" INEST - INTERCONNECTED NORD-EST INNOVATION ECOSYSTEM"

DIGITAL, INDUSTRY & AEROSPACE

TARGET:

iNEST specialization area and the scientific and economic vocations of the territory. The iNEST ecosystem priority line is within the scope of the "Digital, Industry, Aerospace" area of the National Research Plan (PNR). The overarching aim is to rapidly extend the benefits of digital technologies to the key specialization areas of the northeast territory (Triveneto, Nord-Est in the following, that includes the two Regions of Friuli-Venezia Giulia (FVG) and Veneto and the two Autonomous Provinces of Trento and Bolzano), boosting digital technologies in the setting of industrial-manufacturing sector, agriculture, sea, mountains, construction, tourism, culture, health and food. iNEST activities are therefore also aligned with the scopes of other PNR areas, namely, "Food, bioeconomy, natural resources, agriculture, environment" (Green tech; food technologies; knowledge and sustainable management of agricultural and forest systems; knowledge, technological innovation and sustainable management of marine ecosystems), "Health" (Biotechnology; technologies for health), and "Humanistic culture, creativity, social transformations, inclusion society" (Cultural heritage; creativity, design and made in Italy, social transformations, inclusion society). Relevant to iNEST rationale, the European Regional Innovation Scoreboard 2021 (RIS2021 available on-line at: https://ec.europa.eu/docsroom/documents/45954) recognizes the innovation capabilities of the north-east territory (Trentino ITH1, Veneto ITH3, and FVG ITH4 as "Strong Innovator "; the Province Bolzano ITH2, as "Moderate Innovator +"). At the same time, the territory is characterized by a high degree of fragmentation, whereby the iNEST initiative provides the opportunity to scale up the multi-vocation characteristics of the territory.

Despite the scarce investment in R&D in public and private sectors with few local exceptions, the innovation performance of the Nord-Est regions and provinces has increased significantly in recent years (30% for Veneto and Trento and over 20% for Bolzano and FVG). A great contribution to achieving this significant result originates from the scientific research sectors, where the RIS2021 performance indices of the "international scientific co-publications" and "most-cited scientific publications" capabilities of the Nord-Est are almost invariably higher than national and European average. There are numerous scientific excellences within the iNEST partner's universities and other research institutions that form the ecosystem. The iNEST Universities have important and renowned research and educational capabilities in the fields of the "hard sciences" (Mathematics, Engineering, Physical Sciences Computer Science, Environmental Sciences), as well in the "Life Sciences" (Biology, Medicine, Psychology, Agriculture) and in the "Human and Social sciences". The University of Padua (800 years of history), the only large university in the Nord-Est, has been selected to coordinate the iNEST ecosystem.

The choice of the iNEST framework primarily centred on Digital Technologies and Industries stems from the awareness of an evident vocation present in the participating research institutions to meet the challenges for a digital, smart, and green transformation of the society and industry. The ambition of the iNEST Ecosystem is to enable this transformation by working on a common "digital vision" along nine specializations for the benefit of the economy and the citizens compliance with local Smart Specialization Strategies (S3s) to be merged in a shared mission for the Nord-Est.

The macro-region shows a strong manufacturing sector and quick growth in digitization processes and 4.0 infrastructure (accelerated by Covid-19 pandemic), which extends from industry to other economic sectors. In Veneto and FVG, the ERS2021 parameter, which indicates the manufacturing employment share, is close to double the European average. In Veneto, a large part of the over 450.000 companies are active in manufacturing, settling around 25% of the entire regional wealth and generating a third of the Veneto jobs. In FVG, the productive sector is characterized by about 90.000 active companies. In the Region, manufacturing is the leading macro sector, followed by commerce. The FVG is the 2nd Italian Region for export with a GDP ratio of 40%, with 15.4 billion € of export in 2019 (manufacturing activities, machinery and equipment, base metals and metal products, means of transport like ships and boats). To exploit this shared excellence, maintain the leadership by

innovating, and extend the strong asset of innovative ICT-driven process to other professional fields and contexts, we decided to set "Digital Technologies and Industries" as the priority theme of the iNEST project. Three Spokes dealing with a different aspect of this topic will be settled: Padova will focus on the "human/social" side and the ICT based automation of working and living environments, Udine on new industries "sustainability", and on the key topic of "innovative materials", SISSA in Trieste will enhance the digital/AI side of innovative factories.

