

Intelligent Manufacturing for AI at Scale

The Future is Photonics – We automate it.



Dr. Andon Bano
Head of Sales, Europe

The Future is Photonics – but the challenge is precision at scale

PRECISION

µm to sub-µm accuracy



REPEATABILITY

Same process. Same result.



SCALE

Yield · Throughput · OEE · Cost



R & D

Process development

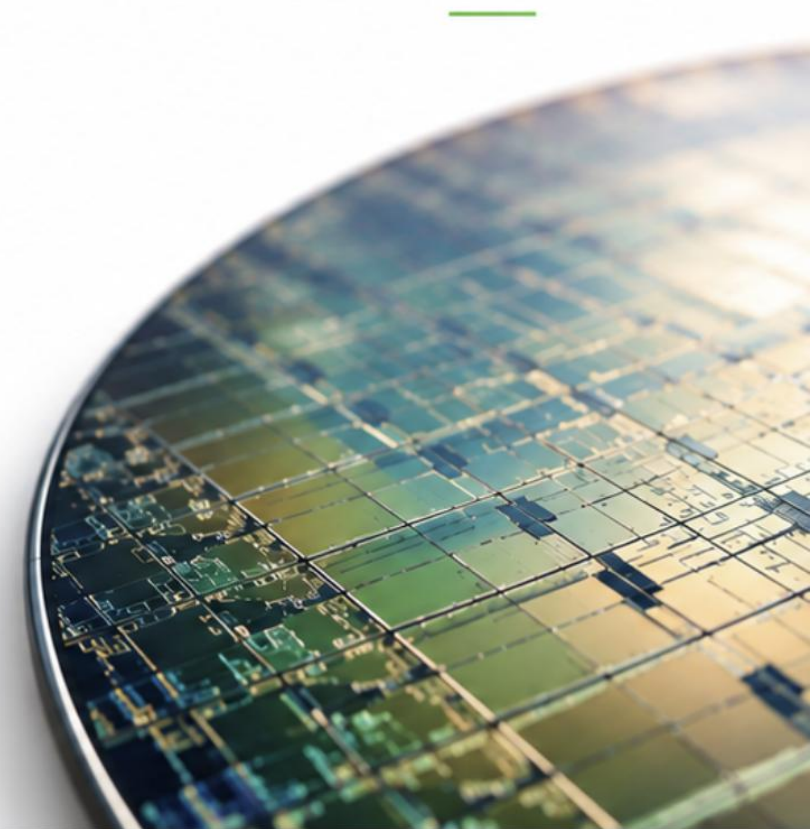
NPI

Process validation & automation

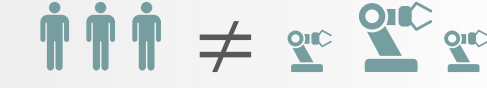
HVM

High-volume manufacturing

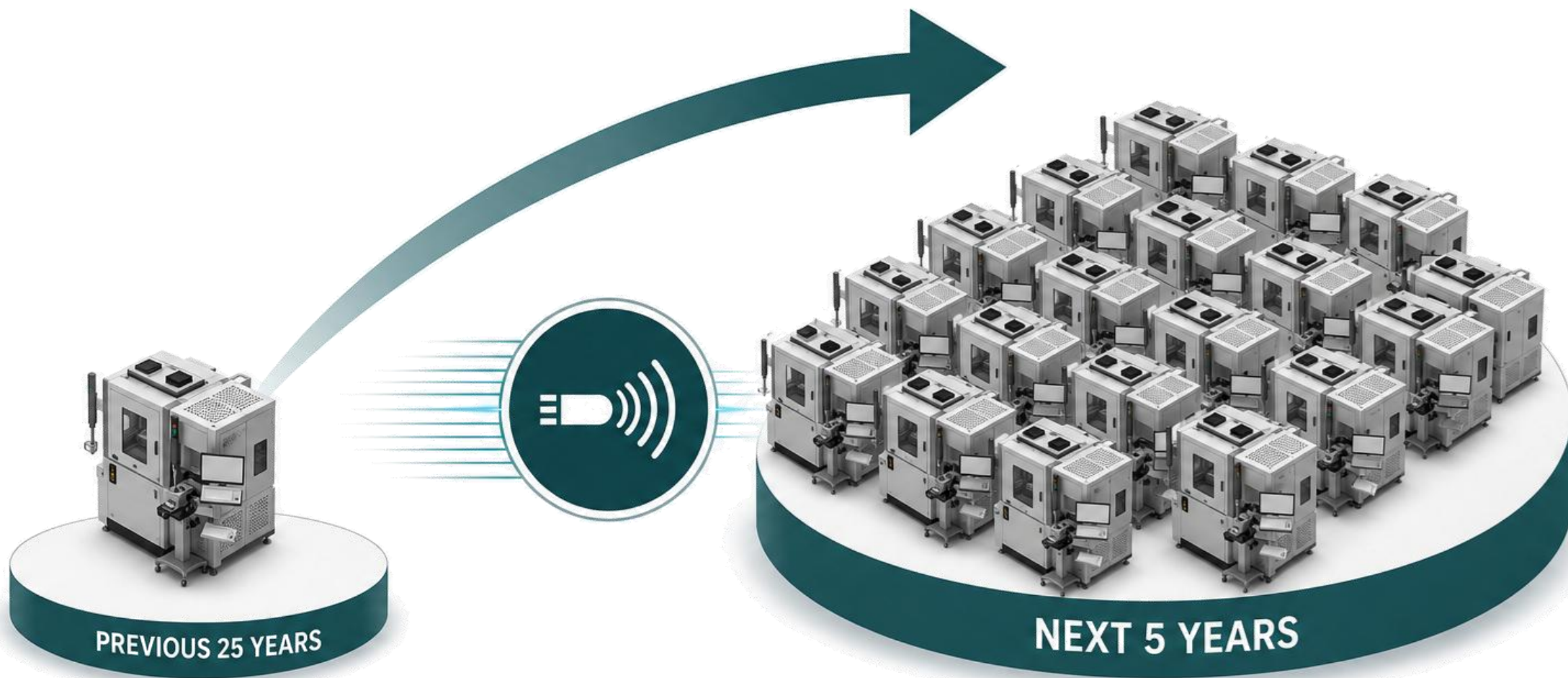
TURNING PHOTONIC INNOVATION
 INTO INDUSTRIAL PRODUCTION.



Key Manufacturing Challenges

01	High-Precision Assembly at Scale		Sub-micron optical alignment accuracy	
02	Testing complexity explodes		Hundreds of optical paths/module	
03	Optical engine density rises		Hundreds of optical paths/module	
04	Yield & throughput become critical		Tiny defects drive large yield loss	 ● Good ● Defect
05	Manual assembly cannot scale		AI deployment volumes exceed labor capacity	 Manual Assembly $\neq$ AI-era Volumes

More capacity in next 5y than previous 25y!



