

EVENT REPORT

Knowledge valorisation: the role of research and technology infrastructures

INESC Brussels HUB – Summer Meeting 2023

Co-organised with Horizon Europe RITIFI project (Research Infrastructures and Technology Infrastructures for Impact)

DATE & TIME:	15 June 2023 – 09:30 - 18:00
PLACE:	Portuguese Permanent Representation, Avenue de Cortenbergh 12, 1040 Brussels
CONTEXT	Under the backdrop of the recent discussions on knowledge valorisation and how to effectively develop research and innovation (R&I) ecosystems, capable of promoting the translation of knowledge to society and the economy, the role of infrastructures of support to R&I has risen as a core dimension. There are challenges at the level of infrastructure-related policy design at both EU and national/regional levels that require a wide and inclusive discussion. In this meeting, INESC and the RITIFI project partners focused the complementary role of RIs and TIs with a particular focus on the support for industry. Knowledge valorisation practices, strategic autonomy in key sectors were central components. Best-practices of individual RIs and TIs were presented and their role in innovation ecosystems was discussed. A central theme of the RITIFI project was brought to fore: how can we promote RI and TI collaboration. Finally, 4 thematic discussion groups (Microelectronics, Materials and Manufacturing, Biotechnology, Energy) focused on exploring the role of infrastructures in supporting value creation, from a research starting point, in a close relation with EU policy priorities took place. These groups benefited from the policy discussion, strategy and best-practice cases presented and discussed earlier in the conference. The conclusions presented in this report refer to the conclusions of these discussion groups.
AGENDA	See Annex 1.
INESC PARTICIPANTS	Ana Soares, INESC Coimbra Ana Teresa Freitas, INESC-ID/IST Arlindo Oliveira, INESC Holding João Claro, INESC TEC

	Jorge Fernandes, INESC-ID Lisboa
	José Carlos Caldeira, INESC TEC
	Justino Rodrigues, INESC TEC
	Luís Neves, INESC Coimbra & Politécnico de Leiria
	Luís Seca, INESC TEC
	Marta Barbas, INESC TEC
	Ricardo Migueis, INESC Brussels HUB
	Sílvia Castro, INESC ID / CMU Portugal
	Susana Cardoso Freitas, INESC MN
	Virginia Chu, INESC MN
ALL PARTICIPANTS	See Annex 2.
VIDEO RECORDING (URL)	https://youtu.be/bEGXSu0zSww

The 4 thematic discussion groups focused on exploring the role of infrastructures in supporting value creation, from a research starting point, in a close relation with EU policy priorities.

These were organised as parallel discussion groups, according to priority thematic areas defined in the scope of the RITIFI consortium:

- Microelectronics. Rapporteur: Jorge Fernandes, INESC ID
- Materials & Manufacturing. Rapporteur: José Carlos Caldeira, INESC TEC
- Biotechnology. Rapporteur: Nicolas Villacorta, Helmholtz
- Energy. Rapporteur: Luís Seca, INESC TEC

A set of key questions was shared with the groups to guide discussion and provided comparative reporting material, resulting from the discussions in different thematic groups. All groups received the same set of questions:

- What are the most important challenges facing Europe within this theme?
- What are the main barriers preventing the challenges in being solved?
- How can RIs and TIs help lower the barriers and solve the challenges?
- How would you most efficiently spend 10 M-EUR to support innovation in this field?

All groups were asked to address the questions having in mind the general RI and TI challenges and the specific challenges to the theme/knowledge domain in question.

MATERIALS AND MANUFACTURING

WHAT ARE THE MOST IMPORTANT CHALLENGES FACING EUROPE WITHIN THIS THEME?

- Supply chains resilience
- De-risking of materials production scale-up
- EU sovereignty
- Faster Innovation Cycles
- Mobilize newcomers (particularly SMEs)
- Highlight the value of innovation for industry (including the value of RI and TI for industry)
- Knowledge access and management by SME's
- Competences (more and more interdisciplinary)
- Circularity
- Alignment and complementarity of funding and financing initiatives and programmes (minimize fragmentation at EU and national/regional level)
- Small series / customization

WHAT ARE THE MAIN BARRIERS PREVENTING THE CHALLENGES IN BEING SOLVED?

