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**State of Play and Sectoral Differentiation of Clusters in Visegrad  
Group Countries and in Germany in the Context  
of Increasing Competitiveness**

**Abstract**

*In accordance with the definition by the European Commission regional competitiveness means the ability of companies, sectors and transnational groupings in the region exposed to international competition to generate sustainable and relatively high income and employment levels. Following this line of thinking, strengthening the potential of local economic operators and their environment should become the priority of economic policies of the governments. One among recognised mechanisms that back up enterprise potential is the organisation and fostering of the competitiveness of clusters. They are a specific case of economic networks based on cooperation and competitiveness which usually need targeted investment in order to be efficient in their operations. Cluster policy implemented by Western European countries is most often systemic, integrated between the central and the regional levels with the material scope of investment focusing on assisting innovation in clusters. From this perspective it is interesting to see the shape the policy takes in Central European countries after their economic transformation. We selected Visegrad Group countries as the subject of our analysis knowing that clusters have been known there since at least the end of 1990s. Although more than 10 years have passed the conclusions indicate that the policy is at its initial development stage and, differently from Western economies (Germany in our case), it hardly effects the innovation of national economies and regional systems of innovation.*

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## **1. Introduction**

In Eastern and Central European countries, clusters are more and more attractive subject of interest, both among theoreticians and practitioners. They are perceived as one of the most important tools for improving competitiveness and innovativeness of the economy. Because of their specific nature (logic of partnership and cooperation between many actors), clusters are often becoming a platform, where hitherto isolated: world of science, world of public sector and world of enterprises meet each other, building territorially embedded business environment. There is no doubt that clusters can contribute to competitiveness and innovativeness of National economy as well. Thus, support and promotion of cluster initiatives remains a very important development policy issue.

A question arises, however, whether actors entrusted with the implementation of the economic policy at the central level and in local authorities are aware of the fact? Can they perceive the benefits and can they correctly recognise conditions for clusters? Do they support the development of clusters which can be easily verified by their number and innovativeness dependent upon the sector they operate in which, in turn, creates competition potential for a given location?

From the perspective of the European Union these questions are especially important for countries at a lower level of social and economic development; for countries which need effective mechanisms that impact innovativeness and the rate of economic growth. That is why in our study we have focused on countries of the Visegrad Group which in our opinion should use clusters to determine the rate of their growth. As a point of reference we have identified a comparable situation in Germany, the economy which is currently the most active with respect to clusters in Europe and also politically active in this field.

## **2. Role of clusters in strengthening economic competitiveness - conditions, essence and benefits**

New technologies allow an exchange of almost everything between different persons and places. The two fundamental dimensions: time and space do not disappear. Instead, in the information society they are subordinated to the logic of network, structure of capital flows, technology, and information. Space, as R. Domański notices, along with socio-economic developments transforms into „a relational space that possesses an ability to process or destroy incentives,

disseminate or hinder innovations, adapt to the dynamics of processes in which it is involved. (...) between enterprises, administration, scientific institutions and social organisations a value added is generated and new resources are created” (Domański 2000, pp.3-4).

The network organisation is formed as a response to challenges posed by contemporary world in the context of competitiveness and development of regions. Network, as pointed out by A. Jewtuchowicz, „is a set of selected relationships with chosen partners depicted in market relations of enterprises. The main motive for their emergence is an attempt to reduce the uncertainty of action” (Jewtuchowicz 1997, p. 14). New network ties are established depending on needs and assumed strategies. In general, networks can be divided into intraorganisational networks and interorganisational networks (Sikorski 1998, p.27).

In the context of regional development the notion of network is closely related to the entrepreneurial network (*entrepreneurial milieu*), which appears in different forms and is subject to continuous changes. Such a form of organisation of enterprises is determined by a new paradigm of post-Fordist production organisation. R. Reich distinguishes some most common entrepreneurial networks such as: autonomous profit centres, external partnerships, internal partnerships, licensing, and pure agency. (Reich 1999, pp.79-80) These are examples of two types of networks, i.e. enterprises in network and networks in enterprises.

The network theory has close relationships with the polarisation theory. (Boudeville 1972, p.68) According to P. Veltz’a „a growth of pools depends on their ability to make combinations with the main streams and networks, to seize rents connected with the points where the networks cross with each other, to create network ties, etc.” (Grzeszczak 1999, p.52). Therefore, the main determinants of the network effectiveness include: flexibility of its elements (ability to adapt) and complementarity of its elements. The main feature of network is that between its hubs, apart from formal, regular and relatively durable contacts, one can notice very often alliances that are characterised by occasional and informal relationships.

