Quantum in Switzerland

Swissmem Quantum-Infoday

Zurich, February 28, 2024

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The Swiss Quantum Initiative (SQI) governance and funding

The Swiss Quantum Initiative (SQI) is

- mandated by the Swiss Confederation via SERI,
- hosted by the Swiss Academy of Sciences SCNAT and
- coordinated and led by the Swiss Quantum Commission (SQC) on a voluntary basis

Cooperation with the Swiss National Science Foundation SNSF and Innosuisse

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Innosuisse - Swiss Innovation Agency

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

State Secretariat for Education, Research and Innovation SERI

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Swiss National Science Foundation

More than a scientific initiative: simplified* view on the "Quantum Value Chain"

Illustrative

SQI goal: "Strengthen Switzerland's leading position across the entire value chain"

* Illustrative. Not strictly linear.

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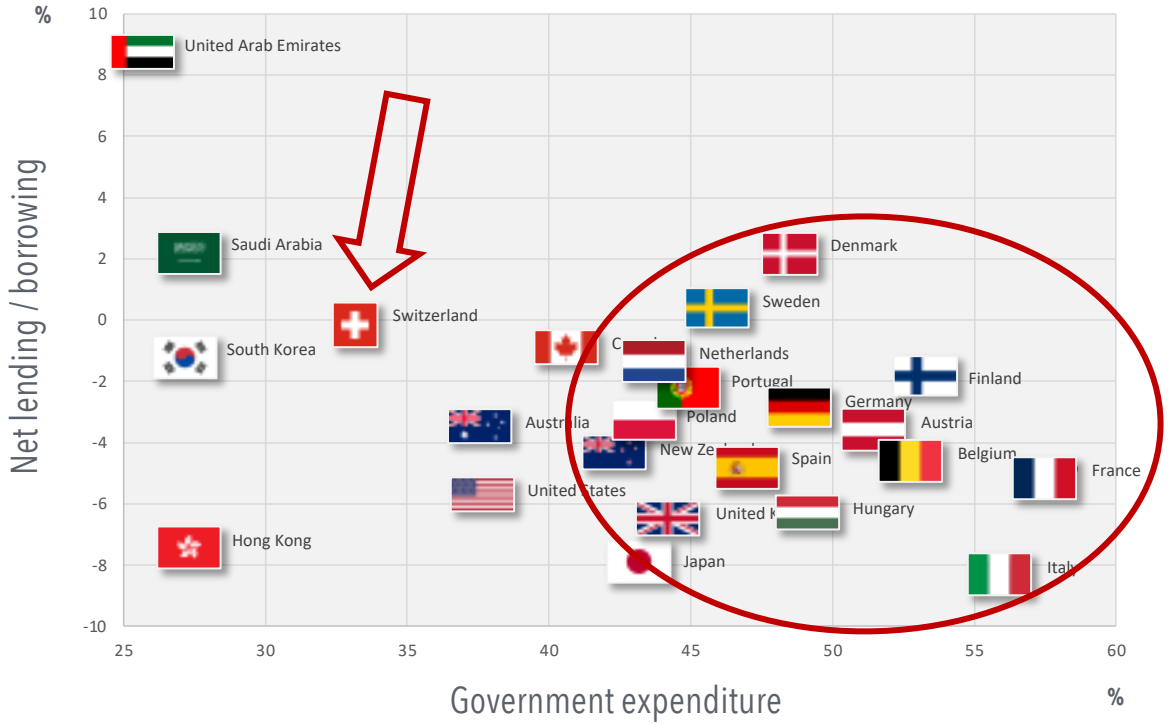
Specialties of the Swiss approach

- Cooperative governance
- Open and liberal market approach; no top-down industrial policy
- Curiosity-driven innovation
- "On top" national funding; complementing existing, decentral structures
- Long-term view

Honest and enthusiastic communication, but not contributing to some of the current "hype"

Government expenditure versus net lending /borrowing



BACKGROUND

Source:
https://en.wikipedia.org/wiki/List_of_countries_by_government_spending_as_percentage_of_GDP

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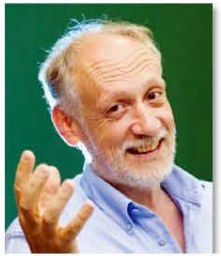
Swiss Quantum Commission (SQC)



