

DE LA RECHERCHE À L'INDUSTRIE



Content:

- Context and perimeter
- Examples and lessons learnt
- Added value for EU
- Messages

INDUSTRY AND TECHNOLOGY INFRASTRUCTURE COOPERATION

Context and perimeter : what is it about?

- Prosperity and competitiveness
- Industrial and societal challenges
- Staying at the forefront of technology development through collaboration and co-creation, allowing EU to shape its future
- What is working, to be shared, coordinated and supported

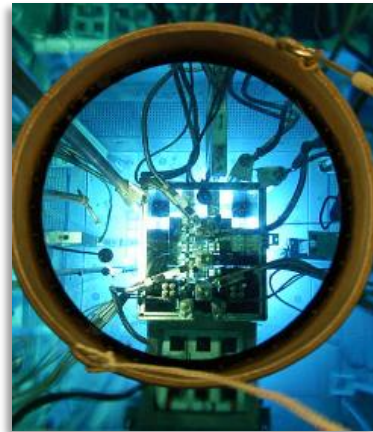
Context and perimeter :

- An European approach on Technology Infrastructures:
 - WS in March, 2018,
 - users (SMEs, large companies, and EU Industry associations),
 - providers of technology infrastructures (research and technology organisations, private companies, public entities)
 - policy makers from regional / local, national and EU levels
 - Commission staff working document, final report published in April, 2019
- Beyond Technology Infrastructure for accelerators and superconducting magnets, some examples from CEA Tech and the lessons learnt...
- Beyond CEA and other RTOs, messages for HEUrope, on Industrial Infrastructures for Research and Innovation

Defence and
security



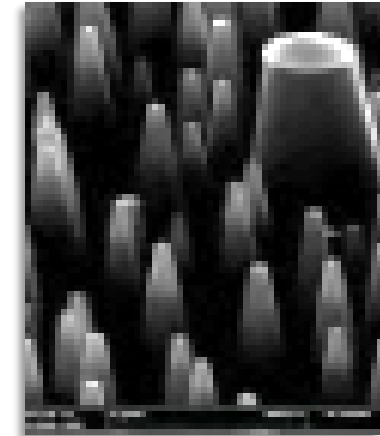
Low-carbon
energies



Technological Research

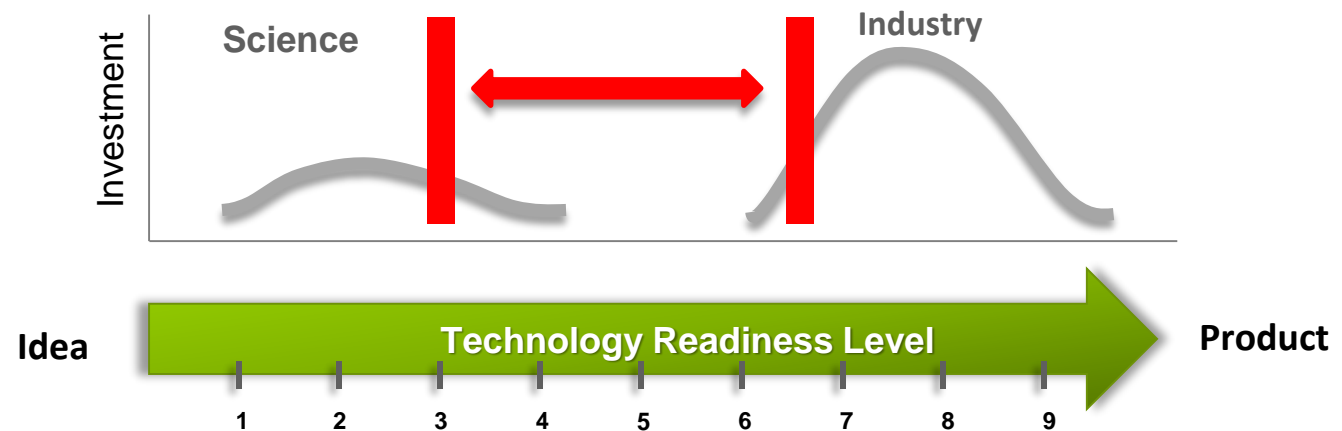


Fundamental research



Mission:

Technology development
and transfer of knowledge,
expertise and technologies
to industry



Bridging the gap between science and industry

- ~30 technological platforms
- 6 regional platforms for innovation and technological transfert

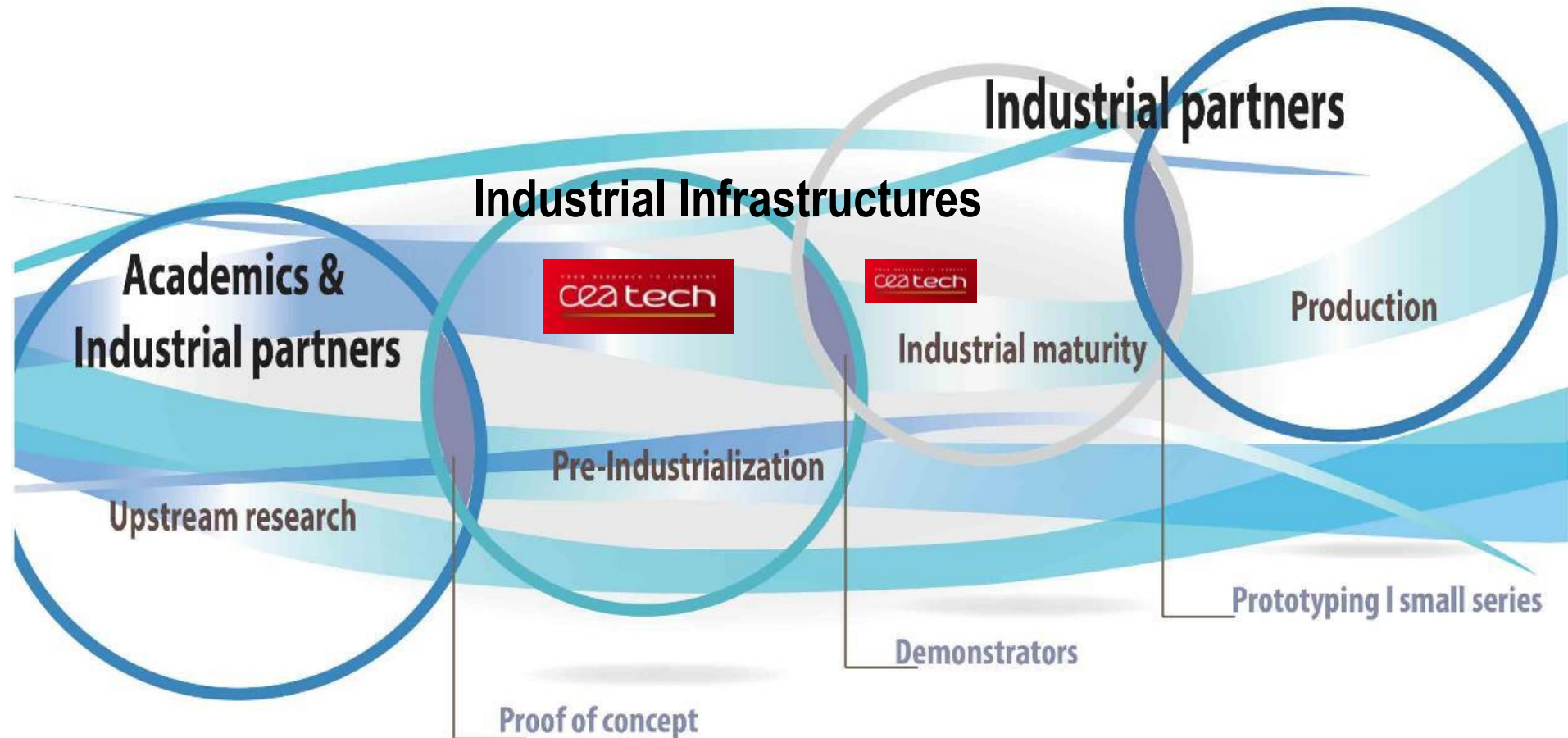
From CEA main sites to a full regional coverage:

- Strong local implantation
- Regional and national coverage
- Connection to EU and international ecosystems

Connecting European regions and giving access to SMEs

- Test bed projects
- European innovation hubs projects





Open, Shared & Accessible

Example 1: From an historical mission, the Leti silicon platform

→ To be at the state-of-the-art and internationally competitive



400
Engineers &
technicians



Investment
€ 500 millions



8000 m²
Clean room



7 days / 7
24 h / 24



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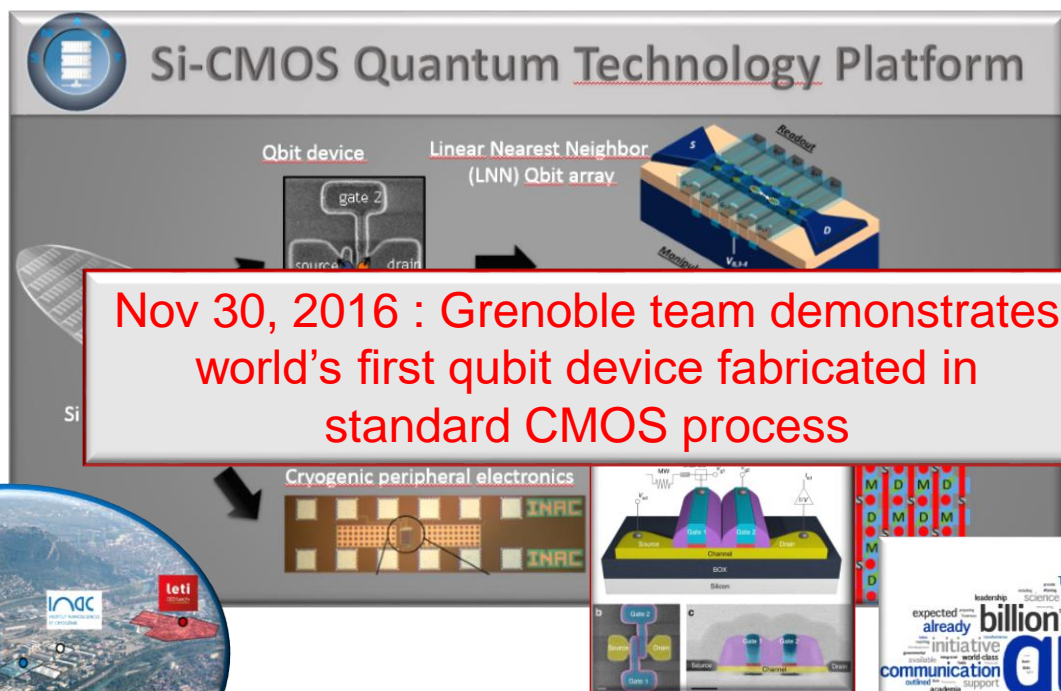

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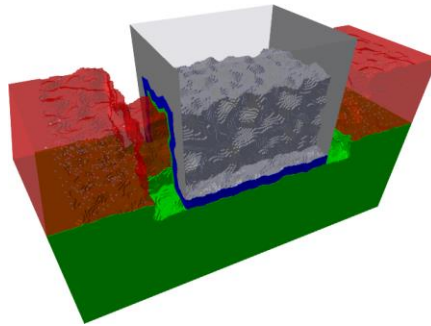
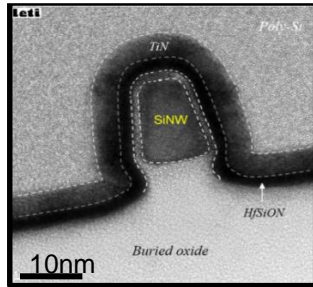
Consolidating the
Quantum Ecosystem



