

CHAMP-ION

Championing A European Advanced Manufacturing Pilot Line of Ion-Traps

Created by: Silicon Austria Labs

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Why Ion Traps?



99.99%

Ion trap just set the world record for qubit accuracy.

That's 1 error in every 10,000 operations — 10× cleaner than Google's superconducting qubits.

two-qubit gate fidelity

IonQ, Oct 2025 · Physical Review Letters

7 NINES

Oxford hit 99.99999% accuracy on a single ion qubit.

The best superconducting qubits sit at ~99.9%. Ion traps are 10,000× more accurate per operation.

99.99999% single-qubit fidelity

University of Oxford · Phys. Rev. Lett. 134, 230601 (2025)

ALL ↔ ALL

Every qubit talks to every other. No routing. No overhead.

Superconducting chips wire neighbours only. Ion traps connect any qubit pair — enabling deeper circuits with fewer qubits.

qubit connectivity

IonQ Forte · Quantinuum H2 architecture

> 10 hrs

An ion trap qubit can hold a quantum state for over 10 hours.

A superconducting qubit loses its state in microseconds. Ion traps beat them by a factor of a billion.

quantum coherence time

arXiv 2603.19631 · Tsinghua / Duke University, 2025



VISION & MISSION

Establish a sustainable, scalable high quality pilot line across the EU to advance trapped-ion quantum chip innovation, secure a European supply chain, support SME involvement, and set standards for industrial production of quantum technologies.

CHAMP-ION AT A GLANCE

Europe's pilot manufacturing infrastructure for ion-trap chips — EU Chips Act

€50M

total initiative funding

21

partner organisations

3

years duration

4

diff. ion trap-flavors

DELIVERING ON EVERY BOTTLENECK



Design PDKs



200mm Pilot Fab



Packaging &
Integration



Testing &
Validation



Process Control



Open Access

Building Europe's sovereign ion-trap chip manufacturing infrastructure – from design enablement to packaging and tested modules, with an open-access pathway to industrial-grade pilot manufacturing.



