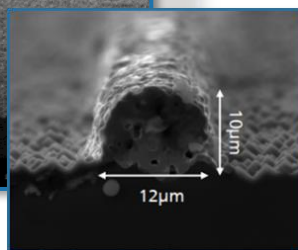
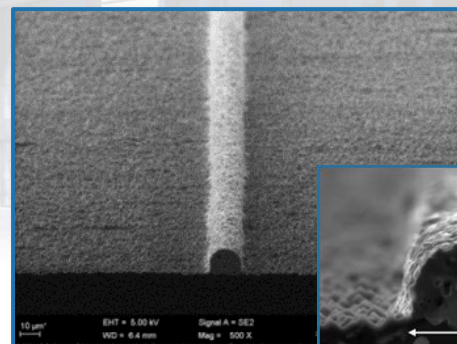
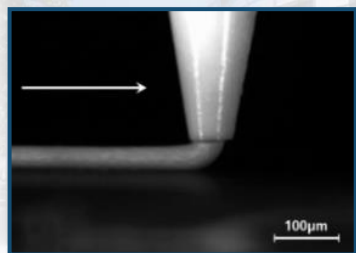


# HIGHLINE

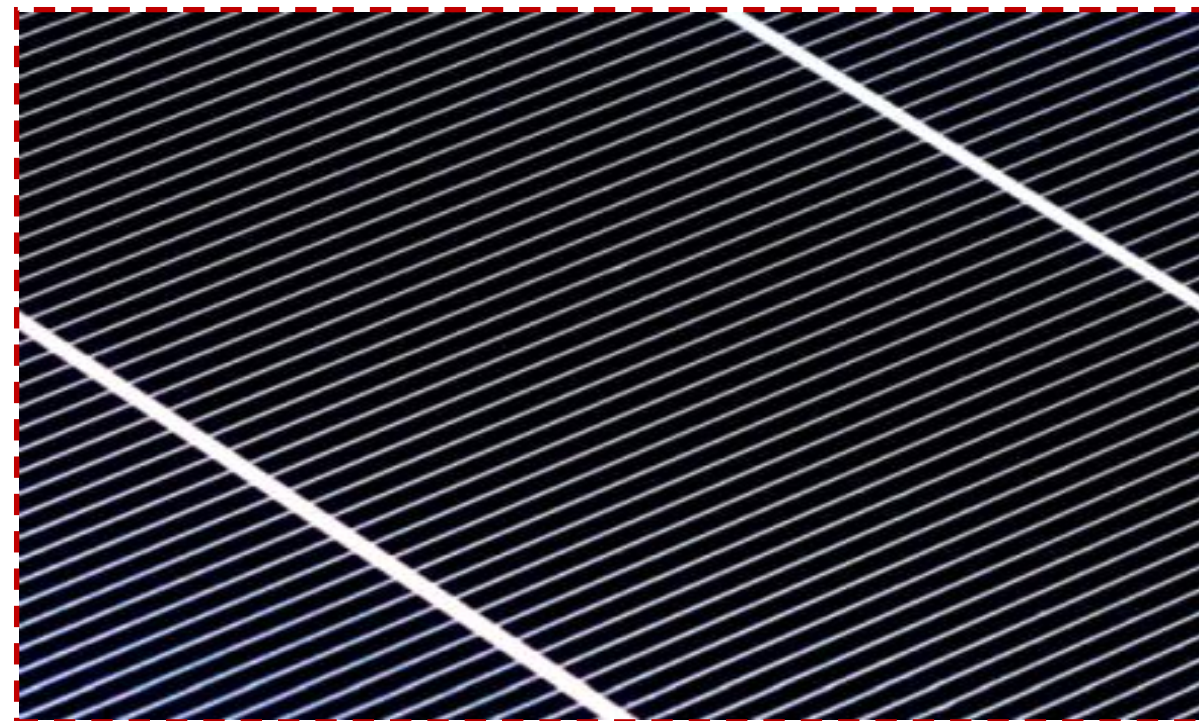
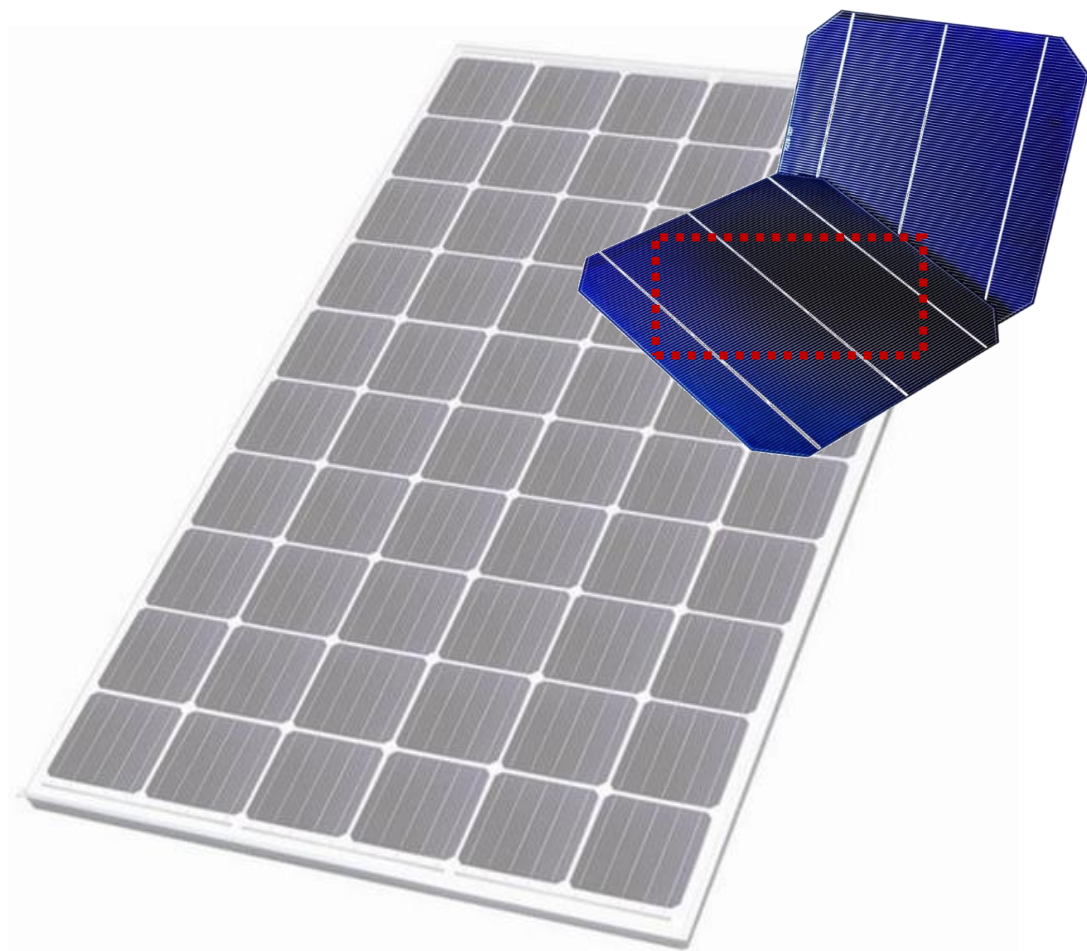
T E C H N O L O G Y