EXPONENTIAL
GROWTH



HIGH-VOLUME
MANUFACTURING



ADVANCED TEST
CAPACITY



GLOBAL SCALE
& INFRASTRUCTURE

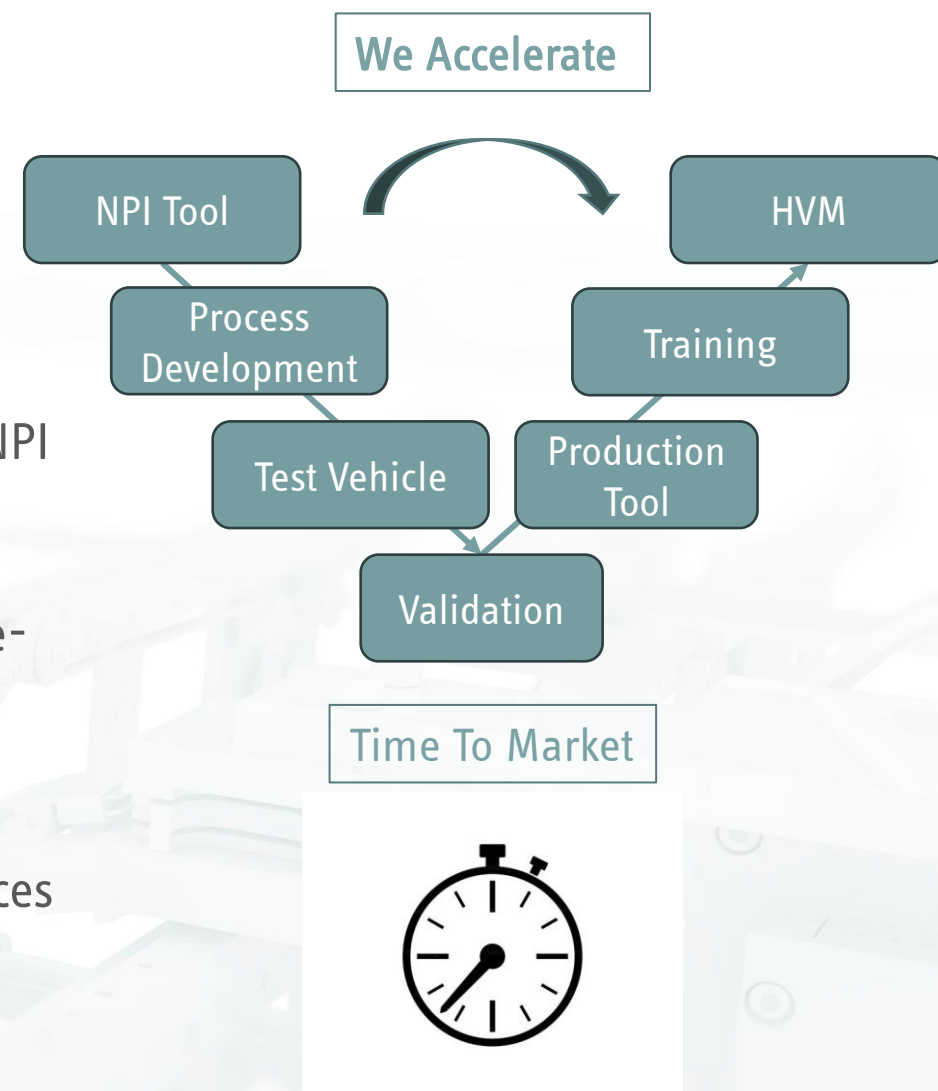


MEETING THE DEMANDS
OF THE PHOTONICS ERA



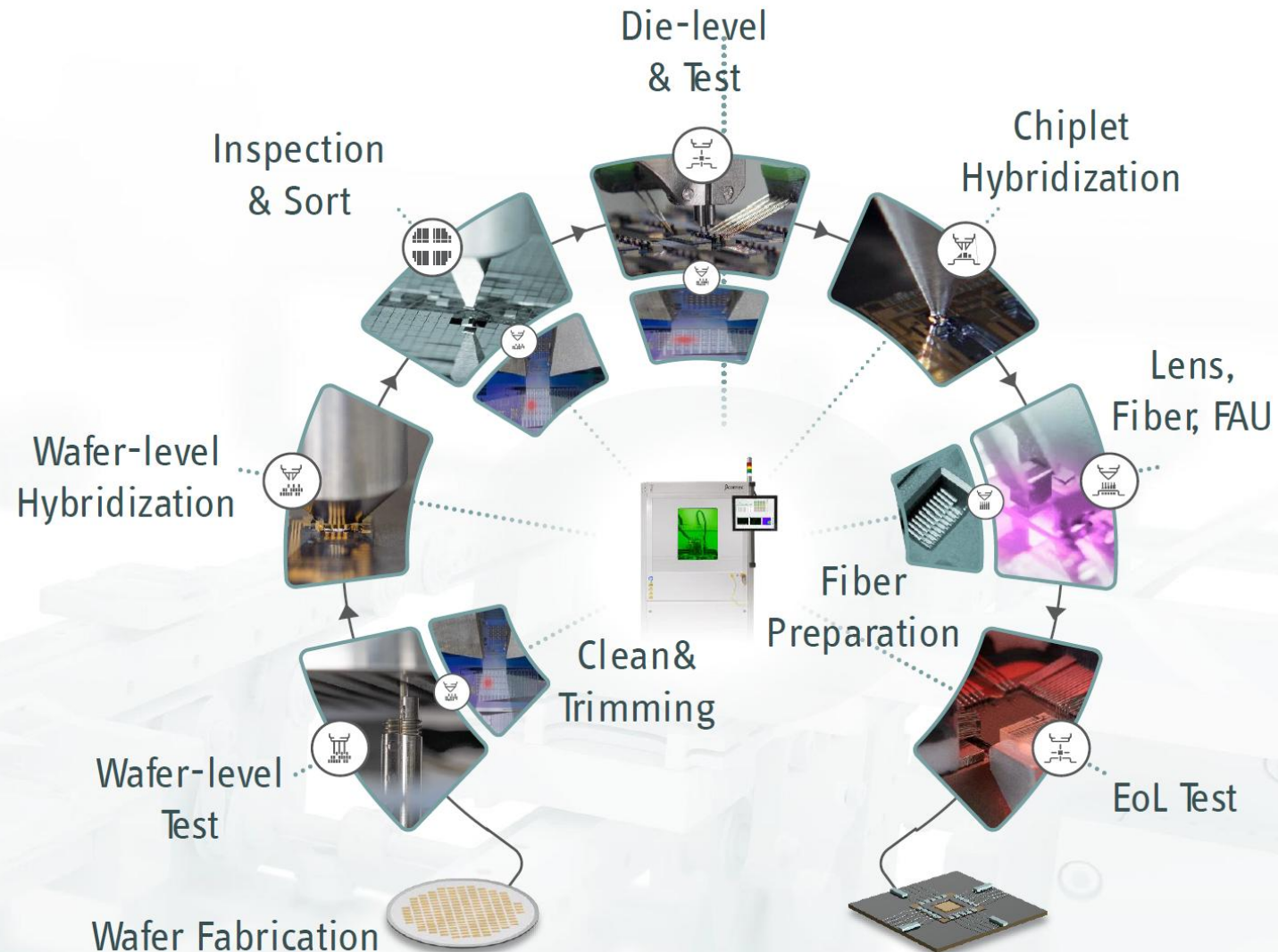
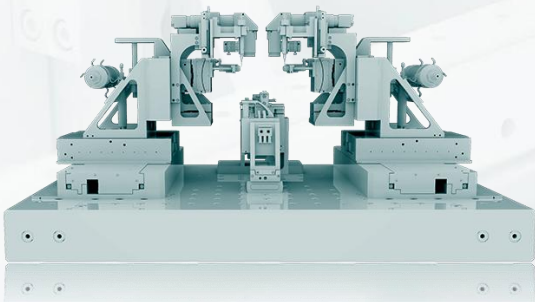
ficonTEC Ecosystem

- **Comprehensive capabilities** from same partner:
 - Inspection and cleaning
 - Testing solution
 - Assembly solution
- **Unified API** across all platforms ensures seamless transition from NPI to HVM, minimizing personnel training effort
- **Upgradability** some platform can support from 100G to 1,6T module- reduces the investment for new product and accelerates time-to-market
- **Modular machine design** enhances spare parts management, reduces maintenance costs, and lowers total cost of ownership (TCO).



