EUROPEAN CLUSTER
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Clusters meet Regions' event in Rzeszów "Exploring the Innovation Ecosystem: Clusters as Catalysts for Regional Competitiveness" – the case of the Podkarpackie region

Input paper

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Executive Summary

The Clusters meet Regions event taking place in Rzeszów on June 3 & 4, 2025 focuses on the role of clusters in boosting regional competitiveness, supporting smart specialisation, and advancing green and digital transitions. It will also serve as a platform to discuss security, dual-use technologies, and advancements in the drone industry. This paper presents observations on the cluster landscape in the Podkarpackie region in Southeastern Poland and outlines some considerations for the future development of the region.

The key takeaways are summarised below:

Context: Economic profile of the Podkarpackie region

- The Podkarpackie region accounts for approximately **3.8% of Poland's GDP**, reaching a total of €28.4 billion in 2023. With a GDP **per capita (PPS) of €21,100**, the region remains below both the national average (€29,500) and the EU average (€31,800). In 2024, the region's **exports** amounted to **€11 billion**, reflecting a 3.9% increase compared to the previous year, despite a national decline in exports.
- **Construction and Agri-Food** are among the largest industrial ecosystems in terms of employment share. Employment levels are also relatively high in the Mobility–Transport–Automotive, Energy-Intensive Industries, and Aerospace & Defence ecosystems.
- The 2023 Regional Innovation Scoreboard classifies the Podkarpackie region as an **"Emerging Innovator"** with a score below both the EU and Polish averages. The region performs well in business R&D, SME collaboration, product innovation, and design applications, but faces challenges in scientific excellence and ICT capacity. Institutions like the Podkarpackie Innovation Centre, the AEROPOLIS Science and Technology Park, the Rzeszów Regional Development Agency and the Podkarpackie Development Fund support research, commercialisation and startup development.

Clusters in the Podkarpackie region and their importance for regional economic development

- Out of the 83 ECCP-registered **cluster organisations** active in Poland, **seven** are based in Podkarpackie, placing the region in a mid-range group of Polish regions. The regional cluster landscape is relatively centralised, with most organisations located in the Rzeszów sub-region. These cluster organisations span six of the 14 EU industrial ecosystems, with a strong focus on industrial and production-oriented fields. The most prominent ecosystem is Mobility–Transport–Automotive, with two cluster organisations active in this ecosystem. In addition to the seven ECCP-registered cluster organisations, 22 further organisations are active in the region, which equals a combined number of **29 cluster organisations**.
- **Cluster policy** is supported at both national and regional levels. At the national level, the Krajowy Klaster Kluczowy (KKK) programme supports recognised clusters through ERDF-funded initiatives. Regionally, the Podkarpackie region fosters cluster development as part of the "Regional Innovation Strategy of the Podkarpackie Province for 2021-2030", with a focus on innovation-oriented sectors such as aerospace, automotive, and ICT. Key institutions like the Rzeszów Regional Development Agency and the Podkarpackie Innovation Centre provide targeted support through funding, mentoring, and infrastructure, while the "Podkarpackie – Smart Region" project promotes collaboration via the Entrepreneurial Discovery Process.
- Cluster organisations play a key role in enhancing **regional industrial competitiveness** by fostering collaboration, innovation, and productivity. In the Podkarpackie region, clusters contribute to stronger

business R&D investment, employment in ICT, and entrepreneurship, which are essential for innovation capacity and economic performance. They also support the twin transition by facilitating the uptake of digital and green technologies, particularly in energy-intensive and manufacturing sectors. As regional intermediaries, clusters help align firms with sustainability goals and promote cross-sectoral cooperation for long-term transformation.

Cross-border cooperation and the involvement of Podkarpackie's clusters in European networks and support initiatives

- Cluster organisations from the Podkarpackie region have been actively involved in a **European Strategic Cluster Partnership (ESCP)**. These ESCPs, supported by the European Commission, have strived to help cluster members to face global competition, by supporting interregional activities for joint innovation and investment projects and facilitating access to other countries & regions in the EU and internationally. In the Podkarpackie region, one cluster organisation has participated in the ESCP for Internationalisation (ESCP-4i) project. That project focused on various topics, including textile manufacturing and recycling.
- The Aviation Valley Cluster is the only cluster organisation from the region that has participated in a **Euroclusters** project. As a member of the METASTARS Eurocluster, it contributes to strengthening the European Aerospace and Defence ecosystem. Additionally, the same cluster has participated in two projects funded under the **Interregional Innovation Investments (I3) instrument**. Furthermore, there are also other cluster outside these environments that contribute to the European Automotive Cluster Network, the Automotive Skills alliance and other sectors, such as the aviation and cosmonautics, information and telecommunication or quality of life.

Smart Specialisation in the Podkarpackie region

- Smart Specialisation (S3) is a strategic approach developed by the European Commission that encourages regions to build on their specific strengths to foster innovation-driven growth. The Regional Innovation Strategy of the Podkarpackie Province for 2021-2030 identifies **four priority areas**: Aviation and Cosmonautics, Automotive, Information and Telecommunication Technologies, and Quality of Life. These priorities reflect the region's focus on industrial competitiveness, research and education cooperation, and the application of advanced technologies to support socio-economic development.
- **Cluster organisations** play a central role in the **governance and implementation of Podkarpackie's S3**, fostering collaboration between industry, research institutions, and government stakeholders. Clusters such as the Aviation Valley Cluster can play an important role in supporting the region to focus on its strategic priority areas.

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Context: Economic profile of the Podkarpackie region

1. Context: Economic profile of the Podkarpackie region

The Podkarpackie Voivodeship (English: Subcarpathia), hereinafter referred to as the Podkarpackie region, is located in the southeastern part of Poland, bordering Slovakia to the south and Ukraine to the east. Its strategic position at the EU's external border provides key advantages for cross-border cooperation and trade, while its strong industrial base and innovation-driven sectors have contributed to its growing importance within Poland's economic landscape. As of 2024, the Podkarpackie region is home to approximately two million people, representing around 5.3% of the national population.[1]

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

Macroeconomic profile of Podkarpackie

In 2023, the gross domestic product (GDP) of the Podkarpackie region reached approximately €28.4 billion, accounting for roughly **3.8% of Poland's total GDP**.[2] The region has experienced strong economic growth over the past few years. Between 2017 and 2019, annual growth ranged between 4.8% and 5.7%, respectively.[3] Although the COVID-19 pandemic caused a recession of 2% in 2020, the region rebounded in 2021 with a growth rate of 4.4% and continued its recovery with 6.3% growth in 2022, while in 2024, the region's growth rate was 4.3%, surpassing both the European and national averages.[4] The GDP per capita in purchasing power standards (PPS) for the Podkarpackie region in 2023 stood at €21,100, placing it below both the EU average (€31,800) and the national average (€29,500).[5]

In terms of gross value added (GVA), the Podkarpackie region contributed approximately 3.8% of Poland's added value in 2023, with the services sector accounting for 59.7% in 2022, while the manufacturing sector accounted for 27% (2022), significantly higher than the national and EU27 average of 21.7% and 16.6%.[6] The region is highly industrialised, with **particular strengths in aerospace, electromechanical, automotive, IT, and chemical industries**. All of these sectors hold **strong potential for innovation transfer**.[7]

The Podkarpackie region plays an important role in Poland's external trade, driven by its **strong industrial base and proximity to key international markets**. In 2024, the region's export revenues amounted to approximately €11.01 billion (PLN 46.840,9 million), representing a 3.9% increase compared to the previous year. This positive performance is particularly notable given the national context, where total Polish exports declined by around 2% over the same period.[8] Looking at the structure of exports, the vast majority—90.4%—of sales revenues were

[1] Eurostat (2025): Population on 1 January by age, sex and NUTS 3 region (last access 30.04.2025).
[2] Eurostat (2025): Gross domestic product (GDP) at current market prices by NUTS 2 regions (last access 30.04.2025).
[3] Eurostat (2025): Gross domestic product (GDP) and main components (output, expenditure and income) (last access 30.04.2025).
[4] To account for inflation, GDP at market prices was adjusted using a deflator derived from national-level chain-linked volumes with a 2010 base year, based on Eurostat data.
[5] Eurostat (2025): Gross domestic product (GDP) at current market prices by NUTS 2 regions (last access 30.04.2025).
[6] Eurostat (2025): Gross value added at basic prices by NUTS 3 regions. (last access 06.05.2025).
[7] Polish Investment & Trade Agency (2025): Podkarpackie (last access 06.05.2025).
[8] Central Statistical Office (2025): Report on the socio-economic situation of Podkarpackie Voivodship in 2025. Available online: https://rzeszow.stat.gov.pl/en/publications/other-studies/report-on-the-socio-economic-situation-of-podkarpackie-voivodship-in-2025,4,13.html (last access 08.05.2025).

generated from the sale of finished products, reflecting the region's strong manufacturing capabilities. The remaining 9.6% came from the export of goods and raw materials.