## Spin-off from Fraunhofer ISE





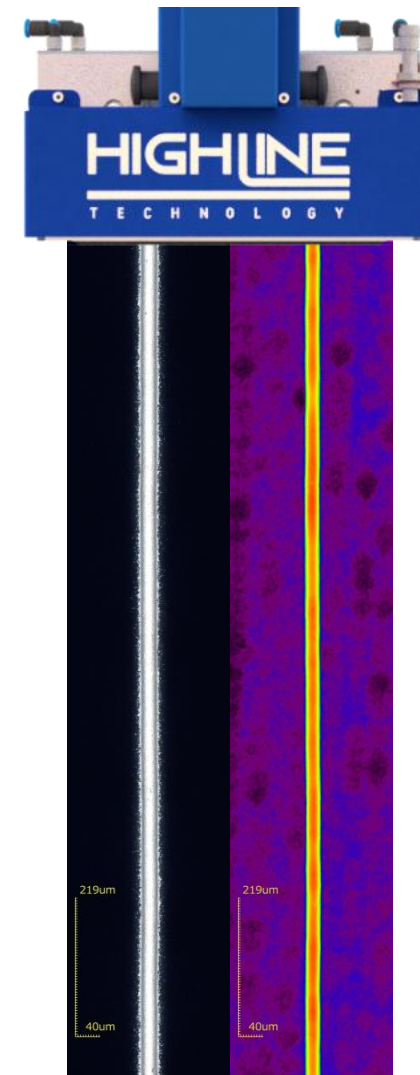
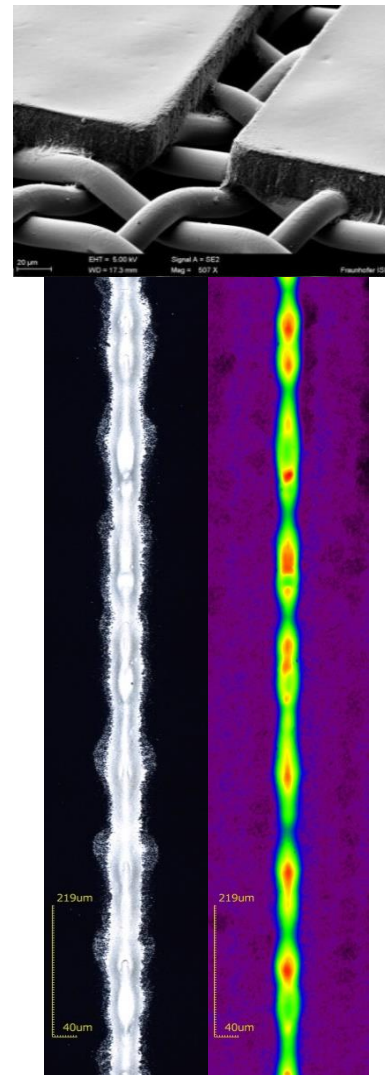
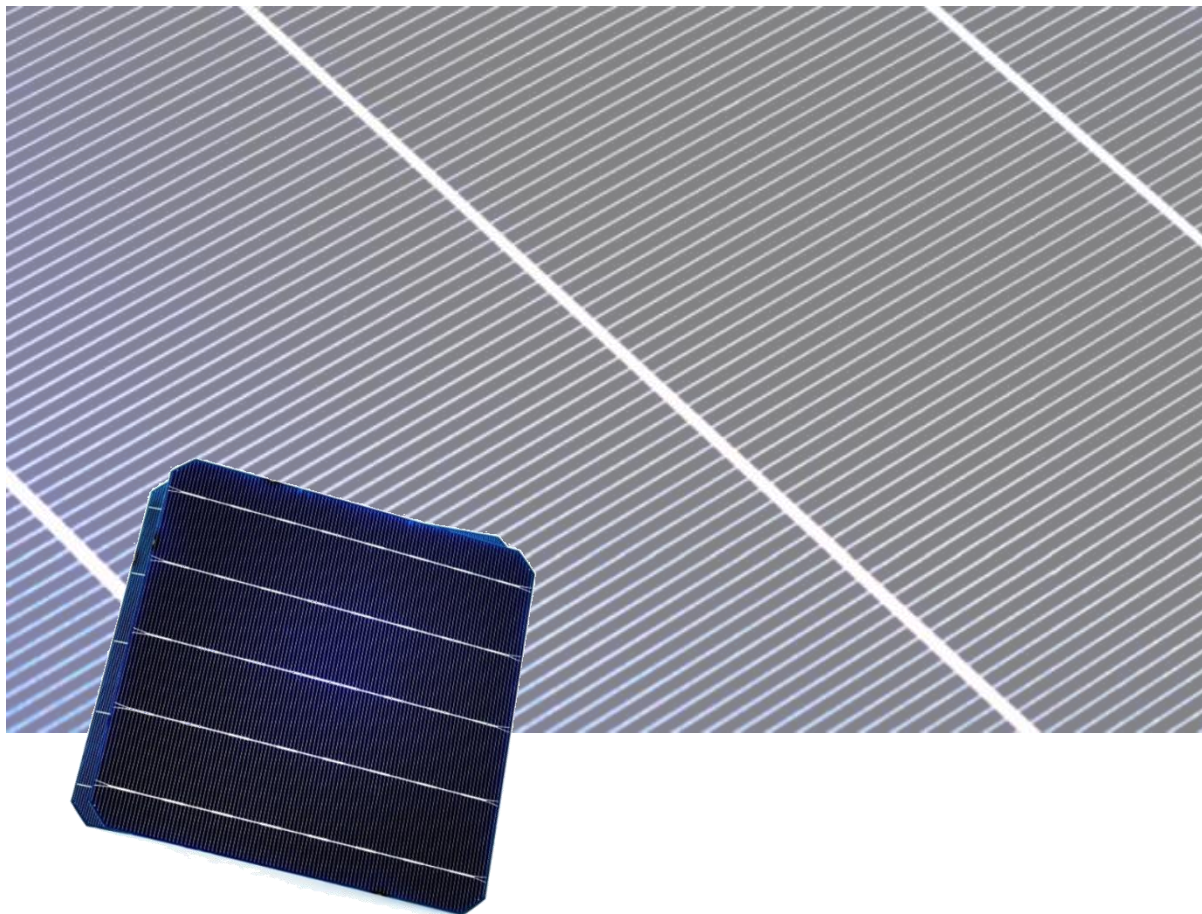
## What is Metallization in PV Cell Production?



