

INNOVATION
**Accademic
PoCs**



NODES

Nord Ovest Digitale E Sostenibile

NODES Academic Proof of Concepts

Scientific knowledge for concrete, useful and shared impact.

NODES is a national ecosystem with strong roots in the North-West and an outlook open to the entire country.

It was created under the National Recovery and Resilience Plan (PNRR) with an ambitious goal: **to promote the digital and ecological transition by leveraging scientific knowledge through technology transfer and cross-sector collaboration.**

The aim is clear: to strengthen the productive fabric, even in the most fragile areas, enhance skills, foster widespread innovation and support the transformation of territories through the connection between universities and industry.

To achieve these goals, NODES promotes a concrete and inclusive collaboration model, based on the synergy between research, business and territory. This model takes shape in its ability to **build bridges between universities and industry, generating productive relationships between those who conduct research and those who can apply it.**

From these connections emerge virtuous processes: knowledge sharing, development of concrete solutions and acceleration of innovation.

The Proof of Concept projects, developed by the research teams of partner universities active in the North-West Ecosystem, tackle **decisive challenges for our future:** from energy efficiency to sustainable mobility, from environmental protection to health, from cultural heritage enhancement to food safety and up to urban regeneration.

Each project represents a concrete example of innovation born from dialogue and from the **NODES Ecosystem's ability to turn knowledge into value**, networking universities, research centers, businesses and territories, and connecting real needs with advanced solutions. In this context, technology transfer emerges as a strategic tool to transform research into a driver of growth, development and sustainable innovation, serving the system that integrates academia with the productive and territorial sectors.

Behind every initiative, there is a research team, a university, a concrete challenge and a shared vision. These are experimental projects, yet already capable of generating tangible impacts: innovative solutions ready to be adopted, field-validated, refined and made scalable.

They are the living testimony of our vision: **making innovation a collective endeavor**, serving territories and society.

Because innovating today is the most concrete way to shape the future.

NODES Ecosystem President
Stefano Paolo Corgnati



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Spoke 1 Aerospace and sustainable mobility



Scan the QR Code
and learn more!

Themes



New space economy



Sustainable mobility

ASTRO



Advanced Space Tethers for Remote-sensing Operations

It involves the validation of the system in microgravity and extreme conditions, such as vacuum and critical temperatures. The PoC will lead to the creation of a prototype using materials suitable for space applications, such as aramid fibers for the structural layer of inflatable links.



SCIENTIFIC LEAD
Prof. Marcello Romano



NODES INVESTMENT
€ 148.487,48



UNIVERSITY
Polytechnic of Turin

DISCARD



Stack-CNN Demonstrator: AI Algorithm for Space Debris Research

It involves the development of a technological and scientific demonstrator system for space safety, monitoring uncatalogued debris in LEO orbit, which pose an increasing risk of collisions with satellites and the creation of new fragments.



SCIENTIFIC LEAD
Prof. Mario Edoardo
Bertaina



NODES INVESTMENT
€ 91.453,75



UNIVERSITY
University of Turin

ePIM



Electrochemical binder based on intrinsically microporous polymers

It involves the development of an innovative PIM-based binder with lower environmental impact, reduced costs and superior performance. It aims to improve the efficiency of fuel cells and electrolyzers, providing an alternative to the reference material.



SCIENTIFIC LEAD
Dr. Sergio Bocchini



NODES INVESTMENT
€ 108.475



UNIVERSITY
Polytechnic of Turin

GRAVITAS



Gravity Reduced Approach for Versatile and Integrated Testing of Artificial satellite proximity-maneuver Scenarios

It involves the development of a technology to simulate reduced gravity on an autonomous satellite simulator, free on 3 degrees of freedom thanks to a pressurized system and a granite surface that can be tilted by algorithmic control.



SCIENTIFIC LEAD
Prof. Marcello Romano



NODES INVESTMENT
€ 149.945,25



UNIVERSITY
Polytechnic of Turin

IDRA



Inflatable and Deployable Robotic Arm

It involves the validation of the system in microgravity and extreme conditions, such as vacuum and critical temperatures. The PoC will lead to the creation of a prototype using materials suitable for space applications, such as aramid fibers for the structural layer of inflatable links.



