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Clusters meet Regions' event in Foligno "Clusters as Drivers of the Green and Digital Transition in Regional Innovation Ecosystems"

Input paper

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Contents

Executive Summary	5
1. Context: Economic profile of Umbria.....	8
2. Clusters in Umbria and their importance for regional economic development.....	14
3. Smart Specialisation in Umbria.....	20
Bibliography.....	24
Annex.....	25

Figures

Figure 1: Employment across the EU industrial ecosystems for Umbria, Italy and the EU27, in 2022	9
Figure 2: Performance of Umbria in the 2023 Regional Innovation Scoreboard	11
Figure 3: Relationship of clusters and regional competitiveness, correlation results	17
Figure 4: Relationship of clusters and digital and green readiness, correlation results	18
Figure 5: Interaction of clusters and S3	20
Figure 6: Priority areas of the S3 2021-2027 of Umbria	21
Figure 7: Performance of the Umbria region in the 2022 Regional Competitiveness Index.....	25

Tables

Table 1: Overview of cluster organisations in Umbria and their addressed EU industrial ecosystems	26
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Executive Summary

The following paper presents observations on the cluster landscape and innovation ecosystem of the Italian region of Umbria, to inform strategic reflections during the **Clusters Meet Regions event in Foligno on June 24 & 25, 2025**. It outlines key characteristics of the region's economic profile, innovation performance, and specialisation patterns, and highlights the role that clusters play in supporting regional development. In line with the focus of the event — “Clusters as Drivers of the Green and Digital Transition in Regional Innovation Ecosystems” — the paper explores how cluster organisations contribute to regional industrial transformation, resilience, and competitiveness. By analysing existing cooperation structures and Smart Specialisation priorities, the paper identifies areas of strength and potential directions for future policy development, particularly in the areas of decarbonisation, digitalisation, skills development and interregional cooperation. The insights aim to support discussions among policymakers, cluster managers, SMEs, and other regional stakeholders at the event.

The key takeaways of this paper are summarised below:

Context: Economic profile of Umbria

- Umbria accounts for approximately 1.3% of Italy's GDP, reaching a total of **€26.1 billion** in 2023. With a GDP per capita (PPS) of **€31,700**, the region is below the national and EU average.
- The industrial ecosystems **Proximity & Social Economy, Energy Intensive Industries and Textile** stand out in terms of employment by surpassing the national and EU average.
- In the 2023 Regional Innovation Scoreboard, Umbria is classified as a “**Moderate Innovator**”, with an innovation performance above the national average but slightly below the EU average.

Clusters in Umbria and their importance for regional economic development

- Out of the 111 ECCP-registered **cluster organisations** active in Italy, no cluster organisations from Umbria are registered. However, there are **three official cluster organisations** located in the region, two of them are located in Perugia and one is located in Terni. The cluster organisations are active in the fields of e-mobility, aerospace and in the boat-building industry.
- Italy employs a **multi-level cluster policy framework** that balances national coordination with strong regional autonomy in cluster development and innovation governance. At the national level, the framework is coordinated by the Ministry of Enterprises and Made in Italy (MIMIT) through the **National Cluster Programme** (Cluster Tecnologici Nazionali – CTNs). At the regional level, Umbria promotes cluster development through its S3 2021–2027, recognising clusters as key tools for implementing innovation priorities. Main support agencies include the Regional Department for Economic Development and the Umbria Region Agency for Innovation (Sviluppumbria).
- The three Umbrian clusters align with regional **S3 priorities** by advancing **smart manufacturing, sustainable practices, digital connectivity, and cultural value**. In addition, cluster organisations play a key role in enhancing regional industrial competitiveness by fostering collaboration, innovation, and productivity. Clusters support the twin transition by facilitating the uptake of digital and green technologies, particularly in energy-intensive and manufacturing sectors. As regional innovation intermediaries, clusters help align firms with sustainability goals and promote cross-sectoral cooperation for long-term transformation.

Smart Specialisation in Umbria

- **Smart Specialisation** is a strategic approach developed by the European Commission that requires regions to identify and focus on their unique strengths and capabilities to foster innovation-driven economic growth. The S3 2021–2027 of Umbria outlines four priority areas "Smart Manufacturing", "Green and Sustainable Economy", "Digital and Connected Communities" and "Culture, Creativity and Quality of Life".
- Cluster organisations in Umbria are crucial to the **S3 implementation**, and Umbria participates in the S3 Partnership on Hydrogen Valleys, focusing on the integration of hydrogen technologies for sustainable growth.



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Context: Economic profile of Umbria



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1. Context: Economic profile of Umbria

The region of Umbria is located in central Italy and borders the regions of Tuscany, Marche, and Lazio. It comprises two provinces: Terni and Perugia, the latter also serving as the regional capital. As of 2023, Umbria has a population of approximately 855,000, accounting for around 1.4% of the Italian population.¹ The region is characterised by a diverse economic structure, with notable specialisations in advanced manufacturing, particularly in the **aerospace, nautical, and e-mobility sectors**. While the agrifood sector, services and tourism contribute to the economy, Umbria's strategic focus on innovation in high-tech industrial fields reflects its commitment to sustainable industrial transformation and regional competitiveness within the EU landscape.²

The following section provides a concise socio-economic overview of Umbria, encompassing key aspects, such as its macroeconomic profile and sectoral specialisation, as well as its innovation and regional competitiveness performances.

Macroeconomic profile of Umbria

This first section provides a headline of economic indicators that position Umbria within the national and EU context. With a regional GDP of **€26.1 billion** in 2023, Umbria accounted for approximately 1.3% of the national economy.³ The region has experienced very moderate economic growth in recent years, which is a result of low productivity and demographic decline.⁴ In the first half of 2024, GDP growth was 0.2% compared to the first half of the previous year.⁵ In terms of **GVA**, Umbria accounts for 1.2% of total Italian GVA.⁶

The per capita GDP (PPS) of Umbria in 2023 stood at **€31,700**, neither surpassing the Italian average (€37,500) nor the EU27 average (€38,100). This positioned Umbria as one of the mid-table Italian regions in terms of economic output per capita.⁷ Key sectors of the region include **agriculture, manufacturing and tourism**.⁸ The food industry and instrumental mechanics have contributed to an investment increase of 37.4% between 2019 and 2023, a significantly higher increase than the national average (+27.6%).⁹

The most recent external trade data for Umbria shows a **€1.4 billion trade surplus**, as exports reached €5.9 billion in 2024, while imports amounted to €4.5 billion.¹⁰ A closer look at sectoral data from 2022 shows that the most frequently exported products were products from the iron and steel industry, which accounted for around 22% of Umbrian exports. This was followed by machines for general use and clothing articles, which were 9.7% and 7.2%, respectively, highlighting the importance of the industry for the regional economy. Most of Umbria's

¹ Eurostat (2025): [Population on 1 January by age group, sex and NUTS 3 region](#) (last access 21.05.2025).

