OECD Science, Technology and Innovation Outlook 2016

Policy Profile

Cluster policy and smart specialisation

Rationale and objectives

Clusters are a geographic concentration of firms, higher education and research institutions, and other public and private entities that facilitate collaboration on complementary economic activities. While some of the world's leading clusters specialise in high-technology industries (*e.g.* Silicon Valley, Bangalore), they are also found in sectors ranging from wine making to automobiles to biotechnology.

Clusters are increasingly exposed to global competition, and many OECD governments are keen to enhance their competitive advantage and to help firms and entrepreneurs in clusters move up the value chain through innovation and greater specialisation (OECD, 2014). The main rationale for public policies to promote clusters, through infrastructure and knowledge-based investments, networking activities and training, is that these increase knowledge spillovers thanks to the co-location of actors in clusters and thus the generation of a collective pool of knowledge that results in higher productivity, more innovation and increased competitiveness.

Major aspects and instruments

Most OECD countries promote a cluster-based approach to innovation (EC/OECD, 2014; 2016). Cluster policies have long been implemented in OECD countries: Austria, Germany and Finland, for instance, have supported clusters since the 1990s. Cluster policies have different features, depending on the stage of development of a country (or a region) and the level of maturity of the cluster itself. Clusters in less R&D-intensive countries tend to promote the agglomeration of companies on the basis of a sectoral comparative advantage. Clusters in more R&D-intensive countries tend to be driven by science and technology, and often a key component of the policy programmes in these countries is support for the linkages between universities and public research organisations and the business sector.

Typical policy instruments to promote cluster through agglomeration include the provision of funds conditioned on location, of facilities and buildings for companies to operate in, generally in close proximity to business innovation services such as technology transfer offices and incubators. Other tools to support exchanges and cooperation in clusters include the regular organisation of meetings of representative of cluster members and other organisations for the purpose of finding suitable partners for business and innovation activities. Clusters are often developed in the vicinity of existing universities or public research facilities, which can provide the knowledge, skills and infrastructure needed for innovation and entrepreneurship notably in the high tech sectors.

Networking platforms

Many OECD countries and regions have developed policies to promote the creation of networking platforms and collaboration among cluster members. These networks facilitate science-science interactions (between research centres and universities), science-industry interactions and industry-industry interactions. These networks are increasingly used to support cluster-to-cluster collaboration, including across regions and countries.

Internationalisation of clusters

Globalisation and competition have fostered both the internationalisation and the specialisation of clusters. This has implications for public support policies. France and Germany (particularly via the new programme "Internationalisation of Leading-Edge Clusters, Forward-Looking Projects and Comparable Networks") are encouraging competition between clusters and targeting public support on the basis of excellence, including

at international level. Poland has a new programme devoted to the promotion of the internationalisation of some key national clusters.

Place-based dimension

Cluster approaches are often seen as a tool to promote local and regional innovation-driven development. In most countries national cluster approaches involve regional and local governments (at the regional or city level depending on the cluster). For instance, most European countries have developed smart specialisation strategies at the national and/or regional level that include clusters in the articulation of the strategy. The French cluster programme ("Pôles de compétitivité") aims to foster innovation in particular sectors and places, notably by strengthening the linkages between large businesses, SMEs and the local environment. In Japan the Industrial Cluster initiative has been developed in cooperation with local governments. The Top Sector approach in the Netherlands and the Launchpads programme in the United Kingdom have a clear place-based dimension. In Korea clusters are developed in the framework of the Promotion of Regional Industries programme. Cluster approaches are also increasingly used to promote innovation in rural areas as in the case of programmes in the United States, Norway, Sweden, Chile, the Russian Federation and Colombia.

