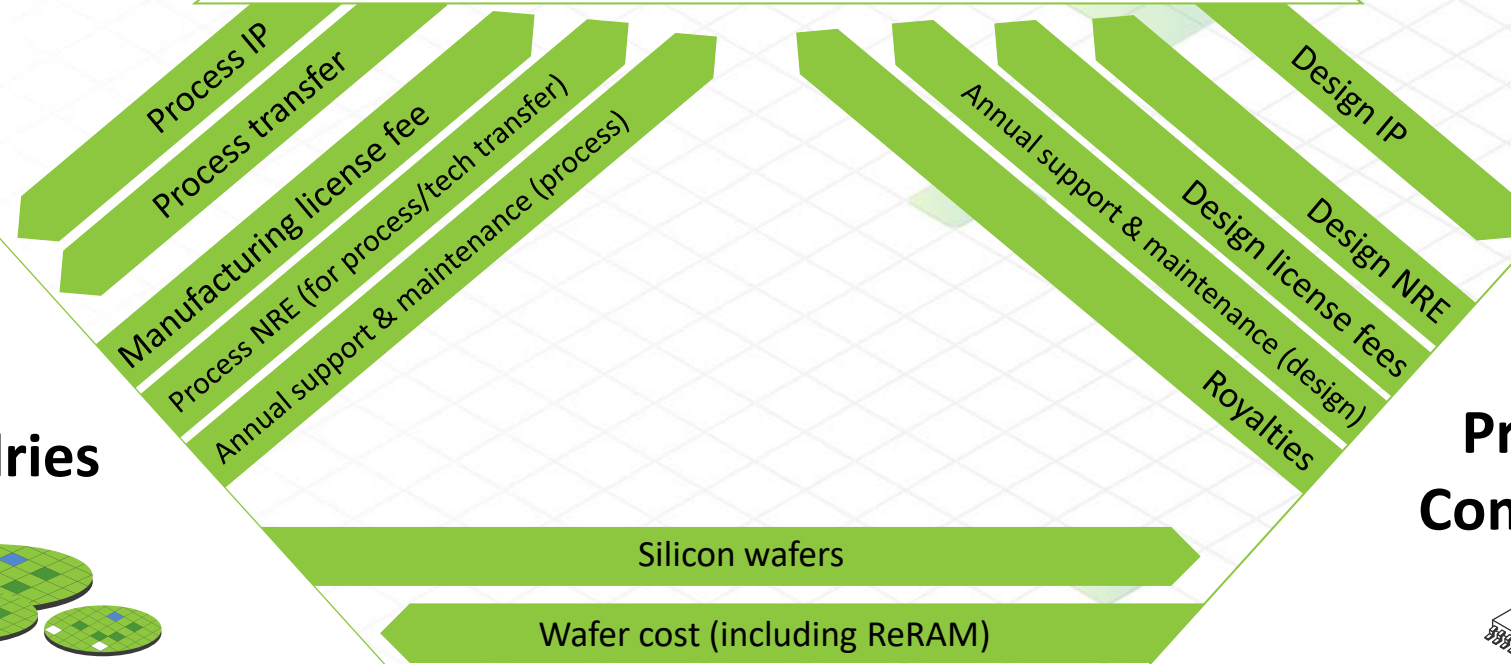
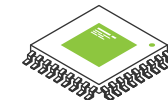


- ❖ License fees and royalties directly depend on memory size, technology type, # of instances, # of uses and other parameters
- ❖ Non-Recurring Engineering (NRE) is contingent on specific scope of work

**Foundries**



**Product Companies**

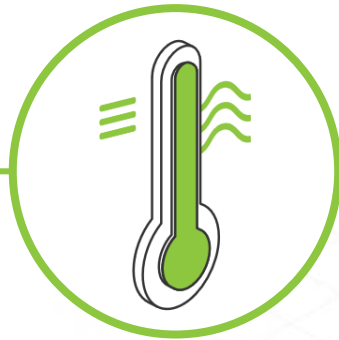


# Weebit ReRAM Fully Qualified for Automotive-grade Temperatures

Major milestone using Weebit's ReRAM memory module produced at CEA-Leti

Qualified module up to 125°C,  
the temperature specified for  
**automotive grade 1 ICs**

- Qualified wafers for **endurance and 10yr retention** per JEDEC industry standards



Demonstrates the suitability of  
Weebit ReRAM for use in:

- Microcontrollers and other automotive components
- **High-temperature industrial and IoT applications**



Based on qual results, Weebit ReRAM is being **evaluated by several Tier-1 fabs and customers**

