



EUROPEAN UNIVERSITIES ALLIANCE FOR SUSTAINABILITY:
RESPONSIBLE GROWTH, INCLUSIVE EDUCATION AND ENVIRONMENT

EU GREEN RESEARCH STRATEGY

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Table of contents

| | |
|---|----|
| Acronym list:..... | 6 |
| 1. Foreword: The allied Universities expectations and desiderata for a common EU GREEN research strategy... 7 | |
| 2. Methodology | 10 |
| 3. Presentation of each universities research organisation | 11 |
| 3.1 Structure of research in the EU GREEN universities..... | 11 |
| 3.1.1 Structure of research in UEx | 11 |
| 3.1.2 Structure of research in UA..... | 12 |
| 3.1.3 Structure of research in ATU..... | 14 |
| 3.1.4 Structure of research in HiG..... | 16 |
| 3.1.5 Structure of research in UNIPR | 17 |
| 3.1.6 Structure of research in OVGU | 19 |
| 3.1.7 Structure of research in UO | 20 |
| 3.1.8 Structure of research in UE..... | 22 |
| 3.1.9 Structure of research in UPWr..... | 23 |
| 3.1.10 Synthesis: EU GREEN RESEARCH STRUCTURATION | 27 |
| 3.2. Research potential | 28 |
| 3.3 Research financial resources | 28 |
| 3.4 Organisation of research support | 30 |
| 3.4.1 ATU..... | 30 |
| 3.4.2 HiG | 31 |
| 3.4.3 OVGU | 31 |
| 3.4.4 UA | 32 |
| 3.4.5 UE..... | 33 |
| 3.4.6 UEx | 34 |
| 3.4.7 UO | 35 |
| 3.4.8 UNIPR..... | 36 |
| 3.4.9 UPWr..... | 36 |
| 3.5 Doctoral schools..... | 38 |
| 3.5.1 ATU..... | 38 |
| 3.5.2 HiG | 39 |
| 3.5.3 OVGU | 39 |
| 3.5.4 UA | 41 |
| 3.5.5 UE..... | 42 |
| 3.5.6 UEx | 43 |

| | |
|--|-----|
| 3.5.7 UO | 44 |
| 3.5.8 UNIPR | 45 |
| 3.5.9 UPWr | 45 |
| 4. Needs analysis | 47 |
| 5. WP3: what is inside and how are we going to implement it | 49 |
| 5.1 General description of WP3 | 49 |
| 5.2 Objectives of WP3 | 50 |
| 5.3 Governance and interactions | 50 |
| 5.4 Some principles in organisation of meetings and teamwork | 51 |
| 5.5 Description of the tasks | 52 |
| 5.5.1 Joint Research Commission | 52 |
| 5.5.2 The 6 clusters | 54 |
| 5.5.3 The support for joint research projects | 59 |
| 5.5.4 The Researchers Mobility Program | 60 |
| 5.5.5. The co-design and implementation of the Joint Master and PhD program | 61 |
| 5.5.6 The Young researchers Blended Intensive Programs | 62 |
| 5.5.7 Research career development centre | 63 |
| 5.5.8 The Research Portal | 64 |
| 5.5.9 HRS4R label | 64 |
| 5.6 Indicators to monitor and assess the general implementation of WP3 | 65 |
| 5.7 Some encouraging preliminary results | 66 |
| 6. The role of cluster in WP3 strategy | 67 |
| 6.1 How the clusters thematic respond to the Sustainable Development Goals | 67 |
| 6.2 Short, medium, and long-term objectives of the clusters | 69 |
| 6.3 Scientific scope of each cluster | 69 |
| Conclusion | 77 |
| Annex | 79 |
| Annex 1: 2022 Shanghai Global Ranking: position of the EU GREEN universities | 79 |
| Annex 2: CWTS Leiden 2022 Ranking: position of the EU GREEN universities | 80 |
| Annex 3: Partner universities own research priorities | 81 |
| Annex 4: List of the nine universities research groups and their affiliations to the EU GREEN clusters | 82 |
| Annex 5: List of scientific equipment | 108 |
| Annex 6: Example of UNIPR strategy to increase the participation in European calls | 123 |

Acronym list:

The EU GREEN nine partners universities:

ATU: Atlantic Technology University, in Ireland

HiG: Högskolan i Gävle - University of Gävle, Sweden

OVGU: Otto von Guericke University, in Magdeburg, Germany

UA: University of Angers, France

UE: University of Evora, Portugal

UEx: University of Extremadura, Spain

UO: University of Oradea, Romania

UNIPR : Università degli studi di Parma, Italy

UPWR: Wrocław University of Environmental and Life Sciences, Poland

1. Foreword: The allied Universities expectations and desiderata for a common EU GREEN research strategy

According to all the EU GREEN allied Universities the project represents a challenging opportunity for interdisciplinary research in the field of sustainability. EU GREEN is challenging as it is an entirely novel project typology as compared to a traditional research project. It requires a large initial effort aimed at sharing different levels of information among partners, including research expertise, infrastructures, experience (e.g., how researchers' mobility, doctoral schools, projects, departments, or faculties are locally organised and managed, how research opportunities are circulated and supported, how research strategies are locally identified and pursued) but also the harmonisation of some procedures and rules. EU GREEN is challenging due to the heterogeneity of the partners' university structures and the structure that we will choose must be able to be coordinated and integrated with our different current structures. Simultaneously, EU GREEN represents a unique European opportunity as it will enable peripheral and regionally located universities to become more internationally oriented. The EU GREEN opportunity is represented also by the possibility to develop collaborative, interdisciplinary research on key topics dealing with sustainability and therefore to grow culturally and become more international and competitive in European projects. The steps that are necessary to this purpose are multiple and the first is to facilitate communication and to share information through multiple channels within the heterogeneous scientific EU GREEN community. It is mandatory to effectively synthesise the local key research themes, macro areas, research expertise and to produce easily readable maps of expertise, skills, and research infrastructures. **The 6 research clusters are the way to initially drive this process, to group and coordinate scientists according to their expertise and to stimulate collaborative research.** Maps of expertise within and across clusters (transdisciplinary research sectors such as law and economics and sustainability management) will facilitate researchers in the identification of colleagues and partners to involve in scientific discussion and in research projects as well as in the identification of novel research themes. In parallel, other non-research units from the different Universities (e.g., international research and administrative offices) interact and exchange information to inform each other, identify University-specific skills and expertise and support inter-Universities research clusters by circulating EU calls and helping during the different application and administrative steps. In the longer-term, collaborative EU GREEN research will be reinforced by setting up joint doctoral programs. This will be a crucial step to further involve the research teams, their doctoral schools and administration offices in the EU Green mission. EU GREEN doctoral programs will be interdisciplinary, built on sustainability and will produce a new generation of young European PhDs, scientifically growing and taking advantage of the variety of allied partners' cultural backgrounds.

As part of its research strategy EU GREEN partners foresee that with the harmonisation of procedures and the discussion of common aims, the possibility to develop research activities sustainable in the long-term, can enable the conversion of short-term, local projects into long-term regional and international initiatives. By doing this the EU GREEN consortium can guarantee the involvement of local and international stakeholders and will be able, with their support, to address local challenges and contribute to both the consortium and local universities development as European institutions and regions.



Getting to know each other will help us to identify commonalities and harmonise our practices. Based on the diverse strength of our universities, we will then be able to form a strong research agenda within the consortium. The EU GREEN research alliance offers the unique opportunity to:

1. Comparatively explore the research strategies of each University.
2. Select the best practices within the consortium (more efficient, more effective, easier to be implemented and shared) to formulate an optimised EUGREEN research strategy.
3. Live a value to heterogeneity and complementarity as a plus of the alliance and research strategies.
3. Identify, based on common best practices, opportunities for further collaboration and funding.



Of course, this is something that cannot be achieved at the beginning of the program, as it is a theoretical formulation that needs to be tested (along with the projects of EU GREEN partners) and eventually improved. The EU GREEN strategy will simplify and reduce bureaucratic issues by selecting and sharing technically prepared personnel, policies, codes of practice, procedures and infrastructures facilitating PhDs, researchers and professors in their research and specifically in the fields of project identification (best practices in the circulation of pre-screened information), project writing strategies (policy-oriented and therefore clearly targeting the needs), project managements (including the procedures to minimise time loss for people recruitment, material acquisition, etc). The EU GREEN research strategy will be effective if it can represent something novel as compared with traditional, local approaches and if it is flexible and less bureaucratic. A challenging issue exists with the research clusters and specifically the communication issues within and between clusters. Such issues are critical as they allow the spread of the EU GREEN research opportunities within the allied universities, to involve an increasing number of researchers along with the project development and to proceed with the identification of key research topics fitting with research calls.

EU GREEN is a major project and represents a great step forward for the allied universities. It is a great step forward to work in a coordinated way with the different pillars that constitute the Universities of

the alliance. That is why, in terms of research, it is very important that a work plan or a roadmap with achievable milestones is formulated each year. Examples of milestones include a specific number of applications to Horizon Europe projects, development of joint doctoral programs in the more advanced clusters, which will favour the mobility and the cultural growth of researchers. An EU GREEN research strategy will generate a joint platform for each cluster consisting of common infrastructures and technical skills that again favour the exchange of researchers and that facilitate research groups with limited access to instruments, ultimately improving the quality of EU GREEN research. A roadmap achievable each year in this regard will be set and we will work conscientiously to achieve these milestones set at the end of the year.

It is of importance that the EU GREEN strategy defines the key research line for the alliance and works on a long-term roadmap for addressing key global challenges. The strategy will identify the strength of the individual universities in the alliance as well as identifying the grounds for building successful common research projects. It is also important that the EU Green strategy includes strategies on how to identify new emerging research clusters within the alliance and to facilitate their interactions. Further, the strategy will be about how to consolidate or amplify new funding opportunities. The strategy also includes means to coordinate and monitor the advancement of the six research clusters. Furthermore, the EU Green strategy will illustrate how the EU Green alliance strives for connecting education with research and with real world needs. To that purpose, strong connections will be established with WP2 (education) and WP4 (innovation and entrepreneurship).

2. Methodology

This document was written based on two types of questionnaires sent in January 2023. One was sent to the research vice-rectors (VR) and the other to the leaders of the six clusters.

The VRs questionnaire asked questions about the organisation of research and the research policy strategy of each university and their expectations regarding the EU GREEN project.

The questionnaire for cluster leaders focused on the scientific scope, the facilities, and resources available and the short-, medium- and long-term objectives of each group. The leaders worked on their responses together with all the members of the groups.

As we are at the beginning of our collaboration, we still need to get to know each other better and learn to work together before defining a long-term strategy. Therefore, this document focuses mainly on the first deliverables and milestones for this first year of the EU GREEN Network. It sets the framework for the Work Package Research for the year 2023. It will be reviewed, completed, and modified in early 2024 to end in a long-term strategy. It is not a fixed and firm document but one that will evolve over time, depending on our progress, successes, and failures.

3. Presentation of each universities research organisation

3.1 Structure of research in the EU GREEN universities

3.1.1 Structure of research in UEx

The organisation of research at the University of Extremadura (UEx) is based on two major levels, the research group, and the University Research Institutes.

Research group structure

Our 203 research groups are organised into 9 thematic clusters, called *Áreas* which are the following:

- Agro-food (AGA). 12 groups
- Biology, Biotechnology and Biochemistry (BBB). 14 groups
- Health Sciences and Technologies (CTS). 39 groups
- Social, Economic and Legal Sciences (SEJ). 46 groups
- Humanities (HUM). 21 groups
- Physics, Chemistry and Mathematics (FQM). 21 groups
- Natural Resources and Environment (RNM). 21 groups
- Production Technologies and Engineering (TPR). 14 groups
- Information and Communication Technologies and Engineering (ICT). 15 groups

The missions of these research group are to:

1. Establish a short, medium, and long-term strategic development plan for the group.
2. Generate research projects to obtain new knowledge products, technological development and innovation, social appropriation and circulation of knowledge and training of human resources, which respond to the needs of the University and the social context.
3. Ensure the scientific production and sustainability of the group according to the national alignments in science, technology, and innovation policy, with the support of a human team, financial resources, and infrastructure, provided by the University.
4. Publish research results and products in national and international Indexing Systems, considering the requirements of excellence and quality.
5. Promote spaces for discussion of the group's research and development projects, inside and outside the University.
6. Promote participation in national and international research networks that facilitate the exchange of knowledge, technology, and innovation.
7. Keep the information of the group and its researchers updated in the University databases.



8. Participate in research calls with projects that are relevant to the development of their lines of research.

University Research Institutes

These are centres dedicated to research related to science, technology and technology, human and social sciences, as well as artistic creation, which encompasses all the areas of knowledge that exist at the UEx. They also provide technical advice around their competence.

The University Research Institutes have a transdisciplinary nature, an integrating function of different areas of knowledge and a high level of specialisation, bringing together researchers and research groups immersed in related and/or complementary research that can generate coherent research structures, facilitating collaboration. between researchers, enabling access to scientific infrastructures and attracting, as far as possible, researchers from other universities, research centres and/or countries, at the same time cooperation with other R&D centres should also be encouraged in both public and private.

These researchers or some research groups, join efforts and facilitate cooperation between them, in a Research Institute which is carried out with research quality criteria and is justified at the UEx thanks to the existence of research groups. consolidated research, which brought together under a common organisation facilitates the improvement of the quality and quantity of research results.

The UEx has 15 University Research Institutes, including two mixed:

- INUBE, with the participation of the Ministry of Health of Extremadura, the Extremadura Health Service and the Secretariat of Science, Technology, Innovation and University of Junta de Extremadura.
- INURA, with the participation of the Scientific and Technological Research Centers of Extremadura (CICYTEX), Centro Tecnológico Nacional Agroalimentario (CTAEX) and the Secretary of Science, Technology, Innovation and University of Junta de Extremadura.

3.1.2 Structure of research in UA

The University of Angers has strong specialisations in plant sciences, mathematics and molecular materials for photonics, electronics, and nanomedicine. Furthermore, other research fields are internationally recognized in medicine (occupational health, mitochondrial diseases, and metabolic dysfunctions) and in paleoclimatology. Multidisciplinary research in Humanities and Social Sciences concern Child Studies, Tourism, Gender Studies.

Research at the University of Angers is organised into 5 clusters. The clusters include research units and, in some cases, platforms and technical facilities. A federative research structure brings together the units and resources of each of the divisions.

a. Federative research structures and platforms

Our research units are organised into 5 thematic clusters (called SFR - Federative Research Structure):

- Languages, Humanities, and Social Sciences,



- Human Health,
- Plant and Environment,
- Materials,
- Mathematics, computer sciences and engineering.

The missions of these SFRs are to:

- Make research areas visible and encourage multidisciplinary research, arbitrate, and prioritise the requests of research units in terms of financial support and means (equipment, human resources),
- Organise scientific animation,
- Encourage the sharing of resources (equipment and human skills) through the management of technological platforms.

On this last point, the heavy and medium-heavy equipment is grouped together in shared technological spaces at the level of each research cluster and is managed by the SFRs. These shared spaces are either of the "technical facilities" type, whose use is mainly internal to the units of the cluster and the institution, or of the "platforms" type, whose use is open to external users. The life sciences platforms are labelled by the GIS BioGenOuest (Scientific Interest Group). Some of them are also certified by IBISA (infrastructures in biology, health, and agronomy), ISO 9001 certified, and may be part of national infrastructures (France life imaging - FLI, Emphasis) or European infrastructures programme (plant phenotyping community in Europe - EPPN).

In 2020, a shared structure of the living lab type dedicated to the analysis of behaviour was created in the human and social sciences thanks to the local authorities and the CPER (national pluri-annual program to support acquisition of research equipment).

In addition to these local structures, the University of Angers also supervises other regional structures: House of Human Sciences Ange Guepin (service and research unit), Nantes Atlantique observatory of the sciences of the Universe - OSUNA (mixed service unit) and a mathematics research federation.

b. Research Units

The research at UA is divided into 26 Research Units (RU), including 12 Mixed Research Units.

In France, research is organised within universities and public research bodies such as the CNRS (National Centre for Scientific Research), INRAE (National Institute for agronomic and environmental research)) and INSERM (National Institute for Medical research).

Some of those public research bodies were created together with universities Mixed Research Units that allow the two institutions to pool their resources.

The University of Angers has 12 mixed research units: part of the staff is employed directly by the university and part by the public research bodies. The general functioning of the units is organised by UA, which is owner and responsible of the premises, materials and running costs.

3.1.3 Structure of research in ATU

ATU is a newly formed multi-campus university and has particular research strengths in several thematic areas:

- Environmental and Resource Sustainability
- Digital Transformation & Emerging Technologies
- Design, Innovation, Creativity and Enterprise
- Life Sciences, Health, and Wellbeing
- Energy transition / Decarbonisation
- Advanced Manufacturing

As a newly formed university ATU is currently in the process of integration. This is likely to involve the coalescence of previously independent research centres into new shared research themes. At this stage the research centres established by the legacy Institutes of Technology remain independent. These “Strategic Research Centres” have each been designated following a formal and independent evaluation of their activity, performance, and ambition.

There are currently ten **STRATEGIC RESEARCH CENTRES** in the ATU:

1. Marine and Freshwater Research Centre (MFRC):

The MFRC involves about 90 people, ~30 research-active academic staff and contract researchers and ~60 postgraduates collaborating on research that enables sustainability, conserves biodiversity, and improves productivity. The centre carries out research projects in cooperation with agencies and industry and provides expertise and advice to national and international bodies.

2. The Centre for Research in Social Professions (CRiSP)

CRiSP researchers are involved in a number of social science and related research areas, such as youth and community, health, psychology, educational progression, learning and teaching, social and environmental sustainability, policy, interculturalism, and community development. CRiSP’s aim is, in partnership with social professionals and local communities, to improve the quality of life for those living in the region.

3. The Centre for Environmental Research Innovation and Sustainability (CERIS)

CERIS researchers are involved in projects relating to past and present environmental research and in the interests of sustainability. Research is undertaken by principal investigators/ lecturers, postdoctoral fellows, postgraduate and undergraduate students. As well as scientific outputs, CERIS plays an important role in developing policy and legislation nationally and at EU level.

4. The Precision Engineering, Materials and Manufacturing Centre (PEM)

PEM researchers have strengths in material science, laser processing, micro-machining, polymer processing, rapid prototyping, general manufacturing process control and statistical process analysis. The PEM structure provides our Principal Investigators, who have all individually demonstrated notable research achievements through engagement with industry, a platform to consolidate our group’s experience, expertise and resources.

5. The Wireless Applied Research Centre (WiSAR Lab)



The WiSAR Lab is an electronic engineering and software applied research centre. The primary research goal of the group is to achieve ultra-low power consumption in Wireless Sensor Networks which are employed in the Internet of Things and in Body Area Networks (BAN). This is achieved through novel antenna design and embedded system hardware and software development.

6. The Medical and Engineering Technologies Research Centre (MET)

MET undertakes research in the areas of biomedical engineering and medical science. Researchers aim to gain a greater understanding of the clinical condition, to inform the future of medical device design, clinical treatment, and to improve patient outcomes. The key research areas are in: stroke; heart failure; aneurysms; congenital heart defects; peripheral intervention; nutrition; and sport performance.

7. The Sustainable Energy Applied Research Centre (SEARC)

SEARC aims to create a synergistic relationship between industry and society to achieve climate change goals. Projects harness offshore wind, photovoltaics, wave and tidal energy, and onshore resources such as anaerobic digestion and wind. Cross cutting themes include numerical analysis; engineering modelling; operations and maintenance; levelized cost of energy; life cycle analysis; techno-economic analysis.

8. Design, Innovation, Creativity and Entrepreneurship (DICE) Research and Innovation Centre

This centre is a hybrid centre across the areas of Business, Design and Humanities where it looks to 'action' learning as an integral part of innovation and creating change. The centre consists of a team of 24 lecturing faculty research associates and visiting professors. DICE has been involved in 22 postgraduate research projects and generated over €1.5m in external funding in recent years. The centre is also supported by eight accredited programmes in innovation and enterprise.

9. Mathematical Modelling and Intelligent Systems for Health and Environment (MISHE).

The MISHE SRC is inherently multidisciplinary, bringing together Principal Investigators from Engineering, Science and Social Science to work together on the application of modelling and intelligent systems to challenges including: sustainable transport and tourism in the region, coastal climate resilience, design and optimisation of novel materials for clean energy production and medical devices; and biological modelling and informatics to support faster diagnostics and improved therapeutic developments in tandem with clinicians and health researchers in the region.

The development of advanced sensing systems and mathematical modelling techniques are key to tackling many urgent societal and health challenges from a local to a global scale. Sensing, data, and mathematical and computational models and analytical tools can play a huge role in effective decision making in almost every sector – from discovering new materials for a cleaner society, to designing novel medical devices and diagnostic systems, to planning a sustainable and inclusive society – including the future of our transport, land use and energy systems.

10. The Health and Biomedical Research Centre (HEAL)

The HEAL Strategic Research Centre (SRC) focuses on improving health and wellbeing at the individual and societal level as well as advocating for patient-centred research and health improvement strategies in national policy development and implementation. The HEAL SRC develops postgraduates

capable of addressing regional, national, and international healthcare challenges focusing on multi-disciplinary health and biomedical research programmes.

ATU's **RESEARCH GROUPS** are smaller in scale and generally reflect new and emerging areas of research for the University, or areas where particular expertise is present in relatively low numbers. It is envisaged that some Research Groups may grow and become established as Strategic Research Centres. ATU's current Research Groups include:

1. Business Research Innovation Network Group (BRING).
2. Cellular Health & Toxicology Research Group (CHAT).
3. Clinical Health & Nutrition Group (CHANCE).
4. Food, Nutrition and Sports Performance.
5. Heritage Research Group (HRG).
6. Integrated Sustainable Energy Research Group (iSET).
7. Mathematical Modelling Research Group (MMRG).
8. Mobilities Research Group (MRG).
9. Nanotechnology & Bioengineering Research Group (Nano-Bio).
10. SportsLab NW – Sports Innovation.
11. Sustainable Tourism Observatory at ATU.
12. Sustainable Wood Technology, Design & Education (SWTDE) Group.
13. The Data Analytics and Computer Science Group (DACS).
14. The Irish Concussion Research Group.

3.1.4 Structure of research in HiG

HiG (University of Gävle) research is organised along two dimensions: subject specific research and interdisciplinary research.

The subject specific research activities (and education) are organised in three faculties, each one divided into three or four departments:

1. The Faculty of Health and Occupational studies focuses on areas such as health promoting work, public health, care and health, criminology, psychology, and social work.
2. The Faculty of Education and Business Studies conducts research within educational sciences, humanities, business administration and economics.
3. The Faculty of Engineering and Sustainable development does research in for instance environmental science, energy systems, industrial engineering, and management.

By means of our interdisciplinary research in four strategic areas – Health Promoting Work, Innovative Learning, Intelligent Industry and Urban Sustainability – the University contributes to the work of tackling many of the challenges our society faces.

Urban Sustainability

This research area meets the societal challenge of creating long-lasting cities in which natural and human resources are used in a responsible manner for the sake of future generations. Our focus is urban development with human-environmental relations at its core. This research area includes development and analysis of technological systems, methods, and strategies for information



management as well as studies of indoor and outdoor environments of buildings and urban landscapes. Research aims include building resilience to climate change with population density and globalisation as important input parameters.

Health-Promoting Work

This research area contributes to the efforts of meeting societal challenges like increasing mental ill-health, increasing inequality, an ageing population, an increased proportion of individuals with chronic disease, violence, and segregation. Research focal areas include health-promoting work for people of all ages oriented both towards the individual and society, work design aimed to promote mental and physical health together with health-promoting organisations and leadership. The activities contribute to creating value-adding measures for the individual as well as for the organisation and/or society at large.

Innovative Learning

This research area contributes to the efforts of meeting societal challenges regarding people's learning in educational and work environments within both the public and the private sector. Our focus is that researchers and practitioners create knowledge for the development of work methods, educational content and innovative elements in the planning, the execution, the evaluation, and the development of teaching, learning and professional development. Central issues include teaching, learning, digitalisation, co-workship, influence, democracy, media, and culture.

Intelligent Industry

This research area contributes to the efforts of meeting societal challenges regarding long-term sustainable production. Innovation, resource efficiency and good working environments are important parts. This research area mainly targets businesses and organisations in industrial networks and value chains. Our focus lies in digitalisation, organisation design and their interaction in innovation processes, from the development of technological systems, products, and processes to the design of production systems, business relations and business models.

3.1.5 Structure of research in UNIPR

The University of Parma is currently organised in 9 Departments and in 25 Centres. The departments assemble and organise aggregations of homogeneous research sectors by purpose or method; coordinate and support research activities and take care of their expression in teaching. Each Department has a website in English, where detailed information about research aims and groups can be found.

[Department of Humanities, Social Sciences and Cultural Industries](#)

[Department of Law, Politics, and International Studies](#)

[Department of Engineering and Architecture](#)

[Department of Medicine and Surgery](#)

[Department of Chemistry, Life Sciences and Environmental Sustainability](#)



Department of Food and Drug

Department of Economics and Management

Department of Mathematical, Physical and Computer Sciences

Department of Veterinary Science

Furthermore, the University of Parma has promoted several centres with different functions, although primarily engaged in interdisciplinary research. As specified below, they are grouped according to their function:

Interdepartmental Research Centres:

- Biopharmanet TEC - Interdepartmental Research Centre for Health Product Innovation
- CERT - Centre of Excellence for Toxicological Research
- CICCRESI - Interdepartmental Research Centre for the Conservation, Construction and Regeneration of Buildings and Infrastructures
- CIDEA - Interdepartmental Centre for Energy and Environment
- CIPACK - Interdepartmental Centre for Packaging
- CIRS - Interdepartmental Centre for Social Research - Rights, Society and Civilization
- COMT - Interdepartmental Research Centre for Molecular and Translational Oncology
- CSEIA - Centro Studi in Affari Europei e Internazionali – Center for Studies in European and International Affairs
- CUCI - University Centre for International Cooperation
- FUTURE TECHNOLOGY LAB
- MRH - Interdepartmental Research Center for Microbiota "Microbiome Research Hub"
- Ro.S.A. – Robust Statistics Academy
- SITEIA. PARMA - Interdepartmental Centre on Safety, Technologies, and Agri-Food Innovation
- UCB - University Center of Bioethics

Service centres responsible for specialised functions for the University and/or its structures

- CAI – Students’ Welcome and Inclusion Centre
- CAPAS - Center for Activities and Professions of Arts and Entertainment
- Service Centre for Health, Hygiene and Safety in the workplace
- University E-Learning and Multimedia Service Centre
- CIM - Interdepartmental Center for Measurements "Giuseppe Casnati"
- CLA - University Language Centre
- CSAC - Centro Studi e Archivio della Comunicazione; Archive and Study of Modern Design and Communication

Research and clinical centres that also perform care-giving functions

- Centre for Sleep Medicine
- University Center of Dentistry

Subsidised study and research centres (Centres in which public and private bodies are involved, with which activities and services can be carried out)

- CISC - International Centre for Studies on Cooperation
- LabSan - Training and research centre on organisation, quality, and sustainability of public health system.



3.1.6 Structure of research in OVGU

The OVGU consists of nine faculties:

1. Faculty of Mechanical Engineering,
2. Faculty of Process and Systems Engineering,
3. Faculty of Electrical Engineering and Information Technology,
4. Faculty of Computer Science,
5. Faculty of Mathematics,
6. Faculty of Natural Sciences,
7. Faculty of Medicine,
8. Faculty of Humanities, Social Sciences and Education, and
9. Faculty of Economics and Management

These faculties form the administrative structures and in which individual research and teaching take place. Based on these faculties OVGU has a distinctive profile with traditional foci of expertise in the areas of engineering, the natural sciences and medicine – and with economics & management as well as the social sciences & humanities as essential disciplines for a modern university in the information age.

At OVGU, two research profile areas have been defined for the further development of the university. One of these profile areas deals with the topic "**Circular Economy Systems Engineering**". This bundles research projects on sustainable chemical production, the development of systems for the use of renewable energies and electromobility. The second profile area "**Precision for Health & Well-Being**" addresses the physical and mental well-being of people. Following the approach "P:IP - Precision in Intervention & Prevention".