The Nord-Est area has a strong vocation also in the sector of agriculture and food processing. Important schools and departments of Agricultural, Environmental, Forestry, and Biotechnology Sciences are based at the Universities of Padova, Verona, Udine, Trento, Bolzano, and Research Centres (e.g., Edmund Mach Foundation). Today, these sectors need to be innovated, introducing new business models and using ICT and AI from fields (precision agriculture) to table and then to end-life using blockchain technology for products traceability. This new path has already started, as shown by some new actions in the Verona area (Live demo "wine factory"). According to this scenario, the Spoke coordinated by the University of Verona will be dedicated to agri-food themes. Nord-Est is also a territory with a touristic vocation. Veneto is the first Region for tourism in Italy and one of the top five regions in Europe. In particular, in Venice, the socio-cultural and economic vocations are linked to tourism sciences and Ca Foscari's Spoke will intersect the contribution of

digital and ICT infrastructures in the updating of hospitality services and business models for tourist destinations. In the past twenty years, Trentino invested in digital health and in the use of digital technologies towards a healthy lifestyle and an innovative health system to ultimately promote citizens and patient wellbeing. This transformation is centred on the combination of digital technologies with other enabling technologies as biotechnologies, pharmacology, and robotics in a synergistic way with the whole ecosystem. Furthermore, the iNEST strategy also seeks to combine the current scientific and economic vocations with the specificities of the geomorphological conformation of its territories. These are extremely heterogeneous, ranging from marine, lagoon and coastal contexts to hilly and mountainous inland environments. The structural and infrastructural conditions of these contexts heavily condition the social, environmental, productive, and economic dynamics of the local territories, and require transversal competences and approaches for the achievement of specific objectives. Therefore, in iNEST, in addition to Spokes dealing with more vertical themes, there are also Spokes focused on application domains featured by a more marked territorial imprint, in which a variety of interdisciplinary competences must necessarily converge. This is the case of the Bolzano, Venice IUAV and Trieste Spokes, respectively dedicated to the problems of mountain ecosystems, sustainable modification of settlement systems, and to blue growth with themes mainly linked to maritime ecosystems and hydrosphere. Altogether, iNEST bridges multiple existing specialisations and seeks to consolidate them across the Nord-Est via transversal actions (see IMPACT section). It is worth mentioning to highlight how apparently distant themes can generate substantial and profitable synergies and innovative intersectoral/interdisciplinary collaborations. Tourism, whose competitiveness goes hand in hand with the technological innovation capacity of the services offered, is an example of this. The "hospitality industries" require a great effort in terms of innovation. Innovation in tourism extends from the introduction of complex digital systems (e.g. digital marketing and e-commerce solutions, use of big data to drive the industrial decision-making process, virtualization of initiatives) to many other consequent needs like the creation of new business models, innovative education and the training actions, new and more consistent links between the public and the private sector. Furthermore, through these digitization processes, sectors like tourism have become more and more driving forces for other commercial and production sectors. In the case of tourism, we are not referring only to the wellknown potential in promoting the artistic, cultural and natural heritage of our land, but rather, concerning the Nord-Est and our proposal, to the solid synergies with the food and wine sector, with manufacturing products like fashion, furniture and design objects, with services related to the well-being and health of the person. The apparent distances among different topics of the iNEST Ecosystem have been seen, by iNEST Consortium, as a challenge to support and innovate intersectoral synergies and collaborations by adopting a

multidisciplinary and cross-sectoral approach. These mentioned synergies and the empowering of collaboration between academics and enterprises, in coherence with the regional strategies (see below), express a first but solid starting point for defining the industrial value of the ecosystem; through the project and, in particular, by exploiting the opportunities offered by the cascade calls, the industrial value of i-NEST partnership will be strengthened. iNEST research and innovation plan and the regional Smart Specialization Strategies. The RIS3 framework in the Nord-Est regions is multifaceted and yet characterized by common approaches and strategies. The iNEST alliance stems from the analysis of the RIS3 in the light of the innovation potential of Nord-Est. The regional innovation strategies have common themes and can be traced back to seven main macrothemes as summarized in Table A1.

