

EARTO Position Paper: Mobilising European RD&I Capabilities & Skills towards the European Green Deal

5 March 2020

EARTO very much welcomes the ambitions of the European Green Deal. European RD&I capabilities and skills offered by actors such as Research & Technology Organisations (RTOs) will be crucial to deliver on many of those ambitions: for the technology scale-up and deployment needed as well as for the design and implementation of new transforming policies. Following the [European Commission Communication on the European Green Deal](#) published in December 2019 and the [European Commission Communication on the Sustainable Europe Investment Plan](#) of January this year, EARTO hereby brings forward a set of recommendations on how to further mobilise European RDI capabilities and skills towards the European Green Deal and its objectives.

As noted by the European Commission, Europe's economy needs growth, however not at the costs of its society and values. The European Green Deal offers a new European growth strategy based on sustainability and inclusion. The targets set are clear: no net emissions of greenhouse gases in 2050 and an economic growth decoupled from resources' use. To deliver the European Green Deal, the European Commission clearly identifies the need to rethink policies and to design a set of transformative policies. It also notes that "*all policy levers: regulation and standardisation, investment and innovation, national reforms, dialogue with social partners and international cooperation*" will have to be used to reach such ambitious targets.

EARTO already proposed [key recommendations for an effective post-2020 RDI Policy](#). **The following recommendations are focusing on how RD&I could further support the target of a sustainable and inclusive growth as defined by the European Commission under the European Green Deal:**

- 1. Support European technology scale-up for green and digital transition by boosting public & private investments in RD&I as key driver of sustainable and inclusive growth:** recognising that Europe's technological capabilities will be the decisive strategic factor to build Europe's future. The European Green Deal should impact the next Multiannual Financial Framework (MFF) by ensuring that grant-based EU programmes, aiming at further leveraging private RD&I investments in Europe like Horizon Europe and Digital Europe programmes, will be prioritised in the next EU budget.
- 2. Develop a European Strategy on Technology Infrastructures to further deliver the European Green Deal's ambitions in terms of deploying green and digital technologies to EU leading industries.** Europe should ensure it has the proper technology infrastructures to support its key industrial value chains. European industries need to have the technology infrastructures available to lower the risks of their own RD&I investments to further develop their innovation capacity (i.e. green & digital technologies up-take diffusion across EU) and support their business transformation fitting the EU Green Deal's ambitions (incl. digitalisation).
- 3. Improve EU RD&I Framework Conditions for a Better Implementation of the European Green Deal:** new transformative policies will need to be developed supported by a strong European Intellectual Property (IP) regime, more standardisation efforts as well as updated state aid rules.

Public & private RD&I Investments as Key Driver of Sustainable and Inclusive Growth

Boosting public RD&I investments and leveraging private investments are key drivers of prosperous and sustainable progress. The European Green Deal recognises that Europe's technological capabilities and skills will be the decisive strategic factor to build Europe's future. As high-risk pre-competitive RD&I activities cannot be financed through loans, grants are the main form of funding for pre-competitive RD&I. The proposed Just Transition Mechanism is an interesting directionality lever to ensure policy coherence and clever use of existing instruments and programmes. It will support the implementation of the sustainability targets to serve the ambitions of the European Commission.

In this context, the Just Transition Mechanism is not expected to have direct financing impact on RD&I actors such as RTOs. However, the Just Transition Mechanism may have positive spill-over effects on public and private RD&I investments if aimed at giving directionality to the European regional funds. Indeed, those should be further directed towards developing regional RD&I capabilities and skills across Europe. Ensuring such directionality of the European regional funds would be targeting both Europe's innovation divide and Europe's green technology leadership.

In parallel, the European Green Deal should not divert EU funds for grant-based programmes to credit-based financial instruments (e.g. in the way European Fund for Strategic Investment (EFSI) was launched in 2015). This would have a detrimental impact on RTOs' business models and accountability, as well as on the public sector's capacity to alleviate market failures. Long-term EU grant-funded programmes are essential to reduce the risks and stimulate private sector's investments. While the use of new financial instruments such as loans, repayable advances, equity-based public funding and other credit-based funds have been increased in recent years, and some RTOs have positive experiences with European Investment Fund (EIF) support to investments platforms for RTOs spin-offs, those financial instruments represent limited complements for very high TRL activities only.