At OVGU there are four "Research Centres", which combine our research profile and perspectives from various OVGU faculties as well as with non-university location partners in overarching research questions that have since significantly shaped the location's research profile:

1. **Centre for Dynamic Systems (CDS)**: The aim of the CDS is to gain a fundamental understanding of complex dynamic systems in biomedicine, chemical production systems and energy conversion processes. This understanding can then be used to specifically influence the systems under consideration or to develop new processes and active substances. Mathematical models and methods are an essential link of the work in the CDS. The OVGU has been cooperating closely with the *Max Planck Institute for Dynamics of Complex Technical Systems (MPI)*. Seven faculties and the MPI co-operate in the Center in an interdisciplinary manner.
2. **Centre for Behavioral Brain Sciences (CBBS)**: combines long-term focal points of Magdeburg's basic research the neurosciences (with medicine, neurobiology and psychology "at the core"). The CBBS currently brings together 107 neuroscientists from seven faculties of OVGU, from the *Leibniz Institute of Neurobiology (LIN)* and from the *German Center for Neurodegenerative diseases (DZNE)*.
3. **Centre for Health & Medical Prevention (CHaMP)**: the core topic of the research centre is the prevention of common diseases. Central elements are the further development of personalised medicine and precision medicine. In the future, it should be possible to treat patients with

customised, individualised therapies in a more targeted way and, in particular, to prevent diseases from developing in the first place through targeted prevention. For this ambitious project, experts from molecular biology, inflammation research, biosensor technology, nanotechnology, high-resolution microscopy and from the material, economic and human sciences, among others, complement each other in the CHaMP.

4. **Centre for Advanced Medical Engineering (CAME):** the research centre enabled an even closer cooperation in the successful profile-forming research focus of medical engineering. The visible medical technology structures that have been established at OVGU for many years in research, teaching and transfer will be strategically institutionalised in CAME. The STIMULATE research campus represents the core of this development, which is now being thematically expanded with the CAME centre and focuses on methods and techniques for imaging procedures as well as image-guided interventions and minimally invasive therapies.

The missions of these Centres are to:

- Make research areas visible and encourage multidisciplinary, arbitrate, and prioritise the requests of research units in terms of financial support and means (equipment, human resources),
- Organise scientific coordination,
- To encourage the pooling of resources through the management of technological platforms or skills centres.

In addition to the basic research the OVGU has also industry-related as well as application-oriented research to strengthen the regional economy. These so called "transfer focal points" are:

1. **Medical technology.** It is strongly influenced by the STIMULATE research campus, which has recently been incorporated into our two new research centres: CAME and CHaMP.
2. **Automotive** has received a "boost" through the Establishment of the Center for Method Development (CMD), which is currently under construction and will in future develop methods for powertrain and vehicle development.
3. **Particle technology,**
4. **Digital Engineering,**
5. **and Renewable Energies** are components of OVGU research structures or initiatives.

3.1.7 Structure of research in UO

Our research is organised into **26 research centres**, internally accredited, of which: one centre is under the patronage of the Romanian Academy (Education-Culture-Society Interdisciplinary Research Centre - CCIEC) and one is a nationally accredited centre (National Centre for Geothermal Research).

Research platforms, laboratories, equipment, and infrastructure are annually updated on www.erris.gov.ro, currently there are 46 laboratories/research entities registered.



| Nr. | Centres/ Laboratories /Platforms | Infrastructure Name |
|-----|--|--|
| 1 | Centre | Modern Technologies for Sustainable Development |
| 2 | Centre | Territorial Studies and Analysis Centre |
| 3 | Centre | Engineering and Management Ecosystems-Impact and Development |
| 4 | Centre | Research Center for Energy Processes Management |
| 5 | Centre | National Centre for Geothermal Research |
| 6 | Platform | Interdisciplinary Research Platform for Technologies in Electrical Engineering |
| 7 | Centre | Centre for Research and Engineering Technology in the Conversion of Electromagnetic Energy - CCITCEE |
| 8 | Centre | Research Centre for Information Technology, Electronics and Automation |
| 9 | Laboratory | Advanced Materials Research Infrastructure - SMARTMAT |
| 10 | Laboratory | Interdisciplinary Research Infrastructure in Mechatronics and IntelBuild |
| 11 | Laboratory | Research Infrastructure for Diagnosis, Reliability Prediction and Maintenance Planning of the Technical Systems - ICDFM |
| 12 | Laboratory | Laboratory for the Research of Thermal-Hydraulic Generators – LTHG |
| 13 | Laboratory | Interdisciplinary Research Infrastructure in Robotics |
| 14 | Centre | Centre for Interdisciplinary Studies |
| 15 | Centre | Laboratory for in Silico Modelling of Radiobiological Processes |
| 16 | Centre | Research Centre for Computer Simulations in Condensed Matter and Statistical Physics |
| 17 | Laboratory | Plant Biotechnology Laboratory |
| 18 | Laboratory | Integrated Sensors and Biosensors Laboratory |
| 19 | Laboratory | Chemical Technology and Applied Electrochemistry |
| 20 | Laboratory | Positron Emission Tomography |
| 21 | Centre | Trace Analysis Laboratory |
| 22 | Laboratory | Laboratory of Plant Physiology and Ecophysiology |
| 23 | Centre | The Research Centre of National Cultural Changes in a Globalized World |
| 24 | Laboratory | Pharmaceutical research laboratory |
| 25 | Laboratory | Cells culture laboratory |
| 26 | Laboratory | Centre for Systems Neuroscience (CENS) |
| 27 | Centre | Dentamark - PhD Research and Educational Centre |
| 28 | Laboratory | Innovative Foodstuff Research Laboratory |
| 29 | Laboratory | Research Laboratory of the Physicochemical Properties and Bioactive Characteristics of Foodstuff |
| 30 | Centre | Research Centre of the Risk Factors for Agriculture and Environment |
| 31 | Laboratory | Research Laboratory for Rural Development |
| 32 | Centre | Research Centre for Biotechnical, Ecological and Silvicultural Systems |
| 33 | Laboratory | Didactic Laboratory for Monitoring the Vulnerability of Horticultural Crops and Identifying Stress Markers for the Effects of Climate Change |

| | | |
|----|------------|--|
| 34 | Laboratory | CCCDD – Quantitative and modelling economics lab |
| 35 | Laboratory | CCCDD – Tourism lab |
| 36 | Laboratory | CCCDD – Applied economics lab |
| 37 | Laboratory | CCCDD – Accounting and analysis lab |
| 38 | Laboratory | CCCDD – Financial and fiscal administration |
| 39 | Laboratory | CCCDD – Financial markets lab |
| 40 | Laboratory | CCCDD – Research lab / resources centre for the doctoral school/SDSE |
| 41 | Laboratory | CCCDD – E-work lab |
| 42 | Laboratory | CCCDD – European economic relations lab |
| 43 | Laboratory | CCCDD – Foreign languages lab |
| 44 | Laboratory | CCCDD – Managerial simulation lab |
| 45 | Laboratory | CCCDD – Informatics lab |
| 46 | Laboratory | CCCDD - E-marketing lab |

3.1.8 Structure of research in UE

University of Évora is a Higher Education Institution (HEI), composed of 6 organic units, including 5 schools:

- School of Fine Arts
- School of Science and Technology
- School of Social Sciences
- School of Health and Human Development
- School of Nursing.
and the
- Institute for Research and Advanced Training (IIFA)

The schools oversee undergraduates and Master programs. Research and PhD programs are coordinated by the IIFA. This Institute is the organic unit of the University of Évora aimed at supporting research in order to ensure the quality of work carried out by research units, the assessment of scientific output and to coordinate its scientific activities with the education and advanced training system, in particular PhD degrees and International Master degrees. Thus, IIFA is simultaneously a Research Institute and a Doctoral School. Its major strength is precisely the high level of interaction between research and education.

Research and Development (R&D) covers various scientific areas through a network of 18 [research units](#) evaluated and financed by the Foundation for Science and Technology:

- Centre for Advanced Studies in Management and Economics (CEFAGE)
- Centre for Language and Cultural Studies (CEL)
- Research Centre for the Sociology and Aesthetics of Music (CESEM)
- Centre for Art History and Artistic Research (CHAIA)
- Comprehensive Health Research Centre (CHRC)
- Research Centre in Political Science (CICP)
- Interdisciplinary Centre of Social Sciences (CICS.NOVA.Uévora)



- Interdisciplinary Centre for History, Cultures and Societies (CIDEHUS)
 - Centre for Research in Education and Psychology (CIEP)
 - Research Centre in Mathematics and Applications (CIMA)
 - HERCULES Lab - Cultural Heritage Studies and Protection (HERCULES)
 - Institute of Earth Sciences (ICT)
 - Institute of Contemporary History (IHC)
 - Associated Lab for Green Chemistry - Clean Technologies and Processes (LAQV-REQUIMTE)
 - Marine and Environmental Sciences Centre (MARE-UE)
 - Mediterranean Institute for Agriculture, Environment and Development (MED)
 - Nova Laboratory for Computer Science and Informatics (NOVA LINCS)
 - Centre for Philosophy, Politics and Culture (PRAXIS)
- The UÉ is the main management entity in 8 of these units, being a partner (Pole) in Centres led by other Institutions in the remaining 10.

Some of these Units are part of the following Associated Laboratories: CHANGE – Institute for Global Change and Sustainability, consortium led by MED, IN2PAST – Associated Laboratory for Research and Innovation in Heritage, Arts, Sustainability and Territory, consortium led by HERCULES and the ARNET, Aquatic Research Network, led by MARE; and two in which our research units are partners; LAQV/REQUIMTE – Associated Laboratory for Green Chemistry – Clean Technologies and Process; REAL – Translation and Innovation for Global Health.

Furthermore, University of Évora has established 10 Chairs (financed by external entities) in areas of excellence (Agriculture, Biodiversity, Computing, Heritage, Health, and Renewable Energies) and participates in the National Roadmap of Strategic Research Infrastructures and has several research infrastructures in agronomy, biodiversity, environment, computer sciences, business studies and entrepreneurship, aerospace engineering, solar energy, heritage, and forest firefighting.

The University of Évora also participates in seven collaborative laboratories, which are non-profit private associations, made up of companies and R&D units of higher education institutions.

3.1.9 Structure of research in UPWr

At Wroclaw University of Environmental and Life Sciences the research is conducted - in line with national regulations (2018) - within scientific disciplines supervised by the Discipline Council. There are 8 leading scientific disciplines which are evaluated once per 4 years by the National Research Agency:

- [Agriculture and horticulture](#) (B+ category)
- [Animal science and fisheries](#) (B+ category)
- [Biological sciences](#) (B+ category)
- [Civil engineering, geodesy and transport](#) (A category)
- [Environmental engineering, mining and energy](#) (B+ category)
- [Nutrition and food technology](#) (A+ category)
- [Social and economic geography and spatial management](#) (A category)
- [Veterinary science](#) (A category)

The Institute or Department is an organisational unit that conducts research activities and teaching, as well as educating scientific personnel in a discipline or several related scientific disciplines. The Institutes/Departments are often interdisciplinary units, which may include divisions and laboratories.

There are 8 institutes and 32 departments:

1. Institute of Agricultural Engineering:

- Division of Agrotechnological Systems Engineering and Work Safety
- Division of Animal Production Engineering and Bioenergy
- Division of Heat Technologies and Processing Engineering
- Division of Low-Emission Energy Sources and Energy Efficiency
- Division of Technology Fundamentals
- Laboratory of Biogas Acquisition
- Laboratory of Biomass Development and Combustion
- Laboratory of Renewable Energy Efficiency Testing
- Training Centre for Plant Protection Techniques

2. Institute of Agroecology and Plant Production

- Division of Herbology, Grassland Cultivation and Green Area Landscaping
- Division of Land and Plant Cultivation

3. Institute of Animal Husbandry and Breeding

- Chromatography Lab and Meat Testing
- Division of Limnology and Fisheries
- Division of Pig and Horse Breeding
- Division of Poultry Breeding
- Division of Cattle Breeding and Milk Production
- Division of Sheep and Fur Animals Breeding
- Laboratory of Milk Assessment and Analysis
- Laboratory of Microbiological Studies and Molecular Genetics

4. Institute of Environmental Biology

- Division of Anthropology
- Division of Plant Biology
- Division of Taxonomy and Invertebrates Ecology
- Division of Vertebrate Ecology and Paleontology
- Sustainable Bio-development Laboratory

5. Institute of Environmental Engineering

- Division of Groundwater and Waste management
- Division of Hydrodynamic Modelling
- Division of Hydrology and Water Management
- Division of Infrastructure and Sanitary Technologies
- Laboratory for Research Studies on the Environment
- Laboratory of Soil Studies
- Water Laboratory

6. Institute of Geodesy and Geoinformatics

- Division of Detailed Measurements and Engineering Geodesy
- Division of Geodesy
- Division of Geoinformatics
- Division of Photogrammetry and Remote Sensing
- GISLAB



- Laboratory of Geodetic Technologies
- Station for Permanent Observation GPS/GLONASS „WROC”

7. Institute of Soil Science, Plant Nutrition and Environmental Protection

- Centre for Environment Quality Analysis
- Division of Plant Nutrition
- Division of Soil Genesis and Transformation
- Division of Environmental Risk Analysis and Soil Remediation

8. Institute of Spatial Management

- Division of Geodetic Rural Planning and Real Estate Management
- Division of Spatial Economics and Management
- Division of Spatial Planning and Management
- Division of Socioeconomic Studies
- Audiosphere and Environmental Acoustics Laboratory

1. Department and Clinic of Surgery
2. Department of Animal Nutrition and Feed Management
3. Department of Applied Bioeconomy
4. Department of Applied Economics
5. Department of Applied Mathematics
6. Department of Food Chemistry and Biocatalysis
7. Department of Biochemistry and Molecular Biology
8. Department of Biostructure and Animal Physiology
9. Department of Biotechnology and Food Microbiology
10. Department of Botany and Plant Ecology
11. Department of Civil Engineering
12. Department of Environmental Hygiene and Animal Welfare
13. Department of Environmental Protection and Development
14. Department of Epizootiology with Exotic Animal and Bird Clinic
15. Department of Experimental Biology
16. Department of Fermentation and Cereals Technology
17. Department of Food Hygiene and Consumer Health Protection
18. Department of Food Storage and Technology
19. Department of Fruit, Vegetable and Plant Nutraceutical Technology
20. Department of Functional Food Product Development
21. Department of Genetics
22. Department of Genetics, Plant Breeding and Seed Production
23. Department of Horticulture
24. Department of Human Nutrition
25. Department of Immunology, Pathophysiology and Veterinary Prevention
26. Department of Internal Medicine with Horse, Dog and Cat Clinic
27. Department of Landscape Architecture
28. Department of Pathology
29. Department of Pharmacology and Toxicology
30. Department of Physics and Biophysics
31. Department of Plant Protection
32. Department of Reproduction and Clinic for Farm Animals

In 2018 the strategic analysis conducted by the University has shown that increasing the impact of scientific activity on the development and responding to current global challenges in the field of Life Sciences will only be possible through research conducted by the research groups within Priority Research Areas (Veterinary Sciences, Technology and Food Sciences, Environmental Sciences). In 2019 the UPWr Leading Research Groups were established as dedicated task forces for research. They operate within disciplines and interdisciplinarity, outside the structures of institutes, departments and faculties, however embedded within the structure in terms of access to facilities and equipment. Their main objective is to face global challenges through the development of interdisciplinary and international collaboration, as well as cooperation with business and further development of the eight leading disciplines of UPWr.

The Leading Research Groups at UPWr:

1. [Agriculture-Environment-Natural Resources – AgrEn](#)
2. [Animal diseases translational research – AnimalTrans](#)
3. [Animal Science for Future – ASc4Future](#)
4. [Biocatalysis and biological activity – BioActiv](#)
5. [Biotechnology for life and industry – BioTech@Life](#)
6. [Food and Health – Food&Health](#)
7. [Innovative diagnostics and veterinary therapy – Inno-WET](#)
8. [Poultry – from stable to table – DroPOWER](#)
9. [Plants Processing & Technology for Bioactive Food – Plants4FOOD](#)
10. [Reg-Med-Lab – Marycz Lab](#)
11. [Space And Close Earth Observation Sciences – SpaceOS](#)
12. [Sustainable Cities and Regions \(SCR\)](#)
13. [Waste and Biomass Valorization Group – WBVG](#)
14. [Water-Climate-Environment – WCE](#)

In 2022 the external evaluation of Leading Research Groups was performed and confirmed the effectiveness of the research strategy.

One of the strategic infrastructure programs currently running at the UPWr and strongly linked with research is CIT (**Regional Centre for Innovative Technologies in Production, Processing and Food Safety at the Wrocław University of Environmental and Life Sciences**) program, which includes the infrastructure for all Priority Research Areas. There are 6 research and development infrastructure facilities:

1. Centre for Applied Biology and Innovative Food Production Technologies (Wrocław)
2. Regional Product Center (Wrocław)
3. Centre for Advanced Horticultural Production Technologies (Psary)
4. Experimental Center for Animal Infections (Wrocław)
5. Research Center for Plant Production Technology (Wrocław)
6. Centre for Diagnostics of Plant Diseases (Wrocław)



The centres' infrastructure is currently being completed. CIT will reach its operational readiness in 2023. An experimental greenhouse is currently in operation. Only recently a cheese-making facility was launched.

3.1.10 Synthesis: EU GREEN RESEARCH STRUCTURATION

The synthesis reported in the previous paragraphs allows to catch the complexity and variety of research structuration within the EU GREEN universities. Along with the EU GREEN project development, such heterogeneity will be explored and analysed comparatively in the perspective of the implications and impacts it produces on local research. EU GREEN research strategy, which has its foundations on partners' strategies, will be continuously implemented and optimised as an alliance research strategy, with its own rules and indicators of performances. With this respect the present document represents the initial data collection, reporting the inventory of research' organisation, targets, and vision of the 9 partners.

Some universities have a traditional organisation in departments, faculties, or schools, sometimes integrating scientifically close areas of research. Besides such traditional organisation most universities have developed or are aggregating novel forms of research organisation in mixed, interdisciplinary research institutes, units, groups, or strategic centres, sometimes in association to public bodies or non-university research centres, or to industries. Some of the EU GREEN universities are also organised in large, multidisciplinary thematic areas or clusters, which is the way the EU GREEN alliance intends also to be organised. In the description of the strategic research areas of all universities the word *sustainability* has a central role and is declined in several specific topics, that reflect both local research tradition and novel frontiers addressing challenging issues. They include environmental and resource sustainability, social sustainability, sustainable energy, transport and tourism, sustainable and inclusive society, sustainable wood technology, sustainable aquaculture, urban sustainability, sustainable production, quality and sustainability of public health systems, sustainable consumption and production patterns, sustainable management of water and sanitation, sustainable agriculture, modern technologies for sustainable development, sustainable chemical production, and sustainability of public health systems. **EU GREEN research strategy will benefit from such a wide perspective in the application of sustainability in research and from the heterogeneity of local research organisations.** Analysing the contributions of the various universities, the enhancement of forms of research structuration that are industry-related, application-oriented, or targeting emerging problems at the societal, environmental, and economic level **seems modern, appropriate, and ready to respond to the real, urgent needs.** The allied universities are strongly supported at the regional level and support with their research the regional economy; it is expected that the EU GREEN consortium will develop **fundamental and applied research on sustainability at both local and macroregional scales.**

3.2. Research potential

| | ATU | HiG | OVGU | UA | UE | UEx | UNIPR | UO | UPWR |
|--|--------------------|-----|------|-----|-----|------|-------|------|------|
| Scientific staff (full professors, associate professors, researchers etc.) | data not available | 243 | 2083 | 878 | 689 | 1719 | 1039 | 1696 | 744 |
| % of women | | 37% | 41% | 40% | 47% | 51% | 40% | 52% | 53% |

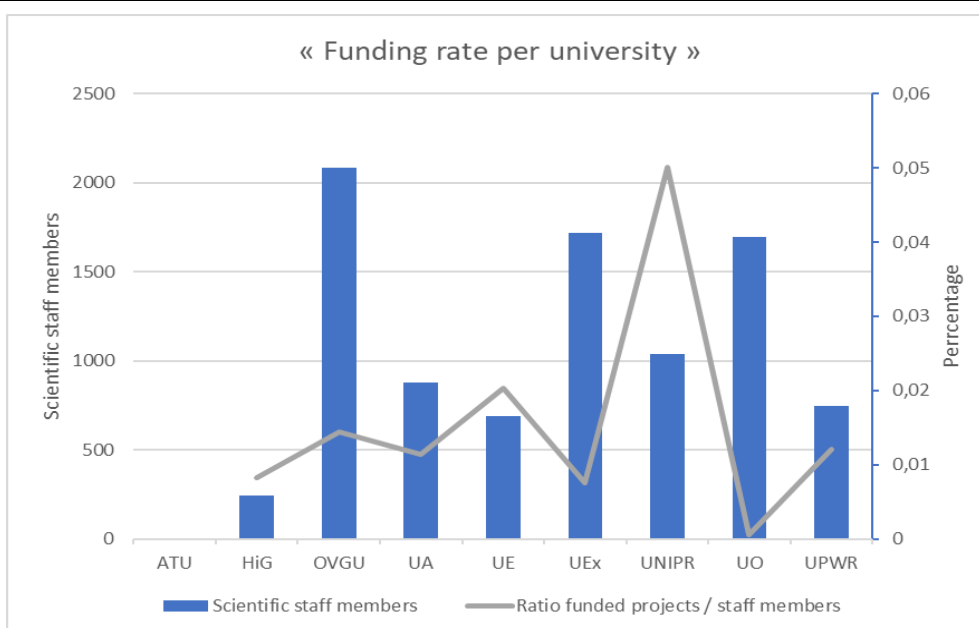
3.3 Research financial resources

A very large diversity in the external funding is mobilised from our universities for the research activities:

- ATU: 12,84 M€ per year
- HiG: 6,8 M€ per year (76 MSEK) from external funds plus 11.5 M€ (116 MSEK) from government
- OVGU: 64 M€ per year
- UA: 10,6M€ per year ⇒ 36% from the National government, 25% from regional and local authorities, 20% from Europe, 19% others (private sectors and foundations).
- UE: 15M€ per year. The main funders are the Portuguese State via Science and Technology Foundation (20%) and the European Commission (27%).
- UEx: 36.3M€ ⇒ 53% from regional funds, 27% from national funds, 3.2% from European funds, 6.1% from others (contracts, agreements etc.)
- UO :7,3M€ whose 5% from National government
- UNIPR: 11M€ ⇒ 59% from National grants, 26% from EU and international competitive grants, 12% from other private funds and 3% from regional grants
- UPWR: 52M€ ⇒ 80% from the National subsidy incl. 16Mln € for research; 3% - from National Centre for Research and Development, 7% - National Science Centre, 4% - European Union.

Participation in competitive European calls

| | Number of H2020 funded projects (2014-2020) | Number of HE funded projects (2021-2022) ¹ | Total of grant received (€) | Number of ERC projects | Number of coordination (multi-partnered projects) | H2020 success rate ² | HE success rate |
|------------------|---|---|-----------------------------|------------------------|---|---------------------------------|-----------------|
| ATU | 6 | 3 | 2 074 396 | 1 | 2 | 7% | 8% |
| HiG | 2 | 1 | 786 204 | 0 | 0 | 4% | 5% |
| OVGU | 30 | 8 | 18 586 555 | 5 | 1 | 15% | 15% |
| UA | 10 | 13 | 6 183 417 | 2 | 1 | 12% | 35% |
| UE | 14 | 9 | 5 223 728 | 0 | 2 | 26% | 39% |
| UEx | 13 | 7 | 4 171 748 | 0 | 4 | 9% | 14% |
| UO | 1 | 0 | 70 000 | 0 | 0 | 12% | 0% |
| UNIPR | 52 | 14 | 25 659 000 | 5 | 8 | 10% | 10% |
| UPW _r | 9 | 2 | 3 131 451 | 0 | 2 | 8% | 10% |
| Total | 137 | 57 | 65 886 449 | 13 | 20 | 9,27% | 12,24% |



¹ These data were collected in early 2023 considering projects submitted and/or accepted in 2021-22. This table will be completed annually considering new project applications and acceptances.

² Projects submitted versus projects accepted.

One of the successes of EU GREEN and this research WP will be the submission and winning of European projects among our universities. These successes will allow us to structure and consolidate our alliance and conversely, having a strong core of partners who know each other well, who have strong working habits, will reinforce our chances of success.

The European Union provides significant financial support for research and innovation through its Horizon Europe programme, which amounts to 95.5 billion euros for the period 2021-2027, and through its Erasmus+ programme with a budget of 26.2 billion euros. In addition, there are several other funds to support researchers and teacher-researchers: Interreg, LIFE ... European projects help to strengthen scientific cooperation and European and international openness. Obtaining financial support from the European Union brings international visibility to the project and helps to promote its results.

Two partners, namely UNIPR and OVGU obtained a large number of European projects. Other partners like UE have a relatively good success rate. It may be interesting to discuss further the support offered to researchers and to exchange practises or maybe upscale successful practises. Annex 6 gives the example of UNIPR's strategy. One of the next steps of this EU GREEN research strategy will be to analyse comparatively the actions the EU GREEN universities (internal benchmarking) and other higher education institutions (external benchmarking) have implemented (successfully or unsuccessfully) to increase performances in European project financing.

3.4 Organisation of research support

3.4.1 ATU

Centralised support: Research and Innovation Offices

ATU has not yet undertaken a formal restructuring of its administrative and corporate support functions. Support for ATU's research activities therefore remains the responsibility of the three research and innovation offices previously established by the legacy constituent institutes of the university.

Collectively the ATU Research and Innovation Offices comprise 21 staff whose services include:

- **Research Services and infrastructure**, for example: pre- and post-award support services, legal and financial review, and research information management systems.
- **Researcher development supports**, for example: Administration of postgraduate research student admission, transfer, and progression; Ethical review; and Management of postgraduate research student quality assurance.
- **Knowledge transfer and commercialisation of Intellectual Property**, for example: the identification of intellectual property; and the administration of the commercial transfer of intellectual property.



- **Enterprise Development and Incubation**, for example: Coordination of entrepreneurship programmes, Management of business incubation centres, and External collaboration in enterprise development.

Decentralised resources in research structures

ATU's current structures favour the mutualisation of human resources support and financial support, in both research administration and in research assistance. However, some research positions are devolved and primarily positioned within the Strategic Research Centres to directly support the delivery of, and technical support for, research activities.

3.4.2 HiG

At HiG the Pro-Chancellor supervises the research strategy of the institution. The centralised research support is located at the Department of Professional and Management Support Service (EVL). The different divisions of EVL provides support according to the following list:

- The library: Scientific publishing, bibliometric analyses, and open data management
- The division of Finance, Planning and Procurement: Financial matters and applications of external funding for research and collaboration.
- The division of Communication and External Relations - Research communication and collaboration with external partners.
- The Management Office – Provide support regarding the development of networks and external partnerships with focus on innovation, manage agreements and contracts and provide support to the Pro-Chancellor in research matters.
- The Division of Human Resources – Provide support regarding recruitment and other personnel matters in the context of research.

At HiG approximately 10 employees are involved in central functions of research support.

3.4.3 OVGU

At the OVGU centralised support is provided by the vice rectorate of Research, Technology & Equal Opportunities. The vice rectorate consists of the vice rector for Research, Technology and Equal Opportunities and three full-time employees: a research officer, an equal opportunities officer and a secretary.

The vice rectorate for research is responsible for:

- support for the institution's scientific policy (structuring, financing, outreach, development of management tools),
- user services (dialogue with the research centres, assistance in setting up research projects, administrative simplification, call for projects monitoring),



- development of networks and partnerships,
- the promotion of research (communication, open science promotion) and the doctorate.

Connected to the OVGU rectorate/vice rectorate for research is the Research data management office, which is currently being set up and consists of the research data manager. This office will support the fundamentals of research data management to ensure high-quality research and scientific integrity.

The Human Resources Department and the Finance Department of the OVGU administration provide overarching support in all personnel and financial matters in the context of research.

The OVGU offers a central service point for researchers about research funding and EU university network Saxony-Anhalt - office of Research funding advice/ EU university network has 6 members, which provide:

- finding suitable funding,
- classification of project ideas, help with funding modalities, application, cost estimation,
- submission of project applications, contract negotiations and project management,
- support in finding partners, arranging contacts, preparing cost calculations,
- support with the project description in general parts,
- provision of institution-specific text modules,
- reading the applications regarding the objectives and specific evaluation criteria,
- [service EU Office North in the EU Academic Network Saxony-Anhalt and EU project management](#)

Further, the Transfer and Start-up Centre (TUGZ) of OVGU is the start-up network with a focus on technical-technological start-ups. The aim of the centre is to transfer potential-rich research results into the regional and supra-regional economy and make them accessible to all market participants.

3.4.4 UA

Centralised support: Directorate of Research, Innovation and Doctoral Studies (DRIED)

The support to the UA research units involves 150 FTEs i.e., 20% of the University's administrative and technical staff. One third of these FTEs are in research administration, including 14 in central services and about 100 in research assistance.

