EUROPEAN CLUSTER COLLABORATION PLATFORM

Country factsheet

Hungary

An initiative of the European Union

Co-funded by the COSME programme of the European Union

LEGAL NOTICE

The information and views set out in this document are those of the author(s) and do not necessarily reflect the official opinion of EISMEA or the European Commission. Neither, EISMEA, nor the Commission can guarantee the accuracy of the data included in this document. Neither EISMEA, nor the Commission or any person acting on their behalf may be held responsible for the use which may be made of the information contained therein.

Contents

European Commission

01

Introduction and economic policy context

1. Introduction and economic policy context

This document presents an overview of the cluster policy in Hungary. Given the importance to contextualise the cluster policies (and related) analysed in the factsheets, a comprehensive outlook of the country in socioeconomic terms can be consulted in the European Semester Country Report for Hungary.

The European Semester was an instrument introduced to coordinate the EU Member States economic policies and address the economic challenges faced by the EU. Its goals are "to ensure sound public finances, to prevent excessive macroeconomic imbalances in the EU, to support structural reforms to create more jobs and growth, and to boost investment". Thus, it focuses on the following areas: business environment; financial and fiscal stability; green economy; public administration; labour market and skills; and social protection and cohesion. Chapter 4.2 provides an overview on how Hungary's cluster policy could help to tackle the economic policy challenges identified in the European Semester country recommendations.

The COVID-19 pandemic has caused unprecedented economic shocks to the European and global economy. In response, policymakers at the EU and natiolevelsevel have acted decisively and at short notice to make available very significant financial resources, notably through the Recovery and Resilience Facility, to tackle the threat of a prolonged downturn. National recovery and resilience plans[1] have been drafted in each Member State to ensure a recovery that addresses the challenges identified in the European Semester. Hungarian clusters are not directly mentioned in the National recovery and resilience plan. In addition to the COVID-19 pandemic, the ongoing Russian military aggression against Ukraine has also taken its toll on EU companies and industrial ecosystems, highlighting the significance of policy efforts in supporting SMEs and clusters.

The ERDF Partnership Agreement 2021-2027 with Hungary highlights clusters, with particular reference to the support of competitiveness and internationalisation of small and medium-sized enterprises in the Danube region.

Hungary's Operational Programmes (OP) for the Cohesion policy funds 2021-2027 all refer to clusters. Particular focus rests on the facilitation of regional cooperation between enterprises, strengthening sustainable growth and competitiveness of SMEs, facilitating cross-border and transnational activities and the promotion of the widespread use of hydrogen as an energy carrier and storage.

In the following, a succinct overview of the cluster policy in Hungary will be provided. The structure of this factsheet generally encompasses:

1) an overview of the industrial ecosystems and cluster landscape in Hungary,
2) an overview of the Hungarian broad policies, which provide policy interventions for the development of clusters in Hungary,
3) an assessment of the state of play of Hungarian cluster policy and its role in broader economic policy challenges mentioned in the European Semester Report.

[1] National recovery and resilience plan of Hungary, https://www.palyazat.gov.hu/helyreallitasi-es-ellenallokepessegi-eszkoz-rrf

02

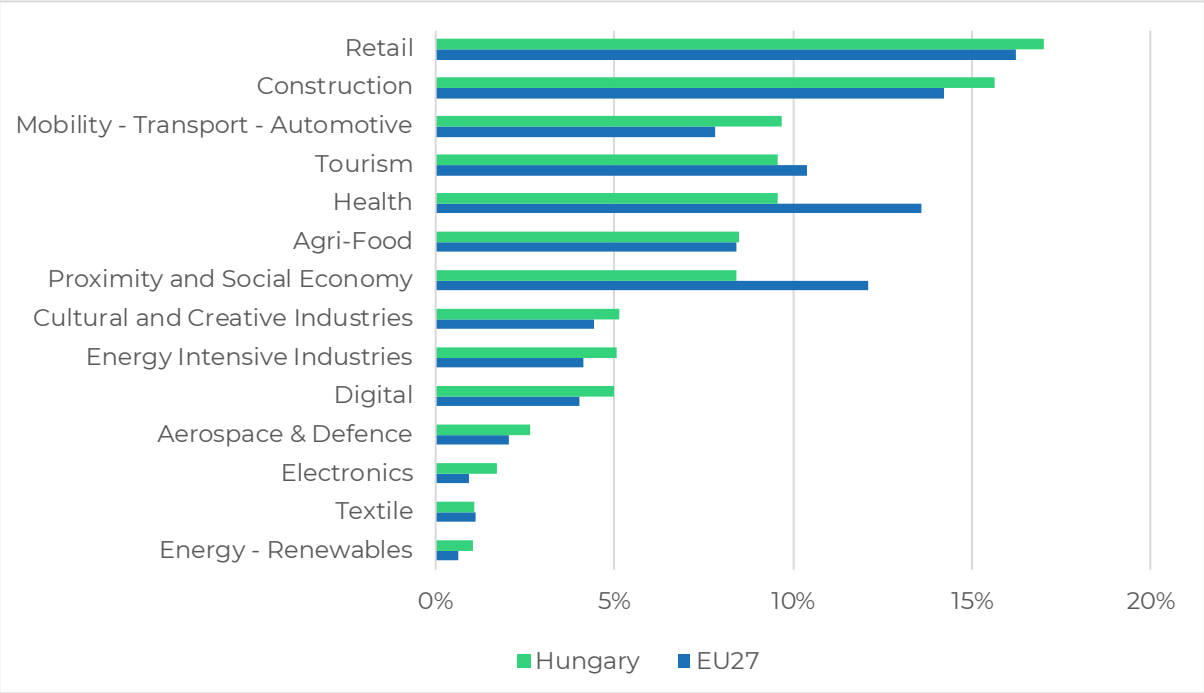
Industrial ecosystem and cluster landscape