- Lack of human resources / skills (namely materials specialists)
- Attention span from industry (Low interest of Industry for low TRLs)
- Appetite for risk / low risk mentality
- Entrepreneurial mentality (lack)
- Regulatory framework
- Quality of funding (adequacy of funding regulations and conditions)
- Poor data management
- Lack of circular economy "mindset" (concepts, practices, etc.)

HOW CAN RIS AND TIS HELP LOWER THE BARRIERS AND SOLVE THE CHALLENGES?

- Education and training (train and transfer people to industry)
- Invest in high risk technologies
- Implement the link between science and knowledge valorisation and industry
- More direct link between RI and industries
- Access gate to knowledge and information (AI + Networking)
- Implement/ensure data management infrastructures / services
- Act as an "One Stop Shop" for companies (namely for information)
- Channel people from industry to the "right organization/person" (depending on the objective)
- Provide a network of contacts for industry (indirect contacts)
- Mutual collaboration agreements between RI and TI

HOW WOULD YOU MOST EFFICIENTLY SPEND 10 M-EUR TO SUPPORT INNOVATION IN THIS FIELD?

- Joint education/training + transfer Programmes
- Meetings (knowledge exchange + knowing people)
- Create TTOs (RI) and improve marketing capabilities

ENERGY

WHAT ARE THE MOST IMPORTANT CHALLENGES FACING EUROPE WITHIN THIS THEME?

- After Russia's invasion of Ukraine, it became clear that we need to accelerate our energy independency based on low carbon technologies, EC gave the sign through REPOWER EU
- The fact is that we require a lot of technological development to electrify society based on renewables (that have variability in time) so how to fast develop European technology to cope with this? Flexibility from demand? Storage?
- Europe is not leading both in R&D and industrial level, so how to keep talent that is capable to support the development of these solutions, on the whole value chain?
- How to install/maintain energy technology companies in Europe if there is lack of highly specialized people and if energy prices are higher than in countries that still support electricity generation on fossil technologies?
- How to reskill people that work in the existing industry to this new challenge?
- How to follow the hype on these technologies in an efficient way, as opposed to through money on top of some technologies that may in fact not work?

WHAT ARE THE MAIN BARRIERS PREVENTING THE CHALLENGES IN BEING SOLVED?

- We believe that EC could listen a little more the experts from RI/TI in higher TRL support programmes.
- Europe is having difficulties to keep the pace, as there is some fragmentation and lack of skilled personnel and lack of industrial capacity in the sector.
- Convince political decision-makers; in fact there seems to be a lack of support/finance in emerging technologies as opposed, for example, to the US that supports research even when TRLs are low, because it accepts a lot of uncertainty is associated with these technologies, but without the investment we will never lead.
- Europe should finance low cost green RI, as many of them are highly energy intensive.

HOW CAN RIS AND TIS HELP LOWER THE BARRIERS AND SOLVE THE CHALLENGES?

- Skilling people – education HUB in Technological infrastructures.
- Mobility between RI, avoid replication.
- Support the creation of added value technology, with focus on green value chain, that is extended to the whole ecosystem; we won't produce cheap products but products that benefit from the added value of integrating multidisciplinary, such as carbon footprint and circularity principles.
- Take ESFRI model all over Europe, avoid regional RI/TI, create Lighthouses on technology infrastructure; example of CERN, foster mobility program between RI/TI to allow increasing speed.

HOW WOULD YOU MOST EFFICIENTLY SPEND 10 M EUR TO SUPPORT INNOVATION IN THIS FIELD?

- RI should not be for free; c-fund R&D projects in these RI and TI to make it cheaper for companies.
- Create innovation fund to support start ups; PPP to support good projects.
- Funding companies to access RI and TI.
- Would use 10M to support projects that clearly are scalable and replicable.
- Use a significant amount to increase literacy, supporting transfer of knowledge to community.
- Support education projects between RI/TI and Industry.
- Invest in more responsible and sustainable products; evaluate carbon footprint.

