



BOOSTING THE EFFICIENCY  
OF COMPOUND SEMICONDUCTOR DEVICES



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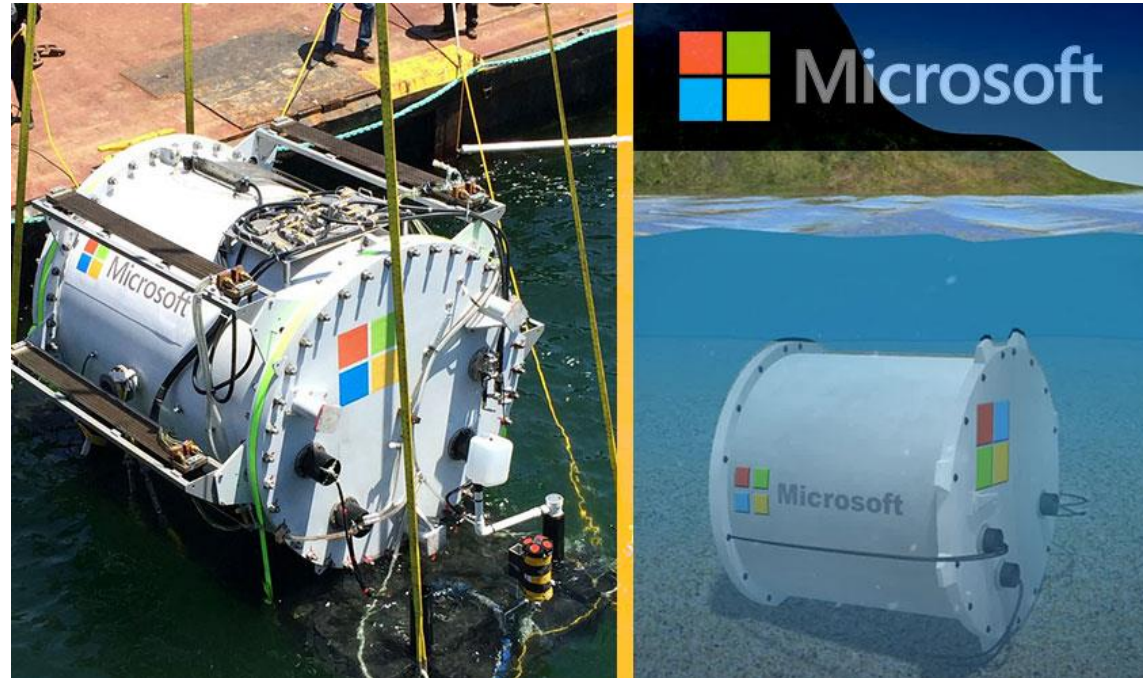
- Forerunner in III-V compound semiconductor surface engineering
- Founded 2017, spinoff from the University of Turku, Finland
- Multicultural and diverse Team of 12 (6 PhD)
- 24 patents (5 granted patent families) and trademarks
- Solid customer base, 1.1M€ revenue in 2020



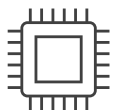




A very typical leak of 10 drops per  
minute wastes nearly **3 litres per day** or  
1300 litres per year