The creation of network structures, between entrepreneurial, is driven and motivated by aspirations to achieve a competitive advantage by individuals. Networks facilitate communication and generate in one place and time the variety and dispersion of technological (innovative), productive, organisational and managerial competences. It is a quite rare situation when a single enterprise, especially a small one, possesses them all, particularly if a reference is made to the requirements of the global market. The possession of the above competences is a starting point to achieve a competitive advantage on the market (Sikorski

1998, p. 17). Therefore, networks can be seen as „a way of organisation of enterprises”, which enable enterprises to accomplish three main goals (Jewtuchowicz 1997, p. 14):

1. gain economies of scale through coordination of production, marketing and research functions with the remaining network actors,
2. control the market of complementary products, which is a necessary condition to be able to respond quickly to external changes,
3. control the strategic directions of development of this complementary production, which enables continuous innovation of own products.

The network reduces or puts aside the hierarchy between its actors, and replaces it with a new, horizontal organisational form, where a firm's economic success is perceived as the outcome of such factors as partnership, cooperation, reciprocity and environment of the firm. „Network is a global concept that brings one fundamental advantage to the local dimension which consists in the fact that it accepts a small and medium dimension, involves it with retention of its all characteristics, gives it the possibility to communicate, get out of isolation and integrate with other networks of the contemporary world” (Arocena 1996). The formation and existence of network organisations is based on the principle of mutual advantage of its elements.

Globalisation processes highlight the local level of economy and make use of the competitiveness of places within space determined by organising innovative *entrepreneurial milieu*. Different forms of production organisation characterised by strong territorial relationships emerge locally. As pointed out by D. Maillat, they are also involved in global activities. „(...) the local scale supports the global scale through the process of territorialisation” (Maillat 2001, p. 1).

A territorial production system forms a whole characterised by nearness of production units, and as pointed out by D. Maillat, in the broad sense „including industrial enterprises and services, research centres and centres of education, supporting institutions, etc., which maintain more-intensive or less-intensive relationships, and generate the production dynamics of the whole.” (Maillat, Bataini 2002, p. 8) In this sense territory plays an active role, whereas the enterprises located on its area contribute to its enrichment.

In the context of these conditions and dependencies one may explain the phenomenon and the potential of clusters in regions. The concept of the development of clusters emerged in the 19th century. It was interpreted in various countries and by different research groups both theoretically and practically and was subject to re-interpretations.

Its development was directly initiated at the end of the 19th century by A. Marshall who used the notion of an industrial district to explain growing effectiveness of economy. (Jewtuchowicz, I. Pietrzyk 2003, pp.11-12) He promoted the idea according to which growing effectiveness is not only the result of economies of scale achieved by large enterprises, but it is also obtained by means of economies of agglomeration<sup>1</sup> and organization generated by the industrial district.

Italian researchers (among others A. Bagnasco, S. Brusco, G. Garofoli, G. Fua, C. Zacchia, C. Trigilia, G. Becattini) enlivened the idea of industrial district in the 1970s and 1980s of the 20th century. In particular, the concept was developed by G. Becattini who made a research on the regions of „Third Italy”. The success of Italian industrial districts, which emerged spontaneously during the years of a big economic crisis, brought attention to essential changes that took place in a spatial dynamics of development. The emergence of new production areas, whose success could not be explained on the grounds of the classical theories of regional development, encouraged to search for a new approach to development. G. Becattini described a district as a „spatial concentration of small and medium-sized enterprises concentrated in industrial sectors and specialised in different phases of the production process, which contribute jointly to specific production identified as the district’s industrial product” (Hsaini 2000, p. 218).

French researchers (representing the so called Grenoble School and including among others C. Courlet and B. Pecqueur) enriched the concept of industrial districts with methods of regulation and introduced the notion of a *system*. When investigating French regions they formulated the concept of *localised production systems*. C. Courlet defined a localised production system as „a system of enterprises grouped in close space around one of many industrial activities. The enterprises maintain the relationships between each other and socio-cultural milieu. These relationships are not only of commercial nature. They also concern an exchange of information and create positive external effects for the group of enterprises” (Hsaini 2000, p. 219).

The American researchers (A. Scott, M. Storper, R. Walker) reinterpret the importance of external effects in their research on the location of enterprises within the space. Their interests focus mainly on large urban agglomerations, therefore in their works they underline the importance of economies of agglomeration, which „are the result of structural factors connected with the

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<sup>1</sup> Under the notion of *agglomeration*, one should understand a set or grouping of elements which form entrepreneurial milieux, and it should not be interpreted in a traditional way as the concentration of population and buildings in a small area resulting in its strong urbanisation.