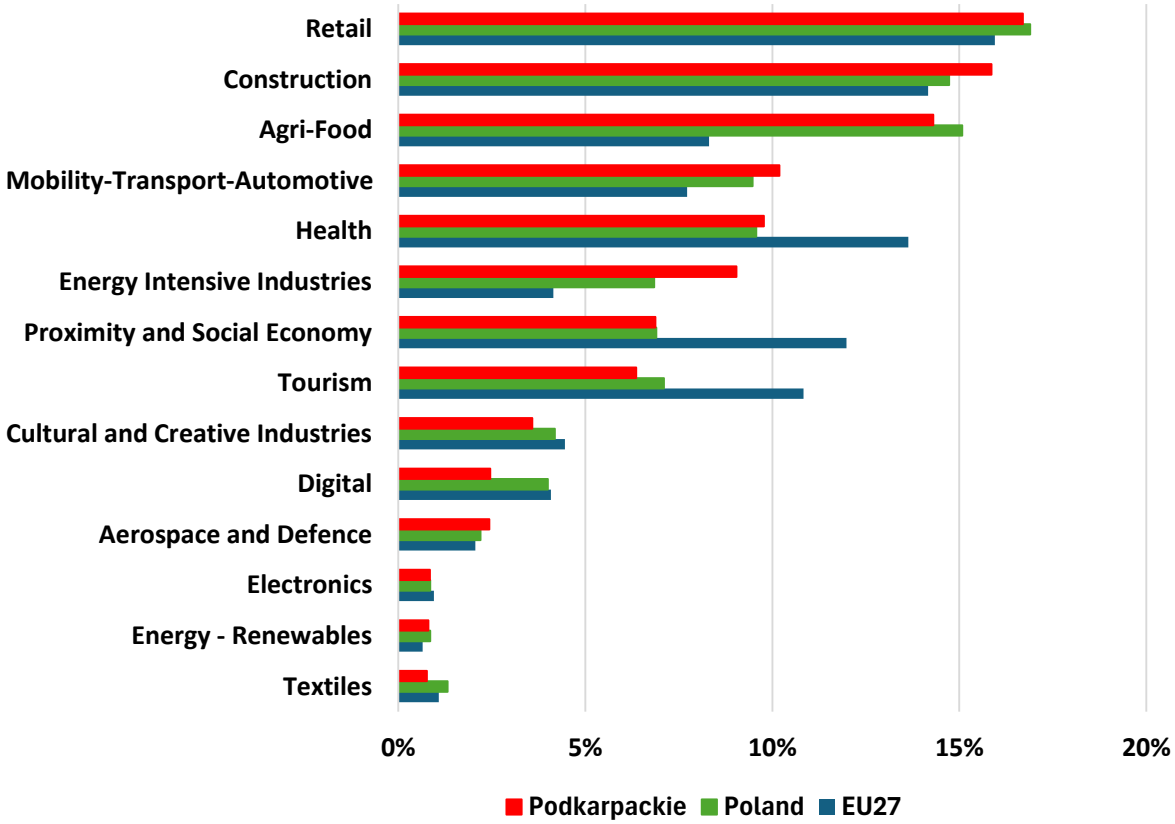
Employment composition and specialisation of the Podkarpackie region

According to the most recent data for 2024 from Eurostat[9], **industry plays a particularly prominent role** in the Podkarpackie region's labour market, employing 25.7% of the workforce. This figure exceeds both the Polish average of 22.4% and the EU average of 17.3%. Employment in the construction sector also stands out, accounting for 9.4% of the workforce—again higher than the national (7.6%) and EU (6.8%) averages. In contrast, the services sector in Podkarpackie accounts for 31.0% of total employment, which is notably below the national average of 37.5% and the EU27 average of 41.2%. Public administration employs 28.6% of the regional workforce, placing Podkarpackie above the national average of 25.8%, though slightly below the EU level of 31.0%. Meanwhile, agriculture remains a smaller but still relevant sector, employing 4.7% of the regional labour force—higher than the EU average of 3.3%, but lower than the national level of 6.5%.

A similar pattern is observed when examining employment distribution across the EU industrial ecosystems. As part of its Industrial Strategy (March 2020), the European Commission has selected 14 industrial ecosystems that are particularly relevant in Europe and encompass all players operating in a value chain. The classification of the 14 industrial ecosystems has been calculated by aggregating NACE 2-digit activities, following the methodology established by the European Commission. The industrial ecosystems capture the entire value chain and can therefore be broader than the above-mentioned employment shares. Figure 1 illustrates the share of employment across the 14 industrial ecosystems in Podkarpackie, Poland, and in the EU27. According to this, the Retail ecosystem is the ecosystem with the highest employment share across all ecosystems in Podkarpackie, with 16.7%. This is slightly above both the EU27 average (15.9%) and the national average (16.9%). Construction is the second largest ecosystem, with a share of 15.9%, exceeding both the EU (14.2%) and Polish (14.7%) averages. The Agri-Food ecosystem ranks third, representing 14.3% of employment. Although this is below the national average of 15.1%, it remains substantially higher than the EU average of 8.3%. Other ecosystems in the Podkarpackie region also show above-EU-average employment shares, highlighting the region's industrial strengths. These include **Mobility–Transport–Automotive, Energy Intensive Industries, and Aerospace & Defence**.

[9] Eurostat (2025): Employment by sex, age, economic activity and NUTS 2 regions (NACE Rev. 2) (1000) (last access 08.05.2025).

Figure 1: Employment across the industrial ecosystems for Podkarpackie, Poland and the EU27



Source: ECCP (2025), own elaboration based on Eurostat. Note: The figures refer to the year 2022, as this was the most recent year for which data at the corresponding sectoral level were available.

Regional competitiveness level of the Podkarpackie region

To provide an overview of Podkarpackie's performance in key dimensions of **regional competitiveness**, the region's ranking in the European Commission's **Regional Competitiveness Index (RCI)** is presented.[10] This index evaluates the competitiveness of EU regions across three dimensions: the Basic Sub-Index, the Efficiency Sub-Index, and the Innovation Sub-Index. Each dimension captures different aspects of a region's ability to offer an attractive and sustainable environment for businesses and residents. A detailed overview of Podkarpackie's performance across these dimensions is presented in Figure 10 in the Annex.

The **overall regional competitiveness score** of the Podkarpackie region stands at **82.7**, placing the region below both the EU27 average (EU27=100) and the national average (88.7). This positions the Podkarpackie region among the less competitive regions in Poland and reflects a broader trend: the region consistently scores below national levels, and both fall short of the EU average.

This pattern is evident across all three RCI sub-indices. In the **Basic Sub-Index** (which includes Institutions, Macroeconomics, Infrastructure, Health, and Basic Education), the Podkarpackie region scores 87.1. The region performs particularly weakly in Institutions and Infrastructure, aligning with national trends. In contrast, the

[10] European Commission (2022): EU Regional Competitiveness Index 2.0 - 2022 edition. Available online: https://ec.europa.eu/regional_policy/assets/regional-competitiveness/index.html#/PL/PL82 (last access 08.05.2025).

region's score in Health (81.0) exceeds the national average (72.6), and Basic Education achieves a score of 134.8, surpassing both national and EU averages—one of the few areas in the index where the Podkarpackie region demonstrates relative strength.

The **Efficiency Sub-Index** reflects a similar pattern, with the Podkarpackie region scoring 84.1. However, differences emerge at the indicator level. For Market Size, the region scores 36.9, below both the national and EU averages. Meanwhile, Labour Market and Higher Education and Lifelong Learning (LLL) indicators paint a more nuanced picture. The Labour Market score (91.1) exceeds the EU average but remains below the national level. Conversely, Higher Education and LLL reach a score of 102.0, outperforming both national and EU benchmarks.

In the **Innovation Sub-Index**, the Podkarpackie region exhibits a low performance, with a score of 64.7. This underperformance is consistent across all three constituent pillars. The region scores 74.2 in Technological Readiness and 77.9 in Innovation, both well below EU levels. The only exception is in Business Sophistication, where the Podkarpackie region achieves 40.9, slightly exceeding the national score (39.0), though still significantly below the EU average. A more detailed analysis of the region's innovation performance is provided in the following section.

Innovation landscape of the Podkarpackie region

This subchapter first examines the regional innovation performance of the Podkarpackie region based on the 2023 Regional Innovation Scoreboard (RIS). In a second step, additional sources are used to explore broader elements of the region's innovation landscape, including research and development (R&D) infrastructure, innovation hubs, and other ecosystem components aimed at strengthening innovation capacity across the region.

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.[11] According to the RIS, the Podkarpackie region is classified as an **Emerging Innovator** with an overall score of 56.7, which is below the Polish score of 62.8 as well as the EU average (EU27=100). Over time, the innovation performance of the Podkarpackie region has increased by 4.3% since 2016.[12]

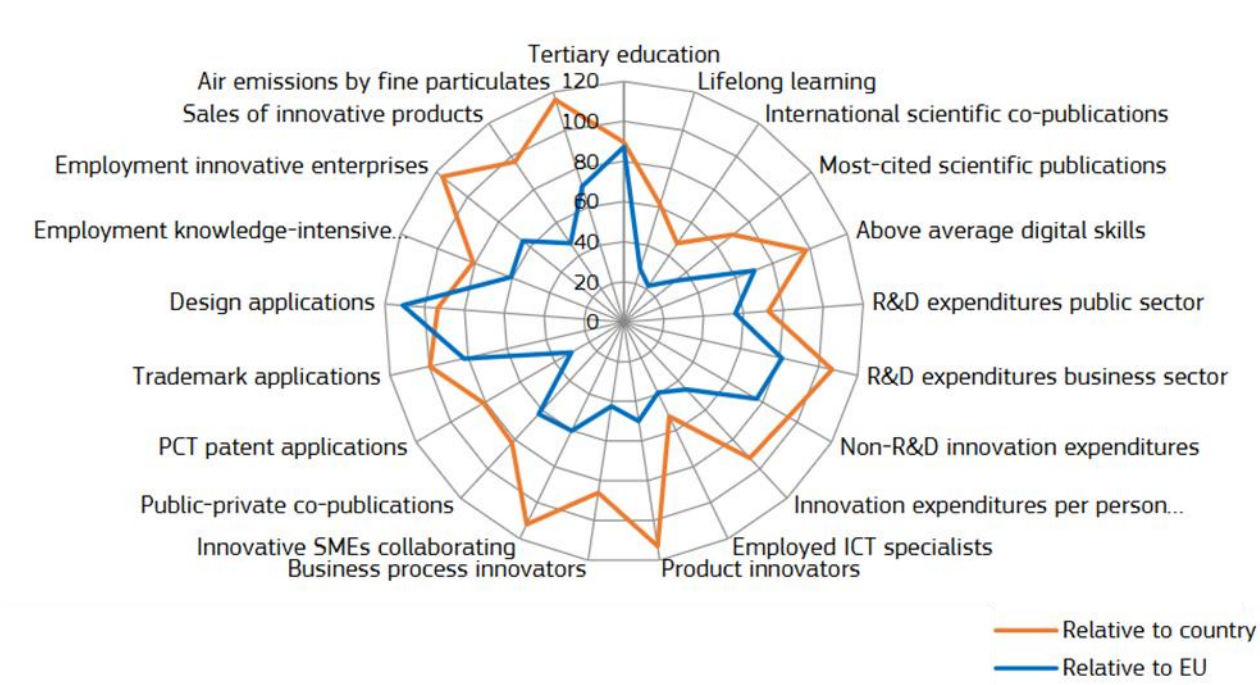
Despite being classified as an Emerging Innovator in the RIS, the region demonstrates several **notable strengths** within its innovation ecosystem at least compared to the Polish average (see Figure 2). In the area of research and development (R&D), the Podkarpackie region stands out for its performance in the private sector, particularly in R&D expenditures by the business sector, where it exceeds the national average. The region also performs above the national average in product innovation and employment in innovative enterprises, indicating a dynamic and innovation-oriented business environment. In terms of SME collaboration, the Podkarpackie region shows a regional strength in the indicator "Innovative SMEs collaborating with others", scoring above the national average. This points to effective inter-firm cooperation that supports the region's innovation capacity.