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Arts

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IBM Rüschlikon

Swiss Quantum "Ecosystem"

https://swissnex.org/boston/news/new-mapping-of-swiss-quantum-ecosystem/

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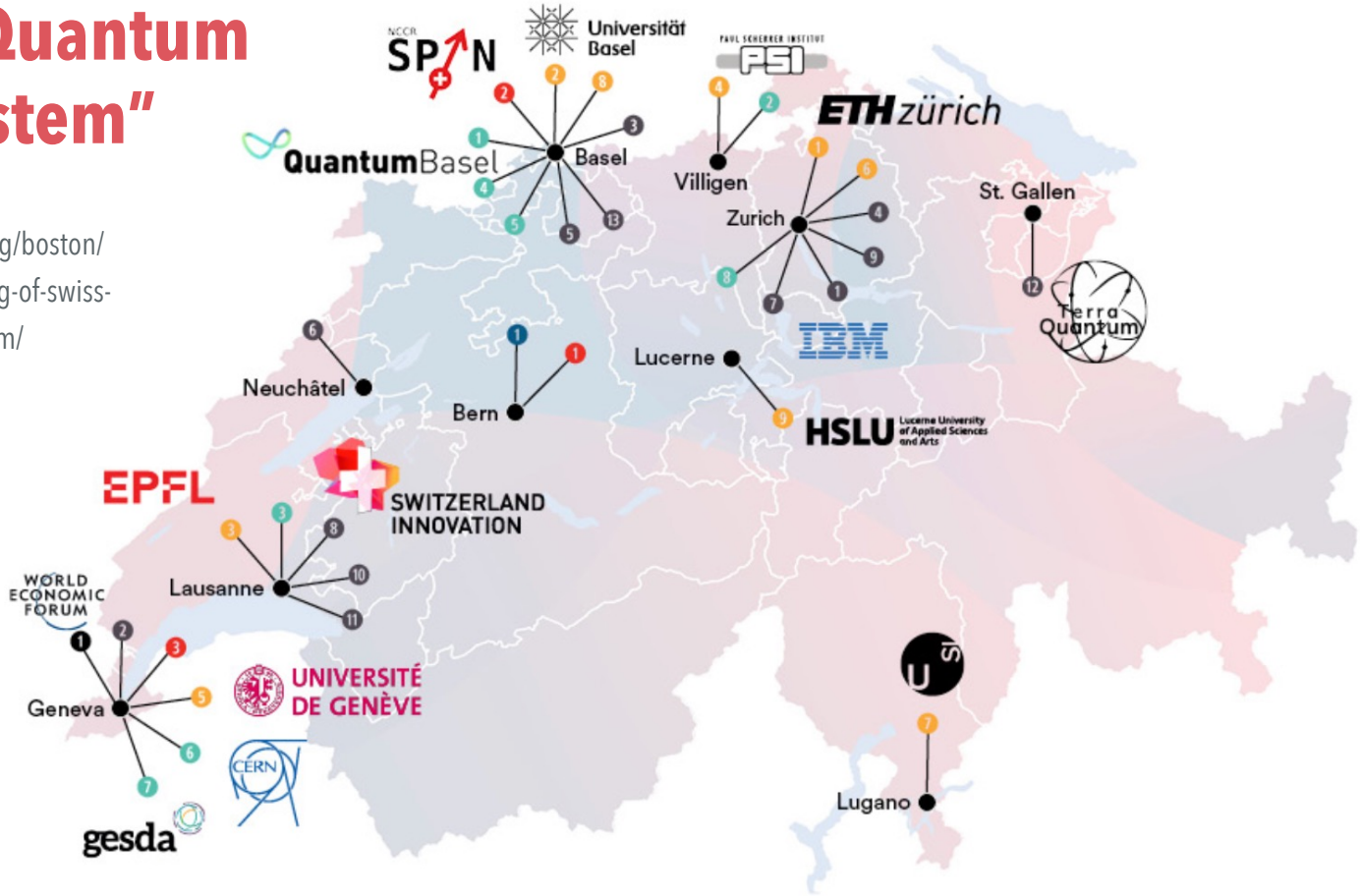