SCIENTIFIC LEAD
Prof. Stefano Mauro



NODES INVESTMENT
€ 147.508,9



UNIVERSITY
Polytechnic of Turin

NAVIGATE



Nautical Autonomy with Viable Integration of Fuel Cells and Advanced Twin Engineering

It involves creating a digital twin of a propulsion system and using AI algorithms for real-time learning of the behavior of these propulsion systems.



SCIENTIFIC LEAD
Dr. Giuseppe Giorgi



NODES INVESTMENT
€ 63.812,20



UNIVERSITY
Polytechnic of Turin

RoboAPP



Robotic Aggregate Programming Platform

It develops an IoT hardware-software platform for the intelligent management of electric fleets and AMRs in facility management, leveraging the potential of electric and autonomous mobility.



SCIENTIFIC LEAD
Prof. Paola Pisano



NODES INVESTMENT
€ 90.000



UNIVERSITY
University of Turin



Spoke 2 Green technologies and sustainable industries



Scan the QR Code
and learn more!

Themes



Circular economy



Water treatment



Green chemistry



Renewable energy

BiOCARE



Cutin: Sustainable and Non-Toxic Biopolymer Obtained from Biomass Waste for Biomedical Use

It recovers cutin from agri-food waste, transforming it into a medical-grade material with the aim of upcycling food waste, generating both environmental and economic benefits.



SCIENTIFIC LEAD
Prof. Rossella Dorati



NODES INVESTMENT
€ 126.466,89



UNIVERSITY
University of Pavia

BioReMedia



Biotechnological Recycling of Exhausted Cell Culture Media Using Microalgae

It develops strategies to recycle exhausted cell culture media, reducing biomedical waste and repurposing it as a substrate for cultivating microalgae for bio-remediation purposes.



SCIENTIFIC LEAD
Prof. Alberta Pinnola



NODES INVESTMENT
€ 104.000



UNIVERSITY
University of Pavia

DST-SRM



Decision Support Tool to Assess Sustainability in the Recovery of Secondary Raw Materials (including critical raw materials) from Mineral Waste

It develops strategies for recovering raw materials (RMs), including critical raw materials (CRMs) and secondary raw materials (SRMs), from landfills and industrial waste through landfill mining and circular economy approaches.



SCIENTIFIC LEAD

Prof. Giovanna Antonella
Dino



NODES INVESTMENT

€ 90.337,31



UNIVERSITY

University of Turin

FSM2C



Use of sawing sludge for the preparation of two-component mortar

It uses marmettola (sawing sludge) as an ingredient in the preparation of two-component mortar (2CG), a technology employed for backfilling in mechanized tunnel excavation using shielded machines.



SCIENTIFIC LEAD

Dr. Carmine Todaro



NODES INVESTMENT

€ 93.987,90



UNIVERSITY

Polytechnic of Turin

GREEN.VAL.



Development of a “bio-based” and “green” pilot process for the valorization of agri-food matrices and recovered organic materials.

It demonstrates the synergistic, convergent and serial applicability of “green” and “bio-based” processes to achieve high-performance upcycling of agri-food by-products and/or marginal biomasses.



SCIENTIFIC LEAD

Prof. Marco Arlorio



NODES INVESTMENT

€ 95.500



UNIVERSITY

University of Eastern
Piedmont

ISS



Infinite Stroke System - Motion Conversion System for renewable energy production

It develops the “Infinite Stroke System – ISS” mechanism to convert wave motion into unidirectional rotation, oil-free, with high efficiency, reliability and zero maintenance.



SCIENTIFIC LEAD

Prof. Andrea Mura



NODES INVESTMENT

€ 132.049,49



UNIVERSITY

Polytechnic of Turin

MATERIALIZED



MATERial Rheology Investigation And Life cycle assessment of a Zero Emission Driving system

It analyzes the environmental sustainability and durability performance of a braking system designed to reduce secondary emissions generated by vehicles.



SCIENTIFIC LEAD

Prof. Massimiliana
Carello



NODES INVESTMENT

€ 130.652,61



UNIVERSITY

Polytechnic of Turin

PFS



Plant Flow Solutions

Plant Flow Solutions, a university spin-off, was launched through 2i3T to develop an automatic system for measuring plant-atmosphere gas exchange using phenotyping technologies.