Quantum Computing



Quantum Sensing



Quantum Communication



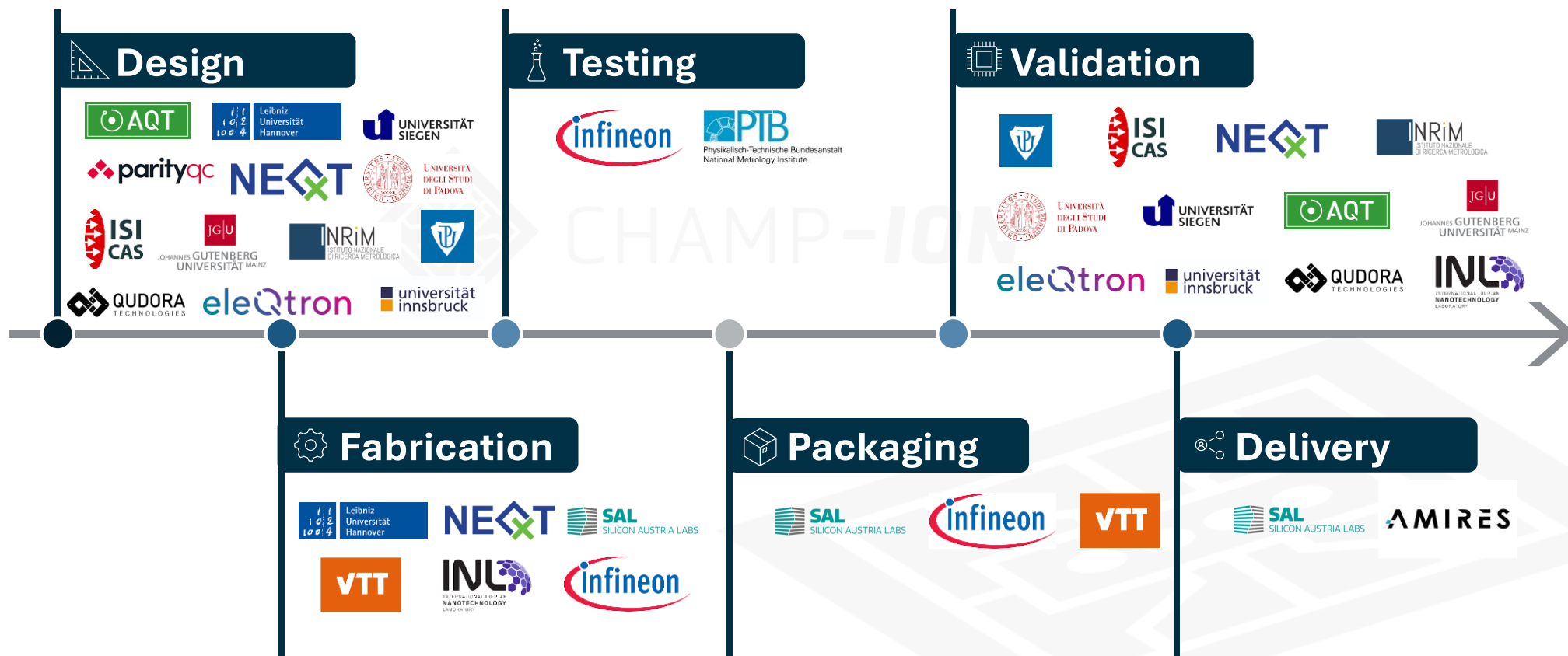
CONSORTIUM

A strong European consortium of RTOs, universities, start-ups, SMEs, and large industrial partners from Austria, Germany, Czechia, Finland, Portugal, and Italy.