2. Industrial ecosystems and cluster landscape

2.1 Employment in the 14 industrial ecosystems

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.[2] The classification of the 14 industrial ecosystems have been calculated by aggregating NACE 2 -digit activities, following the methodology established in the European Commission.[3] This means that the data provided below can differ from other publications by the European Commission that do not consider the industrial ecosystem classification.

Figure 1: Employment in the ecosystems



Source: ECCP (2023), own elaboration based on data from Eurostat.

In Figure 1, the employment share of Hungary and the EU27 in each industrial ecosystem is shown relative to the number of all employed persons in the 14 industrial ecosystems. The ecosystems are ordered, from top to bottom, according to the amount of employment in the country. When the bar for the country is higher than that of the EU27, it indicates that the country is more specialised in that ecosystem. "Retail" is the most prominent industrial ecosystem, making up around 16% of the employment in all ecosystems, thus similar to the share of the EU27. This is followed by the industrial ecosystems "Construction" and "Mobility – Transport – Automotive", both exceeding the respective EU27 share. This shows Hungary's relative strength in those two ecosystems. Other ecosystems in which Hungary specialises include "Energy Intensive Industries, "Digital", "Electronics", and "Energy-Renewables". The strength of these industries is apparent in the sectoral and ecosystem agglomerations that are regionally relevant across most of the eight Hungarian NUTS 2 regions, as shown in the section below.

[2] see here for more information https://clustercollaboration.eu/in-focus/industrial-ecosystems (last access 09.01.2023).
[3] see European Commission (2021): Annual Single Market Report, SWD(2021)351.

2.2 Regional agglomerations

Economic activity is not equally distributed across regions in the EU but tends to agglomerate in certain places. In this context, an Agglomeration is defined as the concentration of a certain industry, sector or ecosystem in a certain geographical area. The following section provides an analysis of, first, the sectoral agglomerations and, second, the ecosystem agglomerations in the regions. Agglomerations are operationalised through the employment-based Location Quotients (LQ), measuring the relative specialisation of one region compared to the EU level, as well as the employment size.

If the LQ for a given activity-region combination is above 1.5, it is considered a specialisation agglomeration, and if the activity accounts for at least 1 % of total employment in the region, it is considered regionally relevant.[4] The following tables shows the total number of regionally relevant specialisation agglomerations in each region in the country and identifies the top five most specialised of these agglomerations. The first table focuses on the 88 NACE 2-digit activities or sectors, totalling 68 in the country, while the second table is based on the 14 ecosystems, which total 23 in the country.

Table 1: Number of regionally relevant sectoral agglomerations and Top 5 agglomerations by region (NACE)

Region	Number of agglomerations	Agglomeration 1	Agglomeration 2	Agglomeration 3	Agglomeration 4	Agglomeration 5
HU11: Budapest	9	M72 – Scientific research and development	J62 – Computer programming, consultancy	L68 – Real estate	M70 – Activities of head offices	N80 – Security and investigation activities
HU12: Pest	11	C27 – Manuf. of electrical equipment	C26 – Manuf. of computer, electronic & optical products	F42 – Civil engineering	N80 – Security and investigation activities	H53 –Postal and courier activities
HU21: Central Transdanubia	7	C24 – Manuf. of basic metals	C27 – Manuf. of electrical equipment	C29 – Manuf. of motor vehicles & trailers	C22 – Manuf. of rubber & plastic products	C26 – Manuf. of computer, electronic & optical products
HU22: West Transdanubia	9	C29 - Manuf. of motor vehicles & trailers	C26 – Manuf. of computer, electronic & optical products	C31 – Manuf. of furniture	C27 – Manuf. of electrical equipment	C16 – Manuf. of wood and of products of wood
HU23: South Transdanubia	8	D35 - Electricity, gas, steam and air conditioning supply	C27 – Manuf. of electrical equipment	C26 - Manuf. of computer, electronic & optical products	F42 - Civil engineering	A01 - Crop & animal production
HU31: North Hungary	10	C26 - Manuf. of computer, electronic & optical products	C29 - Manuf. of motor vehicles & trailers	C27 – Manuf. of electrical equipment	C20 - Manuf. of chemical products	C32 – Other manufacturing
HU32: North Great Plain	7	C32 - Other manufacturing	C26 - Manuf. of computer, electronic & optical products	C22 - Manuf. of rubber & plastic products	C10 – Manuf. of food products	F42 – Civil Engineering

[4] for more information on the methodology please see the methodology note: https://clustercollaboration.eu/in-focus/policy-acceleration/country-factsheets-on-cluster-policies-and-programmes (last access 09.01.2023).