[11] 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%20 (last access 08.05.2025).

[12] European Commission (2023): Regional Innovation Scoreboard 2023 – Regional profiles Poland. Available online: https://ec.europa.eu/assets/rtd/ris/2023/ec_rtd_ris-regional-profiles-poland.pdf (last access 08.05.2025).

Additionally, in the field of intellectual property, the region performs strongly in design applications, surpassing the EU average.

Figure 2: Regional innovation level of Podkarpackie



Source: European Commission (2023): Regional Innovation Scoreboard 2023 – Regional profiles Poland.

Despite these strengths, the Podkarpackie region faces several **challenges** regarding its innovation performance. In the area of scientific excellence, the region scores significantly below both the national and EU averages for international scientific co-publications and most-cited scientific publications, pointing to limited visibility and impact in global research networks. This may be linked to the relatively low number of researchers in the region. The Podkarpackie region recorded 4.3 full-time equivalent (FTE) researchers per 1,000 employees, compared to the national average of 6.7. [13] Public investment in R&D is also an area of concern. R&D expenditure in the public sector, measured as a percentage of GDP, stood at 1.18% in 2022, which is below the national average of 1.46%.[14] Moreover, the region significantly lags behind both national and EU levels in the share of employed ICT specialists, a critical factor for digital innovation and competitiveness.

Although the region of Podkarpackie currently lags behind in several innovation-related indicators, the region is actively investing in the development of a stronger and more integrated innovation ecosystem. Through targeted initiatives and the creation of a well-connected network of innovation and technology centres, the Podkarpackie region seeks to bridge the gap between scientific research and its practical application in the economy. Notable examples include:

[13] University of Rzeszow (2024): Przegląd regionalny. Województwo podkarpackie 2023. Available online: https://rot.podkarpackie.pl/badania-zewnetrzne (last access 08.05.2025).
[14] ibid.

- **Podkarpackie Innovation Centre (PCI)** fosters collaboration between universities and the private sector, turning scientific research into market-ready innovations. It offers funding, mentoring, and infrastructure to support academic research, tech startups, and the commercialisation of innovations.[15]
- **AEROPOLIS Podkarpackie Science and Technology Park Centre** offers a full spectrum of support for businesses at various stages, including pre-incubation, incubation, and investment phases. This structured approach facilitates the growth of startups and established companies alike. [16]
- **Rzeszów Regional Development Agency** aims to support and coordinate regional development activities to foster further economic development. The agency supports a wide range of activities, such as sustainable and innovative tourism based on local natural and cultural resources, innovation and technology transfer, SMEs support, youth entrepreneurship, and policy development.[17]
- **Podkarpackie Development Fund** is a local government-owned company that provides financial instruments to support the growth of micro, small, and medium-sized enterprises (SMEs) in the Podkarpackie region.[18]

[15] For more information see https://pcinn.org/ (last access 06.05.2025).
[16] For more information see https://aeropolis.com.pl/en/ (last access 06.05.2025).
[17] For more information see https://rarr.rzeszow.pl/ (last access 20.05.2025).
[18] For more information see https://www.pardf.org/podkarpackie-development-fund/ (last access 20.05.2025).

02

Clusters in the Podkarpackie region and their importance for regional economic development

EUROPEAN CLUSTER COLLABORATION PLATFORM

Strengthening the European economy through collaboration

2. Cluster organisations in the Podkarpackie region 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 the Podkarpackie region, 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 the regional levels.

Cluster landscape of the Podkarpackie region

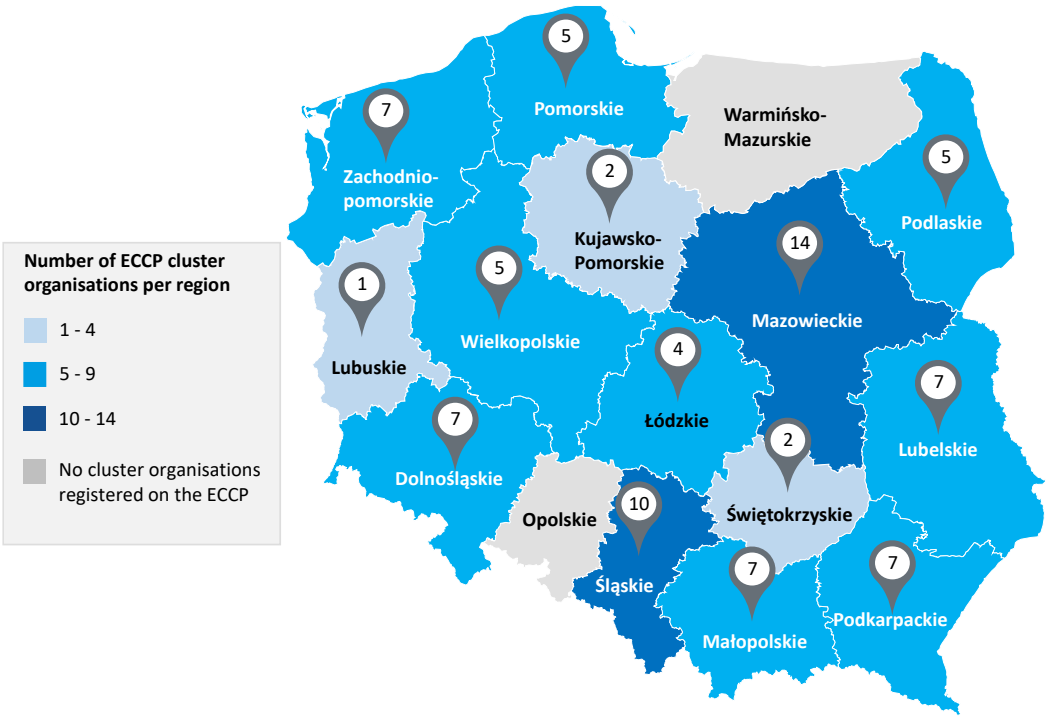
Cluster organisations are **key actors in the European economy**, facilitating collaboration, networking, and knowledge sharing between diverse innovation stakeholders within a geographical or sectoral cluster. In the Podkarpackie region, a total of 29 cluster organisations have been identified and are recognised by the region (see Table 1). Of these, seven are registered on the European Cluster Collaboration Platform (ECCP) and will be examined in more detail in the following section. To provide a comprehensive overview of the regional cluster landscape, additional cluster organisations that are not listed on the ECCP but are highly active in the region are also highlighted.

ECCP-registered cluster organisations in the Podkarpackie region

The ECCP serves as a one-stop shop for cluster organisations at the European level. Therefore, the number of registered cluster organisations and other innovation actors in the Podkarpackie region on the ECCP gives the first impression of the intensity of organisations in regional industrial networks. However, it is important to note that the ECCP-registered cluster organisations do not represent the entire cluster landscape of the region as registration on the ECCP is voluntary.

Figure 3 shows the geographical distribution of the ECCP-registered cluster organisations in Poland. Out of the total 1,247 registered EU27 cluster organisations on the ECCP, there are 83 registered cluster organisations in Poland with **seven of these being located in Podkarpackie**. The region therefore shows a mid-sized cluster landscape and is well embedded in a neighbourhood of regions with strong cluster landscapes in the Małopolskie region (Lesser Poland) and Śląskie (Silesia) to the West and Lublin to the North, as well as Moravskoslezský (Moravian Silesia) on the other side of the national border to Czechia. Only the Mazowieckie region (Mazovia) where the capital of Warsaw is located and the Śląskie region host more cluster organisations. Looking at the geographical distribution of cluster organisations in Podkarpackie, the **landscape appears highly centralised**. Most ECCP-registered cluster organisations are located in the Rzeszów sub-region, with five based directly in the city of Rzeszów, and one situated in the Tarnobrzeg sub-region, located north in the region.

Figure 3: Regional distribution of ECCP-registered cluster organisations in Poland

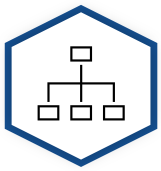


Source: ECCP (2025), own elaboration based on https://reporting.clustercollaboration.eu/all (last access 28.04.2025). Note: A full overview of the 7 ECCP-registered cluster organisations in the Podkarpackie region is provided in Table 2: Overview of ECCP-registered cluster organisations in the Podkarpackie region and their main addressed EU industrial ecosystems in the Annex.