## Defects in semiconductor devices results in poor power efficiency and lower operating performance



MICROPROCESSORS



SENSORS /  
DETECTORS



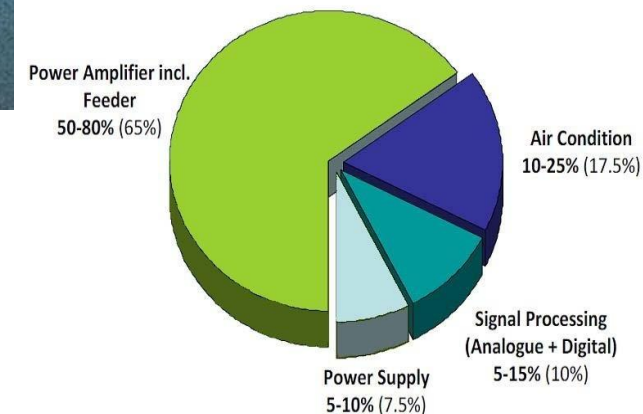
LED/uLED



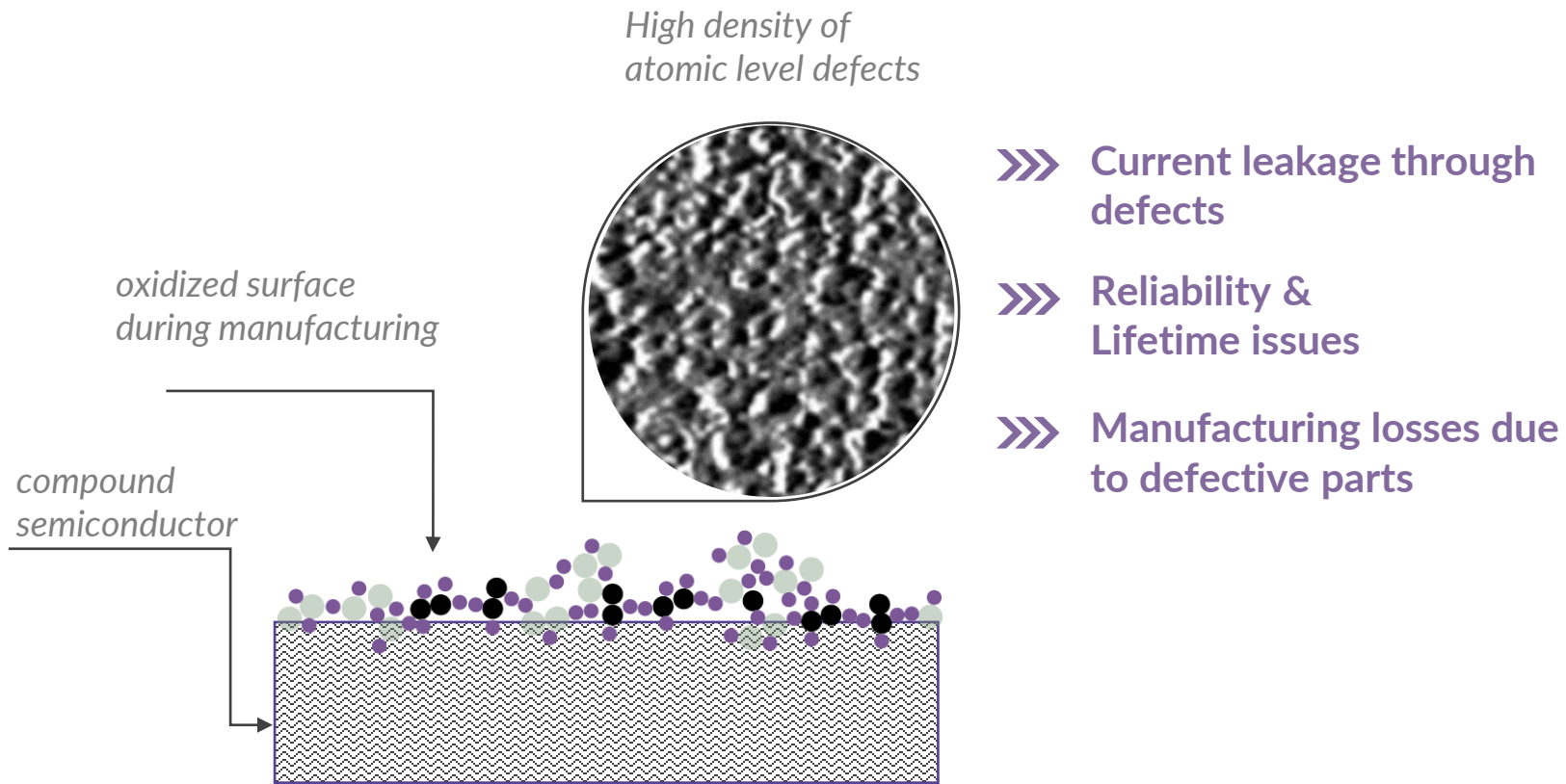
LASERS



RF POWER  
AMPLIFIERS



# Industry bottleneck: Defects due to oxidation limit device performance and manufacturing of semiconductor devices

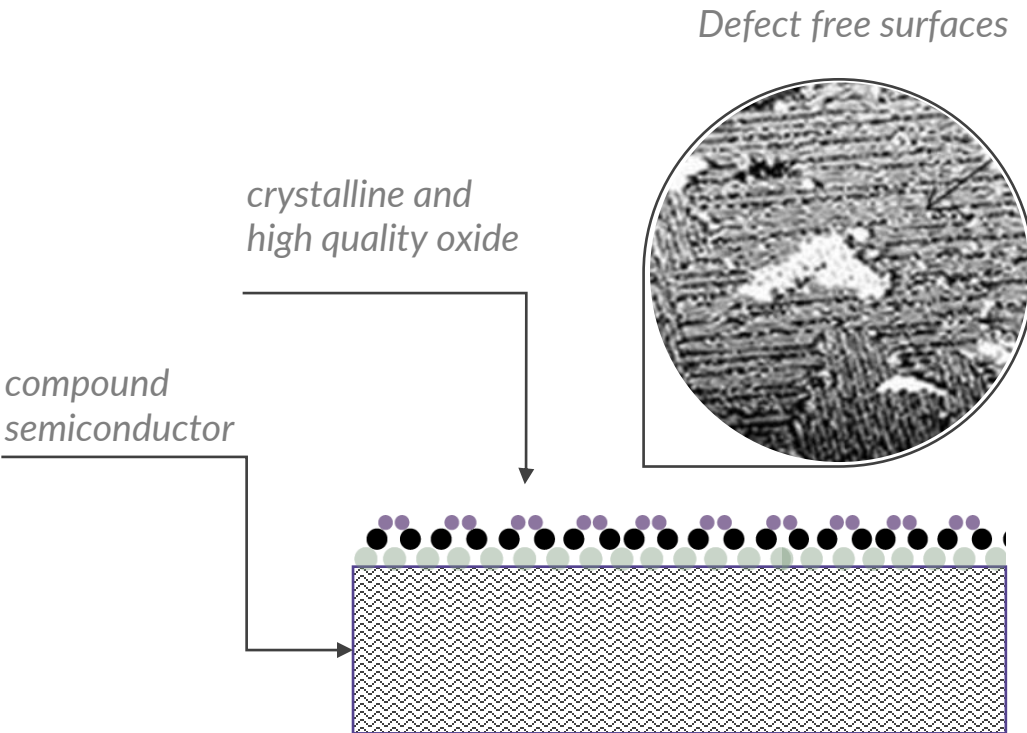


Oxidation makes very difficult & expensive the manufacturing of semiconductor devices



