

CHAMP-ION

Championing A European Advanced Manufacturing Pilot Line of Ion-Traps

Borislav Hinkov – Silicon Austria Labs, Villach, Austria

Created by: Silicon Austria Labs

23.06.2026



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



CHAMP-ION

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



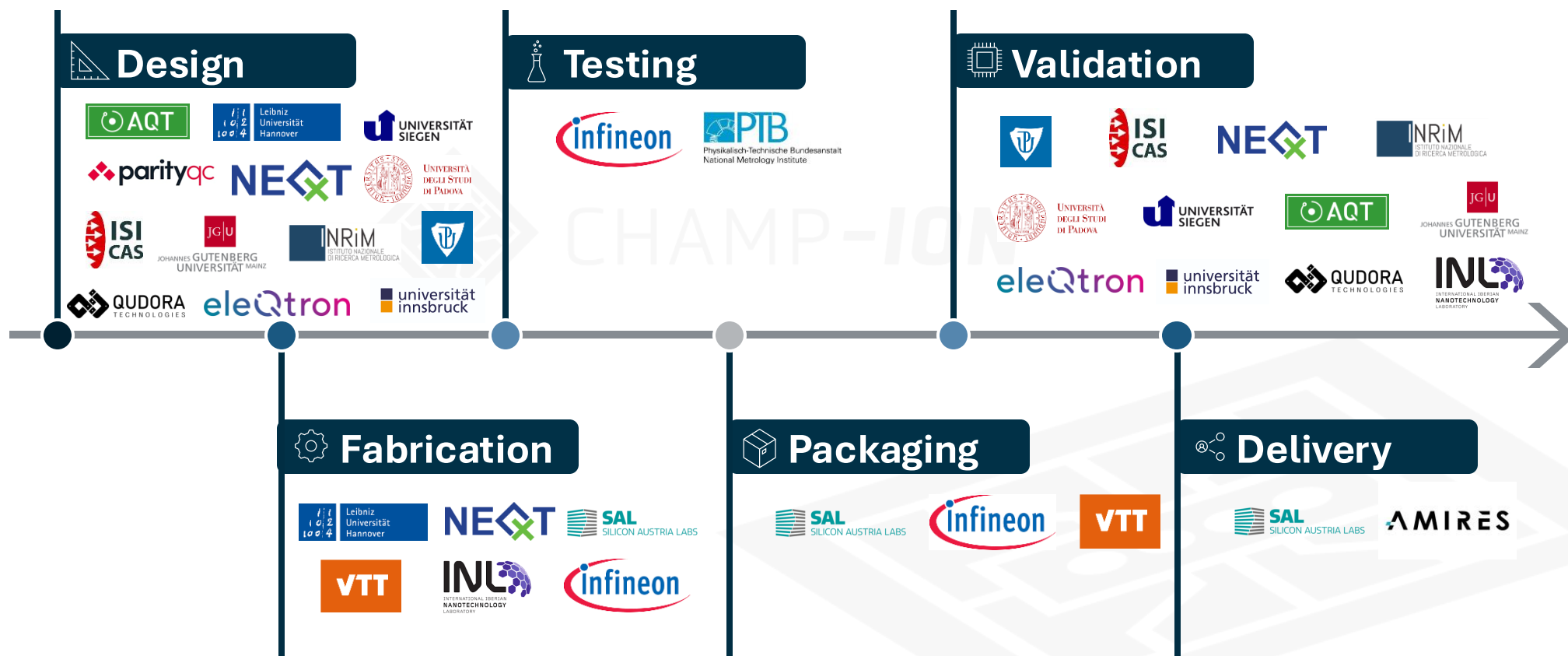
CONSORTIUM

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



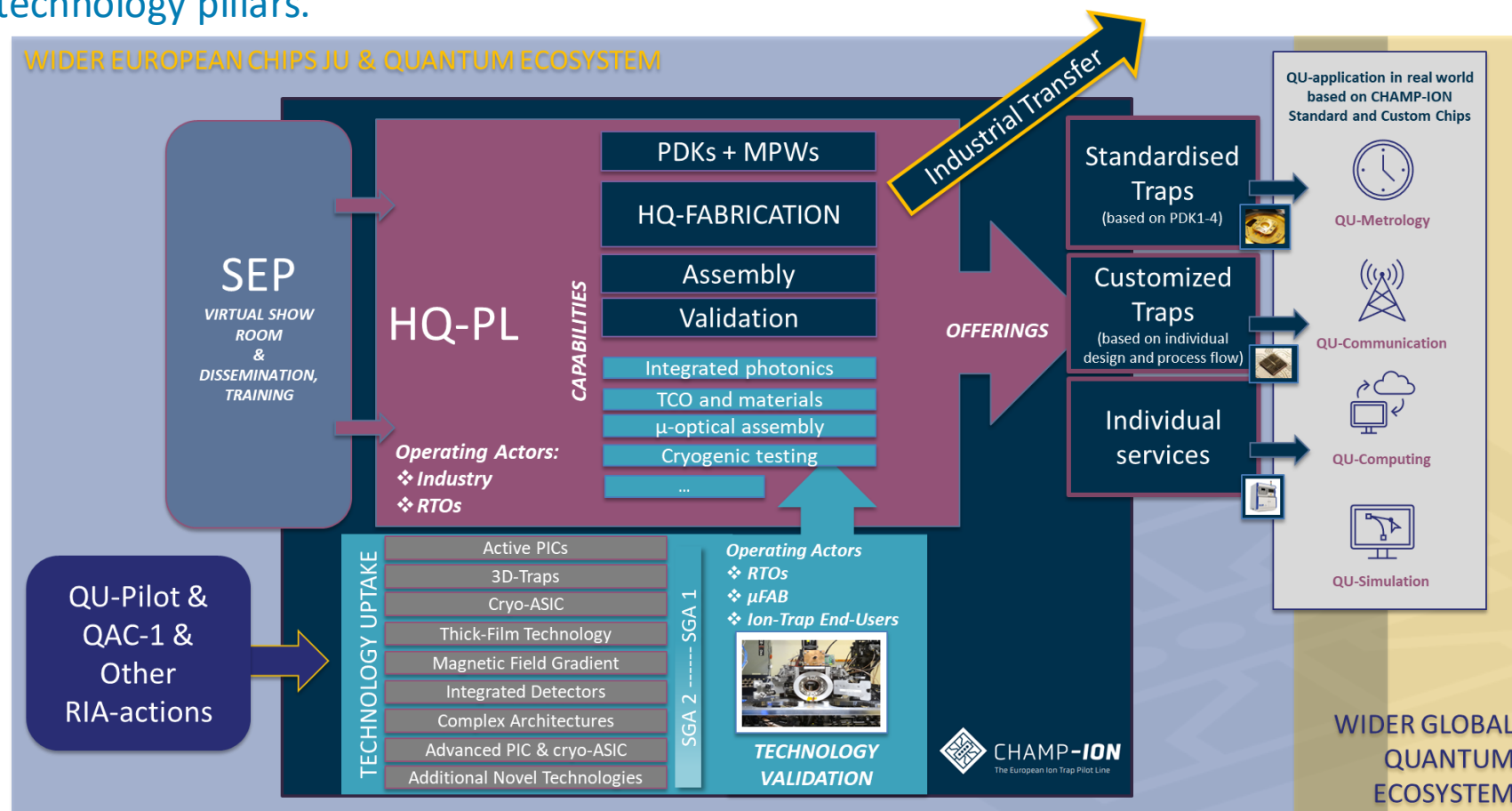
VALUE-CHAIN

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.



