

Towards the new EU Strategy on Technology Infrastructures



**Muriel Attané, EARTO Secretary
General**

3 June 2021



EARTO Motto: **Impact Delivered!**

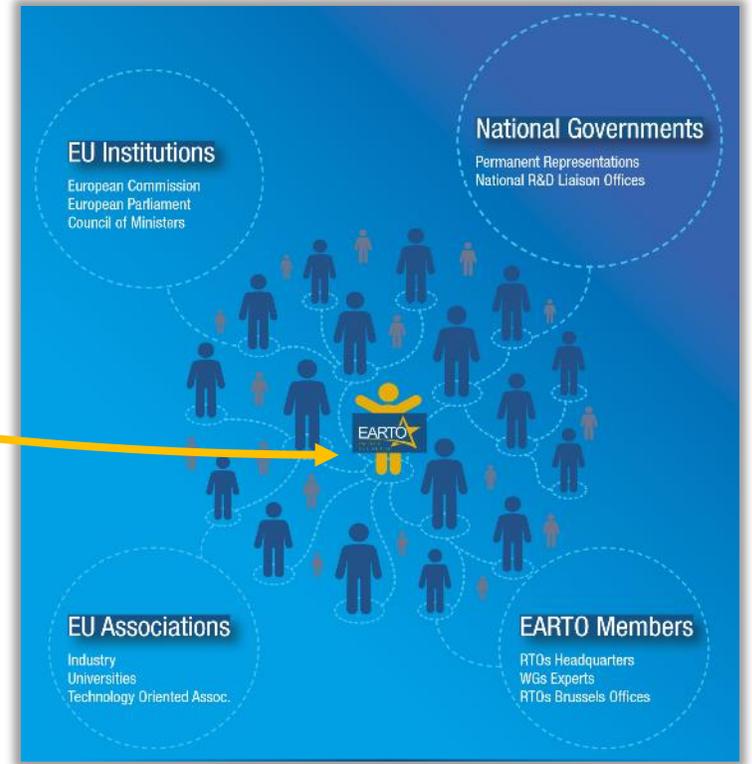
EARTO Vision: **Technology for a Better World**