HU33: South Great Plain	7	C10 – Manuf. of food products	C22 - Manuf. of rubber & plastic products	F42 - Civil engineering	A01 - Crop & animal production	C29 - Manuf. of motor vehicles & trailers

Source: ECCP (2023), own elaboration based on data from Eurostat.

As mentioned at the beginning of this Chapter, the NACE 2-digit activities have been aggregated to the 14 EU industrial ecosystems following the metholdology established by the European Commission. Table 2 provides an overview of the regional distribution of industrial ecosystem agglomerations. Overall, there are fewer numbers of ecosystem agglomerations compared to the regionally relevant sectoral agglomerations by NACE sectors. This more concentrated agglomeration can at least partially be linked to the methodology of measurement of the 14 industrial ecosystems.

Hungary's industrial ecosystems can be divided into three main groups. First, there is the capital region of Budapest (HU11), which as a capital region exhibits ecosystem agglomerations in "Digital" and "Cultural and Creative Industries". The specialisation in the former ecosystem is reflected in its sectoral NACE agglomeration in computer, programming, consultancy (J62). The region of Pest (HU12) represents the immediate hinterland of Budapest and exhibits an ecosystem agglomeration in "Electronics", pulled by its two top NACE agglomerations in the manufacture of computer, electronic, and optical products and electrical equipment (C26-27), as well as "Aerospace & Defence".

Second, the North-Western regions of Central Transdanubia, West Transdanubia, and to a certain extent North Hungary (HU21-22, HU31) are deeply integrated in European manufacturing value chains expressed in their ecosystem agglomerations in "Mobility-Transport-Automotive", "Energy-intensive industries", and "Electronics". Relatedly, in these regions, all top 5 NACE agglomerations can be found in the manufacturing sector. While the composition in each region varies, all of them show a high specialisation in the manufacture in motor vehicles (C29) as well as the manufacture of computer, electric and optical products (C26). Other notable agglomerations include machinery and equipment (C28), and fabricated metal products (C25), both present in two of the three regions.

The third group is represented by the South-Eastern Hungarian regions of South Transdanubia, North Great Plain and South Great Plain (HU23, HU32-33) and is centred on Agri-Food ecosystems, accompanied by some light manufacturing in textiles, electronics or energy-renewables. The agri-food focus is most pronounced in the South Great Plain (HU33) region with NACE agglomeration in crop and animal production (A01) and the manufacture of food products (C10). North Great Plain (HU32) is more steeped in textiles with NACE agglomerations in the manufacture of leather products (C15) and wearing apparel (C14). By contrast, the South Transdanubia region (HU23) complements its ecosystem agglomerations in "Agri-Food" with agglomerations in "Electronics" and "Energy-Renewables". The former is echoed by the NACE agglomerations in the manufacture of computer, electronic and optical products as well as electronic equipment (C26-27), while the latter shows up as a sectoral agglomeration in electricity, gas and steam (D35), mostly driven by the nuclear power plant located in this region.

Table 2: Regionally relevant ecosystem agglomerations

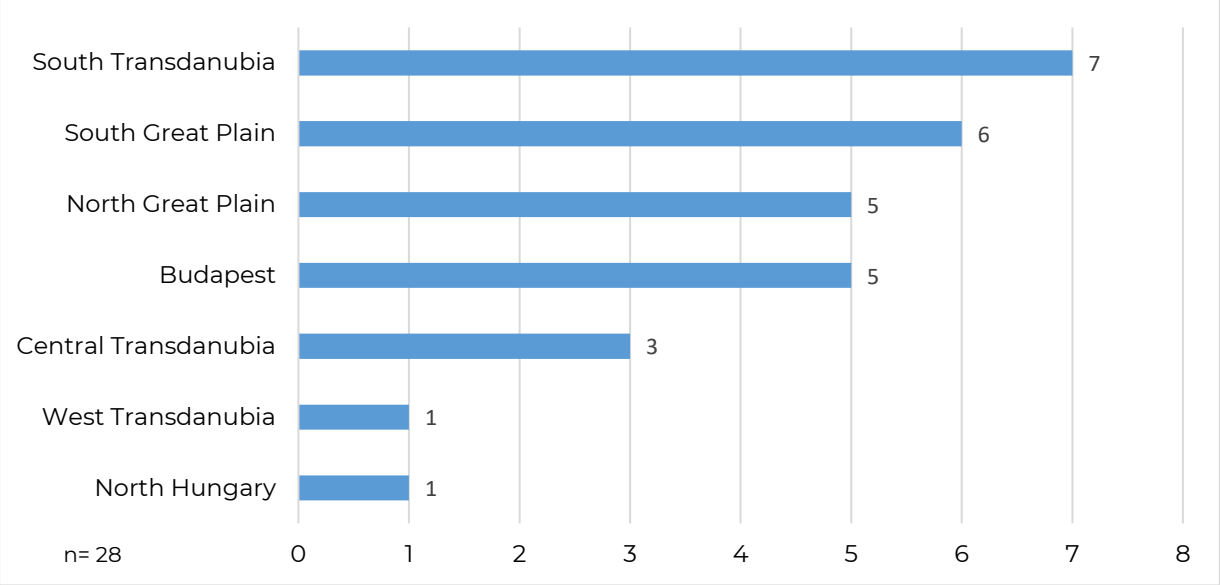
Region	# of ecosystem agglomerations	Agglomeration 1	Agglomeration 2	Agglomeration 3	Agglomeration 4	Agglomeration 5
HU11: Budapest	3	Digital	Cultural and Creative Industries	-	-	-
HU12: Pest	1	Electronics	Aerospace & Defence	-	-	-
HU21: Central Transdanubia	4	Energy-renewables	Electronics	Energy-intensive industries	Mobility-Transport-Automotive	-
HU22: West Transdanubia	4	Electronics	Mobility-Transport-Automotive	Energy-renewables	Energy-intensive industries	-
HU23: South Transdanubia	3	Energy-renewables	Electronics	Agri-Food	-	-
HU31: North Hungary	4	Electronics	Energy-renewables	Energy-intensive industries	Aerospace & Defence	-
HU32: North Great Plain	3	Electronics	Textile	Agri-Food	-	-
HU33: South Great Plain	1	Agri-Food	-	-	-	-