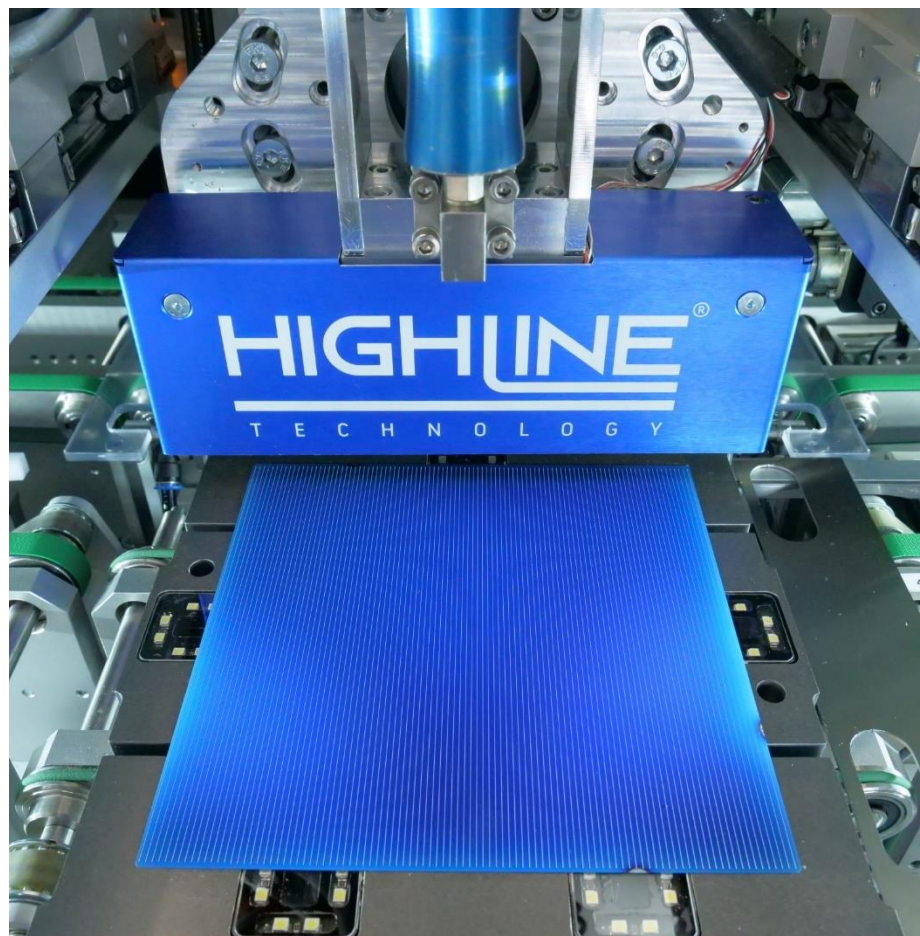
Printing of a conductive grid on the cell (=metallization)

→ 15% of global silver demand



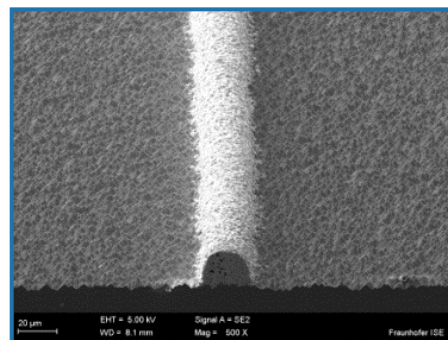


\*Gensowski et al. "Dispensing of low-temperature silver pastes", AIP Conference Proceedings 2367, 020007 (2021)