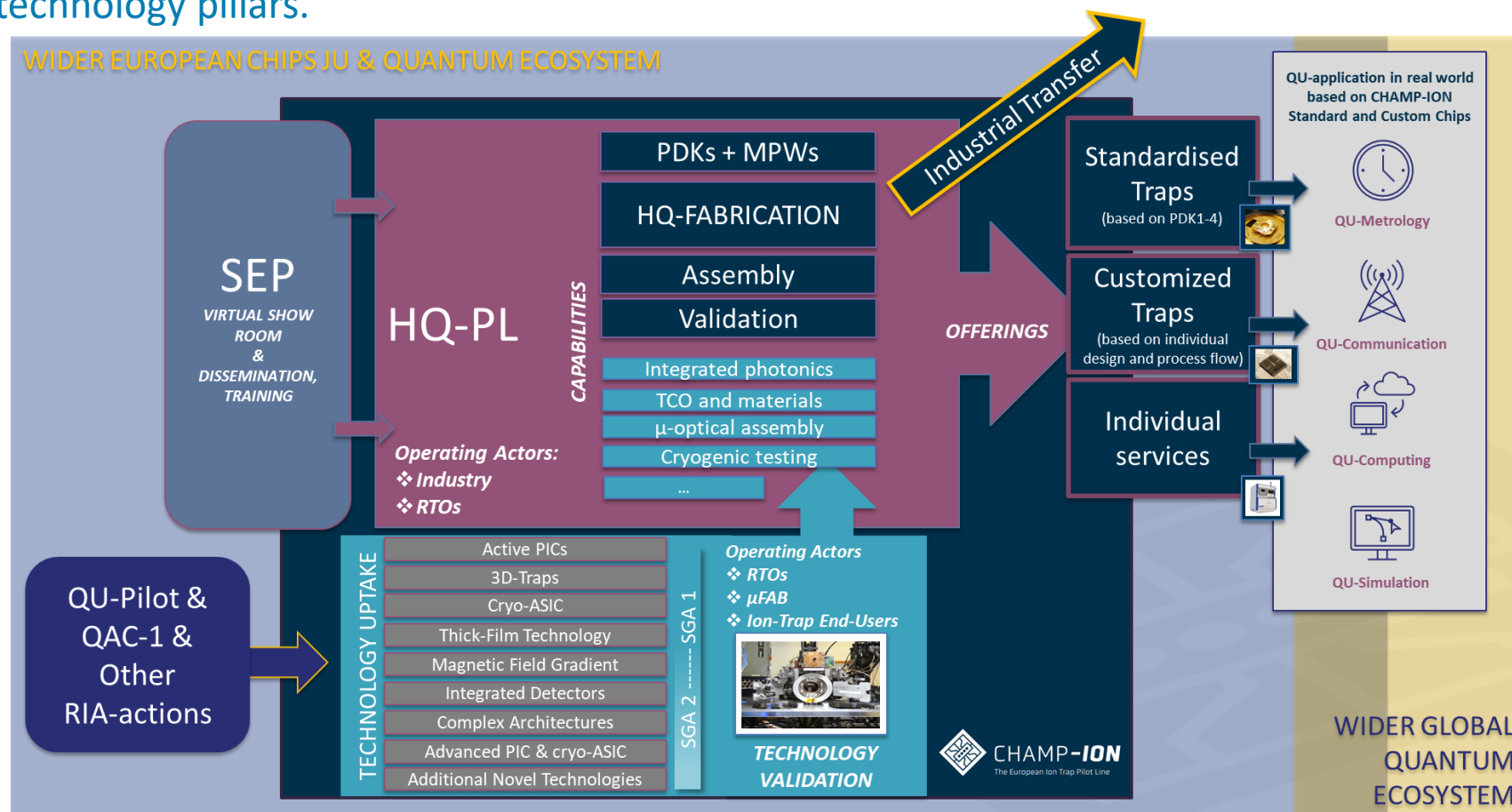
VALUE-CHAIN

CHAMP-ION combines complementary expertise across Europe to provide end-to-end ion-trap development, from design to fully validated devices. The consortium structure ensures access to all key capabilities required for reliable, high-quality quantum chip manufacturing and validation.



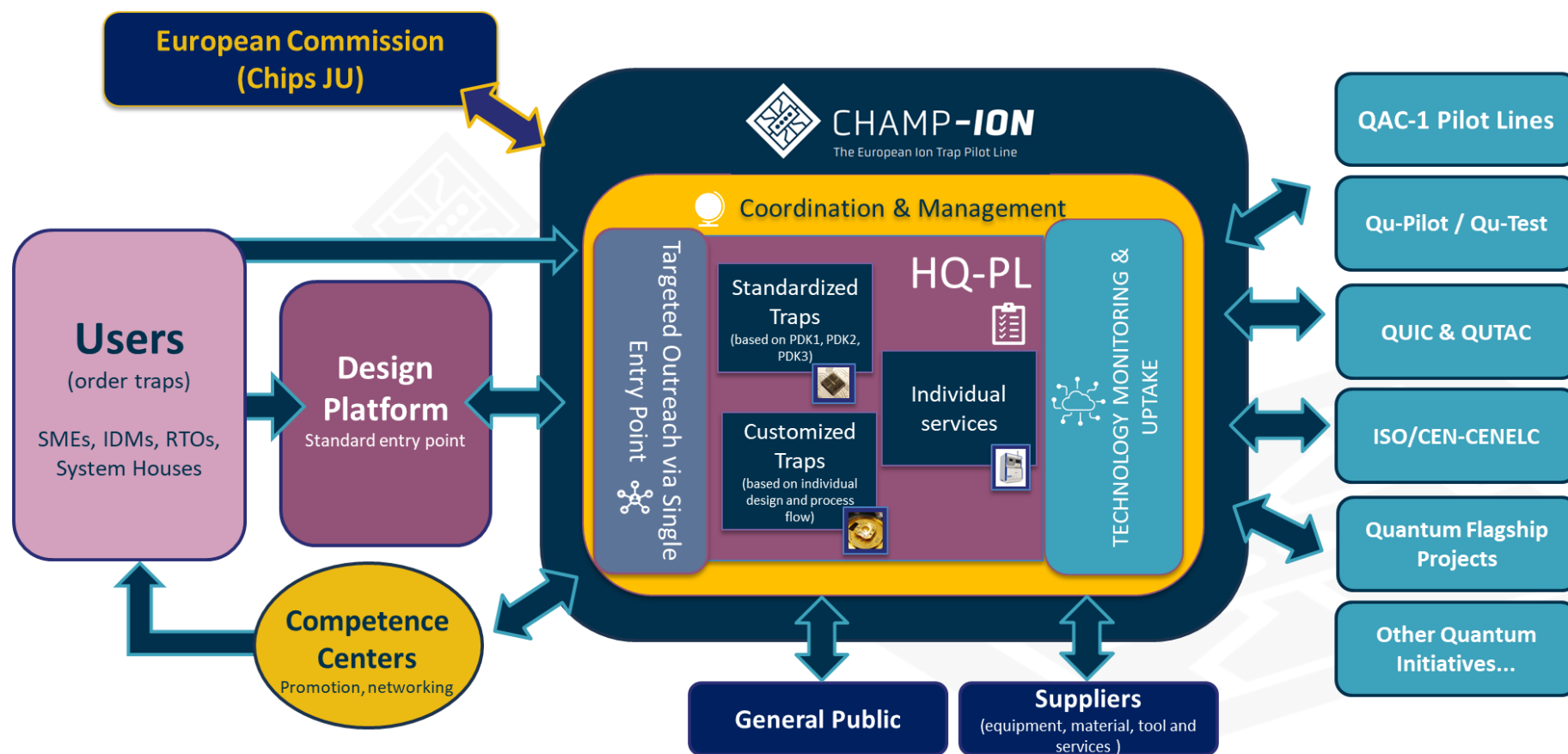
TECHNICAL AMBITION

The CHAMP-ION pilot line combines high-quality fabrication services with a clear technology uptake pathway, enabling both reliable production and continuous innovation. Through a single entry point, users gain access to standardized and customized ion-trap solutions supporting applications across all quantum technology pillars.