organisation of the industrial process inside the selected community. They claim that these benefits determine the choice of location of enterprises.” (Despiney-Żachowska 2002, p. 239; Manuel de Jesus 2003, pp. 87-94) Now, one points to the fact that economies of agglomeration (connected with external economies) give way to network economies in the hierarchy of determinants of the firm’s competitiveness (Gancarczyk, M. Gancarczyk 2002, p. 75). Benefits achieved through networks belong to the category of synergy effects. Also another American researcher M. Porter deals with the problems of competitiveness of enterprises from the perspective of industrial and spatial organisation of location. However, he does not use the notion of a territorial production system, and instead uses the term *clusters*. In the recent years, owing to M. Porter the term won renown. From the viewpoint of works of European and American researchers, the term *clusters* seems to be helpful to identify the differences that result from basically different specificity and conditions of emergence of territorial production systems on both continents. The territorial forms of industrial organisation in the USA (for example, the Sillicon Valley, Pittsburgh, Phoenix) are characterised by a usually lower impact on their appearance from the factors related to history and tradition of place, and a bigger influence of the infrastructure of technology development (universities, innovation creation institutions, etc.). Hence, on the American ground the notions of a *technology district* or *technopolis*, which constitute a specific form of an industrial district, are closer in meaning than a territorial production system<sup>2</sup>. Technopolises arise spontaneously or as a result of specific industrial policy of the government. (Jewtuchowicz 2001, p. 45) However, the definition proposed by M. Porter does not bring any new elements, which would differentiate it from the previous ones and it says „this is the system of interlinked firms and institutions, whose value as a whole is bigger than the sum of values of its elements” (Porter 2001, p. 266). The American research introduced to the analysis of production systems the so called governance methods<sup>3</sup> and highlighted big importance of institutions in their development. It should be emphasized that representatives of the contemporary stream of institutionalism are inclined to consider institutions as the rules or principles of the game, which limit activities of individuals. According to D. North, the interactions between institutions and economic organisations and entrepreneurs give a new shape and direction to the evolution

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<sup>2</sup> *Technopolis* is the centre of technology sales. They constitute a specific form of an industrial district. They emerge as a result of the government’s industrial policy, as it is the case in Japan, Germany or France, or their appearance is a more or less spontaneous result of transformations of production systems, as the US-based Sillicon Valley or Orange County. For more information, see Benko 1993.

<sup>3</sup> The governance methods range from pure market mechanisms to the government’s regulation described as a hierarchy. For more information, see Pietrzyk 2000, p. 53.

of economy. (Morawski 2001, pp. 58-59) „Institutions are limitations invented by human beings, which structure human relationships. Firstly, they consist of formal limitations, e.g. legal regulations (...), secondly, they consist of informal limitations, that is behavioural norms, conventions, mutually recognised customs and codes of ethics” (Grosse 2002, p. 40-41).

The clusters concept is based on the spatial self-organisation theory. N. Grosjean made use of the theories of systems and indicated the characteristic features, which show the autonomy of territorial production systems (Maillat, Bataini 2002, p. 8):

- systems are autonomous if they create organisations that define them as units,
- these organisations are based on the action of dynamic processes, which allow them to maintain their cohesion,
- systems which maintain their own identity are considered as autonomous,
- autonomy makes it possible for the systems to cooperate with their environment without any breach of their own cohesion.

These features enable the systems to work in the longer period through the processes of modernisation (self-organisation).

Cluster are oriented towards the competitive economic development of the territory on which they function making use of innovations and taking into consideration the conditions of the external environment (Maillat, Bataini 2002, p. 8).

Nowadays often used definition of cluster is: a geographic concentrations of interconnected businesses, suppliers, and associated institutions in a particular field. (Porter 1998, p. 78; Porter 1990) In other words, it is a geographic agglomeration of companies, specialized suppliers, service providers, firms in related industries, and associated organizations (such as universities, standard agencies, trade associations), linked by commonalities and complementarities, where both business competition and cooperation take place (Gordon, Ph. McCann 2000, p. 513-532; Hamdouch 2007).

### **3. Effectiveness of cluster analysis methods in comparative studies**

Effective and well directed policy to support clusters requires a diagnosis of the development of clusters and their needs. Unfortunately the array of methods used for the purpose is very limited due to the differentiation of cluster

phenomena, on the one hand, and the lack of statistical data that diagnose economic networks at the local level, on the other hand.

Among the most popular methods, one can mention at least three: an *input-output* method, an analysis of concentration and qualitative research, based e. g. on case studies. Often, these methods are combined in one research project, or are a subject of modifications (Sölvell 2009, pp. 88-90; Solvell, Lidqvist, Ketels 2003, pp. 31-42).

The *input-output*, a method of cross-examination, leads to identification of potential clusters by analyzing interconnections between industries (sectors) of a nation's (or a region's) economy<sup>4</sup>. It shows how the output of one industry is an input to each other industry, e.g. which raw materials or other materials are used in the various sectors as an intermediate good. This method allows an accurate presentation of characteristics of production and consumption of given sectors in given regions, as well as a nature of interrelationships between producers and their links with other producers and economic activities. At present, however, especially in the case of Poland, big gaps in the statistical data on the satisfactory level of spatial disaggregation (extremely important for cluster research purposes), is an important disadvantage of this method.

A *location quotient* method is a relatively easy and quick tool for analyzing the concentration of enterprises in specific sectors<sup>5</sup>. For clusters' identification, this method may be helpful at the first stage of analysis (for identifying potential clusters)<sup>6</sup>. However, even W. Isard already suggested that *location quotient* is meaningless if it is treated as the only method of analysis. It is, however, to some extent useful in the initial phase of the study (Isard 1965, p. 19). To conclude, this method should be treated as a starting point for more deep analyses, since it identifies only concentration of enterprises in specific industries, but does not say anything about the internal structure and functioning of potential clusters (the quality and organization of business networks).

