



Annex no. 4 - Connect Nord-Est 2020 Results

North_East RDA conducted the 3rd edition of the **Regional Entrepreneurial Discovery Process “North-East Connect”**, between March and July 2020, in order to identify/revalidate potential priority areas and specialisation niches, updating the sectoral vision, targets and intervention mechanisms, necessary to be implemented in the period 2021-2027 for each area of specialisation.

Specialisation sub-niches (indicative and not exhaustive description):

AGRI-FOOD & WOOD INDUSTRY Sector	
Niches	Sub-niches
Smart-farming	Agriculture 4.0
	Use of IoT (Internet of Things)
	Construction of machinery, facilities and equipment for agriculture and food industry
Use of agricultural products for non-food purposes	Valorisation of by-products (plants and animals)
Environmental impact of agriculture	Adapting crops and animals to climate change
	Use of no-till technology
	Production of environmentally friendly inputs for the exploitation of some new agricultural resources
	Agro-biodiversity conservation and sustainable management of ecosystem services
	Organic farming
Biosecurity and food safety	The development of safe and healthy novel foods
	Traceability and food quality control; certification
	Marketing and regional local identity
	Developing short chains — harnessing local agri-food products
	Biosecurity
	Traceability and quality control of food and bio-pharmaceutical packaging
Forestry sector and wood industry	Precision, geo-spatial and geo-computing management technologies for forest management
	Adaptation of forest species for production systems with increased resilience to climate change and natural hazards

	Eco-efficiency in the exploitation of forest resources (efficient production chains for raw materials exploitation, secondary and tertiary forest products valorisation)
	Sustainable management of disease and pest

ENERGY Sector	
Niches	Sub-niches
Alternative energy sources	Technologies for production and recovery of alternative energy sources
	Energy recovery of by-products and waste through eco-innovative solutions
	Energy recovery of biogas from urban wastewater treatment plants
	Hydrogen production technologies for energy recovery
Energy efficiency	Smart factoring – energy efficiency in production processes
	Energy efficiency in buildings
	Energy efficiency management in public institutions
	Energy storage solutions
	Innovative energy-saving solutions for household consumers

ENVIRONMENT Sector	
Niches	Sub-niches
Water (innovative solutions)	Innovative solutions for water consumption efficiency
	Wastewater treatment technologies
	Wastewater recovery and recirculation/reuse technologies
	Advanced water quality monitoring and control systems (including priority and emerging pollutants)
	Sludge treatment and recovery
Air (innovative solutions)	Advanced atmospheric air quality assessment systems
	Innovative solutions to mediate the effects of air pollutants

	Advanced indoor air quality monitoring systems
Circular economy	Sustainability assessment of processes, products and services
	Innovative waste treatment and recovery solutions
	Eco-design of products adapted for circularity (e.g. eco-materials and advanced materials, new products containing recycled materials, etc.)
	Advanced systems for monitoring and metering of resource use

TEXTILES Sector	
Niches	Sub-niches
High-tech processes and applications in textiles	Eco-design of manufacturing processes
	Zero-waste textile processes and technologies
Technical and functional textiles	Medical textiles
	Indoor smart textiles
	Protective textiles
	Footwear materials
Digital Fashion	Smart design
	Digital textiles printing

IT&C Sector	
Niches	Sub-niches
Industrial modernisation	Industry 4.0
	Digitised textile technologies
	Industrial design
	Automation, robotisation, mass custom solutions
Cybersecurity	
Traceability and Big Data	Artificial Intelligence, Machine Learning
Smart City and Smart Village	Urban mobility
	Digitalisation of public administration
	IT&C solutions and applications for public services and utilities
Development of new IT&C products hardware & software and test solutions	Education based on IT&C solutions / Gamification of education
	IT&C in the automotive industry