The DRIED has 27 staff members and is organised into 5 divisions: Partnership and Innovation, Research, Doctoral Studies, EU projects supporting office in co-piloting with the International Department and Financial Management of Research in co-piloting with the Financial Affairs Department.

This Directorate is involved in:

- Support for the institution's scientific policy (structuring, financing, outreach, development of management tools),

- User services (dialogue with the research centres, assistance in setting up research projects, administrative simplification, call for projects monitoring)
- Development of networks and partnerships,
- The promotion of research (communication, open science promotion) and the doctorate.

Decentralised resources in research structures

The UA's policy is to favour as much as possible the mutualisation of human resources support, whether in research administration or in research assistance. These positions are primarily positioned in the SFRs (support in terms of programme engineering and engineers in the shared technological structures).

3.4.5 UE

Science and Cooperation Services (SCC)

The Science and Cooperation Service (SCC) is an Evora University service management unit that has as its mandate the support of scientific research within the institution. The work of SCC is distributed among two offices that assume different responsibilities, from support to the execution of scientific activities.

The **Research Support Office (RSO)**, assists the preparation of new project applications, providing technical backstopping to the Researchers and other University Staff interested in applying to national and international funding, either leading an initiative or as member of a larger consortium. In order to do that, a network of private and public partners is well established and maintained by the RSO and the science managers within the office are encouraged to participate and engage in training and other activities that can professionalise their work.

Furthermore, this office is responsible to manage and maintain the digital repository of University's scientific publications, as well as aggregate, promote and disseminate R&D opportunities in the Academia, by advertising the opening of new project calls, scholarships, national and international funding, and other initiatives that may be of interest.

The **Technical Support Office to Research Units and Chairs (TSORUC)**, guarantees the well-functioning of university of Évora Research Units through activities such as:

- Secretariat to all units and chairs activities.
- Human Resource management to guarantee the projects good execution and accomplishments.
- Liaison with other technical services, within the university, to correctly implement all procedures needed for a sound project physical and financial execution.
- Internal network establishment among research units and chairs, as well as with external science managers aiming at the creation of synergies.



Other Services and Divisions

To guarantee a sound implementation of projects, the university counts as well with several other services that give financial and administrative support throughout implementation. Namely: Project Management Division; Accounting Office; Purchase and Acquisition Office and Technical services.

3.4.6 UEx

A centralised support through the Vice-rectorate for Research and Transfer

The support to the UEx research units involves 110 people including administrative and technical staff. One half are in research assistance.

The Vice-rectorate for Research and Transfer is organised into five divisions:

1. Service for the Management and Transfer of Research Results (SGTRI). Divided in:
 - a. Research Results Transfer Management Section and valorisation unit.
 - b. Research Management Section.
 - c. Research Project Management Section.
2. Research Human Resources Management Service.
3. EU projects supporting office (OPE).
4. Scientific culture dissemination service.
5. [Research Support Services \(SAIUEX\)](#)

This Vice-rectorate for Research and Transfer is involved in:

1. Identify and disseminate the scientific and technical offer of the University.
2. Establish, facilitate, and develop relations between the University and any claimant or promoter of scientific-technical research, whether public or private.
3. Facilitate and manage the transfer of the results of scientific-technical research, contracting the corresponding work on behalf of the University and carrying out on behalf of the researchers as many acts and procedures as necessary.
4. Manage agreements, contracts, and research projects.
5. Establish and manage the database of researchers, research groups and research of the University.
6. Inform researchers and Research Groups of public calls for project financing, scholarships, infrastructures, and any others that come to their attention.
7. Manage industrial property rights from the results of research carried out by the University.
8. Planning and support in the execution of the selection processes of Research Human Resources
9. Management of the recruitment and incorporation processes of Research HR.
10. Support in the management and justification of Aid for Research Human Resources.
11. Incorporate the necessary equipment and infrastructures for the development of quality research, increasing the profitability of investments in equipment and favouring and fostering synergy between fundamental research and technological innovation and technology transfer from the UEx to companies and the society in general.

3.4.7 UO

The support to the University of Oradea research units involves 3 structures, consisting of both researchers and administrative and technical staff.

Centralised support

The **Office of Programs and CDI Projects** (BPPCDI) is a technical-administrative structure within the University of Oradea, subordinated to the Vice-Rector for Research and Quality Management. Its role is to manage the projects won in national and international competitions by the UO teaching staff and researchers, with the purpose of carrying out activities related to scientific research, development, and innovation and, implicitly, to support academic activities. Members of the office (5 persons) provide logistical support and advice for the documentation for funding, contracts, and other legal requests (declarations, internal documents, etc.) as well as for the correct and efficient management of projects throughout their duration, for the preparation of technical reports for contracting authorities. They also prepare the documentation, synthesise, and transmit to the responsible Romanian authorities and Ministries the periodical statistical reports regarding the research activity at the level of the University of Oradea. They provide logistical support and advice for the documentation of funding, contracts, and other legal requests (declarations, internal documents, etc.) as well as for the proper and efficient management of projects throughout their duration, and for the elaboration of technical reports for contracting authorities.

As an institution organising **doctoral studies** (IOSUD), the University of Oradea has in its structure seven doctoral schools that manage 20 doctoral fields.

The **Council for Doctoral Studies** (CSUD) is the entity that coordinates the activity of IOSUD University of Oradea aimed at ensuring quality in all components of academic and administrative activity through the implementation and continuous improvement of Total Quality Management (TQM); The CSUD director, representatives of the doctoral schools, and members of the secretariat of doctoral studies are all parts of this council.

Its activity consists in:

- monitoring and improvement of indicators on Institutional Capacity, Educational Effectiveness, and Quality Management, to comply with national and international standards.
- continuous updating of procedures, regulations, and methodologies used in quality management in accordance with national and European legislation and best practices.
- implementation and monitoring of the recommendations of the ARACIS external evaluation commissions, with direct accountability of decision-makers.
- maintaining and updating the database on the quality of educational services at the UO, indicators, and performance criteria for the areas: human resources, financial and material resources, students, and graduates.
- internal, regular, transparent, and objective evaluation of the doctoral schools and doctoral fields at the UO IOSUD level, as well as the establishment of measures to improve their quality and increase their efficiency.
- ensuring optimal conditions for the accreditation process of Doctoral Schools and doctoral fields at the level of IOSUD University of Oradea.



- establishment of new doctoral fields within IOSUD-University of Oradea, authorisation, and affiliation of new Ph.D. supervisors at IOSUD-University of Oradea.

Decentralised resources in research structures

The Centre for Technology Transfer, part of the National Centre for Geothermal Research (CNCG-CTT), is a department focused on technology transfer and commercialization, spin-off creation, engagement with a broad range of innovation stakeholders and with society.

The National Centre for Geothermal Research operates based on a team of collaborators (UO academics and researchers) and administrative staff, and aims to introduce research results into the economic circuit, transformed into new or improved products, processes and services, with the following areas of activity:

- Unconventional energy sources.
- Agriculture.
- Processing of wood and forest products.
- Wood industry.
- Health and wellbeing.
- Balneology.

3.4.8 UNIPR

The research support is organised at central (Area of Research Administration) and departmental level.

The Area of Research Administration is part of the general administration and oversees promoting, coordinating, and supporting research activities within the university.

The Area includes 7 organisational units (UO) in charge of specific tasks:

- EU and international research unit (UO supporto alla ricerca europea e internazionale);
- National and industrial research unit (UO supporto alla ricerca nazionale e industriale);
- Research monitoring unit (UO monitoraggio delle attività di ricerca);
- Libraries units (UO biblioteche di area medica e giuridica; UO biblioteche delle scienze e tecnologie; UO. biblioteche delle scienze umane).

At the departmental level, research support activities are implemented by research managers. Each department has also one faculty acting as director's delegate for research.

3.4.9 UPWr

At UPWr the research support is organised within the administrative units at central level subordinated by Vice-Rectors and Chancellor. The units have their own tasks and responsibilities; however, they are also strongly cooperating with each other to make the research support process

efficient and comprehensive. The units mentioned below are those involved in the research support, but not all supervised by the Authorities.

1) the Vice-Rectorate for Science:

- **Science Administration Department** - supports researchers at every stage of their research career in getting degrees and in applying for national projects, fellowships, scholarships and awards, coordinates activities of the Leading Research Groups through the implementation of the University's research strategy.
- **Doctoral School Office** - focuses on self-development and problem-solving skills among our students. We develop an open-minded approach and application of innovative methods in problem solving tasks. Our goal is to shape an open and innovative attitude among researchers who will soon enter the world of international science and will conduct ground-breaking research. Our individual one-to-one/master–student approach helps to shape each student’s career path.
- **Main Library** - serves the academic community by offering extensive resources and services, while fostering research and collaboration. Through open publishing programmes, provision of valuable tools, and granting publication subsidies, it ensures comprehensive scientific support, creating an environment that encourages knowledge exchange and innovation among students and researchers.

2) the Vice-Rector for Internationalisation:

- **International Relations Office** - responsible for providing support for the development of international academic cooperation, managing bilateral and multilateral agreements; is also responsible for the acquisition and implementation of international networking and mobility programmes that aim to address global challenges and attract the best global talent.
- **International Research Office** - acting as a pre-award project office aims at supporting researchers in applying for projects within international calls under European and national agencies. Its expertise lies in providing targeted information about available granting opportunities for research and enhancing international research cooperation, as well collaboration with non-academic sectors (e.g., local authorities, NGOs).

3) Vice-Rector for University Organisation and Development:

- **Centre for Project Implementation and Settlement** - acting as a post-award project office supports researchers in project implementation and financial management of national and international projects. The Centre cooperates with other administrative units such as: Department of Project Accounting, Human Resources and Payroll Department, Public Procurement and Purchasing Centre.

4) Chancellor:

- **The Centre for Business Development and Commercialization** supports broad cooperation between science and business. It supports scientific teams in obtaining funds for developing innovations. It continuously seeks entrepreneurs who want to invest in innovative solutions. Every day it helps scientific teams solve real industry problems.



3.5 Doctoral schools

Key figures:

| EU GREEN universities | Number of doctoral students | Number of theses defended a year | Number of doctoral programs | Number of Graduate schools |
|-----------------------|-----------------------------|----------------------------------|-----------------------------|----------------------------|
| ATU | 88 | 30 | 10 | 0 |
| HiG | 105 | 15 | 11 | 3 |
| OVGU | 626 | 252 | 0 | 12 |
| UA | 520 | 90 | 10 | 1 |
| UE | 822 | 70 | 35 | 1 |
| UEx | 1026 | 143 | 25 | 0 |
| UNIPR | 550 | 152 | 21 | 0 |
| UPWR | 145 | 32 | 2 | 0 |
| UO | 535 | 75 | 7 | 0 |
| Total | 4417 | 859 | 121 | 17 |

3.5.1 ATU

ATU does not currently operate Doctoral Schools.

ATU has piloted two Postgraduate Researcher Training Programmes (PRTP) in:

- Modelling and Computation for Health and Society (MOCHAS).
- Operations and Supply Chain Research (OSCAR).

These Postgraduate Researcher Training Programmes currently involve 30 PhD scholars (15 in each programme). The PRTPs were initiated to:

- Develop highly trained, skilled researchers.
- Equip graduates with the agility to adapt to evolving workplaces.
- Establish excellent, cohort-based training programmes/environments.
- Deliver thematically aligned research projects of relevance and impact.
- Achieve inter-institutional collaboration and efficiency.
- Forge strong, substantial collaborations with external stakeholders.
- Leverage external funding.

Defining features of PRTPs include:

- Applicant-led definition of the research domain.
- Strong external partnership.
- Cross-institutional environments of research excellence.
- Cohort-based recruitment of postgraduates.
- Provision of high-level training programs in generic, transversal & specific skills.
- Student-focused ethos.

3.5.2 HiG

HiG has about 120 PhD students of which 90 are connected to HiG's 11 PhD programs and about 30 PhD students are affiliated to other universities.

HiG has 11 PhD subject programs organised by the three faculties:

The Faculty of Health and Occupational studies has three PhD programs:

- Occupational Health Science
- Caring Science
- Social Work

The Faculty of Engineering and Sustainable development has seven PhD programs:

- Electrical Engineering
- Energy Systems
- Environmental Psychology
- Geospatial Information Sciences
- Industrial Engineering and Management
- Indoor Environment
- Sustainability Science

The Faculty of Education and Business Studies has one PhD programs:

- Curriculum studies

In addition to this the University of Gävle organises three corporate graduate schools: *Reesbe*, *Future-Proof Cities* and *Change - co-creating a sustainable working life*.

A doctoral student is normally employed at the university for 4 years of full-time studies, or 5 years 80%.

3.5.3 OVGU

The OVGU currently has about 626 enrolled PhD students and 252 completed PhDs/year (2021).

The Otto von Guericke University offers a central service facility for all doctoral students and postdocs in the form of the Graduate Academy (OVG-GA). The OVG-GA supports doctoral and postdoctoral qualifications at this university through targeted activities. A high quality of supervision on the one hand and comprehensive promotion of qualification offers on the other hand are to be achieved through:

- Interdisciplinary continuing education offers (workshops, events, etc.),
- counselling and support services,
- measures to improve the academic and social infrastructure,
- conflict moderation,
- networking with non-university (research) institutions, especially in the vicinity of Otto von Guericke University, and the higher education institutions of the state,
- interdisciplinary cooperation between different subject areas and faculties in joint research projects,
- the promotion of equal opportunities (increase in the proportion of women, support for doctoral students and postdocs with families).

The OVGU offers you various paths to a doctorate:

- within a research training group,
- a structured programme,
- or as an individual doctoral student.

THE OVGU's structured doctoral programmes as well as Research Training Groups or Research Schools are:

- **Graduate school 2297** "Mathematical Complexity Reduction" (Faculty of Mathematics, Faculty of Electrical Engineering and Information Technology, Max Planck Institute for Dynamics of Complex Technical Systems)
- **Graduate school 2408** „Maladaptive processes across physiological barriers in chronic diseases“(Faculty of Medicine)
- **Graduate school 2413** „The Ageing Synapse – Molecular, Cellular and behavioural Underpinnings of Cognitive Decline“(Faculty of Medicine, Faculty of Natural Sciences)
- **Integrated Research Training Group within CRC 1436** "Neural resources of cognition" (Free University of Berlin, Leibniz Institute for Neurobiology (LIN), German Centre for Neurodegenerative Diseases (DZNE), Magdeburg, Jülich Research Centre, Heinrich-Heine University Düsseldorf, Otto von Guericke University Magdeburg)
- **Integrated Research Training Group within CRC TR 287** "Bulk Reaction "(Ruhr University Bochum, Otto von Guericke University Magdeburg, Christian-Albrechts University Kiel)
- **Innovative Training Network (ITN) OptiVisT** (Network in the European Union's Horizon 2020 research and innovation programme)
- **International Max Planck Research School** for Advanced Methods in Process and Systems Engineering Max Planck Institute for Dynamics of Complex Technical Systems (Faculty of Process and Systems Engineering, Faculty of Natural Sciences, Faculty of Mathematics, Faculty of Electrical Engineering, and Information Technology)
- **Graduate school science management and science communication** (Faculty of Human Sciences, German University of Administrative Sciences Speyer, Institute for Higher Education Research Halle-Wittenberg)
- **Doctoral Studies at the Faculty of computer science** (faculty of computer science)



- **CBBS neuroscience graduate program** (combines all neuroscience PhD and MD students from OVGU, LIN and DZNE. The aim is to connect all PhD students working in neuroscience and to combine all information from the already existing graduate schools)
- planned for second half of 2023 European Social Fund funded graduate schools are **NACHOS** “ Navigating the Chaos of Innovation and Transformation: Understanding, Modelling, and Designing Socio-Technical Co-Evolution” (Faculty of Economics, Faculty of Human Sciences) and **TACTIC** “Towards Co-Evolution in Human-Technology Interfaces” (Faculty of Medicine, Faculty of Natural Sciences, LIN, Faculty of Mechanical Engineering, Faculty of Computer Science, Faculty of Electrical Engineering and Information Technology, Faculty of Process Engineering).

The doctorate takes place over 3-4 years. The doctoral students within a research training group or a structured programme must follow a certain amount of training (depending on the graduate/doctoral school programme) which will allow him/her to validate the doctoral degree. The scientific training is directly organised by the graduate/doctoral schools. Individual doctoral students can participate in these training sessions as associated members. Annual progress reports and regular thesis committee meetings will support doctoral candidates in continuously monitoring and evaluating the development of the research project and ensure transparent supervision as well as optimal scientific progress.

3.5.4 UA

The UA currently has about 520 enrolled PhD students and around 90 completed PhDs/year.

The doctoral schools are organised at a regional level: together with the University of Nantes and Le Mans, we propose 10 different doctoral schools:

- Art, literature, and language
- Biology and Health
- Law and political sciences
- Education, Cognition, Language, Interaction
- Economics and Management Sciences
- Engineering and Systems Sciences
- Societies, Times, and Territories
- Plant, Animal, Food, Sea, Environment
- Molecules, Materials and Geosciences
- Mathematics

The doctorate takes place over 3 years. The doctoral student must follow a minimum of 100 hours of training which will allow him/her to validate the doctoral degree. The scientific training is directly organised by the Doctoral schools whereas the cross-cutting training sessions are organised at the regional level together with the Universities of Nantes and Le Mans.

One training is mandatory: ethics and scientific integrity training.

The Graduate School LUMOMAT (« LUmière, MOlécules, MATière » – meaning « Light, Molecules, Matter ») offers training in chemistry in interaction with scientific research and technological innovation, in the fields of molecular chemistry and materials. This programme is part of the high-potential organic electronics and photonics sector and aims to train high-level engineers and researchers capable of responding to major societal challenges: Energy, Environment, Information



Storage. This programme, which is based on a University Research School (EUR), enables students to benefit from a label of excellence offering multiple advantages:

- International environment
- Mobility grants
- Attractiveness grants
- Work-study programmes
- Teaching in English
- Access to the LUMOMAT international network
- Expertise and equipment from 4 laboratories of excellence
- Strong interactions with the industrial world
- Support for students

3.5.5 UE

University of Évora has a doctoral school the Institute for Research and Advanced Training (IIFA), who coordinates 822 PhD students from the 35 existing PhD programs:

1. Agribusiness & Sustainability
2. Agricultural and Environmental Sciences
3. Archaeology
4. Architecture
5. Art History
6. Biochemistry
7. Biology
8. Chemistry
9. Computer Sciences
10. Contemporary History
11. Earth and Space Sciences
12. Economics
13. Educational Sciences
14. Food Sciences
15. Health, Technologies, and Well-being Sciences [CA]
16. History and Philosophy of Science - Museology
17. History
18. Human Kinetics
19. Inter-university Doctoral Programme in History: change and continuity in a global world
20. Interdisciplinary Management of Landscape
21. Landscape Arts and Techniques
22. Linguistics
23. Literature
24. Management
25. Mathematics (B-learning)
26. Mechatronics Engineering and Energy
27. Music and Musicology
28. PHOENIX JDP - Dynamics of Health and Welfare
29. Philosophy
30. Political Theory, International Relations, and Human Rights

31. Sociology: Knowledge for Open and Inclusive Societies - Inter-University PhD Programme OpenSoc
32. Sociology
33. Veterinary Sciences
34. Visual Arts
35. Psychology

IIFA ensures a high level of coordination between PhD programmes and Research Units. All PhD programs are anchored in one or several research centres, students become members of the research units and are integrated, whenever possible, in their activities. Moreover, there are some activities that are developed and offered to all PhD programmes. For instance, there is a transversal competencies programme, with optional curricular units, that is offered to all PhD students and there is a mentorship programme. Besides the synergies that are exploited, having a unique Doctoral School allows students to interact with students from other scientific areas, which is very enriching.

3.5.6 UEx

The organisation and regulation of doctoral studies, leading to obtaining the PhD Degree of the UEx, is regulated by the Governing Council of the UEx.

The Extremadura International Postgraduate School was created in 2011, and since 2021 it changed to the International Doctoral School of the University of Extremadura (EDUEx), which is responsible for the 25 Doctoral Programs (15 own programmes and 10 inter-university programmes) that are currently offered at UEx:

- PhD in Heritage (R001)
- PhD in Languages and Cultures (R002)
- PhD in Science and Technology of New Materials (R003)
- PhD in Molecular and Cellular Biology, Biomedicine and Biotechnology (R004)
- PhD in Public and Animal Health (R005)
- PhD in Aerospace Technology: Electromagnetic, Electronic, Computer Science and Mechanical Engineering (R006)
- PhD in Modelling and Experimentation in Science and Technology (R007)
- PhD in Space Archaeology (R008)
- PhD in Applied Biomedical Research (R009)
- PhD in Innovation in Teacher Training. Advice Analysis of Educational Practice and ICT in Education (R010)
- PhD in Sports Sciences (R011)
- PhD in Biomarkers of Health and Pathological States (R012)
- PhD in Food Science (R013), PhD in Psychology (R014)
- PhD in Sustainable Territorial Development (R015)
- PhD in Information Technology (R016)
- PhD in Research in Teaching and Learning of Experimental, Social, Mathematical Sciences and Physical and Sports Activity (R017)
- PhD in Sustainable Chemistry (R018)
- PhD in Theoretical Chemistry and Computational Modelling (R019)
- PhD in Economics and Business (R020)



- PhD in Information and Communication (R021)
- PhD in Science and Technology of Agroforestry Systems (R022)
- PhD in Health and Human Motricity (R023)
- PhD in Industrial Engineering (R024)
- PhD in Tourism (R025)

The members of the EDUEX Board of Directors are the Director, the EDUEX Academic Deputy Director, the EDUEX Academic Secretary, the Head of Quality Assurance, and the Head of the EDUEX Service. In addition, all the coordinators of the different Academic Commissions of the Doctoral Programs, as well as four representatives of doctoral students from the biomedical, scientific, humanistic, social, and legal fields, are part of this council.

In the International EDUEX there are 1026 students enrolled in doctoral programs, of which 236 are international. In addition, a total of 143 students have defended their PhD during last academic year, of which 33 were with international mention and 85 were carried out in remote format.

The duration of doctoral studies will be a maximum of three years (full-time) or five years (part-time dedication). This period will comprise from the admission of the student to the Program until the presentation of the doctoral thesis. Notwithstanding the foregoing, and at the request of each full-time doctoral student, the Academic Committee of the Program may authorise the extension for 1-2 years, when requested.

3.5.7 UO

An important part of the scientific research is carried out within Doctoral Studies, coordinated by the Council of Doctoral Studies (C.S.U.D). Doctoral Schools are organised as departments and are formed within faculties. Each Doctoral School is managed by a Doctoral School Council (CSD).

7 Doctoral Schools - 20 doctoral fields

- Doctoral School of Biomedical Sciences (Biology, Pharmacy, Dental medicine, Medicine)
- Doctoral School of Engineering Sciences (Agronomy, Electrical Engineering, Electronic Engineering, Telecommunications and Information Technologies, Energy Engineering, Industrial Engineering, Engineering and Management, Mathematics)
- Doctoral School of Economic Sciences (Business Administration, Economics, Finance)
- Doctoral School of Human Sciences and Arts (Philology, Music, Theology)
- Doctoral School of Geography
- Doctoral School of History
- Doctoral School of Sociology

Currently there are 535 PhD students and an average of 75 theses are defended/year. The doctorate takes place over 3/4 years. The doctoral student must follow a certain number of hours of training which will allow him/her to validate the doctoral degree. Ethics and scientific integrity courses are mandatory courses.



3.5.8 UNIPR

UNIPR has 21 Doctoral Courses, organised in 6 Doctoral Schools. Each School is governed by a Director and a Scientific Council. Each Doctoral School includes courses from one or more Departments, which take charge of the logistical support to didactical and research activities. The distribution of the PhD grants between the 21 doctoral courses is decided by a Commission for Doctoral Studies, while the subjects of the grants within each specific course are yearly set by the PhD Course Faculty (it has a minimum of 12 professors and can include external members). The overall doctorate planning and management is supervised by the Post-graduation Administrative Unit; among its tasks are the support to PhD Course Faculties in the accreditation procedure, the call for applications and student recruitment, accounting of sponsored PhD grants. From an administrative point of view, each PhD Course refers to the Departments to which the doctoral course belongs.

In Italy the PhD program lasts 3 years. At UniPr the total number of students at present enrolled in PhD programs is 550 of which 205 at the first year, 203 at the second and 147 at the third year. During 2022, 152 PhD students defended their thesis.

List of the doctoral schools (in brackets the corresponding doctoral courses) in Parma:

1. Science & technology (Physics, Chemical Sciences, Earth Sciences, Materials Science and Technology, Mathematics)
2. Life Sciences, Pharmaceuticals & Nutrition (Evolutionary Biology and Ecology, Biotechnology and Life Science, Food Science, Drugs Sciences)
3. Medicine and Surgery & Veterinary Medicine (Molecular Medicine, Neurosciences, Translational Medical and Surgical Sciences, Veterinary Sciences)
4. Engineering & Architecture (Civil Engineering and Architecture, Industrial Engineering, Information Technologies)
5. Human Sciences (Psychology, Philological-Literary, Historical-Philosophical and Artistic Studies)
6. Economic & Legal Sciences (Economics & Management Of Innovation and Sustainability, Legal Sciences).

The University of Parma promotes and supports cross-cutting training courses open to all PhD students as *English for academic purposes* (4 ECTS) and *European projects* (2-3 ECTS). The doctoral schools, in their turn, support specific and interdisciplinary courses (2-4 ECTS), the latter dealing with statistics, high performance computing, patenting, database handling, digital libraries, open science and research resources.

The University of Parma has signed a large number of bilateral agreements concerning PhD programs, as well as co-tutorship agreements involving both UniPr and foreign students.

3.5.9 UPWr

UPWr Doctoral School focuses on self-development and problem-solving skills among our students. We develop an open-minded approach and application of innovative methods in problem solving tasks. Our goal is to shape an open and innovative attitude among researchers who will soon enter the world of international science and will conduct ground-breaking research.

UPWr Doctoral School educates and conducts research in the following scientific disciplines:

- Veterinary Science,



- Biological Sciences,
- Nutrition and Food Technology,
- Animal Science and Fisheries,
- Agriculture and Horticulture,
- Environmental Engineering, Mining and Energy,
- Civil Engineering, Geodesy and Transport,
- Social and Economic Geography and Spatial Management.

The school's programme of education has been developed by its leading scientists to ensure that our students get the best that the university has to offer. The interdisciplinary programme involves research with the direction and guidance of a selected supervisor and publishing research findings in the best international journals.

UPWr Doctoral School allows its students to become part of the scientific community, setting them on the track to a successful career at any university in the world. Our individual one-to-one/master-student approach helps to shape each student's career path.

Doctoral students of the UPWr Doctoral School develop their scientific competences by participation in various courses, trainings, national and international conferences, as part of 'scientific self-improvement' study subject. They are also welcomed to participate in tutorials and personalised learnings conducted by certified academic tutors, that offer a very rare level of personalised attention from academic experts. Tutorials help our students to develop scientific potential, discover hidden talents and learn essential skills for academic success.

4. Needs analysis

Each university has its own research strategy. For some of them the strategy is precisely defined, for others it is not. For example, the University of Gävle follows two well-defined main goals to drive their actions:

1. The University's integrated research and education environments are internationally renowned. It means that they prioritise subject areas and environments that contain education programs on all levels and are closely connected to strong research groups.
2. The university is a challenge-driven one that, locally and globally, creates societal impact and contributes to solving current and future societal challenges.