SCIENTIFIC LEAD

Prof. Claudio Lovisolo



NODES INVESTMENT

€ 50.000



UNIVERSITY

University of Turin

REDIRECT-Gd



REDucing and RECovering the Gadolinium from Gd-based contrast agents for Magnetic resonance Imaging

It develops solutions to reduce the environmental impact of gadolinium-based contrast agents, used in 40% of MRIs and released annually into urban wastewater.



SCIENTIFIC LEAD

Prof. Giuseppe Ferrauto



NODES INVESTMENT

€ 61.050



UNIVERSITY

University of Turin

REFINEMENT



An integrated biorefinery for the sustainable production of biofuels and emulsifiers from agro-industrial waste

It develops a no-waste integrated biorefinery that valorizes the permeate from dairy whey, producing ethanol and surfactants, creating circular flows from by-products and effluents that are currently unused.



SCIENTIFIC LEAD

Prof. Paolo Magni



NODES INVESTMENT

€ 70.250



UNIVERSITY

University of Pavia

ROSEWATER



Reduction of Contrast Agents in Wastewater

It addresses pollution caused by iodinated and gadolinium-based contrast agents used in diagnostics, which are currently detected in wastewater and pose potential risks to the environment and human health.



SCIENTIFIC LEAD

Prof. Angelo Bifone



NODES INVESTMENT

€ 54.750



UNIVERSITY

University of Turin

SPONDE



Development of a Portable Tool for Rapid Monitoring of Mercury and Methylmercury in Fresh and Salt Water

It develops a portable, simple, and cost-effective procedure for determining total mercury (HgTOT), inorganic mercury (HgIN) and methylmercury (CH₃Hg) in fish products, as an alternative to the laboratory DMA method.



SCIENTIFIC LEAD

Prof. Agnese Giacomino



NODES INVESTMENT

€ 110.800



UNIVERSITY

University of Turin

T2T



Trash to Treasure

It develops a blockchain platform for tracking the reuse of waste, incorporating a database of chemical-biological, toxicological-environmental and commodity information.



SCIENTIFIC LEAD

Prof. Mauro Fasano



NODES INVESTMENT

€ 50.000



UNIVERSITY

University of Insubria

WAKEUP



Waste cooking oils: biopolymers Upgrading

It develops a patented bio-resin for industrial applications, over 80% biobased, with low or zero VOC emissions, in line with Green Chemistry principles. Uses include wood varnishes and high-performance fire-retardant coatings.



SCIENTIFIC LEAD

Prof. Daniele Dondi



NODES INVESTMENT

€ 88.721,25



UNIVERSITY

University of Pavia



Spoke 3 Culture and tourism industry



Scan the QR Code
and learn more!

Themes

- Heritage conservation
- Digital narratives
- Lifestyle tourism
- Eco fashion
- Digital tourism

AIACE



Artificial Intelligence Assistant for Cultural Tourism Enhancement

It aims to develop artificial intelligence tools specific to tourism and the humanities, overcoming the limitations of generic Large Language Models (LLMs) and demonstrating the effectiveness of AI in historical and cultural dissemination.

- SCIENTIFIC LEAD**
Prof. Edoardo Tortarolo
- NODES INVESTMENT**
€ 55.000
- UNIVERSITY**
University of Eastern Piedmont

CERR



Cultural Extended Reality Routes

It aims to enhance local industrial culture and heritage, promoting tourism growth and development through innovative pathways that combine creativity, technology and augmented reality.

- SCIENTIFIC LEAD**
Prof. Roberta Minazzi
- NODES INVESTMENT**
€ 75.000
- UNIVERSITY**
University of Insubria

DIGITALMM



Digital Muse for Museums

It uses algorithms under development to provide museums with a management model that is multidisciplinary, data-driven, transferable and scalable.

- SCIENTIFIC LEAD**
Prof. Giovanni Mastrobuoni
- NODES INVESTMENT**
€ 104.250
- UNIVERSITY**
University of Turin

ETLAV



Enhancing Tourism in the Lower Aosta Valley

It enhances the Lower Aosta Valley through cultural and literary routes inspired by non-Italian travelers, promoting cultured, sustainable and international tourism through innovative digital tools.