HEALTH Sector	
Niches	Sub-niches
Medical and pharmaceutical biotechnologies	Personalised therapies
	New active substances and medicines
	Advanced technologies and materials in pathogen testing and detection programmes
	Solutions and systems to combat the spread of infections
	Nanobiotechnologies
	Advanced materials for health
	Regenerative medicine
Precision medicine	Innovative medical devices, technologies, tools and methods for diagnosis, treatment and prognosis
	Interdisciplinary support in palliative care for patients with multi-morbidity or complex needs
	Interrelationship of micro-organisms with the environment, animals and humans
Prevention medicine	Innovative medical devices, technologies, tools and prevention methods
	Advanced systems and therapies to improve the quality of life in chronic progressive diseases
e-Health	Methodological development and practical implementation of a health eCompetence framework
	IT&C solutions (hardware and software) in disease prevention, diagnosis and management
	Artificial intelligence (AI) in medicine
	Custom diagnostics / teragnostics imaging
Biosecurity (veterinary medicine - human medicine collaboration)	Antibiotic resistance, research on antimicrobial agents, zoonoses, emerging diseases, innovative prevention methods — plasma and Paw

TOURISM Sector	
Niches	Sub-niches
IT&C solutions for tourism	
Marketing and creative promotion	

Healthy lifestyle tourism	Balneary tourism (therapeutic, wellness and spa) and climatotherapy
	Medical recovery (physio/kinetic therapy)
	Nutrition and dietetics
	Accessible tourism
Eco-tourism	Adventure tourism
	Genuine experience/relaxation in nature
	Culinary tourism (slow-food, traditional kitchen) and oenological tourism
	Agro-tourism
	Smart villages
Business tourism	MICE (Meetings, Incentives, Conferences and Exhibitions)
	Bleisure
Cultural tourism	Innovative applications and products in cultural tourism

Challenges, strengths and development opportunities for the North-East RIS3 sectors

Based on the elements identified in the sectoral SWOT analyses (exemplified below) were agreed together with participants in EDP workshops, sectoral ambitions and innovative development strategies for each area with SMART potential. These strategies aim at harnessing skills and development potential (strengths and opportunities) to address critical links in the innovation chain (weaknesses or challenges).

AGRI-FOOD & WOOD INDUSTRY Sector	
Strengths	Opportunities
<ul style="list-style-type: none"> • Large area of agricultural land (including organic certificate) • High contribution to national gross value added • Local producers/processors invest in modernising technologies • Large wood resources (renewable resource) • High level of resilience to crises (economic operators carrying out logging can easily stop and resume activity) • Existence of organic certified processing factories • Existence of 3 academic centres in the area and research infrastructure • The existence of actors needed to build partnerships • The existence of supporting bodies 	<ul style="list-style-type: none"> • Incompletely exploited regional agricultural potential • Growing market for agri-food products • Know-how in processing agricultural products • Development of thematic platforms for the sale of products • Establishment of agricultural cooperatives, clusters • Government grants from EU funds, approx. 200 million EUR (2021) • Experience in R & D projects • European Green Deal — New Green Deal • The Region's membership of the S3 Agri-food Thematic Platform

Challenges
<ul style="list-style-type: none"> • Poorly advanced manufacturing capacities • Poor raw material processing capacity • Inefficient exploitation of resources • Low diversity of local products • Lack of knowledge transfer partnerships between the research environment and the agricultural business environment to test new products and implement innovative solutions • Absence of profile technology transfer centres • Poor users' ability to understand and adapt modern/digital technologies • Poor knowledge of the practices and methods of obtaining the second and third harvest respectively • Low interest of rural residents in cooperation and creation of associative forms • Insufficient entrepreneurial culture and promotion • Difficult commercialisation process for (innovative) products by small producers • Low interest of young people in developing new business in the area • Lack of (specialised) agricultural labour force • Labour drain • Increasing production costs in agriculture • Negative impacts of climate change on soil and biodiversity