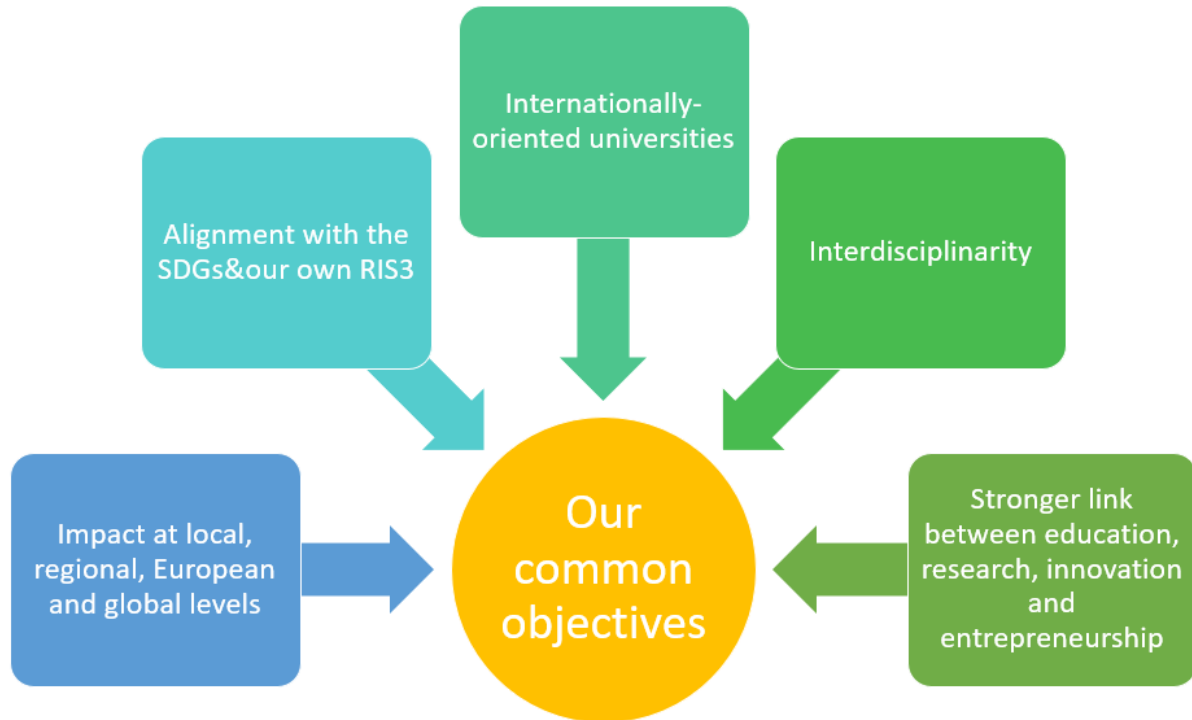
As far as the Université of Evora is concerned, it follows 4 main pillars to sustain the future: leadership, innovation, sustainability, and commitment. These 4 concepts summarise the base in which their common vision is built and take into consideration global concerns, adapting them to the local context and making sure the institution is an active actor in this "glocal" environment, by teaching, producing research and new knowledge and disseminating it, always in articulation with the social level.

What is common to the 9 of us is that we are all characterised by a desire for and strong commitment **to impact at local, regional, European, and global levels**. We all have a strong positioning within our respective local territories and a strong focus on regional development, which entails, especially at a postgraduate level, a culture of collaboration between researchers and industry, government, and community groups. This allows us to identify challenges and have high impact by putting knowledge into action for the benefit of our regional economies. Moreover, we are all **closely aligned with the objectives of our respective Research and Innovation Smart Specialisation Strategies (RIS3)** and our regions' policies on sustainability and the UN Sustainable Development Goals. This also implies working in an **interdisciplinary way** to enable a comprehensive understanding of the issues.

EU GREEN members are recognised for their **research excellence, impact, and engagement in a number of areas** (see tables of the 2022 Shanghai and Leiden ranking in annexes) that cut across engineering and the social sciences, such as agrifood/nutrition, health and wellbeing, renewable energy and built environment, sustainable urban development, and tourism/cultural heritage. Each partner brings to the table know-how in specific areas related to sustainability, "specialising" in a set of SDGs, each partner covering different SDGs. Taken together, our expertise can help advance research on sustainability in a meaningful manner across the entire spectrum of SDGs.

EU GREEN universities are not research-intensive universities however are all deeply concerned with the strong **link between education and research**. This includes teaching at the best-informed level backed up by 'cutting edge' scientific research. Education and research are two fundamental missions of higher education that need to be articulated to serve the general interest. Our education programs need to be closely connected to strong research groups. Studying at EU GREEN universities means living and learning with the people who make science, to guarantee the highest level of training based on the latest scientific advances to become citizens and professionals of the 21st century and, for some future scientific leaders.

As regionally anchored and mid-sized universities, another common preoccupation is to increase our European and international research visibility to become more internationally oriented universities.



EU GREEN defined its strategy in accordance with the Sustainable Development Goals and the ninth Research and Innovation Smart Specialisation Strategies (RIS3). The 6 strategic orientations correspond to the alliance's commitment to respond to the major societal challenges of today:

1. Emerging paradigms for health and wellbeing
2. Agriculture, food, and environmental sustainability
3. Engineering and technology for sustainable development
4. Sustainable tourism for cultural and natural heritage
5. Education sciences for sustainable development
6. Challenges in ecosystem biodiversity and function - a macroregional evaluation

New research cluster can be defined by the Joint Research Commission during the project development, either adding to the list new sustainability-related topics or merging present clusters into interdisciplinary topics.

5. WP3: what is inside and how are we going to implement it

5.1 General description of WP3

The foundations of our common strategy were drawn up when WP3 was drafted. EU GREEN partners commit to build a comprehensive joint research strategy around sustainability. This backbone of the programme is the EU GREEN Joint Research Commission (Task 3.1), a structure that will oversee a network of multidisciplinary Joint Research Clusters (Task 3.2) focused on different dimensions of sustainability.

The EU GREEN Joint Research Commission (JRC) provides the strategic and organisational building blocks to ensure continuous renewal and accelerated support of interdisciplinary research on relevant sustainability questions - it develops and intertwines existing clusters, creates new ones, or ends the activities of an EU GREEN cluster. A key task of the Commission is to build the foundations for exchanges and communication on knowledge created, approaches adopted, and best practices established within and outside each cluster, with the long-term goal of joint EU GREEN appointments of researchers in key areas of interest for the Alliance. This means that it has a role in ensuring that the enabling resources, spaces, and platforms are created, either physically, digitally or in a blended manner (Task 3.8) and to align the human resources procedure of each partner on the HRS4R standards (Task 3.9). To ensure that the trainings are all research-based, the JRC will ensure that all the WP activities involve junior scientists (i.e., PhD or postdoctoral students). A task force on European projects will attract more European funds in competitive calls and offer fundings to secure our EU GREEN research topics in the long term (Task 3.1).

The Joint Research Clusters build on the existing expertise, laboratories, facilities, and other related research infrastructure available at partner institutions. Each cluster seeks to build synergies by pooling the know-how, equipment, and processes of each involved partner to develop a novel and common EU GREEN approach that can serve as a model for other higher education and research institutions (Task 3.2). Each EU GREEN cluster brings together researchers and students from the different partner institutions around common fields of interest and seeks to build and take advantage of the diversity of cultures, disciplines, and local challenges to establish a truly interdisciplinary and transdisciplinary environment for conducting sustainability-centred research and innovation transferable to students and society.

Existing research infrastructure and other resources within the alliance will be identified for joint use (Task 3.8), and key research projects will be defined and supported among EU GREEN partners (Task 3.3). Furthermore, a mobility plan for researchers, post-graduate students and support staff will be created to reach the ambitious mobility goals of the alliance (Task 3.4).

The alliance will also establish close links with industry and regional stakeholders through their participation to the Cluster's commission and their participation in the research weeks (Task 3.2) and the development of researchers' career (Task 3.6 and 3.7).





5.2 Objectives of WP3

- Designing, implementing, and monitoring a comprehensive joint research strategy around 6 clusters linked to SDGs (Tasks 3.1, 3.2).
- Strengthening research on sustainability within our institutions by developing a common agenda (Task 3.1), shared infrastructures and resources (Task 3.8), fostering critical mass, strengthening human capital, and involving non-academic actors, connecting with surrounding innovation ecosystems, with citizens and society through the clusters (Task 3.2) and in synergy with the rest of work packages.
- Creating mechanisms to stimulate bottom-up approaches, interdisciplinarity and developing EU GREEN research collaborations by supporting innovative pedagogical programs (Task 3.5), through mobility (Task 3.4) and joint projects (Task 3.3)
- Pursuing a research-based learning and proposing a complete career path from the bachelor to the post doc, including a wide range of related skills (Tasks 3.5, 3.6 and 3.7), in association with the Work Package on Education (see Work Package 2)
- Reinforcing excellence by enhancing the attractiveness of the alliance (Task 3.9) and by submitting collaborative research proposals (Task 3.1)

5.3 Governance and interactions

The WP3 is led by the University of Angers and co-led by the University of Parma. At the proposal writing, the management of the different tasks had been divided into both partners. UA is more particularly in charge of the tasks 1, 2, 3, 6, 8, 9, 10 and UNIPR of the tasks 4, 5, 7.

The decisions regarding the implementation of WP3 **are taken by the Joint Research Commission**. The Task Force and the Clusters can bring subjects of debate and vote to the JRC. The proposition must be sent to the WP3 leader and co-leader who will add the topic to the agenda of the next meeting.

Quorum: The Joint Research Commission shall not deliberate and decide validly unless two-thirds (2/3) of the EU GREEN universities are present or represented (6 EU GREEN members).

Voting Procedure: each partner university present or represented in the meeting shall have one vote. When consensus is not reached, decisions shall be taken by a simple majority of the votes cast. In case of a tie, the WP leader's vote counts double.

Interactions: The Joint Research Commission may interact with all the EU GREEN boards, though a direct interaction with the Board of Rectors and the Senate is envisaged.

The EU GREEN Joint Research Commission and clusters will work hand in hand with:

- the EU GREEN Education Commission (see Work Package 2) for the development of an educational offer for each cluster (Task 3.5).
- the EU GREEN Mobility Commission (see Work Package 6) for the development of the research mobility program (Task 3.4).
- the EU GREEN Innovation and Entrepreneurship Commission (see Work Package 4) for strengthening of the University-Industry linkages in the six sustainability research excellence fields (Task 3.3).
- the EU GREEN Communication, Dissemination, and Impact Commission (see Work Package 9, specifically Task 9.5) for integrating the research platform and the job & internship platform into the GREENWORK, the Alliance's shared network (Tasks 3.7 and 3.8).

5.4 Some principles in organisation of meetings and teamwork

1. All documents related with meetings of WP3 **should be in the [WP3 shared folder](#)** (up to now Google Drive is used but by approximately May 2023 a common Teams platform will become the unique shared platform. A migration of the documents will then be organised, and Teams will become the reference platform for all WP3 documents.)
2. JRC's, Task Force's and Cluster's meetings should
 - i. **have a pre-specified calendar for the year and duration.** The duration should never be exceeded (lots of participants have other appointments).
 - ii. **send agenda items at least 8 days before the meeting.**
 - iii. **be jointly prepared by the leader and co-leader.**
 - iv. have an agenda with items ordered according to priority (high, medium, low). Items with high priority are the first to be discussed.
3. Participants should be informed of the agenda **one week before and have access to corresponding working documents.** They have the duty of coming prepared to the meeting and doing the required homework after the meetings.
4. **All meetings should have minutes** (including important debates and conclusions, summary of the decisions taken and homework to be done with the corresponding due dates). The coordinator of the meetings and the person in charge of writing the minutes (writer) should

be different (difficulty to do both). Minutes should be available on the shared platform 3 days after the meeting. A template is provided [here](#).

5. When teams are created to work on a specific task, **a task leader must be defined**. The task leader is responsible for meeting due dates and guaranteeing quality of the task output. But each member of the team is responsible for performing the allocated work on time with quality. That is, all participants in WP3 are responsible for high quality execution of WP3, not just the leader.

5.5 Description of the tasks

A complete 2023 WP3 Gantt Chart [is available here](#).

5.5.1 Joint Research Commission

1. Joint Research Commission

All partners participate in the EU GREEN Joint Research Commission chaired by representatives of Angers and Parma universities.

The Commission is responsible for developing a **novel and common research strategy**:

1. Defining the key research line of address for the alliance and working on a long-term roadmap addressing key global challenges,
2. Starting, coordinating, and monitoring the 6 clusters research and their advancement,
3. Facilitating their interactions and identifying new "emerging" research clusters,
4. Consolidating or amplifying new funding opportunities,
5. Connecting education with research and with real world needs.

The Commission will actively co-design the existing curricula or new curricula in coherence with the 6 research clusters (as defined in **Work Package 2**), in order to strategically link our research and education activities.

The Commission will publish an annual report to circulate ideas and summarise the novelties and opportunities inside and outside the alliance.

It will promote citizen science, open access to research and educational material using the Research portal developed in **Work Package 9**.

The Commission will oversee defining the guidelines of the EU GREEN Joint Research Project (Task 3.3) and the Researchers Mobility Program (Task 3.4).

The Joint Research Commission is composed of two members per University: **The Vice-Rector of Research (or equivalent) and the Director of Research (or equivalent)**. These two members can be joined by other participants to the meetings from their organisations letting them know in advance to the WP3 Coordinator.

The EU GREEN Joint Research Commission 2023 calendar meetings:

- Thursday 16th February - 14-16h
- Friday 14th April 10-12h
- Tuesday 20th June 10-12h
- During the research week in Angers (end of June)
- Thursday 5 October, 14-16h
- Thursday 7 December, 14-16h

An annual calendar for the following years will be defined at the end of year (at least quarterly meetings). More meetings can be added upon request of members.

2. Task force on European projects

At the same time, **a task force on European projects** is working to stimulate new projects and to help researchers apply for funding, with the goal of attracting more European funds in competitive calls and offering fundings to secure our research topics in the long term. The Task Force meets on a regular basis and works on joint strategic projects at European and international level and establishes a proactive strategy towards Horizon Europe, especially targeting some of its programmes, e.g., mobility actions like the Marie Skłodowska-Curie Actions, specific topics under the clusters, etc.

The Task Force is also in charge of lobbying for the EU GREEN research interests in the European institutions in line with the economic partners' interest.

It is composed of European project officers from all partner universities. Depending on the topics on the agenda, the participants of the Task Force may change (e.g., if the topic is MSCA PF grants, the referent of each institution may be present). In any case, a coherence in the follow-up of the activities is requested to allow the Task Force to run smoothly.

The EU GREEN Task force 2023 calendar meetings:

- Monday 13th February 10-12h
- Monday 17th April, 14h-16h
- Tuesday 23rd Mai, 10h-12h
- During the research week in Angers (end of June)
- Monday 3rd July, 14h-16h
- Thursday 21st September, 14h-16h
- Tuesday 7th November, 14h-16h
- Monday 18th December, 14h-16h.

An annual calendar for the following years will be defined at the end of year.

The 2023 and 2024 specific objectives for the Task Force are (priorities: H (high) and M (medium)):

- to propose to mutualise or co-organise joint info-sessions on European calls to the EU GREEN community (*H*).
- to identify best practices in European projects that could be upscaled inside the EU GREEN network (best practices in pre-award as well as post-award activities) (*H*).
- to implement a specific EU Green training programme with the cluster's members on European opportunities (*H*).



- to propose a Joint Support Campaign to the MSCA PF call (*H*).
- to explore the opportunity to apply together to a Marie-Sklodowska Curie Actions (MSCA) Doctoral Network call (*M*).
- to explore the opportunity to apply together to a MSCA COFUND Staff Exchange call (*M*).
- to investigate the opportunity to apply together to a MSCA COFUND Postdoctoral action call (*M*).
- to explore the opportunity to apply together to a COST action (*M*).
- to investigate the opportunity to apply together to a Widening action (*M*).
- to explore the opportunity to apply to Horizon Europe Pillar I Infrastructure (*M*).
- to take part in the European Commission Initiative “Startup Villages” preparing a common project on the proposal “HORIZON-CL6-2024-CIRCBIO-01-5: Circular bioeconomy start-up villages” (*M*).
- to map the existing European networks our universities are members of and to identify potential new ones to join (*M*).
- to identify and/or create tools to help our European projects research support offices (*M*).
- to implement specific EU GREEN training on EU Project Management with specific content on sustainability (*M*).

The Task Force is also going to set up an **ERC laureate group** to support the application of the researchers of the EU GREEN alliance. The group will be composed of previous or current ERC laureates and of ERC candidates. Through the collection of best practices, we will thus reinforce our ERC projects proposals.



5.5.2 The 6 clusters

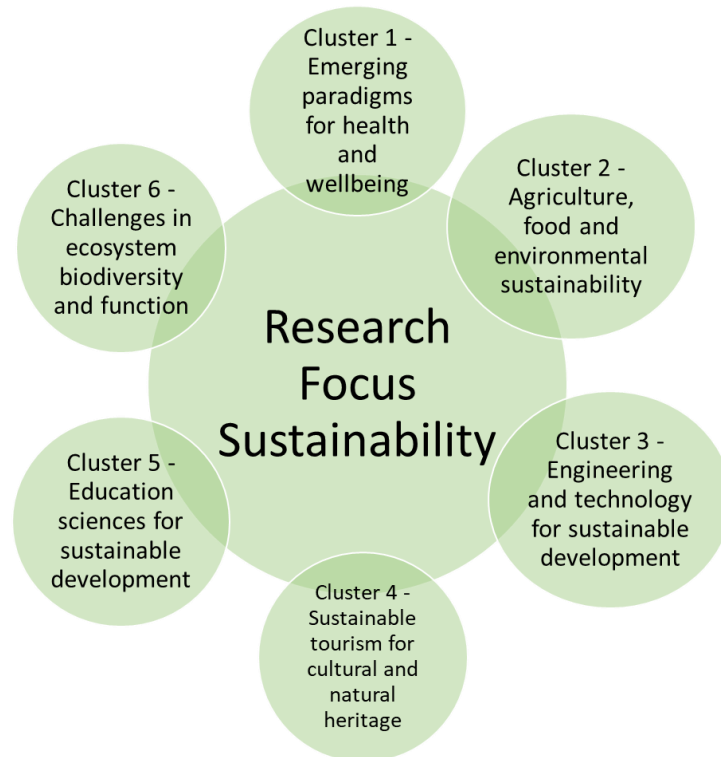
General concept:

EU GREEN is a project built on sustainability that aims at developing new learning and education models based on excellent European research. EU GREEN, in its initial formulation, has identified an early research strategy by formulating 6 open and interacting large macro areas of investigation (research clusters) in the field of sustainability.

The contents of research clusters were formulated to address European and global problems that require urgent solutions such as demographic growth, the need to sustainably intensify food production and to modify through research and education our lifestyle, personal choices and impacts on ecosystems. The solutions to such problems require urgent, cross-disciplinary research as the dramatic effects of climate change are evident and many ecosystems, including urban and agroecosystems, are deeply impacted.

1. **Cluster 1 (Emerging paradigms for health and wellbeing)** deals with the concept of One Health and with our personal choices (e.g., our diet) as they link the planet with human health. Diets higher in refined sugars, fats, oils, and meats imply massive use of water and chemicals and indirectly contribute to global agricultural greenhouse gas emissions, global land clearing, biodiversity and ecosystem services loss, as well as increasing incidence of type II diabetes, coronary heart disease and other chronic non-communicable diseases that lower global life expectancies. Alternative diets that offer substantial health benefits could, if widely adopted, reduce the global impacts of agriculture on ecosystems, and help prevent chronic non-communicable diseases. This research cluster aims at improving healthy ageing and wellbeing through sustainable urban and agricultural development and sustainable diets. Cultural areas of this cluster include medicine, nursing, nutrition, human sciences, education sciences as well as economy and law.
2. **Cluster 2 (Agriculture, food, and environmental sustainability)** deals with the identification of new agricultural practices reducing the amounts of pollutants and waste produced by agro-livestock activity and the processing industry and the impacts on biodiversity, the functional balance of soils, the efficiency of depurative processes, and the quality of soil, water and atmosphere. This research cluster aims at identifying innovative pathways to facilitate an agro-ecological transition, minimising wastes, and promoting sustainability, resilience, adaptation to climate changes, biodiversity and functioning of agroecosystems. Cultural areas of this cluster include Agronomy, Veterinary, Biotechnology, Geology, Architecture, Economy.
3. **Cluster 3 (Engineering and technology for sustainable development)** aims to create sustainable technical solutions in the fields of energy supply, logistics, mobility, circular economy, and materials research. This research cluster aims at minimising the negative impact of the increasing demand for energy, materials, living and housing space, food, and the land for its production through sustainable and innovative engineering and technology. Cultural areas of this cluster include Engineering, Chemistry, Environmental Sciences.
4. **Cluster 4 (Sustainable tourism for cultural and natural heritage)** addresses integrated approaches to achieve a competitive and sustainable European tourism policy, minimising the negative impacts of tourism on society/environment and maximising tourism's positive and creative contribution to local economies, the conservation of natural and cultural heritage, and the quality of life of hosts and visitors. Objectives of this research cluster are to enhance alternative and diversified sustainable tourism practices, aiming at the valorisation of art, culture, natural landscapes, and heritage. Cultural areas of this cluster include Human sciences, Economy, Law.
5. **Cluster 5 (Education sciences for sustainable development)** deals with the development of integral approaches and pedagogies to facilitate reflection on the cognitive and socio-emotional processes underpinning people's learning, everyday life choices and decision-taking. Aims of this research cluster are to promote awareness about local, seasonal, organic, fair trade and higher animal welfare foods, and about ecological differences, impacts and environmental sustainability of different diets (healthier eating in a healthier environment). Cultural areas of this cluster include Education sciences, human sciences, law.
6. **Cluster 6 (Challenges in ecosystem biodiversity and function, A macroregional evaluation)** aims at evaluating, preserving, and improving ecosystems biodiversity and functioning, to assess anthropogenic impacts and mitigate greenhouse gas emission and build resilience

against climate change. Objectives of this research cluster are to develop indicators of ecosystem degradation, biodiversity, and ecosystem functioning, to set reference conditions and to design pathways of recovery while monitoring the effects of ecological interventions towards sustainable scenarios. Cultural areas of this cluster include Ecology, Zoology, Botany, Forestry, Environmental Sciences, Economy.



As part of the initial strategy, the overview of each allied University set of expertise within the cultural areas of the 6 clusters allowed to identify for every cluster a leader and co-leader, in charge of coordinating the activities and to implement cluster-specific strategies of communication, researcher involvement and brainstorming. **The leaders and co-leaders of each cluster have a coordination role to play their clusters: they are responsible for encouraging and motivating the cluster's members.** They should be proactive, dynamic and provide insights on the development of the cluster. **Clusters are not meant to be closed boxes**, rather open, interacting spaces of discussion and research. It is expected that along with the EU GREEN project development the original formulation of the clusters will slightly or deeply change, become more articulated and focused on emerging issues or specific calls and adapt to the alliance scientific background. It is also expected that after an early phase of discussion within each cluster a second phase will see **inter-clusters meetings** to become more and more frequent. The proposal of new research clusters by the allied Universities, within or beyond the initial general research theme is also expected and welcome, along with the mutual knowledge of the multiple local expertise and area of excellence. A dedicated process will be established in the coming meetings by the JRC.

The clusters will enable the realisation of task 3.5, **namely joint degrees**. Indeed, the choice of the themes of the selected joint degrees will be based on the work of the clusters. The work of the clusters is therefore very important: **depending on the level of progress of their group, they will be able to make their theme more widely known and create a joint course.**

They will meet at least every two months the first year.

Clusters composition: as indicated above, clusters are not meant to be closed boxes, meaning that the **participation of every researcher from an EU GREEN university is welcome**. The participation of the 9 universities in each cluster is a desiderata, not an obligation. Participation should depend on the research strengths of the university in question. If an university does not have researchers working on the themes of one of the clusters, it is not due to participate. However, **cluster participants are present as representatives of their institutions** (and not only of their own research topic). According to the topics of the meeting, they may ask to be joined/replaced by more relevant participants. The aim of the clusters is also to create and reinforce the links between our 9 universities, for this reason the participation of all is not an obstacle, rather an opportunity. Each researcher should have the possibility, according to his/her interests, to take part in the work of the clusters.

Along with the growth of Cluster topics, leaders **are encouraged to subdivide their group in more specific research units (e.g., subclusters)**. Indeed, some clusters are very broad (i.e., cluster 2 dealing with agriculture, food, and environmental sustainability) and may feel the need to create subgroups to cover the wide range of research topics implemented in the 9 institutions. In that case, cluster leaders and co-leaders may not be the one in charge of the sub-groups, but they must collectively nominate someone in charge and follow the advancement and coordinate the whole group. In order to avoid an excess of entropy and keep the flow of information constant and ordered, cluster leaders and co-leaders are asked to coordinate and maintain active the communication within and among clusters and the other research-related committees.



General objectives of the clusters

More specifically, they are asked to interact with:

- a) the JCR by regularly reporting their work during the JRC meetings.
- b) the Task Force, that will organise regular trainings on European projects to inform the clusters leaders and participants about calls and research opportunities. One European project officer from the UA team is dedicated to each cluster. They follow the meetings and inform the researchers on the European calls.

Roles of leaders, co-leaders, and participants

| Cluster leaders and co-leaders | Cluster participants |
|---|--|
| Ensure the project objectives are achieved. Contribute to the cluster continuous | Actively participate in the cluster meetings, contribute to the definition of the action plan |

| | |
|--|--|
| improvement and growth. | and its implementation. |
| Are a driving and creative force of the cluster. Create a team spirit among participants. | In the cluster: act as representative of all the research done in his/her university and not only as for his/her own research. |
| Shall use a participatory methodology to define the cluster action plan (and not define it by themselves). | In his/her university: act as representative of the cluster and report the work done to other interested researchers and the EU GREEN local coordinator. |
| Set up a meeting calendar for the entire year , send the agenda and the relevant documents at least one week in advance. | May create a local team in his/her university to help to implement WP tasks and help identify academic staff doing research in specific sustainability field and corresponding research interests. |
| Ensure that the participants are correctly informed about the current state of WP3 and work in a coordinated manner. | When research calls are open, disseminate them internally and coordinate efforts to submit joint proposals. |
| Are responsible for organising the cluster meetings and coordinate the work, for representing their cluster in front of the JRC and for participate to the Coordination Clusters Meetings. | Try to identify synergies with existing projects that may interest in EU GREEN network. |
| When a new member enters his/her cluster, are responsible for briefing about the objectives and achievements so far. | Encourage transdisciplinary teams, joint projects, involvements of students. |

Regular clusters' coordination meetings will be organised at least twice a year by the WP3 leader. Those meetings will gather the clusters leaders and co-leaders. They will aim at coordinating and monitoring the cluster's work. More meetings can be organised upon request of one of the members.

2023 calendar meeting:

- Friday 13th January 14h-16h
- Physical meeting during the EU GREEN staff week in Angers in June (see below)

EU GREEN Research Staff Week in Angers:

A Research Staff Week will be organised in Angers from the 26th to the 29th of June 2023 **for the members of the Joint Research Commission, the 6 clusters and the European Task Force.**

Theme: Maximising research opportunities inside EU GREEN or How to develop an effective EU GREEN research network.



Program:

- Presentation of the state-of-the-art of each cluster to the Joint Research Commission: objectives, workplan and also project abstracts
- Creative session on enhancing EU GREEN research collaborations.
- Training on Horizon Europe opportunities.
- Training on how to build a European proposal.
- Parallel working sessions of the JRC, the clusters and the European task force.
- etc.

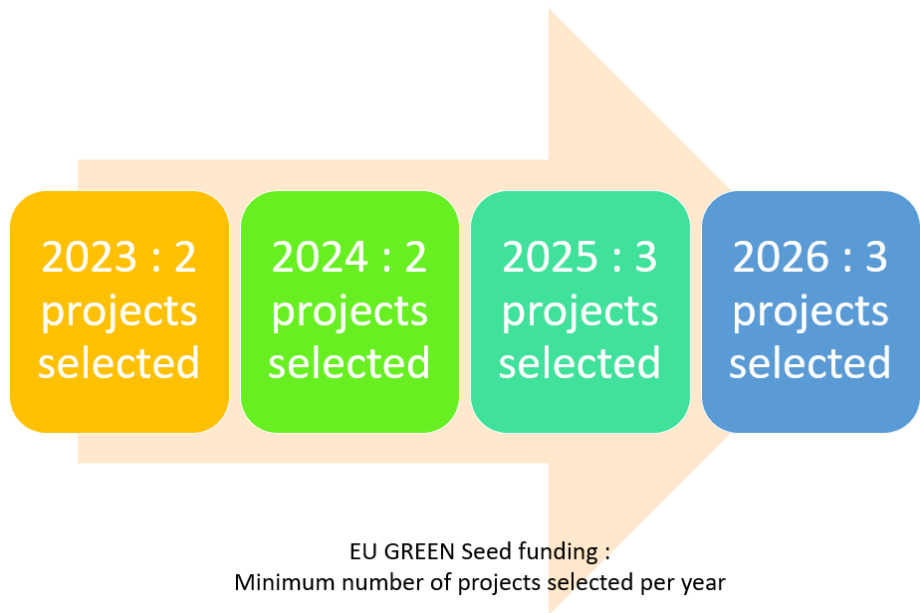
5.5.3 The support for joint research projects

A yearly joint research project call will be set up. Researchers from EU GREEN partner universities can apply for funding to develop collaborative research and innovation projects. Projects funded will be used as **seed funding**: such funding is believed to leverage inter-university collaboration.