Source: ECCP (2023), own elaboration based on data from Eurostat.

2.3 Cluster organisations & interregional cooperation

There are 28 cluster organisations registered on the ECCP in the country. The highest number of these cluster organisations are located in the region of South Transdanubia (HU23), with seven registered cluster organisations. This is followed by the region of South Great Plain (HU33), with six cluster organisations. The regions of North Great Plain (HU33) and the capital region of Budapest (HU11) are both home to five cluster organisations with profiles on the ECCP. Three cluster organisations are located in Central Transdanubia (HU21). West Transdanubia (HU22) and North Hungary (HU31) are the regions in which only one cluster organisation with profile on the ECCP is present (one cluster organisation), while there are none in the region of Pest (HU12). Overall, as a pattern, the more agricultural, less industrialised regions (North and South Great Plain, South Transdanubia) appear to host more cluster organisations profiled on the ECCP than the manufacturing powerhouses in the North-Western parts of the country (Central and West Transdanubia, North Hungary). The following figure shows the presence of cluster organisations across the different regions.

Figure 2: Cluster organisations profiled on the ECCP



Source: ECCP (2023). Note: The data for the analysis was extracted on 21/12/2023.

The majority of member organisations of Hungarian cluster organisations with profiles on the ECCP are composed of SMEs (87%, EU: 83%), followed by large enterprises (5%, EU: 9%) and research organisations (8%, EU: 8%). From a thematic perspective, these Hungarian cluster organisations are operating in the following industrial ecosystems. Since not all cluster organisations on the ECCP provided this information, the number of cluster organisations with an allocated industrial ecosystem is lower than the overall number of cluster organisations in the country. The list below shows that the cluster organisations profiled on the ECCP cover six of the 14 industrial ecosystems. For some ecoystems, the thematic orientation Hungarian cluster organisations is reflected in the employment shares of the ecosystems (e.g., in Energy Intensive Industries, Construction, Digital and Renewable Energy). On the other hand, the ecosystem Mobility – Transport – Automotive, albeit being the third largest ecosystem in terms of employment, is not covered by any ot the cluster organisations profiled on the ECCP.

- Agri-food (3 cluster organisations)
- Energy Intensive Industries (2 cluster organisations)
- Construction (2 cluster organisations)
- Digital (1 cluster organisation)
- Renewable Energy (1 cluster organisation)
- Tourism (1 cluster organisation)

Interregional cooperation

In the 2014-2020 funding period[5], the European Cluster Partnerships and the INNOSUP-1 initiative have been launched by the European Commission to encourage clusters from Europe to intensify collaboration across regions and sectors. Hungarian cluster organisations have been involved in 17 consortia of the European Strategic Cluster Partnerships, out of which seven partnerships were focusing on internationalisation (ESCP-4i), three partnerships were on cluster management excellence (ESCP-4x) and three partnership on thematic areas related to regional smart specialisation (ESCP-S3). Four Hungarian cluster organisations participated in the INNOSUP-1 initiative.

In the 2021-2027 funding period, the Single Market Programme supports clusters as part of the Joint Cluster Initiatives (Euroclusters) for Europe's recovery. Two clusters from Hungary are part of two Euroclusters with partners from seven countries (BE, ES, FR, GR, IT, LT, PL). They include CREATHRIV-EU and SUAVE, which cover the industrial ecosystems "Cultural & Creative Culture Industries" and "Agri-food", respectively. [6]

[5] Many of the programmes of the 2014-2020 funding period have been terminated by December 2023. However, the collaborative projects that were funded may continue to operate.

[6] Assigned Euroclusters to each of the 14 industrial ecosystems is shown on: https://clustercollaboration.eu/euroclusters (last access 20.03.2023).

03

National cluster policy, programmes and initiatives

3. National cluster policy, programmes and initiatives

In this section we provide an overview of the existing Hungarian cluster policies on a national level.