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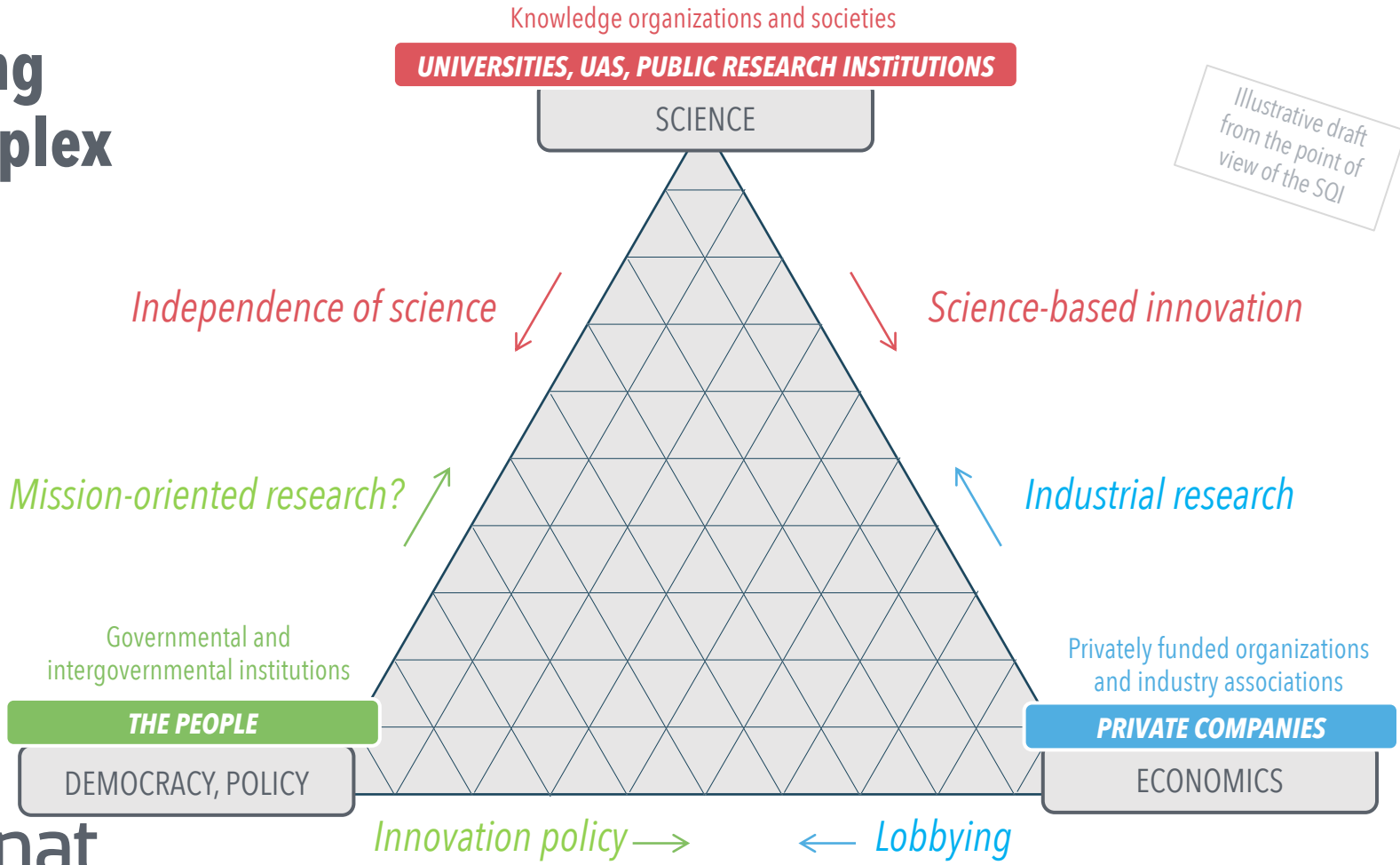
Exciting & complex



