

Milestone 8

Compiled list of STARS EU research needs
developed

Work Package 4 – Challenge Lab



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Objective of the research needs list

The list of research needs is a first step towards developing and implementing a joint STARS EU research agenda. It aims to show how research needs from regions match the existing research conducted at STARS EU institutions and the STARS EU priority areas and where gaps can be identified. The STARS EU project aspires to take advantage of the partners' regional strengths, but also to identify needs for academic support to skills and knowledge development.

In order to identify alignments and gaps between regional needs and existing research priorities three sources have been taken into consideration. These are STARS EU partners' research priorities and specializations, the STARS EU's Thematic Interest Groups (TIGs) and stakeholder consultation in form of a report from Regional Transition Accelerator (*Smart specialization strategies – Current involvement of STARS EU partners and opportunities for interregional cooperation*).

STARS EU partners research priorities and specializations

STARS EU is an alliance of nine complementary universities located in non-capital European regions with a wide spectrum of research competencies and priorities. Here follows a list of the research priorities and specializations at each university, the list should not be understood as an exhaustive list of the research conducted at each university but as an indication of the strengths and priorities at each institution.

Institution	Research priorities/specialization
Hanze University of Applied Science	<ul style="list-style-type: none">• Healthy Ageing• Energy Transition• Entrepreneurship (incl Digitization)• Biobased Economy• Art and Society• Built Environment
University of La Laguna	<ul style="list-style-type: none">• Astrophysics• Renewable energies• Digital transformation and industry 4.0/5.0• Blue economy• Biodiversity and natural products• Connection of regions
Polytechnic Institute of Braganca	<ul style="list-style-type: none">• Mountain research center: from nature (raw materials, natural resources, biodiversity, agriculture and forest management) to products (food or bio-based materials)• Digitalization and Intelligent Robotics

	<ul style="list-style-type: none"> • Basic Education • Applied Management • Sports, Health & Wellbeing • Sustainable construction
Bremen University of Applied Science	<ul style="list-style-type: none"> • Energy, environment, sustainability • Industrial site for mobility and logistics • Urban region and society • Digitalisation of the world of work and society
Silesian University in Opava	<ul style="list-style-type: none"> • Economic transformation of regional development • Entrepreneurship, innovations in business and economy • Smart approach in public and regional administration • Econometrics, applied statistics in various fields • Analysis, simulation and modelling of business processes • Marketing, e-commerce • Financial analysis, financial modelling • Operation research • Mathematics, Physics
University West	<p>Two complete academic environments (Production Technology and Work-Integrated Learning)</p> <p>Work-Integrated Learning:</p> <ul style="list-style-type: none"> • CO-creating sustainable societies • Lifelong learning environments • Knowledge work in a changing world <p>Production Technology:</p> <ul style="list-style-type: none"> • Material and production processes (welding, thermal spraying, additive manufacturing etc.) • Flexible industrial automation • Tech shifts and competence reskilling <p>Additional groups: Youth and Child Studies, Healthcare and Learning, Digital Transition, Center for Activity Theory.</p>
Cracow University of Technology	<ul style="list-style-type: none"> • Bioeconomy, • Bioengineering, • Mechanical, construction, material and chemical engineering, • Energy and Environment transformation, • Spatial Design and Cultural Heritage Conservation, • Applied computer science
University of Franche-Comté	<ul style="list-style-type: none"> • Advanced materials and processes • Microtechnology and intelligent systems • Sustainable, smart, and connected mobility: vehicles and infrastructures • Hydrogen for an energy and economic transition: value chains and uses • Integrated and individualized health and care • Value chain dedicated to a sustainable food
Alexandër Moisiu University of Durres	<ul style="list-style-type: none"> • Entrepreneurship • Legal education and good governance • Health services • Applied computer science • Navigation and marine engineering

STARS EU Thematic Interest Groups

The Thematic Interest Groups (TIGs) are STARS EU multi- and cross disciplinary teams built on the complementary strengths and priorities of the partners aiming to deepen the existing collaboration within the alliance. The TIGs will bring together students, academics, researchers and regional stakeholders to address regional issues and collaboratively provide real solutions to societal challenges. Initially, seven TIGs were created: Arts and Creative Industries; Digital Transformation; Entrepreneurship and Innovation; Energy Transition; Healthy Ageing; Circular Economy and Living Spaces. After a discrepancy was identified between regional needs and the priority areas two more TIGs were created in the spring of 2024: Sustainable Industry and Inclusion and Social Justice (see next chapter for more information). Each TIG has developed a Strategic Cooperation Agenda for the next three years where the objectives and planned activities are presented. These documents will be important inputs to the joint research agenda.

Here follows a short description of each TIG:

Digital Transformation: The world is becoming increasingly connected and technology-driven. Organisations are facing a growing set of challenges and opportunities. From artificial intelligence and machine learning to big data and the Internet of Things (IoT), there are numerous technologies that challenge our daily lives. They are transforming the way organisations operate, compete and innovate. Moreover, they are impacting many domains as various as education, medicine, research, energy, etc.