Therefore, to meet the requirement to depict cluster structures and their specific internal nature in more accurate way, the qualitative (expert) methods are being used more and more often. They are based mainly on carrying out interviews in various forms, depending on research assumptions made *a priori*.

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<sup>4</sup> The creator of this method was a Russian-American economist W. Leontief (Leontief 1986). On the field of regional science, it was introduced by W. Isard (Isard 1960).

<sup>5</sup> *Location quotient* method was previously used for so called *economic base* estimations. Its usage in urban and regional economics is very popular and broad (for more, see e.g. McCann 2001, pp. 144-146; Isserman 1977, pp. 33-41).

<sup>6</sup> For the first time in Poland, this method was used to map the clusters in years 2002 - 2003 (Wojnicka, Brodzicki, Szultka 2003); in a modified form, it is also used as a basis for identifying clusters in Europe by *European Cluster Observatory*.

These interviews are made among cluster members, experts involved in the cluster activity, experts and researchers from the field where cluster operates, the public authorities, etc. To avoid a subjective assessment of qualitative data obtained in this way, as well as to assure its comparability, researchers dealing with issues of clusters try to use various methods aiming at overcoming these advantages. Among the latter, one may mention a *Multi-Sectoral Qualitative Analysis* (MSQA) (Roberts, Stimson 1998, pp. 469-494). This method allows the identification of competitive advantages, business potential, market opportunities and risks, and are based on estimation of weights (strong, average, poor) to each criteria based on data obtained from various sources: *input-output* matrix, interviews with key “actors” and other information available (T. Brodzicki, S. Szultka 2002, pp. 45-60). This method was used, inter alia, by Michael E. Porter in a Cluster Meta-Study project<sup>7</sup>, where on the basis on data concerning around 800 clusters from 50 countries, it was possible to create a list of standard criteria for clusters’ identification and assessment, in order to quantify data for comparative analysis purposes<sup>8</sup>.

In practice, currently in most research, one can observe the usage of more than one quantitative or qualitative methods (so called *methodological triangulation*), in order to adapt them to the specific circumstances of a particular country or region. Thus, most of comprehensive studies of clusters, in their initial phase, is based on an analysis of statistical data, such as the volume of exports, employment, or the number of companies being cluster’s members. This allows identification of potential clusters, their location and market coverage. For further, more deep examination, researchers start to engage qualitative methods, based on case studies, interviews with entrepreneurs and the knowledge of experts.

Last five years witnessed an enhanced interest in searching for effective ways of identification and diagnosing of clusters. That is to a large extent determined by the interest in clusters shown by the European Commission (2008/824/EC; 2008/C 257/12; SEC(2008) 2637) and some important, large scale international research and application projects (such as: Clusters are Individuals NGP Cluster Excellence (2011), TACTICS, Benchmarking of clusters in Poland (2010), The Cluster Benchmarking Project). Two all-European cluster platforms were launched to promote the idea but also to identify actors interested in clusters and cluster policy and to facilitate contacts

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<sup>7</sup> See: Institute for Strategy and Competitiveness, Ludcke House, *Harvard* Business School; ISC Cluster Meta Project: <http://www.isc.hbs.edu/econ-clustermetastudy.htm>, accessed 12<sup>th</sup> of April, 2009.

<sup>8</sup> However, currently both a method and its results are also a subject of criticism (Hamdouch 2007).

among them<sup>9</sup>. The most important platforms of European scale are the *European Cluster Observatory* (Europe Innova, 2007), *Europa InterCluster* (EU 2010) and *Clusters Collaboration Platform* (European Commission, 2011). Many years of Author's experience in clusters allow to assess the credibility and accuracy of data available on the latest *Clusters Collaboration Platform* as acceptable when it comes to the identified clusters and cluster initiatives. Data concerning the identification of cluster phenomena are classified here based on the correct, in the Author's opinion, definition of a cluster. The credibility is confirmed, *inter alia*, by a high degree of consistency with the study *Benchmarking of clusters in Poland 2010* and data verified on the websites of the clusters<sup>10</sup>. This database was used in the comparative analysis in further part of the study. Data represent the state of play as in March 2012.

