



LEVERAGING DEEP TECH GREEN TRANSITION AND DIGITAL SOLUTIONS TO TRANSFORM EU INDUSTRIAL ECOSYSTEMS

Outline

Munich, 27 March 2023

1. Purpose of this workshop

This one-day workshop will address the potential of **deep tech and corporate open innovation** for leveraging green transition and digital solutions to transform EU's industrial ecosystems.

Presentations of **evidence will be delivered in the morning session**. The afternoon will consist of a **roundtable discussion** with the participation of main stakeholders as well as **working group sessions** for more in-depth discussion around the **four main questions** set out below.

The workshop is organised as a hybrid (physical and virtual) event. **On-site participation is by invitation only.**

Key interventions: *Prof. Dr. Helmut Schönenberger (Unternehmer TUM), Dr. Volker Ziegler (Nokia), Marie Wall (Ministry of Climate and Enterprise, Sweden), Pedro Ruão (Omniflow), Asier Rufino (Tecnalia Ventures), Roland Strauss (knowledge4innovation), Sohaila Ouffata (BMW i Ventures), Vlad Gliga (Rubik Hub & The Climate Vertical), Anne-Marie Sassen (EISMEA), Agnieszka Radziwon (University of California Berkeley and Aarhus University), CEFIC representative.*

2. Questions to address

The new European Innovation Agenda strives to increase competitiveness, retain home-grown leading firms and technologies and facilitate growth in emerging sectors, particularly those **enabled by deep tech** developments. It aims at harnessing **innovation ecosystems** in Europe to support the industrial transformation necessary to meet **Green Deal policy targets**. The European industrial strategy is an innovation strategy at heart, building on research and innovation, for example as delivered by European partnerships with industry and through industrial technology roadmaps as input from the European Research Area policy agenda to industrial transition pathways.

The European Research Area Policy Agenda calls inter alia for **“Accelerating the green / digital transition of Europe’s key industrial ecosystems”** (Action 12) whereby one question is **how to better support transfer of fundamental/low TRL research results to industrial R&I.**

While Europe’s researchers and industry are leaders in green tech and related R&I investments and patenting, it is becoming urgent to step up the production of green technologies (“net zero technologies” as highlighted in the **Green Deal Industrial Plan** of 1 February 2023), the decarbonisation of industrial processes and the circular economy. At the same time, the **global tech-race** evidenced by the growing differences between R&D investment levels and growth rates of large EU companies and those from the US and China are a cause for concern and for action to be taken by both the private sector and public

policy. These **large EU companies fertilise innovation and industrial ecosystems** and cooperate as well as **invest in start-ups and scale-ups**.

Innovation and industrial ecosystems link key stakeholders at and between global and local levels. Easy access to **state-of-the-art innovation actors and technology infrastructure** is an important enabler of innovation at the local level, and more so for the creation of breakthrough technologies.

The **questions which arise for this workshop** are:

- How to **mobilize effectively the innovation strategies and technological capacities of large and small firms** to provide the green/digital solutions for the future? What is the potential for cooperation between large and small firms?
- How to **identify where the breakthrough potentials for green/digital deep tech** in Europe are and how to focus effort on these areas?
- How to **harness deep tech stakeholder collaboration and technology transfer** in innovation and industrial ecosystems? What are the best practices for collaboration among actors?
- Which **public policy instruments** could facilitate the increase of investments in green/digital deep tech innovation and infrastructure (demonstrators, testbeds, incubators and accelerators)? How to better support transfer of fundamental/low TRL research results to industrial R&I?

More background can be found in the Annex.

3. Hosts and organisation

The workshop is organised by the European Commission in collaboration with DEEP Ecosystems 500 and hosted by the Technical University of Munich, located in one of the strongest deep tech ecosystems in Europe.

Venue: Technische Universität München, Arcisstraße 21, 80333 Munich, Germany
TUM Central Campus (Stammgelände) - entrance opposite Luisenstr. 51
Building 0505, room Z536
Coordinates: 48°08'59.8"N 11°34'00.5"E or 48.149950, 11.566807
Plus code: 4HX8+XPF Munich, Germany

The hybrid event will offer an evidence-based and open dialogue between policy-makers, corporate officials, entrepreneurs, universities, technology transfer professionals, and other stakeholders. The keynote session in the morning and moderated working group sessions in the afternoon will provide participants with new insight and ample space for exchange.

The European Commission's internal science service, the [Joint Research Centre](#), collaborates with the [Directorate General for Research and Innovation](#) in the design and implementation of EU innovation policies.

[DEEP Ecosystems 500](#) is a global community of ecosystem builders empowering local start-up support organizations to professionalise and improve their services in order to create globally impactful initiatives that tackle society's most pressing challenges including climate change, education, gender equality or regional economic disparities.

The Technical University of Munich (TUM), School of Management, [Professorship Economics of Innovation](#), addresses research and teaching in the field of economics of innovation, the organisation of science & innovation, as well as topics related to science and technology policy.