long-term and multi-path R&D towards a new generation of computing

Example 2 : Predictive modelling platform

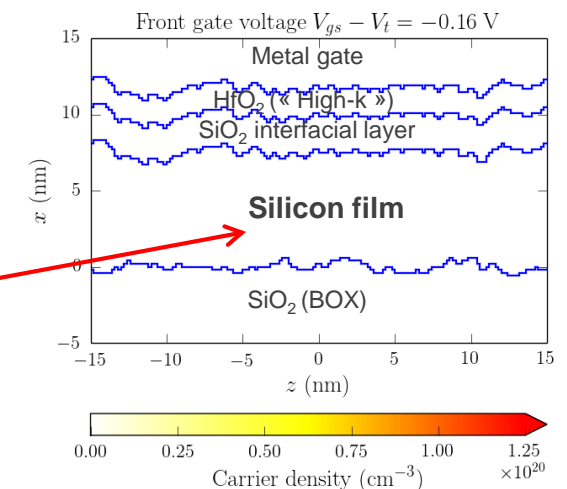
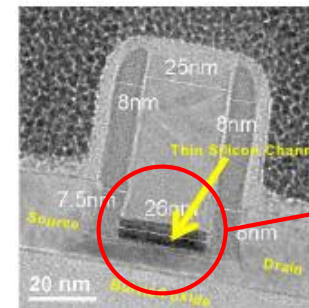
From a long standing collaboration (2007- 2017) with industry



- Meet the challenges posed by the physics and design of nanostructures and nanodevices:
 - Multi-physics, combining characterization and modelling
 - From atomic to ~100 nm length scales.
- Address a wide range of properties:
 - Structure, Electronic structure, Optics, Transport.

2013: First QUANTUM MODELIZATION OF AN INDUSTRIAL TECHNOLOGY

Fully-Depleted Silicon on Insulator devices (FDSOI28/14) from STMicroelectronics:

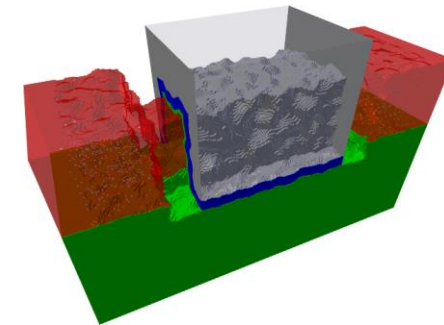
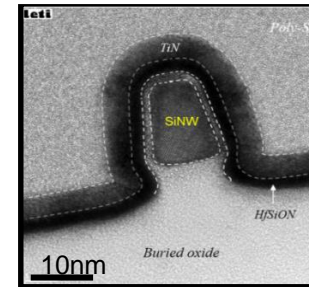


- The collaboration with industrial partners upgrades the performance of the platform and benefit to all activities, up to the most fundamental ones.