² Regione Umbria (2024): Regional Research and Innovation Strategy for Smart Specialisation 2021–2027. Available online: https://www.regione.umbria.it/documents/18/25530698/S3+Umbria+21-27_08+04+2024.pdf/f3f38e6c-33fd-4b3f-bc80-ddef66f77125 (last access 26.05.2025).

³ Eurostat (2025): [Gross domestic product \(GDP\) at current market prices by NUTS 2 region](#) (last access 21.05.2025).

⁴ Camera di Commercio dell'Umbria (2025): [L'economia umbra e i bilanci delle imprese](#) (last access 21.05.2025).

⁵ Banca d'Italia (2024): L'economia dell'Umbria. Available online: <https://www.bancaditalia.it/pubblicazioni/economie-regionali/2024/2024-0032/index.html> (last access 21.05.2025).

⁶ Eurostat (2025): [Gross domestic product \(GDP\) at current market prices by NUTS 2 region](#) (last access 21.05.2025).

⁷ Eurostat (2025): [Gross domestic product \(GDP\) at current market prices by NUTS 2 region](#) (last access 26.05.2025).

⁸ Sviluppumbria (2023): Regional analysis. Available online: https://www.sviluppumbria.it/documents/20182/471263/RegionalAnalysis_Def_compressed.pdf/62e67c04-9e34-4fc2-a92e-6f05fd8025d7 (last access 27.05.2025).

⁹ Corriere dell'Economia (2025): Economia umbra: investimenti record, ma la produttività resta una sfida. Available online: <https://www.corrieredelleconomia.it/2025/02/22/economia-umbra-investimenti-record-ma-la-produttivita-resta-una-sfida/> (last access 21.05.2025).

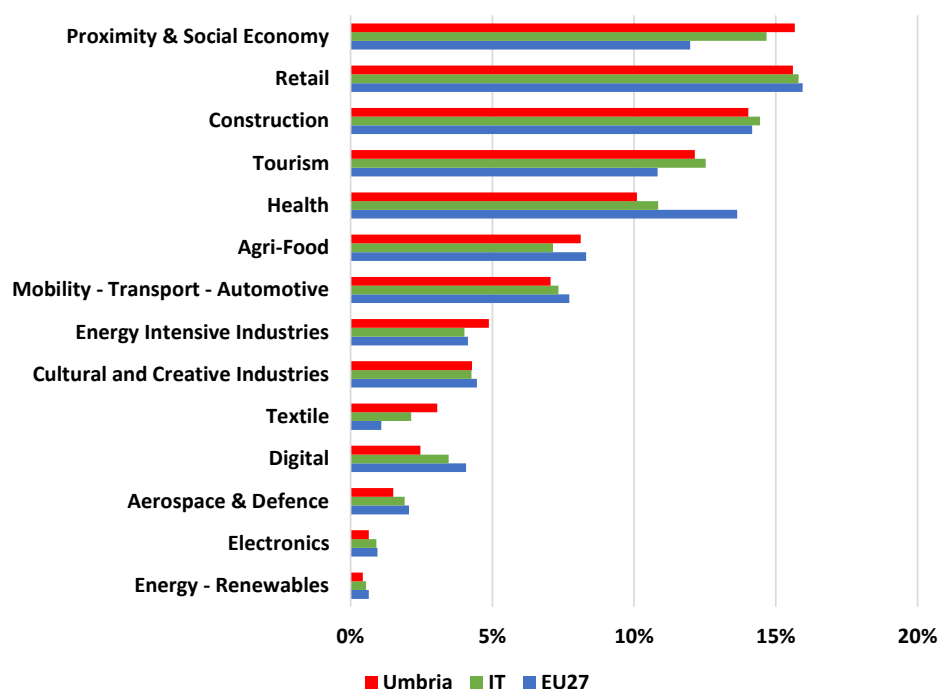
¹⁰ Umbria in cifre (2025): Le esportazioni per regioni nel 2024. Available online: <https://webstat.regione.umbria.it/le-esportazioni-per-regione-nel-2024/> (last access 27.05.2025).

exports were destined for Germany, which received 20% of the region's total exports. The United States followed with 10.5%, and France with 8.5%. On the import side, iron and steel products represented Umbria's largest import category with 16.9%. Oils, vegetables and animal fats were the second most important kind of products, accounting for 9.2% of them. The main trading partners from which Umbria imports its products are Germany, accounting for 19% of Umbrian imports, followed by Spain at 8.5%, and the Netherlands at 8.4%.¹¹

Employment composition and specialisation of Umbria

As part of its Industrial Strategy (March 2020), the European Commission has identified **14 industrial ecosystems** that encompass all players operating in a value chain.¹² **Proximity & Social Economy** stand out as the largest industrial ecosystem, accounting for 15.6% of employment, surpassing the national and EU27 average (Figure 1). The strong employment share in the ecosystem is mostly driven by the sector "Activities of households as employers of domestic personnel" and "Other personal service activities"; this suggests a strong demand for personal and household-related services, highlighting the service sector's central role in supporting daily life in Umbria. The industrial ecosystems, Retail and Construction, follow this, although both ecosystems remain below the national and EU27 average. In addition to the Proximity & Social Economy, two other ecosystems stand out by exceeding the national and EU27 average, namely **Energy Intensive Industries** and **Textile**, with the latter being nearly three times the EU27 average. Both industrial ecosystems highlight the importance of industry for the regional economy. This is also confirmed by the total employment across the industry, which stands at 20.6%, significantly above the EU average of 17.6%.¹³

Figure 1: Employment across the EU industrial ecosystems for Umbria, Italy and the EU27, in 2022



Source: ECCP (2025), own elaboration based on Eurostat. Note that the classification of the 14 industrial ecosystems has been calculated by aggregating NACE 2-digit activities, following the methodology established by the European Commission (2022).

¹¹ infoMercatiEsteri (2023): [Observatorio Economico](#) (last access 22.05.2025).

¹² See here for more information: <https://clustercollaboration.eu/in-focus/industrial-ecosystems> (last access 17.05.2024).

¹³ Eurostat (2024): [Employment by sex, age, economic activity and NUTS 2 regions \(NACE Rev. 2\)](#) (last access 26.05.2024).

Regional competitiveness level of Umbria

To provide an overview of Umbria's performance in key dimensions of regional competitiveness, the ranking of the Italian regions in the **Regional Competitiveness Index (RCI) 2022** is presented.¹⁴ This index measures key aspects of competitiveness among regions across the EU in three dimensions: the Basic Sub-Index, the Efficiency Sub-Index and the Innovation Sub-Index.