- SCIENTIFIC LEAD**
Prof. Carlo Maria Bajetta
- NODES INVESTMENT**
€ 74.203,90
- UNIVERSITY**
University of Valle d'Aosta

HISTORYGRAPHIA



A networked digital platform for an organic and interdisciplinary vision of the widespread cultural heritage across the territory

It aims to create a digital platform to present an integrated and interdisciplinary view of the widespread cultural heritage across the region.

- SCIENTIFIC LEAD**
Prof. Luigi Provero
- NODES INVESTMENT**
€ 56.750
- UNIVERSITY**
University of Turin

ITM



Immersive textile museum

It aims to enhance the historical and cultural heritage of the Como textile sector by developing new digital pathways and augmented reality experiences to make the Silk Museum more inclusive and appealing to young audiences.

 **SCIENTIFIC LEAD**
Prof. Valentina Jacometti

 **NODES INVESTMENT**
€ 75.000


 **UNIVERSITY**
University of Insubria

PiémuntAIs



PiémuntAIs: Revolutionizing Digital Tourism through Generative Artificial Intelligence

It aims to transform the tourism experience in Piedmont through the use of advanced generative artificial intelligence technologies.

 **SCIENTIFIC LEAD**
Prof. Luigi Di Caro

 **NODES INVESTMENT**
€ 80.600

 **UNIVERSITY**
University of Turin

PLANET



Planner Leisure App for Natural & Experiential Tourism

It develops an innovative mobile app to collect, manage and enhance cultural data useful for territorial growth and digital transition, fostering innovation in tourism and promoting Italian heritage globally.

 **SCIENTIFIC LEAD**
Prof. Fabrizio Mosca

 **NODES INVESTMENT**
€ 124.500

 **UNIVERSITY**
University of Turin



Spoke 4 Digital innovation toward sustainable mountain




Scan the QR Code
and learn more!

Themes

 Mountain and smart working

 Mountain resources management

 Mountain regeneration

BLOCCHI



Blockchain for Tourism, Hospitality, and Culture in Mountain Communities

It aims to build and test a blockchain-based platform to support the tourism sector, particularly to promote visits to lesser-known locations and activities in mountain areas.

 **SCIENTIFIC LEAD**
Prof. Claudio Schifanella

 **NODES INVESTMENT**
€ 92.690


 **UNIVERSITY**
University of Turin

DTforVR



Virtual Reality for public training on natural hazards

It aims to synergistically integrate augmented reality, BIM/GIS platforms and IoT networks to prevent natural disasters, enabling real-time monitoring, continuous updates and enhanced safety and resilience.

 **SCIENTIFIC LEAD**
Prof. Enrico Macii

 **NODES INVESTMENT**
€ 113.852,71

 **UNIVERSITY**
Polytechnic of Turin

MASPLIT



Methodology and Application for Assessing Hybrid Work Performance in Mountain Areas

It supports mountain SMEs in hybrid work with a low-cost cloud app to evaluate work performance by breaking down activities into processes, even when carried out in a hybrid work mode.



SCIENTIFIC LEAD
Prof. Antonella Cugini



NODES INVESTMENT
€ 83.175



UNIVERSITY
University of Valle
d'Aosta

NBS4MOV



Nature-based Solutions for Mountain Villages

It aims to apply NBS technology in wastewater treatment in a mountain village, integrating water and energy management, slope stabilization, landscape enhancement, attractiveness and data monitoring.



SCIENTIFIC LEAD
Prof. Elisa Costamagna



NODES INVESTMENT
€ 106.755,21



UNIVERSITY
Polytechnic of Turin

ReSismico



Seismic and energy retrofit of buildings in the Alpine area using engineered wood

In the Alpine region, buildings at seismic risk and with poor energy efficiency require integrated interventions. The PoC develops wooden exoskeletons to improve safety and performance.



SCIENTIFIC LEAD
Prof. Luca Caneparo



NODES INVESTMENT
€ 119.077,61



UNIVERSITY
Polytechnic of Turin

SHAKE



Safe and healthy working remotely

It develops an online training course to support companies in fulfilling the information and training obligations for employees working in smart working mode.



SCIENTIFIC LEAD
Prof. Lavinia Tagliabue



NODES INVESTMENT
€ 99.126,47



UNIVERSITY
University of Turin

TeleFragMont 4.0



Integrated remote sensing systems for managing mountain vulnerabilities

It tests an integrated telemedicine system that strengthens healthcare in marginal and remote areas, addressing the challenges specific to mountain regions.