The TIG Digital Transformation understands the importance of keeping up with these changes and staying ahead of the curve. We do this by developing joint research, (new) projects, collaborating in education, enhancing mobility (students and staff exchange), sharing our knowledge and experience as well as collaborating on existing projects.

Entrepreneurship and Innovation: The Thematic Interest Group (TIG) on Entrepreneurship and Innovation is a collaborative initiative among academic staff, focusing on the vital areas of entrepreneurship and innovation in research and education. As a collective of educators and researchers, our goal is to enhance our understanding and teaching of these subjects through mutual learning, the development of new study programs, and the undertaking of joint research projects. By sharing resources, experiences, and best practices, we aim to contribute meaningful insights and innovations to the academic community and beyond, while fostering an environment that encourages the exchange of ideas and the creation of new opportunities for students and researchers alike.

Energy Transition: The Energy Transition TIG is formed by a vibrant community of researchers devoted to the analysis of the current energy production, management and planification of the decarbonization roadmap in the regions where STARS EU is placed.

The TIG is formed by diverse experts from across the STARS EU alliance, bringing together a wealth of knowledge and perspectives, exploring cutting-edge research, innovative solutions, and best practices in renewable energy, energy efficiency, and smart grids. The aim of the TIG is contributing to impactful projects with real-world applications, driving positive change towards a low-carbon future.

Healthy Ageing: Europe's population is ageing and this brings opportunities, not only for older people and their families but also for societies as a whole. Additional years provide the chance to pursue new activities such as further education, a new career or a long-neglected passion. Older people also contribute in many ways to their families and communities. Yet the extent of these opportunities and contributions depends heavily on one factor: health.

For promoting healthy living and optimizing healthcare and prevention, during the whole lifespan, from birth to the end of life, education of professionals and research is needed. Healthy Ageing is about adding more healthy years to live. Healthy ageing is about creating the environments and opportunities that enable people to be and do what they value.

Circular Economy: The circular economy is a production and consumption model involving sharing, leasing, reusing, repairing, refurbishing, and recycling existing materials and products as long as possible. In practice, it implies reducing waste to a minimum [1].

In the aforementioned context, the Circular Economy Thematic Interest Group (CE-TIG) aims to contribute to a sustainable future in an interdisciplinarity environment within the STARS EU initiative. This will be done by designing different ways of cooperation among members, namely joint research and educational initiatives and projects, which will comprise knowledge and best practices sharing and active mobility of staff and students.

Living Spaces: "Living Spaces" focuses on our environment and how we want to live both now and in the future. It encompasses a wide range of subjects from the intangible to the technical.

The group was initiated from the fields of architecture and civil engineering; however, we are open to all academic fields and disciplines who are interested in addressing the sustainable transformation of our living environment.

Society is changing rapidly and making demands on how we respond to the future challenges. Areas of interest could be:

- the development of attractive inner cities,
- the role of digitalization in the community
- climate adapted building and the sustainable use of resources
- investigation into mobility and the consequences on urban design

Arts and Creative Industries: In the TIG of Arts and Creative Industries, we drive a strong partnership within STARS EU Alliance, that with our partners and communities, heightens awareness and sensitivity, creates economic value, nurtures regional development, develops innovative formative processes, and promotes creative minds and good common places.

Sustainable Industry: Industry in the EU today faces major challenges that affect its future. These challenges affect competitiveness and opportunities for transformation and renewal. The challenges can be summarized under the following 5 points:

1. Digitization and productivity: Increasing productivity through digitization is essential. Small and medium-sized companies in particular should embrace technological solutions.

2. Technological transformation: AI and other technologies are changing the industry. Adaptability and the introduction of new technologies are necessary.
3. Climate change: Climate challenges such as the greenhouse effect due to the burning of fossil fuels to generate electricity and thereby drive process and transport, affect industry. Sustainable solutions for industry are therefore important.
4. Focus on value chains and services: Increased emphasis on regional and national value chains to shorten transport and services linked to products.
5. Demographics and gender equality: An aging workforce and uneven gender distribution are challenges. Diversity and inclusion are important.

Within the TIG Sustainable industry, we will address the points above by developing joint research, (new) projects, collaborating in education, enhancing mobility (students and staff exchange), sharing our knowledge and experience as well as collaborating on existing projects.

Inclusion and Social Justice: Not yet defined.

Findings from Regional Transition Accelerator

The Smart specialization strategies report D2.1 written by the Regional Transition Accelerator (Work Package 2) presents the regional specialization priorities and investigates how the STARS EUs Thematic Interest Groups are meeting these priorities. The main findings in the report are:

“Firstly, it confirms the matching of the STARS EU Priority areas with the regional specialization priorities. Thus, healthy aging, digital transformation, living spaces, arts and creative industries, entrepreneurship and innovation, energy transition, and circular economy are relatively well connected to the regional priorities for innovation.

Furthermore, the analysis highlights complementary fields of research and innovation in the STARS EU Priority Areas and beyond. It also brings to light some partner-specific focuses and regional challenges, thus identifying needs for joint knowledge development and innovation as well as additional accents in the STARS EU Priority areas.