Umbria's overall RCI score stood at 85.0 points (EU average = 100), placing it slightly above the Italian average. This ranks the region 163rd out of 234 EU regions and 12th among Italy's 21 regions, classifying it as a transition region. A detailed overview of the region's performance in various indicators and dimensions of the Regional Competitiveness Index is provided in Figure 7 in the Annex.

In the **Basic Sub-Index**, which assesses fundamental enablers of competitiveness such as institutions, infrastructure, macroeconomic stability, health, and basic education, Umbria shows a mixed performance. Infrastructure remains a notable weakness, falling behind both national and EU standards — a limitation that may hinder the region's attractiveness for investment and its ability to fully capitalise on industrial innovation. Institutional quality is slightly stronger than the national average, yet still below the European benchmark. On a more positive note, the region performs well in basic education and excels in healthcare, both of which are important foundations for long-term competitiveness and social well-being.

The second sub-index overall is the **Efficiency sub-index**, the region benefits from a well-performing labour market and strong outcomes in higher education and lifelong learning. Yet, Umbria's relatively small market size constrains its overall economic potential and underlines the need to foster collaboration and internationalisation within the regional economy to access new markets.

In the **Innovation Sub-Index**, Umbria performs close to the national average. While the region lags behind in terms of technological readiness, it stands out with strong results in innovation output, exceeding the national average and reflecting the region's underlying innovative capacity. These findings are also echoed in the Regional Innovation Scoreboard, which provides further insight into Umbria's strengths and weaknesses within the broader European and Italian innovation landscape.

Regional innovation performance and landscape of Umbria

The 2023 Regional Innovation Scoreboard (RIS) provides an evidence-based and comparative avenue for assessing its level of innovativeness. The RIS contains data on 21 innovation-related indicators across 10 dimensions for European regions at either the NUTS 1 or NUTS 2 levels.¹⁵ According to the RIS, the region of Umbria is classified as a **"Moderate Innovator"** with an RII score of 98 (EU27 = 100), exhibiting a slightly lower innovation performance than the EU27 average while being above the national average of 90.3. Over time, its innovation performance has increased by 17.9 points since 2016.¹⁶

The region of Umbria exhibits **several considerable strengths within its innovation ecosystem**. In the field of scientific publications, the region is surpassing the national and EU27 average in "International scientific co-

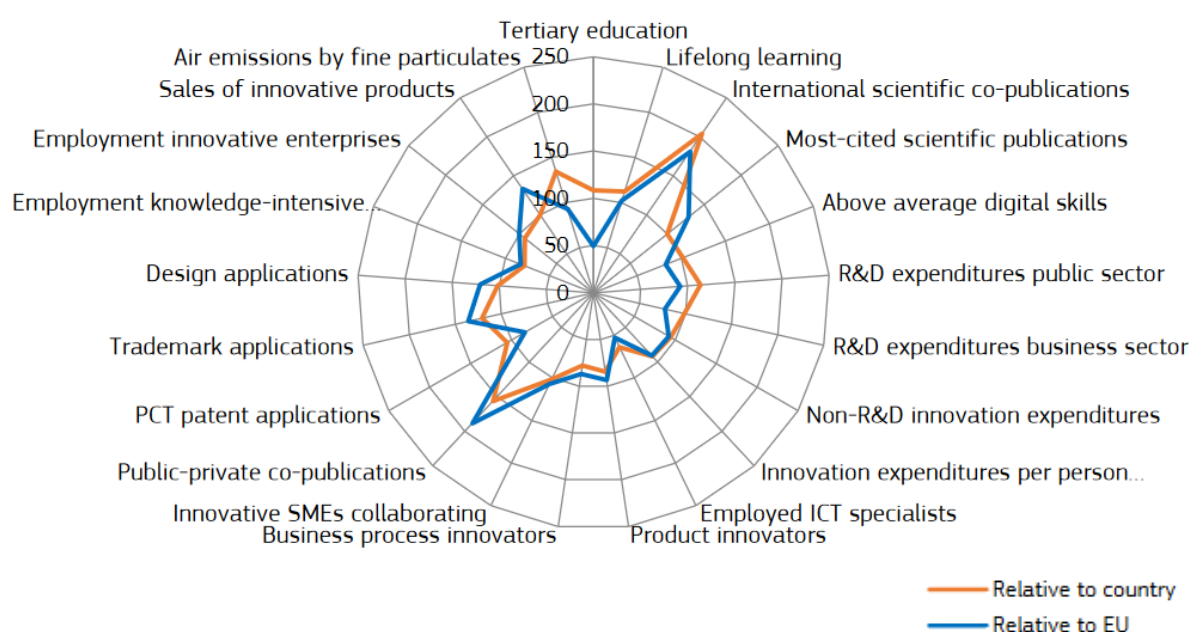
¹⁴ European Commission (2022): EU Regional Competitiveness Index 2.0 - 2022 edition. Available online: https://ec.europa.eu/regional_policy/assets/regional-competitiveness/index.html#/ (last access 09.04.2025).

¹⁵ European Commission (2023); Regional Innovation Scoreboard 2023 – Methodology Report. Available online: https://research-and-innovation.ec.europa.eu/document/download/5357c81b-9222-464b-8468-38ccd83b5624_en?filename=ec_rtd_ris-2023-methodology-report.pdf (last access 26.05.2025).

¹⁶ European Commission (2023); Regional Innovation Scoreboard 2023 – Regional profiles Italy. Available online: https://ec.europa.eu/assets/rtd/ris/2023/ec_rtd_ris-regional-profiles-italy.pdf (last access 14.04.2025).

publications”, reflecting strong cross-border research collaboration, which enhances knowledge exchange, boosts research quality, and strengthens regional integration into the global innovation ecosystem. Regarding innovation expenditure, the region performs well in “Non-R&D innovation expenditure” and in “Innovation expenditure per person employed”, highlighting that the region prioritises innovation as a driver of productivity and economic competitiveness. This also translates to the strong performance in both “Product innovators” and “Business process innovators”, which are exceeding the national and EU average. In the realm of collaboration, the region excels in both “Innovative SMEs collaborating” as well as “Public-private co-publications”, indicating effective collaboration and knowledge sharing between SMEs as well as between the public and private sectors. Another indicator to highlight is “Design applications”, which again surpasses the national and EU average, reflecting the region’s capacity to integrate creative and user-centred approaches into innovation, which enhances product differentiation, user experience, and market competitiveness.

Figure 2: Performance of Umbria in the 2023 Regional Innovation Scoreboard



Source: European Commission (2023): [Regional Innovation Scoreboard 2023 – Regional profile Italy](#).