The cluster organisations in the Podkarpackie region can be associated with **six out of the 14 EU industrial ecosystems** (see also Table 2 in the Annex). The most prominent ecosystem is **Mobility–Transport–Automotive**, with two cluster organisations active in this field. Other ecosystems represented by one cluster organisation each include **Aerospace & Defence, Energy Intensive Industries, Digital, Agri-Food, and Renewable Energy**. This distribution highlights a clear focus on industrial and production-oriented ecosystems, reflecting the region's economic specialisation in high-tech manufacturing and energy-related sectors.

As shown in Figure 4, the majority of ECCP-registered cluster organisations in the Podkarpackie region are **relatively small in terms of staffing**. Six out of seven cluster organisations employ between one and five staff members, while one organisation has a slightly larger team of six to ten employees. This indicates that cluster management structures in the region tend to operate with limited human resources. The member structure also reveals a **predominance of smaller organisations**. Four cluster organisations have up to 50 members, and one cluster comprises between 51 and 100 members. Two cluster organisations are comparatively larger, with a membership base ranging between 101 and 200 members. This distribution suggests that, while a few organisations manage broader networks, the overall cluster landscape in the Podkarpackie region is characterised by compact, tightly knit membership structures. Collaboration interests among these cluster organisations are primarily oriented towards **internationalisation, project partnerships, and participating in training**, which are consistent with broader trends observed across EU cluster networks.

Figure 4: Overview of organisation, structure, and thematic orientation of ECCP-registered cluster organisations in the Podkarpackie region



Organisation

- Six small-sized cluster organisations with 1-5 employees
- One middle-sized cluster organisation with 6-10 employees

Member structure

- Four cluster organisation rather small with up to 50 members
- One cluster organisations with 51-100 members
- Two relatively large cluster organisation with 101-200 members

Thematic orientation

- Cluster organisations can be related to the Renewable Energy, Mobility-Transport-Automotive, Aerospace & Defence, Agri-Food and Digital industrial ecosystems
- Collaboration is often sought in internationalisation and partnering for projects

Source: ECCP (2025).

As mentioned before, the Podkarpackie region has a strong industry sector, especially in the field of aerospace and automotive, which is also reflected in the regional cluster landscape: The Polish Aviation Cluster, known as **Aviation Valley**, is a leading aerospace hub located in southeastern Poland, centred in Rzeszów. The cluster is one example of the strong Aerospace & Defence ecosystem that is concentrated around the aviation industry in the region. The Aviation Valley is characterised by a dense network of aviation companies, research centres, and educational institutions, with strong support from global industry leader Pratt & Whitney. The cluster focuses on developing a competitive supply chain, fostering aerospace research, promoting industry-academia collaboration, and advocating for favourable government policies. Representing 194 companies, Aviation Valley aims to enhance its manufacturing base, attract foreign investment, and strengthen ties with European aerospace hubs, ultimately positioning southeastern Poland as a top European aerospace region. The **Polish Automotive Group PGM** is dedicated exclusively to Polish manufacturers of automotive parts and accessories. It aims to support the growth and competitiveness of domestic companies through unified representation and collaboration. The remaining four ECCP-registered cluster organisations are active in the industrial ecosystems of Digital, Agri-Food, Energy Intensive Industries and Renewable Energy. The **East Automotive Alliance** (EAA) is another cluster that further highlights the strength of the region's automotive ecosystem. The automotive cluster unites manufacturers, suppliers, academic institutions, and regional development agencies to foster collaboration and innovation in the automotive sector. Its mission is to support the development of the automotive industry in Eastern Poland, promote knowledge in automotive technology, and enhance regional competitiveness. The EAA's role in the region's path towards the industrial transition is further described in Box 1.

Box 1: ECCP Cluster Solutions Library – Cluster East Automotive Alliance (EEA)

East Automotive Alliance – EAA Cluster

Cluster EAA: A Cluster for Podkarpackie's industrial transition through vocational education

Founded in 2015 because of a large investment in the automotive industry of the region, this cluster aims to accelerate the green and digital industrial transition in the Voivodeship Podkarpackie. Established after the

merger of several companies, the East Automotive Alliance has established itself as a key actor within the region's innovation ecosystem in line with the region's Smart Specialisation Strategy (S3) objectives.

The Cluster's internal Organisation

The Cluster is composed of 38 members with very different characteristics, from SMEs to universities. Nonetheless, the EAA's work is based on a sound Cluster Strategy (2020-2023), which is based on the protection of the interests of the automotive industry, the creation of conditions conducive to the development of the automotive industry in Poland, as well as promoting knowledge in the automotive industry. Furthermore, the cluster is organised in 12 internal working groups or Think Tanks, which treat the most relevant industrial transition topics, an initiative which is aligned with the Entrepreneurial Discovery Process, while it serves as a mechanism to foster networking and knowledge transfer among EAA members.

Lessons Learned and Transferability

As one of the most innovative branches in the region, the automotive sector has played a central role in the development of regional innovation strategies, such as the S3. The EAA has therefore promoted a strong focus on vocational education, while the region's government has at the same time played an important role in policy support for cluster-based economic development. Additionally, a targeted service portfolio with a strong focus on research-industry collaboration and vocational education has also marked the difference. Lastly, the EAA cluster has been involved in European innovation projects and transnational networks.

Source: ECCP (2025). Note: the full case study on the Cluster EEA can be found in the ECCP Cluster Solutions Library.

Other active clusters in the Podkarpackie region

In addition to the seven ECCP-registered cluster organisations based in the Podkarpackie region, 22 other cluster organisations are currently active in the region but not yet registered on the ECCP. Among these, five are particularly prominent in terms of their visibility, activity levels, and alignment with the region's Smart Specialisation (S3) priorities (see Chapter 4). Within the S3 priority area of aviation and cosmonautics, the **Unmanned Systems Cluster** brings together key stakeholders involved in unmanned systems and aerial vehicles. Its members include drone-producing companies and two major universities in Rzeszów—University of Rzeszów and the Rzeszów University of Technology—which foster a strong link between scientific research and industrial application.[19] In the field of information and telecommunications, the **IT Cluster – Eastern Poland IT Companies Cluster** supports its members with a broad range of ICT services, including software development, hardware solutions, and IT outsourcing, thus contributing to the digital transformation of the regional economy.[20] Three of the most active cluster organisations fall under the S3 priority area of quality of life. The **Carpathian Tourism Cluster** focuses on promoting the southern part of the Podkarpackie region as an attractive tourism destination and strengthening the visibility of local tourism-related actors.[21] The **Podkarpackie Health and Prevention Cluster** addresses the region's health and demographic challenges by developing and implementing integrated solutions for prevention and healthcare, in cooperation with public authorities and medical institutions, responding to the growing needs of the inhabitants of the Podkarpackie region in the field of medicine.[22] Lastly, the **Podkarpackie Hydrogen Valley Association** plays a central role in fostering the development of a hydrogen economy in the region. The association brings together actors from business, research, and government to support scientific work, innovation, and strategic collaboration in this emerging field.[23] While five cluster

[19] For more information see: https://klaster.systemybezzalogowe.pl/ (last access 20.05.2025).
[20] For more information see: https://klasterit.pl/ (last access 20.05.2025).
[21] For more information see: https://www.karpaty.turystyka.pl/index.php/pl/klaster (last access 20.05.2025).
[22] For more information see: https://podkarpackiklasterzdrowia.pl/ (last access 20.05.2025).
[23] For more information see: https://www.dolinawodorowa.org/ (last access 20.05.2025).

organisations in the region stand out for their high level of activity, many of the remaining clusters not registered with the ECCP tend to have smaller membership bases. They span a wide range of focus areas, including tourism, agri-food, ICT, renewable energy, aviation, and health. A full list of the clusters in the Podkarpackie region is provided in Table 1 in the Annex.

Cluster policy in Poland and the Podkarpackie region

Poland's cluster policy incorporates both the national and regional levels of government.[24] It distinguishes three cluster categories:

1. **Emerging or incubation clusters** are at an early stage of development, with a minimum of 18 months of operation and 20 members. They operate mainly locally and can receive support for capacity building from regional programmes.
2. **Developing or growth clusters** (also: **Regional Key Clusters**) have been active for at least two years, have at least 35 members, and show growth potential, but have not yet obtained the status of a National Key Cluster. They can receive support from both the national and regional levels.
3. **National Key Clusters** have been operating for at least three years, have more than 50 members, and have successfully met the criteria set out in the regulations of the National Key Clusters competition. This is described more detailed below.

The National Key Clusters (Polish: Krajowy Klaster Kluczowy - KKK) programme is Poland's dedicated national-level cluster support programme. The competition to receive KKK status is held every three years. A central goal of the programme is to increase international recognition of Polish clusters. While KKK status does not come with funding as such, it allows access to specific funding opportunities, typically through ERDF programmes. In the new funding period, clusters awarded KKK status receive support through the European Funds for Modern Economy 2021–2027 programme. This includes support for the coordinators of National Key Clusters to build and improve cooperation between clusters from different Polish regions, particularly in areas such as the digital transition, circular and low-carbon economy, modern education, internationalisation, and innovation capacity. These activities are designed to strengthen the value offered to cluster members across the country.[25]

The Podkarpackie region can be described as an emerging innovation hub with a strong industrial base and a growing cluster ecosystem. Over the past decade, the region has developed a policy environment that actively supports cluster development, particularly in sectors aligned with its Regional Innovation Strategy: aerospace, automotive, ICT, quality of life, and advanced manufacturing. As previously mentioned, one of the most prominent examples is the Aviation Valley Cluster, a globally connected ecosystem comprising companies like PZL Mielec – Sikorsky, Pratt & Whitney, MTU Aero Engines, and EME-AERO. This cluster alone accounts for 90% of Poland's aerospace production, making the Podkarpackie region a strategically important industrial region within the EU. Other clusters, such as the Eastern Poland ICT Cluster, POLIGEN Plastic Processing Cluster, Eastern Poland IT Companies Cluster and the East Automotive Alliance, align with the key sectors outlined in the Regional Innovation Strategy.