Table 1. Cluster development support policies and specialisation patterns in selected OECD countries

Creating and consolidating clusters	Creation of new clusters through co-ordinated action for R&D activities (e.g. public funding programmes)	Argentina, Australia, Belgium, Chile, Greece, Norway, Russia
	Promotion of network structures, service support for entrepreneurs, cluster co-ordination	Argentina, Austria, Australia, Belgium, Brazil, Canada, China, Colombia, Denmark, France, Germany, Greece, Ireland, Japan, Korea, New Zealand, Norway, Peru, Sweden
Networking Platforms	Science-science (e.g. promotion of collective research centres, centres of excellence)	Belgium, Canada, Denmark, France, Germany, Norway, South Africa, Spain, Switzerland
	Industry-science (e.g. promotion of public-private networks, science parks)	Argentina, Australia, Belgium, Canada, China, Colombia, Croatia, Denmark, Estonia, Finland, France, Germany, Iceland, Ireland, Italy, Latvia, Mexico, the Netherlands, Norway, Poland, Portugal, Slovenia, United Kingdom
	Industry-industry (e.g. promotion of sectoral networks)	Belgium, China, Colombia, Denmark, France, Germany, Lithuania, Poland, Portugal, Spain, United Kingdom
Internationalisation	Cluster competition and cluster excellence programmes	Austria, Australia, Belgium, Germany, France, Ireland, Netherlands, Norway, EC
(Towards) smart specialisation	Austria, Belgium, Chile, Czech Republic, Estonia, France, Finland, Germany, Ireland, Israel, Netherlands, Poland, Russian Federation, Spain, Turkey, United Kingdom, EC	

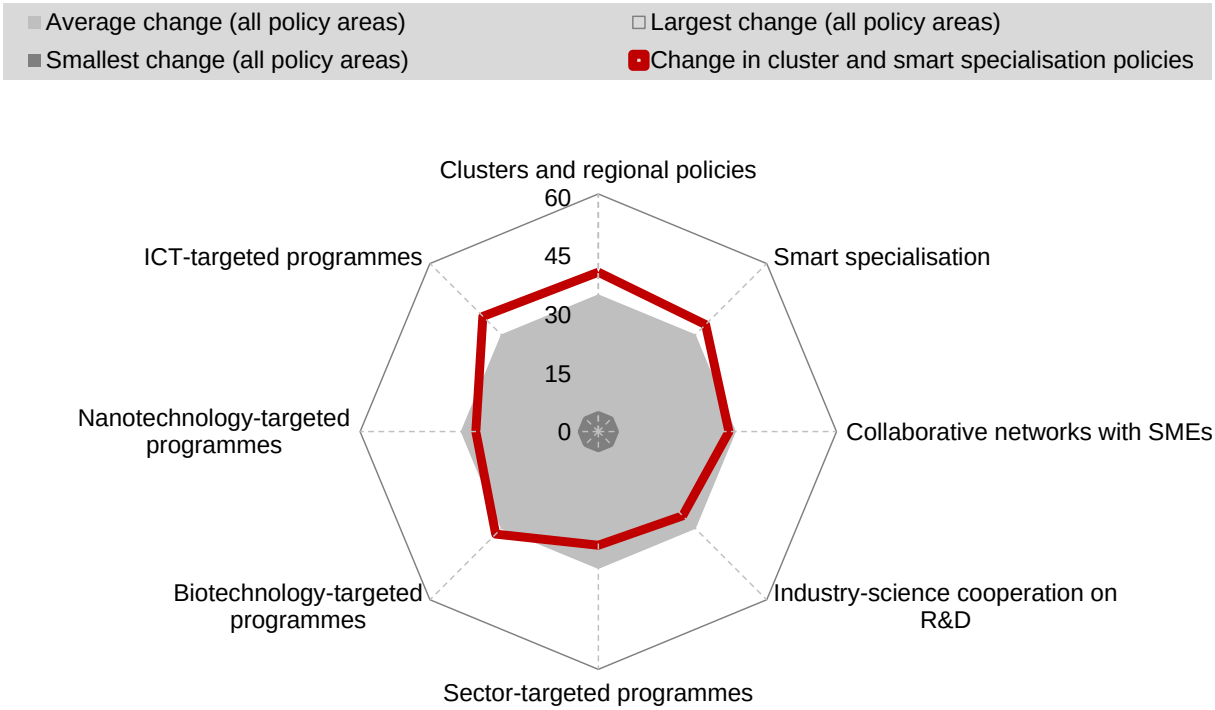
Source: EC (European Commission)/OECD (forthcoming), International Database on Science, Technology and Innovation Policies (STIP), edition 2016, http://www.innovationpolicyplatform.org/sti-policy-database and OECD (2010), *OECD Science, Technology and Industry Outlook 2010*, OECD Publishing, Paris, http://dx.doi.org/10.1787/sti_outlook-2010-en.