The breakdown is presented in the form of a table, with the first column showcasing information on the aspects which constitute the policy (beginning with 'Policy Objectives', following with 'Policy Focus', etc.). The second column represents the case of the Hungarian cluster policy, namely the Széchenyi 2020 - Economic Development and Innovation Operational Programme (EDIOP) '14-'20 and the succeeding Széchenyi Plan Plus – Economic Development and Innovation Operational Programme Plus (EDIOP Plus) '21-'27.

The new cluster policy envisaged for 2024 will be covered in the next edition of the factsheet.[7]

Within the table, the text presented in bold (black) depicts standardised categories across country factsheets (56 in total for 2023), which is applied for comparative purposes. This is followed by a complementary descriptive text to provide more insights about the cluster policy in Hungary.

[7] See Government of Hungary (2023). Cluster Strategy 2023-2030. https://cdn.kormany.hu/uploads/document/8/85/859/859655813b0908ec753dfb28e0365d96b5a3d5e0.pdf (last access 23.01.2024).

Table 3: Overview of Hungarian cluster policy

Policy type:	Broad policy
Policy name:	Széchenyi Plan Plus – Economic Deveopment and Innovation Operational Programme Plus (EDIOP Plus) '21-'27
POLICY OBJECTIVES	**Strengthening cooperation between companies or industry and RTDI actors** **Increasing competitiveness and boosting scale up of SMEs** **Supporting internationalisation activities** **Fostering R&D activities, technology development and implementation** **Fostering innovation and strengthening innovation ecosystems** **Supporting cluster excellence and professionalisation of cluster management** **Promoting employment and upgrading skills and competences**
	The EDIOP Plus's priority areas include improving the competitiveness of SMEs, R&D and innovation, clusters, skills, youth guarantee and higher education.
POLICY FOCUS	**Cross-sectoral**
	EDIOP Plus supports the overall group of all SMEs, however the cluster policy mainly supports the frontrunners of the cutting-edge emerging sectors as defined in the country's S3 Strategy.
RESPONSIBLE AUTHORITIES	**Both drafting and implementation** **Provides funding** **Oversees the implementation**
	Prime Minister's Office operating as the managing authority of EDIOP Plus.

BENEFICIARIES		**SMEs** **Cluster organisations** **Research organisations** **Start-ups** **Large firms** **NGOs** **General population** **Policy makers**
		The EDIOP Plus is expected to benefit SMEs through increased employment and training and innovation and R&D support, done through collaboration with research institutions. There are also provisions for broadband internet and low carbon economy upgrades which will benefit the general population.
INSTRUMENTS	**Financial**	**Support to R&D projects, SMEs becoming cluster members, etc.** **Subsidies for cluster infrastructure**
	Technical assistance	**Support for soft skills development: coaching, management training, upskilling/reskilling**
	Explanation	The EDIOP Plus supports fostering the competitiveness of SMEs through financing their investments and R&D developments, skills and trainings for a more competitive labour force.
HISTORY	**Period**	**Limited period**
	Ending year *(for policies with limited period)*	2027
	Starting year	2021

	Explanation	The name of the Operational Programme for 2021-2027 is Széchenyi Plan Plus – Economic Development and Innovation Operational Programme Plus. It was approved by the EC in December 2022. Relevant funding measures are supporting R&D Developments of enterprises and investments of frontrunner enterprises like Green National Champions, Hungarian Multinationals or the technology transition of SMEs. Besides, Hungary has developed its very first Hungarian Cluster Strategy in 2022/2023. The strategy sets targets for 2030.
BUDGET	**Overall**	EUR 8.8 billion in total, with no indication of how much will be dedicated to cluster organisations.
	Annual	Varies
	Source of funding	The European Union contributes 87.5% of funding through 3 funding sources (Youth Employment Initiative; European Regional Development Fund and the European Social Fund). The rest is complemented by the Hungarian government. The main financial budget for financing clusters in Hungary is EDIOP Plus.
POLICY EVALUATION	**Availability**	**ex-ante**
	Results	The Hungarian cluster policy was evaluated first in 2015 by Colosseum Budapest Ltd. The study assessed the cluster development policy measures taken so far and their effectiveness and made recommendations for further developments. These recommendations served as a basis for the national call for accreditation of clusters (2016) and the call for proposals supporting the development of cluster management services (EDIOP-1.3.2-16). In 2021 The Hungarian Ministry of Finance procured a new study for the purpose of developing a new Cluster Strategy. This study was delivered by Bluefield Ltd. and provided an assessment of the current cluster situation and served as a basis for the Cluster Strategy 2030, which was developed in 2022/2023. Its performance will be followed-up continuously (every year) and a halftime review of the strategy is planned for 2026.
POLICY ALIGNMENT WITH THE EU PRIORITIES		**Green economy** **Digitalisation** **Resilience**

Source: ECCP (2023)

04

State of cluster policy and its role in broader economic policy challenges

4. State of cluster policy and its role in broader economic policy challenges

4.1 The state of cluster policy

This section presents an overview on the state of play of Hungarian cluster policy in the form of a qualitative assessment across four categories of analysis – policy scope, continuity of cluster policies, evidence of performance, and the range of cluster support instruments. Please refer to the **Annex** for a detailed overview of the categories and the scoring system. The table below presents an overview of **state of play of Hungarian cluster policy** for 2023.