BIOTECHNOLOGY

WHAT ARE THE MOST IMPORTANT CHALLENGES FACING EUROPE WITHIN THIS THEME?

- Preservation of anonymity will be a challenge to tackle in the upcoming years, Specially for long-lasting medical studies (e.g. cohorts of epidemiology) where anonymity can be an issue as computational resources to identify anonymous data evolve.
- Lack of resources to deal with industry engagement depicts our current challenge.
- Sustainability critical of nodes. In Portugal we raised awareness of the importance of RIs to funders but now there is not continuity in support. Example of beyond 1m human genome: Funding from DIGITAL EUROPE is 50 % and we cannot afford always the rest 50 % from our own resources.
- Our challenge is knowledge asymmetry. Research funders are not aware of how to prepare funding lines to motivate researchers to make their research exploitable. Turning knowledge into intervention through the different steps. The goals of each steps are near sighted. Researchers we know nothing about certification issues. Other countries have a full pipeline.
- IA and software engineering: We need mid-long time perspective for RI. Political cycles are too short-sighted. Data protection is an issue for all. We're competing with countries who don't care about data protection.

WHAT ARE THE MAIN BARRIERS PREVENTING THE CHALLENGES IN BEING SOLVED?

- Reach self-sustainability of RI/TI is in the first phases very difficult to attain. Our funders ask us from the very first beginning to be self-sustainable, but the process needs time and support.
- Thousands of experiments take place everywhere and are not centralised. In comparison, in the area of particle physics CERN centralises the acquisition of data and its storage. In the case of life sciences, this storage of data that is accessible for many others it's still very difficult to reach: reaching a critical mass (bundle data of similar experiments) is an issue in the valorisation process.
- Life sciences and health sciences need to update its infrastructure at a high pace and that's also a barrier for reproducibility of results and hence validation of research.
- As it's organised, the public research funding process is not suitable for validating results, so translational research is not really taking place.
- In vaccine-designing we need to get some structural information and not all TIs/RIs needed are already built for that. We're building software.

HOW CAN RIS AND TIS HELP LOWER THE BARRIERS AND SOLVE THE CHALLENGES?

- Learn from examples in other countries: China has a full pipeline involving RI/TIs for valorising research. Chinese funding agencies funds all steps. Culture is also different.
- Academia's RI is updating their devices very often. TI could validate results with old devices discarded by RIs that might be more interesting from their goals.

- MS must be committed in following with translational research. This commitment could be reached through compulsory activities.
- Training the next generation. Everybody involved in the science process, also science funding and research management experts.
- Science-advice to policy makers should not only come from fundamental-science popes.
- Research assessment is moving towards using KPIs which are not only based on publications. This helps us in marketing better the services of RIs/TIs Examples of KPIs: Reproducibility, number of collaborations. A further question is how to incentivise transdisciplinarity. Software needs to be tested. Mindset change takes time. In translational research EATRIS is looking for gaps in selecting users. So novelty of research done at our RI/TI is a factor playing a role.
- Industry advice for Infrastructure to continue evolving our is a way for us to overcome the barrier of too low translational research.

HOW WOULD YOU MOST EFFICIENTLY SPEND 10 M-EUR TO SUPPORT INNOVATION IN THIS FIELD?

- Better 100 million.
- We need to consolidate human capital to our experts to have a long-time perspective and good working conditions, otherwise knowledge is lost. Staff scientists who are permanent is a critical part of many facilities in many areas.
- Also training needs investment, especially for research funders to design the whole pipeline of knowledge valorisation in their funding lines. Including sales training to better pitch ideas from research.
- An example to leverage 100 Million of investment for RI/TI will be for them to get funding to support developing plans: Consulting capacities at RI/TI for supporting researchers in fundamental science that use those RI/TI and help them in continuing to diagnostic and clinical research.