ENERGY Sector	
Strengths	Opportunities
<ul style="list-style-type: none"> • Educational and research programmes • Research infrastructure • Reduced operational costs for renewable energy sources (RES) technologies • Potential (resources) for ensuring energy independence from renewable resources • Existence of raw materials for energy production • Biomass resources, waste from various areas of activity • Solar + wind potential • Very good internet infrastructure • Academic and research expertise and experienced staff, including in IT to develop innovative energy efficiency solutions; Advanced technological solutions form partnerships 	<ul style="list-style-type: none"> • Development potential of some cluster • Energy — Environment and Climate Change is a priority set by the National Strategy for Research-Development-Innovation (NSRDI) 2014-2020 and in National Strategy for Competitiveness (NSC) 2015-2020 • Existence of the National Integrated Energy and Climate Change Plan 2021-2030, the Sustainable Energy Action Plan (SEAP) and the Sustainable Energy and Climate Action Plan (SECAP) • Refocusing waste management strategies (towards circular economy) • European Green Deal — New Green Deal • EU non-refundable funds/incl. ROP 2021-2027 with dedicated budget lines • Green House programme • Attractive investment environment • New market segments (new products, solutions and technologies) • Interest in smart heating solutions for electricity grid expansion in unsupplied localities • Membership of the Region in the S3 Energy Thematic Platform
Challenges	
<ul style="list-style-type: none"> • Inefficient and unsustainable exploitation of resources • Lack of regional RES mapping • Lack of coherent policy and government strategy to promote the use of local renewable resources • Outdated and inefficient linear district heating system with losses on the heat distribution network — inefficient for individual consumers (due to their dispersion as a result of disconnection to from the centralised system), with individual plants with high carcinogenic emissions • Lack of digital metering systems — inefficient energy infrastructure not adapted to modern solutions, which cannot support digitalisation and efficiency solutions 	

- Reduced collaboration between business environment and universities/research institutes: reduced regional offer for TRL5-TRL7 level technology transfer services (i.e. pilot stations, demonstration laboratories for testing new products and technologies)
- Slow market growth (reluctance of the population to new products)
- Lack of matching framework for business needs for skilled staff with the specialists training (through universities) and lack of support for skills training through internships, study visits
- Low inclusion of young graduates
- Deficit of the medium-skilled labour force (skilled workers, technicians) — ageing population and emigration of skilled personnel
- Postponement of green certificates to trade, with a negative impact on revenue predictability and investors' perception of the business environment
- Diminishing investor interest and thus investment in new and existing RES capacities (upgrading, major repairs) until abandonment

ENVIRONMENT Sector	
Strengths	Opportunities
<ul style="list-style-type: none"> • Advanced educational and research programmes • High-performance research infrastructure • Access to international education and research networks • Expertise in developing innovative solutions for resource efficiency • Experience in investing in modernising technologies (eco-technologies) • Regional actors interested in partnerships 	<ul style="list-style-type: none"> • Potential for developing start-ups/spin-offs/clusters in the area • Energy — Environment and Climate Change is a priority set by the National Strategy for Research-Development-Innovation (NSRDI) 2014-2020 and in National Strategy for Competitiveness (NSC) 2015-2020 • EU non-refundable funds 2021-2027 with dedicated budget lines and national programmes to support the sector • Refocusing waste management strategies (circular economy) • Attractive investment climate • New market segments (new products, solutions, technologies) • Opening up universities to partnerships with economic operators • Existence of programmes to finance TT • Existence of Profile Demonstrative Project Ideas • Membership of the region in the S3 Industrial Modernisation Thematic Platforms, Thematic Water Smart Territories Partnership • Publication of the Environment Action Plan — Iasi in the debate
Challenges	
<ul style="list-style-type: none"> • Inefficient and unsustainable exploitation of resources (renewable or not), sensitive areas and protected areas in the North-East region • The existence of areas prone to flooding and other natural hazards in the region, with negative effects on the quality of environmental factors • Increased environmental pollution (air, water, soil) entails high remediation costs (rural environment) • Low connection to sanitation services (waste management and recycling) — problems identified particularly for rural population • Low connection to water-channel services (waste water treatment) — problems identified particularly in rural population • Lack of implementation of alternatives for treated waste water recirculation in industry, agriculture and services • Lack of monitoring systems (air, water) in rural areas 	

- Lack of environmental education programmes at the national level (environmental protection is an ignored or superficially treated discipline in pre-primary, primary, secondary and high school education)
- Lack of matching framework between companies needs and training of specialists (through universities), lack of support for skills training through internships, study visits
- Low labour market inclusion of young graduates
- Deficit of the medium-skilled labour force (skilled workers, technicians)
- Lack of a communication and collaboration platform between relevant actors
- Reduced collaboration between business environment and universities/research institutes: reduced regional offer for TRL6-TRL9 level technology transfer services (i.e. pilot stations, demonstration laboratories for testing new products and technologies)
- Population reluctance to new, innovative products (to change, generally speaking) leading to slow market growth and slow progress in developing new solutions