SECTION PARTNERS

TOTAL NO. OF PARTNERS: 24

Proposer: Università degli Studi di Padova

Participants

PUBLIC SUBJECTS

Universities

- Università degli Studi di Verona
- Università Ca' Foscari Venezia
- Università IUAV di Venezia
- Università degli Studi di Trento
- Libera Università di Bolzano
- Università degli Studi di Udine
- Università degli Studi di Padova
- Università degli Studi di Trieste
- Scuola Internazionale Superiore di Studi Avanzati

Research Institutes

- Consiglio Nazionale delle Ricerche
- Istituto Nazionale di Oceanografia e di Geofisica Sperimentale
- Autorità di Sistema Portuale Adriatico Orientale

PRIVATE ACTORS:

Research Organisations

- Consorzio per il coordinamento delle ricerche inerenti al sistema lagunare di Venezia
- EURAC Research
- Fondazione Bruno Kessler
- Fondazione Ca' Foscari
- Fondazione Edmund Mach
- Fondazione Hub Innovazione Trentino

- Friuli Innovazione
- Polo Tecnologico Alto Adriatico Andrea Galvani
- T2i-trasferimento tecnologico e innovazione

Companies

CRESME Ricerche

Covision Lab

SMACT scpa

SPOKE

Spoke n. 1 - *ECOSYSTEMS FOR MOUNTAIN INNOVATIONS*

Leader spoke: Libera Università di Bolzano

Spoke Members: EURAC, COVISION LAB, UNIVR, UNIPD, CA' FOSCARI, UNIUD

- Università degli Studi di Verona
- Università degli Studi di Padova
- Università Ca' Foscari Venezia
- Università degli Studi di Udine
- EURAC Research
- Covision Lab

Spoke n. 2 - *HEALTH, FOOD AND LIFESTYLES*

Leader spoke: Università degli Studi di Trento

Spoke Members:

- Università degli Studi di Verona
- Università degli Studi di Trieste
- Fondazione Bruno Kessler
- Fondazione Hub Innovazione Trentino

Spoke n. 3 - *GREEN AND DIGITAL TRANSITION FOR ADVANCED MANUFACTURING TECHNOLOGY*

Leader spoke: Università degli Studi di Udine

Spoke Members:

- Libera Università di Bolzano
- Friuli Innovazione

- Fondazione Bruno Kessler
- Università Ca' Foscari Venezia
- Università IUAV di Venezia
- Università degli Studi di Trento
- Polo Tecnologico Alto Adriatico Andrea Galvani

Spoke n. 4 - *CITY, ARCHITECTURE AND SUSTAINABLE DESIGN*

Leader spoke: Università IUAV di Venezia

Spoke Members:

- Consorzio per il coordinamento delle ricerche inerenti al sistema lagunare di Venezia
- CRESME Ricerche
- Università degli Studi di Trieste
- Università degli Studi di Padova
- Università degli Studi di Udine

Spoke n. 5 - *SMART AND SUSTAINABLE ENVIRONMENTS (MANUFACTURING, WORKING, LIVING)*

Leader spoke: Università degli Studi di Padova

Spoke Members:

- Consiglio Nazionale delle Ricerche
- T2i-trasferimento tecnologico e innovazione
- SMACT scpa
- Università degli Studi di Verona

Spoke n. 6 - *TOURISM, CULTURE AND CREATIVE INDUSTRIES*

Leader spoke: Università Ca' Foscari Venezia

Spoke Members:

- Università degli Studi di Verona
- Università degli Studi di Trento
- Libera Università di Bolzano
- Fondazione Ca' Foscari

Spoke n. 7 - *SMART AGRI-FOOD*

Leader spoke: Università degli Studi di Verona

Spoke Members:

- Università Ca' Foscari Venezia

- Università degli Studi di Padova
- Università degli Studi di Udine
- Fondazione Edmund Mach

Spoke n. 8 - *MARITIME, MARINE, AND INLAND WATER TECHNOLOGIES: TOWARDS THE DIGITAL TWIN OF THE UPPER ADRIATIC*

Leader spoke: Università degli Studi di Trieste

Spoke Members:

- Università Ca' Foscari Venezia
- Università IUAV di Venezia
- Università degli Studi di Trento
- Università degli Studi di Padova
- Istituto Nazionale di Oceanografia e di Geofisica Sperimentale
- Autorità di Sistema Portuale Adriatico Orientale
- Polo Tecnologico Alto Adriatico Andrea Galvani

Spoke n. 9 - *MODELS, METHODS, COMPUTING TECHNOLOGIES FOR DIGITAL TWIN*

Leader spoke: Scuola Internazionale Superiore di Studi Avanzati

Spoke Members:

- Università degli Studi di Trieste
- Università degli Studi di Padova
- Istituto Nazionale di Oceanografia e di Geofisica Sperimentale

FINANCIAL DATA (by concession decree)

Total ammount: € 110.552.296,89

MUR grant: € 109.866.032,00

Project calls: 40% of project ammount