Accordingly, the European Green Deal should be an additional motivation in the Multi-annual Financial Framework (MFF) negotiations for ensuring sufficient funding for grant-based EU programmes, aiming at further leveraging private RD&I investments in Europe like Horizon Europe and Digital Europe programmes, will be prioritized in the next EU budget. Among others, this requires scaling up the budget for Horizon Europe as key instrument for the European Green Deal to at least 120 billion euros: such budget should also be ring-fenced from any cuts in the MFF negotiations. [EARTO along 90+ European RTOs & Industry associations, has repeatedly called for an increased budget for Horizon Europe with a minimum of 60%](#) of its budget going to its Pillar 2. This is the only Pillar in the proposed Framework Programme that includes directional research programming which policy makers can intentionally steer towards the objects of the European Green Deal. As mentioned in the European Green Deal Communication, Horizon Europe has a set of instruments like industry-led partnerships and missions, under its proposed Pillar 2 that will be essential to leverage private RDI investments by key-to-the-Green-Deal industrial sectors (transport, digital technologies, agrifood, public health and safety, building & construction, bio-based economy, steel, chemicals, energy, etc.). Those European partnerships and missions are even more key today considering the European Green Deal's ambitions and the scale of European industrial sectors facing transformations using new technologies and digitalization. Sufficient funding for Pillar 2 will be crucial for ensuring the contribution of Horizon Europe to the European Green Deal's ambitions.

In parallel, the European policy of Digital Innovation Hubs (DIHs) planned under the Digital Europe Programme will also support such efforts on green related technology and digitalisation on EU industry (large & small). The Digital Europe Programme will play a key role in providing support to industry via its DIHs as well as focusing EU investments on enabling technologies (artificial intelligence, smart systems, 5G, etc.) in key EU industrial value chains (telecom, transport, health, energy, agrifood etc.) needed to achieve the Green Deal's ambitions in terms of sustainability. The European DIHs, as main orchestrators of ecosystems, will be crucial to support the cross-cutting of digital and green technologies. They will enable the uptake and scaling up of digital driven green solutions as first contact point for companies: offering one stop-shops, giving access to expert services and testing/demonstration facilities. RTOs as strategic players and orchestrators of DIHs will play a leading role in this digital and green alignment.

In this context, RTOs with their industrial partners will support the coherence between Horizon Europe and Digital Europe programmes. The development of European partnerships and alliances will be key to ensure a shared direction between the European, national and private investments in order to create the necessary critical mass and to strengthen the Internal Market in order to achieve the objectives of the European Green Deal.

Balance will have to be found between the development of a new policy framework and current activities to avoid that current investments are placed on hold due to policy/market uncertainty. For example, under the SET-Plan, a revision of the Renewable Energy Directive 2 (RED2) which was settled recently (some delegated acts remaining) could mean that the years of uncertainty prior to the settling of RED2 is repeated. This could lead to loss of important lead-time for Europe.

To avoid such issues, the European Commission should use knowledge within existing networks and structures where all relevant stakeholders including industry, RTOs, academia and Member States meet regularly: many of those can be found today under Horizon 2020 partnerships, platforms and networks. A further structured approach could be taken around the flow of EU RD&I investments mapped to innovation pathways (e.g. through the Coordination and Support Actions, then extended and validated via Research and Innovation Actions and Innovation Actions).

RTOS as Key RDI Actors for Deploying Green and Digital Technologies to EU Leading Industries

Technology & Scale-up

To reach the EU Green Deal targets, new solutions in terms of technology-based products and services must be developed to enable the European transition to a decarbonized economy. Low and zero carbon solutions beyond the “business as usual” demand complex combination of technologies and competences across industries, integrating the best options with sound and independent criteria. To ensure leadership, companies will need to converge and tap into each other’s value chains. Specific sectorial technologies in transport, energy, construction, agrifood and environment or testbed infrastructures must be blended with horizontal technologies (digital technologies, new materials, sensors, etc.) to build new solutions.

European RTOs with their multidisciplinary approach to technologies are key to support our industries to sensibly integrate technologies into their products and services. The specific business models of RTOs (non-profit, strong link with industry, yet independent from specific corporations, institutionally supported governance) will make a difference to activate the wide innovation partnerships needed to drive the convergence towards these complex integrated solutions and systems.

Innovation ecosystems are natural environments for European RTOs, connecting them early on with industrial partners and allowing them to align technology maturation with concrete societal and market needs. These networks of RD&I partners are built on trust between partners and form the crucial element of the so-called innovation hubs, providing technological and non-technological skills and services needed to accelerate the uptake of innovation by large and small industry. To efficiently connect and facilitate the relations between all those actors, RTOs very often act as hub orchestrators and integrators along key industrial value chains (See [EARTO Paper on EU Innovation hubs](#)).