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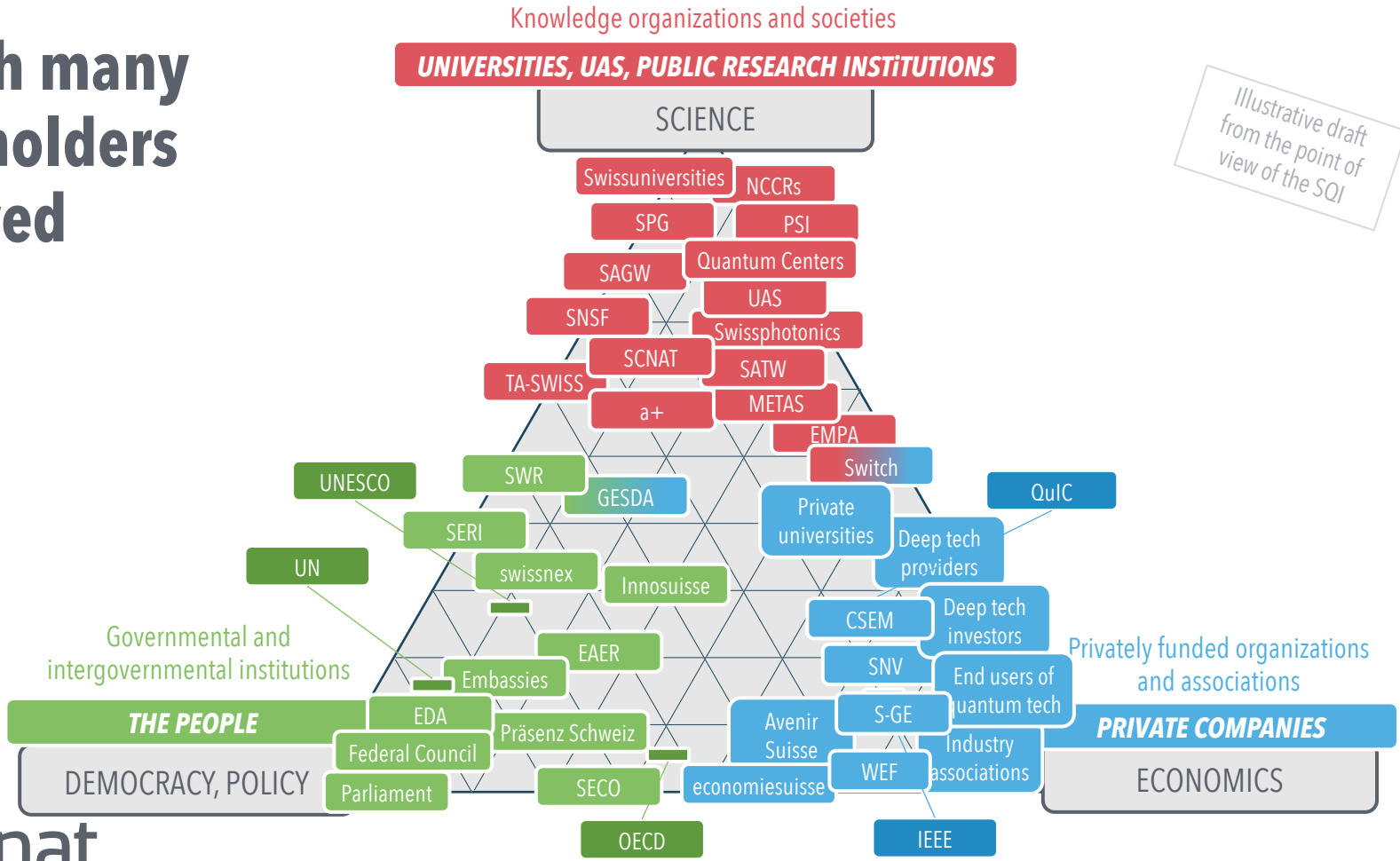
… with many stakeholders involved



Illustrative draft from the point of view of the SQI

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The field(s) of quantum

document available on our web page
quantum.scnat.ch

Mastering quantum systems
on the individual quanta level and engineered entanglement

Fields of applied research and development

- Quantum communication
- Quantum computation
- Quantum simulation
- Quantum sensing and metrology

Fields with a cross-sectional or foundational character

- Materials for quantum technologies
- synthetic quantum materials exhibiting entanglement
- Quantum control hardware
- Computer sciences
- Quantum theory
- …