[24] The first part of this subchapter on Poland's cluster policy is based on a case study originally developed for the ECCP Cluster Panorama Report 2024 (p. 50) and an ECCP Cluster Talk presentation by Monika Antonowicz from the Polish Agency for Enterprise Development (PARP).

[25] Ministry of Development Funds and Regional Policy (2022): European Funds for the Modern Economy 2021-2027. Available online: https://www.poir.gov.pl/strony/o-programie/fe-dla-nowoczesnej-gospodarki/zalozenia-programu-feng/ (last access 09.05.2025).

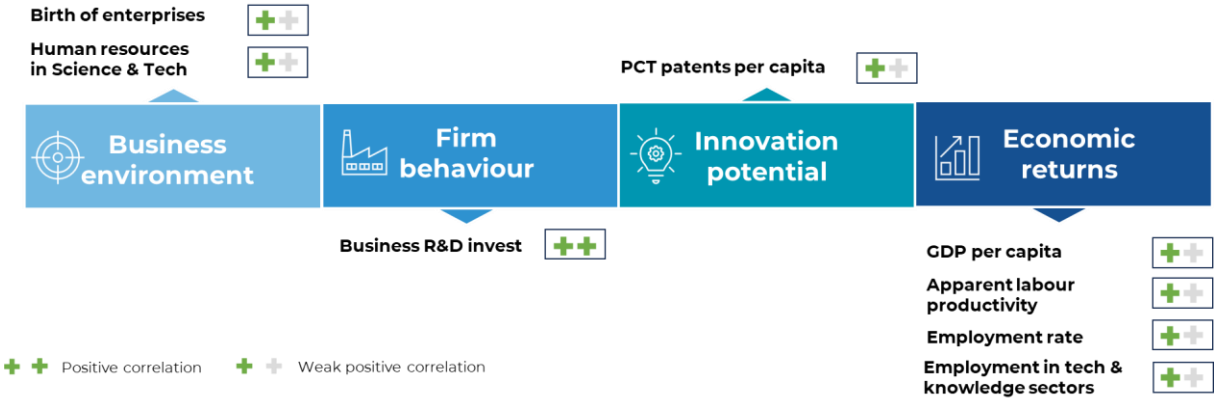
The region's cluster policy is supported by key institutions such as the Rzeszów Regional Development Agency (RARR) and the Podkarpackie Innovation Centre (PCI). These bodies provide strategic and operational support to cluster initiatives, including services ranging from fundraising and prototyping to market deployment. Along with the Podkarpackie Development Fund, these entities were established on the initiative of the Government of the Podkarpackie Region and are wholly owned by the regional government. Infrastructure such as the Podkarpackie Science and Technology Park AEROPOLIS, the Science-Technology Park Rzeszów–Dworzysko, and the EURO-PARK Mielec Special Economic Zone further reinforce the regional innovation ecosystem.

Cluster support has a legacy of two decades in Podkarpackie. Shortly after Poland's EU accession, direct financial support for cluster organisations was provided in 2004–2006. In the following programming periods, clusters were able to benefit from non-financial support, including business missions, fairs, industry conferences, and other promotional formats. In the 2021–2027 period, cluster support is focused on regional incubation and growth clusters, particularly by supporting businesses through services delivered via a simplified regional voucher system. Clusters and their members are also part of the regional government's "Podkarpackie – Smart Region" project, which aims to strengthen cooperation through the Entrepreneurial Discovery Process under the "Regional Innovation Strategy of the Podkarpackie Province for 2021-2030" (see Chapter 4 for more details). This process is supported by a coordination service pilot launched by the Marshal's Office of the Podkarpackie Region.

The importance of clusters for regional economic competitiveness and the 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 5.

Figure 5: 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.

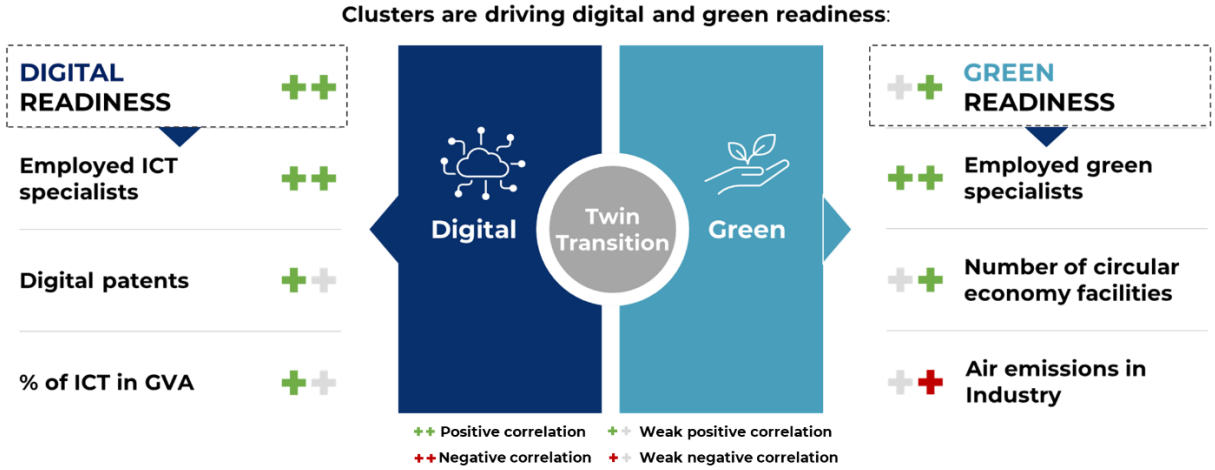
Under the dimension of **innovation potential**, a particularly notable result is the positive correlation between cluster presence and patenting activity, including PCT patents per capita and digital patents, which are important proxies for technological advancement and international competitiveness. 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 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 6).

Figure 6: 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 intermediaries that can simultaneously drive firm-level digitalisation and contribute to the broader transformation of industrial ecosystems.

Concluding remarks on the cluster landscape in the Podkarpackie region

The Podkarpackie region presents a dynamic and evolving cluster landscape embedded in a **strong industrial base and a growing innovation ecosystem**. Supported by regional institutions and aligned with a well-defined Smart Specialisation Strategy, namely the “Regional Innovation Strategy of the Podkarpackie Province for 2021-2030”, cluster organisations in the Podkarpackie region play a strategic role in enhancing regional competitiveness, promoting cross-sector collaboration, and integrating local actors into European innovation networks. The EU Cluster Panorama Report (2024), along with the findings of the ECCP and other studies, such as Ketels & Protsiv (2021), underlines the positive correlation between clusters and key drivers of regional performance—including R&D intensity, patenting, and the employment of ICT specialists. Looking ahead, the significant regional and national investments planned for 2021–2027 will provide a critical boost to the cluster landscape, consolidating Podkarpackie’s position as an emerging innovation hub in Eastern Europe and enabling cluster organisations to act as essential intermediaries in the region’s economic transformation and integration into the European twin transition.

03

Cross-border cooperation and the involvement of clusters from the Podkarpackie region in European networks and support initiatives

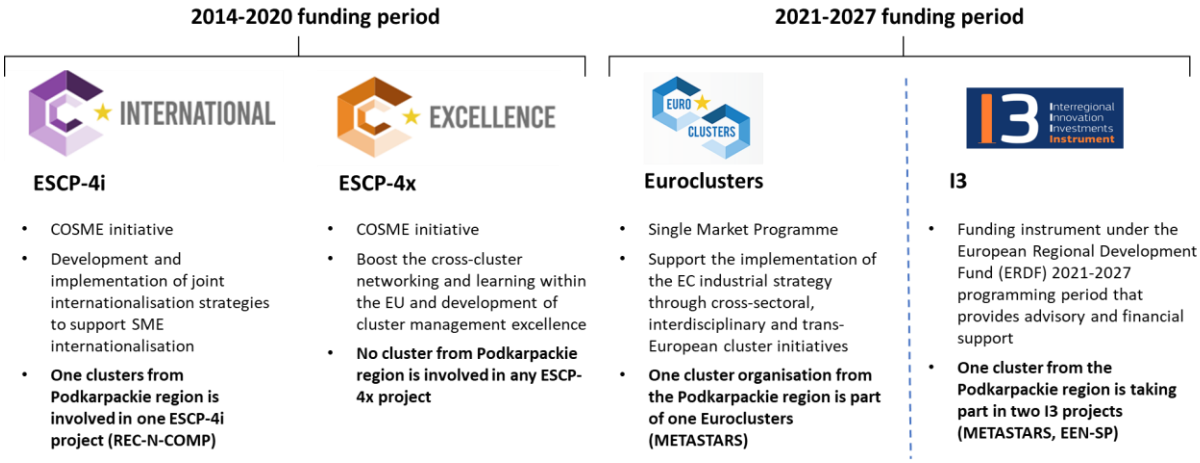
EUROPEAN CLUSTER COLLABORATION PLATFORM

Strengthening the European economy through collaboration

3. Cross-border cooperation and the involvement of clusters from the Podkarpackie region in European networks and support initiatives

Findings from the European Commission's 2021 Evaluation Study and Potential Follow-Up to Cluster Initiatives under COSME, H2020, and FPI highlight that clusters and other innovation stakeholders regard cross-border cooperation as a key activity for supporting sustainable growth and strengthening the resilience of SME members.[26] Therefore, this chapter provides an overview of the cross-border cooperation of Podkarpackie cluster organisations by examining their participation in relevant European support initiatives. Figure 7 provides an overview of those key initiatives targeted at cluster organisations:

Figure 7: Overview of selected EU support initiatives that involve clusters from the Podkarpackie region



Source: ECCP (2025).