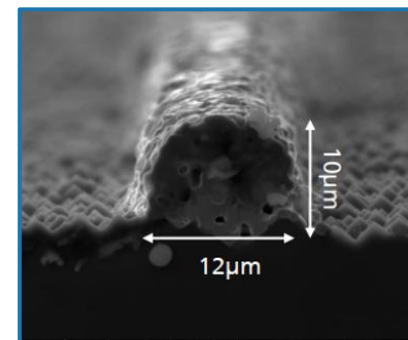


## HighLine Dispensing System

Homogeneous extrusion of metallization pastes through parallel arranged nozzles



Homogeneous  
Geometries  
(> 20% paste savings)



Low width /  
High Aspect Ratios  
(1 % rel.  $\eta$  increase)



High Throughput  
Process

→ Significant savings in CoO and increase in  $\eta$

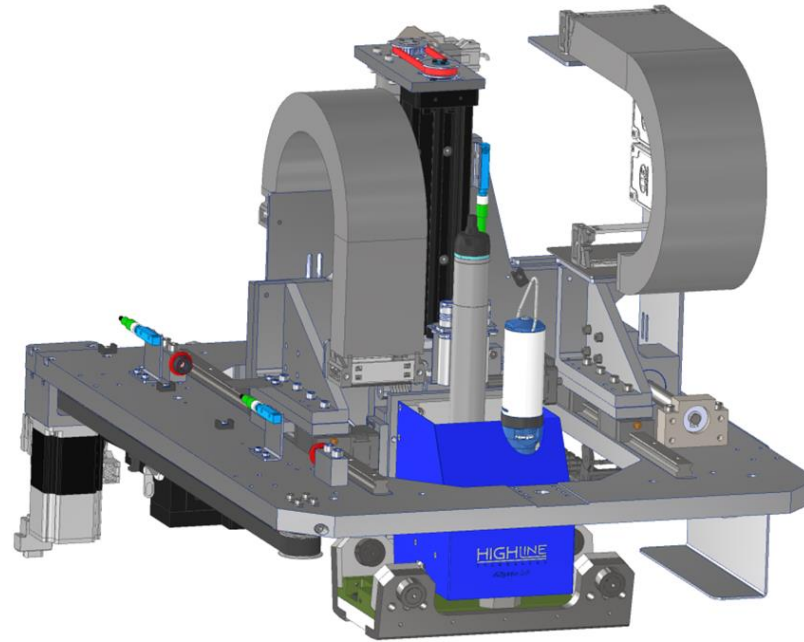


# Products & Consumables protected by IP



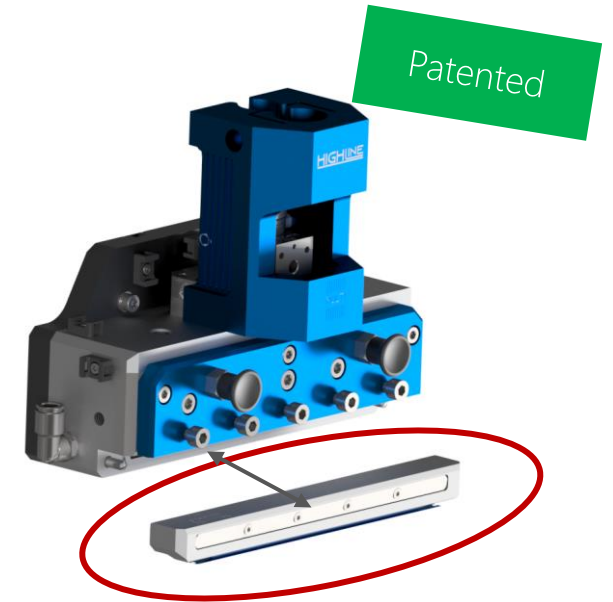
## Dispensing Print-heads

- High printing speed
- Ultra fine nozzles (<25µm)
- Contactless process



## The Upgrade KIT (Cuckoo)

- Upgrade of existing screen-printing platforms
- Integration in new production lines
- Prototype in operation in PVTEC, Freiburg