# Our solution: Kontrox™

Novel technology to produce defect free novel crystalline oxide structures



»»» 98% Surface defect reduction

»»» Device efficiency improvements

»»» Higher reliability

## Kontrox™



### ONE-OF-A-KIND

1<sup>st</sup> time to produce crystalline stable oxide structures on III-V materials



### PATENTED

24 patents (5 families)



### MORE EFFICIENT DEVICES



### LOWER MANUFACTURING COSTS / LESS WASTE



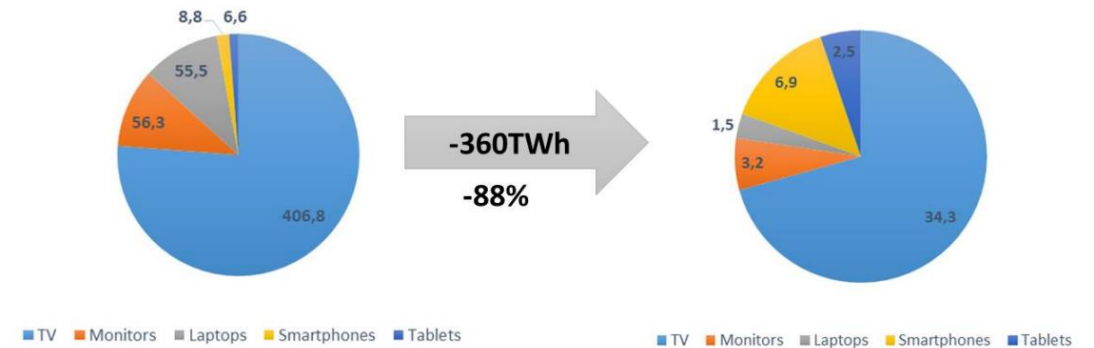
### MAKING SEMICONDUCTOR INDUSTRY MORE SUSTAINABLE