Although the innovation ecosystem in Umbria has many strengths, some indicators suggest that there is **room for improvement** compared to the averages of Italy and EU27. Regarding the R&D expenditure, Umbria scores below the EU average in the “R&D expenditures public sector” while it scores below the EU and national average in the “R&D expenditure business sector”. Umbria's R&D expenditure as a percentage of GDP stands at approximately 1%, below the Italian average of 1.37%²⁰ in 2022, which is already below the EU average.²¹ R&D expenditure in Umbria is largely driven by universities and public institutions, which account for the relatively low level of investment from the business sector.²² Another field where the region scores below the EU and

²⁰ ISTAT (2023): Report on R&D in Italy 2022-2024. Available online: https://www.istat.it/wp-content/uploads/2024/09/REPORT_RS_2024.pdf (last access 26.05.2025).

²¹ Eurostat (2025): [R&D expenditure](#) (last access 26.05.2025).

²² ISTAT (2023): Report on R&D in Italy 2022-2024. Available online: https://www.istat.it/wp-content/uploads/2024/09/REPORT_RS_2024.pdf (last access 26.05.2025).

national average is the “Employment ICT specialist” which is essential for driving technological innovation and digital transformation. In the realm of intellectual property, the region performs below the country and EU average in the fields of “PCT patent applications” and “Trademark applications”.

There are several EU projects active in Umbria that aim to promote innovation in the region. One example of this is the **Green On Umbria for New Development (GR.O.U.N.D.)** project, which is funded by the European Commission as part of the Joint Research Centre’s Science Meets Regions initiative. The project addresses three key challenges in Umbria by developing a bioplastics production chain, promoting compost use among farmers, and raising public awareness of the circular economy. Using the Innovation Camp model, the project brings together the four key players for innovation - government, industry, civil society, and academia to co-create practical proposals for regional policymakers.²³

The **Umbria Digital Innovation Hub (UDIH)** which is part of the **European Digital Innovation Hubs Network (EDIH)**, supports the advancement of digital innovation across the Umbria region. It assists businesses and public sector organisations in adopting digital technologies by providing assessments, guidance, and access to innovation projects, often with the aid of public funding. In addition, it facilitates connections between regional, national, and European networks to address technological and organisational challenges through shared expertise. The hub also offers ongoing training programmes, both in Italy and internationally, aimed at improving digital skills for technical and management staff.²⁴ Another initiative of the EDIH in Umbria is **Umbria Digital Data (UDD)**, which supports SMEs and public administrations in Umbria advancing in the digital transition through key technologies like artificial intelligence, high-performance computing, and cybersecurity, focusing on sectors such as manufacturing, energy, and life sciences. With 13 partners, including universities, research institutes, trade associations, and regional agencies, UDD aims to boost digital skills, promote ethical AI use, and enhance sustainability, while providing a wide range of digital services and expert advice through its connection to the European Digital Innovation Hubs (EDIH) Network.²⁵

²³ For more information, see: <https://www.sviluppumbria.it/en/ground>

²⁴ For more information, see: <https://udih.confindustria.umbria.it/>

²⁵ For more information, see: <https://european-digital-innovation-hubs.ec.europa.eu/edih-catalogue/udd>



02

Clusters in Umbria and their importance for regional economic development



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2. Clusters in Umbria and their importance for regional economic development

The involvement of clusters in regional economic governance, policy design and implementation at the regional level is of central importance for regional economic development. This chapter provides an overview of cluster organisations in Italy and Umbria, including their geographic distribution and key characteristics such as size, membership structure, and thematic orientation based on industrial ecosystems. Furthermore, the chapter outlines the policy framework supporting cluster development at both the national and regional levels, and assesses their contribution to regional economic competitiveness and the twin transition.

Cluster organisations in Umbria

Cluster organisations are **key actors in the European economy**, facilitating collaboration, networking, and knowledge sharing between diverse innovation stakeholders within a geographical or sectoral cluster.²⁷ The European Cluster Collaboration Platform serves as a one-stop shop for cluster organisations at the European level. Out of the 1,248 registered cluster organisations in the EU, 111 are located in Italy. Spain, Germany and France are the only EU countries with more cluster organisations profiled on the ECCP. Despite the high number of cluster organisations in Italy, no clusters from Umbria are currently registered on the ECCP.

However, there are **three official cluster organisations** that are located in Umbria, with two of them located in the city of Perugia and one being located in the city of Terni. The three cluster organisations can be aligned to two industrial ecosystems, namely **Aerospace & Defence** and **Mobility-Transport-Automotive** (A list of the three cluster organisations and their assigned ecosystem can be found in Table 1 in the Annex). The three clusters are presented in more detail in the following.

The **Umbria Nautical Cluster**, established in 2014, is a non-profit consortium of independent Italian companies dedicated exclusively to the **boat-building sector** with a focus on yachts, excluding commercial boats and infrastructure-related activities. The cluster can be aligned with the **Mobility-Transport-Automotive** industrial ecosystem. Currently, the cluster comprises 14 companies of various sizes, from large corporations to small craft enterprises, all active in the yachting industry. The management team consists of two staff members. The primary goal of the cluster is to support member companies in growing their business by sharing expertise and resources. Through collaboration, members benefit from collective knowledge, cost savings in transport, and greater access to incentives and international markets—opportunities that smaller firms might struggle to access independently. The cluster promotes a unified presence at industry events, particularly the annual METSTRADE show in Amsterdam, where its stand serves as a central meeting point and gateway for networking and showcasing members' shipyards.

The **Umbria Aerospace Cluster (UAC)** is a strategic industrial network founded in 2008, which is an association representing the Umbrian regional industry operating in the fields of aeronautics, space and defence and aligns with the **Aerospace and Defence** industrial ecosystem. The cluster is composed of around 47 companies, generating a combined annual turnover of €800 million, with more than 10% reinvested in R&D and employing

²⁷ A cluster, in economic terms, refers to the concentration of interconnected businesses, suppliers and associated institutions that are geographically proximate or related by sector.

around 4,600 people.²⁸ Its members consist of a mix of micro, small, medium, and large enterprises, as well as a smaller number of academic institutions, that are active in advanced manufacturing, aerospace components, avionics, flight control systems, MRO, and defence-related technologies. The cluster is coordinated by a four-person management team and is strongly oriented toward innovation and internationalisation. The cluster's strategic goals include enhancing the international competitiveness of its members, fostering R&D cooperation, and supporting high-level workforce development²⁹. While there is no single dominant hub, the cluster demonstrates a strong territorial integration, with companies spread across the Umbrian manufacturing belt. This decentralised distribution aligns well with the region's industrial geography and avoids excessive concentration in a single urban centre. The cluster also promotes a unified presence at major industry events, such as the Farnborough International Airshow and the International Paris Air Show in Le Bourget, the world's largest aerospace industry event. These participations were supported by Sviluppumbria, the regional development agency, which also assists in the strategic development of the cluster. Furthermore, it has shown increasing engagement in international partnerships as part of its strategic growth to promote internationalisation. It encourages participation in European programmes like *Horizon Europe*, which not only offer funding but also foster cooperation with entities across Europe. Some of the cluster's firms have developed solid relationships with major global aerospace players such as Leonardo, Thales, Airbus, Boeing, Lockheed Martin, Bombardier Aerospace, and Safran. These high-level commercial relationships further strengthen the international profile of the Umbrian aerospace industry.