MICROELECTRONICS

WHAT ARE THE MOST IMPORTANT CHALLENGES FACING EUROPE WITHIN THIS THEME?

- Technology
 - Lack of high-end FinFET/GAA processes (Far-East Asia)
 - Huge investment / has to be state-of-the-art
 - Competitive Bulk/SOI Processes with added technologies
 - Foreseen new technologies as Quantum dots in early stage
- Human Resources
 - Lack of human resources in microelectronics/nanoelectronics area
- Strategy ↔ Funding
 - Competitive Bulk/SOI Processes with added technologies
 - Strong markets (automotive / medical / ...)
 - Funding below 43b USA 280b and China?
- EU has been focused on Societal Challenges and Microelectronics has been considered for years as a Commodity that is “there”.
- This led to the:
 - Reduction of foundries and advanced technologies in Europe.
 - Reduction of the attractiveness, reduction of students and lack of human resources in micro/nano-electronics.
 - Aging of Researchers/Educators.
- Know-how lost, lost fabrication capability and of qualified personnel.

WHAT ARE THE MAIN BARRIERS PREVENTING THE CHALLENGES IN BEING SOLVED? (AND HOW CAN WE RECOVER?)

- Main Challenge: Microelectronics seen as a commodity.
- Perception on Microelectronics has changed with:
 - Strong industry transformation.
 - New applications that can foster a new industry and uses KET.
 - Reduce supply chains (COVID).
 - Reduce dependency (geopolitical situation).
- Use Common structures: create locally what is possible; Use larger infrastructures available.
- Invest in technologies; Europe has the machines and still has the design capability.
- How to ensure Highly qualified Human resources?
 - Increase attractivity and engage more students
 - Increase advanced training
 - Create conditions to keep highly trained professionals
 - Importing talent
 - Industrial theses (Marie Curie Industries)

HOW WOULD YOU MOST EFFICIENTLY SPEND 10 M EUR TO SUPPORT INNOVATION IN THIS FIELD?

- Create mechanisms to help commercializing technology.
- Financing infrastructures as clean room (as a start-up incubator).
- Financing Advanced training program for design or on clean room.
- Create local common structure. Use other RIs TIs.
- Outcome: Creating conditions to attract international investment and companies or start-ups
- Challenge: Maintain and improve these Infrastructures

ANNEX 1 – AGENDA & PRESENTATIONS

Click on each speaker's name to download the presentation.

9h30 Opening

- Manuela Teixeira Pinto, Deputy Permanent Representative of Portugal to the European Union
- Inês Lynce, INESC Brussels HUB Management Committee Chair and President at INESC ID
- Bertrand Bouchet, RITIFI project & Head of CEA Representation in Brussels
- Arlindo Oliveira, INESC Holding President
- Raquel Sequeira, Trade and Investment Officer at aicep Portugal Global

Moderation: Ricardo Miguéis, Head of Office at INESC Brussels HUB

10h15-12h30 Establishing the tools for knowledge valorisation

10h15 Part A: The policy context (speakers + 30 min round table)

Fostering knowledge valorisation and strategic autonomy

- [Dominik Sobczak, Deputy Head of Unit at European Commission, DG Research & Innovation](#)
- [René Martins, Research Infrastructures and Open Science, DG Research & Innovation](#)

European Technology Infrastructures and their role in knowledge valorisation

- [David Holden, European Coordinator Technology Division at CEA](#)

The European Research infrastructures and their role in knowledge valorisation

- [Maja Bucar, Professor at the University of Ljubljana and member of the ESFRI drafting group on RI industry cooperation](#)

Moderation: Simon Pickard, Network Director at Science Business

11h15 Coffee-Break

11h30 Part B: The role of RIs and TIs in supporting industry

European Technology Infrastructures in the EU R&I landscape

- [Sophie Viscido, Principal Consultant at Technopolis Group](#)

Research Infrastructures' role in the innovation ecosystem

- [Kristiaan Temst, KU Leuven and imec, Chair at ESFRI Physical Sciences and Engineering Strategy Working Group](#)