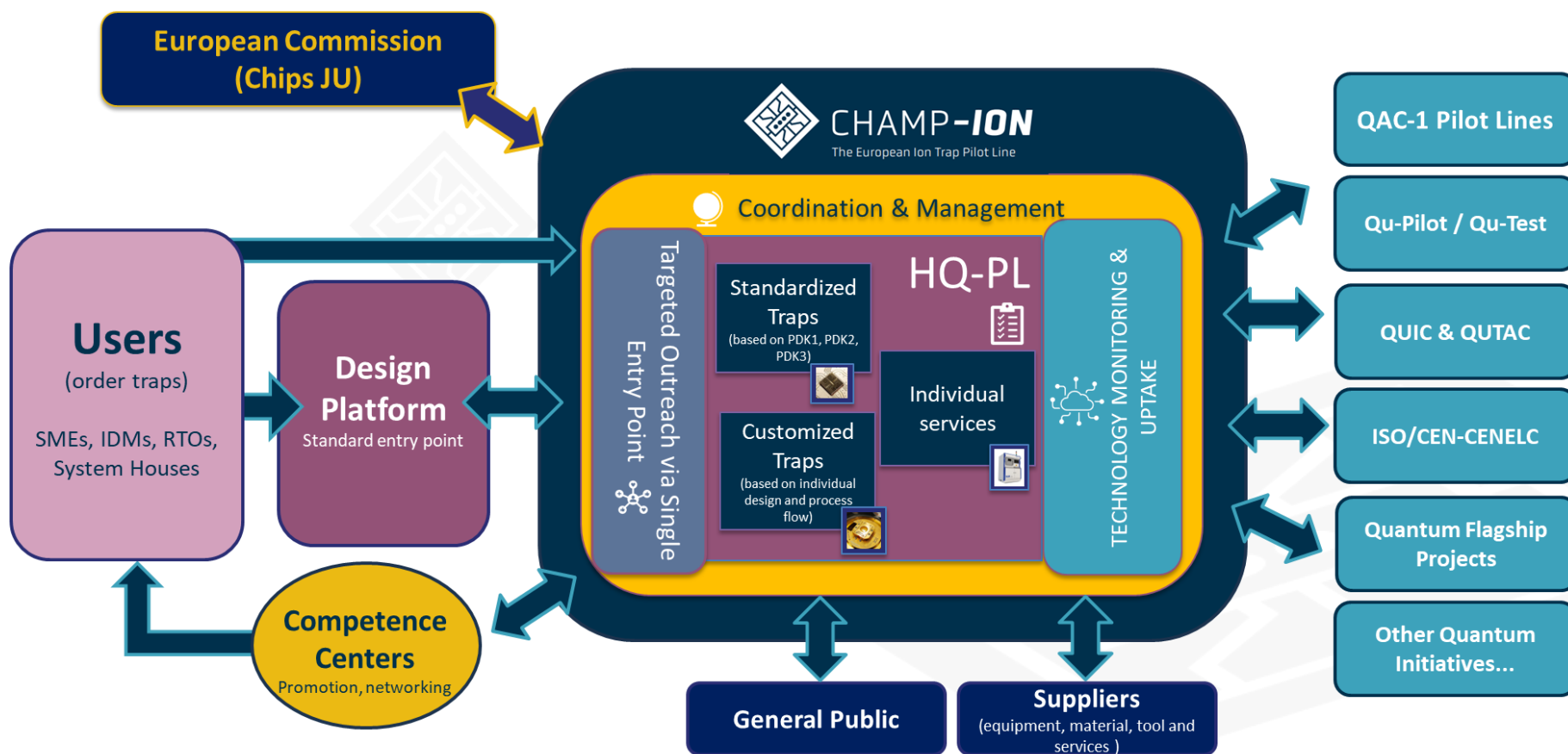
TECHNICAL AMBITION

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.