The third cluster in the region is the **Umbria E-mobility Network**. The cluster was established in 2022, as part of a project promoted by Confindustria Umbria and Umbria Export and is funded by the Chamber of Commerce of Umbria. The cluster has a consortium of 18 Umbrian companies, with its members ranging from SMEs to large industrial companies. The cluster management size is composed of 18 staff members, with one representative from each of the 18 participating companies. With a focus on electric mobility technologies, mechanical and mechatronic systems, digitalisation and smart technologies, the cluster aims to promote innovation and technological development in electric mobility. Therefore, the cluster aligns with the **Mobility-Transport-Automotive industrial ecosystem**. The cluster aims to foster collaboration among manufacturers, universities, and research centres to develop regional and national supply chains and aims to enhance competitiveness through innovation, training, and joint projects to support Umbria's ecological mobility transition. Activities of the cluster include the organisation of joint participation in industry events and fairs (e.g. IAA Mobility 2025 in Munich), the coordination of shared R&D projects, management of collective marketing and communication strategies, as well as the support of professional training courses. In addition, the cluster is launching an innovation lab, offering customised testing and advanced methodologies for advanced batteries and sustainable e-mobility solutions. With its focus on sustainable mobility, the cluster reflects Umbria's S3 priorities in Smart Manufacturing and in the Green and Sustainable Economy (See Chapter 3).

The three Umbrian clusters—the Umbria Nautical Cluster, Umbria Aerospace Cluster, and Umbria E-mobility Network—**demonstrate strong alignment with the region's S3 priorities**. All three contribute to Smart Manufacturing through innovation, advanced production, and collaboration. The Aerospace Cluster plays a leading role in R&D and high-tech systems, while the E-mobility Network supports the development of digitalised

²⁸ Umbria Aerospace (2025): Umbria Aerospace Cluster. Available online: <https://umbriaaerospace.com/en/chi-siamo/> (last access 26.05.2025).

²⁹ Umbria Aerospace Cluster (2024): Documento Strategico di Indirizzo. Available online: <https://www.confindustria.umbria.it/wp-content/uploads/2024/02/Programma-presentazione-Documento-Strategico.pdf> (last access 27.05.2025).

and sustainable value chains. The Umbria Nautical Cluster strengthens technology integration and craftsmanship in the sector of yacht building. Within the priority **Green and Sustainable Economy**, the E-mobility Network is directly focused on ecological mobility, while the other two clusters adopt greener practices and technologies. All three also support the priority area of **Digital and Connected Communities** through the use of digital tools, shared platforms and international collaboration. Lastly, the Umbria Nautical Cluster contributes to the priority area of **Creativity, Culture, and Quality of Life** by promoting Italian craftsmanship and lifestyle products.

Cluster policy in Italy and Umbria

Italy follows a **multi-level cluster policy model**, with national coordination mechanisms and strong regional autonomy in cluster development and innovation governance.

At the **national level**, cluster policy is coordinated by the Ministry of Enterprises and Made in Italy (MIMIT) through the **National Cluster Programme** (Cluster Tecnologici Nazionali – CTNs). These clusters are considered as platforms of collaboration between businesses, research centres, and public institutions in strategic technological domains. These clusters serve as platforms for collaboration between businesses, research centres, and public institutions in strategic technological fields. To obtain national recognition, clusters must demonstrate scientific and technological excellence and align with national priorities such as Industry 4.0, sustainable mobility, and life sciences. Recognised clusters benefit from access to dedicated funding instruments, including the National Operational Programmes (PON) and calls under the Fondo per la Crescita Sostenibile. Overall, national cluster policy places a strong emphasis on fostering public–private partnerships, promoting technology transfer, and ensuring alignment with European innovation ecosystems.

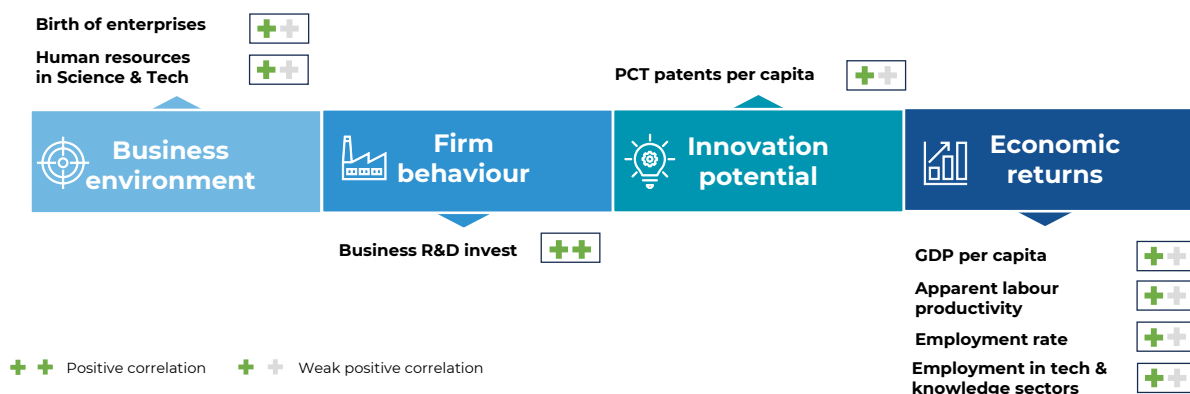
At the **regional level**, the Region of Umbria actively promotes cluster development through its **Smart Specialisation Strategy (S3) 2021–2027**, where clusters are recognised as key instruments for implementing strategic innovation priorities. Although Umbria does not have a standalone cluster strategy, cluster organisations are fully embedded within the regional innovation policy framework. The main actors responsible for cluster support are the Regional Department for Economic Development and the Umbria Region Agency for Innovation (**Sviluppumbria**).

Support for clusters in Umbria is provided through a mix of project-based funding (e.g. ERDF co-financed innovation vouchers and R&D grants), technical assistance, and capacity-building activities. These include initiatives for strengthening cluster governance, supporting digital and green transitions, and facilitating access to EU and interregional programmes (e.g. Horizon Europe, I3). Coordination with the regional innovation ecosystem is ensured through cluster participation in the Entrepreneurial Discovery Process (EDP) and their involvement in the Regional Innovation Council. As shown in the section above, the three Umbrian clusters are particularly active in the sectors of aerospace, e-mobility, and boat-building, aligning with the region's S3 priorities and contributing to the international positioning of local SMEs within strategic value chains.