#### **4. Identification and comparative analysis of clusters by sectors in selected countries**

Innovation in companies is not possible if they do not find themselves in an appropriate environment, such as e.g. a dynamic cluster. According to the report *European Cluster Policy Group* 38% of working Europeans are employed in various sectors of industry concentrated in clusters (European Clusters Policy Group 2010). Considering only the general number of clusters it is hard to link it to indicators depicting economic competitiveness as the latter

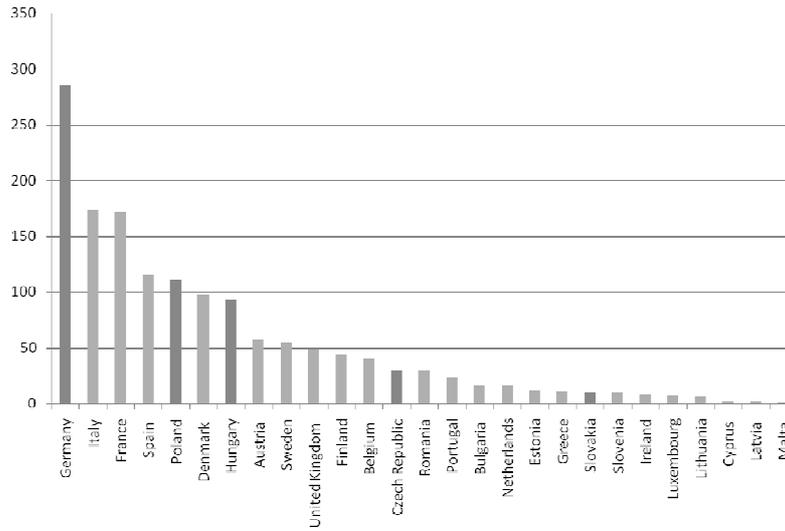
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<sup>9</sup> There are also many national or sectoral platforms, e.g.: *Portal Innowacji (Innovation Portal)*, *European Aerospace Cluster Partnership*, *European Biotechnology Network*, The International Society for Optical Engineering.

<sup>10</sup> The definition by M. Porter, although used the most frequently, is rather imprecise from the point of view of cluster identification. Using it an inexperienced researcher may incorrectly classify as clusters economic phenomena which in fact are not clusters but only try to call themselves that way. That is why various methods or detailed criteria are used to identify clusters. The authors of the methodology for *Benchmarking of clusters in Poland 2010* adopted an operational definition to the M. Porter's definition and identified four criteria that must be met by an economic network to be classified as a cluster: concentration around the core branch identified; geographical concentration and territorial identity of a cluster (cluster must be territorially embedded); the sustainability of cooperation (at least within the core of cluster); commonality of initiatives (e. g. in terms of common promotion, common supply and / or distribution, common training, technology transfer, lobbying, etc.) and the presence of common elements of the value chain realized by companies / institutions operating in the cluster. (A. Nowakowska, Z. Przygodzki, M. Sokołowicz, K. Matusiak, A. Bąkowski, 2010). Such a definition allowed to identify 47 clusters and 74 cluster initiatives out of all of 178 identified cluster phenomena in 2010. The list and the numbers faithfully reflect clusters identified on the platform *Clusters Collaboration*.

largely depends on two elements: natural characteristics and the organisation of the business community in a given country (1) and the degree of organisation and systemic nature of pro-cluster policy (2).

**Figure 1. Number of clusters and cluster initiatives in the EU countries**



Source: own calculations based on Clusters Collaboration Platforms, 09.03.2012.

At the moment German economics represents high propensity to self-organisation of economic actors, business and research communities. That is due to both a relatively high tendency among the business community to cooperate and the policy of public authorities which promote clustering in Germany, especially in highly innovative sectors. The policy is of a systemic nature both at the national and regional levels. (Borras, Dimitrios Tsagdis 2011, pp. 63-67) Poland owes its relatively high ranking (Fig. 1) mainly to high enterprise spirit of the Poles (understood as a tendency and capabilities to take advantage of emerging opportunities) and to instruments of financial support to cluster organisations provided by central authorities. Hence over a half of 111 cluster phenomena registered at the platform *Clusters Collaboration* are only cluster initiatives, not fully fledged clusters (one may estimate there are ca. 48 clusters in Poland (PAED)), nevertheless other organisations that currently are cluster initiatives (often of formalised nature registered as associations) may easily start operating as clusters if circumstances permit. The absence of a long-term vision of systemic arrangements that support clusters also result in the fact that most of

the clusters in Poland (over 50%) are in their initial stage of development and have been remaining in it for some years already (almost 90% of currently active clusters were established between 2006 and 2008) (Deloitte Business Consulting S.A 2010).

Studies show that companies in clusters achieve higher productivity and innovation and the survival rate of start-ups is higher and they grow faster. More innovative clusters operate in highly developed countries but the picture is largely differentiated. The following dependence is a rule: higher level of development of a country determines a higher proportion of clusters active in highly innovative sectors with a relatively high number of participants. The dependence results to a large extent from the concentration of public policy support on those branches and communities which are highly capable of using R&D in their operations. That is confirmed by the German practice where cluster policy has been conducted since 1980s but already in 1990s it was clearly oriented at highly innovative branches (e.g. by implementing programmes like: *BioRegio*, *InnoRegio*, *BioIndustriale*, *BioPharma competition* and other) (Meier do Köcker 2009, pp. 10-14). At present the European Commission has taken a similar approach. In structural support mechanisms for clusters that benefit from Structural Funds the Commission opposes public financial engagement in sectors of low innovation or in areas not linked with R&D. In the current programming period 2007-2013 Visegrad Group countries strongly defend that direction of the policy. As a result and in reflection of poor readiness of the economy and economic policy structures for new challenges and objectives under Europe 2020 strategy we experience difficulties in using financial support instruments for clusters development in Poland within the framework of Operational Programme Innovative Economy in its Measure 5.1 where the investment is directed to assist innovation of a cluster, not its organisation or promotion. Besides financial support at the central level pro-cluster policy is also conducted to a limited extent by the Polish Agency for Enterprise Development under the Operational Programme Innovative Economy and Operational Programme Human Capital but the policy consists only in projects not in systemic activities. In 2011 the Ministry of Economy faced the challenge of identifying the framework and objectives of pro-cluster policy in Poland, however, the policy has not become operational so far. At the regional level the policy to support development of clusters formally exists and is implemented in all 16 regions under the regional innovation policy. In practice, however, the outcomes of the policy are visible only in 6 regions which shows its real importance in regions.