# Examples of Optoelectronic device performance Improvements

## microLEDs : Next generation displays

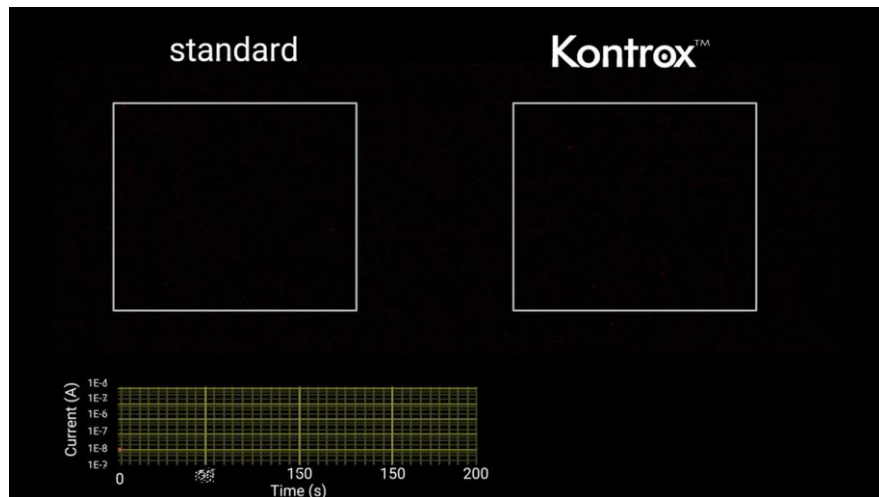
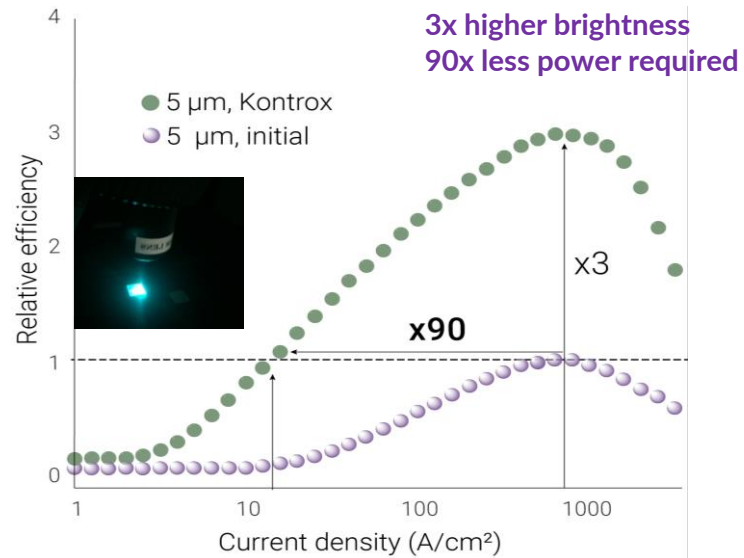
*If all displays would used **microLEDs** =Energy savings of **360TWh**  
(equivalent to the whole renewable energy generated in EU)*

Energy consumption by displays (2015, TWh)    Energy consumption with MicroLEDs (2030, TWh)