The importance of clusters for regional economic competitiveness and twin transition

Cluster organisations play a significant role in enhancing **regional industrial competitiveness and productivity** by fostering collaboration, specialisation and innovation. The findings of the Cluster Panorama Report reinforce this role, showing strong, positive correlations between the presence of clusters and multiple indicators of **economic returns, innovation potential, firm behaviour**, and **business environment**. This is shown in Figure 3.

Figure 3: Relationship of clusters and regional competitiveness, correlation results



Source: ECCP (2024). Own elaboration based on [European Cluster Panorama Report 2024](#). Note: The symbols in the table indicate Pearson correlation coefficients that are significant at 95% level. Positive/negative Correlations include coefficients ≥ 0.3 , weak correlations include coefficients ≥ 0.1 . Green fields indicate a positive relationship and red a negative relationship.

Within the **business environment** dimension, regions with a strong cluster presence tend to exhibit higher levels of human resources in science and technology, which suggests that clusters are magnets for skilled talent and contribute to the development of regional innovation ecosystems. These environments are also more conducive to entrepreneurship and firm creation, as evidenced by the positive correlation with the birth of enterprises. This implies that clusters help build dynamic local economies where new firms are more likely to emerge and thrive.

In the area of **firm behaviour**, cluster organisations are closely linked with increased business R&D investment and the employment of ICT specialists, both of which are fundamental for enhancing firms' innovation capacities and digital readiness. These results indicate that clusters do not just passively reflect the strength of their member firms but actively contribute to improving their performance by facilitating knowledge transfer, cooperation, and access to specialised services and infrastructure.

Under the dimension of **innovation potential**, a particularly notable result is the positive correlation between cluster presence and patenting activity, including PCT patents per capita and digital patents, which are important proxies for technological advancement and international competitiveness. The results also show some degree of correlation with green patents, suggesting that clusters may increasingly support the development of sustainable technologies, although this relationship is still emerging.

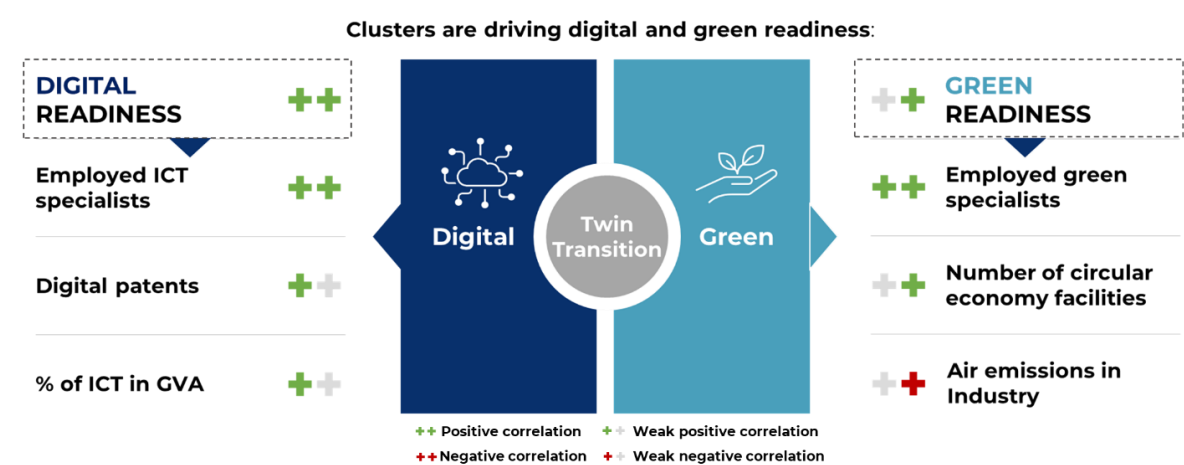
Concerning **economic returns**, the presence of clusters is positively associated with key performance indicators such as GDP per capita, employment rate, labour productivity, and employment in knowledge-intensive sectors. These macro-level outcomes underscore the broader economic benefits of strong cluster ecosystems, which are able to leverage regional assets, support structural transformation, and contribute to long-term growth.

These correlations imply that clusters not only support economic growth but also enhance resilience and adaptability through innovation and entrepreneurship. Moreover, the Cluster Panorama Report highlights the

influence of clusters in creating enabling environments for enterprise formation and knowledge exchange, which are foundational for long-term competitiveness.

Cluster organisations are not only engines of economic competitiveness and innovation—they are also emerging as **key enablers of the twin transition**, which encompasses both digital and green transformation processes. Recent findings from the European Cluster Panorama Report underline the significant positive link between cluster presence and many factors associated with the green and digital transition (see Figure 4).

Figure 4: Relationship of clusters and digital and green readiness, correlation results



Source: ECCP (2025). Own elaboration based on [European Cluster Panorama Report 2024](#). Note: The symbols in the table indicate Pearson correlation coefficients that are significant at 95% level. Positive/negative Correlations include coefficients ≥ 0.3 , weak correlations include coefficients ≥ 0.1 . Green fields indicate a positive relationship and red a negative relationship.

With respect to the **green transition**, the analysis shows that the presence of cluster organisations is positively correlated with green readiness indicators, indicating that regions with a higher number of clusters tend to be better prepared for adopting environmentally sustainable practices. This implies that clusters may facilitate the green transition by supporting eco-innovation, promoting sustainable production models, and mobilising relevant actors across value chains. Interestingly, a positive correlation is also observed between cluster presence and air emissions in industry, suggesting that clusters are often located in more industrialised regions, where emissions are naturally higher due to economic activity. This underlines the importance of involving clusters in decarbonisation strategies, given their influence over industrial ecosystems. Rather than being seen as part of the problem, clusters can be leveraged as platforms for change, helping industries within their networks to implement cleaner technologies and reduce their environmental footprint.

With regard to the **digital transition**, cluster organisations are strongly associated with higher performance indicators such as the share of ICT in gross value added, the employment of ICT specialists, and the number of digital patents. These relationships underscore the critical role of clusters in enabling the diffusion of digital technologies across regional economies. Furthermore, regions with high cluster intensity tend to demonstrate greater digital readiness, as measured by comprehensive indicators including connectivity, digital skills, and ICT usage in firms. This suggests that clusters not only support the digital upgrade of existing industries but also help foster new digital business models through cooperation with research institutions, digital innovation hubs, and testing environments. Importantly, cluster organisations are among the few regional innovation intermediaries that can simultaneously drive firm-level digitalisation and contribute to the broader transformation of industrial ecosystems.