4. Target audience and participation

- ✓ Experienced entrepreneurs and CEOs of successful deep tech start-up companies
- ✓ Large corporations
- ✓ Senior government officials and representatives of government institutions
- ✓ Research and Technology Organisations (RTOs), Universities, and Technology Transfer Offices (TTOs)
- ✓ Representatives of deep tech labs and infrastructure (demonstrators, testbeds, incubators and accelerators)
- ✓ Ecosystem and deep tech facilitators
- ✓ Academics and researchers.

Presence at the event will be limited to 70 participants by invitation only. Hybrid connection will be provided to stakeholders signaling interest. Participation is free of charge and can be registered here:

https://research-and-innovation.ec.europa.eu/events/upcoming-events/leveraging-deep-tech-green-transition-and-digital-solutions-transform-eu-industrial-ecosystems-2023-03-27_en

At the same link you can express interest for participation in person; travel costs are generally not reimbursed.

Annex: Further context and evidence.

Policy Context

EU [industrial](#) and [innovation](#) policies provide incentives to increase competitiveness, retain home-grown technologies and firms, and facilitate growth of emerging – particularly green and/or digital - sectors of activity. This includes policies to transform “traditional” manufacturing sectors, support start-ups and scale-ups, and increase industrial capacities where most added value in value chains is produced.

For example:

- The [New European Innovation Agenda \(NEIA\)](#), *inter alia*, addresses firm creation and growth in deep technologies to trigger spillovers between sectors with the support of the [European Innovation Council](#). A flagship initiative of NEIA aims to strengthen Innovation Ecosystems across the EU, while another targets improvement of policy tools and interactions between stakeholders.
- Action 12 of the [European Research Area \(ERA\)](#) Policy Agenda targets support to accelerate the green and digital transitions in Europe’s key industrial ecosystems.¹ It has as a strategic focus on the role of industry and industrial R&I for the twin transitions and increased resilience. The implementation is structured in four “activities”: Industrial Technology Roadmaps (12.1), Technology Infrastructures (12.2), Policy Framework for transfer of fundamental research results to industrial R&I (12.3), and Social Adaptation of the Green/Digital Transitions (12.4). The action further calls for:
 - (i) Consultation process on the R&I related needs of industry, and
 - (ii) The development of a policy approach to link industrial and R&I policies.
- ERA Action 12 links the industrial technology roadmaps to national strategies and needs of industry to have access to technology infrastructures and their services. It can serve as a contribution to the **Green Deal Industrial Plan**², The implementation of the Action started already in 2021 with the preparation of the two industrial technology roadmaps and with calls for Horizon actions to support a European strategy for technology infrastructures. In 2023, implementation is planned in the form of a six events and reporting to the ERA Forum in March, September and October.

¹ 21 Member States, 3 Associated Countries and 7 key stakeholder organisations have joined this action in mid-2022. Activity 12.3 of ERA Action 12 aims to address stocktaking, forecasting and roadmapping of key technologies of the future with a specific focus on digital and green with input from stakeholders.

² The recently announced [Green Deal industrial plan](#) intends to enhance the competitiveness of Europe's net-zero industry via fast transition to climate neutrality and the scaling up of the EU's manufacturing capacity for net-zero technologies. It is based on four pillars: a predictable and simplified regulatory environment, speeding up access to finance, enhancing skills, and open trade for resilient supply chains.

Research Evidence

As part of the evidence base underpinning policy, the European Commission benchmarks EU companies against their global competitors and monitors trends via the annual [EU Industrial R&D Investment Scoreboard](#).³ It is based on the latest audited accounts of the world's top 2500 R&D investors, including the EU-based top 1000.⁴ The 2022 Scoreboard published in December shows that EU investments in Research & Development (R&D) rebound after a COVID-induced dip. Europe's industry is back on track in research and development investments with an increase of 8.9% in 2021 compared to the -2.2 % pandemic-related dip in 2020. The EU remains the global leader in R&D investments by the automotive sector, where the transformation towards electric vehicles and digitalization is fully underway in both established companies and younger firms. The Scoreboard also shows a broad sectoral diversification for the EU, especially compared to the US where R&D investment is highly concentrated in Information and Communication Technologies (ICT).

The Scoreboard highlights the intensification of the global tech race in the four key sectors which account for more than three-quarters of the total company R&D reported: ICT producers (22.6%), health industries (21.5%), ICT services (19.8%) and automotive (13.9%).

The R&D growth rates of US and Chinese companies - 16.5% and 24.9%, respectively - continued to outpace that of EU counterparts, due to the fact that US Scoreboard companies are leading R&D investors in ICT (both as producers and service providers) and health sectors, while Chinese Scoreboard firms are ahead of the EU not only as ICT producers, but also in ICT services. The number of Chinese Scoreboard companies more than tripled over the past decade (from 176 in 2011 to 678 in 2021) and their R&D investment share surpassed that of the EU for the first time (17.9% vs. 17.6%, respectively), displacing EU and Japanese firms from more traditional manufacturing sectors. The leading share of US firms increased to 40.2% of the global total.