HEALTH Sector	
Strengths	Opportunities
<ul style="list-style-type: none"> • Existence of advanced education and research programmes • The existence of a research base with huge potential: large hospitals, human capital, research infrastructure endowed • Existence of 3 clusters in the region • Existence of a significant number of active companies in the area • Skilled labour force • Regional actors interested in partnerships • SMEs specialising in the production of innovative medical devices and tools • Emergence of medical & IT hybrid start-ups 	<ul style="list-style-type: none"> • Biotechnologies — emerging domain with real entrepreneurial opportunities • Increasing demand for pharmaceuticals (vaccines, antiviral, etc.) obtained through biotechnologies, as well as methods for early testing of diseases (including as a result of COVID-19 epidemiological phenomenon) • Demand for organic and nutritionally improved products due to lifestyle change and healthy lifestyle orientation • Existence of dedicated budget lines from European, national and regional funds • Membership of the region in the S3 Industrial Modernisation Thematic Platforms, Thematic Partnership, Personalised Medicine
Challenges	
<ul style="list-style-type: none"> • Poor population education for health, need for development and deployment of eHealth integrated computing systems to access a wide range of medical information • Lack of qualified medical staff due to labour migration • Low technology transfer, low collaboration between different actors in the sector • Lack of a communication and collaboration platform between academia and the private environment to identify RDI projects (development of equipment, ideas, knowledge, etc.) • The lack of regional infrastructure, which forced patients to go to other regions or countries to treat, leading to the imminent need for innovation in regional diagnostic and therapy infrastructure • Lack of solutions for the internal and external digitalisation of healthcare institutions, with consequences on the information flows standardization for co-morbidity mapping and disease monitoring • Lack of independent analysis and certification infrastructure for certain products obtained through biotechnologies • Lack of raw materials at the national level 	

TEXTILES Sector	
Strengths	Opportunities
<ul style="list-style-type: none"> • Existence of raw materials • Regional expertise and experience in the areas 	<ul style="list-style-type: none"> • Regulation of qualifications in the area • Existence of dedicated budget lines from

<p>— Textiles and Fashion Industry (including footwear)</p> <ul style="list-style-type: none"> • Educational and research programmes, related infrastructure • Large number of active companies in the area • Existence of Astrico Nord-Est Cluster (2010) and Reginova Regional Innovation Association (2019). • Competitive advantages (exports, strong sector position in the region) • The existence of an initiative focused on the fashion industry digitalisation • Existence of a regional skills pole on creative industries • Reduced costs of qualified human resources at all levels 	<p>European, national and regional funds</p> <ul style="list-style-type: none"> • Legal framework for dual education for vocational training • Growing demand for natural textiles • Growing demand for medical and protective materials generated by the COVID-19 crisis • Affiliation to the S3 Industrial Modernisation Thematic Platform, Smart Textile Regions (North-East Region is a co-leading region at the Regiotex Initiative)
Challenges	
<ul style="list-style-type: none"> • Products have low added value • Low collaboration between industry and research, low technology transfer • Lack of medium skilled labour force and low interest in training and employment in the area • Low inclusion of young graduates • Ageing and emigration of skilled personnel • Dependence on imports generated by the shortage of technical plants produced, insufficient local/regional raw materials and lack of raw materials for certain product categories (e.g. footwear, medical and protective products) • Lack of digitalisation of the textile value chain particularly on production, marketing and promotion/sales links • Lack of product certification and testing bodies 	

IT&C Sector	
Strengths	Opportunities
<ul style="list-style-type: none"> • Advanced educational and research programmes, related infrastructure • High number of graduates working towards IT&C specialisation • Large number of companies active in the area • Existence of 2 IT&C clusters (EURONEST and Iconic) • Quality skills and services in integrated areas • Regional actors interested in partnership • Existence of a regional HUB - Digital Innovation Zone (2019) • Efficient data and voice infrastructure in the urban environment • Tax facilities for IT&C • Very strong regional digital community created informally through the strength of community spirit, voluntary (e.g. Codecamp, NDR, etc.); • Experience of some partnerships between academia and the private sector in the region • Existence of informal/non-formal education structures • A good collaboration between Iasi universities 	<ul style="list-style-type: none"> • Potential for developing start-ups/spin-offs/clusters • Digitalisation and Industry 4.0 are major European goals with allocated funds • Regional potential for developing hardware and software building capacity • High potential for developing new IT&C solutions in response to cyber threats • Increasing the need for IT&C products and services, transferring activities online (including education) due to the physical distancing measures imposed by COVID-19 • IT&C can act as a technological catalyst (KET) for the development of other areas with regional specialisation potential • Existence of dedicated budget lines from European, national and regional funds • Harnessing the know-how of multinationals active in Romania in IT&C area (management and development)