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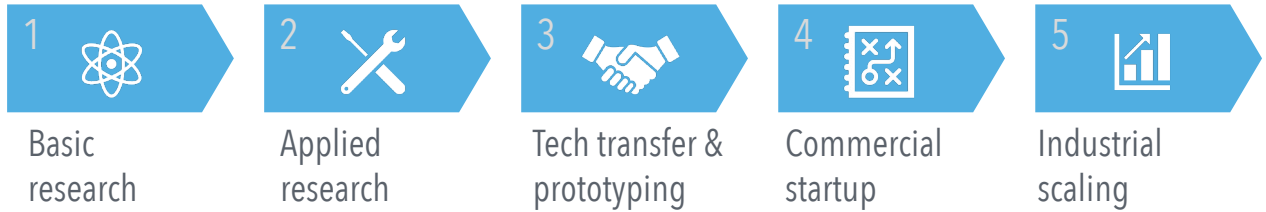
Value chain, TRLs and typical investment stages

ILLUSTRATIVE



TRLs:
Technology Readiness Levels
(indication of typical steps; variations in practice)

TRL 1	TRL 2	TRL 3	TRL 4	TRL 5	TRL 6	TRL 7	TRL 8	TRL 9
"Research"				"Development"			"Deployment"	

Investment stages:
(indication of typical steps; variations in practice, depending on technical area, e.g. higher costs for quantum computing HW)

Corporate sponsors, universities, …	Pre-seed	Seed	Series A	Series B	Series C		
	<$1m	$1-4m	$4-15m	$15-40m	$40-100m	$100-250m	>250m

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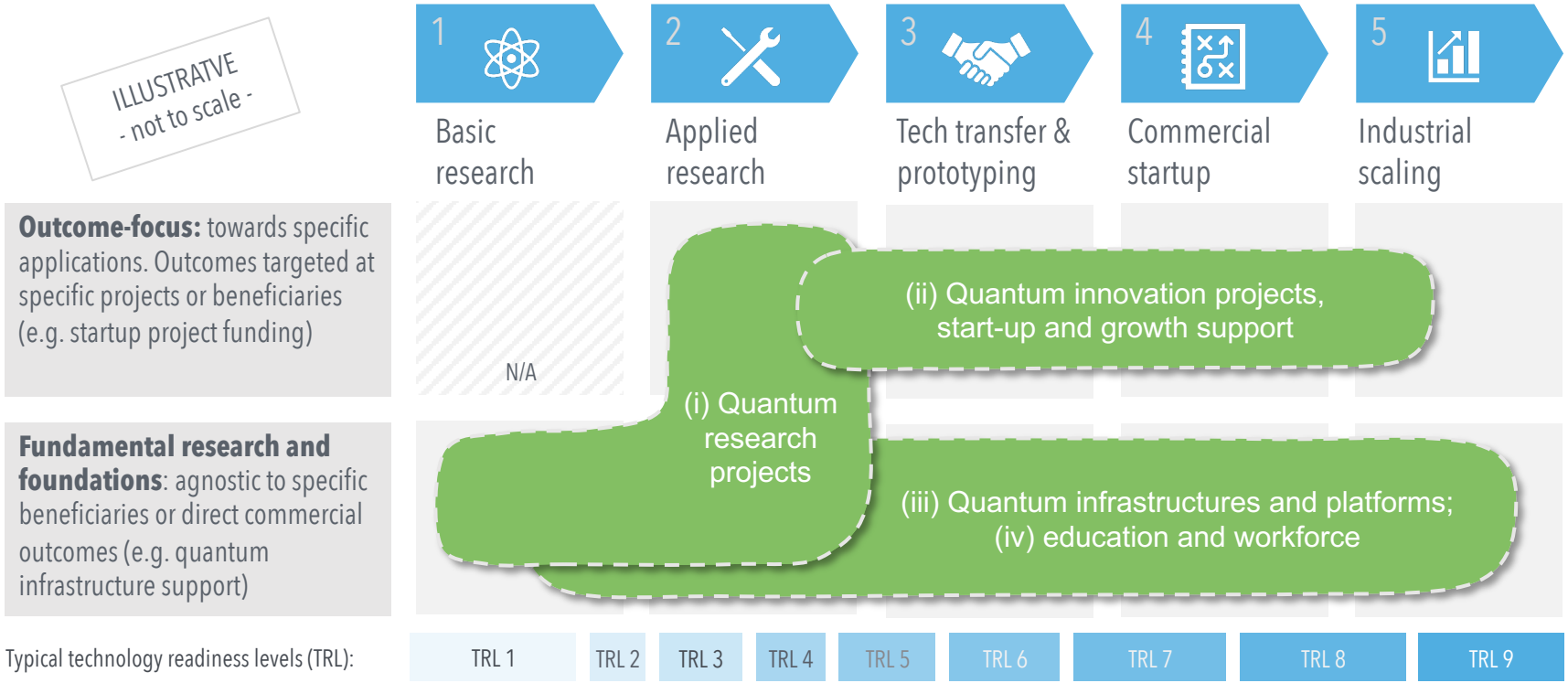
SQI main fields of action and funding