During the global period of the project, we plan to support 10 projects of 20 000€ at the maximum each. Participation of early career researchers will be encouraged.

The projects will of course address the cluster's topic and those addressing interactions between clusters will receive special attention during the selection process. The projects should respond to sustainability challenges at the European or global level.

The project proposals should involve at least 3 researchers from three different EU GREEN partner universities and cover at least one cluster topic.



2023-2024 Calendar:

- April to June: Design phase: procedure and rules to be defined.
- July to September: Dissemination phase - publication of the first call
- October: Deadline of the first call
- November: Evaluation of the proposals
- December: Announcement of the laureates and launch of the first projects
- January: First review to prepare call 2

A dedicated evaluation procedure will be proposed to assess the proposals including a first review from the Cluster Commissions and a final decision made at the level of the Joint Research Commission.

5.5.4 The Researchers Mobility Program

EU GREEN offers mobility opportunities for the research staff of its nine partner universities through an annual dedicated call for proposals for funding mobility between partner institutions. The objective of the Researcher Mobility Program is to support research visits of EU GREEN researchers across EU GREEN partner universities, to foster research collaborations and to allow the sharing of expertise and infrastructures and the development of joint research activities in line with EU GREEN's priorities. The program will also boost cluster's researchers to apply to EU funding. Priority will be given to early-stage researchers.

The mobility program will concern staff (researchers and administrative staff) and students (Master and PhD). Both researchers and technical staff will have the opportunity to visit other consortium labs either to be trained on certain protocols and processes or to transfer knowledge and technology. Also, students will have the opportunity to be trained, perform their research thesis or execute their mobility within alliance partners.

The program may include mobility for:

- Participation in conferences or seminars organised in the frame of EU GREEN.
- Secondment or internship for PhD students.
- Laboratory experimentation.
- Training on protocols, processes etc.
- Co-supervision thesis.
- Joint supervision of Master and PhD Students.
- Consortia meetings working on the application of Horizon Europe projects.

This programme should be applied for when traditional Erasmus+ funds (STT, STA) cannot be obtained, and it is strictly limited to researchers involved in EU GREEN-related activities.

2023-2024 Calendar:

April to June: Design phase: procedure and rules to be defined by the JRC.

July to September: Dissemination phase - publication of the first call.

October: Deadline of the first call.

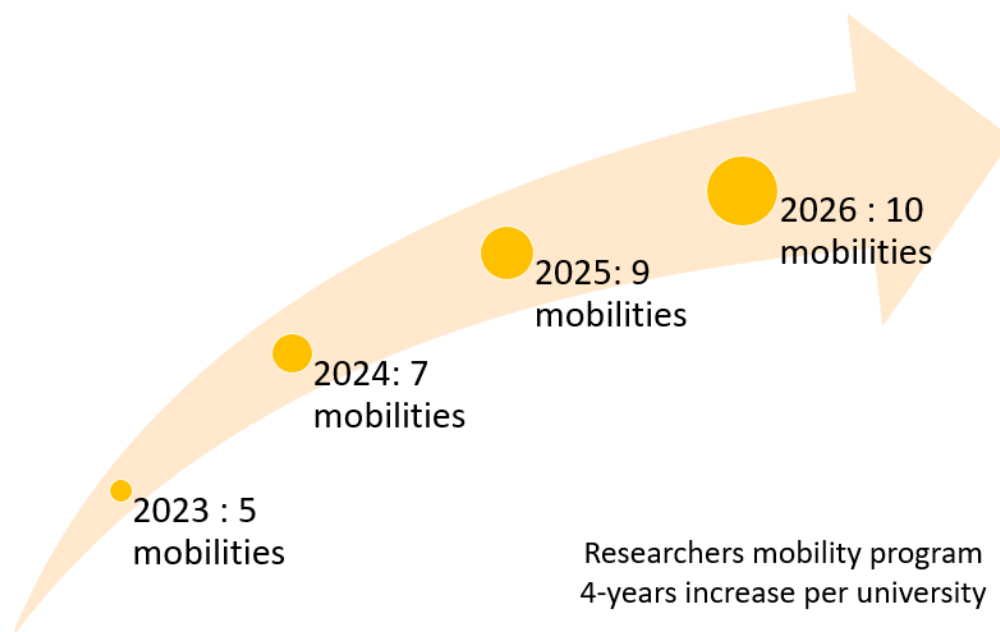
November: Evaluation of the proposals.

December: Announcement of the laureates and launch of the first mobilities.

January: First review to prepare call 2.

The program will be funded **by each university** through their own EU GREEN budget. In year 1 (2023), each university will propose 5 mobilities for 5 researchers, and then gradually the number will increase: year 2, 7 mobilities, year 3, 9 and year 4, 10.





A general call of proposal will be launched, and a common evaluation of the application will be performed by the clusters' leaders and validated by the Joint Research Commission.



The general and regular meetings (virtual or in-person) organised by the six clusters are not concerned by this program as they received dedicated EU GREEN funding for the implementation and management of the clusters. As EU GREEN fully-fledged bodies and part of the WP3 governance, the six clusters will not have to apply to this researcher's mobility program to meet. Their mobility is acquired by right.

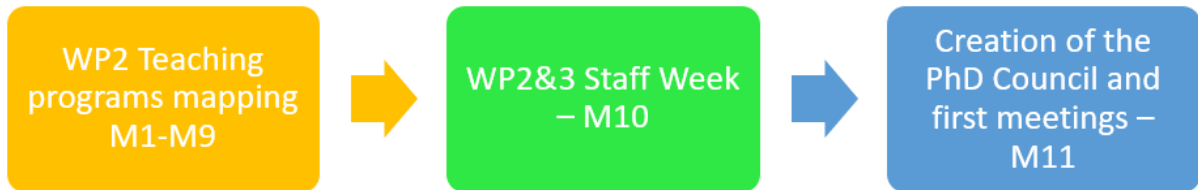
5.5.5. The co-design and implementation of the Joint Master and PhD program

In the long-term EU GREEN will create multiple **Master programs and joint PhD programs aligned with each of the six research clusters of excellence** (see **Task 2.8 in Work Package 2**). They will be offered by a **Graduate School**. The creation of a EU GREEN Graduate School will enrich students' knowledge and an interdisciplinary approach will expose students with perspectives and input from other fields. **The role of the clusters will be essential to define the topics of the joint programs.**

Design phase: In line with the **Work Package 2** strategy, from year 1 to year 3 a PhD Council will be created. It will consist of scientists, experts in the field of doctoral education and students to enhance and intensify the collaboration in the field of doctoral training within the Alliance and to explore the creation of an EU GREEN Graduate School and joint doctorate. It will also collect model approaches on various aspects such as recruitment, application procedures, internationalisation, interdisciplinarity, doctoral supervision as well as support for scientific activities such as publishing and conference participation. The WP2 is currently mapping the different Bachelor and Master programs offered in our universities. **The results will be presented to the WP2 Commission and the 6 research clusters during a staff week organised from the 9th to 13th October.** The staff week will



provide space to discuss how to design and implement the joint programs and which topics they will concern. The PhD Council will be created and hold its first meeting after the Staff Week.



Implementation phase: During year 4, a first pilot EU GREEN PhD program and Master Program will be offered in one of the more structured clusters. To assess the quality of this first-year Program, regular feedback from the students will be asked.

5.5.6 The Young researchers Blended Intensive Programs

The Erasmus+ Blended Intensive Programme (BIP) is a short mobility programme funded by the European Union.

It enables university members (students and/or staff) to carry out a hybrid mobility abroad.

It combines:

- A physical mobility abroad (from 5 to 30 days), with
- A virtual activity before, during or after the physical mobility (no minimum or maximum duration required).

The eligibility criteria for a BIP:

- A minimum of 3 higher education institutions from 3 different programme countries, including the coordinating institution.
- Minimum 15 participants from partner institutions (excluding coordinating participants).
- Duration of physical mobility: between 5 and 30 days.
- Virtual activity: no duration required: no funding.
- Obligation to provide added value: teaching that provides new perspectives.
- The majority or all the BIP activities must be training activities and a minority must be research activities.

The BIP will target young researchers (PhD and postdoctoral students) and focus on development of transferable key competences required for achieving best results in research and identifying further professional opportunities.

Therefore, topics of our PhD BIP include management of scientific research data, Open Science, Citizen-driven research, project management, research integrity and ethics, intellectual property and patent system, communication skills development, etc.

It will also secure a career in academia and outside academia on sustainability issues. Activities such as career Planning activities (individual coaching and mentoring) and career Promotion (building ties between research, development, and innovation) will be proposed.

Young researchers BIP provides the opportunity for intellectually curious doctoral and postdoctoral students to explore new knowledge within the alliance partners, to expand cultural awareness and to exchange experience.

The BIP:

- equips participants with essential skills that are necessary in all fields of science.
- provides participants valuable networking opportunities.
- creates and shares a friendly social environment for the EU GREEN students.

The BIP will be proposed on a yearly basis (starting in M18) in a different partner university.

Calendar:

- M4: Creation a dedicated working group (a core group of 3 universities with at least a leading one who will host the first edition).
- M5 to M12: Design the programme of the BIP.
- M13: Dissemination campaign.
- M15: Selection of the participants.
- M18: First edition of the BIP.

Other new BIP and/or Summer Schools initiatives emerging directly from the cluster will be encouraged.

The support to already existing scientific short programs dealing with sustainability issues to involve EU GREEN students will also be encouraged. Each university is asked to dedicate at least 5 mobilities per year to allow participation of its students to EU GREEN members short programs (BIP, Summer Schools etc.).

5.5.7 Research career development centre

By connecting the different offices of the alliance's partners, this centre will seek to better circulate the information and to ensure that researchers are provided with quality career guidance (employability support courses/seminars, etc.) and information services (job, internship, and funding opportunities) with the goal of facilitating and empowering them to manage career development and make effective career transitions - either in academia or in business. This involves equipping them with a complete set of skills that go beyond the academic realm (e.g., soft skills) and will promote joint cooperation in close collaboration with the Mobility and Engagement offices at the level of the Alliance and of each university. **An inventory of European companies working on sustainability** will be created to enhance researchers' professional opportunities, together with the Engagement Commission. **A common job and internship platform** will be created to share career opportunities on sustainability issues among PhD and postdoctoral students, also together with the Engagement Commission.

Both these platforms will be integrated within the GREENWORK, the Alliance's shared network, in coordination with the Communication, Dissemination and Impact Commission.



A questionnaire on their needs will be sent to the current PhD students and postdoc to better understand their needs to enter the professional market. **A career stories section of former PhD and postdocs** on the EU GREEN website will be envisaged as well as **a common program of online workshops on career management**.

Some of our universities as UNIPR or UA are implementing dedicated incentive programs on the MSCA Post-doctoral call of proposal. Those initiatives (called “Bootcamp” in UNIPR and “Springboard toward MSCA PF” in UA) help young researchers to start their career and to obtain a prestigious MSCA PF grant. **The upscaling of those practices will be considered by the EU GREEN partners**. And finally, we will also envisage **the application of an MSCA Post-doctoral COFUND Program** between the EU GREEN universities to offer positions in the frame of the 6 clusters.

5.5.8 The Research Portal

The EU GREEN Research Portal will be an interconnectivity portal, where users may search for people involved in EU-GREEN, their affiliations, scientific interests, research infrastructures and research teams. We will first need to record the research units and teams of all participating Universities. The recorded data will be entered in the Research Portal, which will be available online for all members. Research Portal users will be able to look up scientific interests, past and ongoing projects, researcher contacts, through smart searches.

The complete insight into the research and teaching potential of the EU-GREEN alliance, is expected to facilitate the formation of consortia for future project proposals, researcher, and student mobility.

Research resources cartography: As EU GREEN universities, we aim to promote the sharing of resources to further strengthen excellent research within the Alliance.

EU GREEN’s universities host a wealth of relevant resources for research. By sharing these resources, we aim not only to highlight the many different areas of activity within EU GREEN, but also to foster a sense of community among our researchers.

5.5.9 HRS4R label

The **Human Resources Strategy for Researchers** supports universities in the implementation of the Charter for Researchers and the Code of Conduct for the Recruitment of Researchers, thereby helping to enhance the attractiveness of the alliance to talented national and international researchers. Research integrity, gender equality, open science practices will be promoted through the seal.

The Universities of Angers and Wroclaw are the only partners of the alliance that already have the seal. Some other partners have started the process. **Common workshops based on best practices will be implemented** to support the other partners in their application process and more particularly from a research perspective.

At the end of the four-years project, **3 partner universities (UNIPR, OVGU and ATU)** will apply to obtain the seal and the remaining 4 will start the application process (i.e., HiG plans to start the initial phase during 2023).



Work methodology:

- creation of an HRS4R Task Force composed of the relevant persons in UA and UPWr - M5
- drafting of a need analysis questionnaire by UA and UPWr - M6-7
- dissemination of the question to the other partners - M8-9
- analysis of the questionnaire M10-11
- organisation of study-visits and virtual best-practises workshops M12-24

5.6 Indicators to monitor and assess the general implementation of WP3

Those indicators will be monitored by the Joint Research Commission on an annual basis.

Cluster specific indicators:

- Meeting calendar defined annually.
- Clusters' meeting agenda, list of attendance and report.
- Absenteeism rate.
- Satisfaction of cluster participants.
- Respect for deadlines.
- Annual report (template provided) and presentation during the JRC.
- Annual roadmap per cluster.

Task force specific indicators:

- Meeting calendar defined annually.
- Clusters' meeting agenda, list of attendance and report.
- Absenteeism rate.
- Satisfaction of participants.
- Respect for deadlines.
- Number of trainings for the clusters organised.
- Annual report (template provided) and presentation during the JRC.
- Annual Roadmap.

General execution indicators (long-term):

- Number of submitted joint European or international projects involving at least 2 partners.
- Number of approved joint European or international projects involving at least 2 partners.
- Number of joint publications.
- Number of co-supervision thesis.
- Number of joint-multiple degree graduate programmes.
- Respect for the milestones to achieve the deliverables.
- Respect the deadline to achieve the deliverables.

In case of failure or lack of one of the WP3 sub-bodies, the Joint Research Commission will act:

- by asking the University in charge of a specific cluster or sub-group to change the leader and/or co-leader.
- by asking for a change of participants.
- by changing the scope, renaming, or terminating a cluster.

If the need arises, the JRC may decide to open a new thematic cluster.

5.7 Some encouraging preliminary results

The EU GREEN project is very recent but nevertheless some results of this privileged partnership between our institutions can already be observed. They should allow us to remain optimistic despite the innovative and ambitious nature of the project.

| Preliminary results | |
|---------------------|--|
| 1 | <p>The ongoing project TECSKILL “Green and digital competences development for European engineering PhD candidates”. The project funded in 2022 by the Erasmus+ Program “Cooperation Partnership” involves the 4 following EU GREEN partners:</p> <ul style="list-style-type: none"> - Hogskolan I Gavle - Universidad de Extremadura (Líder) - Universidade de Évora - Università degli Studi di Parma <p>The TECSKILL objective is to develop the 12 green and 21 digital competences in engineering PhD. candidates in Europe, through international training experiences and appropriate learning methodologies. TECSKILL will develop an innovative methodology that will incorporate the Challenge Based Learning methodology and the Serious Game philosophy. Besides, online training courses will be developed, fostering the exchange and flow of knowledge between the organisations.</p> |
| 2 | <p>The project YEUTOPIA has been submitted in March 2023 to the European Commission (Europe Creative program). Two EU GREEN universities are members of the consortium: UA and UE. The project is coordinated by an Italian NGO. It is about engaging and empowering youth in actively developing innovative ideas built on cultural heritage for new European utopias.</p> |
| 3 | <p>The KA 220 Erasmus+ project SLS4TEENS was submitted in March 2023 to the European Commission. The project is coordinated by UA and included 3 EU GREEN partners (OVGU, UEx and UNIPR). The main objective is to improve foreign/second language teaching by introducing an innovative method to active and pre-service language teachers, with the final aim of improving foreign/second language teaching skills.</p> |
| 4 | <p>Mariastella Rappoccio is the first EU GREEN student moving from Parma to Angers with the ERASMUS SMT support. Her master thesis in Ecology, on amphibians, is co-tutored by a French and an Italian professor and lays within cluster 6 on macroregional diversity issues.</p> |

6. The role of cluster in WP3 strategy

6.1 How the clusters thematic respond to the Sustainable Development Goals

| Sustainable Development Goals | Cluster 1 | Cluster 2 | Cluster 3 | Cluster 4 | Cluster 5 | Cluster 6 |
|---|-----------|-----------|-----------|-----------|-----------|-----------|
| GOAL 1: No Poverty | x | | | x | | |
| GOAL 2: Zero Hunger | | x | | | | |
| GOAL 3: Good Health and Well-being | x | x | x | x | x | x |
| GOAL 4: Quality Education | x | | | | x | |
| GOAL 5: Gender Equality | x | x | | x | x | |
| GOAL 6: Clean Water and Sanitation | x | | x | x | | x |
| GOAL 7: Affordable and Clean Energy | | | x | x | | |
| GOAL 8: Decent Work and Economic Growth | x | x | | x | x | |
| GOAL 9: Industry, Innovation and Infrastructure | x | | x | | | |
| GOAL 10: Reduced Inequality | x | | | x | x | |
| GOAL 11: Sustainable Cities and Communities | x | x | x | x | x | x |
| GOAL 12: Responsible Consumption and Production | x | x | x | x | x | |
| GOAL 13: Climate Action | | x | | x | | x |
| GOAL 14: Life Below Water | | x | | x | | x |
| GOAL 15: Life on Land | | x | | x | | x |
| GOAL 16: Peace and Justice Strong Institutions | x | x | | | | |
| GOAL 17: Partnerships to achieve the Goal | x | x | x | x | x | x |

Examples of integration of the SDG in each cluster:

Cluster 4: Our scope is to promote research about Sustainable tourism for cultural and natural heritage. As such, our objective is to analyse different models of tourism, aiming, on one hand, to **reduce negative impacts on the environment**, by improving environmental management and promoting environmental education (SDG 6, SDG12, 13, 14 and 15). We intend to study more especially models of **slow tourism associated with sporting tourism** (e.g., riding, trekking, cycling, canoeing) that promote affordable and **clean energy** (SDG 7) and contribute to **limiting pollution of water**, earth and climate (SDG6, 13, 14).

Our objective is also to support models that maximise positive impacts, by fostering **economic local development**, thank to creative and innovative tourism (SDG 1, SDG8, SDG 10), that promote **better social inclusion** (SDG11), including **gender equity** (SDG5) and **minorities inclusion**, but also better communication and understanding between **urban and rural areas, favouring wellness and good health**, especially thank to slow and sporting tourism (SDG 3).

Last but not least, we aim to **study and promote tourism models that support natural and cultural heritage revitalisation**, combining conservation and constant reinvention (SDG 15), within communities' involvement and also private and public actors, in participating governance (SDG17). Our objective is to contribute to enhance **bio-cultural diversity and to protect the natural and cultural heritage**, especially of rural areas. It aims at enriching personal experiences, the environment, and all forms of biodiversity awareness (nature, local society, and local culture in general).

We aim to contribute **to promote sustainable tourism development, especially in rural and remote areas**, that has been fragilized by the global trade liberalisation to (re)distribute richness in small communities (SDG 1 &10).



Cluster 5: As we aim to integrate with most of the SDG, we will give here some examples and the development of the cluster work in relationship with other clusters and WPs will develop further. All SDGs provide specific topics to be addressed in educational systems from early childhood education into university, as well as in community work. It is important to adopt an approach that considers all the dimensions of sustainable development (environmental, social and economic) and their interactions, supporting systemic thinking (one of the sustainability competencies) throughout our research work.

- Goal 3. Good health and well-being: by addressing these issues in architectural training, health sciences and other professional courses.
- Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all: by promoting the studies in HE for all, particularly mature students, or other identified groups with particular needs.
- Goal 5. Gender and Diversity equality: by addressing this issue in our courses and research projects and being unselective.
- Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation; by considering the robustness of the built environment and by addressing this issue in our courses and research projects/
- Goal 10. Reduced inequalities: by being inclusive and open to all to learn and ongoing monitoring of such diversity.
- Goal 11: Make cities and human settlements inclusive, safe, resilient, and sustainable: by enhancing the quality of the training of historians, planners, architects, landscape architects, social workers; urban designers.

Cluster 6: The cluster research work will tackle the SDGs in a number of ways. The knowledge generated through the research work will help to make informed decisions related to the SDGs described in the previous section. This knowledge will be of interest for stakeholders and for policy makers. For instance, a non-exhaustive list of potential outcomes of the cluster are to:

- Establish research project(s) that involves universities and local landowners or managers on small portions of land and show that diversity conservation actually improves productivity and stability of ecosystems.
- Demonstrate the real and pervasive effects of climate change on many ecosystem services and clarify to the wider public the implications of these effects on everyday life.
- Propose research projects with implementation of simple but beneficial changes of management on small areas of agro-systems.
- Identify biodiversity indicators to assess the impact of climate change and measure agro-ecosystem degradation in time and diversity depauperization.
- Developing eco-friendly agricultural management strategies.

6.2 Short, medium, and long-term objectives of the clusters

From M1 to M6 each cluster will define its own agenda according to the following objectives:

| To get to know each other better | To develop a solid international research network through collaborative projects | To transfer our results into society and solve societal challenges |
|---|--|---|
| <ul style="list-style-type: none"> • Identification of common research interests • Organisation of online presentation of research units and results • Sharing expertise, resources, methodologies and results • Sharing previous and currently funded project details • Identifying funding opportunities • Creation of database of expertise, infrastructure, knowledge available to partners | <ul style="list-style-type: none"> • Organising Blended Intensive Programs • Developing thesis co-supervision • Writing common European projects • Elaboration of educational programs or courses • Developing inter-clustering collaborations • Organising interinstitutional master theses • Creating a postgraduate network and a dedicated research ecosystem | <ul style="list-style-type: none"> • Organising international conferences • Publishing joint papers, articles, books • Involving external stakeholders in the clusters |

Then, in M6 during the WP3 Staff week in Angers, each cluster will present to the JRC a detailed agenda and Gantt chart for the coming months and project ideas (abstract) for the seed funding.

As already explained in part 5, the clusters will have an essential role in the implementation of task 3.5, namely the joint programs. The decision to support through EU GREEN the implementation of a cluster thematic joint program will depend on the quality of the work made by the cluster.

6.3 Scientific scope of each cluster

Cluster 1

Objectives of this research cluster are to improve healthy ageing and wellbeing through sustainable urban and agricultural development and sustainable diets.

Example of relevant research topics

- Healthy ageing and the prevention of chronic diseases.
- Sustainable urban development for improved people's well-being.
- Pharmacological properties of bioactive natural compounds.
- New ways to optimise the management of medical and pharmaceutical waste.
- Oncology, Immunology, and Infectious Diseases.



- Vascular and metabolic dysfunctions.
- Nanomedicine.
- Epidemiology in occupational health and ergonomics (French leader in this domain).
- Neurodegenerative diseases, Respiratory and cardiovascular diseases, Bioengineering, Immunology and Molecular Medicine of Inflammation, and Personalised medicine and mental health.
- Caring Science.
- Occupational Health Science.
- Elderly Care – Healthy Ageing.
- Living with Long Term Illness.
- Staff Working Environment, Learning and Leadership.
- New drugs (protein-based, radiopharmaceuticals).
- Advanced sensors for human health.
- Diet and human health.
- One Health approach for the reduction of chemicals in agriculture.
- One Health approach for urban regeneration.

Cluster 2

Its objective is to identify innovative pathways to facilitate an agro-ecological transition, minimising wastes and promoting sustainability, resilience, adaptation to climate changes, biodiversity and functioning of agroecosystem.

Example of relevant research topics

- Sustainable management of plant and seed health and quality (Angers, Parma, Wrocław, Oradea, Evora, Gävle).
- Quality of food products (Extremadura, Angers, Wrocław, Evora, Gävle, Parma).
- Consumers' acceptability, preference and emotions associated with food consumption (Angers, Extremadura, Wrocław).
- Environmental remediation (soil and water) (Evora, Parma, ATU).
- Rational use of resources and water in agrosystems (Extremadura, Evora, Oradea, Parma).
- Recovery of waste and by-products for the development of new ingredients and - biomaterials (Extremadura, Parma, Oradea, Wrocław, Evora, Gävle).
- Design of innovative agri-environmental policies and organisational models to promote the agro-ecological transition (Angers, Parma, Wrocław, Evora, ATU).
- Animal welfare, livestock production, and biodiversity conservation (Parma, ATU).
- Design and implementation of IoT systems for smart agriculture applications, including crop and livestock monitoring (Parma).
- Consumer protection and consumers' behaviour, food sustainability, regulation of novel foods, environmental protection (Parma, ATU).
- Analyse sustainable and unsustainable agricultural practices by means of fertilisers and water budgets, and evaluation of surface and groundwater contamination (Parma, ATU).
- Minimise impacts of aquaculture (Parma).

Cluster 3

The research cluster “Engineering and Technology for Sustainable Development” aims to create technical and, above all, sustainable solutions in the fields of energy supply, mobility, circular economy, and materials research. This research focus on optimising all areas of application has to be seen as an integral ingredient of a broader goal: achieving global sustainable development, with its wide-ranging agenda of environmental stewardship, inter-generational equity, social justice and geographical equity.

The cluster members hope to work toward the SDGs more efficiently in comparison to a situation, where sustainability is only one small aspect in separate projects at the different universities. They plan to explore opportunities for collaboration and synergies in relation to research on circular economy and digital transformation toward more sustainable development and decarbonisation of the built environment sector.

Example of relevant research topics

Electronics:

- Electronic aspects for miniaturised and intelligent medical devices.
- Robotics for smart farming.
- Digital twins and Artificial Intelligence applications for manufacturing processes maintenance and industrial logistics.

Wastewater/water treatment:

- Nature-based and technological solutions for wastewater and water management.

(Smart) materials:

- Stimuli-responsive materials.
- Material structure recognition using Artificial Neural Networks.
- Automation of material characterization processes using Machine Learning methods.

Resilient energy systems and renewable energies:

- Energy conversion and storage.
- Geothermal and Solar Energy Use for Sustainable Eco-agricultural Farms in Rural and Remote Areas.
- Ground Coupled Heat Pumps of High Technology.

Circular economy and smart industries:

- Sustainable supply chains and logistics.
- Circular economy in built environment.
- Digital Transformation & Emerging Technologies e.g., Embedded AI & ML for medical devices.
- Supply Chain Analytics for Circular Economy.
- Machine Learning applications for Sustainable Management of Industrial Equipment.
- Modelling and simulation of systems, decision systems based on fuzzy sets.
- Artificial Intelligence applications for manufacturing processes maintenance and industrial logistics.
- Manufacturing processes automation based on the industry 4.0 concept.

Environmental impact assessment:

- Quality of environment, soundscape, social acceptance, environmental psychology.



Cluster 4

The integrated approach to achieve a competitive and sustainable European tourism policy should aim at **minimising the negative impacts of tourism on society/environment** and **maximising tourism's positive and creative contribution to local economies, the conservation of natural and cultural heritage**, the quality of life of hosts and visitors. In this context, **concepts and guidelines promoted by European Union institutions** can be supported by definition of appropriate policies such as the sustainable management of destinations, integration of sustainability concerns by businesses and sustainability awareness by tourists.

Within a context of global trade liberalisation and constrained budgets, agriculture alone in many areas may result incapable of sustaining household livelihoods and socio-economic development. Among various alternatives for rural development, **alternative forms of tourism for domestic and foreign visitors can be explored. Ecotourism** is a form of sustainable tourism that consists of market-linked, long-term solutions for conserving and **enhancing bio-cultural diversity and protecting the natural and cultural heritage** of rural areas. It aims at enriching personal experiences, the environment, and all forms of biodiversity awareness (nature, local society, and local culture in general). It also (re)distributes richness in small communities.

Objectives of this research cluster are to enhance **alternative and diversified sustainable tourism practices, aiming at the valorisation of art, culture, natural landscapes and heritage.**

Example of relevant research topics

- Tourism and governance (Angers, ATU, Evora, Oradea, Parma).
- Tourism and Globalisation (Angers, Oradea, Evora).
- Tourism, sustainable territorial development including rural development (Angers, Oradea, Parma).
- Diversification of tourism practices (slow tourism, ecotourism, agrotourism, sporting tourism, etc.) (Angers, Evora, Oradea, Parma).
- Sociology of tourism, inclusion (minorities, gender), work, inequality (Angers, ATU, Extremadura, Parma).
- Tourism and heritage co-constitution (touristic valorisation and reinvention of arts, culture, and heritage). (Angers, Oradea, Evora, Extremadura).
- Heritage conservation practices and their interaction with economic-social dynamics (Extremadura, Angers, Evora, Parma, Oradea).
- Aesthetic of landscape and environment (Angers, Parma, Evora).
- Tourism and environmental impact (ATU).
- Climatic variables (climate change) and their impact on tourism and tourism activities (Oradea, Evora, Parma).
- Archaeology of ancient towns and landscapes and their impact on tourism (research and development, storytelling, new technologies, management of archaeological museums and sites) (Parma, ATU, Evora).
- Digital archaeology for heritage documentation and communication (Parma, ATU, Evora).
- Tourism and digital (Angers, Oradea).