Table 4: State of play

Hungary	State of play
POLICY SCOPE	Absence of cluster policy
	Broad policy
	Sectoral policy
	National and/or regional cluster policy
CONTINUITY	No cluster-specific policy available
	Cluster policy established recently
	Cluster policy established between over 2 and 10 years
	Cluster policy established over 10 years ago
EVIDENCE OF PERFORMANCE	No evaluation and / or monitoring available
	Existence of evaluations of past policies
	Existence of monitoring or an ongoing / interim evaluation
	Existence of monitoring and ex-ante or ongoing / interim evaluation
CLUSTER SUPPORT INSTRUMENTS	No instruments for cluster development
	Financial support for cluster development in the broader and / or sectoral policy
	Financial or technical support for cluster development in dedicated cluster policy
	Financial and technical support for cluster development in dedicated cluster policy

Source: ECCP (2023).

The text below provides a **qualitative description** of the state of play of the cluster policy in Hungary, which is complementary to the maturity assessment presented above.

Policy scope

The EDIOP prioritises the ICT, energy, and tourism sectors as well as R&D, which ranks as an own priority, and supports the overall infrastructure including financial instruments and the competitiveness of all SMEs. EDIOP Plus supports the overall group of all SMEs, however the cluster

policy mainly supports the frontrunners of the cutting-edge emerging sectors as defined in the country's S3 Strategy.

The new cluster policy envisaged for 2024 will be covered in the next edition of the factsheet.[8]

Continuity

Broad policies that support cluster development started with a supplier target programme in 1998, followed by the Széchenyi Regional Plan in in 2000, which issued a tender for the creation of clusters. The National Development Plan (2004-2006) attempted to improve cluster competitiveness by encouraging more collaboration and cooperation between multinational companies and SMEs. The New Hungarian Development Plan (2007-2013) continued to encourage cooperation between SMEs as well as internationalisation activities. There were also many regional plans developed during this time. The New Széchenyi Plan (2011-2013) started to introduce innovation supports as part of cluster development. Finally, the Széchenyi 2020 plan focused on encouraging clusters to become accredited.

The name of the new Operational Programme for 2021-2027 is Széchenyi Plan Plus – Economic Development and Innovation Operational Programme Plus. Relevant calls are supporting R&D Developments of enterprises and investments of frontrunner enterprises like Green National Champions, Hungarian Multis or the technology transition of SMEs and giving advantages to cluster members at the evaluation of their projects. In 2022/2023, the country developed its very first Hungarian Cluster Strategy. The strategy set targets for 2030. As part of the strategy, a wider-range of cluster support activities are planned both for CMOs and members and further non-financial tools are planned for assisting clusters in the strategy.

During the period 2021–2027, the main change is in the cluster policy as the first Cluster Strategy was launched in 2023. The aim of the Cluster Strategy is to achieve at least one cooperation with outstanding innovation capacity and international visibility in Hungary's main key sectors, by bringing together key players in the given industry, and to ensure that by 2030, 10% of the total gross value added is generated by economic players operating in these cooperation. Through the certification process detailed in the strategy, the government will support the development and quality assurance of domestic clusters through three stages. Applications for certification will be accepted every six months, with the possibility of renewing and upgrading the title once it has been awarded.[9]

Evidence of performance

The New Hungarian Development Plan (2007-2013) was evaluated by the Hungarian Economic Development Centre Ltd in 2013. While this was not a policy targeting clusters, the evaluation found that there are examples of successful clusters. Interviews with cluster actors and stakeholders found that there was still a strong need to support clusters financially, especially those that already exist and/or are successful. The evaluation highlighted that should also be more encouraging of collaborative projects and accountability of cluster development and professionalisation (e.g., legal/regulatory support, evaluation of activities). The review of the cluster accreditation system in Hungary, 2015 by Colosseum Ltd. pointed out that supporting CMOs by supporting their service development would be more successful for strengthening the accredited clusters. With this limited

[8] See Government of Hungary (2023). Cluster Strategy 2023-2030. https://cdn.kormany.hu/uploads/document/8/85/859/859655813b0908ec753dfb28e0365d96b5a3d5e0.pdf (last access 23.01.2024).

[9] Policies & Measures to Support local & regional innovation ecosystems (interregeurope.eu)

financial support, the Hungarian cluster map has been consolidated, confirmed by the 2021 survey carried out by Bluefield Ltd.

Cluster support instruments

The EDIOP Plus supports fostering the competitiveness of SMEs through financing their investments and R&D developments, skills and trainings for a more competitive labour force.

4.2 Cluster policy's potential impact on challenges identified in the European Semester Report

Cluster policy can provide important support to broader economic policy efforts. This section shows how Hungarian cluster policy can play a role in tackling the challenges identified in the European Semester Report for the country. To this end, the European Semester 2023 country report for Hungary[10] has been analysed across policy areas relevant to cluster policy. The results point to a series of issues where in the future cluster policy could play an important role in tackling the country's economic challenges.