Recent policy trends

Some OECD countries have recently reformed their national cluster policies to promote a **network-based cluster development model**, where clusters located in different areas and active in different industrial sectors are pushed to establish cross-cluster linkages domestically and internationally. This has happened for instance in countries like Finland and Germany (Internationalisation of Leading-Edge Clusters as part of the new High-Tech Strategy). Elements of this network-based approach often include the strengthening of the research component of clusters and inter-disciplinary and cross-sectoral approaches. The European Cluster Observatory of the European Commission is currently undertaking a benchmarking exercise to investigate these dynamics at the European level (European Cluster Observatory, 2015).

Figure 1. Cluster policy and smart specialisation initiatives among other areas of STI policy change, 2014-16

Percentage of policy initiatives that have been newly introduced, revised or repealed over the period



Note: The EC/OECD STI Policy survey 2016 aims to review major changes in national policy portfolio and governance arrangements for STI. The survey builds on the conceptual work carried on under the aegis of the OECD Committee for Scientific and Technological Policy (CSTP) for mapping the policy mix for innovation and therefore covers a broad range of policy areas (Kergroach et al., forthcoming-a). 52 economies participated in 2016, including OECD countries, key emerging economies (e.g. Argentina, Brazil, the People's Republic of China, Colombia, Costa Rica, Egypt, India, Indonesia, Malaysia, Peru, the Russian Federation, South Africa and Thailand), non-OECD EU Member States, and the European Commission. Taken together, the countries covered in the STIP survey 2016 account for an estimated 98% of global R&D. The responses are provided by CSTP Delegates and European Research and Innovation Committee (ERAC) Delegates for EU non-OECD countries.

This is an experimental indicator that accounts for the number of major policy initiatives implemented, repealed or substantially revised during 2014-16 as a share of total policy initiatives active at the beginning of the period. Although simple counts do not account for the magnitude and impact of policy changes, this ratio reflects STI policy focus and activity in specific policy areas and over specific periods of time. The chart above shows the intensity of changes in the policy area(s) under review as compared to the whole policy mix for innovation. Changes in the whole mapping are represented by the smallest, the largest and the average changes observed in all policy areas taken together.

Source: Based on EC/OECD (forthcoming), *International Database on STI Policies (STIP);* and Kergroach *et al.* (forthcoming-b).

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Recent policy attention has focused on **strengthening the research component** of clusters and the linkages with higher education institutions. Ireland recently launched the Higher Education Regional Clusters, which are part of the National Strategy for Higher Education to 2030 to foster collaboration between companies and universities and institutes of technology. Policies to promote stronger linkages between public sector research organisations and the business sector have been also developed in France, Germany, Ireland, Italy, Japan, Turkey and the UK.

Many OECD countries and a few non-members are emphasising policies to promote clusters that focus on **inter-disciplinary and cross-sectoral approaches**. Combining and linking different sectors is seen as an opportunity to promote cutting-edge research and innovation. Policies to promote clusters with a clear cross-sectoral focus have for example been developed in Colombia (notably in the field of biotechnology and agro-food), in France and in the Netherlands (where for instance Top Sectors are encouraged to include a cross-sectoral dimension).

References and further reading

EC (European Commission)/OECD (forthcoming), *International Science, Technology and Innovation Policies (STIP) Database*, editions 2014 and 2016, http://www.innovationpolicyplatform.org/sti-policy-database.

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