Cluster 5

We are currently undergoing complex societal changes which demand novel approaches in education sciences to implement sustainability requirements both at institutional and individual levels. In line with cluster 6, we believe that a fundamental prerequisite for success of these approaches is the actual diversity of approaches. Together we bring a wide variety of points of view, experiences, traditions, and cultures; this will be a formidable source of solutions for many different environmental, economic and social problems.

We expect that a multidisciplinary approach, resulting from the shared experiences, knowledge, and expertise of the different members of the EUGREEN research clusters (WP3) and other work packages, will promote an effective know-how to create the foundation of a challenge-based education and culture focused on sustainability values.

Current approaches to sustainable development (in science and education) are often focused on knowledge of natural environments, socio-economic structures, technology, and governance dynamics, coherent with the different pillars of sustainability. This cognitive perspective, however, needs to be integrated regarding the ethical and eco-socio-emotional dimensions underpinning everyday life choices, decision-making and behaviours. This means that a transformative teaching/learning approach needs to be developed in the different educational contexts (from early years to university and in different disciplinary and professional areas). We aim to discuss theoretical views of Education for Sustainable Development among partners, in relation to the UNESCO ESD view (UNESCO, 2017), and build a common ground for transforming learning environments and building capacities of educators that will enable the transition for a more sustainable way of life at different scales and dimensions.

The main objectives of this research cluster are:

- i) Devise a collaborative, interdisciplinary and transdisciplinary research framework on education for sustainable development using a system thinking approach, engaged with an ethical and integrated world vision.
- ii) Develop research that maps integrated sustainable actions across the EU Green education for a sustainable development community of practice, i.e., students, academics, and external stakeholders, identifying gaps and needs.
- iii) Research the use of a variety of pedagogical approaches (both at national and international context) to support sustainable behaviours both at the individual and organisational level (from students, academics, non-academics to schools).
- iv) Research on hot topics (e.g., innovation, the SDGs, climate action and the circular economy) to inform curriculum design and its implementation, campus operation and management, community engagement, and cultural transformations.

The cluster results are expected to contribute to other work packages of the EU Green Project, namely WP2 and WP8, on the design of curricula and learning methods that creates an effective education for sustainability (WP2) as well actions to enhance a culture of sustainability in the academia (WP8).



Example of relevant research topics

- Visions on Education for Sustainable Development
- Education for sustainability (environmental, social, and cultural) from Early Childhood Education to Higher Education with diverse students
 - Within the academia and in cooperation with the WP 2 Education:
 - Academics (professionals and students) perspectives about sustainability (e.g., teachers, architects, arts, biologists and environmental scientists' chemists, engineers, humanities, law, economics).
 - Comparative study mapping teachers' beliefs towards diversity dimensions/teachers' training for teaching in a post-migrant society.
 - Psychological dimensions of students (digital learning and psychological portrait of non-traditional students; students well-being after pandemic; eco-anxiety among students).
 - Mapping teaching practices of ESD within our universities (A suite of case study vignettes could be developed of existing best practice across the network to start populating the website and turn it into an active resource).
 - Research on effective teaching practices on ESD – e.g., systematic literature review on methodologies/ practices in ESD.
 - Curricula for ESD in different areas of knowledge and courses for all EU Green partners.
 - Based on the mapping and SLR, design Teachers' training & other professionals' training in sustainability and evaluate its impacts.
 - Technologies and digital resources in the context of innovative training processes for sustainable topics.
 - Within the educational system & communities
 - Intervention / action-research projects in schools and communities for children, young people and older citizens perspectives, habits/behaviours (e.g., lifelong learning for climate action).
 - Art mediated EDS in schools and communities.
 - Experiential approaches in human-cultural-nature relationships.

Cluster 6

There is an alarming decline in biodiversity worldwide. In Europe alone, about 10 % of described species are threatened. For instance, according to the European Environment Agency, and only considering two taxonomic groups, the common bird and butterfly index has significantly decreased in the last decades in agricultural lands. Human activities are the main driver behind biodiversity loss. Human activities impact in several ways on natural ecosystems. One of the longest and more pervasive human-induced impacts occurring since the agricultural revolution is conversion of natural ecosystems in agricultural lands. With increasing population, there is an evident pressure on food production, not only from terrestrial but also from marine ecosystems. The increasing demand for food comes at the expense of the natural environment. Maximising yields at environmental cost is quite high especially in terms of natural resources deterioration.

Traditional/conventional food production systems come with deleterious impacts on the environment. Such agricultural practices have substantially contributed to soil, atmosphere and water



pollution, loss of biodiversity and ecosystem functioning, and climate change due to greenhouse gases (GHGs) emissions. In this context, the increasing awareness of nature conservation has triggered the adoption of ecological intensification measures, but its potential to halt the biodiversity loss remains still poorly known.

Other global change components jeopardise biodiversity levels too. Climate change and other interacting anthropogenic drivers are modifying all kinds of ecosystems and we should find new ways to manage these ecosystems, including agricultural ones, to increase their sustainability for themselves and for people's health.

Monitoring and performing observational, experimental, or modelling studies to quantify biodiversity loss and to understand mechanisms regulating biodiversity distribution, conservation and management are fundamental to understand ecosystem services conservation, regulation and erosion.

Within the EU GREEN alliance more than one hundred scientists study biodiversity and ecosystem functioning, ecosystem services maintenance and human-induced impacts on the natural ecosystem. These ecosystems must be studied and conserved to understand as much as we can about ecosystem functioning and their regulation of ecosystem services, but also to maintain the biggest treasure of evolution such as genetic diversity from microbiota to big mammals, from old forests to peatlands, from high mountains to plains and coastal habitats, from Arctic lakes to Mediterranean lagoons to deep ocean.

The main scope of this cluster is studying biodiversity and ecosystem functioning, assessing degradation trends and design scenarios or recovery to aid in decision making and maximise nature contribution to people along with the conservation of biodiversity.

Example of relevant research topics:

- Effects of climate change, and other global change components, on Biodiversity and ecosystem functioning in natural and anthropogenic habitats.
- Biodiversity conservation and management of multiple groups including vertebrate and invertebrate terrestrial, aquatic and marine species.
- Biodiversity conservation and management of plant species and communities in natural, semi-natural and anthropogenic habitats including agroecosystems.
- Robust management guidelines and indicators to monitor human effects on biodiversity at different territorial scales.
- Biodiversity conservation and landscape multi-functionality.
- Characterization, valorisation, and enrichment of agrobiodiversity.
- Restoration of degraded ecosystems.
- Assessment of landscape elements on agro-biodiversity conservation.
- Carbon cycle assessment and studying, developing and application of carbon sequestration strategies in key natural or managed ecosystems, such as forests and peatlands, and new strategies for carbon cycle improvement in anthropogenic ecosystems.
- Biodiversity contribution to ecosystem functioning and ecosystem services delivery.

- Improve natural and agro-ecosystems services stability and efficacy through higher genetic and species diversity.
- Promote sustainable use of natural and agro-ecosystems through scientific and technological progress.
- Functioning of interfaces between protected areas and areas of anthropic activities.
- Early detection and management of invasive species.
- Diversity of plant-associated microorganisms.

Conclusion

In a nutshell, this deliverable reports 3 different sets of information:

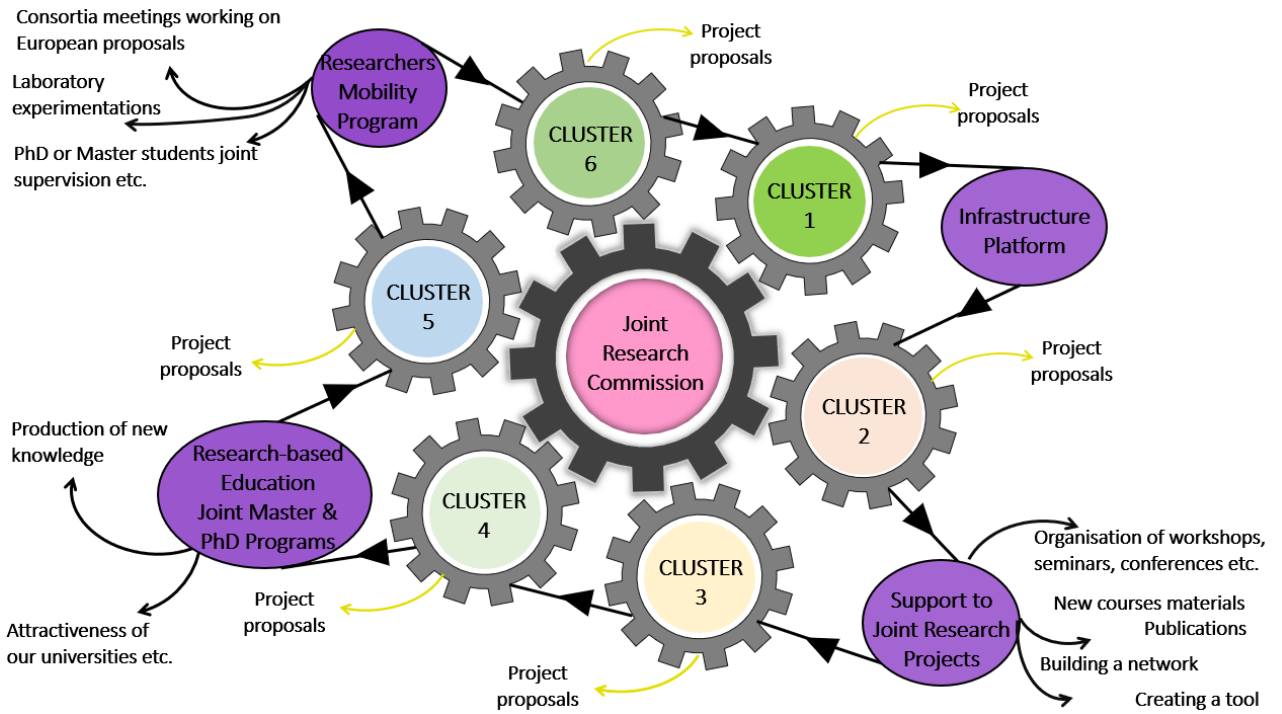
1. It summarises the research macro areas, the research potential, and the organisation of each EU GREEN University.
2. It summarises the tasks of the EU GREEN research work package, defining aims, initial roadmaps, detailed timing, and evaluation criteria.
3. It finally summarises the expanded contents and objectives of the 6 research clusters.

The EU GREEN research strategy is a work in progress that will be shaped starting from this set of information on resources and will develop according to the advancement of tasks and project results. Such research strategy aims at the valorisation of the allied Universities' complementary skills and practices and of their human resources to formulate and convert into competitive and successful research proposals the project ideas generated within the research clusters. It also aims at effective management of financed EU GREEN projects. Such a strategy will be multipurpose as it will produce an advancement of knowledge, providing solutions to local, regional and macroregional issues, stimulating the mobility of students and researchers, the creation of new and international master and doctoral courses and ultimately producing novel expertise that will be rapidly integrated into the job market. Most of the information reported in this deliverable was collected via detailed questionnaires, which revealed a very effective tool to collect, synthesise and report an impressive amount of heterogeneous information. While the answers to the questionnaires sent to vice rectors allowed us to compare how allied universities are structured, the answers to the questionnaire sent to the cluster leaders allow the analysis of how the allied universities expertise and cultural areas are represented or excluded in the 6 clusters. The latter analysis will help the identification of important research fields that need to be urgently included in the EU GREEN research strategy. Simultaneously, the list of the research topics identified during the initial rounds of brainstorming by the cluster leaders, reported in this document, has considerably expanded the original formulation of the clusters, adding new and relevant topics to the 6 general themes. Such expansion creates opportunities for other EU GREEN researchers to find a cultural niche and join the cluster groups.

The questionnaire tool will be likely used in the near future to gather important, missing information to further shape the research strategy and integrate allied universities procedures. Among the urgent missing information is the research strategy that each university has developed to facilitate researchers and how calls are announced and presented. An overview of how UniPr has facilitated researchers, by organising and circulating information and by presenting EU calls is reported as example in annex 6. EU GREEN should coordinate and harmonise the communication of all the calls and of the new EU tools (e.g., the doctoral networks) that can be relevant with respect to the cluster topics. Annex 5 of this document reports the list of instruments and infrastructures that are available to EU GREEN researchers, but this list will be further expanded to an extent that it will require a specific software tool to be useful. A platform where via simple queries instruments, software and infrastructures can be identified seems very useful and urgent to support researchers.

The EUGREEN research strategy identified at month III of the project is graphically summarised below:





Annex

Annex 1: 2022 Shanghai Global Ranking: position of the EU GREEN universities

| 2022 Shanghai Global Ranking of Academic Subjects | |
|---|---------|
| General ranking | |
| UNIPR | 501-600 |
| UEx | 601-700 |
| OVGU | 801-900 |

| Thematic 2022 Shanghai rankings in which several EU GREEN universities appear | | |
|---|--------------|------------|
| Subjects | Universities | |
| Mechanical Engineering | OVGU | UNIPR |
| Human Biological Sciences | OVGU | UNIPR |
| Psychology | OVGU | UNIPR |
| Earth sciences | UA | UEx |
| Clinical Medicine | UA | UEx UNIPR |
| Biological Sciences | UA | UNIPR |
| Food Science and Technology | UEx | UNIPR UPWr |
| Veterinary Sciences | UEx | UNIPR |
| Ecology | UEx | UE |

| Thematic 2022 Shanghai ranking per EU GREEN universities | | | |
|--|---------|------------------------------------|---------|
| Subject | Rank | Subject | Rank |
| OVGU | | UE | |
| Mechanical Engineering | 201-300 | Ecology | 401-500 |
| Human Biological Sciences | 201-300 | UNIPR | |
| Psychology | 301-400 | Food Science & Technology | 50 |
| Management | 401-500 | Veterinary Sciences | 101-150 |
| Chemical Engineering | 401-500 | Mechanical Engineering | 151-200 |
| UA | | Medical Technology | 151-200 |
| Earth Sciences | 151-200 | Mathematics | 201-300 |
| Agricultural Sciences | 301-400 | Pharmacy & Pharmaceutical Sciences | 201-300 |
| Clinical Medicine | 301-400 | Human Biological Sciences | 301-400 |
| Biological Sciences | 401-500 | Physics | 301-400 |
| UEx | | Psychology | 301-400 |
| Remote Sensing | 21 | Clinical Medicine | 401-500 |
| Electrical & Electronic Engineering | 76-100 | Biological Sciences | 401-500 |
| Food Science & Technology | 101-150 | UPWr | |
| Veterinary Sciences | 201-300 | Food Science & Technology | 101-150 |
| Clinical Medicine | 201-300 | Veterinary Sciences | 201-300 |
| Public Health | 201-300 | HiG | |
| Hospitality & Tourism Management | 201-300 | Nursing | 151-200 |
| Ecology | 301-400 | Education | 401-500 |
| Earth Sciences | 301-400 | | |

Annex 2: CWTS Leiden 2022 Ranking: position of the EU GREEN universities

| CWTS LEIDEN 2022 RANKING | | | | | | | | | |
|--|--------|-----|----|--------|-----|--------|----|--------|--------|
| Scientific impact | | | | | | | | | |
| | UA | HiG | UO | OVGU | ATU | UEx | UE | UNIPR | UPWr |
| European ranking | 413 | NA | NA | 254 | NA | 256 | NA | 190 | NA |
| Number of publications | 913 | | | 1769 | | 1743 | | 2460 | |
| Number of top 10% publication | 90 | | | 175 | | 136 | | 246 | |
| Collaborations | | | | | | | | | |
| Number of publications co-authored with another organisation | 2151 | NA | NA | 3768 | NA | 2509 | | 5116 | 1475 |
| Proportion of collaboration publications | 90,00% | | | 86,40% | | 76,80% | NA | 85,80% | 73,80% |
| Gender | | | | | | | | | |
| European ranking | 294 | NA | NA | 306 | NA | 305 | NA | 129 | 297 |
| Number of female authorship | 2811 | | | 2646 | | 2651 | | 7349 | 2773 |
| Proportion of female authorship | 37,50% | | | 24,80% | | 20,50% | | 41,80% | 52,20% |
| Open Access | | | | | | | | | |
| European ranking | 369 | NA | NA | 261 | NA | 347 | | 224 | 386 |
| Number of OA publications | 1499 | | | 2558 | | 1722 | | 3087 | 1327 |
| Proportion of OA publications | 63,10% | | | 58,70% | | 52,70% | NA | 51,80% | 66,40% |

Annex 3: Partner universities own research priorities

| University | Research priorities (key words) |
|------------|--|
| ATU | Environmental and Resource Sustainability, Digital Transformation & Emerging Technologies, Design, Innovation, Creativity and Enterprise, Life Sciences, Health and Wellbeing, Energy Transition/Decarbonisation, Advanced Manufacturing |
| HiG | Urban sustainability, Health promoting work, Innovative learning, Intelligent industry |
| OVGU | Precision for health and well-being and circular economy systems engineering + medical technology, automotive, particle technology, digital engineering, renewable energies |
| UA | Plant, Food & Environmental Sciences, Molecular materials with optical and electronic properties, Tourism |
| UEx | Biodiversity, Agri-food, Energy and green hydrogen, Biotechnology for health |
| UNIPR | All subjects connected to food (farming and breeding, food production, food safety, nutrition and ageing, packaging, recycling, food machinery etc.) + several strategic projects on sustainability, circular economy, ecology, new materials, energy production and storage etc. at the Depts. of Chemistry, Life Sciences and Environmental Sustainability; + Law, Politics and International Studies; + Food and Drug Department.; Engineering and Architecture In these four3 departments, ongoing projects on sustainability, circular economy, nutrition and food policy, ecology, new materials, energy production etc. |
| UO | Bioeconomy, Information and Communication Technology, Space and Security, Energy, environment and climate change, Eco-nanotechnologies and advanced materials, Health (including drug science), Sustainable development, Heritage and cultural identity, public service management reforms |
| UPWr | veterinary; animal science and fishing, food, and nutrition technology; biological sciences, agriculture, and horticulture; civil engineering and transport; environmental engineering, mining and energy; social and economic geography and spatial management |
| UE | Science and Agricultural Technologies; Environment, Territorial Planning and Renewable Energies; Heritage, Tourism and Arts; Digitalization and Data Science; Aerospace; Health and Well-being. |

Annex 4: List of the nine universities research groups and their affiliations to the EU GREEN clusters

| University | Scientific Area | Name of the research unit | Keywords of the unit | Is the unit already part of one EU GREEN research cluster? Yes/no |
|--------------------|-----------------|--|---|---|
| UE | Arts | CESEM | Music; Aesthetics; Culture and sociology | Yes, Cluster 1 (associating arts with new therapies) |
| | | CHAIA | Artistic, architectural and archaeological patrimony; Cultural heritage. | Yes, Cluster 3 |
| | Health | CHRC | Public health; Digital health; | Yes, Cluster 1 |
| | Social Sciences | CEL | Language; Linguistic; Culture and literature | No |
| | | CEFAGE | Strategic management; Entrepreneurship; Finances; Industrial economy; Development | Yes, cluster 2 |
| | | CICP | Political Sciences | No |
| | | CICS.NOVA.UÉvora | Social sciences; Critical thinking and policy making. | No |
| | | CIDEHUS | Social changes; Sustainable Tourism; | Yes, Cluster 4 |
| | | CIEP | Educations Science; Psychology | Yes, Cluster 5 |
| | | IHC | Contemporary history; Philosophy; Society; Culture | No |
| | PRAXIS | Philosophy, politics and culture; Human existence. | No | |
| Multi-disciplinary | HERCULES | Cultural patrimony study, through physical and material analysis | Yes, Cluster 4 | |

| | | | | |
|-----|---|--|--|--|
| | Science and Technology | CIMA | Mathematics | Yes, Cluster 1 |
| | | ICT | Earth sciences: atmosphere; climate; water; energy; natural resources. | Yes, Cluster 1 and Cluster 3 |
| | | LAQV-REQUIMTE | Sustainable chemistry; Molecular synthesis; Environment; Chemical processes. | No |
| | | MARE-UE | Aquatic ecosystems: fresh water, marine and estuarine. | Yes, Cluster 6. |
| | | MED | Agriculture, environment and development; Ecosystem sustainability. | Yes, Cluster 1; Cluster 2; partially Cluster 5 and Cluster 6 |
| | | NOVA LINCS | Computer science and informatic. | No |
| ATU | Environmental and Resource Sustainability | Marine and Freshwater Research Centre (MFRC) | Fisheries; Aquaculture; Conservation; Biodiversity; Aquatic pollution | Yes (clusters 2 & 6) |
| | | Centre for Environmental Research Innovation and Sustainability (CERIS) | Agroecology; Ecosystem management; Molecular ecology; Archaeology | Yes (clusters 2 & 6) |
| | | Sustainable Tourism Observatory at ATU (Research Group) | Tourism; Sustainability | Yes (cluster 4) |
| | | Sustainable Wood Technology, Design & Education (SWTDE) Group | Materials; Construction; Design; Education | Yes (cluster 5) |
| | | Mobilities Research Group (MRG) | Migration | No – EU GREEN clusters don't align to the group's scope |

| | | | | |
|--|--|---|---|--|
| | | Heritage Research Group (HRG) | History; Cultural heritage; Environmental heritage | No – EU GREEN clusters don't align to the group's scope |
| Digital Transformation & Emerging Technologies | | Wireless Applied Research Centre (WiSAR Lab) | Body are networks; RF and Wireless networks; Blockchain; Machine learning | No – EU GREEN clusters don't align to the group's scope |
| | | Mathematical Modelling and Intelligent Systems for Health and Environment (MISHE) Research Center. | Modelling; Statistics; Simulation; Materials | Yes (cluster 1) |
| | | Nanotechnology & Bioengineering Research Group (Nano-Bio) | Nanotechnology; Bioengineering; Food technology; Photocatalysis | Yes (cluster 6) |
| | | Mathematical Modelling Research Group (MMRG) | Mathematical modelling: Algebra; Coding theory; Biomedical engineering; Soft sensors; Bayesian networks; Material science modelling | Yes (cluster 1) |
| | | The Data Analytics and Computer Science Research Group (DACS) | Data analytics | No – EU GREEN clusters don't align to the group's scope |
| | | Design, Innovation, Creativity and Enterprise | DICE Research and Innovation Centre (Design, Innovation, Creativity and Enterprise) | Digital & Marketing Futures; Operations & Supply Chain; Entrepreneurship & Innovation; Learning & Skills; Human Performance; Social Change |

| | | | | | | |
|--|---|--|------------------|--|--|-----------------|
| | | Business Innovation Group (BRING) | Research Network | Economics; Blockchain | No – EU GREEN clusters don't align to the group's scope | |
| Life Sciences, Health and Wellbeing | Medical and Engineering Technologies Research Centre (MET) | | | Medical Imaging Technologies; | Yes (cluster 1) | |
| | | | | Anatomical Modelling & Physiological Replication; | | |
| | | | | Data Analytics & Visualisation; | | |
| | | | | Design Engineering & Verification; | | |
| | | | | Medicinal Nutrition & Sport Technologies | | |
| | Health and Biomedical Research Centre (HEAL) | | | | Population Health and Clinical Research; Biomedical and Wearable Technologies; | Yes (cluster 1) |
| | | | | | Digital Health Technologies; | |
| | | | | | Health Analytics, Evaluation and Policy | |
| Centre for Research in Social Professions (CRISP) | | | | Youth and community; Health; Psychology; Educational progression; Teaching and learning; Social and environmental sustainability; Policy; Interculturalism; Community development | Yes (cluster 1) | |
| | | | | | | |
| Cellular Health & Toxicology Research Group (CHAT) | | | | Radiation Biology; Mitochondrial Biology; Biomarker development; Drug discovery; Nutrition; Biosurfactants; Analytical techniques; Parasitology; Nanotoxicology biocompatibility testing; Microbiology | Yes (cluster 1) | |
| | | | | | | |
| | | Clinical Health & Nutrition Group (CHANCE) | | Clinical rehabilitation; health promotion; Preventative healthcare management | Yes (cluster 1) | |

| | | | | |
|-------------------------------|--|---|--|--|
| | | Food, Nutrition and Sports Performance | Nutrition; Sports and exercise | Yes (cluster 1) |
| | | SportsLab NW – Sports Innovation | Sports and exercise | Yes (cluster 1) |
| | | The Irish Concussion Research Group | Concussion; Sports and exercise | Yes (cluster 1) |
| | Energy transition / Decarbonisation | Sustainable Energy Applied Research Centre (SEARC) | Numerical analysis; Engineering modelling; Operations and maintenance; Levelised cost of energy; Life cycle analysis; Techno-economic analysis | No – EU GREEN clusters don't align to the group's scope |
| | | Integrated Sustainable Energy Research Group (iSET) | Renewable energy integration | No – EU GREEN clusters don't align to the group's scope |
| Advanced Manufacturing | Precision Engineering, Materials and Manufacturing Centre (PEM) | Engineering, material science, laser processing, micro-machining, polymer processing, rapid prototyping, general manufacturing process control; statistical process analysis. | No – EU GREEN clusters don't align to the group's scope | |
| HiG | Urban Sustainability | Urban Studio | This research area meets the societal challenge of creating long-lasting cities in which natural and human resources are used in a responsible manner for the sake of future generations. Our focus is urban development with human-environmental relations at its core. This research area includes development and analysis of technological systems, methods and strategies for information management as well as studies of indoor and outdoor | Partly. The research on sustainable energy systems is part of cluster 3. |
| | | Urban Commons | | The other research areas yet don't clearly correspond to the scope of the EU |
| | | Urban Transitions | | |

| | | | | |
|-----------------------|----------------------|--|---|---|
| | | | environments of buildings and urban landscapes. Research aims include building resilience to climate change with population density and globalisation as important input parameters | GREEN research clusters |
| Health Promoting Work | Flexible Work | Inclusive Working Life Digital Shapeshifting | This research area contributes to the efforts of meeting societal challenges like increasing mental ill-health, increasing inequality, an ageing population, an increased proportion of individuals with chronic disease, violence, and segregation. Research focal areas include health-promoting work for people of all ages oriented both towards the individual and society, work design aimed to promote mental and physical health together with health-promoting organisations and leadership. The activities contribute to creating value-adding measures for the individual as well as for the organisation and/or society at large. | Yes, the research on health promoting work relates to cluster 1 |
| | | | | |
| | | | | |
| Innovative Learning | Democracy and Equity | Digitalisation, Technologies, Media and Learning | This research area contributes to the efforts of meeting societal challenges regarding people's learning in educational and work environments within both the public and the private sector. Our focus is that researchers and practitioners create | Yes, involved in cluster 5. |
| | | | | |