- Repeatability, uniformity and maturity of Weebit's embedded ReRAM



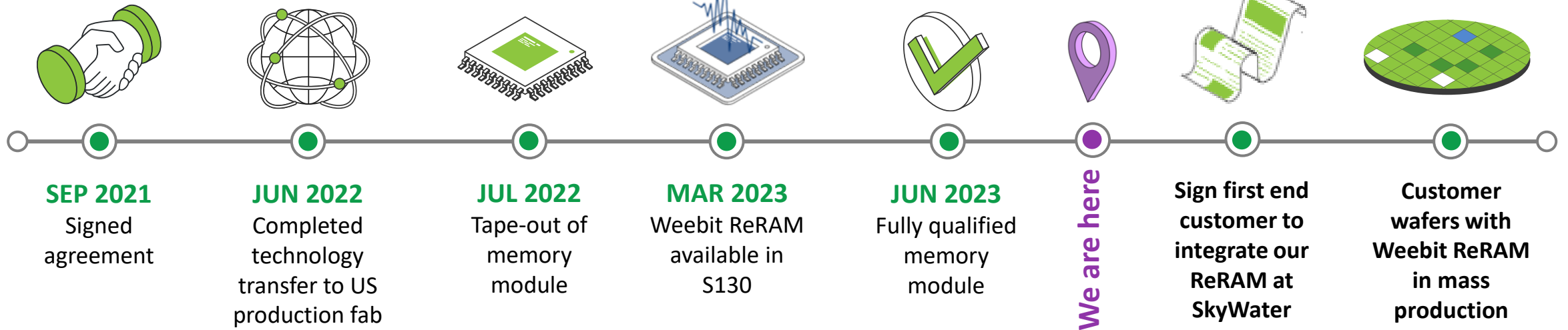
Weebit is working with CEA-Leti and SkyWater to qualify Weebit's ReRAM module at higher temperatures and endurance levels

# SkyWater Taking Weebit ReRAM to Volume Production

SkyWater Technology (Nasdaq:SKYT)  
is the only US-owned pure-play silicon foundry



Weebit CEO Coby Hanoch holding a SkyWater wafer, November 8, 2022





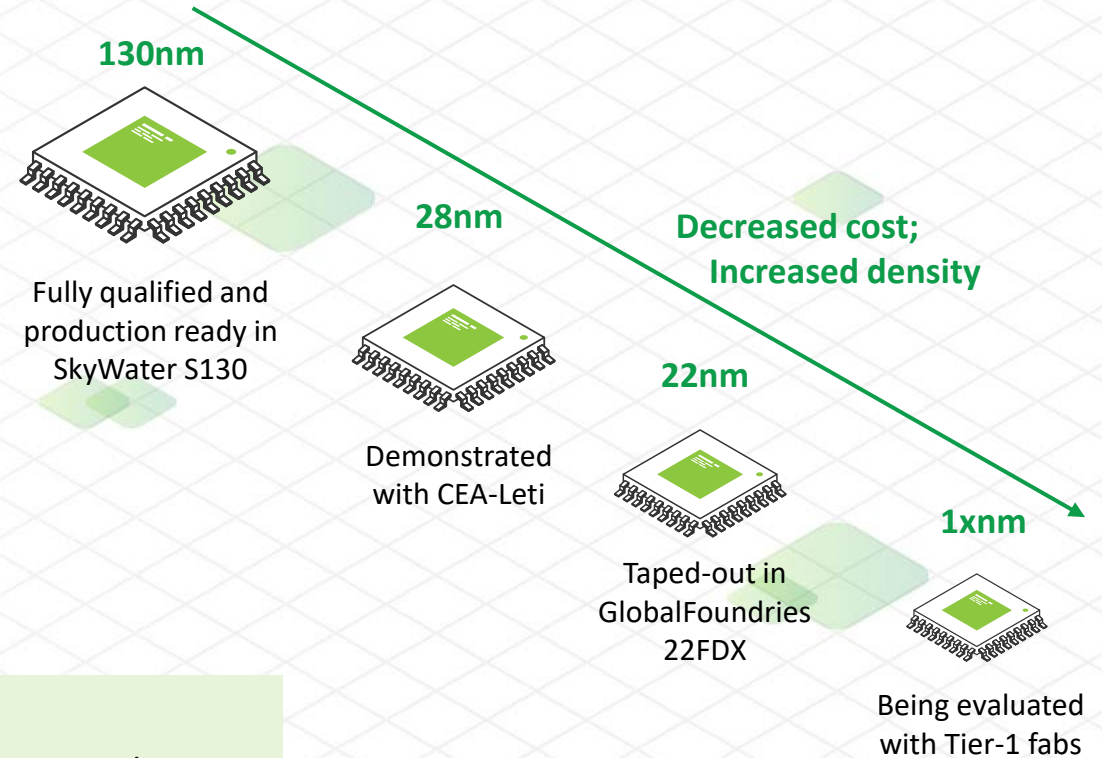
# Weebit ReRAM Scaling to Advanced Nodes