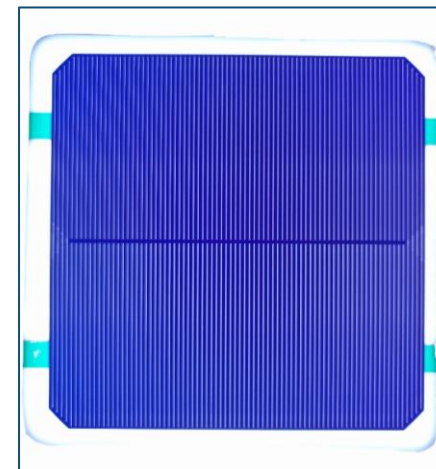
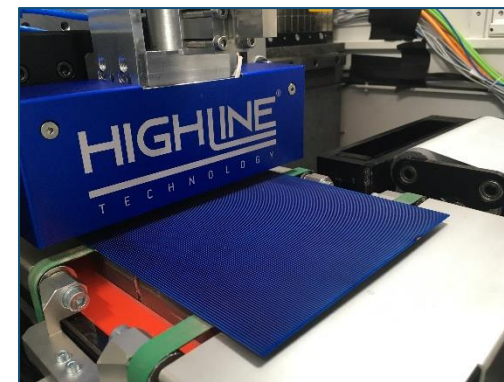
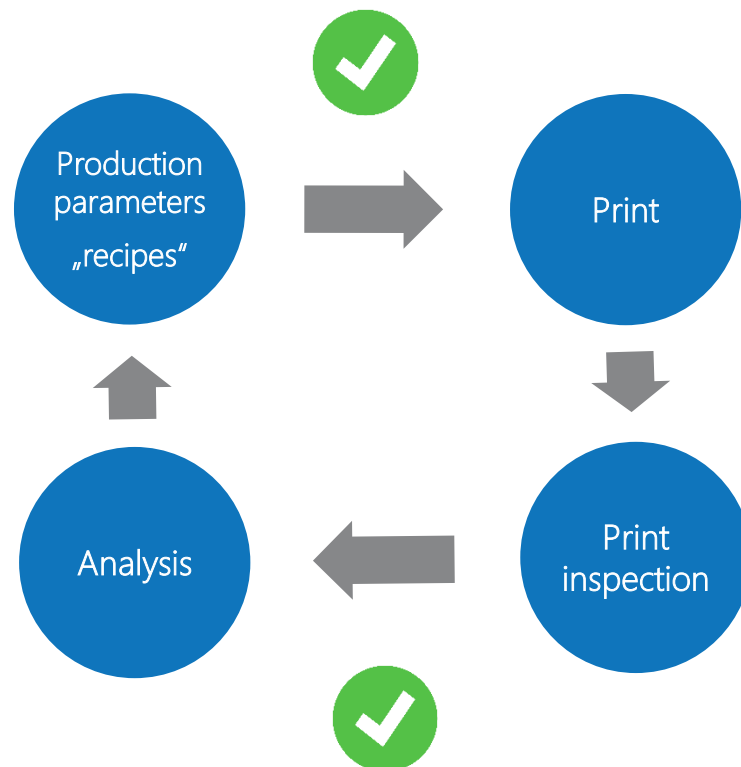
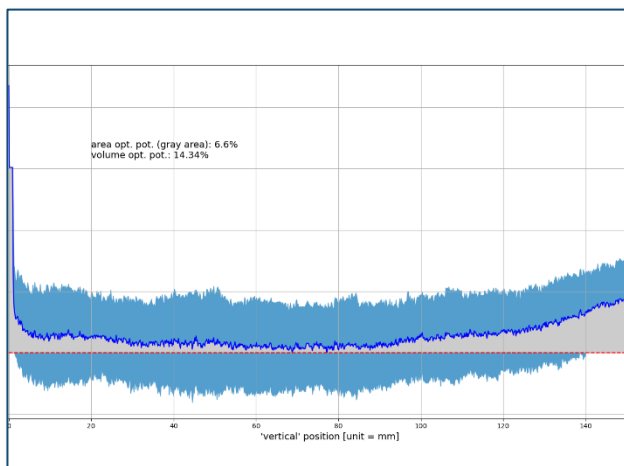
## The Nozzle-KIT Consumable

- Integration of ultra-fine nozzles (10 - 25µm)
- Flexible regarding design
- Quickly exchangeable for high uptime

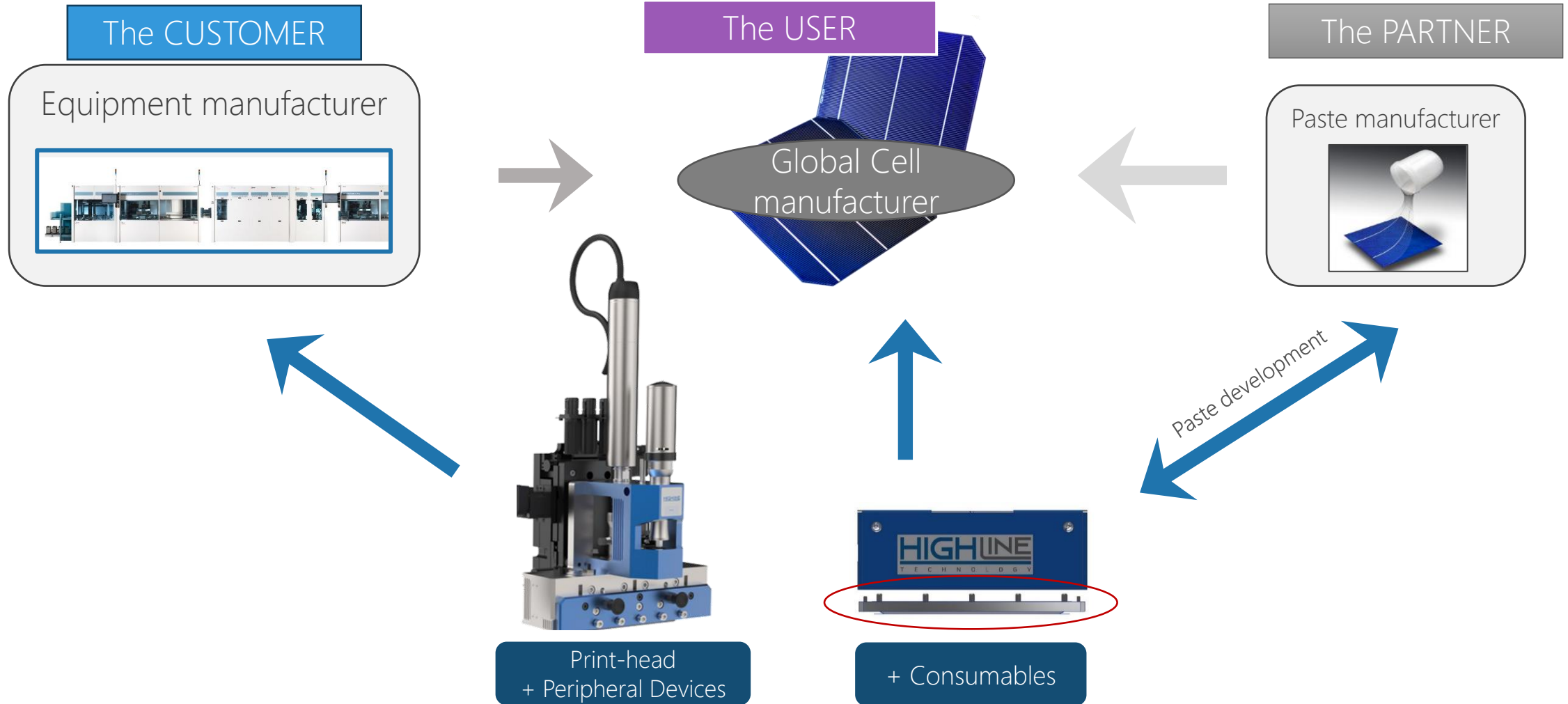
## Inline Process Control and Analysis System