Involvement of Podkarpackie cluster organisations in the European Strategic Cluster Partnerships (ESCP)

The European Strategic Cluster Partnership (ESCP) initiative, funded under the EU Programme for the Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME) is an EU support initiative to increase cross-border cooperation of EU cluster organisations and other intermediary organisations. The ESCP initiative established partnerships of European clusters and intermediary organisations from the different EU Member States or associated countries. Those partnerships focused on three different thematic areas, which were internationalisation (ESCP for Going International), cluster excellence (ESCP for Excellence) and smart

[26] Prognos et al. (2021): Evaluation Study of & Potential Follow-Up to Cluster Initiatives under COSME, H2020 & FPI (DG GROW, Unit D2 - Industrial Forum, alliances, clusters). Study on behalf of the European Commission. Available online: https://op.europa.eu/en/publication-detail/-/publication/a2c3e9e1-3deb-11ec-89db-01aa75ed71a1/language-en/format-PDF/source-241039860 (last access on 20.03.2025).

specialisation (ESCP for Smart Specialisation) out of which the ESCP for Going International was still running throughout 2024[27] and the ESCP for Excellence[28] ended in December 2023.[29]

Among the 29 ESCP projects in Poland, one is based in the Podkarpackie region. The participating organisation is the Polish Automotive Group, located in Sędziszów Małopolski, which acts as a project partner. The title of this ESCP-4i project is **European recycled materials-based composites and end-of-life products processing technologies go international**" (**REC-N-COMP)**. This project aims to support the internationalisation of SMEs whose activities focus on manufacturing composites from recycled materials, particularly textiles. This project counts with a total budget of around €608,420 and has a requested grant of around €84,394. International partners involved in the project are based in France, Italy, and Belgium. A joint internationalisation strategy will be developed and tested through this initiative, targeting markets in the United States, Japan, and Singapore.[30]

Euroclusters

Euroclusters are funded under the Single Market Programme.[31] The Euroclusters initiative aims to support cross-sectoral, cross-regional European industry clusters and their cooperation with other economic stakeholders such as companies or business organisations. One cluster organisation from the Podkarpackie region, namely the **Aviation Valley Cluster**, was part of the **METASTARS Eurocluster**, which aimed to deliver efficient services to boost SME competitiveness and support the growth of the European Aerospace and Defence ecosystem. It offered financial support for SMEs to develop innovative projects benefit from services to adapt to new technologies, develop or strengthen their green and digital transition, innovation potential, internationalisation strategy towards Japan and Canada, and the upskilling of their work force. This project's main objectives were to 1) provide a wide range of services to support innovation, favouring SME's resilience, strengthening green and digital transportation and increasing business opportunities; 2) strengthen and sustain the European Aerospace and Defence network, involving new stakeholders acting in cross-sectorial domains; 3) develop joint activities to enhance the training and skills development of the ecosystem. The METASTARS Eurocluster consisted of two calls: the first was oriented to innovative projects at both low and high technology readiness levels. The second was an invitation for services, providing SMEs access to vital resources aligned with the five key Eurocluster objectives: networking, innovation, adopting new processes and technologies, training, and internationalisation. METASTARS concluded in early 2025. Other participating entities were situated in France, Germany and Spain.[32]

Interregional Innovation Investments (I3)

The Interregional Innovation Investments (I3) partnership is a funding instrument under the European Regional Development Fund (ERDF) 2021-2027 programming period, providing advisory and financial support through the

[27] See https://clustercollaboration.eu/eu-cluster-partnerships/escp-4i/fourth-generation (last access 20.03.2025).

[28] See https://clustercollaboration.eu/eu-cluster-partnerships/escp-4x (last access 20.03.2025).

[29] For more information on the European Cluster Partnerships see: https://clustercollaboration.eu/eu-cluster-partnerships (last access 20.03.2025).

[30] For more information on the REC-N-COMP project, see https://www.flandersmake.be/en/offer/research/research-types/european-projects/rec-n-comp (last access 29.04.2025).

[31] For more information on the Euroclusters, see https://eismea.ec.europa.eu/funding-opportunities/calls-proposals/joint-cluster-initiatives-euroclusters-europes-recovery_en (last access 29.04.2025).

[32] For more information on the METASTARS Eurocluster, see https://www.eacp-aero.eu/projects/metastars/ (last access 29.04.2025).

European Innovation Council and SMEs Executive Agency (EISMEA).[33] It seeks to assist interregional innovation actors in bringing their mature ideas to commercialisation and up-scaling by providing them with the tools to overcome regulatory and other barriers, ultimately supporting them in reaching readiness for further investments. For the 2021-2027 programming period, there are €570 million available (up to €10 million per project) and EU contribution covers 70% for all beneficiaries and cost categories.

Among the different project with participation from Polish entities, the **Aviation Valley Cluster** from the Podkarpackie region has taken part in two I3 projects:

- **METASTARS**, as mentioned above, aims at providing efficient services for SMEs in the context of the European Aerospace and Defence ecosystem. The main objectives are to provide a wide range of services to support innovation, strengthen and sustain the European Aerospace and Defence network, and to develop joint activities to enhance the training and skills development of the ecosystem. The entity from the Podkarpackie region participating in this I3 project was the **Aviation Valley Cluster**.[34]
- **EEN-SP**, the Enterprise Europe Network South Poland, is a network that offers tools such as comprehensive services to help SMEs fully develop their potential and innovation abilities. The network combines achievements and advantages of two previously networks, also for the SME sector (Euro Info Centers and Innovation Relay Centers). Through EEN-SP, SMEs gain access to comprehensive support services that promote their growth and international competitiveness. The Enterprise Europe Network also acts as an intermediary between SMEs and European Union institutions, helping the latter better understand the needs of small and medium-sized enterprises. Its main objectives include enhancing enterprise competitiveness, facilitating technology transfer, fostering innovation and entrepreneurship, and supporting SMEs in entering global markets. The cluster from the region participating in the project is **Aviation Valley Cluster**, with two other partners from the region, namely the Rzeszów Regional Development Agency Joint Stock Company and the University of Information Technology and Management in Rzeszów.[35]

Participation in Other Partnerships and Alliances

Other partnership alliances in which Subcarpathian cluster participate are the **European Automotive Cluster Network** and the **Automotive Skills Alliance**. The **European Automotive Cluster Network (EACN)** is a network of clusters active in the automotive, transport and mobility fields. Founded in 2017, EACN represents more than 4.500 companies pointing at the value chain, R6D institutions and public authorities, among others. The Subcarpathian cluster participating in the EACN are the **Polish Automotive Group (PGM)** and the **East Automotive Alliance**.[36] Regarding the latter, the Automotive Skills Alliance is a partnership for collaboration on skills which provides support to the implementation of the green and digital transformation of the labour force in the Automotive-mobility ecosystem. The **East Automotive Alliance**, as well as the **EACN**, and therefore the **PGM** are industry partners.[37]

[33] For more information on I3, see https://eismea.ec.europa.eu/programmes/interregional-innovation-investments-i3-instrument_en (last access 29.04.2025).
[34] EACP (2025) https://www.eacp-aero.eu/projects/metastars/ (last access 29.04.2025).
[35] EEN (2025) https://een.net.pl/en/ (last access 29.04.2025).
[36] European Automotive Cluster Network (EACN): https://www.eacn-initiative.eu/cluster-members/#PL (last access 19.05.2025).
[37] Automotive Skills Alliance (2025): https://automotive-skills-alliance.eu/ (last access 19.05.2025).

04

Smart Specialisation in the Podkarpackie region

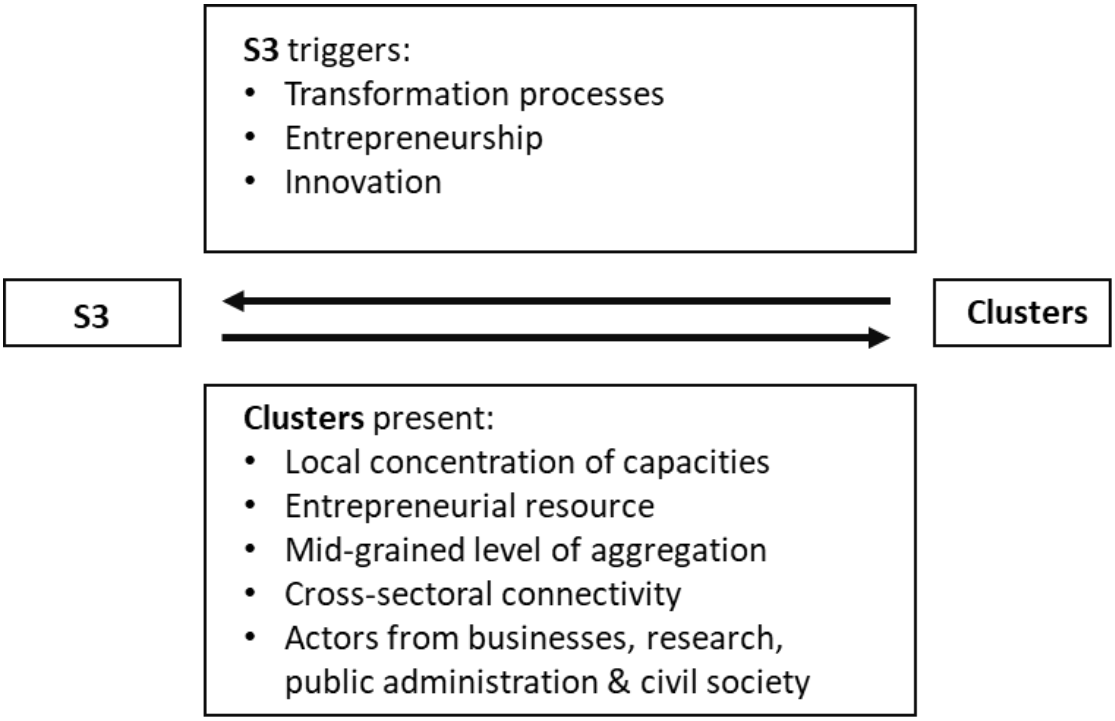
EUROPEAN CLUSTER COLLABORATION PLATFORM

Strengthening the European economy through collaboration

4. Smart Specialisation in the Podkarpackie region

Smart Specialisation is a strategic approach developed by the European Commission that requires regions to identify and leverage 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 are key elements. 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.[38] The interplay between clusters and smart specialisation is visualised in Figure 8. Box 2 at the end of this chapter provides some good practices of cluster involvement in S3 from other European regions and especially in the Entrepreneurial Discovery Process[39] (EDP). Against this background, this chapter focuses on Smart Specialisation in the Podkarpackie region.