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SQC recommendations for 2025-2028 (selection)

- Overall, we are (still) in a time that calls for more **curiosity-driven research and innovation**
- SQI funding for **scientific research** in 2025-28 should be bundled into **one larger call**, ca. in 2027
- Significant attention should be given to **infrastructures** and emerging platforms for quantum (both with fundamental and applied characters)
- There is a need to **support innovation** and **young companies** without interfering excessively in market dynamics with taxpayers' money

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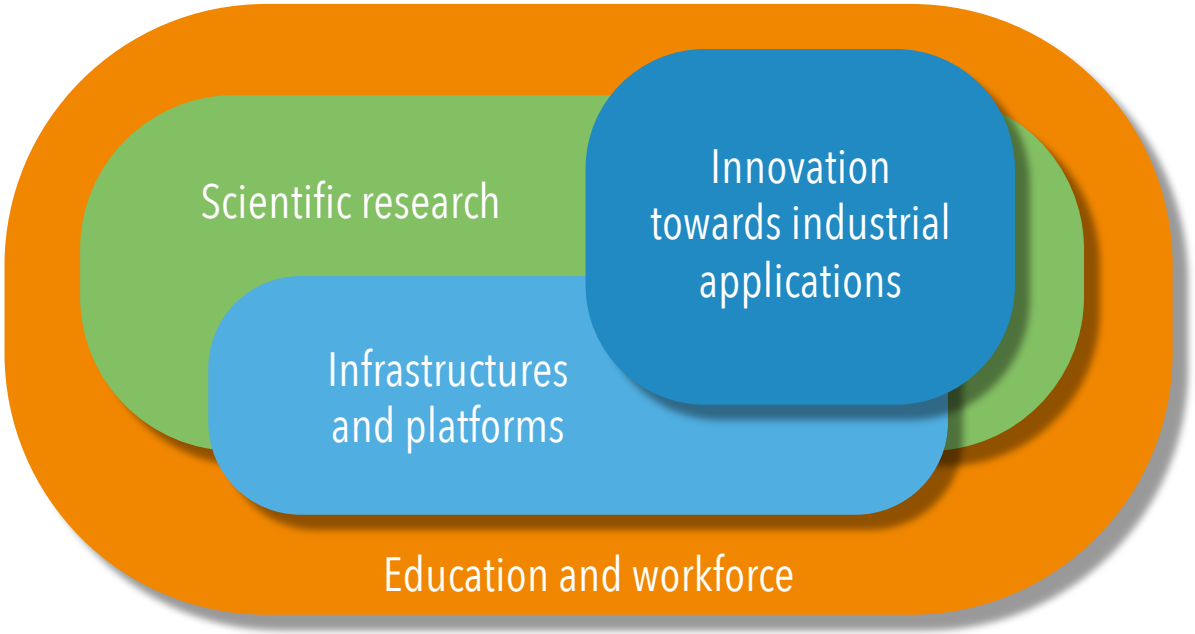
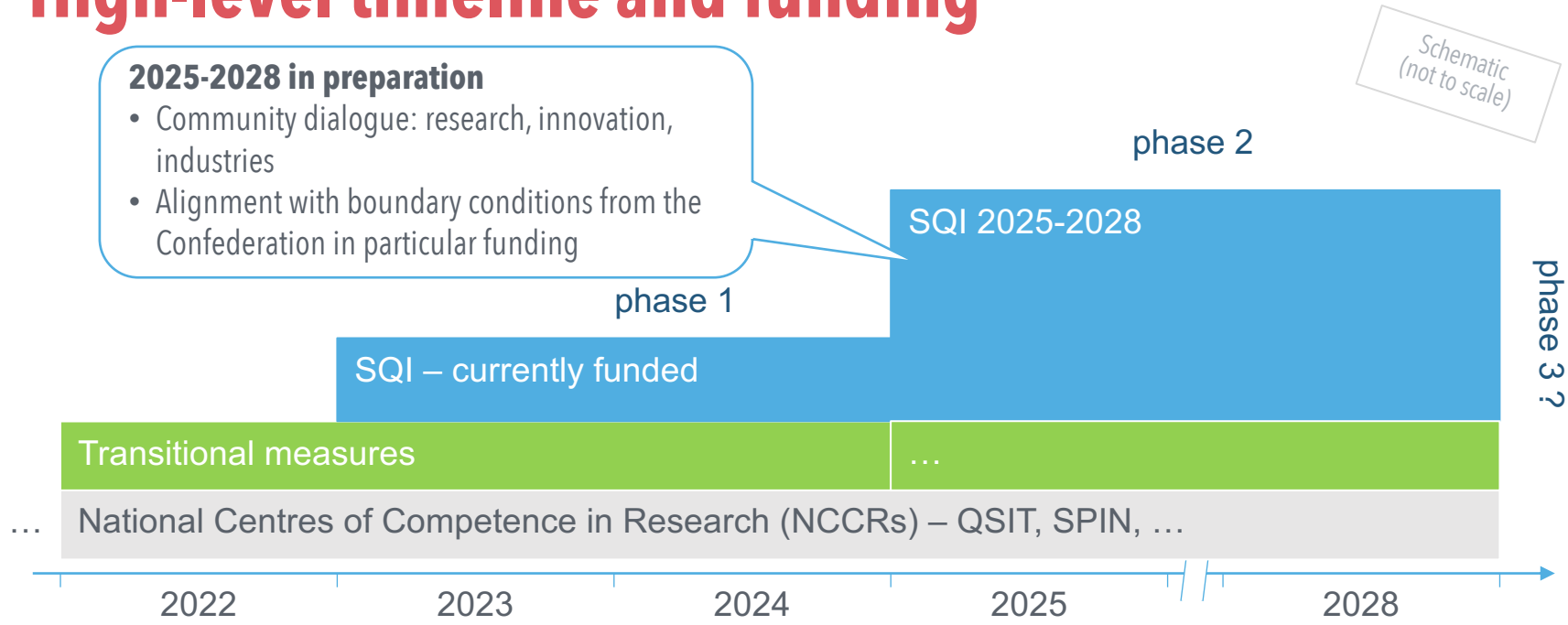
Education as an underlying topic for all fields of action within the Swiss Quantum Initiative

Illustrative



International aspects and communications embedded in all themes

High-level timeline and funding



Current SQI funding: 20 Mio. CHF for 2023-2024

Further funds planned for 2025-2028: ca. 80 Mio. CHF (TBD)

Limited to accredited institutions
(Some exceptions possible via Innosuisse)

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Funding instruments, announcements:
quantum.scnat.ch

- **Research**: Swiss Quantum Call 2024; via SNSF (submission date tomorrow)
- Call for 2-pager ideas on **national quantum infrastructures** developments with a national & industrial relevance
- Support for **events and conferences**

In preparation:

- **Voucher model** to utilize existing, shared **infrastructures for quantum**
- Financing **industry PhDs**
- **Innovation** support; via Innosuisse