## Clear opportunities for NVM at 22nm and below

- ❖ Existing embedded flash technology is not a viable option
- ❖ Serving various applications including IoT, 5G and AI

## Recent development: taped-out ReRAM IP module in GlobalFoundries' 22FDX™ FD-SOI (fully depleted silicon on insulator) platform

- ❖ Weebit ReRAM + FD-SOI is ideal for low-power embedded devices

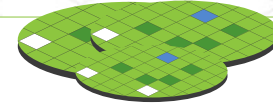


“The work Weebit and CEA-Leti are doing to make Weebit ReRAM available on GlobalFoundries' 22FDX is a welcome development as we continue to expand the ecosystem around this platform. Embedded NVM is a key element of our customers' designs, but since embedded flash is difficult to scale below 28nm, many customers are looking to NVM solutions such as embedded ReRAM.” – Mike Hogan, Chief Business Officer



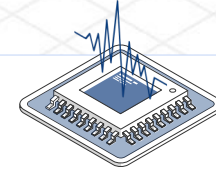
# Weebit is Engaged With Most Top-10 Foundries & IDMs

- ❖ In different levels of evaluation/negotiation with most of the top foundries / IDMs
- ❖ Expect to sign an agreement with a top manufacturer by end of the year



## Top-10 Foundries\*

- 1 TSMC
- 2 Samsung
- 3 UMC
- 4 GlobalFoundries
- 5 SMIC
- 6 Hua Hong (HLMC)
- 7 PSMC
- 8 VIS
- 9 Tower
- 10 DB HiTek



## Top-10 Integrated Device Manufacturers (IDMs)<sup>(1)</sup>

- 1 Samsung
- 2 Intel
- 3 SK Hynix
- 4 Micron
- 5 Texas Instruments
- 6 Western Digital
- 7 Infineon
- 8 STMicroelectronics
- 9 NXP
- 10 Analog Devices

# Discrete Market Segment Opportunity

The discrete (standalone chips) NVM market is very broad; numerous opportunities for Weebit ReRAM

Market	Applications	Opportunity	Weebit Advantages	Timeline
NVSRAM and EEPROM <sup>(1)</sup>	IoT, Medical, A&D	<b>\$2B in 2021</b> 1% CAGR 2021-2027	<ul style="list-style-type: none"> <li>✓ Die size</li> <li>✓ Cost</li> </ul>	Short-term
NOR Flash	Consumer, automotive & industrial	<b>\$3.5B forecast in 2022</b> 63% growth in 2021 6% CAGR 2021-2027	<ul style="list-style-type: none"> <li>✓ Ultra-low-power operation</li> <li>✓ Ultra-low standby current</li> <li>✓ Die size</li> <li>✓ Cost</li> </ul>	Low densities: short-term Med/high densities: mid-term
NAND Flash	Data storage: on-device or cloud-based	<b>\$67B in 2021</b> 6% CAGR 2021-2027	<ul style="list-style-type: none"> <li>✓ Ultra-low power consumption</li> <li>✓ Endurance</li> <li>✓ Cost</li> </ul>	Multi Gb dies: longer term
Storage Class Memory (SCM)	Emerging market filling gap between DRAM & NAND storage	<b>~\$925m in 2027</b> 16% CAGR 2021-2027		

## Weebit has various commercial routes to address the discrete market

- ❖ Development / commercialization of own memory chips
- ❖ Strategic partnerships with discrete foundries
- ❖ Licensing technology to Tier-1 / Tier-2 silicon vendors

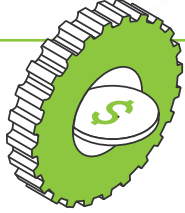
Sources:

<https://www.yolegroup.com/product/report/status-of-the-memory-industry-2022/>  
<https://www.yolegroup.com/product/report/emerging-non-volatile-memory-2022/>  
<https://www.electronicshobby.com/news/business/2021-market-63-2022-06/>

(1) EEPROM = Electrically erasable programmable read-only memory

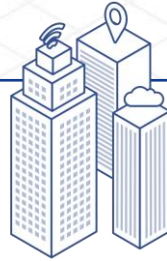


# Weebit Nano Key Targets for CY23



## Initial Revenue

By end of CY 2023



## Fab Partners

Sign with a Tier-1 fab



## Customers

Close initial agreements



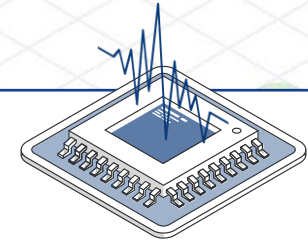
## Qualification

Qualify technology for even higher endurance



## Continue R&D

Further technical enhancements to ReRAM cell and selector technologies



## Scaling to 22nm & below

Continue scaling the technology

# Weebit ReRAM: The Next NVM is Here!



The industry needs a new Non-Volatile Memory solution:

Lower-power, faster, cheaper, reliable in extreme conditions



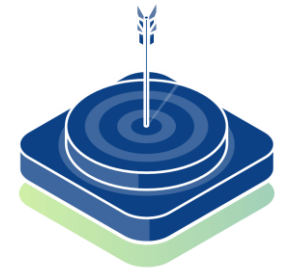
Weebit ReRAM has unique advantages; well positioned to replace flash in various markets



Strong tech progress: completed 3 full qualifications including 125°C automotive grade temperature



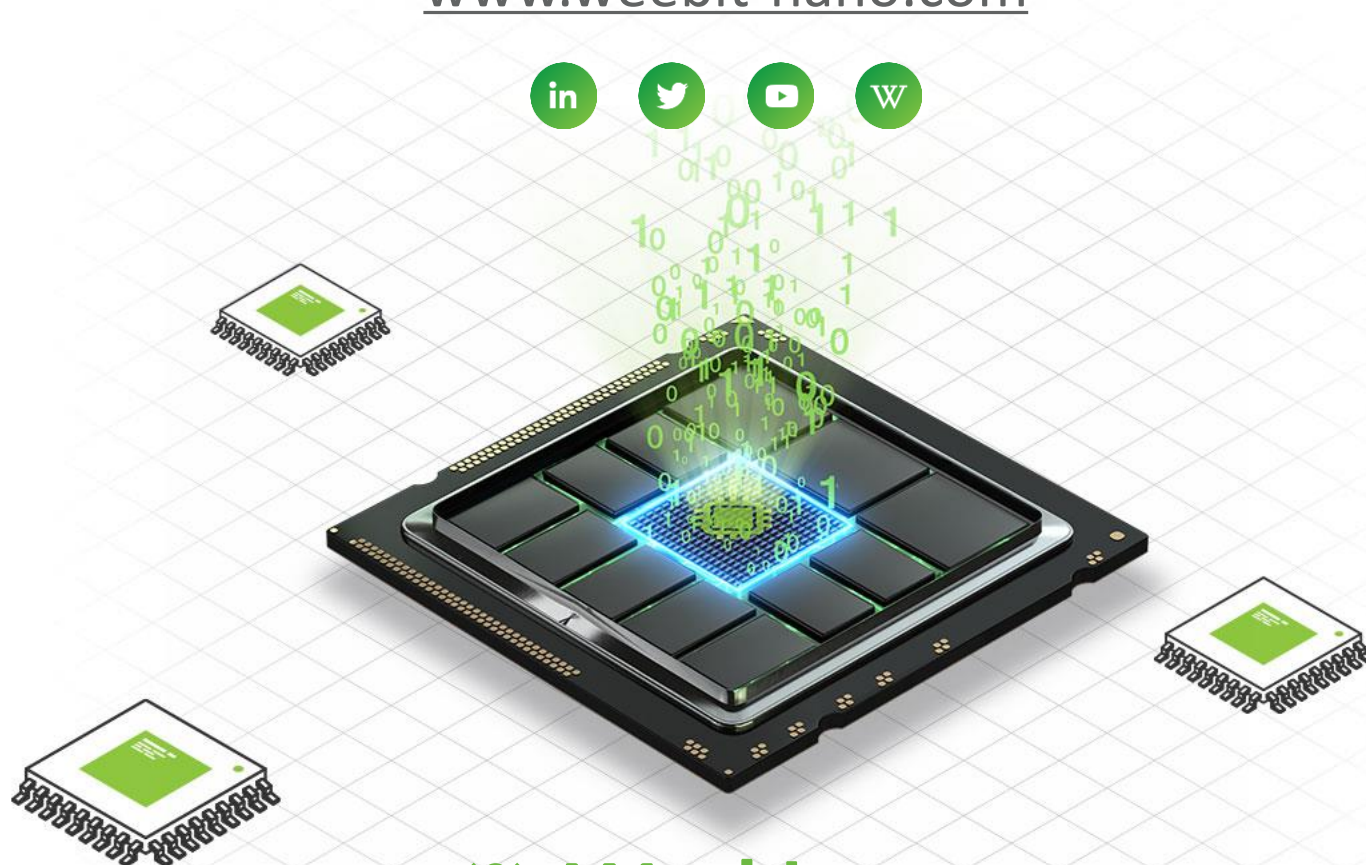
Board & management team have extensive semiconductor commercialisation experience



Multiple customer engagements underway; First agreements within 2023

# Thank You!

[www.weebit-nano.com](http://www.weebit-nano.com)



 **Weebitnano**  
THE NEXT NVM IS HERE