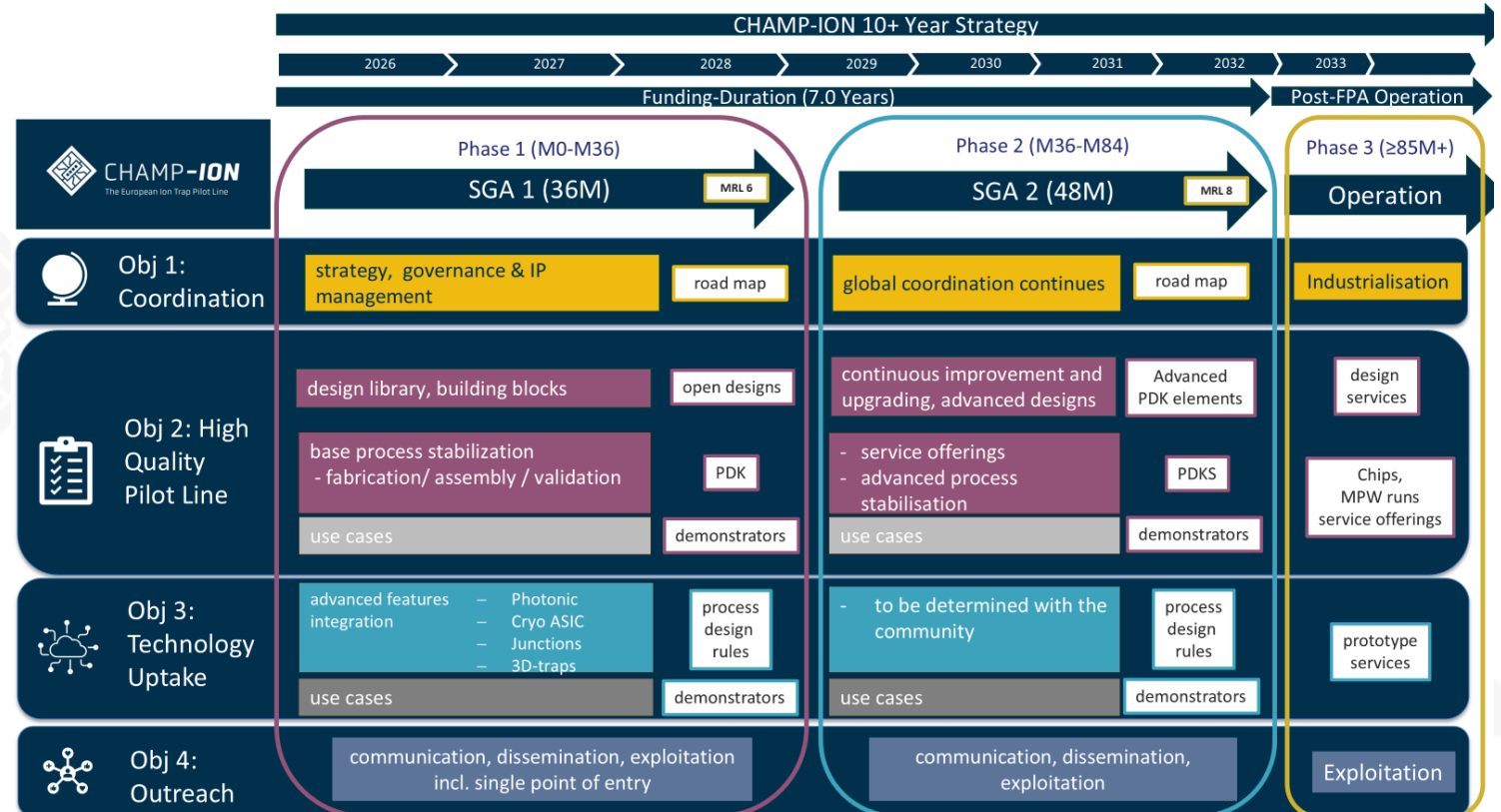


TIMELINE

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.