As shown previously, Hungary does not have a dedicated national cluster policy (although one is envisaged for 2024). However, since its establishment in 2012, the National Association of Innovative Clusters (IKOSZ) serves as Hungary's umbrella organisation for clusters. It focuses on enhancing the competencies and collaborative efforts of Hungarian cluster organisations, with a strong emphasis on policy influence, cluster development, and internationalisation. IKOSZ represents members from various sectors across Hungary, aiming to bolster the capabilities of cluster organisations.[11]

The table below outlines how Hungarian cluster organisations are already contributing to the challenges outlined in the European Semester Reports in the absence of a dedicated cluster policy. A dedicated cluster policy has the potential to further strengthen and focus the activities of Hungarian cluster organisations towards broader economic policy challenges.

Table 5: Contribution of Hungarian cluster organisations to the challenges identified in the European Semester Report

Policy area	Challenges	Cluster activity
SKILLS 	• Integration of disadvantages groups in the labour market through upskilling • Green skills needed for the green transition should be promoted more	With regard to **upskilling and reskilling**, the report underscores the importance for the country to enhance the labour market integration for the disadvantaged groups, notably the Roma, in particular through targeted upskilling initiatives. Furthermore, in the context of both upskilling & reskilling as well as the green and digital transition, the report also highlights the importance of intensifying policy initiatives aimed at facilitating the provision and acquisition of skills required for the green and digital transition. Enhancing skills and advancing higher education are key priorities within the EDIOP Plus programme, providing training opportunities designed to strengthen the competitiveness of the labour force. Within this context, clusters can assume a pivotal role, as research consistently emphasises its contribution to skill development.[12] In the case of Hungarian cluster organisations, this is done through the provision of training tailored to industry-specific needs, which help enhance the skills relevant to the green and digital transitions More generally, as cluster organisations act as intermediaries between companies and research and educational institutions, they can also be seen as part of

[10] https://economy-finance.ec.europa.eu/document/download/5b97712f-b1f6-44e1-b58f-147579f896f2_en?filename=HU_SWD_2023_617_en.pdf (last access 02.05.2024)
[11] https://ikosz.hu/en/
[12] Hsu, M.-S et al. (2014).

Policy area	Challenges	Cluster activity
		the training and educational infrastructure in the innovation ecosystem.[13]
GREEN  TRANSITION	• Need to address its economy's reliance on fossil fuels and ensure security of supply • Need to step up policy efforts aimed at the provision and acquisition of the skills needed for the green transition • Strengthening the energy efficiency of buildings	In regard to the **green transition**, it expresses the need to reduce the country's overall dependency on fossil fuels through the expeditious expansion of renewable energy sources, encompassing wind energy, geothermal resources, and sustainable biomethane. The EDIOP Plus programme acknowledges this need and offers low-carbon economy enhancements , which are set to benefit the wider population. As facilitators of technology transfer, clusters are assigned an important role in supporting the green transition. Clusters in Hungary are addressing the challenges and recommendations mentioned by the European Semester Report. Cluster organisation, such as Arch Energy and the Blue Economy Innovation cluster seem to contribute to the green innovation efforts. ArchEnerg specifically contributes through initiatives that focus on reducing fossil fuel dependence and enhancing energy efficiency in buildings.[14] Their projects, such as PASSHOUSE, which assesses energy-efficient houses, directly support the transition towards more sustainable energy practices.[15] Studies also show that clusters can play a vital role in the green transition of the economy[16] and it can be underlined that cluster organisations have a positive influence on the green transition, not least because they facilitate exchange between different actors, disseminate relevant knowledge and practices and deepen environmental awareness among stakeholders.[17]
Digital  Transition	• Need of increasing investment in the digitalisation of businesses	There is a **lack of digitisation of businesses**, which requires an increase in investment. The EDIOP Plus programme addresses the issue of low proficiency in digital skills within the country by prioritising the provision of broadband internet access to the general population. Additionally, the lack of digitalisation in firms can be tackled through investments aimed at enhancing the competitiveness of SMEs.[18] Research consistently indicates that clusters play a contributing role in this context, positively affecting the successful application of open innovation digitalisation in SMEs as well as the positive contributions of clusters to the development of industry 4.0[19] as a subtopic of the digital transition.

[13] European Expert Group on Clusters (2020).
[14] https://www.archenerg.eu/ (last access 14.05.2024)-
[15] https://www.archenerg.eu/projektek/lezart-projektek/passhouse-performance-assesment-of-energy-efficient-houses-through-monitoring.html (last access 14.05.2024)-
[16] Lis, A. & Mackiewicz, M. (2023); ECCP (2021).
[17] Hatch et al. (2017).
[18] Okuwhere, M. et al. (2022).
[19] Götz, M. & Jankowska, B. (2018).