As shown by studies on Polish clusters conducted in organisations registered on *Clusters Collaboration Platforms*, cooperation among the members

to clusters focuses mainly on common promotion and marketing, organisation of markets and only occasionally does it take the form of common research projects.

**Table 1. Areas of cooperation undertaken by clusters' participants**

Common projects implemented	Common promotion	Common marketing and distribution	Common supply	Common staff training	Expertise and consultancy ordered jointly	Common R&D projects	Common works on product's quality improvement
Number of indications	39	28	21	28	24	11	3
Percentage of indications	83%	60%	45%	60%	51%	23%	6%

Note: There was a possibility to indicate more than one choice. Thus, percentages do not add up to 100%.

Source: own calculations.

A similar orientation of cluster innovation policy can be observed in Hungary. *Hungarian Pole Program* (operating since 2008) supports clusters at three levels: establishing cooperation, cooperation development and support for innovation. In the first two objectives the policy is mainly of regional dimension with little involvement in innovativeness of clusters, consisting most of all in animation and coordination of structures and actors. The third objective, however, is delivered first of all by central authorities under innovation and R&D projects that currently are available only to 25 clusters. The number indicates a limited potential and importance of clusters for the Hungarian economy<sup>11</sup>.

The Czech Republic has got the poorest record when it comes to pro-cluster policy of innovative nature as the policy practically has not been defined. Clusters are mentioned in general documents on regional policy or industrial development policy. Most often, however, public engagement in the subject focuses on infrastructural investments and interferences with labour market policy. Thus competitive potential of Czech clusters is „bottom up” driven and depends solely upon how much their members are determined to cooperate and to be competitive. In practice there are just two well developed clusters. One in

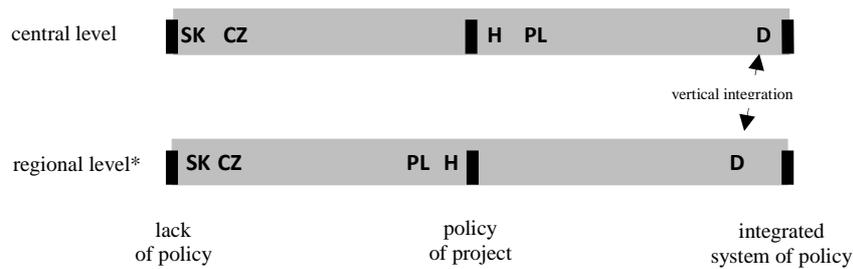
<sup>11</sup> Participation in these programmes requires a special accreditation available to clusters which generate important numbers of new jobs, represent high innovation potential and are international in their operations.

the automotive sector dependent in its development on the efficiency of strong foreign partners (who, by the way, are German). The second cluster is a film industry one with local, endogenous development potential.

In Slovakia the level of supporting the development of clusters is similar to that in the Czech Republic. At present the notion of a cluster can be found in strategic documents of the country but the cluster-oriented policy is of marginal importance. The policy is absent at the regional level (Borras, Tsagdis 2011, pp. 134-137).

The number and innovativeness of clusters in the countries covered by the study largely depend on how much the policy to support clusters is integrated and targeted. The conclusion in a simplified version confirms the ratio of operators active in highly innovative sectors in the overall population of clusters in a given country.