23 COUNTRIES

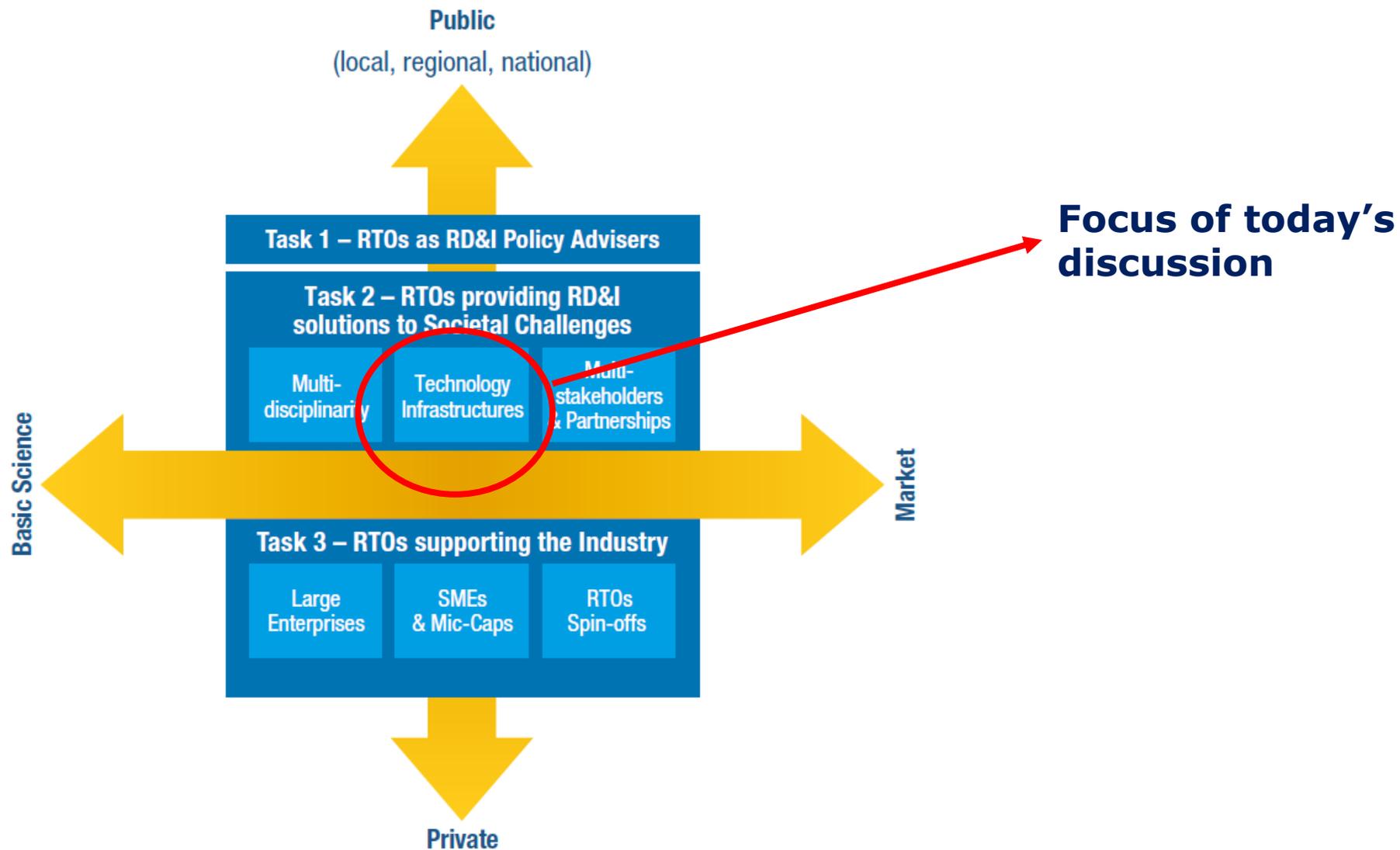
350 RTOs

NETWORK
150 000
RESEARCHERS
ENGINEERS &
TECHNICIANS
SHARING IDEAS
& INFORMATION



*logos of EARTO Board members

RTOs & Technology Infrastructures



New ERA Communication 2021

The EU and Member States will shape the new European Research Area through 14 actions:

- 1 Reaffirm the [target of 3% GDP on EU research and development investment](#) and propose a new EU 1.25% GDP public effort target to be achieved by Member States by 2030.
- 2 Support Member States in the coordination and prioritisation of national research and innovation funding and reforms through an [European Research Area Forum for Transition](#). Voluntarily commit 5% of national public research and development investments to joint programmes and European partnerships by 2030.
- 3 Support Member States that are below the EU average level of research and innovation investments to [increase their investment by 50% in the next 5 years](#).
- 4 Support Member States that have lower performance in training their researchers to access and develop excellence and [increase their number of highly cited publications by one-third over 5 years](#).
- 5 Develop common [industrial technology roadmaps](#) to maximise innovation in strategic areas like Artificial Intelligence, circular industries and resilient health industries.
- 6 Develop and test a [networking framework in support of Europe's research and innovation ecosystems](#), building on existing capacities, to strengthen excellence and maximise the value of knowledge creation, circulation and use.
- 7 Update and develop guiding principles for [creating value from knowledge](#) and a code of practice for the [smart use of intellectual property](#).
- 8 Deliver a [toolbox of measures to support researchers' careers](#), through a mobility scheme, trainings and more, in order to make Europe more attractive for talent.
- 9 Launch a platform of [peer-reviewed open access publishing](#) and incentivise [open science practices](#) by improving the research assessment system.
- 10 Support the creation of [world-class research infrastructures](#) and establish an updated governance structure for research and [technological infrastructures](#).
- 11 Develop a [roadmap of actions](#) for creating synergies between higher education and research, notably building on the dual role of universities.
- 12 Develop concrete plans with Member States to promote [gender equality](#), as well as diversity and inclusiveness, in science, research and innovation.
- 13 Organise [citizen science campaigns](#) and hackathons to engage citizens, especially young people, in science and innovation.
- 14 Develop with Member States a new approach to set and implement [strategic priorities](#) for the European Research Area, through a [Pact for Research and Innovation in Europe](#).