ECOSYSTEM

CHAMP-ION acts as the central European hub for ion-trap technologies, connecting users with design, fabrication, validation, and specialized services through a single entry point. Through strong integration with the broader quantum ecosystem, the pilot line supports innovation, standardization, and the development of next-generation quantum technologies.

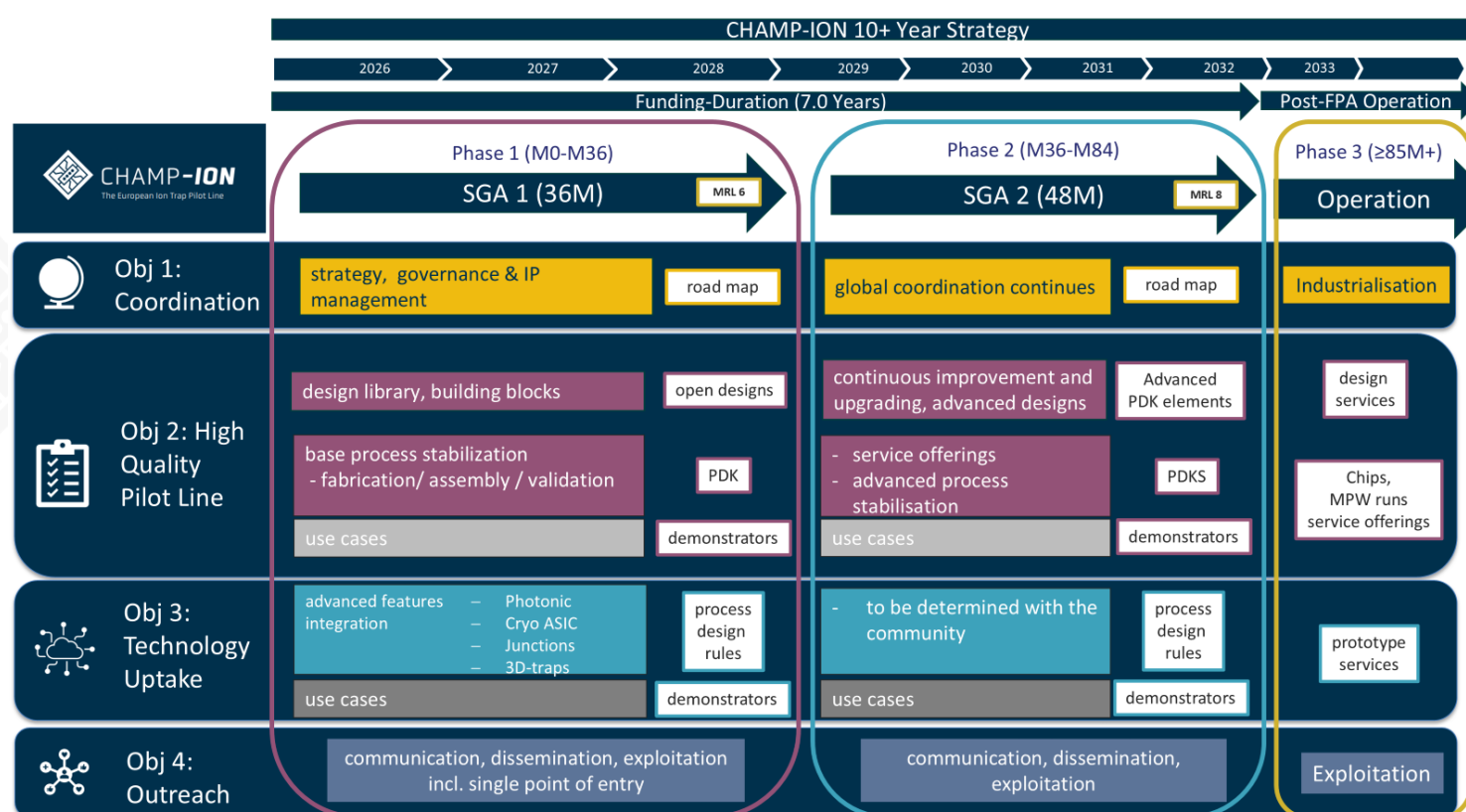


TIMELINE

The CHAMP-ION FPA defines a 10+ year roadmap, progressing from SGA1 and SGA2 towards a sustainable and fully operational European ion-trap pilot line.