ficonTEC's Role in the Ecosystem

- End-to-end automation platforms for Silicon Photonics manufacturing
- Integrated assembly, test & fiber preparation under one unified platform
- Support from R&D and NPI through High Volume Manufacturing
- Enabling "From Lab to Fab" industrialization accelerating commercialization





Unified Software Platform

One Platform, one
Data Model, one
User Experience



AI/ML ANALYTICS

Real-time Insight
Predictive
Maintenance
High Yield



Digital Twin

Optimization of
Data acquisition, AI
and Machine
Learning, and Edge
Computing



Adaptive Control

Closed-loop Control
Process
Optimization
Max Performance



MES & Smart Factory

Traceability,
Visibility Data-
Driven Decision
Industry 4.0 Ready



ficonEDGE

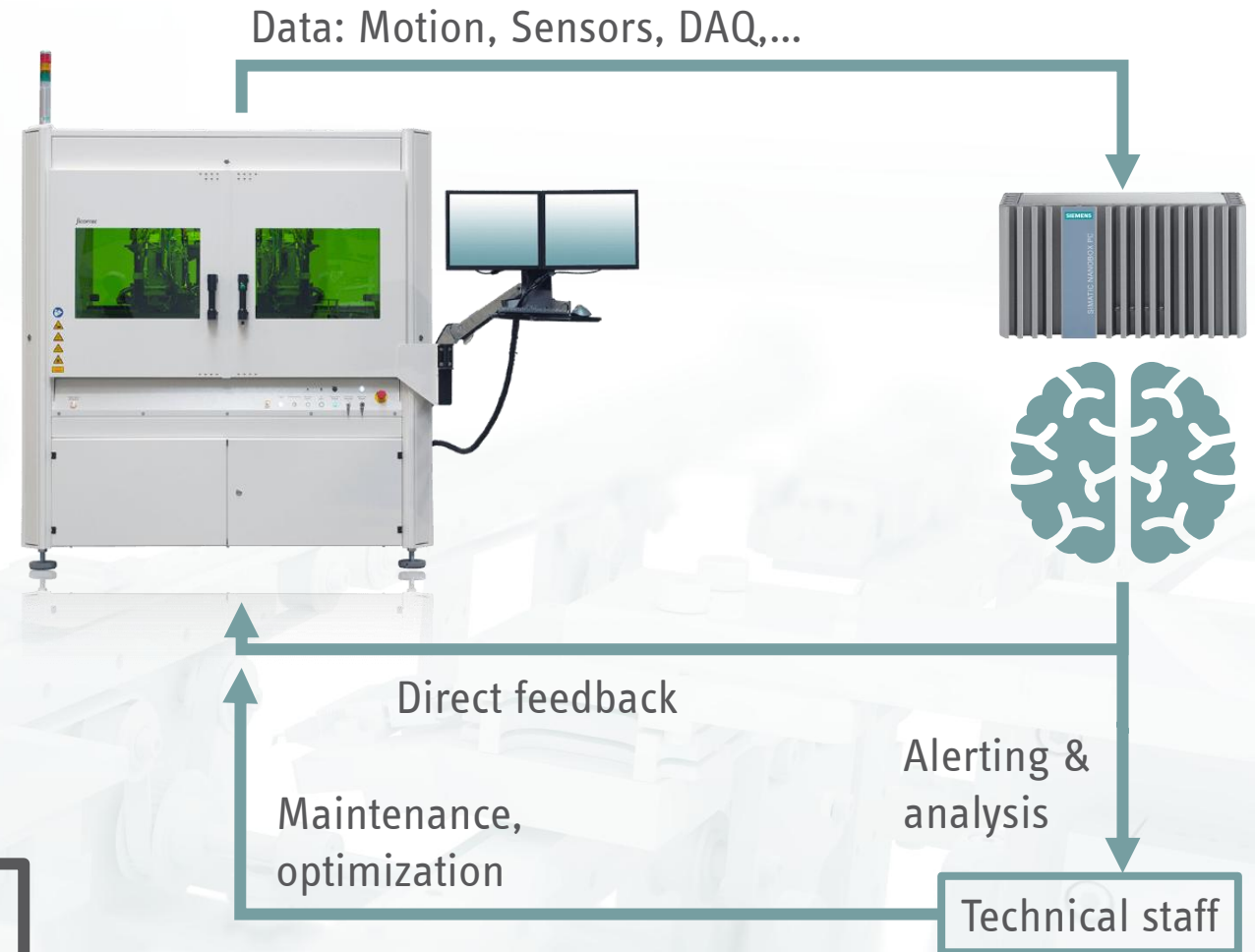
$$\frac{\text{Operating Real Time}}{\text{Planned Time}} \times \frac{\text{Real Speed}}{\text{Planned Speed}} \times \frac{\text{Valid Pieces}}{\text{Total Pieces Produced}} = \text{OEE}$$