**Figure 2. Integration of cluster policy in Visegrad Group countries and in German**

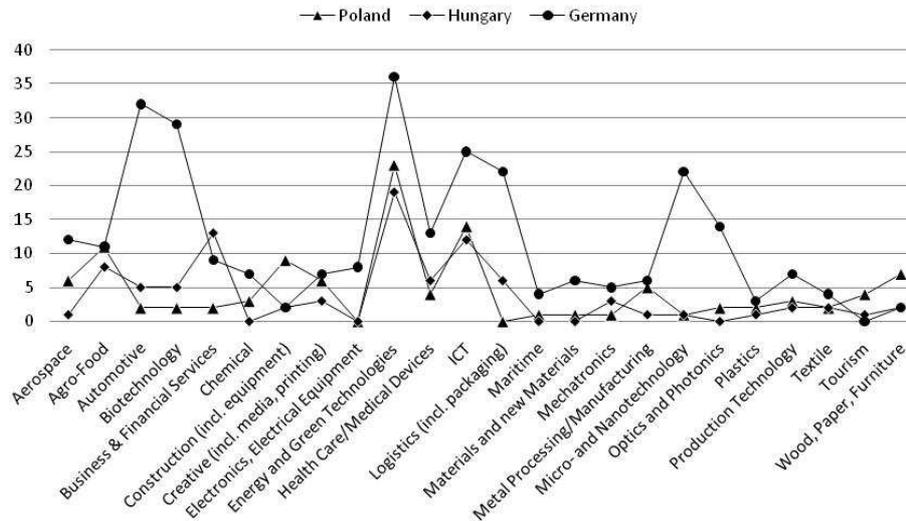


\* - average assessment for all regions of the country

Source: own calculations.

It is easy to note (fig. 3) that in Germany the clusters are mostly of highly innovative nature with dominant sectors such as: biotechnology, energy green technologies, nanotechnology, production technology, optics, photonics and ICT.

**Figure 3. Sectoral structure of clusters and cluster initiatives in Visegrad Group countries and in Germany in 2012**



	Aerospace	Agro-Food	Automotive	Biotechnology	Business & Financial Services	Chemical	Energy and Green Technologies	ICT	Micro- and Nanotechnology	Plastics	Textile	Tourism	Wood, Paper, Furniture
Czech Republic	1	1	2	2	2	2	6	3	2	3	1	1	6
Slovakia	0	0	2	0	0	0	0	3	0	1	0	2	2

Source: own calculations based on: Clusters Collaboration Platforms, 09.03.2012; clusters websites, *Europe InterCluster EU*.

In Poland and in Hungary, similarly to Germany, one can observe the same tendency and a considerably large share of clusters in energy green technologies and ICT. These are the only highly innovative sectors which by themselves with relatively little public support are able to organise their communities. One must remember, however, that the absence of clusters and cluster initiatives in highly innovative sectors of German economy is mostly due to the combination of innovation and cluster policies at the national and regional levels and a strong promotion effect resulting from the policy of selecting and supporting the so called key clusters.

**Table 2. Clusters and cluster initiatives by innovation level of a sector in Visegrad Group countries and in Germany in 2012**

industry	Poland		Hungary		Czech Republic		Slovakia		Germany		total of clusters and cluster initiatives in the industry	
	number	%	number	%	number	%	number	%	number	%	number	%
Aerospace	6	5,4	1	1,1	1	3,3	0	0	12	4,2	20	3,8
Agro-Food	11	9,9	8	8,6	1	3,3	0	0	11	3,8	31	5,8
Automotive	2	1,8	5	5,4	2	6,7	2	20	32	11,2	43	8,1
Biotechnology	2	1,8	5	5,4	2	6,7	0	0	29	10,1	38	7,2
Business & Financial Services	2	1,8	13	14,0	1	3,3	0	0	9	3,1	25	4,7
Chemical	3	2,7	0	0,0	1	3,3	0	0	7	2,4	11	2,1
Construction (incl. equipment)	9	8,1	2	2,2	0	0,0	0	0	2	0,7	13	2,5
Creative (incl. media, printing)	6	5,4	3	3,2	0	0,0	0	0	7	2,4	16	3,0
Electronics, Electrical	0	0,0	0	0,0	0	0,0	0	0	8	2,8	8	1,5
Energy and Green Technologies	23	20,7	19	20,4	6	20,0	0	0	36	12,6	84	15,8
Health Care/Medical	4	3,6	6	6,5	0	0,0	0	0	13	4,5	23	4,3
ICT	14	12,6	12	12,9	3	10,0	3	30	25	8,7	57	10,8
Logistics (incl. packaging)	0	0,0	6	6,5	0	0,0	0	0	22	7,7	28	5,3
Maritime	1	0,9	0	0,0	0	0,0	0	0	4	1,4	5	0,9
Materials and new Materials	1	0,9	0	0,0	0	0,0	0	0	6	2,1	7	1,3
Mechatronics	1	0,9	3	3,2	0	0,0	0	0	5	1,7	9	1,7
Metal Processing/ Manufacturing	5	4,5	1	1,1	0	0,0	0	0	6	2,1	12	2,3
Micro- and Nanotechnology	1	0,9	1	1,1	2	6,7	0	0	22	7,7	26	4,9
Optics and Photonics	2	1,8	0	0,0	0	0,0	0	0	14	4,9	16	3,0
Plastics	2	1,8	1	1,1	3	10,0	1	10	3	1,0	10	1,9

Production Technology	3	2,7	2	2,2	0	0,0	0	0	7	2,4	12	2,3
Textile	2	1,8	2	2,2	1	3,3	0	0	4	1,4	9	1,7
Tourism	4	3,6	1	1,1	1	3,3	2	20	0	0,0	8	1,5
Wood, Paper, Furniture	7	6,3	2	2,2	6	20,0	2	20	2	0,7	19	3,6
total of clusters and cluster initiatives in the country	111	100,0	93	100,0	30	100,0	10	100	286	100,0	530	100,0

Source: own calculations.