Operator?

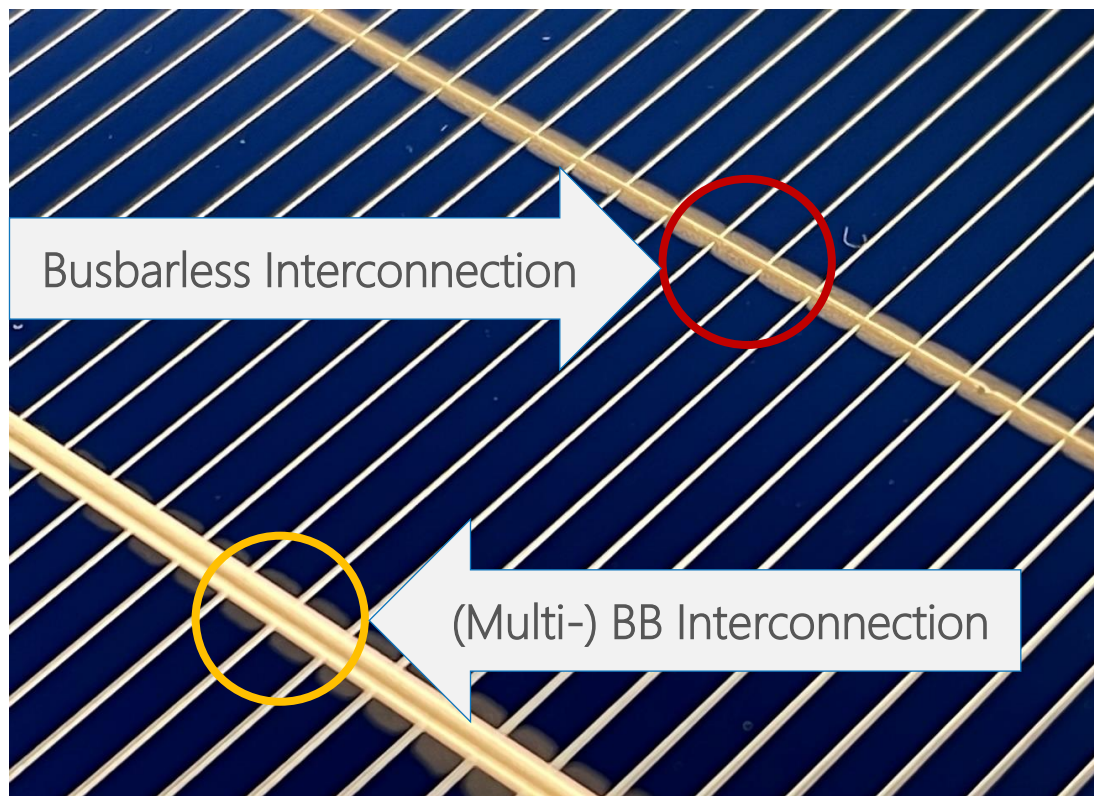


# Commercial Strategy

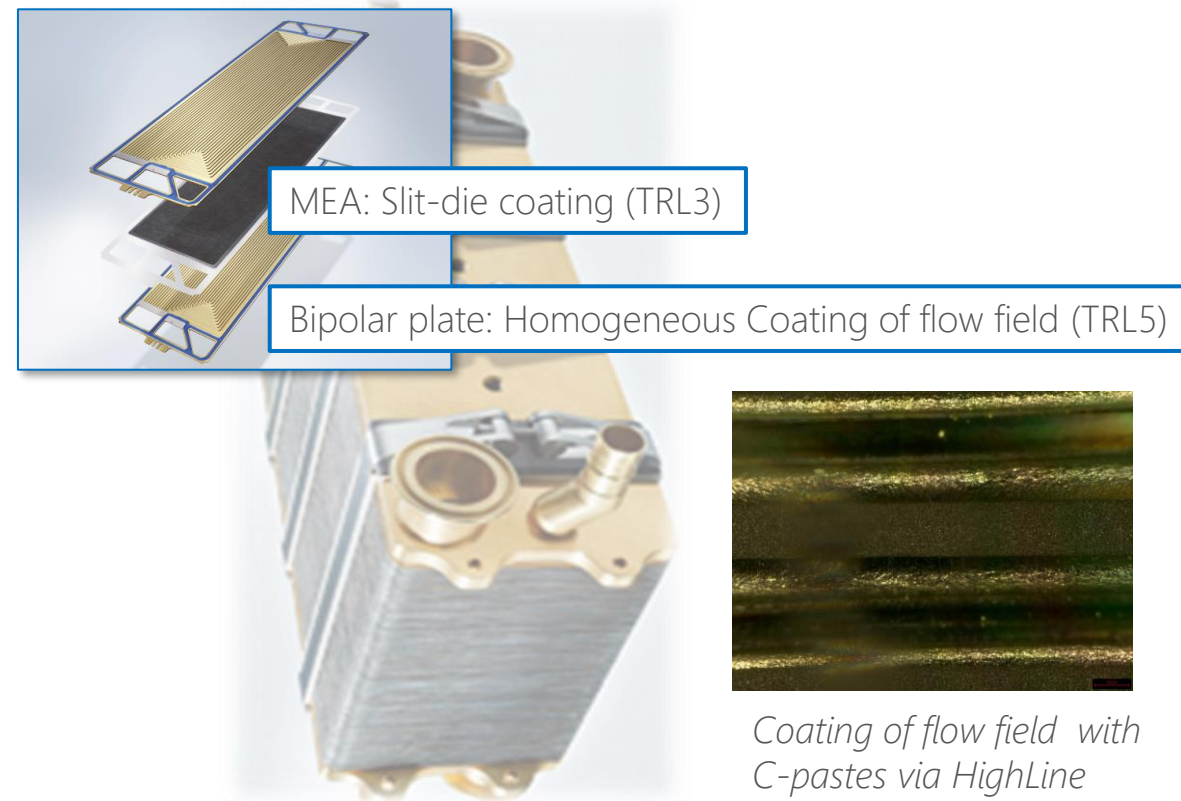




# Additional fields of