**Issues:** very low manufacturing yields (<30%) , Real efficiency <15%

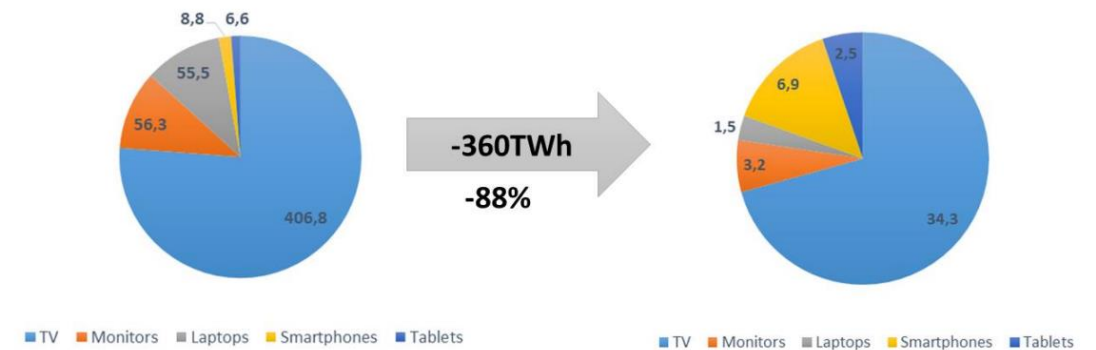
# Examples of Optoelectronic device performance Improvements



## microLEDs : Next generation displays

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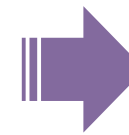
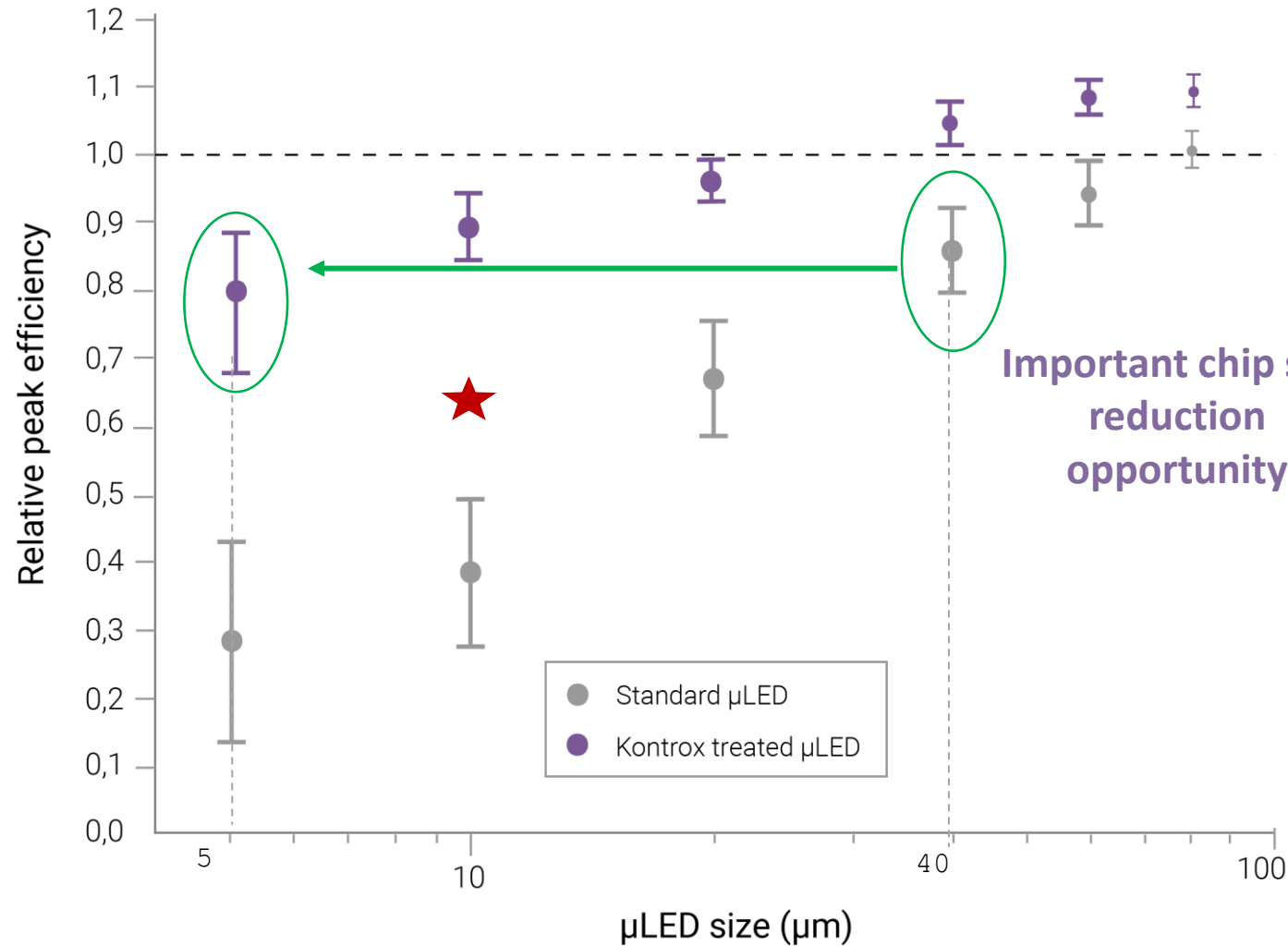
Energy consumption by displays (2015, TWh)    Energy consumption with MicroLEDs (2030, TWh)