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|------|----------------------------------|---|---|--|
| | | Learning Environments of Tomorrow (LET) | knowledge for the development of work methods, educational content and innovative elements in the planning, the execution, the evaluation and the development of teaching, learning and professional development. Central issues include teaching, learning, digitalisation, co-workership, influence, democracy, media, and culture. | |
| | Intelligent industry | Digitalisation | This research area contributes to the efforts of meeting societal challenges regarding long-term sustainable production. Innovation, resource efficiency and good working environments are important parts. This research area mainly targets businesses and organisations in industrial networks and value chains. Our focus lies in digitalisation, organisation design and their interaction in innovation processes, from the development of technological systems, products and processes to the design of production systems, business relations and business models. | Partly. The research area partly corresponds to the scope of the EU GREEN research cluster 3 |
| OVGU | Center for Dynamic Systems (CDS) | Energy Conversion | Efficient storage of energy / energy sources from biological production, e.g., biomethane; CO ₂ and H ₂ | Yes |

| | | | | |
|--|--|--|---|-----------|
| | | Chemical Production | methods for systematic development / robust operation of particle processes / sustainable chemical production / increased use of residuals and renewable raw materials, energy efficiency and automatic adjustment of desired product properties | yes |
| | | Active Substances | Personalised therapy strategies for various diseases and the decoding of fundamental cellular processes / computer-assisted modelling and prediction of molecular and cellular reactions /development of new active substances as drugs for personalised therapies. | Cluster 1 |
| | | Key Technologies | Modelling/ simulation/ optimization / control design of experiments / machine learning and artificial intelligence / complexity reduction / algorithms and Software | Cluster 3 |
| | | SmartProSys | Mechanical & Thermal Pre-processing / Chemical & Biological Decomposition / Chemical & Biological (Re-) Synthesis / Systems Engineering & Computational Methods / Supply Chain & Sustainability Management / Societal Support & Individual Appropriation | yes |
| | Centre for Behavioral Brain Sciences (CBBS) | Perception / attention / learning & memory Adaptive behaviour, decision processes | yes | |

| | | | |
|--|---|--|-----|
| | | Cognitive resources / performance decline | |
| | | Molecular, cellular, systems physiology and behavioural basics | |
| | | Neuronal networks / functional connectomics | |
| | Centre for Advanced Medical Engineering (CAME) | Planning / Navigation | |
| | | Therapy monitoring | |
| | | Robotics / OP tools | |
| | | User interfaces | |
| | | Image processing, visualisation | |
| | | AR / VR | |
| | | Measurement methods, signal processing | |
| | | Reconstruction | |
| | | Hardware development | |
| | | Sensor technology, ... | |
| | | Simulations / Modelling | |
| | | Assistance systems (AI) | |
| | Human-machine interaction | | |
| | Centre for Health and Medical Prevention (CHaMP) | Immunology & Inflammation in Oncology, Cardiovascular etc. | yes |
| | | Biomarkers / Prediction | |
| | | Nano- and microtechnology | |
| | | Biosensorics | |
| | | Material sciences for medicine | |
| | | Molecular biology | |
| | | Imaging (molecular and cellular) | |
| | | Biosignal processing | |
| | | Dynamic measurement techniques | |
| | | Biokinetic modelling | |
| | | Clinical decision systems | |
| | Flow modelling | | |

| | | | | |
|----|--|---|---|--|
| | | | Biosignal analytics | |
| | | | AI for medicine | |
| | | | Modelling of dynamic processes | |
| | | | Clinical data | |
| | OVGU "Transfer focal points" | Automotive (CMD) | yes | |
| | Medical technology, | | | |
| | Renewable energies, | | | |
| | Digital engineering, | | | |
| | Partical technology | | | |
| UA | MATERIALS | Lphia | Phonotics / Optics / Lasers. | Yes (cluster 3) |
| | | Moltech-Anjou | Molecular materials with optical and electronic properties. | Yes (cluster 3) |
| | HEALTH | CRCI2NA | Innate Immunity Cancer Senescence Radiopharmaceuticals. | Yes, the leader of the SFR is member of cluster 1 and represent the 8 research units |
| | | HIFIH | Hepatic steatosis Liver cancer. | |
| | | INCIT | Mycobacterium mycolactone Buruli ulcer | |
| | | IRF | Respiratory Fungal Infections Cystic Fibrosis | |
| | | | Scedosporium apiospermum. | |
| | | IRSET-ESTER | Occupational health MSD | |
| | | | (Musculoskeletal disorders) Prevention | |
| | | MINT | Drug delivery systems Nanomedicine. | |
| | Mitovasc | Vascular Biology Mitochondrial Diseases | | |
| | | Ischaemia and Reperfusion | | |
| | REGOS-Rmès | Bone fragility Bone quality | | |
| | PLANT & ENVIRONME NT | IRHS | Quality and health of horticultural productions and seeds | Yes, cluster 2 |
| | | | | |

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|---|--|----------------------------------|--|--|
| | | SIFCIR | Insecticides Synergistic Agents | Yes, cluster 2 (innovative pathways to facilitate an agro-ecological transition) |
| | | | Repellents | |
| | | SONAS | Phytochemistry (Hemi)Syntheses | Yes, cluster 2 |
| | | | Valuation of Natural products | |
| | | BioDIVAG | Ecology Biodiversity Dynamics | Yes, cluster 6 |
| | | | Anthropogenic forcing | |
| | | LPG | Marine Geochemistry Paleooceanography | Yes, cluster 6 (climate change) |
| | | | Biomonitoring | |
| | LL-SHS: Letters, Languages, Humanities and Social Sciences | 3L.AM | Cinema Civilisation. | Potentially cluster 4 – from a cultural perspective |
| | | Jean Bodin Centre | Heritage Justice | Potentially yes if new cluster on Environment Adaptability Risk Transitions Health |
| | | | New regulations Borders and territories. | |
| | | CIRPaLL | Myths and the Sacred News and | No but participation possible in cluster 4 |
| Short Forms Shared Language(s) Heritage | | | | |
| and Legacy. | | | | |
| CLiPsy | Psycho-pathology Trauma | No but participation possible in | | |
| | Families Parenting. | | | |

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|-----|--|---------------|--|--|
| | | | | cluster 1 (children well-being etc.) |
| | | ESO | Social Geography Territories Social Processes Tourism. | Yes, cluster 4 and 5 |
| | | Granem | Tourism, territories and culture Health, food, work Finance and risk | Yes, cluster 2 |
| | | LPPL | Cognition Regulation Risks. | No but participation possible in cluster 1 |
| | | TEMOS | History Archivists Childhood Gender Religions Plants. | No but participation possible in cluster 1 |
| | MATH-STC Mathematics, Sciences, Information and Communication Technologies | LAREMA | Geometry Algebra Probability Statistics. | No – EU GREEN clusters don't correspond to the lab's scope |
| | | LARIS | Optimisation Signal-Image Operating safety. | Yes cluster 3 |
| | | LERIA | Artificial intelligence Combinatorial Optimisation. | No – EU GREEN clusters don't correspond to the lab's scope |
| | | | | |
| Uex | IACYS | 14 groups | Treatment and water depuration Environmental chemical analysis Green chemistry and | Yes |

| | | | | |
|--|-----------|-----------|--|-----|
| | | | sustainable development | |
| | | | Climate and climate change | |
| | ICCAEx | 7 groups | Physics of Complex Systems | Yes |
| | | | Fluid Dynamics | |
| | | | Theoretical Chemistry | |
| | | | Stochastic models | |
| | | | Pattern Classification and Image Analysis | |
| | I-PAT | 16 groups | History of Art and Archeology | Yes |
| | | | Historia, cultura y sociedad | |
| | INDEHESA | 13 groups | Biodiversity | Yes |
| | | | Dehesa Conservation | |
| | IPROCAR | 8 groups | Physicochemical, microbiological and sensory analysis of raw materials and products. | Yes |
| | | | Obtaining new antioxidants from natural sources. | |
| | | | Detection and control of microtoxins and contaminants in food | |
| | INBIO G+C | 9 groups | Animal health | Yes |
| | | | Ecotoxicology | |
| | | | Hunting Management | |
| | | | Reproductive Biotechnology | |
| | LINGLAP | 4 groups | Critical discourse analysis | Yes |
| | | | Intercultural communication | |
| | | | Diachronic linguistics and interculture | |
| | IMUEX | 7 groups | Quantum computing | Yes |
| | | | Mathematical statistics | |
| | | | Applied Statistics | |
| | INURA | 10 groups | Agricultural Production. | Yes |
| | | | Phylogenetic Resources. | |

| | | | | |
|--|---------|-----------|---|-----|
| | | | Process Technology. | |
| | | | Microbiology and Food Safety | |
| | | | Food Quality and Health. | |
| | | | Marketing and Commercialisation | |
| | INTERRA | 15 groups | Environmental research and natural resources. | Yes |
| | | | Socio-economic and administrative framework research. | |
| | | | Research, development, and innovation in civil and building engineering and geotechnologies. | |
| | INTIA | 4 groups | Software Engineering | Yes |
| | | | High Performance Parallel and Distributed Computing | |
| | | | Advanced Communications | |
| | IBPM | 10 groups | Biomarkers (genes, proteins, lipids, and metabolites) of molecular pathologies and metabolic disorders. | Yes |
| | INUBE | 8 groups | Clinical, epidemiological, and social health research and clinical trials | Yes |
| | | | Chronic diseases, aging and human nutrition | |
| | | | Personalized medicine and therapeutic | |
| | | | Cellular and molecular mechanisms of disease | |
| | | | Biomaterials and bioengineering | |
| | INPEX | 10 groups | Technologies and Education | Yes |
| | | | Health and Education | |
| | | | Inclusion, Gender, and Education | |
| | IUEVE | 2 groups | Green Economics Institute | Yes |

| | | | | |
|--|--|--|--|-------------------------|
| UNIPR | Department of Humanities, Social Sciences and Cultural Industries | Classical studies | Documents, texts, images; representation and models of reality; conservation and transmission of cultural heritage; critical debate of ideas; communication; relationships; interculturalism; identity and the construction of identity. | Cluster 4 and Cluster 5 |
| | | Art history, music and the performing arts | | |
| | | Education | | |
| | | Philosophy | | |
| | | Italian studies | | |
| | | Modern Languages | | |
| | | Psychological and social studies | | |
| | Hystory | | | |
| | Department of Law, Politics and International Studies | Research Unit 1: A Sustainable Consumer Behaviour as a Driver for a More Sustainable Food Production: Economic and Legal Aspects; | Food sustainability, Consumer protection and consumers' behaviour; Regulation of novel foods; Environmental protection. | Cluster 2 |
| | | Research Unit 2: Food for Future" (<i>Dipartimento di Eccellenza 2023-2027</i>); | | |
| | | Research Unit 3: Food and History; | | |
| | | Research Unit 4: Novel Foods. | | |
| | Department of Engineering and Architecture | Engineering - Architecture | Energy chains, Renewable sources; Sustainable water use, management and depuration, Hydrogeological risk | Cluster 2 & Cluster 3 |
| | | Landscape architecture; Architecture regeneration and sustainability; Landscape planning and design, Sustainable towns | | |
| Department of Mathematics I, Physical and Computer Sciences | <i>Macroareas</i> | New materials for energy production and energy saving; Semiconductors; Magnetic materials; Nanostructures; Bioinformatics; Proteins; Foam and emulsions; | Cluster 1 & Cluster 3 | |
| | Mathematics & Informatics | | | |
| | Physics | | | |
| | <i>Research groups</i> | | | |
| | Algebra; Geometry; | | | |

| | | | | |
|--|--|--|---|--|
| | | Mathematical analysis; | Cosmology and gravitational physics; Complex systems; String theory; Particle physics; Numerical simulation; Machine learning | |
| | | Probability and Statistics; | | |
| | | Mathematical Physics; | | |
| | | Numerical analysis; Programming languages and Algorithms; | | |
| | | High-performance computing; | | |
| | | Theoretical physics; | | |
| | | Biophysics and Soft matter; | | |
| | | Condensed matter physics and Functional materials; | | |
| Department of Chemistry, Life Sciences and Environmental Sustainability | <i>Macroareas</i> | New materials, devices for sensors, green technologies, new investigation techniques, prediction models of biological and geological systems, agro- and food-industry, energy production, waste cycle management, ecology, biodiversity, conservation. | Cluster 2 , 3, 5 & 6 | |
| | Chemistry/Biology/Geology | | | |
| | <i>Research Units</i> | | | |
| | Evolutionary and Functional Biology Unit; Biotechnology, Ecology and Sustainability (BES) Unit; Analytical Chemistry, Cultural Heritage, Inorganic Chemistry and Crystallography Unit; Organic, Physical and Industrial Chemistry Unit; Biomolecular, Genomic and Bioinformatic Sciences Unit; Earth Sciences Unit | | | |
| Department of Medicine and Surgery | <i>Areas</i> | Impact of diverse food components or diet patterns on insulin/glucose metabolism, beta-cell | Cluster 1 | |
| | Nutrition/Metabolism/chronic non-communicable diseases | | | |
| | <i>Research unit</i> | | | |

| | | | | |
|----|---|--|--|-----------------|
| | | Unit of Nutrition and Metabolism; Unit of Endocrinology and Metabolic Diseases. | function, immunometabolism and cardiovascular disease risk. | |
| | Department of Food and Drug | Human Nutrition Unit; Advanced Drug Delivery Research Lab; Medicinal Chemistry Unit, Department of Food & Drug; Bio-Organic Synthesis Group; | Metabolomics application in nutrition studies; measures of dietary intake; nutrition education projects; biocompatible and biodegradable nanomaterials; drug delivery; innovative formulations; sustainable chemistry; synthesis of bioactive compounds; green methods; bioactive compounds. | Cluster 1 |
| | Department of Economics and Management | <i>Macroareas</i> | Social Accountability, Environmental economics and policy, Sustainable local and rural development, social innovation, Green Finance, Green marketing. | Cluster 1&4 |
| | | Business and Economics | | |
| | | <i>Research Units</i> | | |
| | | Business Administration | | |
| | | Agri-food economics | | |
| | | Finance | | |
| | | Applied economics | | |
| | Department of Veterinary Science | Animal Production Science Unit | Feeding, Nutrition, Innovative and sustainable animal production | Cluster 2 |
| UO | Diet and human health | Medical Body Bioelectrical Impedance Analyzer | Clinical nutrition for patients with metabolic syndrome | Yes (cluster 1) |
| | | | The correlation between the bacteria presents in the gingival crevicular fluid and intestinal inflammation. | |
| | Healthy ageing and the prevention of chronic diseases | Clinical Recovery Hospital Baile Felix | Sarcopenia | Yes (cluster 1) |
| | | | Neurodegenerative diseases | |

| | | | |
|---|---|--|-----------------|
| Pharmacological properties of bioactive natural compounds | https://eeris.eu/ERIF-2000-000R-0555 | Pharmacological properties of bioactive natural compounds | Yes (cluster 1) |
| | | Pharmacological properties of bioactive natural compounds | |
| | | Pharmacological properties of bioactive natural compounds | |
| | Clinical Recovery Hospital Baile Felix | The role of mineral waters and natural climate factors. | Yes (cluster 1) |
| Agriculture, food and environmental sustainability | Interdisciplinary Research Center in Bioeconomy (CCIB) | Food Safety / Valorisation of | Yes (cluster 2) |
| | | Natural products / Quality and health of agricultural productions and seeds / | |
| | | Traditional product / | |
| | | Water management in agriculture / Fighting pollution and soil degradation | |
| | | SCDP | |
| | Interdisciplinary Research Center for Rural Development (CCIDRO) | Sustainable rural and agricultural development/ biochemistry, biology and animal production/Agro tourism | |
| Engineering and technology for sustainable development | National Centre for Geothermal Research | Geothermal and Solar Energy Use for Sustainable Eco-agricultural Farms in Rural and Remote Areas; | Yes (cluster 3) |
| | | Ground Coupled Heat Pumps of High Technology; | |
| | | Using Geothermal Energy in Compressed Air Energy Storage Systems (CAES) | |
| | Nanoscience Research Platform – SMARTMAT | Material structure recognition using Artificial Neural Networks | Yes (cluster 3) |

| | | | | |
|--|--|--|---|-----------------|
| | | | Automation of Material Characterization processes using Machine Learning Methods | |
| | | CCTIEA/Applied Electronics | Processing and analysis of multidimensional images and signals, medical imaging, biometrics, robotics; artificial intelligence and neural networks, human-computer interaction; shape recognition, virtual reality and IOT. | Yes (cluster 3) |
| | | (CCTIEA=Research Center for Information Technology, Electronics and Automation) | Applied electronic systems. | |
| | | SMART Industries Technology Transfer Center | Modelling and simulation of systems. | Yes (cluster 3) |
| | | | Performance evaluation of manufacturing systems through Petri net modelling and simulation. | |
| | | | Decision systems based on fuzzy sets. | |
| | | | Implementation of the concept of Digital Twins. | |
| | | | Project management using critical path methods. | |
| | | | Machine Learning applications for Sustainable Management of Industrial Equipment. | |
| | | Interdisciplinary Research Infrastructure in Mechatronics and Intelligent Building | Models to evaluate the operational performance of complex systems - application to infrastructures and buildings. | Yes (cluster 3) |
| | | Interdisciplinary Research Infrastructure in Robotics - IRIROB LAB | Smart farming: development and deployment of autonomous terrain/aerial robots and various environmental sensors for | Yes (cluster 3) |

| | | | | |
|--|---|---|---|------------------------------------|
| | | | precision agriculture | |
| | | | Intelligent medical devices (robots in rehabilitation, soft robotics for biomedical applications) | |
| Sustainable tourism for cultural and natural heritage | Tourism Lab | | Cultural tourism and local development | Yes (Cluster 4) |
| | | | Health tourism | |
| | | | Sustainable rural tourism | |
| | Learn2Do4Entrepreneurs hip Lab | | Sustainable entrepreneurship in tourism | Yes (Cluster 4) |
| | | | Education for sustainable tourism | |
| | Research Center for Competitiveness and Sustainable Development/Tourism Research Team | | Sharing economy in tourism Digitalisation | Yes (Cluster 4) |
| | | Virtual and augmented reality in tourism | | |
| TASC (Territorial Analyses and Studies Centre) | | Tourism/Territorial Planning/Geosites/Environment | Yes (Cluster 4) | |
| Education Sciences for sustainable development | Statistical software for social sciences (SPSS) | | Socio-emotional processes underpinning non-traditional students' learning | Yes (Cluster 5) |
| | iMotions - Software for experimental research design | | Academic well-being for sustainable learning | Yes (Cluster 5) to be purchased |
| | Superlab 6 - Software for experimental research design | | Cognitive and emotional processes supporting self-determination for continuous education | Yes (Cluster 5) to be purchased |
| Challenges in ecosystem biodiversity and function - a macroregional evaluation | Mobile laboratory for analyzing biological quality of waters in Bihar (RO)-Bihar (HU) macroregion | | Ichthyology, Aquatic ecotoxicology, Invasive species | Yes (Cluster 6) |

| | | | | |
|------|---|---------------------------------|--|-----------------|
| | Zoological research | | | |
| | Aquatic ecology research | Plant biothechnology laboratory | Plant vitrocultures | Yes (Cluster 6) |
| | | Jiului Gorge Natural Park | Zoogeography, herpetology, conservation ecology | Yes (Cluster 6) |
| | Plant cell and tissue culture | Iron Gates National Park | Zoogeography, herpetology, conservation ecology | Yes (Cluster 6) |
| UPWr | Plants Processing & Technology for Bioactive Food – Plants4FOOD | | Bioactive compounds and profile; polyphenols; LC MS QToF, UPLC-PDA-FL, fruits, vegetables, edible flowers, herbs; pomace; functional foods; nutraceuticals; bioavailability and digestibility of bioactive compounds; analysis of pro-healthy properties; technological process; microencapsulation; nanotechnologies; drying, dust accumulation | Yes |
| | Food&Health | | Plant proteins, starch modifications, resistant starch, microencapsulation in starch, extrusion, bioavailability, digestibility, snack products, potato products, fats, functional foods, fungal metabolites, biodegradation, food by-products | Yes |
| | BioActiv Biocatalysis and biological activity – BioActiv | | Biocatalysis, Microbiological transformations, Chemo-enzymatic reactions, Fermentation processes, Chirality, Isolation of natural products, | Yes |

| | | | |
|--|--|--|-----|
| | | <p>Bioactive compounds (polyphenols, phospholipids, steroids, proteins, terpenes, lactones), Green chemistry, Green solvents (Deep Eutectic Solvents), Interaction of compounds with biological membranes, The mechanism of action of bioactive compounds, Lipid membrane models, Biological activity (antitumor, antimicrobial, anti-inflammatory, cytotoxic, antioxidant, antidiabetic, hemolytic, antifeedant), Anticancer compounds in targeted therapy, Nutraceuticals, Dietary supplements, Functional food, Biorefining of agri-food by-products, Valorisation of plant-derived waste, Pharmaceutical, agri-food and cosmetics industry</p> | |
| | BioTech@Life | <p>Yarrowia lipolytica, Trichoderma, bacteriophages, lipids, erythritol, mannitol, citric acid, α-ketoglutaric acid, flax, metabolic engineering, agro-food waste, phospholipids, nanostructured lipid carriers, biologically active compounds, dietary supplements, prevention of cancer, neurodegenerative and metabolic diseases</p> | Yes |
| | Biotechnology for life and industry – BioTech@Life | | |

| | | | |
|--|--------------------------------------|--|-----|
| | Water-Climate-Environment – WCE | integrated water management, sustainable drainage system, urban hydrology, climate change, municipal waste, industrial waste, rainfall model, Land use management, eutrophication, water consumption prediction, diagnostic methods, microfiltration, ultrafiltration, waste composting, water quality, geocomposites, corrosion, sewage systems, wastewater treatment, urban area, rural area, monitoring, anthropopressure, flood protection | Yes |
| | Sustainable Cities and Regions (SCR) | sustainable development, integrated spatial management, quality of life, living conditions, ageing society, renewable energy sources, consumption, carbon footprint, ecological footprint, urban development, rural development, regional development, urban agriculture, circular economy, adaptation to climate change, urban logistics, smart city, land use planning, urban design, geographical information systems, ecosystem services, landscape services, landscape management, landscape change, social participation, housing policy, real estate, Europeanization | Yes |

| | | |
|--|--|-----|
| Waste and Biomass Valorization Group – WBVG | bio-waste, food waste, municipal solid waste, sewage sludge, biomass, biochar, biocarbon, biogas, compost, pyrolysis, torrefaction, combustion, fermentation, composting, biodrying, emissions, volatile organic compounds, odors, heavy metals, life cycle analysis, environmental impact, Waste to Energy, Waste to Carbon, Circular Economy, Waste in Space | Yes |
| Space And Close Earth Observation Sciences – SpaceOS | GNSS, global geodynamics, positioning, SLR, LiDAR, InSAR, troposphere, deformations | Yes |
| Agriculture-Environment-Natural Resources – AgrEn | climate change, ecosystem monitoring, natural succession, agroecosystems, invasive plant species, carbon sequestration, warming gases, soil biology, environmental mycology, soil protection, nature conservation, remediation of degraded lands, groundwater quality, health risk, ecological risk, food quality, ecosystem functions | No |
| Animal diseases translational research – AnimalTrans | translational research, civilization diseases, animal model of human disease, preclinical studies, heart failure, neurodegenerative diseases, equine model of asthma, animal study of biomaterials | No |

| | | | |
|--|--|--|----|
| | Animal Science for Future – ASc4Future | livestock, animal welfare, organic livestock production, feed additives, biochar, mobile poultry housing, organic feed, odors, dietary supplements | No |
| | Innovative diagnostics and veterinary therapy – Inno-WET | innovations, artificial reproductive techniques, production animals, companion animals, endangered species, innovative diagnostic tools, modern surgical techniques, gene therapy, herd-based prevention, molecular studies, clinical immunology, pharmacokinetics, high throughput techniques, pro and antioxidant balance, genetic diseases, disorders of sex development | No |
| | Poultry – from stable to table – DroPOWER | Poultry, poultry meat, quality, pro-health value, innovative meat and egg products, eggs, feed, feed ingredients, by-products valorization and utilization, blood, feathers, collagen rich materials, glycosaminoglycans, nutritional value of meat and eggs, bacteriophages, poultry microbiome, meat hygiene, meat defects, poultry microflora, reproductive features, biopreparations, biocomposting, innovative packaging for meat and products, bioconservation | No |

| | | | |
|--|--------------------------|--|----|
| | Reg-Med-Lab – Marycz Lab | Metabolic disorders; insulin resistance; diabetes; osteoporosis; new therapeutic strategies; progenitor cells; cell rejuvenation; biointelligent scaffolding; expression of long and small non-coding RNA; gene expression; protein expression | No |
|--|--------------------------|--|----|

Annex 5: List of scientific equipment

| Cluster number | Name and utility of the equipment | To which university does it belong to? |
|---|---|--|
| 1 | Clinical Recovery Hospital Baile Felix | UO |
| | Pharmaceutical research laboratory | |
| | Equipment within the SmartProSys Research Cluster Max Planck Institute for Dynamics of Complex Technical System, Helmholtz Center for Environmental Research, Fraunhofer Institute for Factory Operation and Automation IFF | OVGU |
| | SMEs in Sweden as models for self-sufficiency in circular energy systems, e.g., biogas production from farm biowaste for production energy and fertilisers | |
| | Lentivect: platform of vectorization in gene transfer. | UA |
| | PACEM (Cellular and Molecular Analysis Platform): infectiology sequencing. | |
| | - SCIAM: Imagery and Microscopy analysis devices. | |
| | Elemental and molecular analysis service (SAEM) | UEx |
| | Animal facility and animal experimentation service | |
| | Imaging diagnosis service in veterinary sciences and biomedicine and preparation of sexed seminal doses for equine reproduction | |
| Radiological protection service techniques applied to bioscience service (STAB) | | |
| 2 | Dryers (freeze-dryer, vacuum dryer, spray dryer, etc.) : food production in powdered form | UPWr |
| | HPLC: determination of selected bioactives | |
| | Milk analysis lab: Milk characterisation and cheese making | UNIPR, Department of Veterinary Science |
| | Feed analysis lab: Feed chemical and nutritional characterisation | |
| | Food analysis lab: Food chemical and nutritional characterisation | UNIPR, Department of Food and Drug |
| | Internet of Things (IoT) Lab: Design and implementation of IoT systems for agricultural applications | UNIPR, Department of Engineering and Architecture |
| | Law library and online legal database | UNIPR, Department of Law, Politics and International Studies |
| | Labs for characterisation of microorganisms : Study the diversity and functions of microbiomes in agroecosystems | UNIPR, Dept. Chemistry, Life Science and |

| | | |
|---|---|---|
| | Labs for soil and water analysis (micro and macro nutrient/contaminants) and GHG exchange: Study all parameters of relevance in the environmental matrices | Environmental Sustainability |
| | Labs for “omic” characterisation of crop plants: Study the modifications of plant genomes, transcriptome, proteome, metabolome | |
| | UV reactor: Microbiological reduction | CIPACK - UNIPR |
| | Bioinformatics lab: Genomic tools for genetic improvement of livestock | UNIPR, Department of Veterinary Science |
| | Infectious Diseases lab : Generation of new animal disease prevention strategies based on innovative vaccines development | |
| | Histology lab : Evaluation of nutritional strategy on animal digestive traits morphology | |
| | Infectious Diseases lab: Development and study of alternatives to antimicrobials | |
| | Agricultural management and accounting and rural appraisal lab : Economic-financial assessments in the agricultural, livestock and industrial fields | |
| | Anaerobic Digester | ATU Donegal Research Facility |
| 3 | Water channel - 12 m long, 1.2 m width, 1 m³/s : Research on hydraulic and tidal turbines, fish passage and compatibility | OVGU |
| | Wind tunnel incl. rain simulation (--> experiments for soil erosion with wind + rain) : Research on rain formation in clouds, rain impact on devices and structures | |
| | Multi reactor system - 6-x 90ml Parr high pressure | |
| | Reactor system - 300ml Parr with dosing system | |
| | Reactor system HITEC - homogeneous catalysis (fully automatized) | |
| | Reactions calorimeter RC1 MettlerToledo with dosing system | |
| | Reactions calorimeter Optimax and EasyMax with dosing system | |
| | C80 Calvet Calorimeter Multiple glas reactors - Batch, Semi batch, CSTR (with dosing systems) | |
| | Kinetic fixed-bed reactor (fully automatized) | |
| | Berty-Reaktor - CSTR heterogeneous catalysis | |
| | Analytics: GC, GC-MS (Agilent), HPLC (VWR, LaChrome), FTIR- (Si- and Diamant,, <i>operando</i> or <i>in situ</i>, Mettler Toledo), Raman (Kaiser), Benchtop-NMR (¹H, ¹⁹F, ³¹P; 43MHz), | |

| | |
|---|-----|
| UV/VIS | |
| Membrane reactors (1-/Multi-channel), Adsorptive reactors | |
| Membrane filtration (MF, UF, NF) with Polymeric-/Ceramic modules (plate, tube, Multi-channel, spiral winding modules) | |
| Simulated Moving Bed plant - Thermo Gravimetry/ Differential Scanning Calorimetry Netzsch | |
| Fermentation system Sartorius (1l und 5 l) | |
| Bi-plane 3D-Angiographiesystem Siemens ARTIS icono | |
| Interventionelles CT - Siemens SOMATOM X.cite | |
| 3 Tesla Magnetresonanztomograph - Siemens Magnetom Skyra | |
| Lightweight construction Roboter for medical use - KUKA iwa | |
| Miniature MRI 0.55T - Fa. PURE DEVICES | |
| Miniature X-ray system 50kV - Fa. MOXTEK | |
| Flextronik-Labor mit COS Laserschneidanlage CS6090 | |
| 3D Drucker Stratasys Fortus 380mc | |
| LPKF ProtoLaser U4 | |
| Living lab "Advanced cooling technology for development of advanced metals" | |
| Excellence in heat treatment processes to design sustainable advanced metal products in a complete environment for researching and developing the most creative and innovative technological solutions. The living lab has been equipped with advanced physical test facilities for heat treatment of long and flat steel products, resources for computer simulation, as well as resources for material testing. | HiG |
| https://www.hig.se/Ext/Sv/Organisation/Akademier/Akademier-emin-for-teknik-och-miljo/Forskning-vid-akademin/Advanced-Metals-Living-Lab.html | |
| Robotics | |
| Wind tunnel | |
| Fundamental studies of natural ventilation, Ventilation of Compact cities, wind turbines, etc | |
| Laboratory of building energy and indoor environment measurement | |
| o Thermal comfort loggers | |

| | |
|---|---|
| o | Temperature & humidity loggers |
| o | Heat flux meters (thermopiles) |
| o | Ventilation and air infiltration measurement equipment |
| | Tracer gas equipment |
| • | Ventilation rate & effectiveness |
| • | Tracking of airborne contaminants |
| • | Passive equipment for large scale (field survey) measurements |
| | Wind pressure on building structures (e.g. air infiltration appl.) |
| | IR thermography |
| | Building aerodynamic wind tunnel, model tests of: |
| • | wind conditions around buildings, incl. detailed turbulence |
| • | wind pressure on structures |
| • | air infiltration assessment |
| | Ventilation duct air flow meters |
| o | Air speed and air flow pattern |
| | Omnidirectional thermistor anemometers (several) |
| | Sonic anemometers (speed + direction) |
| | PIV and LDA (speed + direction; detailed turbulence mapping) |
| | Visualization techniques (particle tracking etc.) |
| | Tracer gas equipment |
| o | Air quality measurements |
| | CO2 loggers |
| | Airborne particulate matter (particle counters & filter collection) |
| | GC-MS for air chemical composition |
| | Radon |
| • | Outdoor climate measurement equipment (portable): |
| o | Wind speed (sonic anemometers) |
| o | Solar radiation (diffuse + direct) |
| o | Precipitation |
| o | Temperature |
| o | Humidity |
| | Laboratory of Environmental Acoustics and Soundscape |

| | |
|---|------|
| 1. microphones | UPWr |
| - binaural ("ears"), | |
| - binaural - in-ear, | |
| - ambisonic, four-way, | |
| - ultrasonic, | |
| - electret, | |
| - directional, open, condenser "shotgun" type. | |
| 2. Acoustic array camera (164 directional microphones) with "Noise Inspector" software. | |
| 3. programmable microcontrollers with Enviro pHAT sensors. | |
| 4. software: Ableton, Kaleidoscope Pro. | |
| 5. VR goggles Oculus Quest and HTC Vive Pro. | |
| 6. 10-channel sampler and mixer. | |
| 7. microcontrollers: Raspberry Pi B+, A, and 2. | |
| 8. drone with multispectral camera | |
| 9. mobile eye-tracker Pupil Invisible | |
| Laboratory of Environmental Research | |
| 1. Chlorofluorocarbon (AOX) analyser | |
| 2. Total organic carbon (TOC) analyser for liquids and suspensions | |
| 3. Distillation apparatus | |
| 4. Batometer | |
| 5. Gas chromatograph (GC) + gas analyser (tedlar bags) | |
| 6. Gas chromatograph (GC/MS) + headspace (HS) | |
| 7. Ion chromatograph Dionex 3000 | |
| 8. Extractor | |
| 9. Photometer for cuvette-based assays | |
| 10. Calorimeter | |
| 11. Conductivity meters | |
| 12. Plate luminometer | |
| 13. Sound level meter | |
| 14. Multi-parameter meter | |
| 15. Microwave sample digester | |
| 16. Fluorescence microscope | |
| 17. Confocal microscope | |
| 18. DELTA inverted microscope | |
| 19. BIOLAR trinocular microscope | |