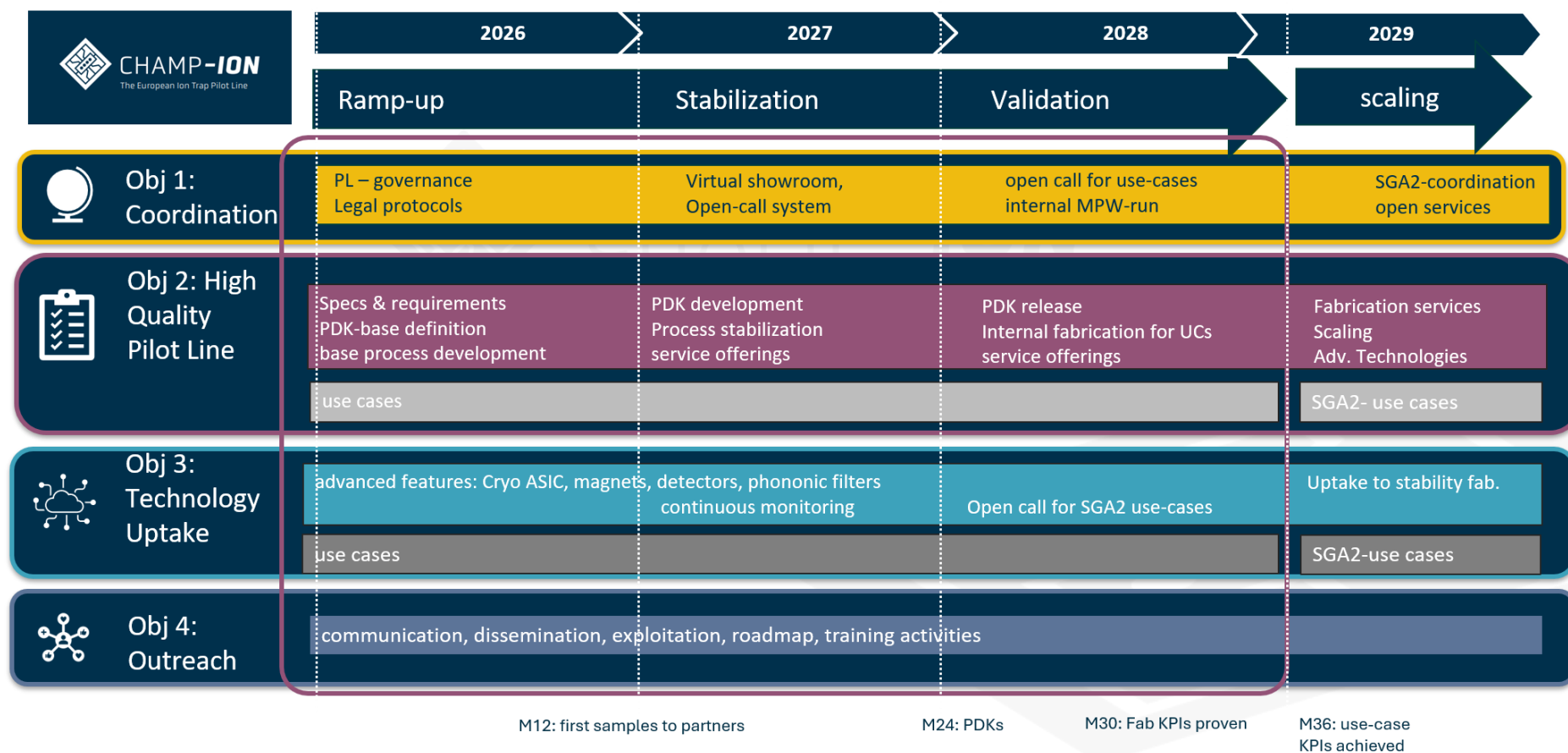
The long-term strategy addresses two key challenges:

- 1) establishing a stable high-quality pilot line and
- 2) integrating advanced technology features to enable future generations of quantum devices.



SGA1:ROADMAP

SGA1 runs from March 2026 to February 2029, progressing through ramp-up, stabilization, and validation phases toward a high-quality European ion-trap pilot line. During the project, governance structures, fabrication processes, PDKs, advanced technology features, and open-call use cases will be developed and validated to prepare the ground for future scaling and SGA2 activities





CHAMP-ION



www.champ-ion.eu



LinkedIn



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