- **Achievements:**

- **Design recommendations:**

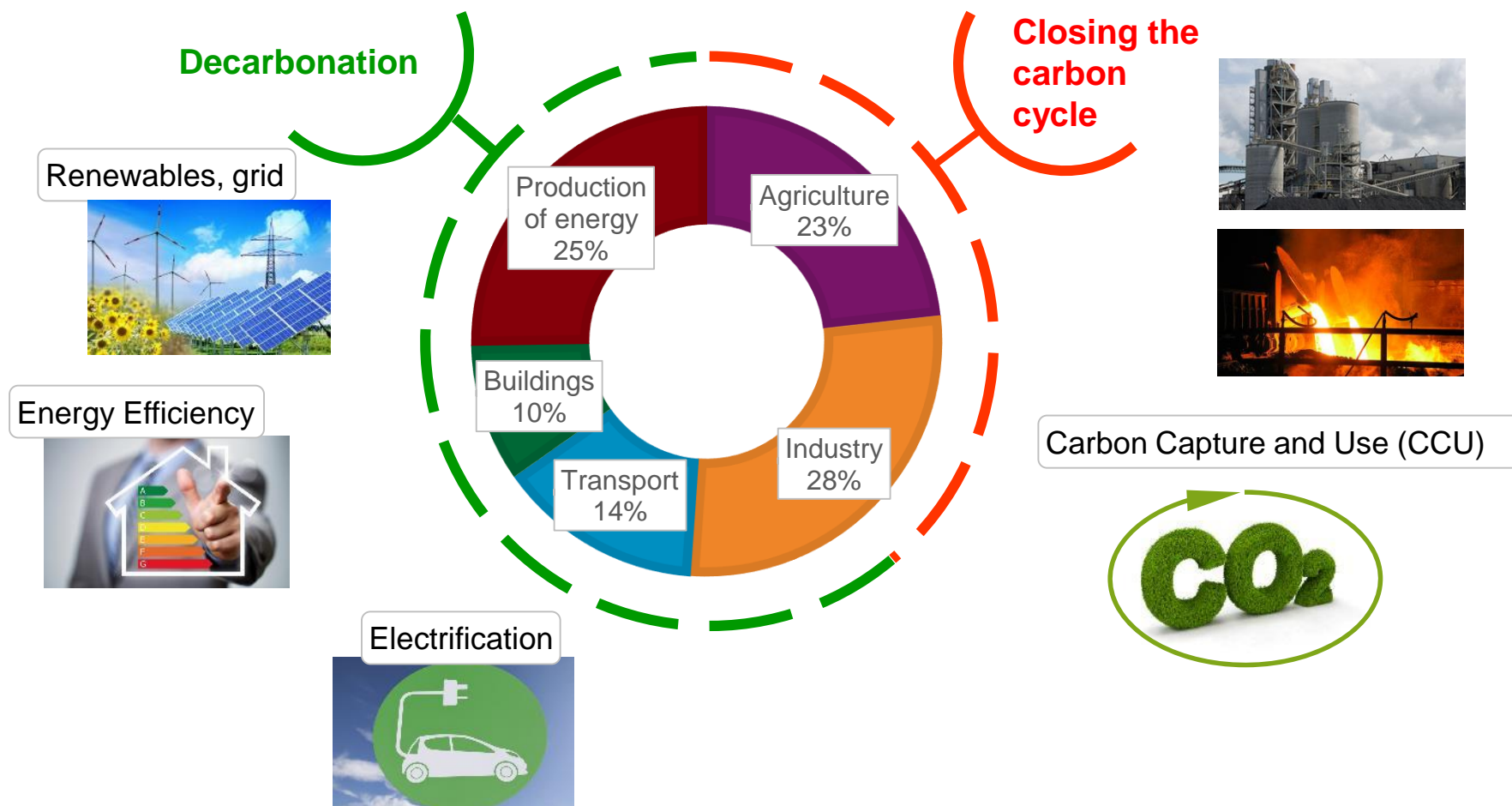
- Optimization of contact resistances, ...
 - Assessment of options for the next technology nodes



- **In-depth analysis of the physics of these devices:**

- Advanced modelling of carrier-phonons, surface roughness and charged defects scattering,
 - Exploration of “new” scattering mechanisms (e.g., “remote” surface roughness scattering).