Figure 8: Interaction of clusters and S3



Source: ECCP (2024), own adaptation based on Keller et al. (2019): Implementing S3 with Clusters – An Innovation Model for Transformative Activities.

[38] 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 20.03.2025); 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 20.03.2025).

[39] 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 03.05.2024).

A key reference point for examining of the S3 2021-2030 of the Podkarpackie region is the Regional Innovation Strategy of the Podkarpackie Region for 2021-2030.[40] The strategy for 2021-2030 was developed by the Podkarpackie Regional Government and adopted through a resolution of the Podkarpackie Regional Board in January 2022. Cluster organisations play a central role in the regional innovation strategy of Podkarpackie region, as they are recognised as an integral part of the region's innovation system. Moreover, the S3 highlights the role of clusters in providing a place for the transfer of knowledge and technology, enabling their members to create or contribute to pre-established supply chains and, by participating in the cluster structures of research and research entities, to carry out joint research activities with those entities and to share their results. The region's innovation governance model promotes close cooperation among public authorities, clusters, academia, and the private sector. Cluster organisations participate actively in the Entrepreneurial Discovery Process (EDP) and are represented in the Podkarpackie Innovation Council, contributing to the ongoing refinement of the region's S3 priorities.

The Regional Innovation Strategy of the Podkarpackie Region for 2021-2030 identifies **four priority areas** (see Figure 9). These priority areas reflect the region's strategic focus on strengthening industrial and technological specialisations, supporting applied research and innovation, and aligning education and skills development with the evolving needs of key sectors such as aerospace, automotive, ICT, and quality-of-life industries.

Figure 9: Priority areas of the Regional Innovation Strategy of the Podkarpackie Province for 2021-2030

Source: ECCP (2025), own elaboration based on the Regional Innovation Strategy of the Podkarpackie Province for 2021-2030.

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

- **Aviation and Cosmonautics:** This priority aims to consolidate the region's global position in the aerospace sector by supporting the development of new aircraft materials and propulsion technologies. It focuses on strengthening R&D infrastructure, promoting collaboration between universities and industry, and stimulating international competitiveness through innovation. Space technologies are also gaining traction, with initiatives like nanosatellite development, radiation measurement systems, and satellite data processing supported by local scientific circles.
- **Automotive:** Recognised as a high-tech sector, the automotive industry in the Podkarpackie region plays a key role in regional exports and employment. The strategy supports the integration of alternative propulsion systems (electric and hydrogen), lightweight material use, automation, circular economy principles, and stronger cooperation between enterprises and education. The aim is to develop local

[40] Marshal's Office of the Podkarpackie Region (2022): Regionalna Strategia Innowacji Województwa Podkarpackiego na lata 2021-2030. Available online: https://rsi.podkarpackie.pl/documents/regionalna-strategia-innowacji-wojewodztwa-podkarpackiego-na-lata-2021-2030/ (last access 08.05.2025).

supply chains, improve vocational education, and integrate regional companies into international automotive value chains.

- **Information and Telecommunication Technologies:** ICT is considered a cross-cutting enabler for all other specialisations. The priority supports digital transformation, Industry 4.0 adoption, cloud computing, artificial intelligence, and smart solutions for health and tourism. It emphasises strengthening education and R&D capacities, increasing technology transfer, and fostering the development of regional ICT clusters, particularly in the Rzeszów area.
- **Quality of life:** This priority addresses socio-economic well-being through innovations and is structured around four interconnected pillars, each representing a sub specialisation area:
    - **Sustainable Tourism:** Focused on enhancing eco-tourism initiatives, this pillar aims to boost the attractiveness of the region as a desirable place to live and visit, promoting responsible travel and sustainable development
    - **High-Quality Food:** This pillar emphasizes innovations that ensure superior food quality and safety, contributing to the region's reputation as a culinary destination and enhancing residents' well-being
    - **Medical and Fitness Services and Products:** By incorporating modern technologies into healthcare and wellness, this pillar seeks to improve healthcare services and promote a healthier lifestyle among the population
    - **Environmentally Friendly Energy:** Dedicated to advancing the use of clean energy, this pillar supports sustainable development goals and fosters an eco-friendly living environment

In this context, one can outline the participation of the Podkarpackie region in in the S3 Thematic Platform "Energy" through its involvement in the partnership Sustainable buildings. Furthermore, the region has taken a strategic step by engaging in major **European R&D partnerships**, including the **Clean Sky 2 Joint Undertaking**, where the Podkarpackie region is the only Polish region formally involved. This engagement, supported through synergies between regional ERDF funds and EU programmes such as Horizon 2020, has resulted in local companies participating in high-tech projects like **SAT-AM – Small Air Transport – Affordable Manufacturing**, involving five regional firms[41]. Another strategic instrument is the **ESA Business Incubation Centre (ESA BIC) Poland**, launched with support from the regional authorities in 2017. It promotes entrepreneurship through the transfer of space technologies to non-space sectors and vice versa[42]. This initiative strengthens the Podkarpackie region's positioning within the European space innovation ecosystem. Complementing this, the region is a member of **NEREUS – the Network of European Regions Using Space Technologies**, which fosters knowledge exchange and contributes to the regional adaptation of European space policies. Finally, since February 2025, the Podkarpackie region has become a member of the European Regions Research and Innovation Network (ERRIN), another significant step towards enhancing its research and innovation landscape. Indeed, by joining ERRIN, the Podkarpackie region gains access to a robust platform for sharing knowledge, best practices, and building collaborative projects with other European regions. This membership enables the region to actively participate in thematic working groups, access EU funding opportunities, and engage in policy discussions that align with its strategic priorities. As a member, the region can leverage ERRIN's extensive network to foster innovation, enhance its competitiveness, and reinforce its role in Europe's research and innovation community.

In alignment with its Smart Specialisation Strategy, the "Regional Innovation Strategy of the Podkarpackie Region for 2021-2030", the Podkarpackie region has developed a set of strategic projects and infrastructures that serve as **regional lighthouse initiatives**. These initiatives support innovation, foster collaboration between research and business, and strengthen the competitiveness of regional ecosystems in line with key S3 priorities. The **Podkarpackie Science and Technology Park "Aeropolis"** and the **Podkarpackie Innovation Centre (PCI)** are

[41] For more information on the SAT-AM see: https://www.clean-aviation.eu/clean-sky-2/demonstrators/key-demonstrators/affordable-aerostructures-for-small-air-transport (last access 02.05.2025)
[42] For more information on the ESA BIC Poland see: https://esabic.pl/ (last access 02.05.2025)

examples of **regional lighthouse initiatives** in the Podkarpackie region, having already been described in Chapter 1. Furthermore, in the field of renewable energy and hydrogen, the Podkarpackie region has established the **first "Hydrogen Valley" in Poland**, making it a national leader in green transition technologies. This initiative fosters cross-sector collaboration and is linked to broader European hydrogen economy networks.[43]

Furthermore, within the regional innovation support framework, the Podkarpackie region has developed specialised pilot and demonstrator infrastructures, as well as support for technology transfer and collaboration between businesses and research organisations, particularly in the aviation and ICT sectors. These investments are designed to mobilise the potential of research institutions, such as the **Aviation Valley Cluster** and the **Łukasiewicz Research Network – Institute of Aviation**, and to promote international cooperation, especially under the S3 approach.

These efforts underscore the Podkarpackie region's strong commitment to European innovation networks and its capacity to leverage the smart specialisation strategy not only to build competitive advantage but also to contribute to broader EU industrial and green transitions. As seen, a key driver of this process is the region's dynamic cluster ecosystem—particularly in aerospace, automotive, and ICT—which plays a central role in fostering business–research collaboration, promoting technology transfer, and enhancing SME competitiveness. With a consistent focus on interregional collaboration, technological modernisation, and entrepreneurship, the Podkarpackie region is consolidating its role as a key innovation hub in Eastern Europe.

Box 2: 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).

Skåne, Sweden – Board of cluster organisations:
In Skåne, the innovation strategy is part of Skåne's Regional Development Strategy (The Open Skåne 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 the academic sectors. 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.

[43] For more information on the Subcarpathian Hydrogen Valley see: https://rzeszow.uw.gov.pl/aktualnosci/na-podkarpaciu-powstanie-dolina-wodorowa (last access 02.05.2025).