**EC Staff Working
Document on
“Identifying
Europe’s
Recovery Needs”**



Latest EARTO Paper

EARTO’s set of recommendations to set-up a new EU Strategy for Technology Infrastructures:

- 1. Prioritise technology infrastructures in new EU and national policies, including in the new European Research Area (ERA) strategy, and make the key role they have in EU RD&I ecosystems more visible at EU level**
- 2. Ensure the creation and long-term sustainability of the necessary technology infrastructures at EU level**
- 3. Support pan-European access to technology infrastructures by companies of all sizes to leverage their innovation capabilities**



EARTO Paper: Setting-up a European Strategy for Technology Infrastructures

31 July 2020

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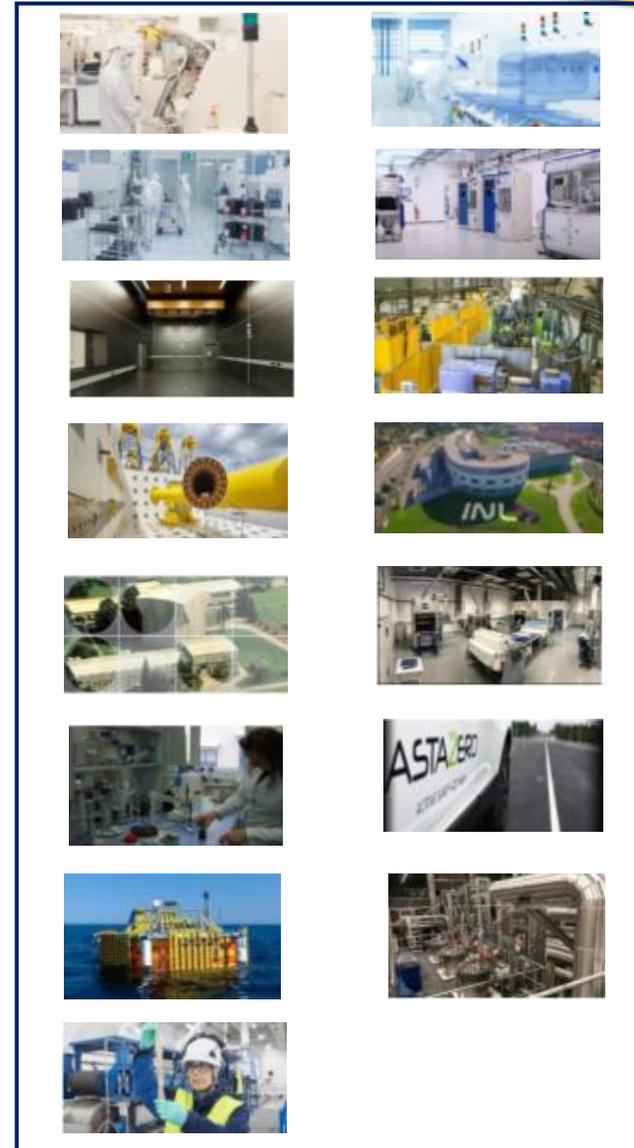
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EARTO Definition of Technology Infrastructures

Functionality	Users	Public Added Value
<p><i>"Technology infrastructure" means facilities and resources, used either for technology development activities at intermediate TRLs or for testing and demonstration activities at higher TRL or for both activities:</i></p> <ul style="list-style-type: none"> • <i>Technology development activities at intermediate TRLs, include activities to develop technologies via: <ul style="list-style-type: none"> • <i>Own internal technology development projects carried out by research performing organisations,</i> • <i>Collaborative RDI projects between research performing organisations and universities, often together with industry.</i> • <i>Collaborative RD&I projects partly or fully funded by industry.</i> </i> • <i>Testing and demonstration activities at higher TRL include activities to test, demonstrate and upscale technologies in industrially relevant environment, including the first industrial deployment prior to mass production: test beds, pilot lines, etc.</i> 	<p><i>Access to technology infrastructures is open to a variety of users including:</i></p> <ul style="list-style-type: none"> • <i>Public organisations/users such as research performing organisations, universities, and public authorities.</i> • <i>Private users such as private companies including SMEs.</i> 	<p><i>Availability of and access to technology infrastructures allows companies to lower the risk before market introduction and to get ideas and concepts faster to the market, while enhancing research organizations own knowledge and skills, in the Public Interest.</i></p> <p><i>Technology infrastructures typically operate in research and innovation ecosystems.</i></p>