DEEP ECOSYSTEMS aggregates information and insights from local sources with global trend data. The [Startup Heatmap Europe](#) is its most visible outlet, and the [DEEP Ecosystem Conference](#) brings together ecosystem leaders globally to unearth local insights and jointly identify strategies to adapt to global trends. The development of new ecosystem initiatives is supported in the accelerator program. The DEEP Community spans >20 countries and more than 250 ecosystem builder organizations. Currently, DEEP is involved in the buildup of over 30 innovation hubs across the world ranging from the HR Valley in Zurich to the City of Sapporo's international start-up hub.

³ The Global Industrial Research & Innovation Analyses (GLORIA) project is jointly carried out by the European Commission's Joint Research Centre —Directorate B, Innovation and Growth— and the Directorate General for Research and Innovation (R&I) —Directorate E, Prosperity.

⁴ The world's top 2500 Scoreboard companies, with headquarters in 41 countries and more than one million subsidiaries all over the world, each invested over EUR 48.5 million in R&D in 2021, and the EU-1000 firms EUR 3.1 million, respectively.

Science to policy questions

Firstly, progress towards the above EU policy objectives **to retain and grow home-grown firms and establishing spill-overs** would have the effect of reducing both EU R&D investment and R&D intensity gaps vis-à-vis its main competitors and increase Europe's technological sovereignty and strategic autonomy. Although large players such as top R&D investors play a key role in R&I investment worldwide due to their size and centrality, radical and game-changing green and digital innovations often come from young and innovative companies which were able to grow and scale-up quickly. As a recent aspect of corporate innovation strategies, Corporate Venture Capital (CVC) has been analysed. It is used by two-thirds of Scoreboard companies and increased over the past 20 years, with positive correlation and complementarity between R&D and CVC especially in ICT and health. CVC by EU Scoreboard companies is just around half of that by US ones, and 80% of funds from EU-based companies go to US-based start-ups. **The first question is how to effectively mobilize the innovation strategies of larger and smaller firms** providing the green solutions for our future.

Secondly, Scoreboard companies are also central in **developing breakthrough technological and scientific solutions** to tackle the Societal Development Goals (SDGs). Patenting linked to climate action (SDG 13) is concentrated in technologies related to energy storage, decarbonisation, and materials for low-power electronics, also relevant to clean and affordable energy (SDG 7). In contrast, scientific research relevant to SDG 7 is concentrated in relatively few technologies, while scientific research linked to SDG 13 is spread across a much wider range of fields. This is another indicator of the potential for breakthrough technologies, to help achieve green and energy policy goals as well as SDG targets. The EU has an existing base of smaller firms in key industrial ecosystems across Member States and excellent technology capacities. **The second question is about the breakthrough potential of green deep tech in Europe** and where it is/should be focused.

Thirdly, **innovation ecosystems is where it happens**, linking key stakeholders between the global and the local dimension. Global lead companies, such as those in the Scoreboard, play a key role in vitalising innovation ecosystems given their large (direct and indirect) market and innovation power, and an as entry point towards regional and local upgrading via collaboration and internationalisation. Presence of such large companies or their subsidiaries in regional innovation ecosystems could leverage the New Innovation Agenda's connected regional innovation valleys or other territorial policies by the Commission.⁵ By better understanding the distribution of technology development efforts across actors and places in the EU, efforts could be better coordinated diffusion of solutions facilitated.⁶ **The third question about harnessing deep tech stakeholder collaboration and technology transfer in innovation ecosystems** arises.

Fourthly, the **policy mix across all governance levels together with the access to deep tech infrastructure** comes into play. Securing an easy access to state-of-the-art innovation actors and technology infrastructure (demonstrators, testbeds, incubators and accelerators) is a main enabler of innovation at the local level, and more so in creating breakthrough technologies such as deep tech.⁷ Research and Technology Organisations (RTOs) can promote the links between actors and facilitate access to shared research capacities. In the context of implementing the above ERA action 12 policy agenda, this produces the **fourth question about what public policy instruments can incentivise and facilitate increase of investments in green/digital deep tech innovation and infrastructure** (demonstrators, testbeds, incubators and accelerators). It will also build on the critical question of *how to better support transfer of fundamental/low TRL research results to industrial R&I*.

⁵ The [Partnerships for Regional Innovation](#) (PRI) enhance the coordination and directionality of regional, national and EU innovation policies, bringing the above aspects into policy implementation.

⁶ Diodato D., Moncada-Paternò-Castello P., Rentocchini F., Tübke A. (2022) 'Industrial innovation for sustainable competitiveness: Science-for-policy insights'. Science for Policy Brief – Industrial Innovation & Dynamics Series. No. JRC128430. European Commission, Joint Research Centre – Directorate for Growth and Innovation, Seville (Spain), February 2022.

⁷ See: Viscido, S., Taucer, F., Grande, S. and Jenet, A., Towards the Implementation of an EU Strategy for Technology Infrastructures, Publications Office of the European Union, Luxembourg, 2022, ISBN 978-92-76-46490-7, doi:10.2760/4834, JRC128007.