## 5. Conclusion

The European Union member states will soon enter the new programming period and will face new strategic challenges outlined in Europe 2020 strategy. Since the Lisbon Strategy was announced the EU member states have oriented themselves to invest in improved innovativeness of their economies. The policy to support innovation in businesses has been significantly amended also directions of investment are different. In short we may say that traditional, easy but little effective investment areas are not approved by the European Commission any more. More developed EU countries by promoting clusters invest mainly in their innovativeness and the same is expected from other member states including Poland.

Assuming an appropriate scale of the phenomenon we might boldly conclude that clusters may become the driving force for economic growth of countries and regions in which they operate. That is also visible in the case studies as independently of the country ca. 50% of clusters operate in highly innovative branches and sectors<sup>12</sup>. In highly developed countries (in our case in Germany) the category is more differentiated meaning higher competitiveness of business sectors and of the economy. Another dependence tells us that in countries where cluster policy is not clearly related to the objectives of

<sup>12</sup> For the needs of the paper we divided clusters and cluster initiatives into three classes of branches depending on how innovative they are: highly innovative (1): aerospace, biotechnology, energy and green technologies, ICT, mechatronics, micro- and nanotechnology, production technology; average innovative (2): automotive, business & financial services, creative (incl. media, printing), electronics, electrical equipment, health care/medical devices, materials and new materials, plastics; traditional industries (3): agro-food, chemical, construction (incl. equipment), logistics (incl. packaging), maritime, metal processing/manufacturing, textile, tourism, wood, paper, furniture.

innovation policy the share of clusters in traditional industries is substantial. On the one hand the tendency to form clusters in less innovative sectors is positive but for the growth potential partnership networks should definitely be encouraged among actors of knowledge-based economy.

**Table 3. Share of branches by innovation level in total number of clusters and cluster initiatives in studied countries in 2012**

Branch innovation level	Poland	Hungary	Czech Republic	Slovakia	Germany	amount of clusters and cluster initiatives
highly innovative	46,8	46,2	46,7	30	52,4	49,4
average innovative	15,3	30,1	20,0	30	27,3	24,9
traditional industries	37,8	23,7	33,3	40	20,3	25,7

Source: own calculations.

The analysis shows that less developed countries (in our study: Poland, Hungary, Czech Republic and Slovakia) should clearly: firstly, engage themselves into the construction of a systemic, long-term support for economic networks including clusters; and secondly, shift the support from the current focus on organisation and stimulating cooperation to investments in support of innovation and competitiveness of clusters in order to strengthen the potential of innovative businesses. Cluster policy should ideally become a part of innovation policy oriented at concrete results and priority sectors for economic development.

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## Streszczenie

### STAN I ZRÓŻNICOWANIE SEKTOROWE KLASTRÓW W KRAJACH GRUPY WYSZEHRADZKIEJ ORAZ NIEMCZECH W KONTEKŚCIE WZMACNIANIA ZDOLNOŚCI KONKURENCYJNYCH

Zgodnie z definicją Komisji Europejskiej pod pojęciem konkurencyjności regionów należy rozumieć zdolność przedsiębiorstw, przemysłu, a także ponadnarodowych ugrupowań, zlokalizowanych w regionie, wystawionych na międzynarodową konkurencję, do osiągania trwałego i relatywnie wysokiego poziomu dochodu i zatrudnienia. Zgodnie z tym rozumieniem wzmocnienie potencjału rodzimych podmiotów gospodarczych i ich otoczenia, powinno być priorytetem polityk gospodarczych rządów. Jednym z uznanych mechanizmów wspierających potencjał środowisk przedsiębiorczości jest organizacja i wzmocnienie konkurencyjności klastrów. Stanowią one specyficzny rodzaj sieci gospodarczych opartych na logice współpracy i konkurencji, których sprawne funkcjonowanie najczęściej wymaga ukierunkowanych inwestycji. Polityka klastrowa realizowana przez kraje Europy Zachodniej ma dziś najczęściej charakter systemowy, zintegrowany między poziomem centralnym i regionalnym, natomiast rzeczowy zakres interwencji dotyczy przede wszystkim wspierania innowacyjności klastrów. Z tej perspektywy interesujące jest jaki kształt polityka ta przybiera w krajach Europy Środkowej po zmianach związanych z transformacją gospodarek. Jako przedmiot analizy wybrano kraje Grupy Wyszehradzkiej, wiedząc, że zjawiska klastrowe były tutaj znane już przynajmniej od końca lat 90-tych. Mimo, iż upłynęło już ponad 10 lat wnioski z analizy wskazują, że polityka ta jest dopiero w początkowym stadium rozwoju i w przeciwieństwie do gospodarek zachodnich (w analizowanym przypadku Niemiec) w znikomym zakresie oddziałuje na innowacyjność gospodarek krajowych i regionalnych systemów innowacyjnych.