Examples of RTOs' Technology Infrastructures

- The European Research Fab for Microelectronics connecting TIs from 3 European partners: CEA (France): [LETI's cleanrooms](#), Fraunhofer (Germany): [Research Fab Microelectronics](#), imec (Belgium): [The FAB3 300mm Cleanroom facility](#)
- DTI (Denmark): Centre for Industrial 3D-printing
- EURAC Research (Italy): [terraXcube](#)
- EURECAT (Spain): [Plastic Processing Pilot Plant](#)
- FORCE Technology (Denmark): [Test facility for large-scale mechanical test of large structures](#)
- INL (Spain-Portugal): [The International Iberian Nanotechnology Laboratory](#)
- JSI (Slovenia): [TRIGA MARK II research reactor](#)
- LIST (Luxembourg): [N-CCL Technology Platform](#)
- Łukasiewicz - ITEE (Poland): [Centre for Sustainable Technologies and Circular Economy](#)
- RISE (Sweden): [AstaZero - Active Safety Test Area](#)
- Tecnalia (Spain): [Harsh Lab 1.0](#)
- VITO (Belgium): [Deep Geothermal Program](#)
- VTT (Finland): [Bioruukki Pilot Centre](#)



Complementarities between RIs and TIs

Research Infrastructures	Technology Infrastructures
TRLs 0 to 2	Above TRL 2
Scientific discovery and education	Applied research and technology development, including maturation and acceleration of uptake by industry, SMEs and public sector
Transnational access and training of researchers and students	Knowledge and skills' transfer in collaboration with research performing organisations and companies
Open and Excellent Basic Science	Open innovation (i.e. open to large innovation ecosystems and a variety of stakeholders being owned & managed by PROs, which would not be the case if they were owned by the industry).
Science diplomacy	EU Technological sovereignty

A Diverse Landscape Supporting a Wide Range of Industrial Needs

Technology Infrastructures:

- can be **physical or virtual**, and sometimes a combination of both
- are **rarely single domain-led**, and many are focused across more than one technological or economic sector
- can typically have **two main purposes (sometimes combining them both)**:
 - **Co-creation, development and maturation of upcoming, “breakthrough” and highly innovative key enabling technologies with the potential of creating new markets**
 - **Transfer to and effective uptake of existing commercially available technology by the market, often in different domains, also called “broad roll-out” of technology**
- can have **different dimensions**:
 - **National/European/International dimension**: only capability of its kind at national or even European/global level, even though other similar capabilities may exist in other countries
 - **Regional/local dimension**: capability replicated in the country at a regional level, embedded in the local/regional ecosystem and answering the needs of local/regional customers (often SMEs)