Thirdly, it appears that some of the STARS EU Priority areas should be more specifically addressed from a cross-sectoral perspective. Indeed, Entrepreneurship & innovation, as well as Digital transformation, are considered in most of the S3 as supporting sectors to the regional priorities.

Finally, an interesting insight of the assessment is that almost all the regions identify the production industry, notwithstanding regional variations, as a specific priority, with a particular emphasis on sustainability. So far, this priority has not been addressed such as a STARS EU priority area and might be considered as a necessary additional thematic approach. In addition, a social and societal approach to sectoral challenges, such as equal access to health services, might be of high added value.” (p. 4-5)

Table 1 (retrieved from Smart specialization strategies report) shows the correspondence between the originally created STARS EU Thematic Interest Groups and the regional priorities:

Theme/ STARS EU Priority Area	Health	Digitalization	Mobility	Agrofood and Biobased materials	Production industry	Energy	Creative, tourism and leisure industries
Health Ageing	X	X		X			
Energy Transition		X	X	X		X	
Digital Transformation	X	X	X	X	X	X	X
Circular Economy		X		X	X	X	X
Entrepreneurship and Innovation	X	X	X	X	X	X	X
Living Spaces	X	X	X	X		X	X
Arts and Creative Industries		X					X

Table 1: correspondence between regional priorities and STARS EU priority areas (excluding the two recently created)

Development of new TIGs

The Regional Transition Accelerator identified two thematic areas prioritized by the regions that were not reflected, or not sufficiently addressed, by the Thematic Interest Groups: production industry and the social and societal approach to sectoral challenges. This has led to the creation of the two new TIGs Sustainable Industry and Inclusion and Social Justice, in order to strengthen the insufficiently covered areas. Table 2 shows the correspondence between all the currently existing STARS EU Thematic Interest Groups and the regional priorities:

Theme/ STARS EU Priority Area	Health	Digitalization	Mobility	Agrofood and Biobased materials	Production industry	Energy	Creative, tourism and leisure industries
Health Ageing	X	X		X			
Energy Transition		X	X	X		X	
Digital Transformation	X	X	X	X	X	X	X
Circular Economy		X		X	X	X	X

Entrepreneurship and Innovation	X	X	X	X	X	X	X
Living Spaces	X	X	X	X		X	X
Arts and Creative Industries		X					X
Sustainable Industry		X		X	X	X	
Inclusion and Social Justice	X	X	X				X

Table 2: correspondence between regional priorities and TIGs (including the two recently created)

Conclusion

Our institutions' commitment to our main research themes reflects our dedication to addressing real contemporary challenges in our regions and driving innovation across various domains. By prioritizing co-creating sustainable societies, fostering lifelong learning environments, and adapting to the evolving landscape of knowledge work, we strive to make meaningful contributions to society. Our priority areas Energy Transition, Digital Transformation, Healthy Ageing, Living Spaces, Circular Economy, and Entrepreneurship & Innovation, Sustainable Industry and Inclusion and Social Justice, serves as focal points for interdisciplinary collaboration and knowledge creation. These themes underscore our commitment to addressing pressing societal challenges and driving sustainable development through research and innovation.

By conducting an in-depth assessment of the needs for STARS EU Research Agenda, valuable insights have been gained to guide the development of strategic priorities and initiatives within the STARS EU framework. Collaboration, stakeholder engagement, and a focus on addressing societal challenges emerge as key themes. Across our main research themes, we prioritize interdisciplinary collaboration and societal relevance, aiming to address pressing challenges and drive positive change. Our strategic research approach prioritizes impactful co-creation and co-production ecosystems, involving teaching, research, and cooperation with companies, social organizations, and the public sector. By embedding research at companies/organizations and establishing consultative/advisory councils, we ensure that our research efforts remain closely aligned with real-world needs and priorities.

Through collaboration, creativity, and a commitment to excellence, we are well-positioned to address complex challenges and drive positive change in diverse fields, including healthcare, environmental sustainability, technology, entrepreneurship, legal education, and beyond. Our dedication to advancing knowledge and fostering innovation underscores our role as a leader in applied research and education, shaping a brighter future for future generations.

Recommendations

- Innovation and entrepreneurial support to research.
- Establishment of STARS EU Technology Transfer Office (TTO).

- Establishment of STARS EU Mentoring Programme.
- Incorporation of PhD students in the industry network as a collaboration ecosystem.
- Foster interdisciplinary collaboration and knowledge exchange to address complex challenges and drive innovation through the development of STARS EU concept of Thematic Interest Groups (TIG's) with relevant content for the future challenges in our regions.
- Prioritize research and innovation efforts that have the potential to generate tangible societal impact and economic benefits.
- Continuously monitor and evaluate the effectiveness of research solutions to ensure alignment with stakeholder needs and evolving priorities.
- Continued desk research combined with Challenge Lab meetings and interviews with STARS EU HEI's research units are carried out to identify how STARS EU partners and other regional stakeholders (existing cooperation structures in the field of R&D) can contribute to a regional-focused STARS EU Research Agenda.

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