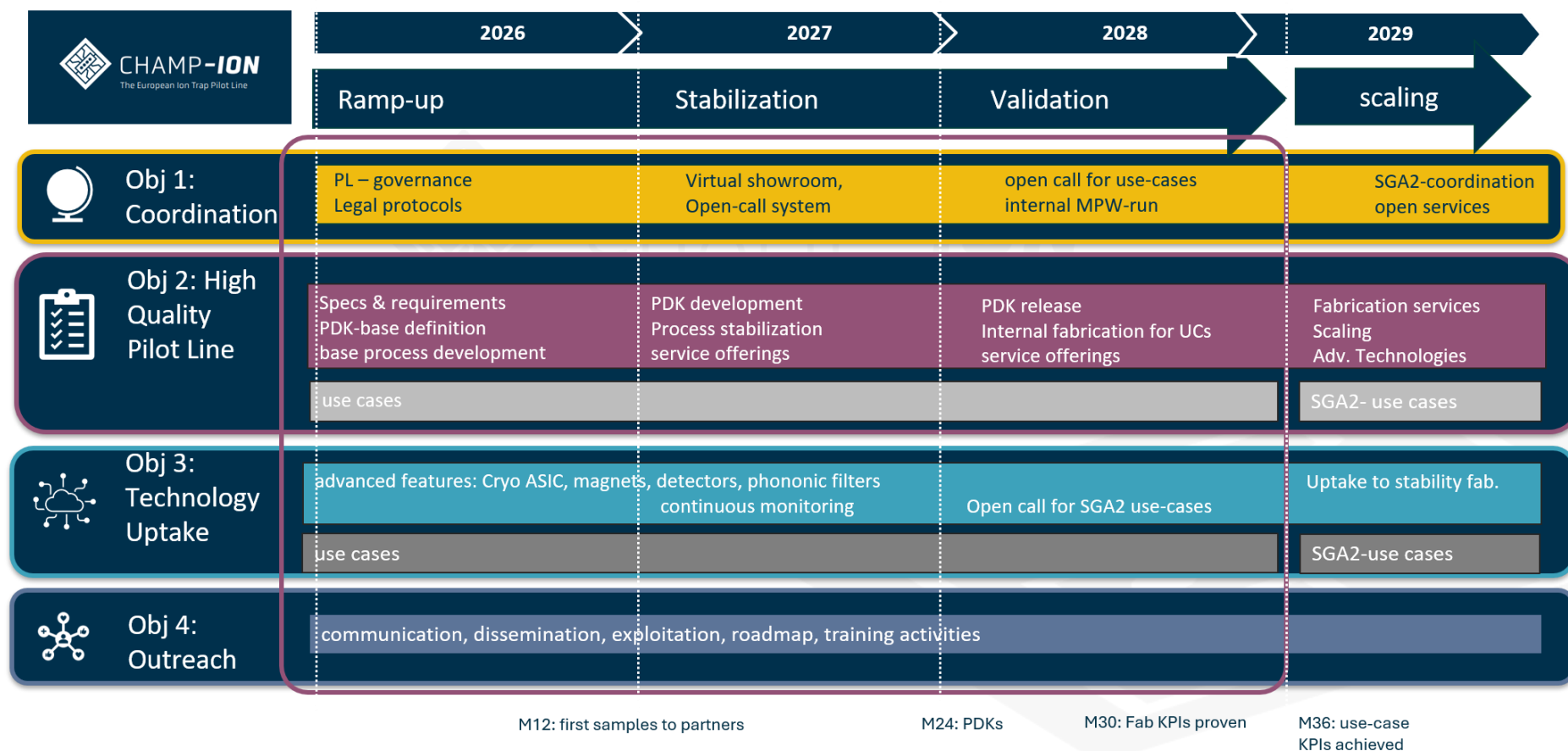
The long-term strategy addresses two key challenges:

- (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



CHAMP-ION, the European Ion Trap Pilot Line, is supported by the CHIPS JU, Horizon Europe and the National Public Authorities of the partners involved in the Framework Partnership Agreement Grant No. 101233101 and Specific Grant Agreement 1 Grant No.101288915.