03

Smart Specialisation in Umbria



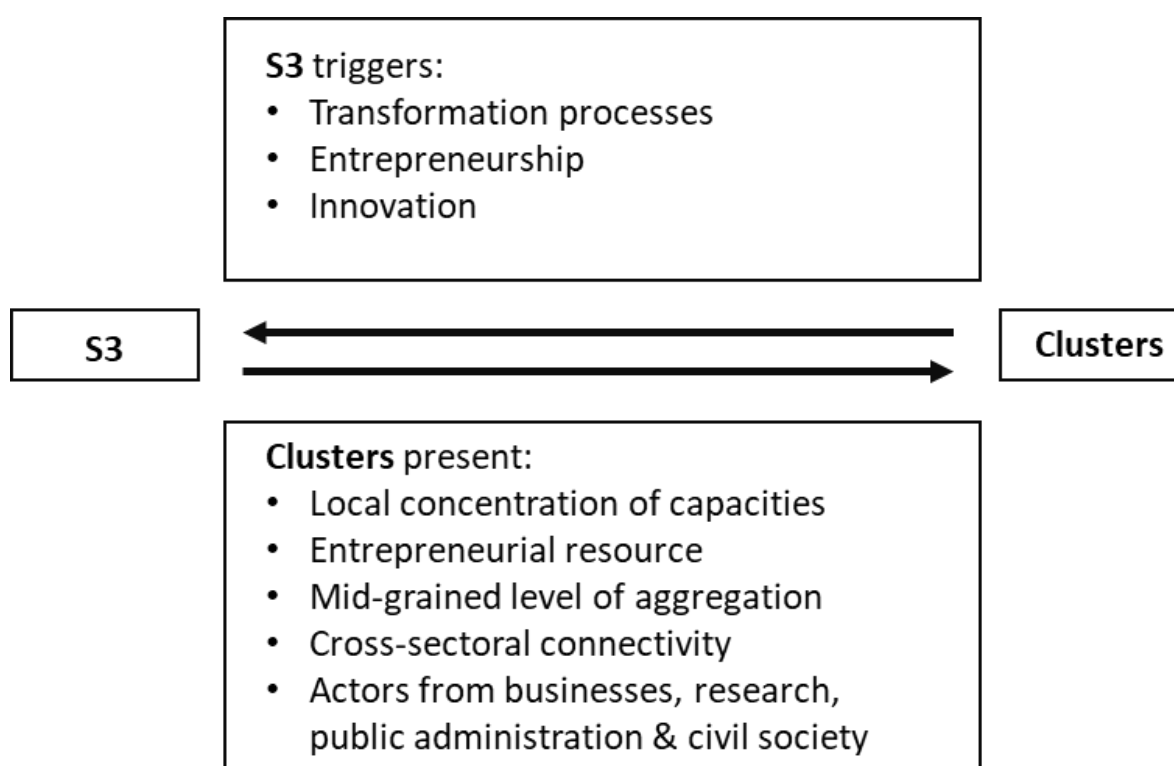
EUROPEAN CLUSTER
COLLABORATION PLATFORM

Strengthening the European economy through collaboration

3. Smart Specialisation in Umbria

Smart Specialisation is a strategic approach developed by the European Commission that requires regions to identify and focus on their unique strengths and capabilities to foster innovation-driven economic growth. **Cluster organisations can play an important role in the design and implementation of Smart Specialisation Strategies (S3)** since in both concepts, the promotion of economic growth and competitiveness through regional proximity is the key element. The S3 can help to transform the efforts of individual cluster organisations into a regional agenda, while clusters provide a broad range of actors with specific abilities.³⁰ The interplay between clusters and smart specialisation is also visualised in Figure 5. Against this background, the following section outlines the Smart Specialisation approach pursued by the region of Umbria.

Figure 5: Interaction of clusters and S3



Source: ECCP (2025), own adaptations based on Keller et al. (2019): Implementing S3 with Clusters – An Innovation Model for Transformative Activities.

A key starting point for the analysis of the **Umbrian S3 2021-2027** is the **Regional Research and Innovation Strategy for Smart Specialisation 2021-2027**, developed by the Region of Umbria. The S3 2021-2027 of

³⁰ See also European Commission (2013): The role of clusters in smart specialisation strategies. Available online: <https://op.europa.eu/en/publication-detail/-/publication/2fe44194-e5a8-42b7-ac14-9c9b8e157de3> (last access 14.04.2025); OECD (2016): OECD Science, Technology and Innovation Outlook 2016 – Cluster Policy and Smart Specialisation. Available online: https://www.oecd-ilibrary.org/docserver/sti_in_outlook-2016-28-en.pdf?expires=1628167848&id=id&accname=guest&checksum=54667669BA762145CD40965A391C05BE (last access 10.04.2025).

Umbria identifies **four priority areas**. These priority areas encompass advanced manufacturing and sustainable technologies, as well as digital and creative industries (see Figure 6).³¹

Figure 6: Priority areas of the S3 2021-2027 of Umbria



Source: ECCP (2025), own elaboration based on the [Regional Research and Innovation Strategy for Smart Specialisation 2021–2027](https://www.regione.umbria.it/documents/18/25530698/S3+Umbria+21-27_08+04+2024.pdf/f3f38e6c-33fd-4b3f-bc80-ddef66f77125).

A closer examination of the different priority areas provides a clearer understanding of the objectives pursued by Umbria through its Smart Specialisation Strategy:

- **Smart Manufacturing:** This priority aims to reinforce the competitiveness of Umbria’s industrial base by promoting the digital and ecological transformation of manufacturing sectors. It focuses on strengthening advanced production systems, smart automation, and sustainable industrial processes. Key actions include supporting innovation in machinery, mechatronics, and advanced materials, particularly in sectors like e-mobility, aerospace, and nautical technologies.
- **Green and Sustainable Economy:** By enhancing energy efficiency, fostering circular economy practices, and supporting low-carbon technologies, this area promotes the transition towards a sustainable and green economy. The objective is to develop green value chains, encourage environmental innovation, and support businesses in integrating sustainability into their production and organisational models. Emphasis is placed on renewable energy, sustainable construction, and waste recovery technologies.
- **Digital and Connected Communities:** This priority supports the digital transformation of the region by investing in enabling technologies, connectivity infrastructure, and smart services. It seeks to develop integrated digital platforms and foster data-driven innovation to modernise public administration, improve quality of life, and support innovation across sectors. Technologies such as artificial intelligence, IoT, and big data play a central role in this priority area.
- **Culture, Creativity and Quality of Life:** To drive social and economic innovation, this area leverages Umbria’s cultural and creative assets. It focuses on enhancing the cultural and tourism value chains, promoting creative industries, and fostering social cohesion. The priority also addresses demographic challenges by improving services, promoting territorial attractiveness, and fostering innovation in education, health, and social well-being.

³¹ Regione Umbria (2024): Regional Research and Innovation Strategy for Smart Specialisation 2021–2027. Available online: https://www.regione.umbria.it/documents/18/25530698/S3+Umbria+21-27_08+04+2024.pdf/f3f38e6c-33fd-4b3f-bc80-ddef66f77125 (last access 26.05.2025).