Tip:
Partner with one or more accredited institutions

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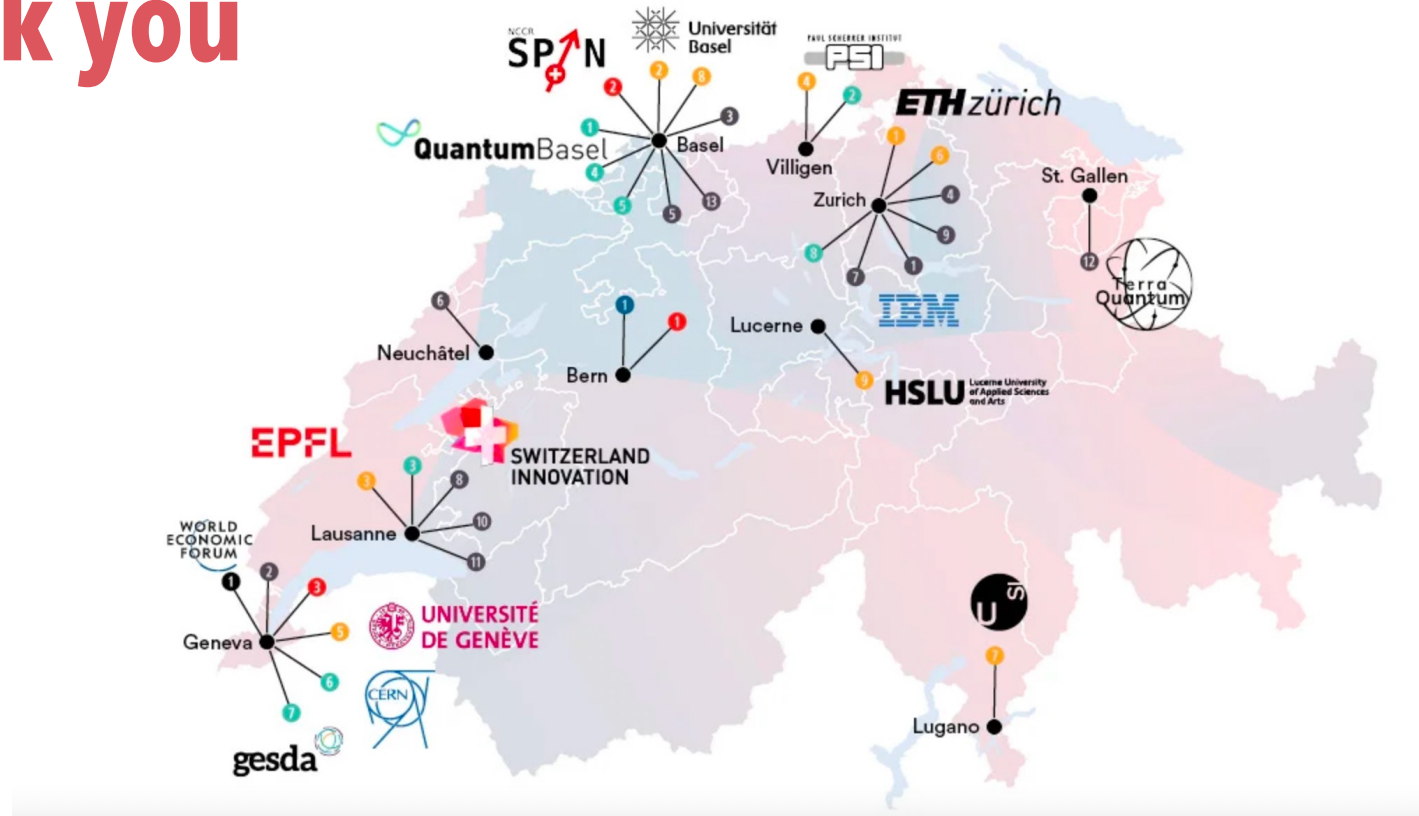
Call for 2-pager ideas for quantum infrastructure with a triple value: academic – industrial – national

- Part of the strategic dialogue with the Swiss Quantum Community
- No funding decisions in this phase (it is about *ideas* and a *dialogue*)
- 14 papers submitted so far with 20 ideas from academia and industries
- Broad range of national infrastructure topics / ideas / projects including: materials science, preparation and testing; cleanrooms; device fabrication; communication networks / links; computing services / platforms; algorithm development (sample key words for illustrative purposes only)
- Next step: first review; strategic round-table, Villars-sur-Ollon, February 1, 2024

Thank you



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