Application



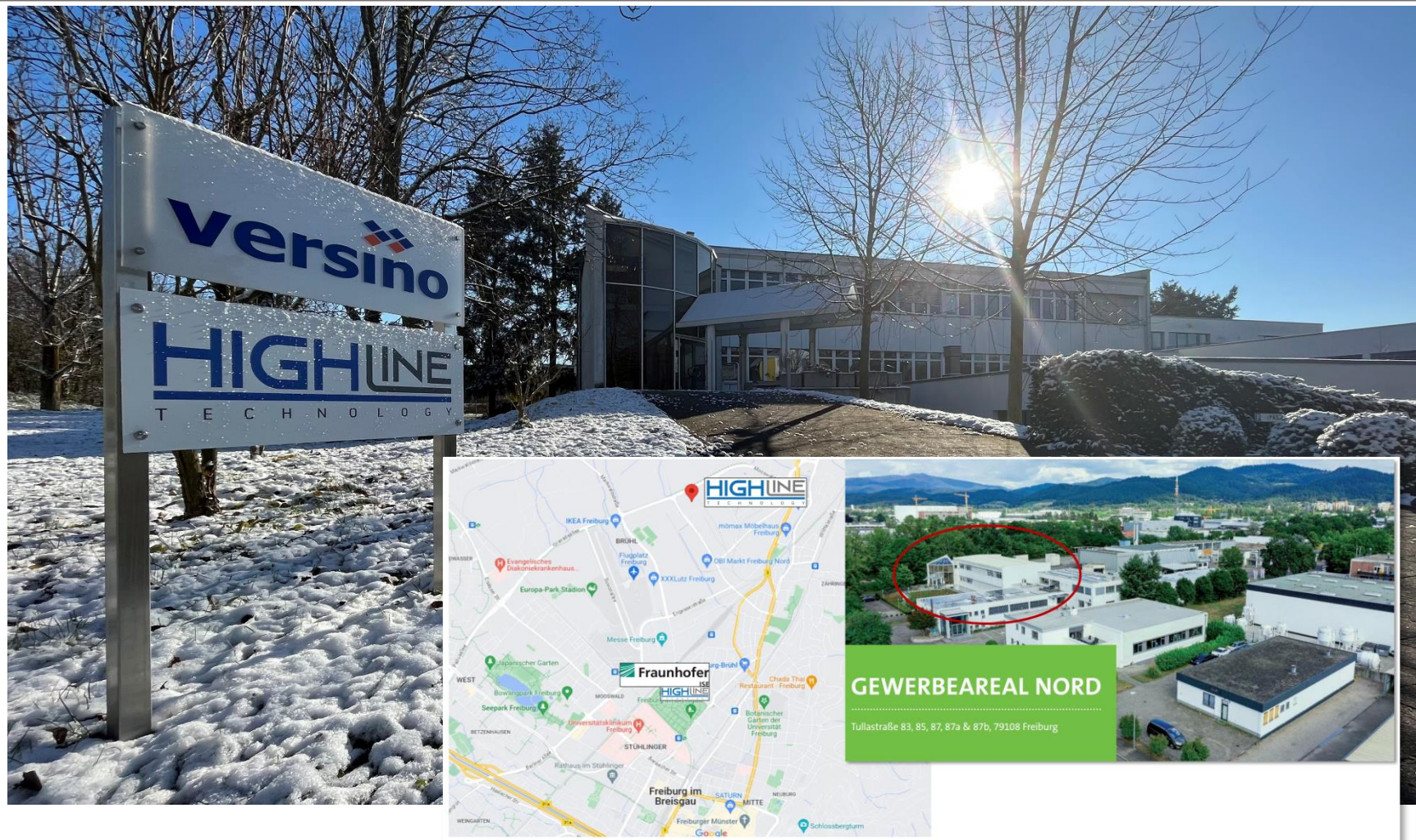
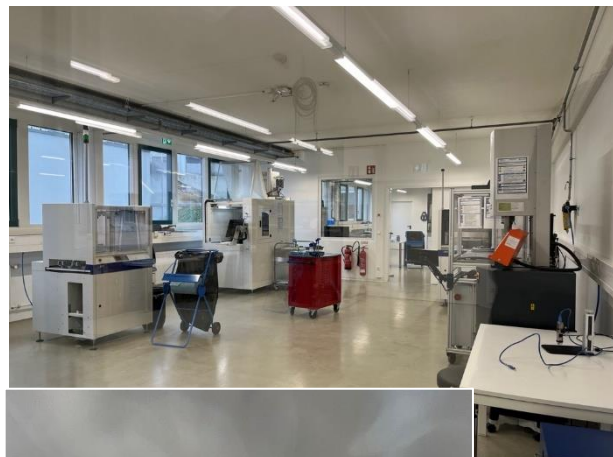
Module Interconnection  
→ Vertical Integration