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# Application case: Improved performance also leads to Improved manufacturing process



More than 10x microLED chips / wafer

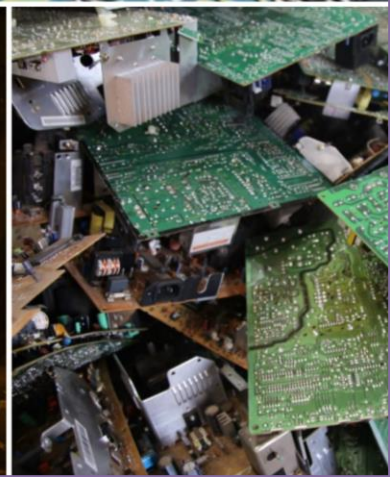


- Reduction of production volumes / Costs
- Less use of natural resources & electricity
- Less waste generation



Results from Nobel Laureate Nakamura *et al.*  
[Appl. Phys. Express 12, 097004 (2019)]: KOH treatment combined with ALD sidewall passivation







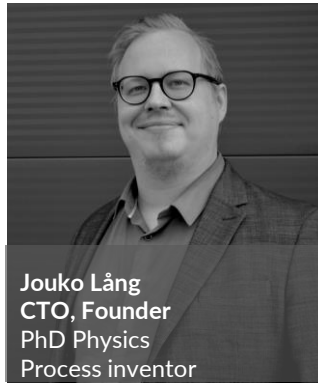
*Enabling significant power savings while making  
semiconductor industry more sustainable*





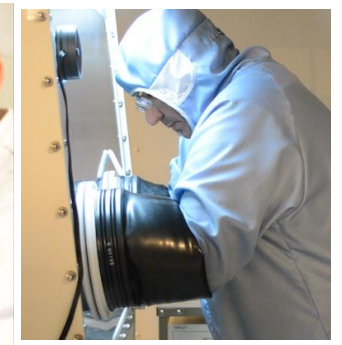
# The team

## Leadership team



R&D

Top-skilled, diverse R&D team of 8 (5 PhDs) with strong experience and know-how in cs surface engineering & characterization techniques



## Board members



**Timo Tirkkonen**  
Chairman of the board  
Investor, Partner at  
Inventure



**Erkki Heinonen**  
MD at EQT Solutions Ltd.  
Former Director of  
Sourcing, Nokia



**Matti Hellgren**  
CEO, IoT foundation  
Former CVP  
Microsoft & SVP  
Nokia



**Keith Kobayashi**  
Board observer  
Sr. manager Hamamatsu  
Photonics



## Sales & Marketing

Sales & Business Development Director – currently recruiting

Anastasia Manner - Marketing Communications

# Traction



- Good traction in the optoelectronics market
- 1st commercial license agreement and steadily growing revenue
- Exponential revenue growth once in scale-up phase

Partners:

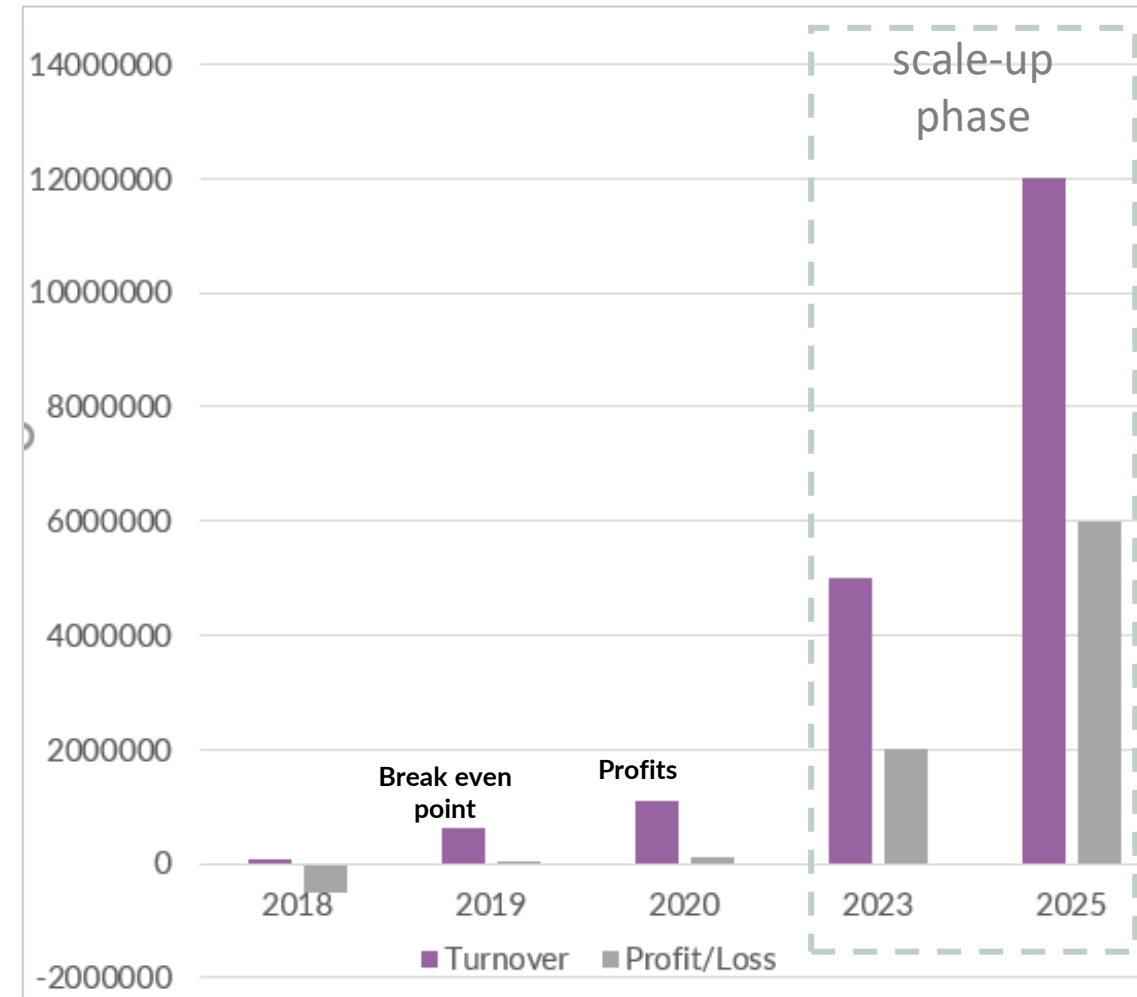


Customer PoC/ Pilot runs:



ODM under NDA

Letters of intent:



**Funding to date:**  
**1.05M€ in equity, 1.1M€ public funding**

**Raising A series @ 5M€**

1M€ committed by current investor

Target to close end Q1/22



Current targets:

**Speedup technology transfer / Industrialization readiness**

- Implementation of pilot line to produce customer pilots in production real environment

**Expand our capabilities**

- Increase internal capacity (HR and equipment) to shorten the time to revenue cycle
- serving more customers in parallel

**Strengthen the IP portfolio**

What we are looking for:

**VC or CVC with experience in deep tech industry**

**Potential Industrial partners**

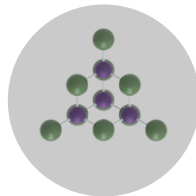




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## In search of improved performance?

Comptek Solutions is your partner



## For more information

Please contact us at

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