SCIENTIFIC LEAD
Prof. Riccardo Beltramo



NODES INVESTMENT
€ 119.100



UNIVERSITY
University of Turin



Spoke 5 Industry for health and silver economy



Scan the QR Code
and learn more!

Themes



Eco healthcare



Digital care innovation

BRAVE

ABsoRbAble DeVice for Tendon REpair

It aims to validate an innovative biodegradable device for tendon rupture repair, eliminating the use of sutures.



SCIENTIFIC LEAD
Prof. Andrea Bertuglia



NODES INVESTMENT
€ 63.168



UNIVERSITY
University of Turin

DIAGNO-VAP

Development of a diagnostic kit for precision diagnosis of ventilator-associated pneumonia (VAP)

It aims to develop a rapid and minimally invasive diagnostic test for identifying bacterial infections in intensive care units through the analysis of exhaled breath condensate (EBC).



SCIENTIFIC LEAD
Dr Elettra Barberis



NODES INVESTMENT
€ 100.000



UNIVERSITY
University of Eastern
Piedmont

IMPAVID 2.0

Intelligently Microfabricated Patches as a Drug-Eluting Platform for In Vivo Myocardial Implant - 2.0

It aims to bring to market an innovative, biocompatible and resorbable cardiac patch, offering economic benefits and improvements in patients' quality of life and care.



SCIENTIFIC LEAD
Prof. Claudia Giachino



NODES INVESTMENT
€ 57.600



UNIVERSITY
University of Turin

NanoZoom

Nanoparticles as innovative high-resolution, deep-contrast agents for tumor imaging

It develops a diagnostic system using ultrasonic probes and Lipo-NPs nanoparticles to detect tumors accurately, combining advanced imaging and AI for high-resolution diagnosis.



SCIENTIFIC LEAD
Prof. Valentina Cauda



NODES INVESTMENT
€ 88.448,16



UNIVERSITY
Polytechnic of Turin

NAPTER

Hybrid polymeric nanoparticles for RNA therapy in the treatment of cardiac diseases: production scale-up and preclinical validation

It develops a new platform of hybrid polymeric nanoparticles for delivering specific microRNAs to target cells to restore cardiac function, reprogramming scar fibroblasts into cardiomyocytes.



SCIENTIFIC LEAD
Prof. Valeria Chiono



NODES INVESTMENT
€ 72.000



UNIVERSITY
Polytechnic of Turin

POTENTE



Plasma-treated biocompatible glasses and ceramics with osteointegrative and antibacterial properties

It aims to develop glassy and ceramic biomaterials to promote osteointegration and reduce infections without antibiotics, using non-thermal atmospheric-pressure plasma treatments.



SCIENTIFIC LEAD
Dr. Marta Miola



NODES INVESTMENT
€ 74.250



UNIVERSITY
Polytechnic of Turin

PREDIRE



Co-Crystal Prediction

It aims to develop software based on artificial intelligence and machine learning algorithms to reliably predict the formation of co-crystals between active pharmaceutical ingredients and cofomers.



SCIENTIFIC LEAD
Prof. Roberto Gobetto



NODES INVESTMENT
€ 64.085,76



UNIVERSITY
University of Turin

REPEDITOR.IO



Incorporating Patient Preference Studies into clinical Research and decision models

It aims to facilitate the use of Patient Preference Studies (PPS) in healthcare decision-making with a platform for collecting and analyzing preferences, improving healthcare strategies and therapy development.



SCIENTIFIC LEAD
Prof. Paola Berchiulla



NODES INVESTMENT
€ 81.500



UNIVERSITY
University of Turin

Restore-MAM



Telerehabilitation with electromyographic interface and multimedia support for breast cancer

It aims to improve upper limb function post-breast cancer, using telemedicine and an mHealth app to provide personalized physical therapies and patient support.



SCIENTIFIC LEAD
Prof. Lia Rimondini



NODES INVESTMENT
€ 75.000



UNIVERSITY
University of Eastern
Piedmont

TWINS4RA



Biological and digital synovial twin on a vascularized chip analyzed via webcam in the transition towards 4P medicine for treating rheumatoid arthritis

It aims to develop a microfluidic platform for 3D culture of joint tissues, focusing on the synovium and synovial fluid, while also integrating the immune system.