Example 3 : Hydrogen Platform for a Carbon-Neutral Society



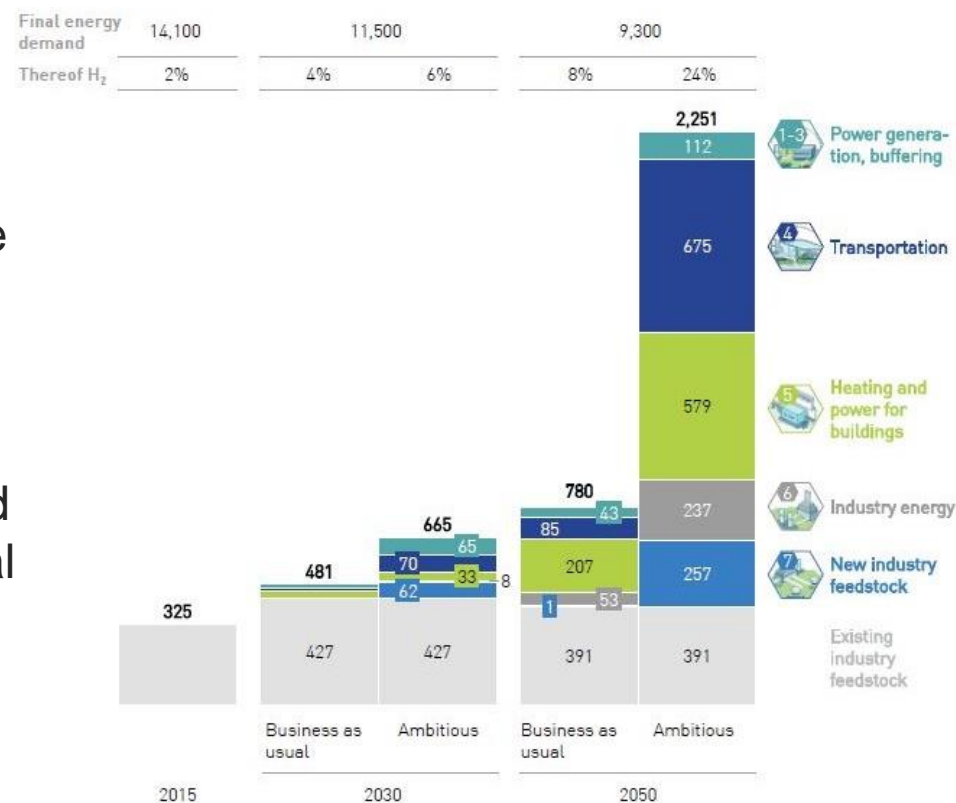
→ Help the European industry to take its place in the race in a just emerging market

HYDROGEN MARKET POTENTIAL

European Hydrogen roadmap, 2019, FCH JU

2% Today, Hydrogen represents only 2% of the final energy demand

24% By 2050, Hydrogen could provide up to 24% of total energy demand



Keys for success: open, shared and accessible technology infrastructures

- Always be at the state of the art in many technologies
- Serve both research and industry for disruptive innovation
- Adapt the management (processes, timeline, agreements, IPR, finance): tailor-made!
- Adapted to SMEs' needs
- Collaborate actively with mixed teams and people with diverse “cultures”
- Develop KETs by involving the full industrial value chain

A few Key Challenges for Technology Infrastructures



Keeping pace with technology requires:

- Continuous **equipment upgrades** which are not covered by running costs.
- Acquiring new skills and **crossing boundaries between disciplines.**



Managing multiple users requires:

- Procedures to respect **customer confidentiality** in a mixed environment.
- **Accounting principles** which are easily understood and accepted by both users and funding agencies.

Additional factors:

- Study / valorize the connection between S&T and citizens&society:
 - Work with the local authorities
 - Events, visits, connection with the schools and associations, etc
 - Work with SSH: history, geographies, culture
- Invest in Education:
 - Train (young) researchers to connect / understand / work with industry
 - Train expert engineers to connect / understand / work with research
 - *Ref.: could be KICs training programmes for professionals and PhDs*
- Pay attention to reciprocity: what the industry can bring to research?
 - Expression of the needs first
 - External approach and understanding
 - Business model, processes, etc
- Methodology to measure impact (*OECD: "Reference framework for assessing the scientific and socio-economic impact of research infrastructures" - March 2019*)

European Mastering, Excellence and Sector Coverage

- Short-term Industrial need, including SMEs
- Long-term multi-paths R&D, partnerships and collaborative research
- European, national and regional accessibility
- Identification of KETs and complementarity between European RTOs

<https://ec.europa.eu/growth/tools-databases/kets-tools/kets-tc/map>

- Key-elements of OIH ecosystems

European Competitiveness and Prosperity

- European full industrial value-chains
- European Sustainability and Sovereignty
- Widespread adoption of KETs
- Start-up « effect »

- Industrial technologies are synonymous of growth, competitiveness and jobs.
- They played an immense role in creating added value, addressing societal challenges and tackling any kind of technological issues.
- Long term and multipath applied research is not in the radar of Industry.
- In this aspect, there is a crucial need for supporting open, shared and efficient technology infrastructures.
- With this support, Europe will be fully able to transform its huge potential for the benefit of re-finding its flourishing industry.



**A European
support for
strategic
world class
TI4R&I&I**

THANK YOU

FOR YOUR ATTENTION