Roadmap for aviation research infrastructures in Europe – the RINGO Project

- [Francesco Ferrigno, Business Development & Strategic Planning at CIRA – the Italian Aerospace Research Centre](#)

Moderation: Susana Cardoso Freitas, Director at INESC Microsystems and Nanotechnologies

12h30 Lunch Break

14h Inspirational cases for knowledge valorisation

Test infrastructures supporting the transition to the hydrogen society

- [Nikolaj Zangerberg, Innovation Manager at Danish Technological Institute](#)

Co-designing with industry for new high impact services in micro-electronics, pharma, batteries

- [Edward Mitchell, Head of Business Development at ESRF](#)

EATRIS Public private Innovation Hub

- [Anton Ussi, Operations & Finance Director at EATRIS](#)

The Advanced Materials initiative 2030

- [Philippe Jacques, Managing Director at EMIRI – the Energy Materials Industrial Research Initiative](#)

The example of accelerator based RIs and TIs

- [Angeles Faus-Golfe, chair of the Industry Advisory Board in the I.FAST project](#)

Moderation: Maurits Butter, Senior Orchestrating expert at TNO

15h30 Coffee break

15h45 Unlocking value creation for strategic autonomy: discussion groups

5 thematic discussion groups focused on exploring the role of infrastructures in supporting value creation, from a research starting point, in a close relation with EU policy priorities.

Parallel discussion groups:

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Materials & Manufacturing. Rapporteur: José Carlos Caldeira, INESC TEC

Biotechnology. Rapporteur: Nicolas Villacorta, Helmholtz

Energy. Rapporteur: Luís Seca, INESC TEC

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Key questions:

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- All questions should be answered having in mind the general RI and TI challenges and the specific challenges to the thematic group where you are participating.

17h15 Conclusions and the way forward – round table

Rapporteurs of the different thematic discussion groups present the outcomes of the discussion.

Moderation: Maurits Butter, Senior Orchestrating expert at TNO

18h Close of meeting

ANNEX 2 – PARTICIPANTS PER DISCUSSION GROUP

MANUFACTURING & MATERIALS

Ana Simões	INESC TEC
Angeles Faus-Golfe	IN2P3 CNRS
José Carlos Caldeira (Rapporteur)	INESC TEC
Robert Fisher	LRN
Edward Mitchell	ESRF
Nikolaj Zangenberg	DTI
Philippe Jacques	EMIRI
René Martins	European Commission
Sylvie Leray	CEA
Uwe Sassenberg	DESY
Verena Fennemann	Fraunhofer EU Office

ENERGY

Ana Soares	INESC Coimbra
Hein Brookhuis	KU Leuven University
Doinita Ulinici	Moldovan Office for Science and Technology
Dominik Sobczak	European Commission
Hendrik Sändker	Fraunhofer
Justino Rodrigues	INESC TEC
Lavanya Premvardhan	AnaEE-ERIC
Luís Neves	INESC Coimbra & Politécnico de Leiria
Luís Seca (Rapporteur)	INESC TEC
Marta Barbas	INESC TEC
Sílvia Castro	INESC ID / CMU Portugal
Victor Trapp	Fraunhofer

BIOTECHNOLOGY

Ana Teresa Freitas	INESC-ID/IST
Andrew Smith	ELIXIR
Anton Ussi	EATRIS
Edith Euan Diaz	EBRAINS AISBL
Nicolas Villacorta (Rapporteur)	Helmholtz
Orsolya Symmons	COCIR
Pawel Swieboda	EBRAINS
Yumer Kodzhayumer	Permanent Representation of Bulgaria to the EU

MICROELECTRONICS

Adam Edström	RISE
David Holden	CEA
Francine Papillon	CEA Grenoble
João Claro	INESC TEC
Jorge Fernandes (Rapporteur)	INESC-ID
Léa Bayon	CEA
Patrick McCutcheon	IP Europe VZW
Susana Cardoso Freitas	INESC MN
Virginia Chu	INESC MN