in the IT area	
Challenges	
<ul style="list-style-type: none"> • Brain drain; difficulties in retaining young people in academic centres and companies in the region • Pay gaps between North-East Region and other regions/countries • Limited range of labour force specialisation in the IT&C area • Lack of basic digital skills (large scale at certain age groups) coupled with poor data and voice infrastructure (especially in rural areas) • Lack of digital maturity of companies and public authorities and low level of information on information security • Low number of existing national IT&C solution providers in the region (10%) • Weak development of entrepreneurial and digital culture for the deployment of digital solutions in the industry and other areas of human activity 	

TOURISM Sector	
Strengths	Opportunities
<ul style="list-style-type: none"> • High tourism potential (natural, cultural, ethnographic) • Certified balneotherapy resorts • High quality mineral waters; red peat deposit for mud baths; fertile soils for agro-tourism (agriculture, oenology, beekeeping, etc.); traditional cuisine and regional specialities (incl. quality mountain products and local gastronomy); • Favourable climate to climate therapy (heliotherapy, etc.) • The existence of a large number of protected areas (national parks, nature parks and reserves) included in the European Natura 2000 network and in a certified Eco tourist destination • Developed and varied accommodations network, with increased accommodation capacity in agro-tourism guesthouses • Good airport infrastructure (3 international airports) • Existence of territorial brands and products in the region (Ex: "Produce in Bucovina") • Diversity of traditions and customs, crafts / diversified and authentic cultural landscape • Rich calendar of festivals and cultural events • Hospitality 	<ul style="list-style-type: none"> • The potential for mountain areas to be exploited throughout the year through hiking, riding, mountainous and extreme sports; • A switch towards active tourism, nature tourism; switch towards domestic tourism (incl. rural tourism) due to COVID crisis 19 • Possibility to promote COVID SAFE destinations • Increased international interest in balneary tourism (including prevention treatment — wellness/spa), eco-tourism, agro-tourism and rural tourism, adventure and experience tourism • The trend of replacing medication with natural cure, recreation and rest factors • Exploiting synergies between tourism and IT&C, creative and cultural industries, environmental protection, agri-food (healthy food), biotechnologies (medical recovery and special nutrition), etc.; • High potential for business tourism and its combination with leisure tourism = Bleisure • Public-private associative potential • Increased interest in harmonising local initiatives • Existence of the Master Plan for Tourism Development in Romania
Challenges	
<ul style="list-style-type: none"> • High degree of wear and failure to adapt treatment bases of balneary resorts to European standards • Low use of accommodation capacity and average length of stay duration in the region • Weak development of the local leisure industry (plant, machinery, etc.) • Non-compliant developments near regional tourist sites (especially in rural areas) • Low number of travel agencies doing incoming and lack of interest in promoting package holidays in the North-East Region • Lack of zoning of tourism experiences in Moldavia Region • Lack of (attractive) tourist packages retaining tourists • Limited extra-season tourism actions 	

- Low number and lack of integrated character for thematic tourist routes
- Reduced number of routes for ATVs and bicycles
- Weak development of the prophylactic component in curative tourism
- Poor scientific (not tourism) promotion of mineral water springs
- Low number of foreign (seasonal) tourists
- Lack of solutions to monitor visitors satisfaction in the North-East Region
- Lack of promotion, especially creative, and limited interest in unitary regional promotion initiatives (territorial, tourism or product)
- Limited AR (Augmented Reality) and VR (Virtual Reality) solutions for the complex promotion of cultural objectives
- Gradual disappearance of traditions
- Demotivation of territorial actors in the context of the current situation
- Insufficient cooperation between different tourism operators
- Lack of qualified and specialised staff (management and execution) in tourist accommodation
- Lack of information for local people
- Poor organisation and promotion of public transport towards tourism objectives
- Poorly developed utility infrastructure (water, sewerage, waste management) in rural areas and the need for innovative solutions