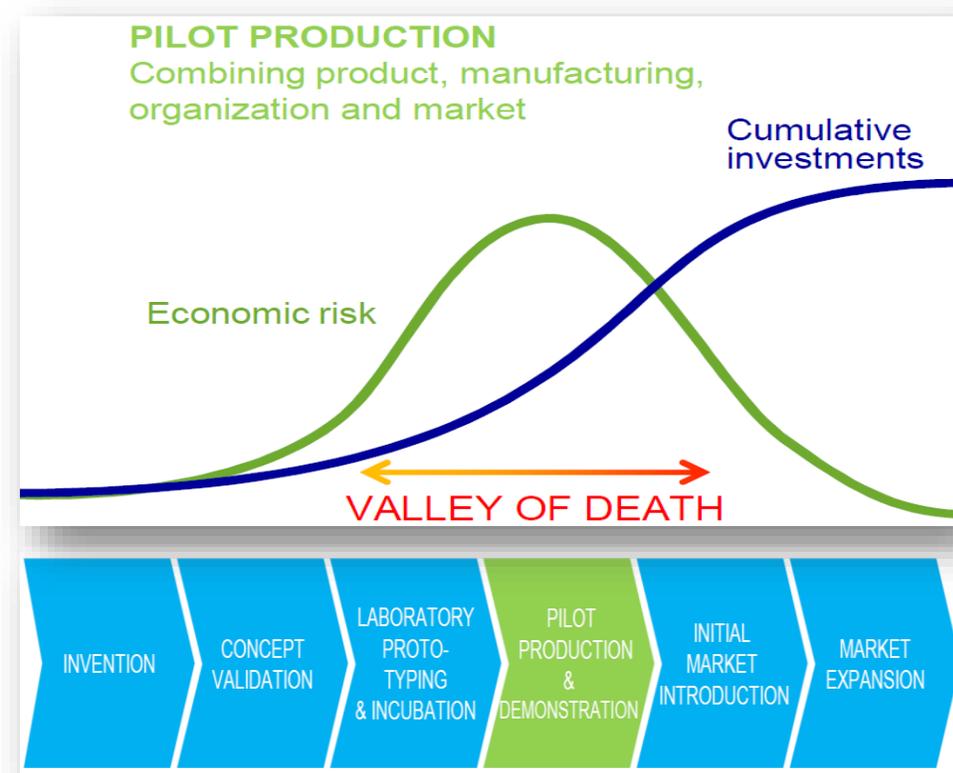
Such typology is an attempt at generalising a complex and diverse landscape, and it can of course lead to oversimplifications in several cases

Skills to Manage Technology Infrastructures

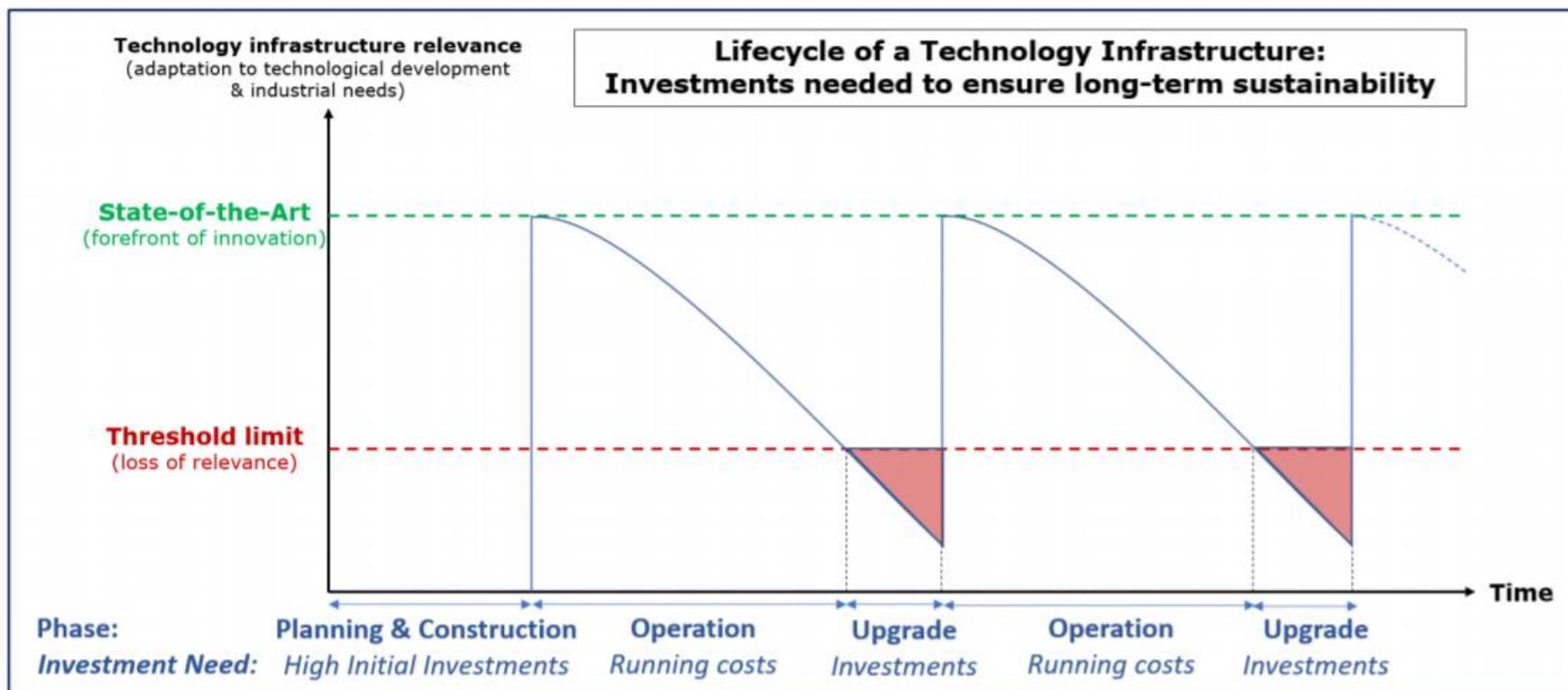
Skills required to operate TIs across the TRL scale:

- **Close connection both to the academic research world and the close-to-market industrial world thanks to their open innovation business model,**
- **Expertise for horizon scanning and technology foresight and assessment,**
- **Highly skilled and specialised human capital and know-how**

**TOTAL TIME SPAN 5 - 40 YEAR
DEPENDING ON INDUSTRY**



Key Issue 1: High and Long-Term Investments Needed



- **Planning & Construction: High Initial Investments Required**
- **Operation: Covering the Running Costs of Technology Infrastructure at their Real Value**
- **Upgrade: Securing Long-Term Investments to Ensure Sustainability**

Key Issue 2: Gaps in TIs Landscape

- **As highlighted in the European Industrial Strategy, Green Deal and Digital Strategy, there is already a lack of appropriate technology infrastructures in certain areas in Europe:** such gaps need to be filled to ensure Europe's technology sovereignty in key industrial ecosystems and attached strategic value chains
- **There are also tensions between the establishment of new technology infrastructures against maintaining and upgrading the existing ones. Making such investment decisions is a critical part of managing any technology infrastructure portfolio and ensure the best value for public investment.** The current lack of strategic oversight makes future planning difficult. A coordinated strategic approach at national and European levels is needed with a forward-looking approach to identify the priorities in the next decade
- **Connecting technology infrastructures together across borders and across sectors would also be very beneficial to increase knowledge transfer and capacity building,** as well as to spread excellence and expertise in order to overcome the European innovation divide

Current TIs Support Schemes

National Programmes (Examples)	EU Programmes
Denmark: <u>Green Labs Programme</u>	DG R&I: <ul style="list-style-type: none"> • Horizon Europe RIs programme: focused on RIs and ESFRI • Horizon Europe Cluster 4 (formerly H2020 Open Innovation Test Beds, pilot lines calls) • ERA Hubs: may be usefull for Tis management skills?
Germany: Industry 4.0 initiative	DG CONNECT: <ul style="list-style-type: none"> • DIHs strategy: some coordination of TIs • Testing & Experimenting facilities (TEFs): trial with AI • DEP skills agenda: may be useful for Tis management skills?
Norway: <u>Norwegian Catapult Programme</u>	DG REGIO: <ul style="list-style-type: none"> • Some regional investments using ESIF • I3: may support connecting some TIs
Poland: <u>R&D Infrastructure Programme</u>	DG GROW: <ul style="list-style-type: none"> • Industrial strategy: looking at gaps vs EU technology sovereignty, strong involvement of RTOs on EU alliances missing. • EU Invest: No investments in TIs so far
Sweden: <u>Smart Industry Programme</u>	DG COMP: <ul style="list-style-type: none"> • IPCEIs

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