In addition, scaling-up technologies will be needed to take technology development towards effective and extended use in industrial contexts. Those scaled-up technologies will bridge the gap between application-ready technology and its large-scale industrial implementation. Often, scaling-up of innovative solutions entails to tune the social and financial mechanisms needed to make the new approach work effectively in real environment. A variety of actors must be involved to cooperate actively including industries from different sectors, knowledge partners, institutions and users or citizens. For both the development of new technologies as well as of scaling-up technologies, RTOs play an essential role in supporting the kind of collaboration needed: RTOs orchestrate complex consortia in multi-stakeholder projects requiring a high degree of public-private partnership agreements. RTOs’ involvement provides a certain level of trust between competitors which allows for collaboration for the common interest. In addition, RTOs have proven to be very effective developers of pilot initiatives and demonstrators enabling technological solutions to reach the high TRL levels needed to enter the diffusion phase in market and society.

Key Industrial Value Chains & Technology Infrastructures

In this context, EARTO very much supports the European Green Deal Communication’s recognition that Europe needs to promote “*new forms of collaboration with industry and investments in strategic value chains*”, including in the form of IPCEIs. The upcoming European Commission Communication on the future EU industrial strategy will be key in this context. Considering the need to further position Europe as global technology leader (in particular in green and digital technologies), EARTO strongly advocates for further work to be done at EU level to link the identified key EU value chains with the attached needs of strategic technology infrastructures. This will require further efforts in:

- linking EU industrial and RD&I policies together, and
- setting up of a European strategy on technology infrastructures needed to foster the development of innovative technologies and their deployment by industry (large and small) across sectors and across the single market.

EARTO very much welcomes the [EC SWD on Technology Infrastructures](#) and is looking forward to the next steps. A European-wide strategic approach is necessary to ensure that the required technology infrastructures to support European industry to develop their innovation capacity and business transformation capabilities are indeed available in Europe with the proper skills. RTOs will be key to manage such infrastructures as well as provide the necessary skills.

Moreover, in order to further deliver the Green Deal’s ambitions in terms of deploying green and digital technologies to create new EU leading industries, EU should be clear in its support of European deep-tech start-ups. Contrary to US-type digital companies, EU-type deep-tech start-ups, especially RTOs spin-offs, have great life expectancy and low rate of failure as demonstrated by [EARTO economic footprint study](#). In this context, the European Innovation Council (EIC) under Horizon Europe could support the target of the Green Deal’s ambitions in terms of technology deployment and industry creation in Europe if supporting RTOs spin-offs (See [EARTO Paper on RTOs Deep-tech Start-ups](#)).

Sustainable Development Goals & Directionality

In addition, the United Nations Sustainable Development Goals (UN SDGs) are used as guiding principles to target RTOs' research efforts. Today, some RTOs are already mapping how their projects contribute to one or more sub-targets of the SDGs, which then feeds into their research programming. Those developments at national level could be further monitored and best practices exchanged by Member States using the DG R&I Policy Support Facility (PSF).

At EU level, since Horizon Europe missions are directly linked to one or more of the UN SDGs: at least four out of the five main missions can be considered as "green" missions (i.e. healthy oceans, seas, coastal and inland waters; climate-neutral and smart cities; soil health and food; and adaptation to climate change and societal transformations), those missions could be used to give directionality to EU RD&I policy. In addition, RTOs capabilities should be further used to set-up Horizon Europe missions' agendas: RTOs' involvement in EU missions' boards is so far limited.

Improved EU RDI Framework Conditions Required for a Better Implementation

Transformative Policies

As stated by the European Commission EU Green Deal Communication, *"Conventional approaches will not be sufficient. Emphasising experimentation, and working across sectors and disciplines, the EU's research and innovation agenda will take the systemic approach needed to achieve the aims of the Green Deal. The Horizon Europe programme will also involve local communities in working towards a more sustainable future, in initiatives that seek to combine societal pull and technology push."*

RTOs tackle a wide range of disciplines, competences and skills that will support understanding of the needs and obstacles to green and digital transformation of our economy from two perspectives: technological and sociotechnical system. RTOs will support the transformation of sociotechnical systems in different areas such as energy, mobility, urban development, production, all targeted by the EU Green Deal objectives. By experimenting with and developing technological solutions in co-creation/co-design processes both with industrial partners and other stakeholders (public utilities, regulatory bodies, cities managing authorities, public infrastructures and NGOs), RTOs are supporting the combination of societal pull and technology push as bases for targeted technological innovation and innovative business models for (small and large) industry.