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|---|----|
| 20. COD mineraliser | |
| 21. FTIR spectrophotometer with microscope | |
| 22. FTIR spectrometer | |
| 23. Inductively coupled plasma optical emission spectrometer ICP OES | |
| 24. UV-VIS spectrometer (SPECTROLAB) | |
| 25. Heating and cooling equipment (incubators, refrigerators, dryers) | |
| 26. Centrifuges MPW-260 | |
| 27. Automatic particle image analysis kit | |
| 28. Membrane filtration kit | |
| 29. Kit for collection, measurement and determination of physico-chemical parameters of groundwater | |
| 1 computing station cluster | |
| 1 continuous wave laser at 532 nm | |
| 1 Nd:YAG laser at 1064 nm (doubled, tripled) with short pulses 17 ps | UA |
| 1 tunable parametric oscillator OPO 1 μ m to 2 μ m | |
| 1 Nd:YAG laser at 1064 nm (doubled, tripled) short pulse 9 ns, 10 Hz | |
| 1 dye pumped laser at 532 nm | |
| 1 short-pulse 1064 nm Nd:YAG laser (doubled, tripled) 40 ps (not operational) | |
| 1 cooled germanium camera | |
| 3 Er:Yb doped fiber power amplifiers | |
| 1 13 GHz real-time oscilloscope | |
| 2 optical spectrum analyzers | |
| 2 optical autocorrelators | |
| 1 microwave spectrum analyzer | |
| 1 THR 1500 spectrometer with 0.1 nm resolution | |
| 1 LCOS spatial light modulator (reflection) 1920x1080 pixels | |
| 1 cooled monochrome camera 14 bits 2750x2200 pixels | |
| 1 ocean optics 2000+ spectro | |
| 1 FLIR monochrome camera | |
| 1 FLIR portable infrared camera | |
| 1 ellipsometer UVISEL, | |
| 1 LEICA microscope, | |
| 1 Dektac profilometer | |

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| 1 Bruker Avance III HD 500 MHz NMR spectrometer |
| 1 Bruker Avance III 300 MHz NMR spectrometer |
| 1 NMR Spectrometer JEOL 400 MHz |
| 1 spectromètre RMN Bruker 600MHz (to come in 2023) |
| 1 Mass spectrometer, high resolution Jeol JMS 700, sources EI, CI, FAB, ESI, APCI. |
| 1 Bruker Esquire 3000+ ion trap, ESI, APCI ionization sources coupled with a Waters Alliance HT 2795 HPLC separation module, Waters 2487 UV detector |
| 1 GC-MS Shimadzu (IE source) |
| 1 Spiral-TOF mass spectrometer with TOF/TOF option JEOL JMS-S3000 |
| 1 Mass Spectrometer Waters Xevo QTOF G2-XS, source ESI avec UPLC |
| 1 Thermo Electron elemental analyzer (Flash 2000) with two furnaces (CHNS and O) |
| 1 M-Braun dry glove box with 6 gloves incorporating 1 Boc Edwards evaporation rack |
| 1 Keithley 2036 |
| 2 Keithley source meters |
| 1 Solar simulator AM1.5 / KHS |
| 1 Solar simulator AM 1.5 / Newport |
| 1 Spectrophotometer UV-visible-NIR Lambda 950 Perkin-Elmer |
| 1 GBX contact angle measurement bench |
| 1 PLASSYS ME300 evaporation frame under turbo-molecular vacuum |
| 1 Bruker Vertex 70 infrared spectrometer |
| 1 Biologic/Roper Scientific/SETI spectroelectrochemical measuring bench |
| 1 Atomic force microscope NanoObserver/CSInstrument |
| 2 Spectrophotometers UV-visible / Shimadzu |
| 1 Spectrofluorometer / Shimadzu |
| 1 Spectrofluorometer / JASCO |
| 1 Circular Dichroism UV-vis spectrophotometer |
| 1 Profilometer / Tencor |
| 1 MBraun dry glove box with 8 gloves + 1 MBraun evaporation rack + 1 spin coater |
| 1 EQE TFSC |
| 1 PYSA HITACHI (Photoemission Yield Spectroscopy in Air) |

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|---|
| 1 Filmetrics F20 reflectometer |
| 1 LEICA MSZ12 microscope equipped with a video camera |
| 1 Kappa CCD single crystal diffractometer (BRUKER NONIUS) (Mo source) equipped with a low temperature system (N2) (90K-373K) |
| 1 Supernova four-circle single crystal diffractometer with Cu microsource (Agilent Technologies) equipped with a low temperature system (N2) (90K-500K) |
| 1 D8 ADVANCE powder diffractometer (BRUKER), equipped with a temperature chamber (100K-723K) |
| 1 Thermogravimetric analyzer TGA 2050 (TA instruments) (293K-1273K) |
| 1 Differential enthalpy analyzer DSC 2010 (TA Instruments) equipped with a low temperature system (N2) (100K-873K) |
| 1 LEICA M125 microscope equipped with a video camera |
| 1 LEICA DM2500 polarizing microscope equipped with a video camera and a temperature chamber (100K-693K) |
| Laser nano, Spectra Physics, 1064,532, 355 nm + Laser Dye Opton 550 to 700 nm |
| Jobin Yvon spectrometer |
| Stanford SR 430 photon counter |
| Cryostat Optistat DN-V |
| Laser pico Continuum 10Hz (7 mJ @ 1064nm) (532nm and/or 355nm) |
| OPO TOPAS laser, 400 nm-1650nm |
| Synchronous detection Stanford SR 830 |
| Continuous laser diodes, Thorlabs, 972 nm, 980 nm |
| Oscilloscope Tektronix TDS6124C |
| 1 femtosec. laser TSUNAMI Spectra-Physics coupled to a YAG:Nd MILLENIA 10W |
| Ellipsometer, HORIBA Jobin-Yvon, UVISEL NIR, 75 W lamp, spectral range 245-2100 nm |
| 1 CCD camera imaging spectrometer Roper Scientific |
| Hamamatsu photomultiplier |
| 1 inverted microscope IX 71 Olympus |
| Spatial light modulator, HOLOEYE, Pluto NIR 1000-1064nm |
| 2 photon counting acquisition chains in transmission and reflection HAMAMATSU |
| Green continuous wave laser (532 nm), LASOS (100 mW) |
| Oscilloscope Agilent DSO-X 3054A |

| | |
|---|---|
| Femtochrome autocorrelator FR-103XLWS | |
| TurboVac SL80 Oerlikon pump | |
| CCD camera QImaging, cooled 0°C, Retiga 6000 | |
| 1 inverted microscope IX 83 Olympus | |
| Laser diodes | |
| 1 Diagnosis and material characterization bench of possible defects (delamination, bubbles, cracks, damage ...) in materials (composites, bonded assemblies, ...) | |
| 1 Robot POODLE: PrOtOtype of LasEr weed control. | |
| 1 Experimental Platform for the (autonomous) NaviGation of a Symmetrical Agricole Robot. | |
| 1 Bio-inspired humanoid RObot. | |
| 1 Platform of instrumentation and multimodality imagery dedicated to the phenotyping of plants. | |
| 1 Virtual reality platform: Platform allowing the immersion of one or several person(s) in virtual environments. | |
| 1 Eye-tracking systems | |
| 2 High density electroencephalogram (EEGhd) | |
| 1 Climatic and vibratory chamber | |
| 1 HAST (High Accelerated Stress Test) experimental device monitored in humidity and/or temperature. | |
| 1 Vibration pot | |
| Geothermal power plant | |
| SCADA Laboratory | |
| Geothermal well station | UO |
| Geothermal pumping station | National Centre for Geothermal Research |
| Geothermal station for heating and domestic hot water | → Research in renewable energy |
| 5-axis CNC Laser machine tool | Prof. Cornel Antal |
| Robot performing handling, assembly or processing tasks such as drilling or deburring and the second | cantal@uoradea.ro |
| Robot performing MIG welding assembly tasks | UOradea |
| The high-speed digital camera | SMART Industries Technology Transfer Center |
| The confocal laser scanning microscope for | Technologic and Scientific Park |
| IIoT servers, Machine learning servers | → rapid prototyping, automation, robotics |
| 5 axis CNC machine | Prof. Vesselenyi Tiberiu |

| | |
|---|--|
| Additive manufacturing machine | tvesselenyi@yahoo.co.uk |
| Mechanical testing machines | |
| Fatigue testing machine | |
| Construction materials testing | |
| Plastic materials testing | |
| 3D measurement machine | |
| 3D laser scanners | |
| Scanning Electron Microscope | |
| AFM5000, Agilent | |
| Nanoindenter | UO |
| Optical interrogator with fiber Bragg sensors for temperature, strain and acceleration measurements | Nanoscience Research Platform – SMARTMAT |
| Portable Digital Vibrometer | → material characterization |
| Acoustic Tube | Prof. Vesselenyi Tiberiu tvesselenyi@yahoo.co.uk |
| Thermovision system | UOradea |
| Smart Camera | Interdisciplinary Research Infrastructure in Mechatronics and Intelbuild |
| Hydraulic equipment set | Prof. Bungau Constantin |
| Pneumatic equipments set | bungau@uoradea.ro |
| Sensors for pneumatics and hydraulics | |
| KNX system for building control | |
| Accelerometers | |
| Cryogenic probe station with handling arm for non-destructive testing of the materials and equipment in electric/electromagnetic field. | |
| Thermal imager for high temperatures | |
| Set of research equipment for measuring very low temperatures - 12 probes and field values - Gauss-metre and accessories | UOradea |
| Microwave research equipment with measurement and control systems for the study of ceramics susceptor | Interdisciplinary Research Platform for Technologies in Electrical Engineering |
| Microwave research system with measurement equipment for oil extraction from grape seeds/floral plant substrate | Prof. Francisc Hathazi |
| Microwave field laboratory reactor, used to obtain hybrid materials (conductive polymers, semiconductors, dielectrics) through pyrolysis processes by spray | francisc.hathazi@gmail.com |

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|---|--|--|
| | NI LabVIEW Robotics Starter Kit | |
| | Flexible Manufacturing System FMS UO 01 | |
| | E-Laboratory for ABB robots | UOradea |
| | Autonomous robots | Interdisciplinary Research Infrastructure in Robotics - IRIROB LAB |
| | Augmented/Virtual Reality Systems | Integrated Sensors and Biosensors Laboratory - ISBL |
| | Quadcopter Thrust Data Logger | Prof Tarca Radu |
| | Quadcopter monitoring air pollution | rtarca@uoradea.ro |
| | Hexacopter platform for crop treatment | |
| | PXI DAQ System with Optical Sensor Interrogator for Fiber Bragg Gratings | |
| | Fiber Bragg Grating sensors | |
| | Jaz Modular Spectroscopy Suite | |
| | SpectraSuite Spectrometer Operating Software | |
| | UV-VIS Spectrophotometer Specord 210 Plus | |
| | Optical fiber biosensor | |
| | LMC-3000, Laboratory Centrifuge | |
| | High-Performance Computer | |
| | GIS Etudes Touristiques : Association carried by the University of Angers, for promoting and developing research in tourism, that has 21 universities and institutions of research in France. Label CNRS. 185 researchers, 26 scientific disciplines. GIS Etudes touristiques offers two funds to support research project : Tremplin (to help to organise consortium of research); International publication (funds to translate scientific article in English) | |
| | Tourism Innovation Lab chair : The chair has a mission to help to increase better partnership between tourism researchers, institutions and companies (example : Espaces review ; Accor group; Alpes Compagny, etc.) | ATU Donegal Research Facility |
| 4 | Portuguese Platform; CityUMacau Chair in Sustainable Heritage : Aims to develop and promote joint common cultural heritage research projects with the City University of Macau To promote the creation of a Joint Laboratory in Macau involving the City University of Macau and the University of Évora | UA |

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|---|---|-----------------------------------|
| | <p>UNESCO Chair in Intangible Heritage and Traditional know-how. The aim is to promote an integrated system of research, training, information and documentation on intangible cultural heritage and traditional craftsmanship.</p> | UA |
| | Marketur_Research group on Tourism marketing and management | UE |
| | <i>The Annals of the University of Oradea. Economic Sciences:</i> http://anale.steconomieuoradea.ro/en/ | UE |
| | <i>The Annals of the University of Oradea. Economic Sciences:</i> http://anale.steconomieuoradea.ro/en/ <i>Oradea Journal of Business and Economics (OJBE)</i> Two local scientific journals that can help diffusion of results | UEx |
| | <i>The Annals of the University of Oradea. Economic Sciences:</i> http://anale.steconomieuoradea.ro/en/ <i>Oradea Journal of Business and Economics (OJBE)</i> Two local scientific journals that can help diffusion of results European and International Research Support Unit | UO |
| | Scientific Equipment Fund | |
| | NECSTouR | University of Parma |
| | STORY | University of Parma |
| | ATLAS | Atlantic Technological University |
| | INSTO | Atlantic Technological University |
| | ArtériaLab laboratory for experimentation, prototyping and transdisciplinary research at the crossroads of art, science and design | Atlantic Technological University |
| | Hércules Lab is a research infrastructure devoted to the study and valorisation of cultural heritage, focusing on the integration of physical and material sciences methodologies and tools in interdisciplinary approaches. | Atlantic Technological University |
| 5 | OBSERVES – CIEP - The Observatório de Escolas do Sul (Observatory of Southern Schools) is an academic and interdisciplinary structure based at CIEP-UE, destined to create inter-institutional synergies involving schools/groupings, HE Institutions , Training Centers and Association of Schools, with the objectives: a) Support schools/groups in self-assessment processes; b) Monitor the implementation of strategic action plans; c) Provide training that responds to the needs of schools/groups; d) Promote the sharing of experiences and resources. | UÉ |

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|---|---|-----|
| | Recirculation Facility: Live rearing of fin fish and shellfish, fish and invertebrate health research | UÉ |
| | Molecular/proteomics laboratories: genetic sequencing of aquatic organisms, eDNA, immunology studies | UÉ |
| 6 | Histology and image analysis suite: Analysis of tissues from aquatic organisms, sclerochronology, microplastics research, immunology | ATU |
| | Fourier-transform infrared (FTIR) spectroscopy: Marine and freshwater microplastics | ATU |
| | Bioacoustic monitoring equipment: Acoustic monitoring of aquatic and terrestrial organisms | ATU |
| | Boats, engines & sampling equipment including water sampling drones: Sampling of aquatic environments | ATU |
| | Cell culture and microbiology facilities: Immunology of aquatic organisms, host-pathogen interactions, antimicrobial responses | ATU |
| | Sediment analysis and macroinvertebrate taxonomy: Granulometric analysis and taxonomic identification of marine and freshwater biota | ATU |
| | Integrated Multitrophic Aquaculture and Seaweed/Bivalve Aquaculture field sites: Collaboration with Marine Institute and Seaweed and Oyster producers for access to licensed sites with possibilities for ecological restoration, biodiversity and environmental monitoring. | ATU |
| | SCIR mapping: a 3D workstation that including a 3D monitor and 3D glasses. CIR ortho-rectified imagery : stereographic near-infrared false colour (sCIR) imagery for habitat mapping | ATU |
| | Environmental Research laboratories: A wide range of monitoring and analytical equipment | ATU |
| | Biomolecular lab: Lab equipped for biomolecular and toxicology research | ATU |
| | Protistology : cultivation facilities | ATU |
| | ATU Mountbellew (education and research farm): Education and research farm; 169ha and associated facilities; 80 Dairy cows; 60 suckler cows and 250 sheep; | ATU |
| | Long-term Tree-grass ecosystem research site: Experimental site of 500 ha where the effect of N deposition of ecosystem functioning is measured since 2014. The site is equipped with three eddy-covariance towers, lysimeters, phenocams, and other instruments to measure ecosystem functions | ATU |

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| Elemental and molecular analysis laboratory: Laboratory to analyse soil, plant and water, molecular spectroscopy, food and pollutants | ATU |
| Bioscience laboratory: Laboratory that gives support to molecular, cellular, and genetic analysis | UEx |
| UNESCO Biosphere Reserve Nedre Dalälven: Finding possibilities for new ways for humans to interact in and with nature and finding new ways for sustainable life and -development | UEx |
| UNESCO Biosphere Reserve Voxnadalen: Finding possibilities for new ways for humans to interact in and with nature and finding new ways for sustainable life and -development | UEx |
| Gävle city: Co-operation over development of green areas and their biodiversity etc | HiG |
| Upplandsstiftelsen: Co-operation over development of natural reserves and other biodiverse areas | HiG |
| Harmånger Maskin & Marin AB: A small company making fishing traps, that are seal safe, and by-catch reducing. These pontoon traps are used in the Baltic Sea, Donau Delta, and other seas in Europe | HiG |
| University of Gävle culture collection (UGCC): An international collection of microorganisms | HiG |
| Molecular biology laboratory: This infrastructure is available for conducting basic experiments in microbial molecular biology for genetic analysis of individual organisms or populations | HiG |
| Plant growth chambers, tests for plant pathogenicity: Enables experiments on plants in controlled environments, for example pathogenicity tests of plant pathogens | HiG |
| Mobile laboratory for analysing biological quality of waters in Bihor-Bihar macroregion: This infrastructure is a mobile, biomonitoring and environment qualifying laboratory able to examine and evaluate the surface waters in a fast, accurate and relatively cheap way, thus letting the scientific results be economically beneficial following the rules of environment and nature protection. This facility can carry out physico-chemical parameters analysis and monitoring of the aquatic organisms communities from inland surface waters. | HiG |
| Plant biotechnology laboratory: The laboratory carries out research activities in the field of in vitro tissues plant culture and implicitly of the plant eco-physiology, anatomy and morphology. | HiG |

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| <p>Jiului Gorge Natural Park: Cooperation in biodiversity studies, biodiversity conservation.</p> | <p>UO</p> |
| <p>Iron Gates National Park: Cooperation in biodiversity studies, biodiversity conservation.</p> | <p>UO</p> |
| <p>Mitra Experimental estate: Experimental estate owned by the university of Evora, dedicated to studies in environmental and agrarian sciences - precision agriculture, grazing, cork oak irrigation, rewilding patches, bird monitoring, camera trapping, etc.</p> | <p>UO</p> |
| <p>Hwange LTSER: Monitoring of the dynamics of biodiversity, and the coexistence between humans in biodiversity in Hwange National Park and its surroundings (Zimbabwe)</p> | <p>UO</p> |
| <p>Plaine et Val de Sevre LTSER: Experiments in agroecology in farmland landscape (France)</p> | <p>UE</p> |
| <p>Lake Santo and Lake Scuro LTER aquatic environments: Lakes whose biodiversity has been studied since the 1950's</p> | <p>CNRS, UA</p> |
| <p>Guadine – Pradaccio Forest Park: Many trees studied for genetic and ecophysiology traits. About 350 European beech trees of 16 years of age whose parents are known. Useful for genetic assessment and evolutionary potential of ecophysiology traits</p> | <p>CNRS, UA</p> |
| <p>Passo Gavia Long Term Monitoring and Experimental Site: Long Term Monitoring and Experimental Site in alpine habitat in which several experimental facilities are installed for the study of the effects of climate change (for example, temperature increase using OTC, precipitation reduction using rain-out shelters, reduction of snow cover, interaction between nutrient deposition and climate drivers) on biodiversity and ecosystem processes in high altitude environments.</p> | <p>UNIPR</p> |
| <p>Microbiome Research Hub (Microbiology) (https://www.microbiomeresearchhub.com/): The MRH supports research across a wide spectrum of microbiome-related topics, all aimed to devise methods for improving human and animal health by manipulating microbial populations.</p> | <p>UNIPR</p> |

Annex 6: Example of UNIPR strategy to increase the participation in European calls

As an initial example of the analysis that will be carried out on the research strategy of each allied university, we report here some of the actions that UniPr developed to stimulate project submissions by researchers and professors and to increase the probabilities of success.

They can be divided in three categories:

1. Actions that support economically researchers (e.g., money transfer following meritocratic analysis of scientific production, economic support to buy or repair instruments and software).
2. Actions that favour the circulation of the information about international, national, and regional funding opportunities or that favour the connection of researchers with private companies, regional, national, or international bodies).
3. Actions that support researchers by online or in presence presentations of new EU calls and tools, identifying aims and context, by improving the strategic writing of their drafts, by supporting project management procedures (e.g., specific personnel units dedicated to national and international research).

More in detail, the University of Parma has a Strategic Plan that includes dedicated funding to support its professors and researchers in their research activities. **The Local Research Fund (FIL)** for example represents the UniPr funding action allocated based on evaluations regarding products consistency and quality resulting from the research activities carried out by faculty members and researchers as well as in incentive-type considerations designed to generally improve the opportunities and performance of the university. The quota of the FIL “level of research products” is allocated following evaluation procedures of research products referable to the main scope of the different scientific areas. The identification of the products subject to evaluation and their evaluation are consistent with the criteria used at the national level by Research Quality Assessment actions. The “level of research products” (generally varying between 1000 and 2500 euros, supporting for example the participation to a congress or travels for project writing) is attributed to single faculty members on the basis of individual scientific production in the three-year period preceding the year of the call, evaluated according to the general criteria defined by the University Research Commission, supplemented and/or adapted by the scientific committees to the specificities of the respective areas. The scientific area committees define the evaluation criteria, upon recommendation of the university scientific commission, in compliance with these regulations and the implementing calls, and proceed to their application for the purpose of evaluating those faculty members belonging to the respective scientific area. Criteria are based exclusively on the evaluation of quantity indicators and quality of scientific production in the period under consideration.

To increase national and international competitiveness and the ability to attract financial resources of structured research groups within the University, UniPr created **the Scientific Equipment Fund**. It is earmarked for the acquisition and/or extraordinary maintenance of equipment of general interest, including software packages closely related to research activities, through co-financing that normally does not exceed 85 percent of the total cost. The acquisition or maintenance of scientific equipment, financed with the Fund is approved by the Board of Directors upon the proposal of the University Research Committee.



The UniPr website provides online access search engines for research funding opportunities. **Research Professional (Research Professional - Home, in English)** for example offers an intuitive interface to make browsing for research funding simple. Powerful search tools help researchers to browse through open calls from national, EU and international sponsors, pre-filtered for Italian institutional eligibility. Whether researchers are after a funds to conduct a clinical trial or a small travel grant to attend a conference, a large competitive programme from a government funder or a prize from a niche foundation, Research Professional help locate the funding opportunities. Research Professional also provides up-to-date news and independent analysis on developments in the research policy landscape, making sure researchers are informed and can plan accordingly.

UniPr circulates via mail a **weekly newsletter** that provides information service on EU, national and regional funding for research, innovation, technology transfer, training and mobility of researchers and international cooperation in research and innovation.

All UniPr research staff receives regularly by mail **invitation to join the presentations by APRE** (– Agency for the Promotion of European Research, the first and unique entity of its kind in Italy, that operates in close collaboration with the Ministry of Education and Research with the objective of supporting and promoting Italian participation in the European Union research and innovation (R&I) programmes, by providing information, education and assistance services). APRE is a national agency and not exclusive of UniPr but each Italian university can act via APRE a **lobbying action** to the EC to drive the general and specific research themes/needs for the future EU calls. APRE has an Italian/English website (Homepage - APRE) that can be explored also by EUGREEN partners. APRE organises interactive meetings (in Italian), with experts presenting the calls and with open discussion.

UniPr plays a proactive role in the regional innovation ecosystem promoted by the Emilia-Romagna Region and has equipped itself with an ad hoc service to profit from the research funding opportunities that are part of the calls for the promotion of innovation and scientific research issued by the Emilia-Romagna Region from the resources of the structural funds POR FESR, PSR and FSE (European Regional Development Fund, European Social Funds and Rural Development Program). The Service "Support for Regional Research" performs the function of institutional liaison with the Emilia-Romagna Region and provides faculty with information, support and assistance services on financial management and administrative aspects related to participation in regional calls for proposals. The University of Parma has joined several Clust-ERs, associations promoted by the Emilia-Romagna Region to foster knowledge exchange and collaboration between public and private entities in research and innovation.

The National Research Service offers information, support and assistance services on financial, managerial, and administrative aspects related to scientific research projects funded by the MUR and other national agencies. It collaborates with university bodies in planning and launching specific initiatives to support research. It supports the University Commission for Research for administrative and managerial aspects and manages the activities of allocation, management of local funds for university research - FIL. Main ministerial sources of funding: MUR – PRIN, MUR- FARE - Framework for Attracting and Strengthening Research Excellence in Italy; MUR - Special Supplementary Fund for Research (FISR); MAECI - Ministry for Foreign Affairs and International Cooperation; MUR - Italian Science Fund (FIS); MUR - Fondo Italiano per le Scienze Applicate (FISA)

Concerning the INTERNATIONAL RESEARCH, the University staff involved in European and International calls for proposals may receive assistance in the design and review of the drafts of project





proposals, support in managing a research project, training on major community scientific research programs, information on funding opportunities for international research. At the departmental level, research support activities are assisted by the Referents/Research Managers (PTAs) and the Directors' Delegates for Research (teaching staff). At the central level, the UO Support for European and International Research is active.