Clusters play a central role in Umbria's Regional Innovation Strategy, serving as key intermediaries in the development and implementation of the Smart Specialisation Strategy (S3) 2021–2027. They act as facilitators of collaboration between enterprises, research centres, universities, and public authorities, helping to translate regional priorities into concrete innovation projects. In particular, clusters support the regional value chains identified within the S3 priority areas—such as smart manufacturing, green technologies, and digital innovation—by facilitating knowledge exchange, pooling demand, and promoting internationalisation. Their active involvement in the entrepreneurial discovery process (EDP) and in co-designing strategic actions reinforces their role as engines of industrial transformation and territorial cohesion. Umbria's innovation policy recognises clusters as strategic platforms to support SMEs, mobilise investment, and strengthen the regional innovation ecosystem.

A concrete example of this strategic approach is Umbria's involvement in the S3 Partnership on [Hydrogen Valleys](#). This interregional partnership focuses on areas such as the development of green hydrogen value chains, the integration of hydrogen technologies in energy systems and mobility, as well as the deployment of pilot projects across regions. Through this collaboration, Umbria aims to strengthen its role in the green transition by leveraging local industrial capabilities in advanced manufacturing, energy, and mobility. Participation in the Hydrogen Valleys partnership allows the region to access shared knowledge, co-develop innovation projects with other EU regions, and position its enterprises and research actors within emerging European hydrogen ecosystems. This supports the implementation of Umbria's Smart Specialisation Strategy and reinforces its commitment to sustainable industrial transformation.

Further good practices of cluster involvement in S3 from other European regions, and especially the Entrepreneurial Discovery Process (EDP),³² are highlighted in Box 1.

Box 1: Good practices of cluster involvement in S3

Good practices of cluster involvement in S3

Basque Country, Spain – Cluster working groups:

In the Basque Country, cluster organisations are actively involved in the identification of key sectors for the definition of the S3 priority areas to ensure an alignment with the strengths of the region. Moreover, cluster organisations are involved in the implementation of the S3 through working groups and special committees which develop project proposals that are submitted to various funding programmes (e.g., ERDF).

Tuscany, Italy – Foresight & Roadmapping:

In Tuscany, clusters were key actors involved in the EDP which built on a 5-step model for strategic planning based on foresight and roadmapping. In this process, the 13 regional Innovation Poles play a key role as they are tasked to organise open workshops in which scientific and technological roadmaps were developed based on foresight exercises on the regional strengths and weaknesses.

Skåne, Sweden – Board of Cluster Organisations:

In Skåne, the innovation strategy is part of Skåne's Regional Development Strategy (The Open Skåne

³² The entrepreneurial discovery is an interactive and inclusive process in which the relevant actors identify new and potential activities and inform the government. The government assesses this information and empowers those actors most capable of realising the potential. See https://ec.europa.eu/regional_policy/policy/communities-and-networks/s3-community-of-practice/entrepreneurial_discovery_en (last access 02.05.2025).

2030) and was developed by the Research and Innovation Council of Skåne. The Research and Innovation Council of Skåne is a forum of collaboration composed of a variety of actors from the public, private and academic sector. Cluster organisations are represented in this Research and Innovation Council through the board of cluster organisations.

Walloon Region, Belgium – Coordination cells & Strategic Innovation Initiatives:

In the Walloon Region, cluster organisations are actively involved in the Smart Specialisation Strategy (S3) 2021-2027 through their participation in coordination cells for each of the five priority areas. These coordination cells, which include both regional administration and cluster organisations, are responsible for monitoring the development of their respective priority areas. Furthermore, Strategic Innovation Initiatives, which are cross-sector consortia aiming to achieve S3 objectives through a set of coherent projects covering the entire innovation chain, play a key role in the region's innovation framework. Walloon cluster organisations have supported the emergence and structuring of these initiatives and continue to assist in strategy development and ecosystem building to enhance cross-sector collaboration and innovation.

Source: ECCP (2025).

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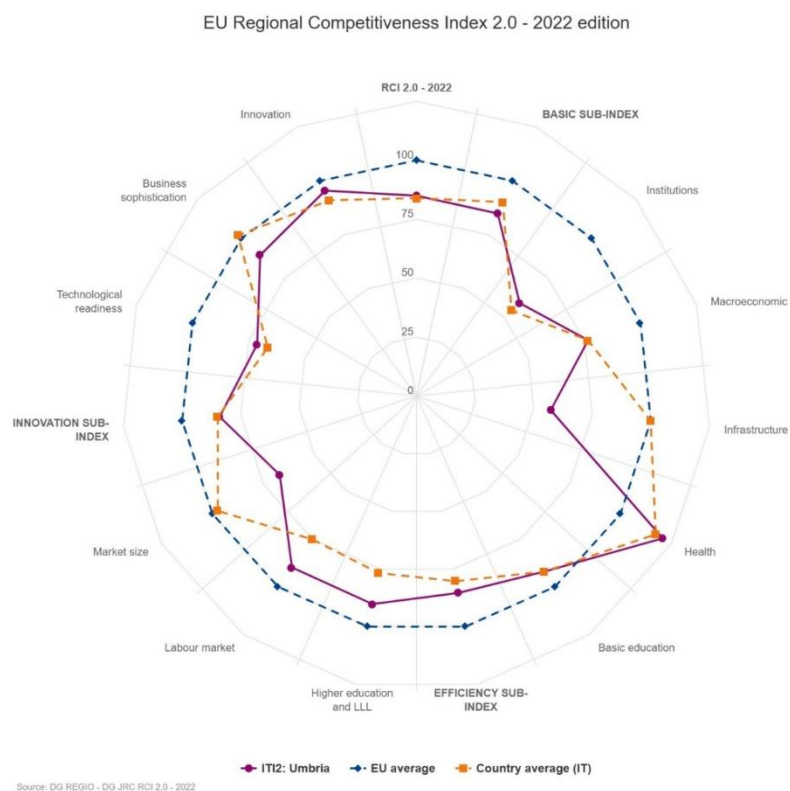
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Annex

Regional Competitiveness Level in the Umbria region

Figure 7: Performance of the Umbria region in the 2022 Regional Competitiveness Index



Source: European Commission (2022): EU Regional Competitiveness Index 2.0 – 2022 edition.

List of cluster organisations in Umbria

Table 1: Overview of cluster organisations in Umbria and their addressed EU industrial ecosystems

No.	Cluster organisation (English name)	Assigned Industrial Ecosystem	Website
1	Umbria Nautical Cluster	Mobility-Transport-Automotive	https://www.umbrianaauticalcluster.com/
2	Umbria Aerospace Cluster	Aerospace & Defence	https://umbriaerospace.com/en/
3	Umbria E-mobility network	Mobility-Transport-Automotive	https://www.umbriaemobilitynetwork.it/en/home-en/

Source: ECCP (2025).