Fuel Cell Production  
→ Further New Energy Markets



# New Facilities since Q4/23





Product Maturity

Setting up Production Facilities

Integration with Equipment Manufacturer

Industrial Field Test (HJT, Cell)

Industrial Field Test (ECA, Module)

Market Entry and Scaling

Bridge Round (3M EUR)

SeriesA in Q1/2026 (6M EUR)

2024

Q1

Q2

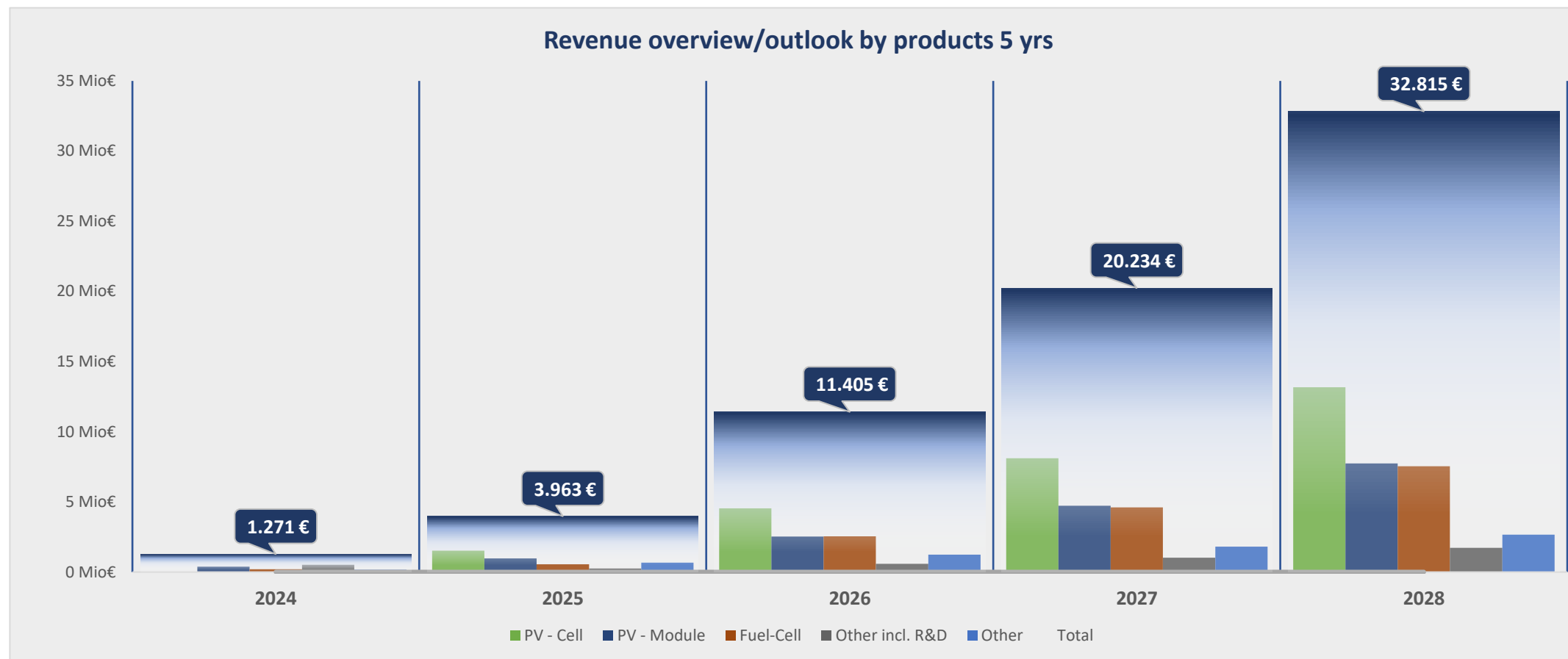
Q3

Q4

2025



# Revenue Outlook



# Management Team



Dr. Maximilian  
Pospischil

Managing Director  
(CTO)

**Before:** Fraunhofer ISE –  
Head of Team Dispensing  
Technology

**PhD:** Dispensing  
Technology/Rheology

**Diploma:** Mechanical  
Engineering and  
Management (TUM)



Marian  
Breitenbücher

Managing Director  
(CFO)

**Before:**  
Fraunhofer ISE - Business  
Development Dispensing  
Technology

**Master:** Sustainable  
Resource Management  
(TUM)



Martin  
Kuchler

Director of  
Engineering

**Before:**  
Fraunhofer ISE - Technical  
Expert Dispensing  
Technology

**Master:** Microsystems  
Engineering



Dr. Florian  
Clement

Networking,  
Consulting

**Fraunhofer ISE:**  
Head of Department  
Printing Technology



**Many thanks for your attention**

Contact us:

Marian Breitenbücher

+49 1520 3621383 | mb@highline-technology.de

Dr. Maximilian Pospischil

+49 152 59348571 | mp@highline-technology.de

[www.highline-technology.com](http://www.highline-technology.com)

Our partners:



Funded by  
the European Union



**Fraunhofer**  
ISE

**FTTF**



High-Tech Gründerfonds