SCIENTIFIC LEAD
Prof. Annalisa
Chiocchetti



NODES INVESTMENT
€ 64.085,76



UNIVERSITY
University of Eastern
Piedmont



Spoke 6 Primary agroindustry



Scan the QR Code
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Themes



Sustainable agroindustry



Digital agriculture

DIGI-FERT



Demonstration project for precision and digital fertilization with variable rate application of mineral fertilizers and digestate

It aims to demonstrate and validate, in real-world environments, the use of variable rate (VR) fertilization strategies through the application of mineral fertilizers and livestock effluents in cereal-based farming systems.



SCIENTIFIC LEAD
Prof. Massimo Blandino



NODES INVESTMENT
€ 60.000



UNIVERSITY
University of Turin

bioRESTART 4.0



Digitalization of a sustainable process for recovering functional compounds from plant waste

It aims to enhance agri-food by-products through bacterial enzymes and 4.0 technologies, using AI and machine learning to optimize the sustainable extraction of bioactive compounds.



SCIENTIFIC LEAD
Dr. Cinzia Calvio



NODES INVESTMENT
€ 119.710,58



UNIVERSITY
University of Pavia

DigiMilk



Digitizing precision nutrition and animal welfare to produce high nutritional quality milk

It aims to enhance milk quality and animal welfare through precision feeding and smart monitoring, integrating production data and the SDIB (Animal Welfare Diagnostic System) to foster a sustainable and efficient livestock sector.



SCIENTIFIC LEAD
Prof. Antonio Gallo



NODES INVESTMENT
€ 105.000



UNIVERSITY
Catholic University of the Sacred Heart

DEMETRA



Demo system for simulation and virtual training of primary agroindustry operators

It aims to develop an immersive platform for agricultural training in virtual reality, overcoming seasonal constraints through human-in-the-loop, haptic and omnidirectional technologies.



SCIENTIFIC LEAD
Prof. Marco Carnevale



NODES INVESTMENT
€ 124.977,27



UNIVERSITY
University of Pavia

DigiNut



Development of digital twin tools for decision support in the hazelnut supply chain

It aims to develop a hazelnut digital twin to simulate growth, productivity and shelf life, supporting agronomic and industrial decision-making through 3D models, Functional-Structural Plant Models (FSPM) and economic assessments.



SCIENTIFIC LEAD
Prof. Sergio Tombesi



NODES INVESTMENT
€ 105.000



UNIVERSITY
Catholic University of the Sacred Heart

DROUGHT



Data-driven resilience: supporting grapevines in response to drought using spectrometry and sequencing technologies

It aims to mitigate drought stress in grapevine cultivation through multidisciplinary technologies, combining spectrometry and sequencing to improve quality, yield and sustainability in the context of climate change.



SCIENTIFIC LEAD
Prof. Alberto Acquadro



NODES INVESTMENT
€ 60.000



UNIVERSITY
University of Turin

MYCO3DMASK



Recycling of by-products for a 3D mushroom-based cosmeceutical

It aims to develop an innovative and sustainable anti-aging beauty mask using *Lentinus tigrinus* extracts, rich in beta-glucans, combined with 3D printing technologies and cultivation on hazelnut shells.



SCIENTIFIC LEAD
Prof. Paola Rossi



NODES INVESTMENT
€ 125.000



UNIVERSITY
University of Pavia

SAPEVO



Integrated biostimulation strategies applied to the voghera pepper

It aims to enhance the Voghera pepper through a biostimulant based on *T. asperellum* and targeted agronomic protocols, improving yield, pathogen resistance and soil health.



SCIENTIFIC LEAD
Dr. Carolina Elena
Ciometta



NODES INVESTMENT
€ 124.999,63



UNIVERSITY
University of Pavia

ScA.SOS



Recovery of food waste for a sustainable and high-quality beef supply chain

It aims to assess the use of former bakery products in beef cattle diets, reducing waste while analyzing effects on gut health and animal welfare from a sustainability perspective.