In this context, the EU Green Deal may call for a new governance of innovation combining new approaches/models/instruments such as regulatory sandboxes, anticipatory greenhouses, trial & error-and speed & scale approaches. Here the foresight capabilities of European RTOs will be an asset to support experimentation processes and to develop further transformative policies. Those governance approaches will have: 1) to support the integration of new and existing technologies across different sectors, 2) to use the opportunities of new business models and changes in our regulatory framework and, 3) to enable the involvement of a variety of new social actors. Thanks to their experience conducting collaborative pilot initiatives combining those three elements (technology development, regulatory framework and societal challenges), RTOs will support the cross-learning needed among many of these experimental initiatives at the local/regional level.

Protecting Europe's Intellectual Property (IP) Regime

As the European Commission notes, the EU is the world's largest single market: as such Europe can set standards that apply across global industrial value chains, giving a leading position to EU industries. For the European Green Deal to bring benefits in terms of creating new sustainable industries, we must recognise the crucial role of Intellectual Property (IP) in innovation and in fostering knowledge co-creation between RD&I actors such as RTOs and industry. Especially when we bear in mind the multitude targets of the Green Deal and the aim of the Sustainable Europe Investment Plan to leverage large public and private investments, the support of our European IP system will be very much needed.

Accordingly, the European Institutions should protect Europe's intellectual property (IP) regime. The long-standing experience of RTOs shows that industry is usually only willing to invest in RD&I leading to a competitive edge over entities that have chosen not to invest. This will be true as well in the context of green and digital technologies. This requires protecting certain results with IPRs. IP systems are designed in large part to provide adequate incentives for creators and inventors to invest in the production of novel ideas and content, while at the same time encouraging beneficial diffusion of knowledge. In this context, the European Commission should foster a balanced approach between Open Science and IP policies, to incentivise collaboration and co-creation between entities.

Standardisation & Technology Leadership

In addition to protecting our IP system, standardisation is another instrument the EC has at hand to implement the EU Green Deal European. Today designing and setting the first standards is of key importance to ensure technology leadership: those who set the standards 'rule the game'. RTOs are actively participating in Standard Setting Organisations (SSOs), Standard Development Organisations (SDOs) and digital standardisation communities (e.g. CEN-CENELEC, ETSI, ISO, ITU, DVB, ATSC, IETF, OMG). This allows RTOs to support the development of essential technical standards early on, allowing European industries to scale up technology developments to new products and services that will be internationally competitive and as such further develop the European Single Market. However, standardisation is costly: ways (both at national and EU levels) should be developed to further support and incentivise it.

EU State Aid Rules to Facilitate Green Transition

Furthermore, EU policy makers should further integrate RD&I and competition policies preventing any unwanted regulatory barriers hampering the EU's innovation capacity and preventing Europe from keeping its seat amongst the frontrunners of the technological revolution. We need a better balance between the need to safeguard free and fair competition in the EU internal market and the need to enable transition towards sustainable EU competitiveness through knowledge co-creation and innovation.

EARTO appreciates the EC plan to revise the EU state aid rules for combining funding of EU instruments. In addition, the specificities of the RD&I sector should be clearly recognised in the future revision of the EU state aid rules planned for 2022 (for e.g. by distinguishing the construction and running of research and technology infrastructures by non-profit actors like RTOs from the more traditional infrastructures cases such as ports or airports).

To conclude, European RTOs will be key enablers to achieve the European Green Deal's ambitious goals. As key actors in the European RD&I ecosystem and innovation-driven strategic value-chains, RTOs have a prominent role in EU RD&I programmes and policies.

RTOs - Research and Technology Organisations

From the lab to your everyday life. RTOs innovate to improve your health and well-being, your safety and security, your mobility and connectivity. RTOs' technologies cover all scientific fields. Their work ranges from basic research to new products and services development. RTOs are non-profit organisations with public missions to support society. To do so, they closely cooperate with industries, large and small, as well as a wide array of public actors.

EARTO - European Association of Research and Technology Organisations

Founded in 1999, EARTO promotes RTOs and represents their interest in Europe. EARTO network counts over 350 RTOs in more than 20 countries. EARTO members represent 150.000 highly-skilled researchers and engineers managing a wide range of innovation infrastructures.

Contact: Muriel Attané, Secretary General, attane@earto.eu, + 32 2 502 86 98