The diagram illustrates the OEE (Overall Equipment Effectiveness) calculation. It consists of three circular icons representing different metrics: Availability (24 hours), Performance (gauge), and Quality (checkmark). These are multiplied together to equal OEE.

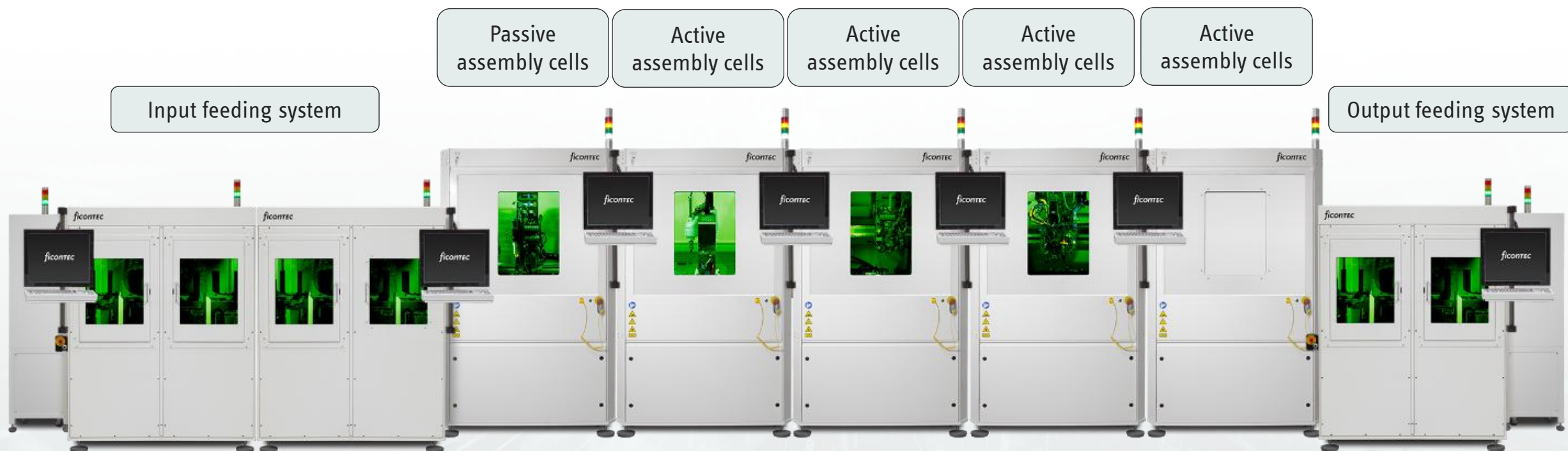
Priorities in Production:

- High yield
- High throughput / UPH (units per hour)
- Low unscheduled downtime

Data driven OEE optimization

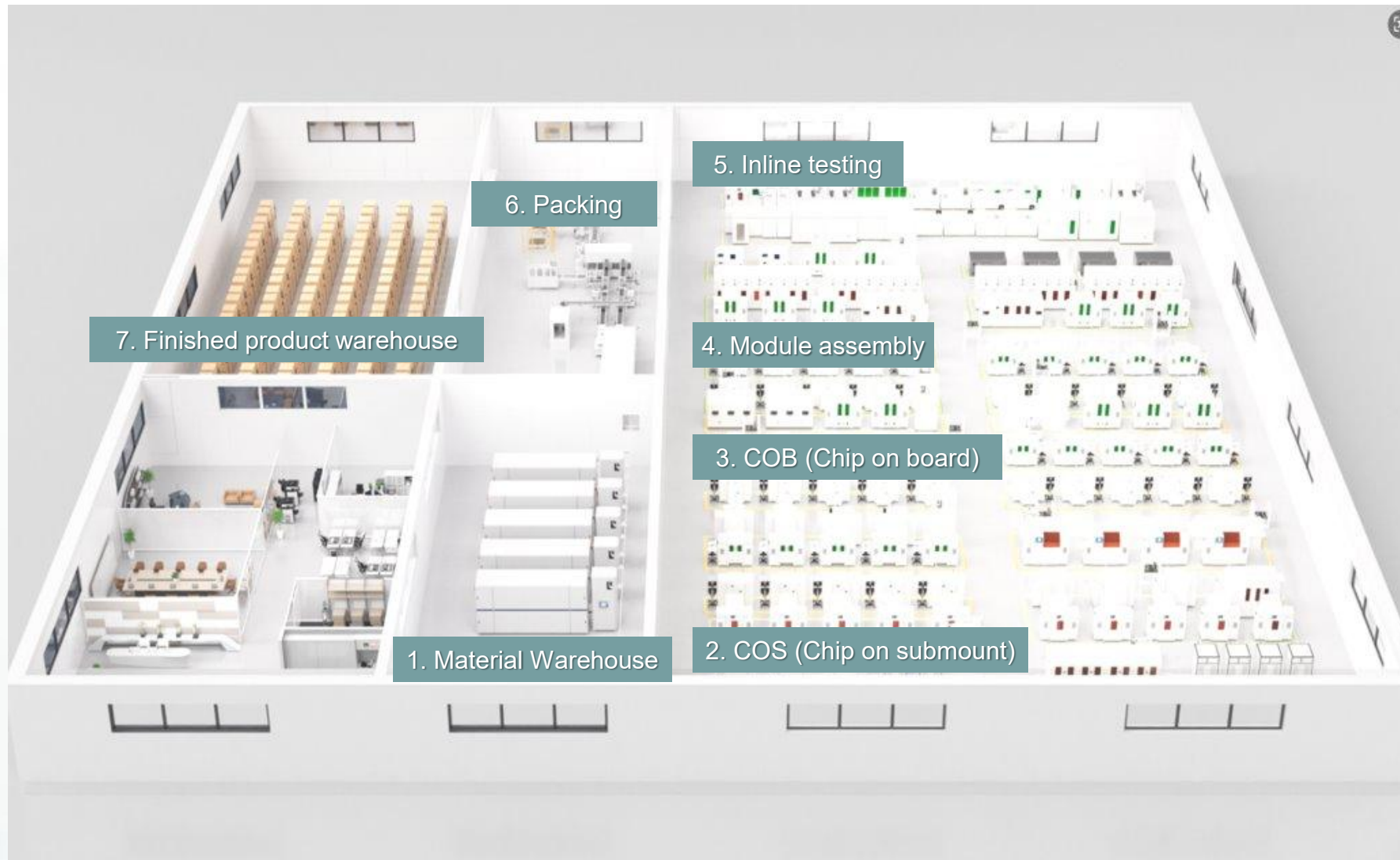


Path to Scale #1: Inline Manufacturing



Low variation - high volume

Path to Scale #2: Modular Manufacturing



Adaptive capacity - Scale gradually

Better serviceability - reduced downtime

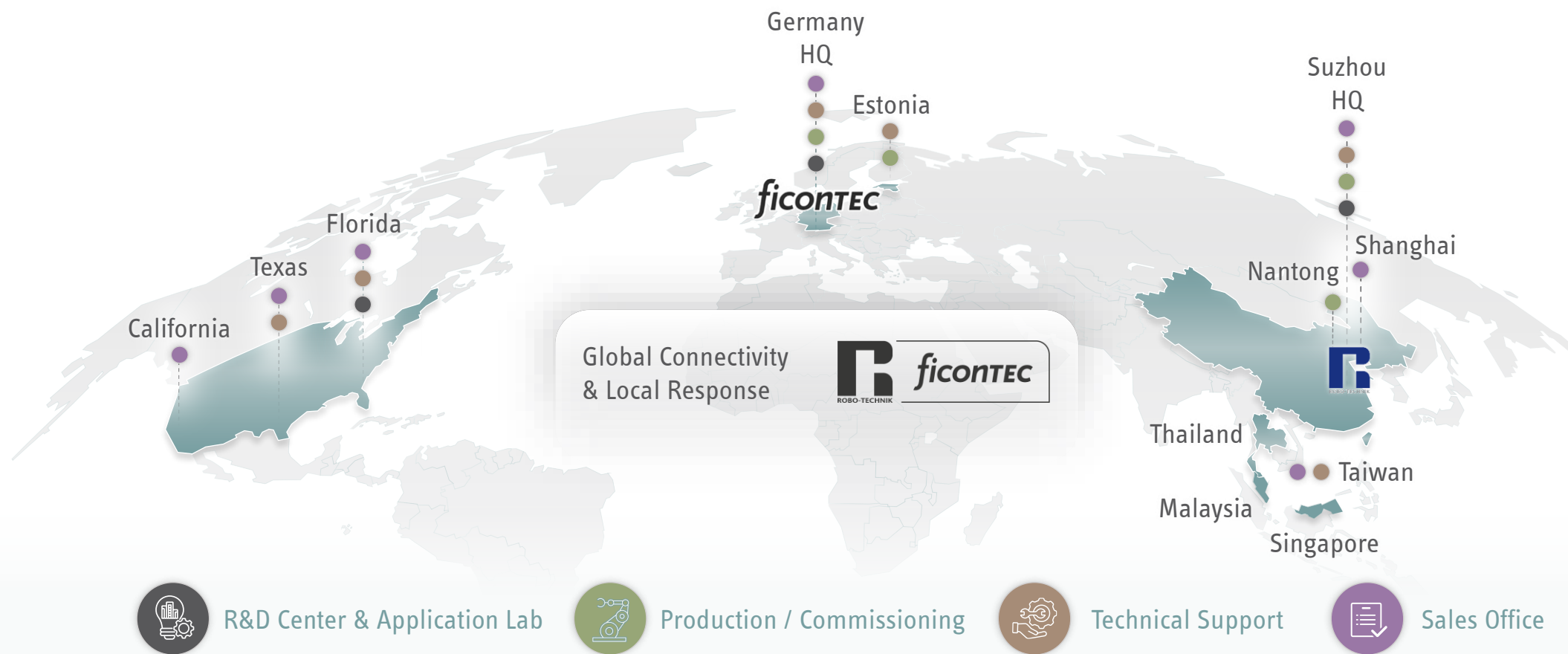
Partial upgrades - reduced downtime

Additional capabilities expansion

End-to-end traceability and quality control



Global Footprint Covering Assembly, Test & Fiber Preparation End-to-end



MANUFACTURING MADE LIGHT
Solutions for integrated Photonics. Built to Scale.



Thank you!

The future is photonics – We automate it.



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