SCIENTIFIC LEAD
Prof. Francesca Tiziana
Cannizzo



NODES INVESTMENT
€ 71.550



UNIVERSITY
University of Turin

Spoke 7 Secondary agroindustry



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Themes



Green food



Smart food



Healthy food

CEFW

Circular Economy For Wine

It promotes the integration of social sustainability into the circular economy of the wine sector, in line with UNI/TS 11820:2022, by disseminating knowledge and best practices through www.circulareconomyforfood.eu



SCIENTIFIC LEAD
Prof. Franco Fassio



NODES INVESTMENT
€ 90.000



UNIVERSITY
University of Gastronomic
Sciences

DMD

Digital Mediterranean Diet

It promotes the Mediterranean Diet through EATMED, a web app that rewards healthy and sustainable food purchases. The app assigns points based on compatibility with the Mediterranean Diet, which can be converted into goods, encouraging virtuous behaviors among the population.



SCIENTIFIC LEAD
Prof. Luisa Torri



NODES INVESTMENT
€ 69.485



UNIVERSITY
University of Gastronomic
Sciences

HYSENS

HYbrid hydrogels for piezoresistive gas and water SENSors

It develops self-powered sensors to detect humidity and gases in the agri-food supply chain, using hybrid hydrogels with conductive nanomaterials. The HYSENS project aims to improve quality monitoring through IoT, leveraging sensitive, stable and biocompatible technologies.



SCIENTIFIC LEAD
Prof. Teresa Gatti



NODES INVESTMENT
€ 157.497,95



UNIVERSITY
Polytechnic of Turin

NOODLE

Functional foods enriched with cricket proteins and plant-based proteins

It develops new fortified foods based on edible insects and legumes, promoting a more sustainable diet. The project studies the impact on the gut microbiome and adopts a holistic approach to foster acceptance of these new foods.



SCIENTIFIC LEAD
Prof. Ilario Ferrocino



NODES INVESTMENT
€ 69.600



UNIVERSITY
University of Turin

PISTA

Selective and controlled pyrolysis of polymeric materials for smart tag labeling in agri-food packaging

It develops low-impact RFID smart tags on agri-food packaging through selective laser pyrolysis. The project aims to optimize a sustainable, fast and cost-effective process for traceability.



SCIENTIFIC LEAD
Prof. Valentina Bertana



NODES INVESTMENT
€ 159.616,39



UNIVERSITY
Polytechnic of Turin

SUPREME



Solution for alternative proteins in line with the circular economy: mycoprotein

It aims to produce biomass from fungi grown on agri-food waste, creating sustainable protein-rich foods. After testing and optimization, a prototype will be developed for local implementation.



SCIENTIFIC LEAD
Prof. Giovanna Cristina
Varese



NODES INVESTMENT
€ 105.150



UNIVERSITY
University of Turin

Themes



New space economy



Sustainable mobility



Circular economy



Water treatment



Green chemistry



Renewable energy



Heritage conservation



Digital narratives



Eco fashion



Lifestyle tourism



Digital tourism



Mountain and smart working



Mountain resources management



Mountain regeneration



Eco healthcare



Digital care innovation



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Digital agriculture



Green food



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NODES – Nord Ovest Digitale E Sostenibile

An innovation ecosystem connecting knowledge, businesses and territories across Italy.

NODES is one of the 11 Innovation Ecosystems promoted by the **Ministry of University and Research** under the **PNRR** (M4C2 - Investment 1.5). With over **112 million euros**, it inclusively supports institutions, businesses and territories in the digital and ecological transition, promoting sustainable growth in Italy. Active in **Piedmont, Valle d'Aosta**, and the Lombardy provinces of **Como, Varese, and Pavia**, NODES brings together a network of partners representing excellence in research, innovation and local production: **universities, research institutions, innovation clusters, competence centers, incubators and accelerators**. Its impact also extends to **Southern Italy**, with 15 million euros dedicated to research projects and funding calls for businesses in the southern regions.

From knowledge to impact: PoCs and technology transfer.

NODES operates through **seven thematic Spokes**: aerospace and sustainable mobility, green technologies and sustainable industry, tourism and culture, mountain areas, health, primary and secondary agro-industry. In each area, the strategic lever is **technology transfer**: a process that takes ideas from laboratories to the market, turning knowledge into real impact.

The **61 academic PoCs** collected in this publication are among the tangible outcomes of this activity. Multidisciplinary projects, rooted in local territories, capable of generating solutions for the **challenges of the digital and ecological transition**. Discover them one by one in these pages – and in full on the official website ecs-nodes.eu – each project is a building block for a more sustainable future.



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