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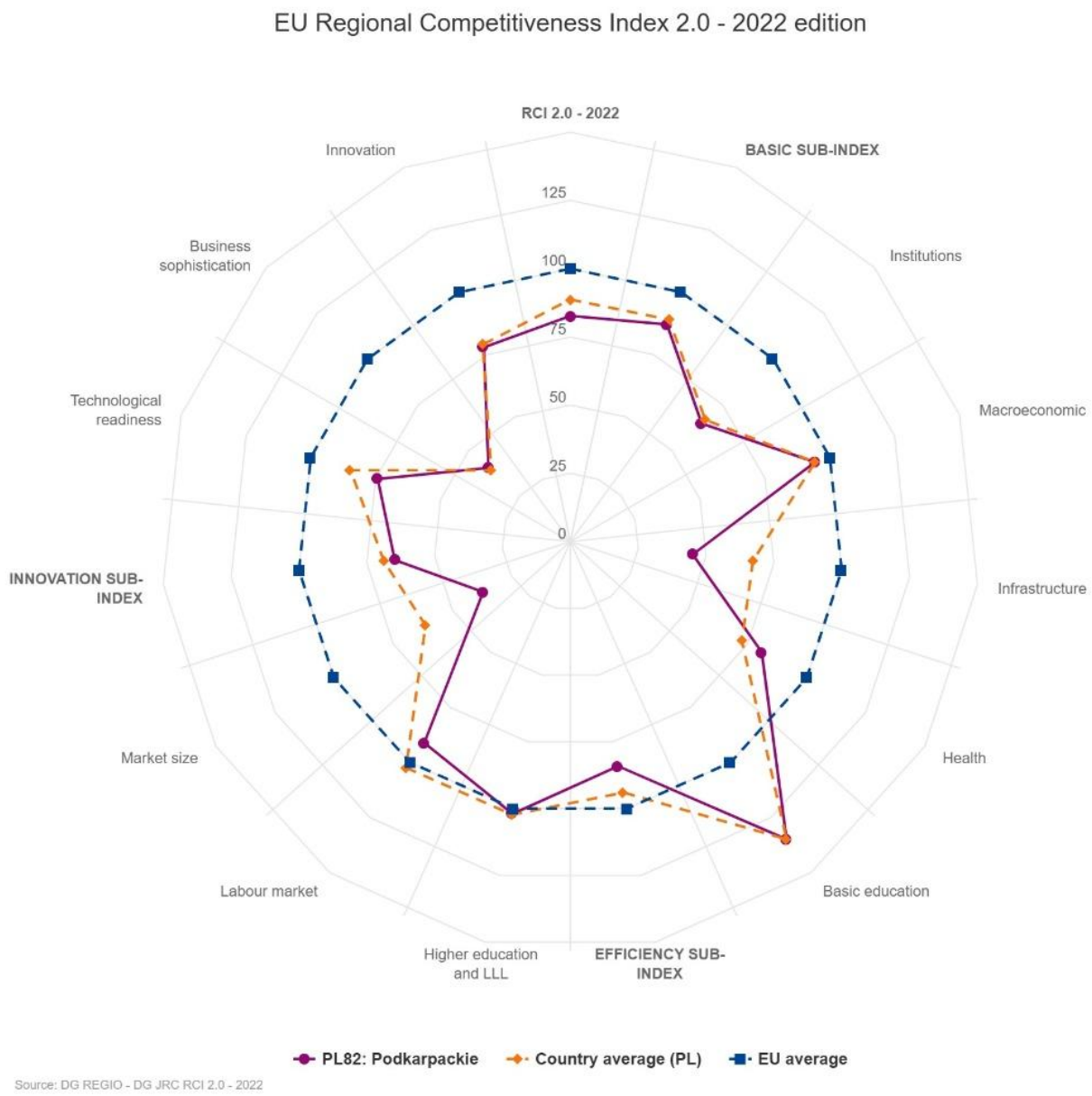
Annex

Regional Competitiveness Level in the Podkarpackie region, compared to the National and EU levels

Figure 10: Performance of the Podkarpackie region, Poland and the EU-average in the 2022 Regional Competitiveness Index



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

List of Cluster Organisations in the Podkarpackie region

Table 1: Full overview of cluster organisations in the Podkarpackie region

No.	Cluster organisation (English name)	Cluster organisation (Polish name)	Website
1	Aviation Valley	Dolina Lotnicza	https://www.dolinalotnicza.pl/
2	East Automotive Alliance	Wschodni Sojusz Motoryzacyjny	https://eaa-wsm.pl/index.php/en/
3	POLIGEN Plastic Processing Cluster	Klaster Przetwórstwa Tworzyw Sztucznych	http://www.poligen.pl/
4	Polish Automotive Group PGM	Polska Grupa Motoryzacyjna	https://pgm.org.pl/en/
5	Polish IoT & AI Cluster SINOTAIC	Polski Klaster IoT&AI SINOTAIC	https://www.sinotaic.com/
6	Subcarpathian Flavours Cluster	Klaster Podkarpackie Smaki	http://www.podkarpackiesmaki.pl/
7	Subcarpathian Renewable Energy Cluster	Podkarpacki Klaster Energii Odnawialnej	https://energia.rzeszow.pl/
8	Cluster of Unmanned Systems	Klaster Systemów bezzałogowych	https://klaster.systemybezzalogowe.pl/
9	IT Cluster – Eastern Poland IT Companies Cluster	Klaster IT – Klaster Firm Informatycznych Polski Wschodniej	https://klasterit.pl/o-nas/
10	Carpathian Tourism Cluster	Karpackim Klastrze Turystycznym	https://www.karpaty.turystyka.pl/index.php/pl/klaster
11	Podkarpackie Health and Prevention Cluster	Podkarpacki Klaster Zdrowia i Profilaktyki	https://podkarpackiklasterzdrowia.pl/
12	Podkarpackie Hydrogen Valley Association	Stowarzyszenie Podkarpacka Dolina Wodorowa	https://www.dolinawodorowa.org/
13	Kraina Nafty	Lokalna Grupa Dzialania Kraina Nafty	https://kraina-nafty.pl/
14	Tarnobrzeg Special Economic Zone	Tarnobrzeska Specjalna Strefa Ekonomiczna EURO-PARK WISŁOSAN	https://arp.pl/en/sez/europark-wislosan/
15	Przemyśl Tourism Cluster	Przemyski Klaster Turystyczny	http://klaster.perlagalicji.pl/
16	Southern Podkarpacie Energy Cluster	Klaster Energii Południowego Podkarpacia	https://kike.org.pl/klaster-energii-poludniowego-podkarpacia-nowym-czlonkiem-krajowej-izby-klastrow-energii/
17	Lasowiacki Cluster	Klaster Lasowiacki	https://www.klasterlasowiacki.pl/
18	Sanocka Hydrogen Valley Energy Cluster	Klaster Energii Sanocka Dolina Wodorowa	https://koordynatorklastrow.pl/nasze-klastry/podkarpackie/klaster-energii-sanocka-dolina-wodorowa/
19	Environmental and Energy Initiative Cluster	Klaster Inicjatywa Środowiskowo-Energetyczna	N/A
20	Rzeszów Hotel Cluster	Rzeszowski Klaster Hotelowy	https://klasterhotelowy.pl/
21	Social Economy Cluster	Karpacki Klaster Ekonomii Społecznej	https://kkes.pl/
22	Light and Ultralight Aviation Cluster	Klaster Lotnictwa Lekkiego i Ultralekkiego	https://klasterlotniczy.pl/

23	AGRO-KARPATY Agricultural and Food Cluster	Podkarpacki Klaster Rolno-Spożywczy AGRO-KARPATY	https://www.agrokarpaty.pl/
24	Organic Food Cluster	Klaster Żywności Ekologicznej	http://www.dolinaeko.pl/
25	Industrial and Scientific Cluster "ZIEMIA SANOCKA"	Klaster Przemysłowo-Naukowy „ZIEMIA SANOCKA"	N/A
26	Soliński Energy Cluster	Soliński Klaster Energii	N/A
27	Cluster Expo Rzeszów	Klaster Expo Rzeszów	klasterexpo.pl
28	Krośnieński Energy Cluster	Krośnieński Klaster Energii	https://www.ekrosno.pl/projekty/krosnienski-klaster-energii
29	National Industry 4.0 Cluster	Krajowy Klaster Industry 4.0	N/A

Source: ECCP (2025), based on information from the Marshal's Office of the Podkarpackie Region.

Table 2: Overview of ECCP-registered cluster organisations in the Podkarpackie region and their main addressed EU industrial ecosystems

No.	Cluster organisation (English name)	Cluster organisation (Polish name)	Primary Industrial Ecosystem	Link to ECCP profile
1	Aviation Valley	Dolina Lotnicza	Aerospace & Defence	https://www.clustercollaboration.eu/content/aviation-valley-dolina-lotnicza
2	East Automotive Alliance	Wschodni Sojusz Motoryzacyjny	Mobility-Transport-Automotive	https://www.clustercollaboration.eu/content/east-automotive-alliance
3	POLIGEN Plastic Processing Cluster	Klaster Przetwórstwa Tworzyw Sztucznych	Energy Intensive Industries	https://www.clustercollaboration.eu/content/poligen-plastic-processing-cluster
4	Polish Automotive Group PGM	Polska Grupa Motoryzacyjna	Mobility-Transport-Automotive	https://www.clustercollaboration.eu/content/polish-automotive-group-pgm
5	Polish IoT & AI Cluster SINOTAIC	Polski Klaster IoT&AI SINOTAIC	Digital	https://www.clustercollaboration.eu/content/polish-iot-ai-cluster-sinotaic
6	Subcarpathian Flavours Cluster	Klaster Podkarpackie Smaki	Agri-Food	https://www.clustercollaboration.eu/content/subcarpathian-flavours-cluster
7	Subcarpathian Renewable Energy Cluster	Podkarpacki Klaster Energii Odnawialnej	Energy Renewable	https://www.clustercollaboration.eu/content/subcarpathian-renewable-energy-cluster

Source: ECCP (2025) and own adaptations based on the Mapping Tool (last access 28.04.2025).