Policy area	Challenges	Cluster activity
		In Hungary, there are cluster organisation that are dedicated to the digital transition, one of which is the digital cluster Innoskart. is Innoskart, a digital cluster. Focused on the digitalization of the industrial and agricultural sectors, Innoskart has facilitated significant advancements by engaging in European projects and partnerships. Since 2014, the cluster's tendering activities have channeled over €10 million into initiatives that significantly enhance the digital capabilities of local SMEs, boosting both quality and efficiency.[20]

[20] https://www.innoskart.digital/en/projects (last access 14.05.2024)-

References

References

Government of Hungary (2023). Cluster Strategy 2023-2030. https://cdn.kormany.hu/uploads/document/8/85/859/859655813b0908ec753dfb28e0365d96b5a3d5e0.pdf (last access 23.01.2024).

Government of Hungary. About the Széchenyi Plus Programme. https://www.palyazat.gov.hu/programok/szechenyi-terv-plusz (last access 23.01.2024).

European Commission. "Operational Programmes." https://ec.europa.eu/regional_policy/in-your-country/programmes_en (last access 26.10.2023).

European Expert Group on Clusters (2020): Recommendation Report. Available online https://clustercollaboration.eu/sites/default/files/news_attachment/European%20Expert%20Group%20on%20Clusters%20-%20Recommendation%20Report.pdf (last access 21.12.2023).

Evolution of cluster policy in Hungary - 2000-2020. https://clustercollaboration.eu/news/evolution-cluster-policy-hungary-2000-2020 (last access 26.10.2023).

Government of Hungary. Ministry of Finance. "Cluster Development Office." http://www.klaszterfejlesztes.hu/ (last access 26.10.2023).

Götz, M. & Jankowska, B. (2018): On the Role of Clusters in Fostering the Industry 4.0. Available online: https://www.emerald.com/insight/content/doi/10.1108/S1745-886220180000013016/full/html (last access 10.01.2024).

Hatch et al. (2017): The Role of Social Actors in Advancing a Green Transition: The case of Québec's Cleantech Cluster. In Journal of Innovation Economics & Management. Available online: https://www.cairn.info/revue-journal-of-innovation-economics-2017-3-page-63.htm (last access 21.12.2023).

Hsu, M.-S et al. (2014): „The impact of industrial clusters on human resource and firms performance", Journal of Modelling in Management, vol. 9 (2). Available online: https://www.emerald.com/insight/content/doi/10.1108/JM2-11-2012-0038/full/html (last access 21.12.2023).

National Smart Specialisation Strategy (S3) 2021-2027 / Hungary. https://www.s3.nkfih.gov.hu/english (last access 26.10.2023).

Nándor, Kadlok and Szabó Levente. "Ex-ante evaluation of operational programmes 2014-2020 – Lot 2: Economic Development. Third evaluation report." Equinox Consulting and KPMG. Hungary Ministry of Finance. 2014. www.palyazat.gov.hu/a-2014-2020-as-operatv-programok-ex-ante-rtkelsei# (last access 26.10.2023).

Okuwhere, M. et al. (2022): The catalyst roles of clusters in the relationship between open innovation and Digitalisation: A systematic review and research agenda within SME context. Available online: https://pure.coventry.ac.uk/ws/portalfiles/portal/56311371/The_catalyst_roles_of_clusters_in_the_relationship_between_open_innovation_and_Digitalisation_A_systematic_review_and_research_agenda_within_SME_context_FinalPaperUpload_904_0623073209_Published_copy.pdf (last access 10.01.2024).

Review of the Hungarian cluster accreditation system and proposals for its renewal based on the national cluster situation and international practices, proposals for the the content of the cluster

development concept for the period 2014-20, Colosseum Ltd. http://klaszterfejlesztes.hu/content/cont_5007fe14d8ba95.44814012/klasztertanulmany_2015.pdf (last access 26.10.2023).

Annex

Table 5: Analytical framework for the state of cluster policy

Criterion	Description	Categorical variables
Policy scope	assessment whether the country has a dedicated cluster policy, or cluster creation and/or development is targeted through broader policies, e.g. foreign trade policies, labour and social policies or specific sectoral policies, e.g. industrial policy tourism policies, agriculture policies	**absence of cluster policy** **existence of broader policies** **existence of specific sectoral policies** **existence of targeted cluster policies**
Continuity of cluster policies	assessment of the duration and experience of the country in carrying out cluster policies. This criterion assesses only existence of targeted cluster policies and not broader policies or sectoral policies	**absence of policies supporting cluster development** **cluster policy established recently (within the last 2 years)** **cluster policy established between over 2 and 10 years** **cluster policy established over 10 years ago**
Evidence of performance	assessment whether there are evaluations of past and ongoing policies and a monitoring system in place. The existence of monitoring and evaluation mechanisms determines the degree of policy development in the country	**no evaluation and / or monitoring available** **existence of evaluations of past policies, e.g. ex-ante** **existence of monitoring or an ongoing / interim evaluation** **existence of monitoring and ex-ante or ongoing / interim evaluation**
Cluster Support Instruments	assessment whether the policies provide any instruments to support the policy implementation, being these financial and/or technical support	**no instruments for cluster development** **financial support for cluster development in the broader and / or sectoral policy** **financial or technical support for cluster development in dedicated cluster policy** **financial and technical support for cluster development in dedicated cluster policy**

Source: ECCP (2023).